

Ecology, Culture and Development Gaddis and Pangwalas of Himachal Pradesh

Veena Bhasin, M.K. Bhasin and Indera P. Singh
Department of Anthropology, University of Delhi, Delhi 110 007, India

KEY WORDS Human Ecology. Himachal Pradesh. Transhumant. Gaddis. Pangwalas. Culture. Development.

ABSTRACT The present paper covers two tribes—Gaddis a transhumant group of Bharmour *Tehsil* and Pangwalas, a settled group of Pangi *Tehsil*, District Chamba, Himachal Pradesh. Both of these areas are isolated, therefore they lagged behind in social and economic progress. Planned economic development was adopted as our national policy soon after independence. But task of implementing the development programmes in tribal areas was much more difficult as these areas were with meagre communications and little institutional infrastructure. Therefore in 1954, Multi-purpose Tribal Development Blocks were started in the country. In Bharmour and Pangi *Tehsils* the programmes are provided for tribal welfare work by National Extension Service (NES) and by two Integrated Tribal Development Projects. These Community Development Programmes aim at economic development of rural villages, with emphasis on agriculture, and at the same time their aim at fundamental changes in the social life of villages. The impact of these development programmes in the two tribal groups has been discussed in the paper.

The most important mountainous region threatened with ecological disaster is the Himalayas. Step by step, nature is being destroyed and human, terrestrial and aquatic life are being shortened by the effects of development, in the form of landslides, sedimentation, the eutrophication of reservoirs, lakes and rivers, the drying-up of springs etc. The fast-growing population and the human aspirations for a better standard of living have increased pressure on the land. The felling of trees for timber, fuel, fodder, building construction, road construction, dams and canal construction and the development of sites has caused crop land to be seriously damaged and the vegetal cover of the ground has been destroyed.

The paramount importance of environmental protection and regeneration is recognized not only because the Himalayas are a source of water for irrigation and hydro-electricity, and of natural resources, but also because of their crucial importance for the survival and growth of the people living in the Himalayan region. In view of the need to balance economic development

with the imperatives of environmental conservation of mountain ecosystems, the protective, regeneration of resources and productive strategies should be visualized. The resource base has to be projected in all its aspects, namely soil, forest, water and other natural resources present in the ecosystem. The basic strategy should be development without destruction.

Development is difficult to describe or to measure, because it involves multi-dimensional qualitative changes and that too irreversibly large ones (Hicks, 1957). That is why development is more complex than growth which require merely incremental changes in quantity. In analytic terms, growth is a linear, marginal phenomenon while development is a non-linear process which stretches the economy beyond the elastic limit and bends it into a new shape altogether (Indiresen, 1990: p. 14). There are as yet no accepted standards for indicating the quality of development. In evolving development indicators, it is the usual practice to select significant consequences of development, such as literacy and infant mortality. The choice which set of factors con-

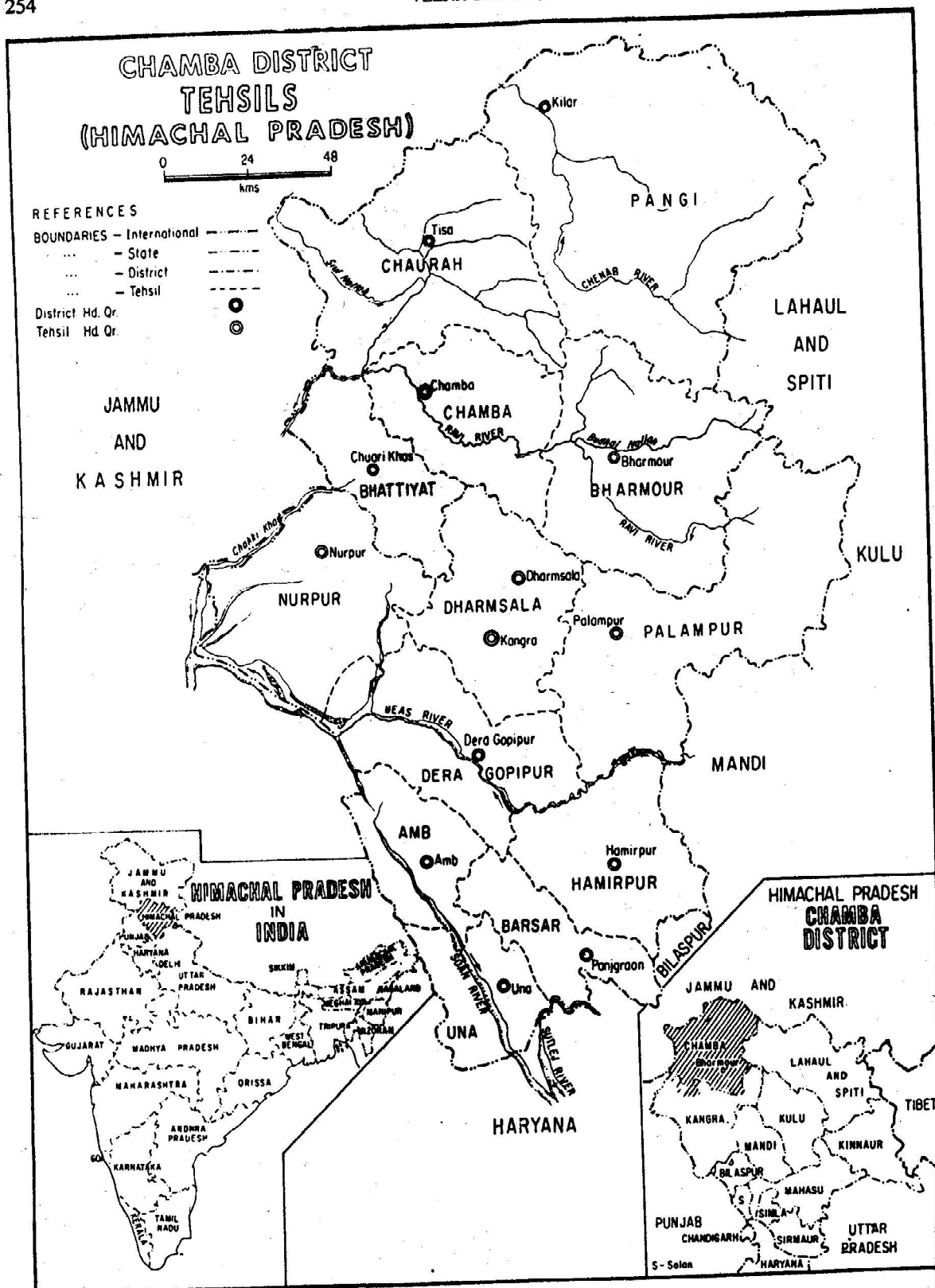


Fig. 1

stitute significant elements in development—is a subjective one. Gross National Produce (GNP) is a poor indicator of the status of development. Therefore, to GNP we add several other factors as well.

The ecological system, in the mountain region of the state of Himachal Pradesh is under great stress because of growing pressure from the human and livestock population. Forests are being destroyed, marginal lands are being cultivated and grasslands have disappeared. This depletion of forests has not only resulted from timber extraction only but with overgrazing too. Nowhere else in the Himalaya is the grazing economy more complex, or the ecological implication more critically important. Sedentary farmers at lower altitude maintain their own mixed livestock. Migratory Gujjar graziers from the plains below take their buffalo herds through the valleys of Himachal Pradesh on their routes to summer pastures every year. And most important, transhumant Gaddis who pursue large scale sheep and goat herding in the entire Himalayan region. The mountains of Himachal are supporting a complex interaction between sedentary agriculture and transhumant grazing. This traversing of mountains in these areas have been going on for centuries. Before independence British administrators and after independence state government has attempted to channelize and restrict grazing by laying down certain policies. "In the long run the interactions among regime, rural economy, and ecological base have produced a slow downward spiral which while depriving no one of subsistence, has not fully satisfied anyone" (Tucker, 1986: p. 18).

This paper cover two tribes (Gaddis and Pangwalas) of District Chamba, Himachal Pradesh (Fig. 1). Gaddis are transhumant, while Pangwalas are settled. Gaddis transhumance is materialized as a vertical movement with herders having a permanent base located at mid-altitude. Transhumant Gaddis residing in Mid-Himalayan zone spend summer in their permanent homes in Bharmour *Tehsil* and cultivate their lands, and in winter they migrate to lower hills along with their sheep and goat in and around Kangra Hills. In Pangi valley, the people do not migrate in winter months though the valley remains cov-

ered with snow for a period of about five months. For these five months, it remains cut off from the state as well as the country as the passes remain blocked with snow. As both these areas remained isolated, these lagged behind in social and economic progress. Planned economic development was adopted as our national policy soon after independence. The First Five Year plan was started in 1952. Fifty six Community Development Projects were established in the country in 1952 with the objectives of intensive development of selected areas. However, it became clear quite early that it would not be possible to cover the entire country by such an intensive effort in a reasonably short period. It was decided to adopt a comparatively less intensive and modest model of Community Development Blocks. National Extension Service was adopted as the instrument for rural development. Harmonious development of all facets of community life was envisaged as the main task in the programme. Since the Community Development Programme was comprehensive, it was equally applicable to the tribal areas. But the task of implementing in tribal areas was much more difficult. These areas are hilly with meagre communications and little institutional infrastructure. It was, therefore, decided to supplement the programme of Community Development in these areas. In 1954, Forty Three Special Multi-purpose Tribal Development Blocks were started in the country. On the eve of the Fifth Plan, a comprehensive programme of development was prepared, in the first stage, for areas of tribal concentration. All areas with more than 50 per cent tribal population have been treated as predominantly tribal areas. Separate plans have been prepared for these areas, which are known as 'tribal sub-plans'. A tribal development block has been taken as the smallest unit for inclusion in the new programme. A group of blocks, which generally comprise a *Tehsil*, has been taken as the basic unit of planning and development of the new tribal development programme. This unit is now known as Integrated Tribal Development Project (I.T.D.P.).

Out of the four sub-divisions of the Chamba District, the Pangi *Tehsil* and Bharmour *Tehsil* are the most backward. These two development project areas were demarcated in to two project

areas i.e. Sub-Project Bharmour and Sub-Project Pangi. The headquarter of Bharmour and Pangi project was at Chamba, the District headquarter. During 1979-80, Bharmour and Pangi Project was divided into two I.T.D.Ps viz. I.T.D.P. Bharmour and I.T.D.P. Pangi with their headquarters at Chamba and Kilar respectively.

The ecology, culture and development of the two above mentioned tribal areas of District Chamba, Himachal Pradesh in Western Himalayas forms the contents of this report starting with an overview of District Chamba, with a brief discussion of physical environment, socio-cultural environment of two tribal areas, land use patterns, population data, the constraints to development and an overview of the efforts made in the past in management of mountain ecosystem. It then briefly discusses by sectors the ecological aspects of various development issues and strategies, proposing their management in such a way that the development is consistent with the environmental requirements of the Himalayan ecosystem.

FIELD AREA

The field work for the present work was conducted between the year 1976-1979 in the two Tehsils—Pangi and Bharmour, in Chamba District, Himachal Pradesh (Fig. 1). Data were collected from all the 26 Panchayat circles in Bharmour Tehsil (Fig. 3) and 15 Panchayat circles in Pangi Tehsil (Fig. 4). Himachal Pradesh is bordered by Jammu and Kashmir in the north, Punjab in the west and southwest, Haryana in the south, Uttar Pradesh in the southeast and Tibet in the east. The state is therefore, strategically situated, being adjacent to China and Pakistan. It is situated between 30°-3'N and 65°-3'E. Its altitude ranging from 450-6700 metres above mean sea level.

The former princely State of Chamba is one of the thirty one mountainous States that merged in 1948 to form the Union Territory of Himachal Pradesh. To this were added the Punjab Districts of Kangra, Kulu and Lahaul-Spiti in 1967, almost doubling the size of the State. At present it is a compact territory of mountainous terrain with its capital at Shimla. The altitude in the Himachal

Pradesh ranges from 450 to 6700 metres with a little more than a third of the State 3050 metres.

Chamba district was formed as a separate administrative unit on the merger of the erstwhile State with Himachal Pradesh on the 15th April, 1948. At that time it had three Tehsils and two sub-Tehsils. Now the district comprises of five Tehsils and two sub-Tehsils. There are 5 urban units in the district. There have been some inner district as well as inter Tehsil changes in the district after 1971 Census. 118 villages of Pangi Tehsil were transferred to Lahaul and Spiti district. Two new sub-Tehsils viz. Saluni and Sihunta were created during the decade of 1971-81.

PHYSICAL FEATURES

The district is situated astride the main Himalayas, touching on the fringe at one corner a bit of Shivalik ranges, before the start of plains on the other side of the border. It is situated between north latitude 32°-10' and 33°-13' and east longitude 77°-55'. It is bounded by Jammu and Kashmir on the north-west and west by Ladakh area of Jammu and Kashmir State, Lahaul of Lahaul and Spiti district and Bara-Bhagal area of Kangra district on the north-east and on the south-east and south by the districts of Kangra and Gurdaspur of Punjab.

Configuration

The district is more or less rough, oblong in shape contracted towards the north. The entire district is mountainous with an altitude ranging from 610 metres to about 6400 metres above mean sea level. The habitable areas of the district are upto 3000 metres. There are three big valleys (i) Beas valley, (ii) Ravi valley or Chamba valley, and (iii) Chenab or Pangi-Chamba-Lahaul valleys. The valleys on the south-west of the district are fertile. In the lower areas of the Ravi or Chamba valley, vegetation is semi-tropical. At higher elevation *Pinus longifolia*, oak and chestnut are found. Above these birch and juniper occur. In this valley the villages are diminutive. In the villages up to an altitude of 2100 metres, two crops are grown while in the villages above 2100 metres only one crop is grown.

The region between Pangi and Zaskar ranges

comprise the valley of Chenab (Chandrabhaga). The Chandrabhaga flows at higher level than the Ravi. This valley is divided into two parts, Gurdhar and Pangi. The area is sparsely populated. Winter in Pangi and Lahaul is very severe and snowfall usually begins as early as October and entire valley remain under deep snow till March or April. Communications with the outside world are completely cut off.

Chamba district exhibits a pattern of vertical life zones, and these life zones are integrated by human in to resource exploitation strategies. In the Chamba there are three different geographic zones and four major ecological adaptations. Animal husbandry contributes to some extent to the economy of the households. The extent to which a family depends for its subsistence on livestock varies according to the locality. There are four human ecologies in Chamba District—sedentary farming and three types of transhumance. The traditional inhabitants of each of these exhibit differences in language, dress, religion and social organisation. There are seasonal fluctuations in the human and animal population composition of these zones. In Chamba, five distinct dialects of *Pahari*, namely *Chambiali* or *Chambiali*, *Gaddi* or *Bharmouri*, *Churahi*, *Bhattiyalli* and *Pangwali* are spoken. The district has an area of 6984.8 sq. km. and inhabited by 311147 persons (160752 males and 150395 females) [District Census Hand Book, Chamba District, 1981].

ECOLOGICAL ZONES IN CHAMBA DISTRICT

The habitable area of Chamba District is divided into three geographic zones, roughly separated by four mountain ranges: Hathi-Dhar, Dhaura Dhar, Pir Panjal or Pangi Range and Zaskar Range (Fig. 2). Within these geographical zones, human populations have different ecological adaptations ranging from sedentary farming to different kinds of transhumance (Table 1).

The villages in all the three zones are small, none having a population of more than one thousand, and most having populations of less than a hundred. The fields are invariably terraced, and the dwellings located very close to them. Almost ninety five per cent of the whole population in Chamba District owns all or most of the land it

cultivates. The remaining five per cent of the population is primarily engaged in non-agricultural pursuits. In Chamba town in 1960 only about seventeen per cent of the cultivated land was not cultivated by the owner. Much of this seventeen per cent land may have been owned by temples and since 1960 many tenant farmers have successfully claimed title to it. The main exportable commodities of the area are timber, corn, wool and woollen products, leather and more recently apples and seed potatoes.

Forests account for about twelve per cent of the whole of the Chamba District, and pastures 80.5 per cent. Net area sown is only five per cent and most of it is already being farmed (Statistical Abstract, District Chamba 1973-74). A considerable portion of the pasturable land is suitable for horticulture. The highest ratio of cultivated land to pasture land and forests lies in the south-west or outer zone and progressively decreases in the middle and the inner zones. In 1971, the population density for the entire district was 31 per sq. km.,¹ but in Bhattiyat Tehsil in south-west, the density was 98 per sq. km. In Bharmour and Churah, the density was 14 and 43 per sq. km. respectively. In contrast to this, the population density on agricultural land throughout the district, except in Bharmour is between 600 and 700 per sq. km. In Bharmour it is 800 per sq. km. uniformly. This may be due to the fact that in Bharmour there is a greater emphasis on sheep herding than elsewhere.

Some of the major ethnic groups in Chamba District such as Brahman, Rajput, Rana, Rathi and the Scheduled Castes are found throughout the district, while Scheduled Tribal groups like Gaddis, Gujjars, Pangwalas and Lahaulies are found in limited areas. All these groups are characterised by specific ecological adaptations as well as social organisation of the each region where they live.

ECOLOGICAL ADAPTATIONS AND THEIR DISTRIBUTIONS

There are four major adaptations in Chamba, none of which are totally independent of the others.

1. In 1981, the population density for entire district was 47 per sq. km. [District Census Hand Book, District Chamba 1981 (1985)].

Table 1: Geo-ecology and human adaptations in Chamba Distinct

<i>Geographic Zonal Habitable Altitude and Climate</i>	<i>Tehsil/ Sub-Tehsil</i>	<i>Human Adaptation</i>	<i>Crops Grown</i>	<i>Density per sq. km.</i>
<i>Inner Himalayan Zone 2000-3500 metres Temperate, Severe Winter</i>	Pangi	Dry Agriculture Transhumance, Sheep and Goat herding	Pulses, Coarse Cereals, Barley, Wheat, Maize, Potatoes	7
<i>Mid Himalayan Zone 1000-3000 metres Temperate, Cold to Severe Winter</i>	Bharmour, Northern Part of Churah	Dry Agriculture, Transhumance, Sheep and Goat herding by Gaddis, Buffalow herding by Gujjars Horticulture	Maize, Wheat, Barley, Pulses, Coarse Cereals	16
<i>Outer Himalayan Zone 600 to 2300 metres Temperate, Warm to Cold</i>	Chamba, Southern Churah, Bhattiyat	Wet and dry Agriculture, Sedentary Farming, Live-stock	Wet Rice, Maize, Wheat	118

1. transhumance based on buffalo herding without agriculture, practised by Muslim Gujjars in Churah and Bharmour;
2. transhumance based on goats and sheep with equal emphasis on agriculture, practised by the Gaddis and other residents of Bharmour;
3. transhumance based on cattle, sheep and goat but secondary to agriculture, practised by the people of northern Churah and Pangi;
4. sedentary farming with limited livestock raising practised by the people of Bhattiyat, Chamba and South-west Churah Tehsil.

In terms of ecological adaptations the two significant environmental factors are the availability of pastures in the 2000-3000 metres range and the severity of winter. Where high pastures are available, transhumance with or without agriculture becomes profitable, and where winters are severe it becomes necessary to retreat at that time or to limit the size of flocks.

From the development point of view the district is divided in to Chamba, Mehla, Tisa, Salooni, Bhattiyat Community Development (C.D.) Blocks and Bharmour and Pangi Tribal Development Blocks. In addition two Integrated

Tribal Development Programme (I.T.D.P.) projects viz. Bharmour and Pangi are functioning in Chamba.

BHARMOUR TEHSIL : DISTRICT CHAMBA

The Bharmour Tehsil lies approximately between the north latitude 32°-11' and 32°-41' and east longitude 76°-22' and 76°-53' (Fig. 3). The lowest altitude is about 1340 metres and the highest about 5900 metres above sea level (Fig. 6). This valley of Ravi is enclosed on the south by the lofty Dhaula Dhar, on the north by the Pir Panjal or the Pangi Range, on the east by an extension of the Dhaula Dhar which ultimately meets the Pir Panjal near Rohtang Pass. The valley extends towards the west via Chamba town. Bharmour Tehsil is remarkably mountainous, level and flat pieces of land are an exception. Cultivation ranges approximately between 1400 metres and 3700 metres. The slopes are considerably for the greater part, and in many places the slope is too steep for average agriculture. Because of the steepness of the slope in the rainy seasons, the good soil cover is lost and soil

conservation becomes a real hazard. Land sliding is a common feature in this area. The demarcated forests occur between 1850 metres and 2450 metres. The forests are often intersected with rocks and cliffs.

Bharmour *Tehsil*, with an area of 1818.3 sq. km. is inhabited by 29944 persons, out of which 3975 are Scheduled Castes and 24639 Scheduled Tribes. Density of population per sq. km. is 16 (District Census Hand Book, District Chamba 1981). Bharmour *Tehsil* is spread in to 251 villages. Out of which 112 are inhabited with 267 average number of persons per inhabited village. Roughly speaking, on the basis of the information available on the general geographical and economic condition of the people, the whole area of Bharmour *Tehsil* can be divided in to 5 valleys: Kugti valley, Tundah valley, Samra valley, Holi valley and Bharmour valley. The whole *Tehsil* is divided in to 26 *Panchayat* circles of about 51 sq. km. and an average population of 1040. Each circle is further divided into several villages. *Panchayats* are at three levels, *Gram Panchayat*, *Naib Panchayat* and *Tehsil Panchayat*. Within each *Panchayat* circle, there are several extension workers, village level workers (*Gram Sevek*), veterinary stock assistant, medical workers, trained midwife, one primary school teacher—for every 35 students, their official servants, peons since Circle now coincides with *Patwar* circle, there is also one revenue assistant (*Patwari*) who maintain land records, classifies newly developed land and determines the land revenue accordingly. There are 14 *Patwar* circles.

All these villages are inhabited by the trans-humant Gaddi population who spend their winters on lower hills and summers at higher elevations on *Dhars*. They maintain their permanent residence at mid-altitude. Agriculture and allied occupations such as sheep and goat rearing, weaving and spinning of wool etc. are main occupations of the people. The term Gaddi is a generic term and under it are included Brahman, Rajputs, Khattris, Thakurs and Rathis. They are Hindus and their ancestors migrated to this region because of Muslim persecution. Anthropologi-

cally, Gaddis can hardly be called a tribe. They have been declared as a tribe mainly for the purpose of development in view of their social and economic backwardness.

PANGI TEHSIL : DISTRICT CHAMBA

Pangi is situated in the north of the district and lies between north latitude 32°-15' and 77°-21'. The valley is bounded by Jammu and Kashmir including Zaskar in the north and north-west, by Lahual-Spiti district in the east and by Bharmour *Tehsil* and Churah *Tehsil* in the South (Fig. 4). The altitude ranges from 1500 to 6500 metres (Fig. 6) and the inhabited area upto 3500 metres. The climate in the valley is temperate in summer and semi-arctic in winter. Pangi *Tehsil* is divided into two parts by a spur of what is known as Gurdhar range. The western part of the *Tehsil* is known as Pangi of which the eastern part is known as Lahul (Chamba Lahaul).

The isolation of Pangi valley, which lies sandwiched between the heights of the Zaskar Range (average height 4500-5000 metres) and the Pangi range of mountains, is complete. For more than six months in a year the passes remain closed across which pedestrian traffic is sustained. The easiest approach from Chamba to Pangi is via Sach pass (4000 metres). Kilar is the headquarter of the *Tehsil* and is at a distance of 150 km. from Chamba, the District Headquarter (Fig. 5).

The total area of the *Tehsil* is 1653.7 sq. km. with a population of 12256 (Scheduled Castes 919 and Scheduled Tribes 11237). The density of population is 6 per sq. km. Pangi *Tehsil* is spread into 106 villages. Out of which 60 are inhabited with 204 average number of persons per inhabited village [District Census Hand Book, District Chamba 1981 (1985)].

Three main tribes, viz., Pangwalas, Bhots and Lahaulas inhabit the valley. The majority of the local population are Pangwalas. They are Hindus and their ancestors migrated to the valley due to Muslim and alien invasions. On higher altitude i.e. above 3000 metres live the Bhots, who are Buddhists by religion. They are more akin to Lahaulas except for their language. The main

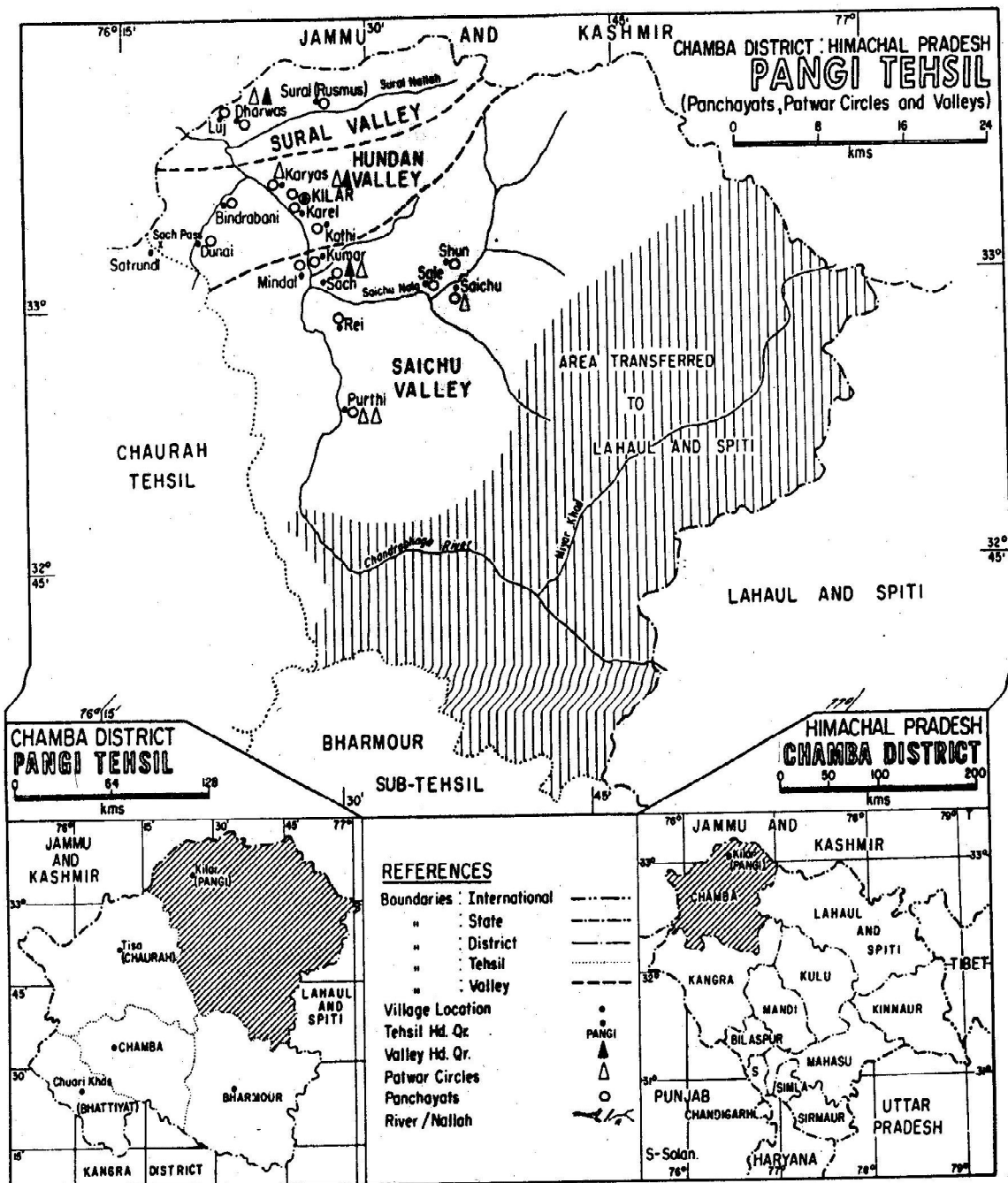


Fig. 4

occupation of the people in the valley is agriculture and the main subsidiary occupation is weaving and spinning. In some areas people were also found to be working as labourers in the construction work. People in Mear Nallah sub-valley are known as Lahaulas who are also Buddhists. They are more sturdy and economically well off as compared to Pangwalas and Bhots.

Pangi Tehsil with an area of 1653.7 sq. km. is divided into six *Panwar* circles having 15 *Gram Panchayats*. Each *Gram Panchayat* is further divided into several villages. Village is a distinct compact community having a name and well established territory.

Chenab (Chanderbhaba) river, which flows in to the valley from the Lahaul, runs through its whole length and divides it in to two parts. As a result, Sural, Hundun, Saichu and Mear Nallah (stream) which are major tributaries of the Chanderbhaba and flow across the valley, the Pangi valley stands divided in to Sural, Hundun, Saichu and Mear sub-valleys named after the streams.

CLIMATE

In Bharmour Tehsil, depending upon the altitude the climate varies a good deal. Taken as a whole, the climate is temperate with well marked seasons. The winter lasts from December to February (both inclusive) and is characterised by snowfall which is generally heavy and descends lower in the inner valleys. Higher still, semi arctic condition prevail along the main ranges and from November to March the passes are blocked with snow. The change-over from winter to summer is gradual.

The monsoon usually begins with spasmodic showers in June, sets in properly by the July, and continues till the middle or end of September. The average annual rainfall in Bharmour valley is 1264.4 mm. as shown in figure 6 (Working Plan for the Upper Ravi forests 1954-55 to 1968-69).

The Pangi valley lies in the semi-arid zone in the inner Himalayas, where monsoon rains seldom penetrate. The snowfall on the other hand

is heavy. Snow usually begins to fall on the passes in October and closes then early in November reaching lower altitudes by the middle of December. It begins to disappear in March although sometimes it snows in April also. The passes reopen in May, though the snow lasts on them till July and some of the higher elevations remain perpetually covered. The region on the whole is subjected to severe winters, heavy snowfall, strong winds and frequent avalanches, which are responsible for many landslips throughout the valley. There is only one rain guage in the Pangi valley located at Kilar. The average annual rainfall recorded during the last four years is 105 cm. and the average snow fall to 5.70 metres.

WATER SOURCES

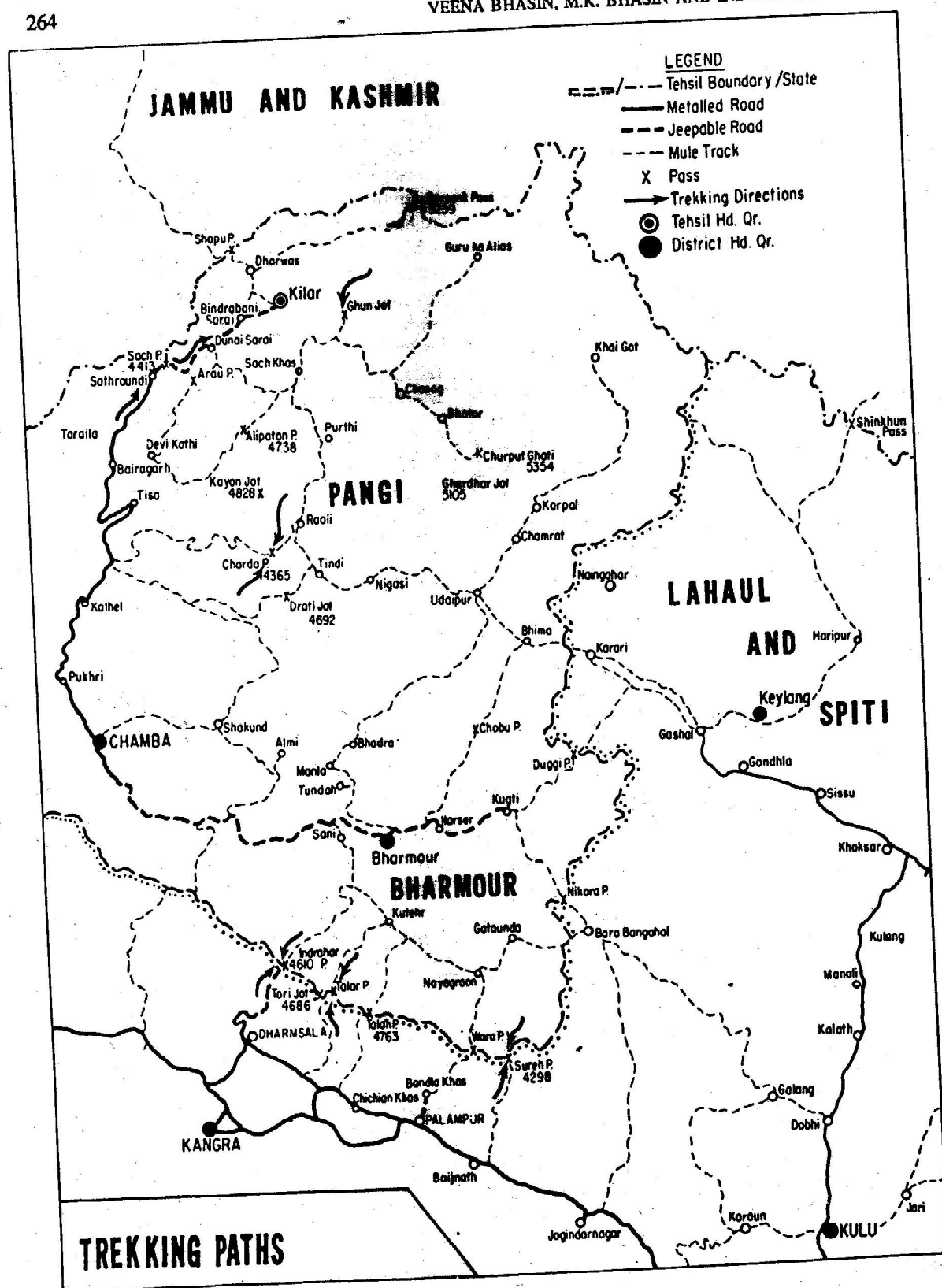
In both the *Tehsils*, the streams and rivers are mainly snowfed and receive large quantities of water from the melting of high-level snow during the hot weather. Perennial springs are also common. The water supply is ample, but in certain localities in Bharmour Tehsil, from where forests have denuded it becomes difficult to obtain an adequate supply of water, especially during the hot weather. Agricultural lands are mostly rainfed, but there is enough water to irrigate most of the fields where the gradient is moderate enough to allow it.

FORESTS

Forests occupy an important place in the life of Gaddis and Pangwalas. The forests in the area can be divided into four broad categories (Table 2).

Table 2: Categories of forests in Chamba District

Forests			
Unreserved		Reserved	
Demarcated Protected Forests (D.P.F.)	Undemarcated Protected Forests (U.P.P.)	Undemarcated Working Circle (U.W.C.)	Regular Working Circle (R.W.C.)



In all reserve forests (U.W.C. and R.W.C.) no villager becomes a right holder unless his forefathers were declared as such. Only those persons can inherit rights in such forests whose forefathers were given *Bartondari* rights in the forests.

Bharmour forest consists of 20476 hectares of land and permanent pastures and other grazing land area is 154695 hectares (Table 3).

The rights in all the reserve forests were settled between 1879 and 1882. They consist of grazing, collection of firewood, cutting grass and torchwood, looping oak trees for fodder and rights to way, etc. Rights to building timber are restricted to a few cases. Gaddis have occasionally been given privileges for temporary halting of their flocks during their march to and from Alpine pastures. In accordance with the forest settlement, one third of the area of any forest burdened with rights can be closed, for regenerating purposes, to the exercise of all such right and privileges.

Agriculture and allied occupations such as sheep rearing, weaving and spinning of wool, etc. are the main occupations of the people. Their wants with respect to agricultural purposes consist of mainly of wood for implements, lopping for fodder and litter, grazing and grass for their cattle. Timber is required for building of houses and fuel for domestic purposes. Consequently, the forests form an integral part of the economic fabric of this area. As the slopes are very steep and the terrain hilly, at higher altitudes, soil is very poor and stony and is not good for agriculture. So the size of the fields are very small and food produced here is not sufficient for the subsistence of the people. To compensate for the demographic pressures and to increase food production, clearing of vegetation in the area goes on and the perennial streams dry up soon after the rainy season. Once these streams dry up the shortage of drinking water is felt and women have to fetch the water from long distances. The forests of Bharmour may be broadly classified as given in figure 7 (Working Plan, Uppar Ravi Forests, 1961).

Pangi forest consists of 17193 hectares and permanent pastures and other grazing land is 139267 hectares (Table 3).

The Alpine pastures situated on the right bank of Chenab in the Pangi zone, popularly known as *Dhars* are traditionally grazed, free of charge, by the local inhabitants, flocks and cattle and no foreign graziers are allowed therein. The rest of the Alpine pastures, are annually sold for seasonal grazing (mid July to end September) on permit system to the sojourners shepherds on payment of prescribed fees. Notwithstanding the above the local people obtain permits for digging and collection of *Dhoop* and other valuable medicinal herbs on payment of nominal fees, as per provisions of the erstwhile Chamba State.

The Pangwalas are poor, illiterate and almost entirely agricultural. Almost every suitable piece of land outside the forest not required for village grazing, has been broken up for cultivation, so that waste lands are now very scarce. Only one rabi crop of wheat or barley (sown late in autumn and harvested in the following July and August) is possible to raise at the source of *Nallahas*; elsewhere two crop rotations are generally followed. Potatoes are also cultivated on a small scale to supplement the staple food supplies. A good deal of the grain produced locally is diverted to brewing of wine which is taken practically by everyone. After brewing, the fermented grain is made into balls, dried and eaten in winter.

Practically all the arable lands are now cultivated. They are hardly sufficient to support the present population, so that grain requirements are supplemented by mixing husk and leaves of *Pan* (*Tramaurus himalicus*). Roots of *Tilla* (*Aconitum violaceum*) are eaten *in situ* during June each year.

The cultivated fields are poorly terraced and, as such, whatever manure is put into the fields as also the valuable top soil, is frequently washed away during flood irrigation from the overhead *Kuhls*. To meet their manurial requirements the people rear a large number of cattle, which are stall fed during winter, but a major part of their droppings during summer is lost to the owners,

on account of loose grazing in the neighbouring forests. The comparatively poorer classes supplement their meagre income by collecting and selling minor forest produce like *Dhoop* and *Karu*. The medicinal herbs are commonly sold at Trella in exchange for other necessities of life. *Dhoop* is extracted from the hill-tops with a valid permit from the Divisional Forest Officer. The fee is Rs. 5/- for non-right holders and Re. 1/- from a right holder. The forests play an important part in the economy of the area. When extraction of timber is started in the surrounding forests these people find employment as unskilled labourers. The forests of Pangti division can be broadly classified as given in figure 7 (Working Plan, Pangti Forest Division, 1967).

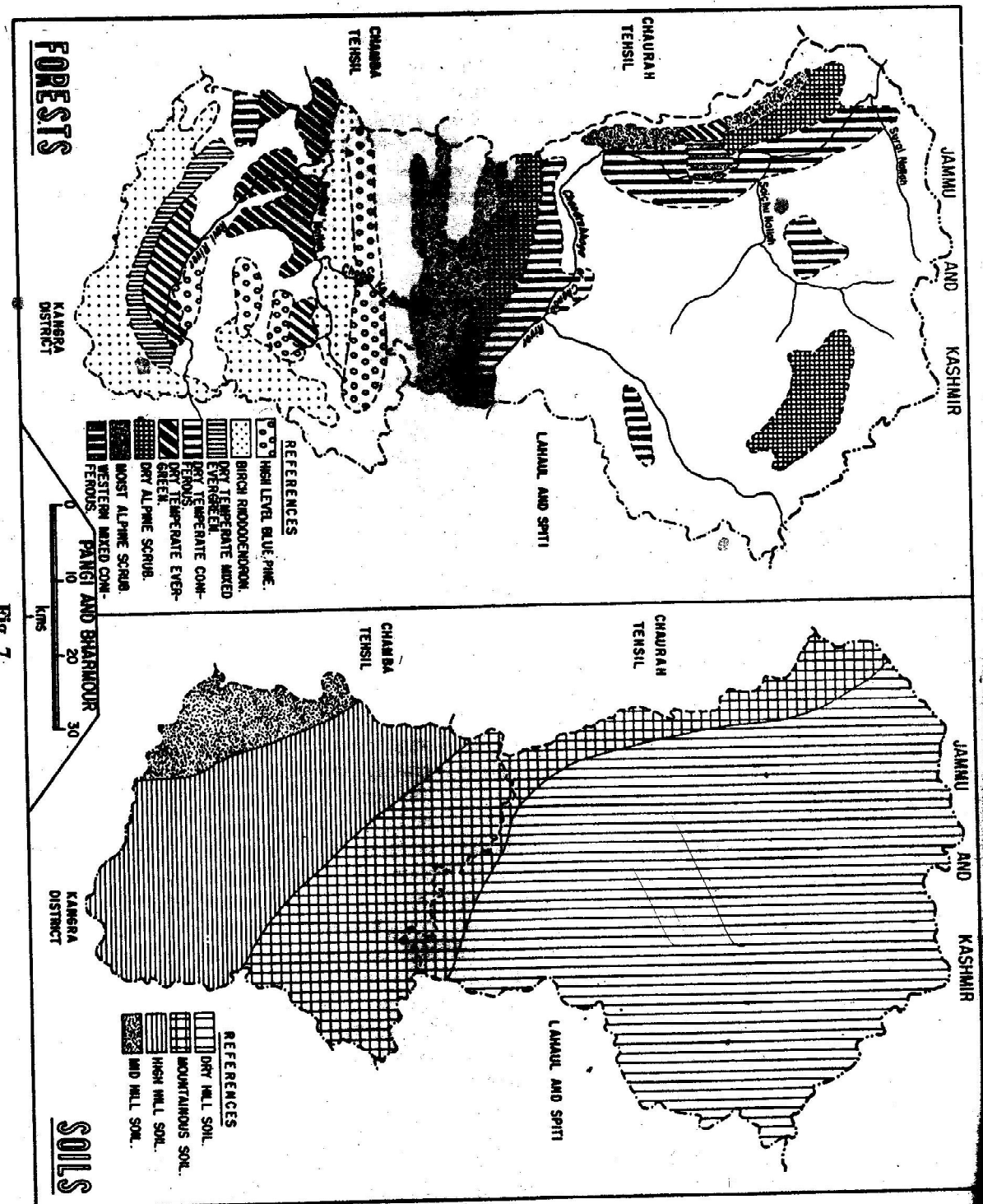
Deforestation

In Bharmour and Pangti, deforestation is caused by excessive lopping, cutting, grazing and clearing of land for economic activities. As Gaddis of Bharmour are sheep and goats breeders, grazing has become a major hazard in the area. These sheep and goat breeders are openly defying restrictions on grazing inside reserved forests. Under the rules framed under the Forests Act browsing by goats and sheep inside reserved forests or in any part of the protected forests is totally banned.

The rules provide for the issue of permits to professional graziers allowing them to take flocks of sheep and goats on payment of a fee for grazing inside certain areas of protected forests. Such permits are issued by divisional forest officials. Divisional forest officials are empowered to declare any forest area closed to grazing from time to time. There have been many instances of shepherds crossing the buffer zone to trespass into reserved forests with their sheep and goats. This unauthorised grazing has assumed alarming proportions posing a threat to the forest ecosystem. Some professional graziers have not even bothered to secure permits. Gaddis own large flocks, but they do not allow their flocks to be

enumerated correctly. They just want to evade full payment of grazing taxes and to keep the officers in the dark about the correct number of sheep. It is because of this difficulty that year to year the enumeration of their flocks did not show appreciable fluctuations. The natural desire of these people was to own as many animals as their fathers owned. If the father had three sons and owned hundred animals, the sons must have one hundred each inspite of the fact that the area for grazing remains the same. The tricks they adopt to evade correct enumerations are very strange. They dispose off as many sheep and goat as possible so that their flocks dwindle down to the minimum when they reach their villages. They do not cross the snow range by the pass adjacent to their own villages. They will not bring all their sheep and goats in one flock, would not graze them in a single flock, especially when they smell that some enumerator is nearby. When the flocks are enumerated in the higher hills or in the snowy passes the Gaddis will do their best to give incorrect figures. The interrelationship of the Gaddis of different parts of the district is also used by them as a garb to cover the correct enumeration figure.

The damage done to the forests and other vegetative growth, during the movements of these migratory flocks, from alpine pastures to winter grazing grounds and *vice-versa*, is tremendous. The almost total absence of undergrowth of natural regrowth in such forests, except in the areas under closures or duly fenced, clearly shows the incidence of heavy grazing done by the flocks. Apart from this deforestation is also being brought by commercial exploitation by outside contractors and entrepreneurs, who often devastate huge areas under government licence for quick profit oblivious to their long term impact. These enterprises are the biggest threat to the mountain ecosystem. An example of this type of forest cutting was observed on the Kharanukh-Bharmour Road, few kilometres from Bharmour, whole mountain side was cleared of the forest resulting in the loose sand and stones. Travelling is a hazard in these parts



as stones are always falling from above. In the rainy season, this stretch of road gets blocked for days together, thus isolating the region from Chamba or outside world.

In Pangi, villages still have adequate cultivation land, extensive wild lands, and the many domestic animals they support, sufficient firewood to allow animal manure to be used for fertilizer, consequently, it has an adequate level of productivity to support its population though at subsistence level. But all these are highly vulnerable to outside intervention and overexploitation by local population. Therefore, Pangwalas, like Gaddis face the threat of deforestation, consequently less resources, less productivity of land and disturbed environment to live in. They face this, as their forests are being cut off by outside contractors and by the encouragement of a cash economy in the region. As these activities will continue, the fertility of the land will decline and it will surpass the carrying capacity. Then there will be no resources left and people will have to depend on outside resources like importation of food. This will lead to total dependence on national world market conditions.

LAND UTILISATION

The land utilisation in table 3 shows that the total cropped area is quite small in comparison to the total geographical area in both the *Tehsils*. Net area sown is only 2.13 and 1.03 per cent in Bharmour and Pangi *Tehsil* respectively. Forest constitutes 13.10 per cent in Bharmour and 10.74 per cent in Pangi. Much of the land classified as pastures should be treated as waste land either because it is too steep or inaccessible or because it consists of out cropping of rocks. 104 villages of Bharmour *Tehsil* has a total land area of 350187.71 hectares. Of this, 29209.29 hectares or 8.34 per cent are cultivable without irrigation facilities. 60 villages of Pangi *Tehsil* put together have a total area of 42597 hectares. Of this, 17278 hectares or 40.56 per cent are cultivable and 99 hectares or 5.55 per cent of the

cultivable area have the irrigation facilities. Land under cultivation, permanent pastures and other grazing lands in Bharmour and Pangi *Tehsils* are given in tables 4 to 6. It can be seen from the tables 4 and 6 that in both Bharmour and Pangi *Tehsil* area sown has decreased in the last five years. The area under permanent pastures and other grazing land has shown a slight decrease in Bharmour *Tehsil* but there is an increase in Pangi *Tehsil* (Tables 5, 7). In Bharmour both

Table 5: Permanent pastures and other grazing land in Bharmour *Tehsil*

Year	Permanent pastures and other grazing land (Hectares)
1971-72	1,54,779
1972-73	1,54,778
1973-74	1,54,767
1974-75	1,54,770
1975-76	1,54,695
1977-78	1,54,723
1978-79	1,51,368
1979-80	1,51,343

Table 7: Permanent pastures and other grazing land in Pangi *Tehsil*

Year	Permanent pastures and other grazing land (Hectares)
1971-72*	3,17,114
1972-73*	3,17,148
1973-74*	3,17,197
1974-75**	1,39,939
1975-76**	1,39,940
1977-78	1,39,804
1978-79	1,39,262
1979-80	1,39,267

* Total Geographical Area = 3,56,804 Hectares (10 Patwar Circles)

** Total Geographical Area = 1,65,368 Hectares (6 Patwar Circles)

Source: 1. Statistical Abstract District Chamba 1973-74, 1975-76, 1981

2. District Land Records Office, Chamba

3. *Tehsildar* Office, Pangi *Tehsil*

Table 3 : Land utilisation in Bharmour and Pangl Tehsil, Chamba District (1979-80)

S. No.	Classification of area	Bharmour Tehsil		Pangi Tehsil	
		Hectares	Percentage	Hectares	Percentage
1.	Geographical area by village papers	1,81,833		1,65,368	
2.	Forests	23,812	13.10	17,193	10.74
3.	Not available for cultivation:				
	(i) Barren and unculturable land	280	0.15	684	0.43
	(ii) Land put to non-agricultural uses	1282	0.71	811	0.51
4.	Other uncultivated land excluding current fallows:				
	(i) Cultivable waste	450	0.25	80	0.05
	(ii) Permanent pastures and other grazing lands	1,51,343	83.23	1,39,267	87.02
	(iii) Land under miscellaneous tree crops and groves not included in net area sown	11			
5.	Fallow land:				
	(i) Current fallows	718	0.39	366	0.23
	(ii) Other fallows	59	0.03	2	
6.	Net area sown	3,878	2.13	1,644	1.03
7.	Area sown more than once	1,561		657	
8.	Total cropped area	5,439		2,301	

Source : Statistical Abstract, Chamba District, 1981

Table 4: Land under cultivation in Bharmour Tehsil, Chamba District

Year	Put to non-agricultural use	Cultivable waste	Fallow land	Net area sown	Area sown more than once to net area sown	Total cropped area
1971-72	1,279	473	534	4,017	1,555	5,572
1972-73	1,194	477	581	4,015	1,272	5,287
1973-74	1,193	479	519	4,037	1,533	5,570
1974-75	1,193	473	607	3,946	1,538	5,484
1975-76	1,199	529	577	3,981	1,551	5,532
1977-78	1,281	467	487	4,106	1,323	5,429
1978-79	1,280	446	530	4,105	1,482	5,587
1979-80	1,282	450	777	3,878	1,561	5,439

Table 6: Land under cultivation in Pangl Tehsil, Chamba District

Year	Put to non-agricultural use	Cultivable waste	Fallow land	Net area sown	Area sown more than once to net area sown	Total cropped area
1971-72*	2714	118	425	1,996	956	2,952
1972-73*	2158	118	344	2,037	973	3,010
1973-74*	2142	117	340	2,091	887	2,978
1974-75**	778	101	309	1,671	1,001	2,672
1975-76**	822	97	276	1,703	724	2,427
1977-78**	922	89	362	1,650	181	1,831
1978-79**	809	79	410	1,600	625	2,225
1979-80**	811	80	368	1,644	657	2,301

* Total Geographical Area = 3,56,804 Hectares (10 Patwar Circles)

** Total Geographical Area = 1,65,368 Hectares (6 Patwar Circles)

culturable waste land and fallow land has increased, while in Pangli it is showing a decreasing trend. In Pangli more land is being brought under plough because of population pressure. Cultivation of land for raising fodder crop has been unknown. General shortage of cultivable land and the availability of pastures in the State waste, wooded pastures in Government Land Settlement records has curbed the need for fodder crop.

At present the main sources of fodder are hay made out of the grass growing on the *Ghasnis* (privately owned or occupied grasslands), stalks of maize, chaff of wheat and pulses and foliage of trees which either on the land of cultivators or in the State wastes and are lopped, as and when necessary. The quantity available from all above sources is inadequate. The pressure on the grazing lands is heavy because of large flocks of Gaddis, erosion has spoiled pastures also and thirdly intense cold renders all alpine pasture inaccessible for considerable period. The system of stall feeding has still not taken its roots in Bharmour.

COMMUNICATION

The *Tehsils* of Bharmour and Pangli are highly inaccessible to surface roads. Bharmour lies 64 km. from Chamba. The 50 km. long Chamba-Kharamukh road is motorable, single lane and fit for heavy vehicular traffic. From Kharamukh to Bharmour, the journey was by a 14 km. long road, which is mostly under construction. It was valuable mostly to officials or travellers. It was of little importance to the villagers since they still walk. Winter snows, summer rains, land slides, fallen rocks and collapse of some weak sections prevent the road from being open more than a few months of the year. Almost at the end of road was Bharmour the headquarters of the *Panchayat*. Due to difficult terrain, the transport and communication are very few. People use suspension bindges, *trangaries* and ropes to cross the rivers.

To reach Pangli is a still more difficult. People

have to walk from Tisa onwards. Because of the difficult hilly terrain, the only means of transportation available are human labour, mules, sheep and goats. The conditions of the paths is not very satisfactory. The journey is on foot and it takes three to four days to reach Kilar, the block headquarters.

Generally three routes are followed one from Chamba, the other from Kishtwar in Jammu and Kashmir, and third from Trilokinath near the Rohtang Pass. Of all the three, the route from Chamba, which remain open during the summer months from June onwards is used commonly. The last bus terminus is Tisa at a distance of 70 km. from Chamba. From Tisa a 18 km. bridle path runs up to Tarela. Tarela is the base business centre for supply of commodities to Pangli. The journey is performed on foot and the goods are carried on mules. Starting from Tarela the first halt is at Bhanodi at a distance of 10 km at a height of 2400 metres, the next halt is at Satrundi at 3500 metres. It is also the base camp for the Sach Pass ascent, which is at a distance of 5 km. After crossing the Sach Pass, the onward journey is mostly in steep descents.

POPULATION OF BHARMOUR AND PANGI TEHSIL

According to the Census of 1981, the Bharmour *Tehsil* is inhabited by 29944 persons, 16012 males and 13932 females (in 1971, there were 27067 person in Bharmour *Tehsil*). The Pangli *Tehsil*, is inhabited by 12250 persons, out of which 6401 are males and 5855 females (in 1971 there were 9794 persons in Pangli *Tehsil*). In the both the *Tehsils* there is less concentration of Scheduled Castes as compared to Scheduled Tribes. Pangli and Bharmour *Tehsils* are tribal belts of the district. In Bharmour, the Scheduled Tribes constitute 82.28 per cent of the total population, while in Pangli the tribal population is 87.89 per cent of the total population. Literacy rate is low in both the *Tehsils*. In Bharmour *Tehsil*, the total literacy rate comes to 22.50 per cent, male literacy being 34.21 per cent and

females 9.03 per cent (Table 8). In Pangi *Tehsil*, the literacy rate is still lower being 19.58 per cent, male literacy rate in Pangi being 32.10 per cent and 5.81 per cent among females (District Census Hand Book, District Chamba, 1971, 1981). The classification of workers (Census, 1981) in Bharmour and Pangi *Tehsils* given on table 9 shows that the most of the persons are cultivators followed by other workers.

FACILITIES AVAILABLE IN THE *TEHSILS*

In Bharmour *Tehsil* out of 104 inhabited villages, 73 villages constituting 70.19 per cent of the total number of villages in *Tehsil* covering a population of 26078 (87.09 per cent) have been covered under the educational facilities of one type or the other. There are 77 primary schools, 9 middle schools and five high schools in 73 villages, while remaining villages have no education facilities in the village itself. Students have to walk between two to four kilometres to avail education facility.

In Pangi *Tehsil*, 36 villages out of 60 inhabited villages, covering a population of 70.81 per cent have educational institutions of one type or the other. There are 34 primary schools, 3 middle schools, 3 high schools and one another type of educational institution in the Pangi *Tehsil*. There are 24 villages in the *Tehsil*, where there are no educational facilities available.

There is one hospital, two primary health sub-centres and nine dispensaries in Bharmour *Tehsil* which cater to the need of the 40.26 per cent of the total population. 28 villages have only health workers to cater to their needs.

In Pangi *Tehsil* there are 4 dispensaries, one hospital and three primary health sub-centres catering to the need of only 16.11 per cent population.

All the villages in the Bharmour have drinking water facility. 55 villages have tap as the drinking water source, 18 villages depend upon river water and other villages have more than one source of drinking water.

In Pangi, since most of the villages are situated at places where natural water supply is available, there is no shortage of drinking water. All the 60 villages are covered under the drinking water supply scheme.

21 villages of Bharmour *Tehsil* have post office facilities, while only one village has both post and telegraph facility. Ways and mean of communication are so poor, that only eight villages have bus stops. There are no motorable *pucca* roads in the *Tehsil*. Electricity for domestic purposes has been given to 39 villages in the *Tehsil* till March 1982.

In Pangi *Tehsil*, only nine villages covering a population of 2994 (24.43 per cent) have the post and telegraph facilities. There is not even a single village in Pangi *Tehsil* connected by bus. No village in the Pangi has been electrified.

HOUSINGS

Most of the houses in both the *Tehsils* are semi *pucca* and double storeyed. In Bharmour, the lower storey consists of *Obra* for keeping cattle and agricultural implements. In Pangi too the upper storey is used for living as well as for cooking purposes. The lower portion is used for keeping animals and keeping fodder, fuel etc. However during months when it snows heavily, the ground floor is also used for living purposes, thus sharing it with animals. The general condition of the dwellings however is not satisfactory. There is no proper ventilation arrangement. The houses are mostly without separate bathroom or laterines. Most of the material used for house construction is available locally.

ECONOMIC PURSUITS

Land, live-stock and considerable knowledge of the skills necessary to exploit them effectively are the principal economic resources of the Bharmour *Tehsil*. Supplementary but nonetheless of considerable importance, is the income from non-traditional sources. The economy of the Bharmour *Tehsil* is agro-pastoral. Although

Table 8: Area, revenue villages and population of Bharmour and Pangi Tehsils

S. No.	Particulars	Bharmour Tehsil		Pangi Tehsil	
		1971	1981	1971	1981
1.	Area (sq. km.)	1818.3	1818.3	1,653.7	1,653.7
2.	No. of Revenue Villages	251	252	106	106
3.	Inhabited	112	104	61	60
4.	No. of Occupied Residential Houses	4,521	5,360	N.A.	1,913
5.	No. of Households	5,155	5,946	N.A.	1,951
6.	Population:				
	Male	14,367	16,012	4,996	6,401
	Female	12,700	14,367	4,798	5,855
	Total	27,067	29,944	9,794	12,256
7.	No. of Females per 1000 Males	884	870	961	
8.	Density (per sq. km.)	15	16	6	
9.	Scheduled Castes	3,599	3,975	629	919
10.	Scheduled Tribes	19,809	24,639	8,978	10,772
11.	Literate Persons:				
	Male	2,621	5,479	913	2,060
	Female	230	1,258	79	340
	Total	2,851	6,737	992	2,400

N.A. = Not available

Source: District Census Handbook, District Chamba 1971 (1975)
District Census Hand Book, District Chamba 1981 (1985)
Statistical Abstract of Chamba District, 1975-76, 1981

Table 9: Classification of workers-1981 Bharmour and Pangi Tehsils

S. No.	Particulars	Bharmour Tehsil		Pangi Tehsil	
		Male	Female	Male	Female
1.	Cultivators	5,051	1,062	2,763	2,668
2.	Agricultural labourers	178	34	3	5
3.	Household industry, manufacturing, processing, servicing and repairs	157	32	8	1
4.	Other Workers (who work in field of economic activities other than cultivation)	3,597	186	911	74
Total Main Workers		8,983	1,314	3,685	2,748
5.	Marginal Workers (A person who has worked for less than six months or 183 days)	442	4,036	217	533
6.	Non-Workers (A person who has not worked at all during the preceding one year from the date enumeration)	6,587	8,582	2,499	2,574

Source: District Census Handbook, Chamba District 1981 (1985)

agriculture provides the bulk of the staple food, Gaddis themselves give major importance to sheep and goat rearing. From this source they obtain additional food in the form of meat and milk and wool for clothing. Due to heavy snow fall for about three to four months during winter, the Gaddis generally migrate to lower hills and plains along with their flocks of sheep and goats. During this period the main source of livelihood is sale of wool and employment of their children and women as domestic servants. A small percentage of population is left behind to look after the cattle and fields and spinning and weaving of woollens. The migration is necessitated because the pastoral and grazing lands are covered with snow, and it is difficult to maintain the large number of sheep and goats, and secondly, for the selling of raw wool which is available in large quantities without market facilities. Other secondary traditional pursuits in the area are collecting minor forest produce, various kinds of household industries such as spinning and weaving, tailoring and beekeeping, and specialised occupations such as carpentry, iron-smithery, medicine, religions and para-religious activities. More recently, the increase in mercantile and government activity has created new sources of income in transport, road building, construction, whole-selling and retailing. Horticulture, while not yet significant, may become a major source of income in the coming years. The type of soils found in Bharmour Tehsil are Mid hill soils, High hill soils, Mountain soils and Dry hill soils (Fig. 7). The mid-hill soils are good for wheat and maize crop. The high hill soils are suitable for growing potatoes and fruits. Mountainous soil is not suitable for any cultivation.

In Pangi Tehsil, the agriculture is the mainstay of the peoples the bulk of the population depends directly or indirectly on agriculture for their livelihood. Owing to heavy snowfall during winter, the agricultural operation remains suspended for that period. In the Mear Nallah sub-valley, however, people were working as construction labourers. The main subsidiary occupation of people of Pangi Tehsil is spinning and weaving. Generally, the inhabitants of Pangi do

not migrate because of severe snow-fall except in few places. In Sural Nallah and Hundan Nallah sub-valleys some people do migrate on account of better accessibility to adjoining areas of Chamba and Churah Tehsil. Majority of this migratory population works as labourers and domestic servants during this period. The non-migratory population engages itself in spinning and weaving during the winter months.

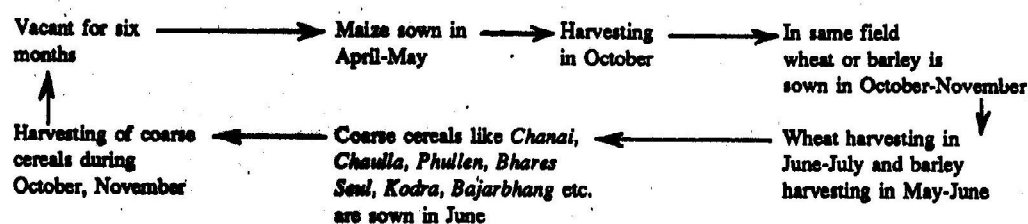
AGRICULTURE

Cropping Pattern

In Bharmour, dry terrace cultivation, carried out on steep hill slopes, produces two crops each year. The *Kharif* (summer), crops are sown from April to June and harvested from August to October. The *Rabi* (winter) crops are sown in October and November and harvested in May and June. The main *Kharif* crop is maize and other coarse cereals grown throughout the district. Other *Kharif* crops are pulses, potatoes, tobacco, beans, *Gadholi* (Pumpkin) and cucumber. The main *Rabi* crops are wheat, barley and oil seed (Fig. 8). Where the soil is too bad to grow these crops, coarse cereals like *Phullen* and *Bhars* (*Phaseolus aureus*); *Kodra* or *Ragi* (*Eleusine coracana*); *Chanai* (*Cicer anentum* Linn); *Chaula* (*Casania elliptica* wild); *Seul* (*Xylasoma Longifolium* clas); *Koni* (*Baeobotrys indica* Roxb); *Bajarbhang* (*Ocimum ocimides* Linn) are grown instead.

The sowing period of maize crop is from end of April to the beginning of May. The harvesting period is middle of October. After maize has been harvested wheat or barley is sown in the same fields. Corresponding to the harvesting of maize, the sowing of wheat or barley is begin in the uppermost fields and then gradually advance downwards to the lower fields. The sowing period of wheat or barley is from October-November and harvesting period of wheat is from June-July and barley is May-June. After wheat or barley has been harvested, coarse cereals are sown in the same fields, and harvested during October-November. Area under principal crops in Bharmour Tehsil is given in figure 8 (Table 10).

CROPPING PATTERN IN BHARMOUR



The important crop rotations followed in Bharmour Tehsil are:

- (i) Maize followed by wheat or barley,
- (ii) Chanai followed by wheat,
- (iii) Barley followed by Mash (Pulses),
- (iv) Wheat followed by Chanai or Pullen or Bhares or Seul, and
- (v) Maize followed by Musur (Pulses).

To make maximum use of land different crops are grown in one piece of land. The important crop mixture grown in three Bharmour sub-valleys are as follows:

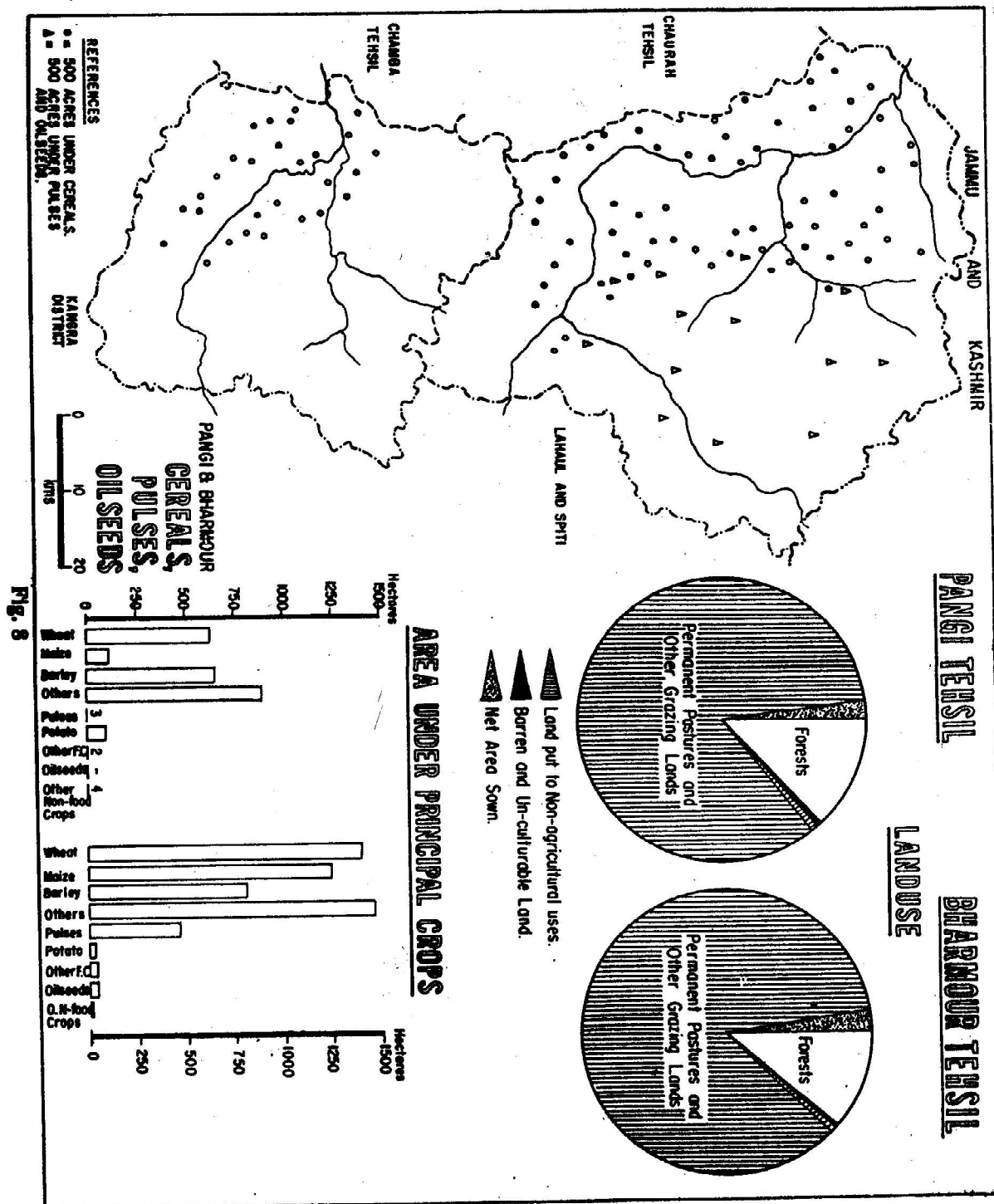
1. Tundan subvalley: Maize and Mash; Maize and Rong and Gandholi (vegetables), Chanai and Mash, Wheat and Masur and Mash and Seul;
2. Kugti sub-valley: Maize and Seul, French beans, Rong, Chaula and Maize, Phullen and

Table 10: Area under principle crops in Bharmour Tehsil.

S. No.	Crop	Area (Hectares)							
		1971-72	1972-73	1973-74	1974-75	1975-76	1977-78	1978-79	1979-80
A. FOOD CROPS									
I. Cereals									
1.	Wheat	1,456	1,421	1,397	1,343	1,405	1,418	1,448	1,259
2.	Barley	845	878	878	786	813	747	776	834
3.	Maize	1,276	1,185	1,304	1,255	1,253	1,165	1,250	1,341
4.	Other	1,531	1,365	1,452	1,532	1,473	1,431	1,327	1,231
Total Cereals		5,108	4,849	5,031	4,916	4,944	4,761	4,801	4,665
II. Pulses									
		378	383	439	481	470	554	656	632
III. Other Crops									
1.	Potato	25	30	29	33	32	32	50	45
2.	Other Food Crops	26	10	32	29	36	25	34	70
B. NON-FOOD CROPS									
1.	Oil Seed	27	27	30	13	39	43	36	20
2.	Other Non-food crops	8	8	9	12	11	14	10	8
Total Food Crops		5,537	5,272	5,531	5,459	5,482	5,372	5,541	5,367
Total Non-food Crops		35	35	39	25	50	57	46	28
Total All Crops		5,572	5,307	5,570	5,484	5,532	5,429	5,587	5,395

Total Geographical Area= 1,81,832 Hectares

Source: Statistical Abstract, District Chamba 1973-74, 1975-76, 1981. District Land Records Office, Chamba. Block Development Office (B.D.O.) and Tehsildar Office, Bharmour Tehsil



Bhares and Wheat and *Mash*;

3. *Holi Subvalley*: *Mash* and *Rong*, *Chanai* and *Mash* and *Mash*, Maize and *Rong* (*Mash*, *Rong* and *Masur* are pulses).

In *Pangi Tehsil* the important cereals grown are barley (including *Ailo*—a special variety of barley used for wine preparation), wheat and maize (Fig. 8). Among important cash crops are potatoes, *Kuth* and tobacco. Whereas, barley, wheat, potatoes, tobacco and millets are grown throughout the *Tehsil*, maize is grown only in the *Saichu Nallah* and *Mear Nallah* subvalley. Like *Bharmour*, in *Pangi* also there are two cropping seasons *Kharif* and *Rabi*. Due to the severe winters and heavy snowfall, *Pangwalas* get most of their produce in *Kharif* crops and less in *Rabi* crops. *Kharif* crops grown in the *Tehsil* are Maize, *Chanai*, *Bhares*, *Seul*, *Phullen*, Tobacco, Potatoes and *Kodra*. The *Rabi* crops grown in

Pangi are wheat, barley and *Ailo*. *Kharif* is the principal crop season and in only about 19 per cent of the cultivated area, two crops are raised. The *Kharif* crops are sown in April-May and harvested in October-November. The *Rabi* crops are sown in November and harvested in June-July. The potatoes are grown in lines where as sowing of barley, wheat, maize and millets is by broadcast. Area under principal crops in *Pangi Tehsil* is given in table 11. The main crop rotations practised are barley followed by millets in the *Sural Nallah* sub-valley. Wheat and barley followed by *Cholai* (a type of spinach) and *Phullen* in *Mear Nallah* sub-valley.

Crop-mixing is practised only in *Hundan Nallah* sub-valley. The important crop mixtures are:

- (i) Maize and beans;
- (ii) Wheat and barley; and
- (iii) Potatoes and vegetable.

Table 11: Area under principal crops in *Pangi Tehsil*

S. No.	Crop	Area (Hectares)							
		1971-72*	1972-73*	1973-74*	1974-75**	1975-76**	1977-78**	1978-79**	1979-80**
A. FOOD CROPS									
I. Cereals									
1.	Wheat	935	771	720	601	634	527	623	668
2.	Barley	676	872	864	665	659	463	332	397
3.	Maize	65	74	82	106	121	103	144	190
4.	Other	1,116	1,138	1,157	1,130	902	667	1,013	926
Total Cereals		2,792	2,855	2,823	2,502	2,316	1,760	2,112	2,181
II. Pulses									
		1	2	1	1	3	1	4	1
III. Other Crops									
1.	Potato	111	113	121	143	102	69	103	112
2.	Other Food Crops	12	8	5	8	2	-	3	3
B. NON-FOOD CROPS									
1.	Oil Seed	6	1	4	-	-	-	-	-
2.	Other Non-food crops	30	31	24	18	4	1	2	4
Total Food Crops		2,916	2,978	2,950	2,654	2,423	1,830	2,222	2,297
Total Non-food Crops		36	32	28	18	4	1	2	4
Total All Crops		2,952	3,010	2,978	2,672	2,427	1,831	2,223	2,301

* Total Geographical Area = 3,56,804 Hectares (10 Patwar Circles)

** Total Geographical Area = 1,65,368 Hectares (6 Patwar Circles)

Source: Statistical Abstract, District Chamba 1973-74, 1975-76, 1981. District Land Records Office, Chamba. Block Development Office (B.D.O.) and *Tehsildar* Office, *Pangi Tehsil*

In Bharmour, maize is the staple diet. There is no doubt that a much larger population base can be supported on maize than on wheat and barley in the Himalayas, using traditional agricultural methods. Although there has been a sharp increase in wheat production in the district between 1951 and 1960 as a result of improved seeds and greater use of chemical fertiliser, in 1951 the yield per acre of maize in Chamba District was twice the yield per acre of wheat or barley (H.P., 1967: 261). However, on plots sampled by the government in Bharmour, the yield per acre of maize was as much as six-times as that of wheat and barley in 1960 (Ibid : 274-5).

In Pangi, wheat is extensively used for purposes of food. *Chukri* is mixed with wheat flour. Out of *Ailo* and barley a portion is left for extraction of wine. When the brew ferments, the liquor is distilled. The dried up remnants, are again ground into flour and used as such. In case fermentation is not successful, the mixture is thoroughly stirred and consumed in raw form. This mixture is known as *Lugri*. Along with liquor people take boiled meat or potatoes or dried and baked *Ailo* called *Khalo*. People keep meat for drying during October or November and use the same in winter.

Although the use of manures and chemical fertilisers, is very essential for quick result in the agriculture production, yet use of chemical fertilisers in Bharmour and Pangi is very limited due to (i) non-availability of these fertilisers in sufficient quantities, (ii) lack of irrigation facilities, (iii) high cost of transportation and (iv) ignorance of the people. The few people who can afford chemical fertilisers only apply fertilisers to wheat as the crop remains under snow soon after sowing and application of fertilisers, thereby making up for the deficiency of irrigation. People in the Mear *Nallah* sub-valley in Pangi *Tehsil* have started using urea for manuring their *Kuth* fields by obtaining it from the Lahaul at exorbitant rates.

Gaddis have their own system of manuring the crops: (i) Cow dung from the sheds, pens and camps of livestock is brought and spread on the

fields before ploughing, (ii) the litter for the livestock (leaves and grass) used as bedding of the livestock is collected periodically and taken to fields and thirdly, the Gaddi traditional custom *Goth* where shepherd with their flocks spend sometimes in the fields of farmers for manuring the field. This *Goth* custom was important enough to be taken in to consideration in the assessment report of land settlement. These traditional practices continue unchanged, the only improvement introduced being coverage in case of rain.

A great deal of the value of this sort of manure is lost however, as the manure for the summer crops is laid on the ground just before the snow falls and the manure for the autumn crop is laid on the ground without the addition of any dried vegetable matter so that it cannot form a compost. Although there is a large live-stock wealth and plenty of organic material (from shrubs, leaves, grass) in Bharmour which when mixed and preserved in pits for a specified period can serve an effective substitute for nitrogenous fertilisers, yet no such substitutes are prepared. In Bharmour, there is a practice of grazing the livestock in the open and therefore most of the dung and urine which is possible to be used as manure is wasted. Whatever manure is available during the nights is preserved on the surface and therefore has poorer nitrogenous contents as compared to the Farm yard Manure preserved in pits. The know-how for preparation of organic manure has not been demonstrated by the Block Authorities and as a result it remains unutilised.

In Pangi also the local manure is generally preserved on the surface and only 20 to 25 per cent is preserved in pits. Most of the manure is applied before sowing, but in some cases, small doses are also applied soon after the sowing. The dose of manure varies between 5 to 10 *maunds* per acre for millet and 50 to 60 *maunds* per acre for wheat, barley and potatoes.

Seeds

The main source for the supply of seeds is the

farmer's own produce in Bharmour and Pangi. Limited quantities of seeds of wheat have also been supplied by the block agency in the Sural and Hundan Nallah sub-valleys and the N.P. 707, 770, 792 and 809 variety of improved seed are becoming increasingly popular among the farmers. Accordingly, the possibility of setting up seed multiplication forms at suitable places in the sub-valleys for the supply and propagation of improved seeds need to be explored.

Irrigation

Due to the peculiar topography of Bharmour area, the ample water available for irrigation from perennial snow-fed streams is not being utilized. Water flows in abundance in this valley, but the gorges are so deep that no economic channels for irrigation have been taken out. Out of the total cultivable area only 5 hectares have facilities for irrigation. In Pangi, however 513 hectares are provided with irrigation facilities (Table 12).

Table 12: Net area under Irrigation (in Hectares)

Year	Bharmour Tehsil	Pangi Tehsil
1973-74	-	969
1974-75	5	968
1975-76	5	665
1977-78	5	513
1978-79	5	513
1979-80	5	513

Source: District Land Records Office, Chamba

Agricultural Implements

No improved agricultural implements have so far been introduced in Bharmour and Pangi. Commonly used implements are wooden ploughs, sickle and *Kudal*. In Bharmour, the only digging implements are the metal tipped plough and various sized hoes. Both sexes can use all these implements except the plough, which can only be used by a male, the reason apparently

being that an impure woman might offend the earth by cutting it up. The major cereal processing tools are water mills or *Gharats*. Perhaps the most important feature of the list of agricultural implements is the omissions especially of any wheels (except the circular quern) or of any tools utilising animal powers except plough. In every sphere the consumption of labour is increased by the absence of tools. Transportation of manure, fodder and cereals is carried by human beings. The precipitous hillsides are cultivated with extremely light and simple tools, that gives great flexibility since they may be adapted to work on different crops at different altitudes. Most of the tools are multi-purpose one. The storage system for grains, is large containers made of wooden planks joined together.

Agriculture work in a Bharmour village is very arduous. Adult labour is insufficient as men are on pastoral duties. Men and women are busy throughout the year. Their life is harsh and unrewarding. The hillsides are extremely steep and rocky so that communications are still primitive, almost all travels is done on foot. Almost every thing is carried on human back.

Agricultural Operation

Men, women and children work jointly in the field all over the Bharmour and Pangi valley. The agricultural operations carried on by men are tillage, sowing and harvesting. Women play an important role in the conduct of weeding, harvesting and thrashing operations. Children also render considerable assistance in thrashing the produce and in carrying it to homes. The farmers are mostly owner, cultivators of small holdings. The earning from agriculture are generally low and it does not pay to hire labour for assistance. Generally, cultivators render mutual help to each other in various agricultural operations during the peak season. The farmers in whose fields work is to be done by others stands the day's meals. However, if labourers are employed, then they are paid in kind. The commodities thus

bartered in exchange for money are maize, millets and pulses etc.

The rentier class is conspicuous by its absence in this area. In few cases of land being leased out, the 'Batai system' is followed. Under this system, half of the produce goes to the landlords as the rent and the remaining half is retained by the tenants. The landlords do not contribute anything towards the expenses on cultivation which are thus exclusively borne by the cultivators. On such lands, in view of increase in cost of cultivation, the improved seeds, chemical fertilisers and other improved agricultural practices are not applied.

Working Force

In Bharmour and Pangi as in other rural areas of Chamba, every male and female, adult and child, if he is physically fit and old enough to work, participates in the economic activities. The extent of participation in the economy on all India basis can be observed and compared with Chamba, Bharmour, Pangi Tehsil and certain adjacent districts of Punjab.

Table 13: Working force in India, Punjab State, Himachal Pradesh and Chamba

Areas	Working force to total population	Working females to every 100 working male
All India	40.0	54
Punjab State	39.3	28
Gurdaspur District (Punjab)	29.0	6 ¹
Himachal Pradesh (H.P.)	59.5	69 ²
Chamba District	61.5	75
Bhattiyat Tehsil	53.3	64
Bharmour Tehsil	65.4	71
Churah Tehsil	64.5	78
Pangi Tehsil	66.5	98 ³

1. NCAER 1966: 10, 139 2. NCAER 1961: 107, 159 3. H.P. 1967: 101, 105

From the table 13, it may be inferred that working force forms substantially greater proportion

of the population in Chamba District than it does in other parts of India, and is even slightly higher than in other parts of Himachal Pradesh. This is due to high percentage of women's participation in economic activities outside the house. The major reasons for higher female participation in the economy are universality of land ownership, marginality of the economy and shortage of labour.

There is a comparatively less difference in the female participation among the Chamba Tehsil, Churah Tehsil, Pangi Tehsil and Bharmour Tehsil of the Chamba District. But the fifth Tehsil of the Chamba District, Bhattiyat shows a much greater difference. Bhattiyat itself is more influenced by the Punjab than is any other part of Chamba, where extent of female participation show a sharp decline as can be seen from the table 13. Bhattiyat Tehsil is adjacent to Gurdaspur district of Punjab and marriages with Punjabi families are not uncommon here. It has become a matter of pride for Bhattiyat households to claim that their women do not work.

Due to peculiar topography of the area, the ample water available for irrigation from perennial snow-fed streams is not being utilized for irrigation. Absence of irrigation, chemical fertilizers, and organic manure accompanied by primitive methods of farming has resulted in low average yield per acre. The crops grown in the village are predominantly retained by the cultivators for their own consumption, seeds and customary payments in kind to *Purohit* or village artisans. Ten per cent of the produce is sold to meet the day-to-day needs and only one per cent is used as animal food, and rest is kept for own consumption and customary payments.

Average yield of Principal Crops

The average yield per hectare of principal crops in both the areas is very low, which can be attributed to primitive methods of farming. The yield per acre of wheat, maize, barley and other cereals in Bharmour is 6 *maunds*, 10

maunds, 8 maunds and 6 maunds respectively. The average yield per acre of millets is about 4 maunds. In Kugti-sub-valley, only one crop is grown in an agricultural year, the yield per acre are highest in this sub-valley while these are least in Holi sub-valley. In Pangti, the yield per acre of barley, wheat and millet in irrigated lands from local seed is 6 maunds, 6 maunds and 7 maunds respectively. The yield per acre of wheat obtained from the use of improved seed is estimated at 7 maunds. Crop yields are still lower in unirrigated areas where average yield of barley, wheat and millets from local seed is about 4 maunds, 3 maunds and 4 maunds per acre respectively.

Disposal of Cash Crops

There is no cash crop grown in Bharmour Tehsil. The principal cash crops grown in the Pangti valley are potatoes, ~~Kash~~ and tobacco. Potatoes are mostly consumed by the growers themselves. Only the farmers around Kilar (the Tehsil headquarters) sell their surplus produce of potato to the government employees stationed there. Tobacco is grown in small kitchen gardens for personal use only.

There is much scope in the valley for the improvement of agricultural practices. The crops are predominantly grown by broadcasting. 'The line' and other improved methods of sowing have not so far been adopted in the block. While more than 50 per cent were found to be conversant with the improved agricultural methods, only a few knew about the use of chemical pesticides, green manure, seeds and improved implements. All the farmers who were conversant with the practices did not accept the utility of practices due to their conservative outlook, and some times because of adverse reactions of fellow cultivators. Some farmers could not accept the practices because of lack of finances, absence of irrigation, non-availability of timely and adequate aid and difficulties in obtaining the aid. Some of the people have discontinued the use of practices after adoption. The main reasons ascribed to the discontin-

uance of these practices were: people's finding these non-profitable to the extent of addition to the cost and difficulties in the procurement of materials. Some people are willing to adopt improved practices only if free or subsidised aid was timely and adequately given by setting up depots at convenient centre and their use is demonstrated to them by government officials at experimental farms. The table 14 shows the difference of average yield per acre of principal crops (kilogram) approximately by use of local and improved seed.

Table 14: Average yield per acre of principal crops

Crop	According to Block Agency	
	Local seed	Improved seed
	Un-irrigated	
Wheat	240 kg	320 kg
Maize	600 kg	800 kg
Barley	300 kg	400 kg
Buckwheat	500 kg	-
Potato	4000 kg	4500 kg

In Pangti, in irrigated lands from local seeds the yield per acre of barley is one quintals, wheat two quintals, millets 2.5 quintals and from improved seeds, the yield per acre of wheat is 2.5 quintals. Crops yields are still lower in unirrigated areas where average yield per acre of barley from local seeds is 1.5 quintals, wheat one quintal and millets 1.5 quintals.

Size of Holdings

The average size of holdings is small in Bharmour and Pangti. The small size of landholdings is attributed mainly to the hilly terrain and partly to the division of the property on break-up of joint family. In Bharmour very often, the different fields belonging to a family are widely scattered. Almost all the culturable land has been brought under the plough. Little virgin land has been left, and that too in far off places at considerable

height. Whenever a joint family breaks up each field is divided into smaller parts, leading to extremely small, scattered fields. Historically speaking, all the lands used to belong to the Rajah of Chamba who would rent out small fields to different families. A person was given the right to only as much land as he and his family could personally cultivate. This type of land distribution has prevented the emergence of any significant group of large landholders. Male residents could acquire the right to cultivate land for their personal use irrespective of their caste or *Gowar*. After obtaining permission to cultivate a tract of land, it was necessary to level the land, clear it of rocks, stones, trees, and to build retaining walls. This was a very arduous and time consuming process. It required the co-operative effort of the whole family. Non-availability of labour, made the amassing of land fruitless. After independence, when the idea of private ownership was introduced the problem of non-availability of labour remained as it was, as a result, large landholders did not emerge as a group. At present, virgin land available is at a considerable height and far-off from the residential villages. It is not economical to cultivate such land as much time is wasted in walking from one field to another for cultivation of whatever land it has, a family has to depend entirely on its own manpower resources, since no hired labour is available. In Pangi, also the average size of holdings is small, which may be attributed mainly to the hilly terrain and partly to sub-division of land as a result of the prevailing law of inheritance. A family with 30 *Bighas* (6 acres) of land is considered above average. On the average a family has land measuring about 3 acres.

Spread of Improved Agricultural Practices

Much still to be remains in the spread of improved agricultural practices in Bharmour and Pangi. Predominantly, the crops are grown by the broadcasting method. The line and other improved methods of sowing have not so far been adopted. In developmental blocks improved

seeds, some chemical fertilisers, pesticides and improved agricultural implements have been supplied (Table 15).

In Pangi, improved varieties of wheat seed and potato seeds are increasingly becoming popular, while in Bharmour the more emphasis is on maize. The reactions of the cultivating sample households to the adoption of improved agricultural practices are given in table 16.

It was seen that in Bharmour, while more than 50 per cent of the households were found to be conversant with the use of improved seeds and fertilisers, only a few knew about the use of chemical pesticides, green manure seeds and improve implements. All the cultivators conversant with the improved agricultural practices did not accept the utility of those practices because of lack of finance, absence of irrigation in the area, non-availability of timely and adequate aid and other difficulties in obtaining the aid. Some cultivators were reluctant in accepting improved agricultural practices because of their conservative outlook and the adverse reactions of the fellow cultivators.

Short working season, absence of irrigation, fragmentation of the land, resulting in small fields thus preventing the mechanisation of agriculture practices, absence of surplus labour, shortage of chemical fertilisers and improved seeds, and extremely simple technology are the factors which arrests the agricultural production in these areas, the agriculture technology is extremely simple and time consuming. These people have a pre-wheel culture in which the human back lifts and move everything. The only non-human power so far utilised is that of oxen in ploughing and thrashing and of water mills for grinding.

Given simple technology and rugged terrains, how do these people manage? Gaddis compensate for the agricultural deficit, by utilizing the grazing grounds in the area by rearing sheep and goats. The environment with which they are dealing has potential for exploitation by man through agriculture and pastoralism. As the terrain is rugged and altitude varies the land for agriculture is less. Because of the lack of irrigation

Table 15: Amount of chemical fertilisers, improved seeds and pesticides supplied in Bharmour and Pangi Tehsil

S. No.	Particulars	Amount	
		Bharmour Tehsil	Pangi Tehsil
1.	Chemical fertilisers	15 tons	13 tons
2.	Improved Seeds:		
	(i) Wheat	150 kg	320 kg
	(ii) Maize	300 kg	36 kg
	(iii) Potato	-	400 kg
	(iv) Vegetable	75 kg	150 kg
3.	Chemical pesticides	319 kg	278 kg

facilities people have to depend on rain fall for their crops. Because of lack of mechanical farming tools, improved seeds and pesticides, etc. people have to depend on a multitude of crops, many of them quick maturing, hardy and drought resisting. The great number of crops, mixed sowing, placement of fields far apart, all are attempt to reduce the risk the individual runs. The high altitude restricts the agricultural production and the number of animals that can be kept during winter season. No parallel restrictions operate on the possibility for summer grazing. The upper mountain ranges are noteworthy for their large, lush mountain meadows which animal herders are able to exploit. However, these mountain pastures are only seasonal and cannot be relied upon for year round sustenance, consequently a pattern of transhumance is developed. People practicing transhumance utilise different *niches*. The Gaddis utilize upper ranges in summer and lower ranges in winter. It cannot however be said, that environment alone drives them out of Bharmour during winter, but the economic reality is also responsible for the same. The small fields of land they own rarely gives them anything during the winter. There are families in Bharmour who do not have enough land or do not rear enough sheep and goats to fulfil their economic needs, throughout the years. They have to look for odd job in Kangra. They work on daily wages as road

labourers, wood cutters etc. and their women and children work as domestic help, thus earning their livelihood for winter months. Apart from this, wool and woollen products needs some way of disposal which is not possible if they are stagnant locally.

Agriculture is the mainstay of people in Pangi valley. The possibilities of increasing cultivated area through bringing pasture land under plough is not a practical proposition. The villages are situated mostly close to the agricultural lands and the cattle are grazed in the nearby pasture. The reclamation of such pastures may have adverse effects and lead to the problem of grazing for animals which play a prominent role in an agro-pastoral economy. If the distant pastures are made cultivable, people may not like to cultivate those fields because of topographical conditions and lack of means of transportation.

The people of Pangi are not transhumant like Gaddis of Bharmour, though the climatic conditions are more or less similar. Due to heavy snowfall in Pangi, the area is almost disconnected from the outside world for about 5 to 6 months in a year. During this period people are confined to their homes and depend upon the stored food grains. Due to snow cover on pastures and grazing land, the animals are stall fed. During this period, people are mostly idle, except for carrying on household chores like spinning and weaving etc.

The limited working seasons due to heavy snowfall, uneconomic land holdings, slopy land coupled with the primitive methods of agricultural operation are mainly responsible for keeping the region deficient in food grains. Agriculture is a way of life rather than an economic proposition.

Besides land the only available source of livelihood to the Pangwalas is the forest. Forests yield firewood, timber for construction, *Chukri*, which is mixed with flour and eaten as such, local tea herbs and minor forest produce, the only item of commerce in the area. The Pangwala has therefore been leaning very heavily on the forest for

Table 16: Reactions of households to the adoptions of improved practices

S. No.	Name of improved agricultural practices	Number of Sample Households					
		Conversant with the practices		Non-conversant with the practices		Having adopted the practice	
		Bharmour	Pangi	Bharmour	Pangi	Bharmour	Pangi
1.	Improved seeds	137	113	112	87	25	59
2.	Chemical pesticides	89	16	160	190	20	9
3.	Ammonium sulphate	130	17	119	183	24	10
4.	Calcium ammonium nitrate	67		192	-	72	-
5.	Green manure seeds	16		233	-	1	-
6.	Super phosphate	120		129	-	23	-
7.	Improved agricultural implements	20	152	229	48	1	152

his continued existence. The minor forest product which he can collect include *Zira* and *Dhoop* which can be readily exchanged for salt at *Terola* across Sach Pass. The energy utilized in one trip and the time it takes is so long that Pangwalas hardly if ever does more than one trip across the pass in a year and that also simply because he must have salt and, if possible, some minor luxuries. The passes remain open during the summer, which is of a short duration in the valley and coincides with the main agricultural season of the place. At this time every day counts for the Pangwala, who must prepare his fields, sow the seed hurriedly, and finish with the collection of wood.

The other minor forest produce available in the valley are medicinal herbs, which are found in abundance all over the extensive forest area. These herbs are collected by local people after getting collection permit from the Forest Department. The herbs thus collected are sold to licence holders. About 200 local labourers are regularly employed by the forest lessees during the working season.

The intensity of soil erosion in the Pangi valley is low as compared to Bharmour *Tehsil*. However, soil erosion that occurs in the valley is mainly due to cattle population and to some extent to disturbance of soil caused by the people in search of edible fruits and climatic factors.

Nature has no doubt adorned this area with

perpetual beauty, but the isolation and desolation of the place is also both perpetual and complete. Man is circumscribed by the limitations of resources. Land, what little he has, and forests, for what little they can yield for local consumption, are all that Pangwalas have to look up to. Water flows in abundance in this valley but the gorges are so deep that no economic channels have been taken out.

The other difficulty is the limited opportunity. The working season collides with the agricultural season. There are therefore periods of stress and strain as far as utilisation of manpower is concerned. During the main season there is a rush on labour and even ten rupees a day is not sufficient to divert labour from agriculture. Money counts for nothing because it cannot be eaten as a substitute for food. Food is the first priority. Besides agricultural activity, the forest provides some source of employment but then again the Pangwala is so much occupied with his own land that he does not find anything attractive enough to divert him from his way of life. The off season is a season of complete inactivity. It is a period of, one might say, hibernation. The family and the cattle get huddled up together in the family abode and pass the dreary long months. Going out is both unprofitable as well as dangerous. No rescue parties are available to locate a missing person. Snows are heavy and cold is extreme. Danger of both exposure as well as accident is

there. A man has to live on his own. A man lost is a man lost. Movement and enterprise therefore remain suspended during the winter months.

HORTICULTURE

Contrary to the bleak prospects of agriculture, horticulture has tremendous potentialities in Bharmour and Pangi. The climate, the soil, the topography are all favourable for fruit plantation. Apple, apricot and almonds are the fruits grown in the valley. For the raising of orchards, initial expenditure on preparation of fields is not needed and at the same time the fruit trees check the soil erosion, but spraying the trees annually is costly. The total investment that must be made in the five to six years before the trees mature, has been such that those who have already planted orchards are telling others not to bother, although once there is a bumper crop, it is likely to encounter the pessimism. The quality of Bharmour apple is very good, but problem of exporting and marketing is there. The produce is generally sold locally at marginal price to the agents of the traders. In both areas the means of communication and transportation pose a major problem. The fruit growers have to suffer a considerable damage to fruits on account of carriage of their produce. In Bharmour, due to rains and land slides, the road gets blocked for days together, so the apples get spoiled. Technical guidance on picking, packing and grading of fruits is not adequately available at present. No canning units have been set so far in the area. The surplus fruits cannot, therefore be utilised for preparing jams, jellies and squashes etc.

In Pangi, except in the Saichu Nallah and Hundan Nallah subvalleys, which are situated at comparatively higher altitude and consequently have heavy snow fall, there seems to be a vast scope for the development of horticulture in the Pangi valley. The only hurdles in the horticultural development appears to be the shortage of saplings and lack of marketing facilities. The important fruits grown at present in the valley are apples, walnuts, apricots and grapes. Grape-

vines are, however, found only in the Sural sub-valley. Fruit preservation and canning plants, if installed at suitable places, should go a long way towards overcoming the initial hurdles in quick export of fresh fruits.

Horticulture Development

In Bharmour there is much scope for apple, almond and walnut growing in the area. The horticulture development programme was started in the year 1961-62. It started with the supply of different varieties of fruit plants, the survey undertaken during 1970-71 reveal that 33373 fruit plants existed on 132 hectares of land. Out of it, 4135 are in bearing stage. The slow progress during the earlier years was due to the fact it took some time to make the people orchard-minded. One obstruction which comes in way is their habit of migrating. The plants need attention in the early stages of plantation.

As the land holdings of people are very small, people are reluctant to use it for orchards. For economical orchard, it is advisable to have not less than four or five thousands of plants. It is only possible if seven or eight farmer whose fields are adjoining join together, thereby avoiding the aforesaid difficulties and have better results, like technical guidance, spraying, pruning, operations and packing facilities (inclusive of boxes i.e. five-seven farmer can combinedly put). Other reason for reluctance is that the farmer has to wait for a long period of returns and during this period the methods of earning livelihood are scarce.

VEGETABLES

At present vegetables are not grown in large quantities, although the conditions throughout the valley are most suited for vegetable cultivation. It is partly due to the fact that people are generally not accustomed to vegetable consumption, and partly due to lack of adequate marketing facilities. Accordingly, growing of vegetables is restricted to villages in and around Kilar, where

they can find a ready market. Turnips, raddish, beans, peas, cabbage and knol-khol are the important vegetables grown. Shortage of seed is the other handicap. For the supply of the seed and saplings, there are possibilities for the development of vegetable nurseries by the government in pasture lands and the control of the Forest Department.

APISCULTURE

Apiculture is practised in the valley according to primitive methods. No feeding arrangements are made for bees during the winter season. There is abundance of flora and fauna in the valley suited to the development of apiculture as a subsidiary means of augmenting the otherwise meagre income from agriculture.

ANIMAL HUSBANDRY

In an agro-pastoral economy like that of Bharmour where mechanisation of agricultural operations is not possible, cattle are kept not only for providing protective food like milk, but also for the valuable drought power and manure essential for agriculture. Sheep and goat are reared for sale, meat and wool purposes. Although animal husbandry mostly provides subsidiary means of livelihood to the agriculturist, livestock raising is an integral part of the agriculture itself. Animal husbandry supplements agriculture to a major extent.

The Gaddis keep cattle, mainly bulls and cows. No one keeps a buffalo as the climate is not conducive to the proper rearing of a buffalo. The total number of cows is not enough to ensure an adequate milk supply to the population of the entire village and, accordingly, they suffer from lack of this nutritive food. Still the cows and bulls have their economic importance. The manure of these animals is used to maintain the fertility of soil, to which it is applied is vital for good crops. It is acknowledged by all the villagers that soil fertility depends largely on the manure. As chemical fertilizers are not yet popular because of price

and unavailability, this animal manure is of great importance. The availability of firewood (from the forest) makes it unnecessary to use cowdung for fuel, as is mostly done in the plains. The breed of the cattle is very poor in Bharmour. The typical cow today gives one to two kilograms of milk a day after its calf has been weaned. But it goes dry within a few months especially during the winter when it subsists mainly on corn stalks. No fodder crops are grown, although chaff, stalks and occasionally grain, are fed to them. The animals subsist on wild fodder, which they forage and that which is gathered for them comes from forest trees, brush and grasslands. Thus, animals are a crucial link in the mountain ecosystem.

Gaddi flocks consists of both sheep and goats. Although sheep produce more wool, they are less hardy and give less milk and meat. Goats are also able to live on poorer pasture after they have grazed for a certain length of time, as their sharp hooves cut the turf, exposing the top soil, which is blown away by the wind.

There are about 20 per cent more sheep than goats, and this proportion appears to have remained the same for at least the last ten years. Even though the destruction by goats of the top soil is greater and the tax is heavy, every shepherd requires both animals.

In Pangi, the main breed of cattle is *Choor* (male) and *Choori* (female). This breed is obtained by crossing Yak and the hill cow. These breed animals are much superior to the ordinary local breed of bullocks and cows in draughtability and milk yielding capacity respectively. The average daily milk yield of *Choori* is 2 kg. as against 1.30 and 0.10 kg. of milk yielded by hill cow and a goat respectively.

In view of a great demand for wool which is used extensively for the manufacture of woollens, as a common household industry, sheep and goat are reared in large number. The average yield of wool (over three shearings) in a year is 1.20 and 0.30 kg. per sheep and lamb respectively as against a yield of 0.75 and 0.40 kg. for the Himachal Pradesh as a whole. The yield is quite high (2.0 and 0.45 kg.) in the Sural Nallah sub-valley.

There appears, however, considerable room for increasing the wool yield through the introduction of suitable sheep breeding schemes. Provisions of co-operative facilities presently in the field of marketing and other allied spheres will surely give a fillip to the widely popular wool weaving in the area.

Extensive pastures are available for grazing in the valley. Besides, grazing is also allowed in the forests free of charge, to the right holders. These pastures are natural blanks and possibility of afforestation of these areas is out of the question. The pastures on the left bank of Chandrabhaga are utilized for grazing by migratory flocks from other parts of the Chamba District.

The pastures on the left bank, with the exception of those in Lahaul Parganas, are open to grazing by the local cattle free of charge. Although there is some scope of introducing more flocks in these pastures, the local people apprehend that this may result in the destruction of *Kand mool* growth on the *Dhars*, which is used by the local people as food during the time of scarcity. However, in view of the deterioration in the grass cultivation, partial periodical closure of those pastures also seems necessary.

In spite of large livestock population in Bharmour and Pangi (Table 17), the productivity of livestock is comparatively very low. In view of the importance of livestock the Government has taken steps to improve the conditions of livestock by organizing veterinary services. Due to the poverty of people, improvement in the feeding of the animals has not been possible. The animal husbandry department in the Pradesh has, therefore, concentrated on the other two methods. Cross breeding of non-descript animals will no doubt help to improve the stock radically, but the process is very slow in large animals and, at the same time, the cross breed animals give higher yields only if better fed. However, the diseases of baines are fairly under control with mass vaccination campaign against Rinderpest, and availability of vaccines against other principal diseases except 'Foot and mouth

Table 17: Livestock in Bharmour and Pangi Tehsils

S. No.	Item	Bharmour		Pangi	
		1972	1977	1972	1977
1.	<i>Cattle</i>				
	(a) Males over 3 years	6,077	6,300	1,612	1,313
	(b) Females over 3 years	6,402	6,334	5,233	4,617
	(c) Young stock	5,040	5,634	1,432	1,213
	Total Cattle	17,519	18,268	8,277	7,143
2.	<i>Buffaloes</i>				
	(a) Males over 3 years	1	1	- -	- -
	(b) Females over 3 years	76	59	- -	- -
	(c) Young stock	10	28	- -	- -
	Total Buffaloes	87	88	- -	- -
3.	Sheep	60,089	48,840	24,013	18,011
4.	Goats	44,871	41,407	6,672	5,591
5.	Horses and Ponies	71	145	5	-
6.	Other Livestock	171	70	1,367	1,100
	Total Livestock	1,22,808	1,08,818	40,334	31,845
	Poultry	431	731	962	988

disease' which still debilitates animals with frequent attacks.

Due to tropical climate and uneconomic conditions of the enterprise and consequent low productivity of livestock, the value of production of the livestock industry is not commensurate with such a large size of livestock population. However, the livestock population generally goes on increasing thereby adding to the wealth of the community.

There are four veterinary hospitals (Bharmour, Tundah, Gorolla and Holi) and five veterinary dispensaries at Kugti, Khani, Bajol, Chobia and Chanoata in Bharmour Tehsil. In Pangi Tehsil, there are two veterinary hospital at Kilar and Dharwas and six veterinary dispensaries at Sach, Saichu, Tai, Mindal, Hundan and Purthi respectively (Fig. 9). In both the areas, as the means of communications are extremely difficult and the approach to these institutions is not possible, the services

remain unutilised. Poultry rearing and dairying is almost non-existent in the *Tehsils* due to lack of marketing facilities and proper means of transportation. Therefore, recourse has to be taken to the primitive methods of combating various cattle diseases. The main diseases from which cattle generally suffer are retention of placenta, haematuris and foot and mouth disease.

INDUSTRIES

In Bharmour and Pangi which are entirely rural areas, agriculture forms the main occupation of people. Industries are usually run during slack agricultural seasons at the residence of the artisans as their secondary occupation only. In these

industries, mostly family labour is employed and the work is carried on manually in the absence of power. The goods are predominantly manufactured for personal use. As the means of communication are difficult, the goods have not been standardised. The other factor is the absence of markets, which has not promoted the place of industry in the society. These factors make the industries local in nature, and they form an integral part of the economy of the area. In the days of regional isolation and complete local self-sufficiency, these industries have played an important part.

Artisans and menial castes are not found since their work is generally done by each family. As special skill is either not required, or it is done by skilled workers of any caste, the proliferation of secondary and specialised skills has not taken place.

The important household industries carried on by the people in Bharmour and Pangi are spinning and weaving of wool, tailoring, flour grinding, carpentry, oil crushing and blacksmithy. There are two saw mills in Bharmour.

Spinning and weaving is done in every household in both the *Tehsils*. There is no weaver by occupation and the woollen cloth required for preparing their woollen apparel is woven by the people out of the wool spun by themselves. The wool obtained from the sheep reared by the family, or purchased from others, is spun on *Charkha* by ladies or on *Takli* called *Unsar* by men-folk. The weaving is done on handloom mostly by men, although women folk might also know this art. The Gaddis prepare *Pattis* and blankets locally called *Gardus*. The *Patti* is used for preparing *Chola* or the coat as the case may be, and the *Gardus* serve as cover cloth. The *Gardus* are really of fine quality and command a ready market in the low-hills where people sell them during their stay there in the winter months. The production, however, is limited and just sufficient for their own needs. Among the main items manufactured by Pangwals are *Pattoos*, *Pattis*, *Chaddar* and *Thobis*.

In view of the importance of weaving and

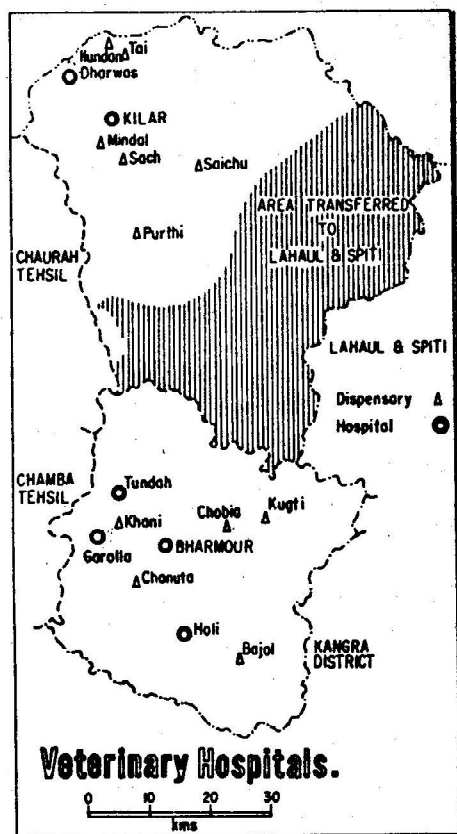


Fig. 9

spinning of wool in the economy of the Pangi valley, and with a view to introducing modern equipment like improved *Khaddis*, a weaving centre has been started at Kilar by the Welfare Department. The centre provides training in weaving of cotton cloth, woollen shawls and chemical dyeing, etc. With a view to inculcating the spirit of self help, an industrial co-operative society has also been organised.

The industrial sector is under developed, though the natural endowments of the areas are capable of supporting a large number of industries. The topography and the fragility of the mountain environment, together with lack of infrastructural facilities, go against the establishment of many heavy industries in the mountains. Industrial development therefore, is limited to medium, small and cottage industries. The constraints in industrial development in Bharmour and Pangi are: (i) power and raw materials; and (ii) duration of working period.

Power and Raw Materials

Only manual labour is used by the households engaged in these industries. In the case of flour-grinding and oil crushing industries, however, water and bullock power respectively, is used. The raw materials, too, are locally available or purchased from the adjacent villages. The tools are indigenously prepared and no improved tools, although having a wide scope, are in use in the area.

Duration of Working Period

As stated earlier agriculture is the principal occupation of the people. These industries, are run seasonally during the slack agricultural season. The working season of the households who do not migrate with their sheep and goats to the plains during winter extends from October to March. The migrating households, on the other hand, spin during the period of migration and the weaving is done during the summer and rainy season from June to September when they are partly free from agricultural operations.

Flour grinding is done during the rainy season from June to September when sufficient quantity of water is available in the *Nallahs* to the *Gharats*.

Since the construction and repair of houses and sewing of new clothes for the fairs is done by the farmer during the slack agricultural season, the peak working period of carpentry and tailoring also falls in these seasons.

It was seen that on an average spinning and weaving of wool and flour grinding have a working period for 4 months, carpentry of 6 months and tailoring and other industries of 5 months in a year.

The households engaged in spinning and weaving of wool are found to be producing woollen goods for their own consumption as well as for selling. The households engaged in carpentry, flour grinding tailoring and other industries (oil seed crushing and blacksmithy) work for others.

It was seen that the gross income from the spinning and weaving of wool, which is the most common industry in the area, is very little. In the absence of markets, the exploitation of the people by the middleman is extensive. Absence of advance technology is the prime factor and the development of the industry on modern lines presents a great scope for the economic betterment of people. There is a large scope for utilizing the idle capacity in case of spinning and weaving of wool industry by providing necessary incentives and required facilities to the households.

The idle capacity in the region is because of the following factors:

1. lack of finances,
2. difficulties in procurement of right type of raw material,
3. heavy snowfall, and
4. pre-occupation in agriculture, illiteracy and lack of technical guidance.

EDUCATION

Educational Institutions

In the erstwhile hill state of Chamba of which Bharmour and Pangi form a part, adequate facil-

ities were not available to the people and were almost non-existent for the education of women. Whatever schools did exist were generally houses in dingy dilapidated buildings. There was hardly any equipment and they were poorly staffed. Gaddis are transhumants and the means of communications were little to the education of the children was not possible. The literacy rate was very low. It was a gigantic task to organise education programme in this area. Because of difficult terrain and rigorous climate, trained teachers were not attracted to this area. It was necessary to appoint teachers from outside by providing incentives in the form of extra pay, residential and medical facilities etc.

There are ninety one educational institutions in Bharmour. Out of this, there are five High Schools nine Middle Schools and seventy seven Primary Schools. In Pangti Tehsil there are only forty educational institutions (3 High Schools, 3 Middle Schools and 34 Primary Schools). All of these schools are managed by the Education Department. There is no college in these tribal areas. The nearest college is in Chamba Town.

Student-Teacher Ratio

At the end of the third plan there were about 160 teachers and 1160 children. Only 6 per cent of the total population above the age of seven years was literate. The percentage of school going girls as compared to total school going children is only 5.13. Education does not go beyond the eighth class generally. Only five per cent of the children up to the age of 17 years are going to school.

The children of the area are given scholarships, stipends, free text books and mid-day meals. As the Gaddis are transhumants, the children are exempted from the operation of the Punjab Primary Education, 1961. Previously, the children used to get admission in local schools at the place of their migration (from Bharmour Tehsil to Kangra District and other places). No tuition and examination fees were charged. But now they have changed this system. They have adjusted the

holidays in such a way that the children do not have to get the migration certificate.

In spite of the efforts put in by the government for spreading education, the education facilities have only touched the fringe of the population. The people are still shy of sending their children to school because of a subsistence economy and non-availability of labour. As there is a shortage of labour in the area, parents need help of the children in minor agricultural operations like weeding, thrashing, grazing of cattle, minor forest produce collection etc. Therefore, school timings and vacations should be adjusted according to their economic cycle. The school should be closed when the local economy requires the help of children.

The schools are not in the vicinity of the villages, and the students have to walk to reach the village. Thirty percent of the school going children have to walk more than four kilometres to the school. As the terrain is hilly and difficult much time is consumed in coming and going to school. At home the parents also require their help in domestic matters, so very little time is left for studying. This acts as a big handicap in the education of children. All the villages are not electrified in Bharmour Tehsil and none in Pangti Tehsil, and most of the people cannot buy kerosene for burning the lamps. They usually burn *Jagni* at night and the children cannot read in this light.

In addition to this, the people are afraid to send their children to schools because of the fear of emigration. According to local people, education always encourages emigration i.e. they want to go out of the village to the nearby city and work there in some office. This results in the reduction of working force.

One other reason is the communication gap between parents and teachers. Parents should be called to school and told about education and its uses. There should be more participation of the community in education programme. Extension lectures for the parents should be arranged. When the parent-teacher association increases the parents will know more about education and what

their children are being taught. It will increase their interest in their education.

Changes should also be made in the education pattern. There should be a text book on basic education and vocational courses. The syllabus should include practical training in Agriculture, Animal husbandry, Horticulture, Spinning and Weaving, Poultry Rearing, Apisculture etc. Emphasis should be laid on inculcating a sense of dignity of labour and encouraging creative activity among them.

MEDICINE AND HEALTH

The basic objective of health planning is to organize medical and health service in such a way as to prevent disease and provide proper curative service to the people for their physical and social well-being. The provision of efficient health services also help reduce out-migration from the mountains. The medical facilities in the Chamba District as a whole are very scarce mainly because of the widely scattered population and difficult means of transportation. It is only 7 per cent of the villages which have medical facility within the village. There were eight hospitals (including one Ayurvedic) five Primary Health Centres, 12 Allopathic and 36 Ayurvedic dispensaries functioning during the year 1980-81.

The environment in which the people live is dirty and unhygienic. There is no proper drainage system in the villages. Water from springs, *Bowlies* and in some case *Nallahs* is used for drinking purposes. In all the villages surveyed, the drinking water facilities were found to be inadequate, no proper washing arrangements existed. The washing was done near the sources of drinking water, resulting in the pollution of water. The houses are poorly ventilated. Although health education formed a part of the Community Development Programme not enough attention is paid by the people to sanitation and cleanliness.

In Bharmour and Pangi *Tehsils*, the natural slope in the villages is the only drainage system for the out let of the waste water. There are no

latrines, either public or private. In Bharmour only 6 per cent households responded with good sanitary conditions and 59.9 per cent with poor general sanitary conditions. Improper disposal of night soil and human excreta are responsible for (i) the contamination of soil or of ground or surface water; (ii) the possibility of disease transmittance to man through the agency of insects or animals. In the absence of latrines, Gaddis and Pangwalas go to nearby fields for defecation, thus polluting the soil indiscriminately which results in heavy infestation with helminthic parasites. In the absence of proper facilities, animal dung and urine further aggravate the insanitary condition of the villages. Fly breeding is enormous.

Diseases Common in the Area

The climate of the area, as a whole is salubrious. The common diseases are goitre, veneral diseases and all types of leprosy. Malaria has been eradicated from the area.

The staple diet of the people is maize. Indigestion and bowel-complaints are common and many patients suffer from appendicular abscess. Symptoms of malnutrition, especially pellagra and night blindness are also common. The pellagra is due to the deficiency of vitamin B (P.P. factor) in the diet. Night blindness is due to the shortage of vitamin A.

The incidence of tuberculosis is common in Bharmour *Tehsil* and Pangi *Tehsil*. Other chest-diseases such as pneumonia, bronchitis and asthma are also fairly common. Incidence of hydatid-cyst in lung and liver is also rather high, because the Gaddis are mostly owners of sheep and goats, to guard the flocks and for which they keep dogs and this disease is caused by *taenia echino coccus*, a worm found in the dogs. Stone in bladder and kidney is also quite common. Usually multiple stones are found in the kidney and in many cases bilateral rheumatic affection involving both joints and heart is also fairly common. Diseases of the eye such as trachoma, conjunctivitis and senile cataract are also present.

Table 18: Health Institution in Bharmour and Pangi Tehsils, Chamba District

<i>Tehsil</i>	<i>Health institution</i>	<i>Name of village</i>
Bharmour	Primary Health Centre	Bharmour
	Leprosy Centre	Holi
	Ayurvedic Dispensary	Kugti, Tundah, Chanauta, Holi, Durgethi, Runukothi, Ulhansa, Khani
Pangi	Primary Health Centre	Kilar
	Civil Dispensary	Purthi
	Ayurvedic Dispensary	Sach, Saichu, Dharwas

The incidence of the diseases of the alimentary system such as gastric ulcer, gastritis, diarrhoea and dysentery, electric fever, anaemia with or without hookworm and that of injuries, including fractures, are also very high (Fig. 10).

Health Institution in Bharmour and Pangi

For providing medical care and health education, hospitals and dispensaries have been opened in the area by the medical department. The table 18 gives the medical facilities in Bharmour and Pangi (Fig. 10).

One Leprosy unit, under the charge of technician, was started in 1961 at Tundah in Bharmour *Tehsil*, because the incidence of leprosy was high in this area.

There is one Primary Health Centre at Bharmour for the whole *Tehsil*, with one M.B.B.S. doctor and other staff. There is a maternity and child welfare centre. It has an accommodation for eight observation beds. There is one lady health visitor, who looks after pre- and post-natal care, care of children under 4 years of age (immunization and vaccination). She has got three sub-centres:

	<i>Place</i>	<i>Incharge</i>
Lady Health Visitor	Khani	Midwife
	Holi	Auxillary nurse and midwife
	Ohra	Midwife

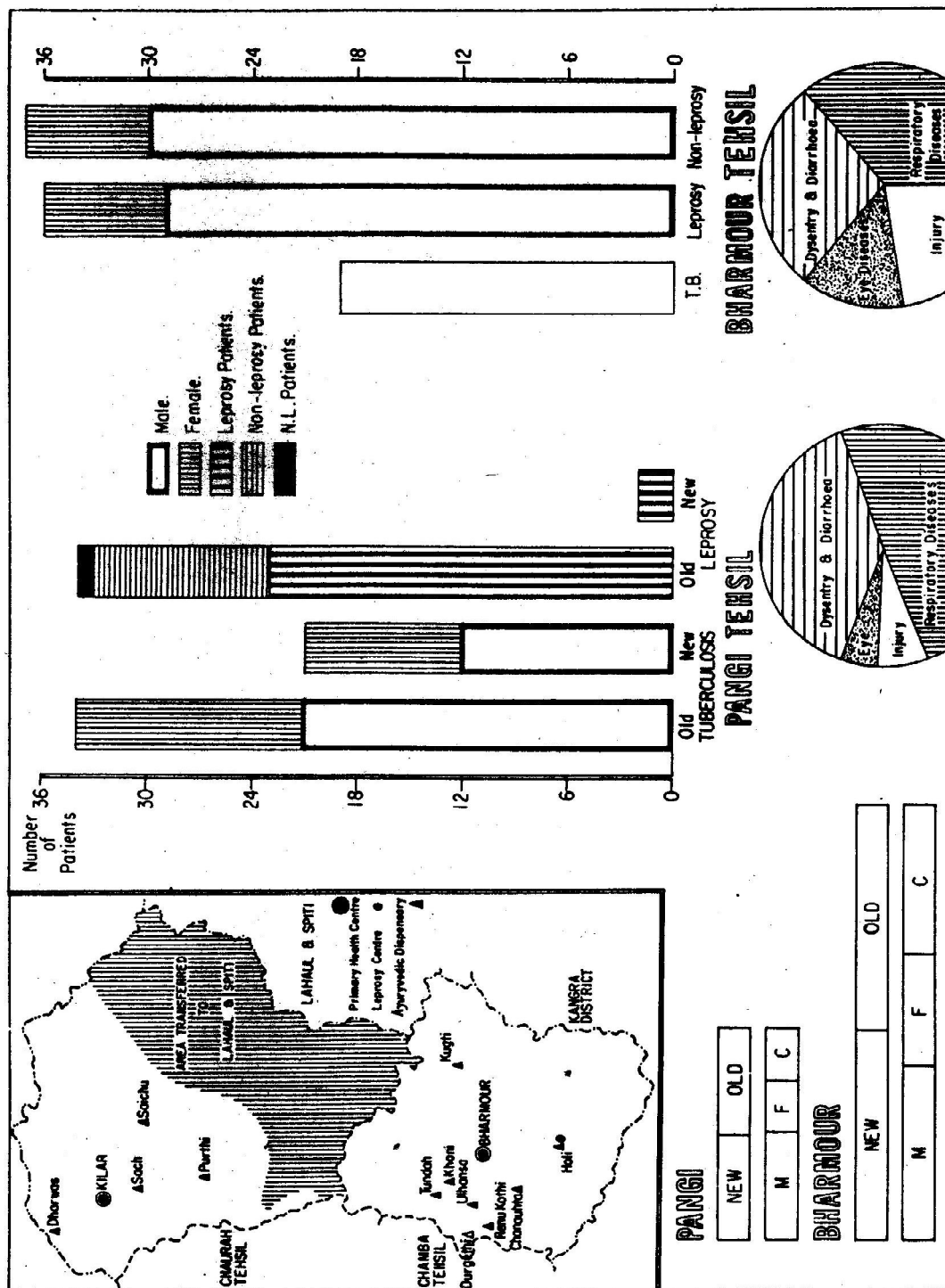
For tuberculosis, the diagnostic centre is at Chamba and the medical treatment is given at Bharmour Primary Health Centre. *Ayurvedic* Institutions also exist at the following places:

Kugti, Ulhansa, Durgethi, Chanauta, Tundah, Runukothi, Holi. These are poorly equipped with staff—only one *Vaid* and others have *Up-vaids*.

No Homeopathic and Unani institutions are in this area. One of the major problems of the area is malnutrition. An applied nutrition programme has been started. But in actual practice, there is nothing. Water-supply is not protected. It is deficient in calcium. To supplement the deficiency of iodine, iodized salt is given. Most of the programmes are not practical because the population is floating. Their migration hinders every programme. In Pangi there is one public health centre at Kilar with one M.B.B.S. doctor and other staff. There is one mobile *Ayurvedic* dispensary functioning in this *Tehsil* with headquarters at Sach. The mobile dispensary is provided with a *Vaid*, one *Ayurvedic* compounder and *Beldar*. They tour villages in order to provide medical aid to the people at their homes.

The area being difficult, the sanctioned posts in most cases remain vacant. Thus, the medical facilities are not sufficient to cater to the needs of people. Those who want to avail these facilities, often have to travel long distances. This combined with shortage of medicine especially during winter (in Pangi), results in most of the patients remaining unattended. So the people in interior areas have to depend on their own medical treatment. In view of the extremely difficult means of communication and distance of dispensaries from the villages in Bharmour and Pangi, the medical aid is not availed of by the people except in serious cases. The use of traditional herbs for curing diseases is most common in the area.

It has been a common belief among Gaddis and Pafigwalas, that they can trace the cause of a disease to the provocation of gods or ghosts. If a *Chela* or *Dayan* is annoyed, he or she may make anybody a patient. Instead of consulting a



Vaid or doctor, they would prefer to consult some magic man or priest. Hence, they offer animal sacrifice to propitiate the deity associated with the disease concerned. The *Chelas* are consulted for the treatment. With their age-old folk medical system people have been able to survive and maintain ecological balance. With the advent of western medicine, a new system is introduced and people always react differently to this transplanted system. This type of system which does not allow any scientific exploration is obviously based on myths and powers that are not within human control *i.e.*, for such things supernatural element may be responsible and consequently the treatment of ailment is reflection of not really for curing the patients but appeasing the supernatural powers which is extraneous to the individual (patient). Within this type of society adoption of new medical therapy obviously will be challenged by the existing system and hence, unless the new system is capable of replacing the traditional values by its efficacy and acceptability, it will not be a success.

From the interviews, which were carried out in the health centre, one thing was clear that patients were coming to health centre only after they had the treatment from their own practitioners. Disease as an area of inquiry and the attitude to curing disease has its special importance *vis-a-vis* other area like status, political power, because of the personal equation and time factor involved. It is a matter of life and death in case of critical disease and the range of actional pattern is limited. It is a crisis response rather than calculated response. When human system is out of order, all sorts of irrationalities come into play. Since the responses to critical diseases are *ad-hoc*, they are not reflective of traditional cultural norms. Therefore, analysis was done at two levels — responses of the people when the disease was not critical and the responses when the disease was critical.

Surgical treatments are very helpful to Gaddis and Pangwalas. Gaddis, are usually travelling and on the way they may get injured or the bones of the animals may be fractured. They are experts

in setting the fractured bones of the animals.

It is their necessity which has made them self-sufficient in this respect, because each time they cannot go to hospital or veterinary dispensary. Their way of life is like that and they have adjusted to the environmental conditions. Pangwalas, in the months of winter are always on their own, and they must know a few facts about first-aid.

RESPONSES TO COMMUNITY DEVELOPMENT IN BHARMOUR AND PANGI

In Bharmour and Pangi *Tehsils*, the funds are provided for tribal welfare work by National Extension Service (NES) and by two Integrated Tribal Development Projects. These Community Development Programmes aim at economic development of rural villages, with emphasis on agriculture, and at the same time their aim at fundamental changes in the social life of villages. In practice, the programmes have functioned primarily to improve agriculture productivity. As a result, their effect has been, over much of India, to benefit primarily the farmers those who own land and these tend to be high caste people who are already the most economically advantaged. Dube observed about the aspect of development in two villages of western Uttar Pradesh that "nearly 70 per cent of its benefit went to the elite group and to the more affluent and influential agriculturists (Dube, 1958 :pp. 82-83). But in Bharmour and Pangi situation is different. All the castes, regardless of the rank in the hierarchy, have their own land the family can usually provide sufficient income for economic independence. This acts as a natural deterrent to any inclination that the artisans and menial castes might have to practise a specialised trade or to hire themselves out as agricultural labourers. The high castes are unable to hire such labourer even if they can afford it, this factor further promotes intercaste and intra-family occupational generalization. Since there is no significant differentiation occupationally or at income level, and rarely

any hiring of a day labourer on a caste basis, one of the traditional basis and motivations for hierarchical differentiation is lacking. In the absence of economic power a caste has no leverage to suppress, exploit or otherwise assume a superior position. The economic reality in these areas does not permit and maintainance of the kind of complex stratification found in the plains. Until very recently there was no land pressure in the sense that every household owned as much land as it could use. Those families that are short of land now are almost equally distributed among the several castes, and so far they have been able to maintain their income level by road labour and other work that does not involve working for other local families. Families were and still are autonomous economically, socially and ritually. They are self sufficient, but at the same time, due to land and labour limitations, they are unable to rise much above the average economic level of the region. Both land labour are required for significant surplus. Amassing land is pointless if there is no sufficient labour available to make it productive either for agriculture or for grazing. Horticulture does present an option now but it has yet not brought about any significant change in the land holding pattern.

The nature of the terrain has prevented the development of market because transportation of goods was inhibited. And with family self-sufficiency there generally was little or no need to buy local products. A proverb in the district says "if the harvest is plenty there is no one to buy; if the harvest is scanty, we must lie down and die" (Hutchison, 1910: p. 223) when a family harvests a good crop, other families do so too. This has generally been the case for the entire district, and there has traditionally been little export market. The result has been a subsistence economy with insignificant variation in the economic level from one family to another. Specialization of labour never came about and nor did an elaborate social system involving sharp hierarchical differences. Even at present the population is not large enough to make up or to support the socio-economic complexity of the

plains. As such there are perhaps fewer prejudices among the people that would inhibit economic development, given adequate opportunity and adequate assurance that they are not endangering their economic position. The economy is sufficiently marginal that there is not much room for risk taking. It is this aspect that has prevented more extensive development of horticulture and more intensive use of chemical fertilizers, both of which would significantly increase income.

The degree of individual autonomy and family self-sufficiency is a mixed blessing for future economic development. While it means less commitment to tradition, it inhibits co-operative effort and activity. This is a problem that occurs throughout India, but its causes seem to be different elsewhere. In Bharmour and Pangi, Community Development has so far benefitted only few villages around the Block headquarters and that too not significantly. Although there is no caste conflict as in other parts of India, but the reasons of the failure are different. It is a paper success and a practical failure. The whole program is inappropriate to be applied in these mountain areas and is ineptly presented to the people. Inadequate transportation plays a significant role in arresting the developmental activities.

The Horticulture Department encouraged the Gaddis to grow apples and many Gaddis took to orchard farming. The results were good and encouraging. But in 1976, the road was blocked by heavy snowfall, and there were no other means to send apples to markets and no other way to utilise these fruits. People lost heavily and were afraid to try any other innovation.

The *Khadi Gram Udyog* Commission (Government's Cottage Industry) tried to keep the Gaddis from migrating in winter to the lower hills. The Commission Centre in Bharmour engaged them in making woolen shawls. The experiment did well for sometime, but one winter all the roads were blocked and the raw materials from Amritsar could not reach Bharmour. The Commission does not use the local short staple material which is considered to be of an inferior

variety. The Gaddis who had stayed back found themselves without any means of livelihood. Little wonder, they reverted to their traditional migration the following year. Till 1970-71, the commission was purchasing local wool. The purchase was stopped because of administrative problems. According to rules, presence of full committee was required at the time of purchase. If the quorum was not complete, there was no purchase. Secondly the local breeders were using unfair means by mixing dust, water or saline water to increase the weight at the time of purchase. At the time of stock checking it was found less and created problems.

Then there is deficiency in selection, training and motivation of the personnel invested with responsibility of introducing the programme into the area. Although the programme has been running in this area for the last twenty-five years its success has touched only fringe of the people. However, inspection of records filed by village level workers to higher authorities would lead one to think it was a total success. But in practice its effectiveness has been greatly limited by lack of personnel, lack of funds, inadequate roads, corruption and lack of interest on the part of both the officials and people. Some short-sighted programme have however retarded the progress, for example the Government decision to allot five *bighas* of land to every landless family. Since cultivable land is scarce, land on the hillsides was allotted to the landless, resulting in severe land erosion.

Why rural development in mountains areas is so difficult? First of all, there are constraints which arise from the geographic situation and difficulties in building up the necessary infrastructure like the roads, railways, appropriate communication system, and the complete social infrastructure, including education, health and public administration. In Bharmour and Pangi, these elements are barely functioning, and there are no economic incentives which justifies the building-up of such infrastructure. The availability of mineral or other natural resources which could be exploited or industrial sites which could

be subject to further development are basic requirement for investment in infrastructure. The Bharmour and Pangi mountain lack these resources which can be utilised economically. The only resource is wood, which is used as fuel or timber, and its exploitation results in the denudation of the forest areas, thereby threatening the ecological imbalance. This aggregates the already existing problem of soil erosion by upsetting the water/soil equilibrium. As the processing of timber takes place, the local population is hardly benefitted.

THE ECOLOGICAL MANAGEMENT OF DEVELOPMENT IN BHARMOUR AND PANGI

Efficiency of the existing system can be increased in several ways. The main source of livelihood of these two areas is predominantly agriculture. The strategy for the development of agriculture in these hill areas is to increase the productivity of agriculture crops. The major thrust for increasing agricultural production will be through the following measures:

- (a) implementation of intensive and improve cultivation practices, provide better input facilities with extension and training support, so that productivity per unit of area increases, particularly in the higher hills;
- (b) make diversification into oilseeds, soya-bean, pulses, spices etc., and introduce high yielding varieties of barley and other coarse cereals (major crops of the area);
- (c) sponsor training and visit programmes under the integrated watershed management programmes;
- (d) to increase cropping intensity further provide better irrigation facilities, introduce advanced agricultural practices and scientific management of land and water resources and take integrated soil and water measures;
- (e) a package of services (improved seeds, chemical fertilisers, know-how of organic manures, sprinkling irrigation) in easy reach of the villagers; and

- (f) intensify agriculture research, introduce cold resistant seeds and teach management of rainfed agriculture.

In view of the ecological and environmental importance of the region, efforts should be directed towards bringing steeper slopes under perennial shrubs and trees, and waste land should be developed. Integrated development of agriculture on a catchment basis, micro-planning at the village level for formulating cropping plans, with proper soil and farm management and people's involvement in the optimal use of the land should be introduced. Agricultural research institutions should be involved in quality seed production, dressing and applying result oriented research programmes, ensuring a laboratory-land-relationship, particularly for varied soil and differing climatic conditions of the hilly areas of the region. Emphasis should also be given to intensifying programmes for increasing production of oil seeds and pulses, and dry level farming.

Horticulture

Horticultural development should be assigned a high priority to ameliorate the economic conditions of the people of the area, to provide them additional income and to encourage proper land use, especially on steep slopes on which crop production is discouraged. Efforts should be made on consolidating the horticultural infrastructure and maximising the capacity utilisation of services and facilities so far created. The integrated development of horticulture, with proper linkages between storing, grading, packing, marketing and processing support should also be envisaged. The major thrust for this will come from:

- (a) increasing the area given to horticulture by developing compact areas. Stress should be laid on nuts, hazelnuts, walnuts, apricots, fruits, off season vegetables, spices etc.;

- (b) increasing productivity per unit area of the existing orchards through better scientific management, the application of inputs and the adoption of modern packaging practices;
- (c) strengthening the existing infrastructure to provide better extension services, advance research and training programmes;
- (d) providing marketing facilities, grading and packing, storing and processing facilities to ensure a proper return to the growers;
- (e) expanding bee-keeping programmes;
- (f) intensifying certified potato and vegetable seed production; and
- (g) providing credit and subsidy facilities to the growers.

Soil and Water Conservation

The hills and mountains in these areas are subjected to significant erosion. The enormous quantities of sterile detritus are washed off the mountain sides silting harbours, riverbeds and spreading over prime agricultural lands in the rainy season. The primary reason for the increasing floods and soil erosion is the human and large livestock population inhabiting these areas have resulted in depletion of the forest cover.

The main approaches for the soil and water conservation programme should be through:

- (a) the protection of agricultural land and the reduction of soil erosion; and
- (b) the reclamation of denuded and degraded land through an integrated watershed development programme.

Watershed Management

The strategy of the watershed management programme envisages ecological regeneration and the optimal utilisation of land, water and human resources in a scientific way. Under this programme, the main thrust is on integrating various development activities having a bearing on the ecological balance, and the development of the potential resources of the mountain areas,

through afforestation, soil and water conservation, agriculture, horticulture, animal husbandry, minor irrigation works etc., with a multidisciplinary approach. Under this programme efforts are being directed towards ensuring optimal utilisation of land, water and plant resources on the one hand and the human and animal resources on the other.

- (a) to minimise soil erosion and surface water run-off afforestation on denuded hill slopes should be started;
- (b) production of domestic timber, wood for fuel and fodder consistent with the requirement of local people should be a priority;
- (c) to ensure socio-economic development improved seed minikits, good animal health services, with feed and fodder minikits, minor irrigation facilities and by maximising efforts for increasing the productivity of agriculture, as well as evolving a proper land use pattern should be provided;
- (d) employment opportunities for both skilled and unskilled labour and educated unemployed persons should be created; and
- (e) the participation of the people, and reorienting their productive efforts through training and a visit system should be engaged.

Animal Husbandry

The topography and agro-climatic conditions prevailing in these areas offer better scope for livestock development activities. Livestock play a vital role in the economy of these areas. The main objective of the animal husbandry programme is to increase productivity per unit of cattle, sheep, goats and poultry, eliminate poor livestock in order to reduce pressure on the land and forests, and encourage the occupational diversification of the people by providing subsidiary occupations to marginal and small farmers, landless labourers, and the weaker sections

of the society.

In order to achieve these objectives an integrated approach towards the improvement of genetic potential of local livestock should be made. Feed and fodder resources should be increased, adequate health cover and extension services should be provided, applied research should be conducted, training should be given in marketing livestock and livestock products, and adequate credit provided to marginal and small farmers.

The animal population is greater than the carrying capacity of the area, in view of available feed and fodder resources. Efforts are therefore needed to reduce the population by suitable measures.

In view of their adverse effects on the ecology, goats should in general be discouraged in these areas.

Forestry

The heavy dependence of human and animal population on the forests in respect of timber, fuel wood and fodder has led to very serious depletion of forest resources. Soil erosion and consequent floods are posing a serious threat not only to hills but also to plains. In view of these objectives, the major emphasis in ecological management will be to:

- (a) ensure ecological security, environmental conservation and resource base;
- (b) undertake afforestation programmes with emphasis on multi-storeyed forests;
- (c) create energy plantation with mini-hydroelectric power generation, wind mills, solar energy, smokeless stoves etc;
- (d) cultivate and upgrade grasses, fodder herbs and medicinal plants;
- (e) develop pastures;
- (f) cultivate grasses, fodder and fuel areas in fallow and agriculture waste and particularly in vacant or marginally productive agricultural lands; and
- (g) encourage the use of non-conventional sources of energy.

Besides the prime importance of regenerating the ecology, the forestry programmes also cum at providing the mountain population with sustainable supplies of fuel, fodder and timber for their needs. Appropriate reforestation of bare, degraded and denuded village forest areas should be undertaken. Fuel and fodder plantation on waste and marginal lands should be encouraged. The regeneration of bad lands by providing grass cover should be envisaged. Stress should be laid on obtaining subsidiary forest products such as nuts, fruits and silkworms from surplus land and marginal cultivated land and steep slopes.

Environmental degeneration has resulted in drying up of hill springs or decline in discharges. This will have adverse consequences for mountain flora and fauna. Creation of "Spring sanctuaries" in areas around the springs will help to regenerate the springs.

For affective co-ordination in social forestry and a massive planting programme with the people's participation, education and training programmes to generate awareness, conserve natural resources and maintain the ecological balance should also be established.

Co-operation

In these areas, the organisation of co-operatives is not strong. In order to link development programmes, the restructuring and strengthening of co-operative societies should be undertaken. Valuable herbs and medicinal plants are becoming scarce due to unscientific collection. The co-operative structure will also provide for scientific collection, processing and marketing of herbs and medicinal plants.

Irrigation and Flood Control

These areas suffer from a lack of assured irrigation facilities. This has been due to the fact that only limited irrigation is available on the banks of major rivers and the major portion of the cultivable areas lies at considerably higher altitude, where water is scarce. Whereas possible and eco-

nomical, small polythene-lined tanks should be constructed to store rain water. Construction of contour channels and sprinkler irrigation should be encouraged.

Mainly anti-erosion works should be carried out under the flood control programme.

Power

Power is one of the most important infrastructural elements for economic and social development. The availability of power reduces the pressure on forests to provide fuel in these areas. A high priority, therefore should be assigned for accelerating the pace of power development, especially rural electrification, and optimal utilisation of hydro-potential through micro-hydro electricity schemes.

Needs of fuel energy should be supplemented by subsidising cooking and heating equipment and electric power should be provided for the development of cottage industries in the villages. Renewable or alternate sources of energy, namely bio-gas water power and water mills, solar and wind power should be developed. Consumption of soft coke, kerosene oil, cooking gas, etc. should be encouraged by providing financial incentives through transport and cost subsidies. Ways and means for conserving energy should be devised.

Rural Industries

The topography and the fragility of the mountain environment, together with lack of infrastructural facilities, go against the establishment of the heavy industries in the mountain. In these areas resource-based cottage industries compatible with environmental security should be developed. In view of the importance of weaving and spinning of wool in the economy of Bharmour and Pangi, improved tools and equipment should be introduced. Advanced technology and the development of the industry on modern lines should be presented for economic betterment of people. Minor improvements should be made in the

designs to improve the quality of production. Raw material should be made available to people through co-operatives.

Financial aid should be made available for utilising the idle capacity of the people. Marketing facilities should be provided in the *Tehsil* itself to avoid exploitation by the middlemen.

Fruit processing industries should be started in the area.

Transport and Communication

The development of the road network is a precondition for the opening up of the economy and utilisation of the natural potential of the area. In these areas, instead of concentrating on arterial motor roads, the main emphasis should be on main motor roads, feeder roads and bridle paths. All-weather arterial roads connecting key potential areas of horticulture, markets and hospitals etc. should be developed. The stress should be made on a large coverage of villages by developing feeder roads and bridle paths. The clusters of villages should be connected with rural roads, aiming at complete coverage.

A suitable technology of road construction compatible with the need for maintenance and regeneration of the ecological balance of the region should be evolved. Both engineering and biology should be used to arrest soil erosion caused by road construction and other factors causing ecological degradation.

An adequate number of footbridges for connecting remote and accessible areas should be provided.

The road system should be supplemented by suitable gravity ropeways for transporting produce.

Education

As education has been recognised as the main instrument for development of manpower resources, greater emphasis should be laid on improving the quality of education and making elementary education universal, while specially

emphasising girls education. For the development of education, the main objectives should be to:

- (a) extend education facilities in inaccessible rural areas and the relatively less developed area. The coverage of elementary education should be given priority by providing a primary school within one kilometre and junior school within three kilometres distance of each other;
- (b) streamline the education of girls;
- (c) extend and improve the facilities for science education;
- (d) improve the quality and diversity of higher education;
- (e) make use of existing facilities to the fullest extent by reducing wastage and tackling the drop-out problem more effectively;
- (f) meet requirements in buildings, libraries and equipments;
- (g) extend the vocational nature of education at various levels. The link between education and development is of great importance for the mountains. Therefore, the strategy should be on vocational-oriented specially related to accepted development programmes. An occupational based design for education should be prepared. Health education should be made compulsory and design for improving the living conditions (sanitation, methods of cooking and using of fuel, using human and animal waste for manure, making bio-gas and compost etc.); and
- (h) the diversification of training programmes and courses to be in line with development requirements of region and there should be provision for degree-level technical education.

Medicine and Health

The main emphasis in health planning in these areas should be on:

- (a) strengthening and expansion of health services in poorly served areas by upgrading primary health centres and providing sub-centres for every 3000 people;
- (b) expansion of rural dispensaries to cater for the needs of the population within early reach *i.e.* one dispensary within a radius of a five kilometre area;
- (c) control and eradication of communicable diseases;
- (d) providing modern equipment, buildings and referral services;
- (e) improving training facilities and the quality of services;
- (f) encouraging the development of an indigenous system of medicine;
- (g) introducing multi-purpose health workers in remote areas to look after the preventive and curative aspects of medicine, especially for children and women;
- (h) improving nutritional standards and providing adequate immunization services;
- (i) introducing a school health education programme; and
- (j) the mountain areas suffer from an acute scarcity of drinking water. Many water-borne diseases are being caused in the mountains because of the pollution of the water sources. The primary necessity is to provide potable drinking water. This can be done if springs are tapped at source and if the catchments are protected from pollution. A high priority should, therefore, be given to provide drinking water free of contamination. Ventilation and sanitation should be improved in the houses.

People's Participation

With a view to gaining direct benefit from development activities, stress should be laid on people's participation in the formulation and implementation of programmes for which voluntary agencies (co-operatives, local level statutory organisations responsible for managements of forests, village and block level committees)

should be actively involved in the planning and implementation process. For proper co-ordination and linkages of various activities, particularly in soil conservation, forestry and watershed management programmes, extensive extension support, training, organisation and motivation of the local people for specific development should be emphasized.

For the creation of truly appropriate development, the importance of *Indigenous Technical Knowledge* (ITK) cannot be ignored. The critical issues that emerge from the close observation of both communal and individual resource management systems should be highlighted. An understanding of local resource users perceive, react to, and ultimately manage land and forest ecosystem is essential. It is important to work programatically with local people to maintain, conserve, and ultimately sustain the local resource base. Messerschmidt (1990) at the risk of sounding trite, advocates practicing what he calls the '2-by-4 test'. It consists of carefully applying the two 'L's' of *Listening* and *Learning* from the locals, and the four 'E's' of *Engaging*, *Encouraging*, *Enabling* and *Empowering* the locals.

It is a fact that local people know a great deal and have plenty to tell us about their natural environment and resource use. They have an incredibly rich store of indigenous technical knowledge gained from generation of trial and error. It is useful to gather such knowledge and incorporating into resource education systems, technician training and development planning.

Women are the backbone of the economy in these areas. Women are burdened with the responsibility for gathering fuel, fodder and water along with taking care of the children. Women are also responsible for agricultural and livestock activities, and various domestic chores. The primary role of the development should be to reduce their burden. The direct involvement of women in the planning, implementation and operation of projects that are of their immediate concern, specially in matters relating to fuel, fodder, timber

and drinking water, etc., will go a long way towards effective implementation of development programmes. It is through their active participation that the family welfare and planning programmes can progress. A special programme for extensive child development services, including care of children below the age of five and pregnant and lactating mothers; for education and training would go a long way towards protecting the ecosystem.

ACKNOWLEDGEMENTS

The present research was conducted under the auspices of the Ecological and Environmental Research Programme of Government of India. The programme was previously under the Department of Science and Technology but now comes under the Department of Environment. The Department provided financial assistance to the project entitled "Impact of Technological and Economic Development Programmes on Biocultural Heritage of Gaddis and Pangwalas Population Groups of Himachal Pradesh under MAB (Man and Biosphere UNESCO) Project Nos. 6 and 12. Veena Bhasin is thankful to the University Grants Commission, New Delhi for financial aid in the form of Research Scientist.

REFERENCES

- Bhasin, V.: Ecology and Gaddi Culture. *Hindustan Times Weekly*, August 29, 1982, p-9 (1982).
- Bhasin, V.: *Himalayan Ecology, Transhumance and Social Organisation*. Kamla-Raj Enterprises, Delhi (1988).
- Bhasin, V., Bhasin, M.K. and Singh, I.P.: Some Problems in the Education of Gaddis of Bharmour, Chamba District Himachal Pradesh. Presented in Seminar on Education and Social Change in Himachal Pradesh (H.P.) in H.P. University, Shimla, November 13 to 16, 1978 (1978).
- Bhasin, V., Bhasin, M.K. and Singh, I.P.: Ecological Anthropology—Social Science in Environmental Studies. pp. 57-62. In: *Ecology and Development*. V. Bandhu and V. Bhardwaj (Eds.). Indian Environmental Society, New Delhi (1979a).
- Bhasin, V., Bhasin, M.K. and Singh, I.P.: People and Forests of Bharmour Tehsil, Chamba—Himachal Pradesh. pp. 247-254 In: *Ecology and Development*. V. Bandhu, and V. Bhardwaj, (Eds.). Indian Environmental Society, New Delhi (1979b).
- Block Development Office and Tehsildar Office: *Land Revenue Records*. Pangi Tehsil, Chamba District, Himachal Pradesh (1978).
- Block Development Office and Tehsildar Office: *Land Revenue Records*. Bharmour Sub-Tehsil, Chamba District, Himachal Pradesh (1976, 1977, 1978, 1979).
- District Land Records Office: *District Chamba, Land Records*. Chamba, Himachal Pradesh (1977, 1978).
- Hicks, U.: Learning about economic development. *Oxford Economic Papers*, 9: 1 (1957).
- Himachal Pradesh: *District Census Handbook. District Chamba, Town and Village Directory*, 1971. Printing and Stationery, Himachal Pradesh, Shimla (1971).
- Himachal Pradesh: *District Census Handbook, District Chamba Town and Village, Directory*, 1981. Printing and Stationery, Himachal Pradesh, Shimla (1985).
- Hutchinson, J. and Vogel, J.P.: *History of the Punjab Hill States*. 2 Vols., Government Press, Lahore (1910, 1933).
- Indiresen, P.V.: *Managing Development: Decentralisation, Geographical Socialism and Urban Replication*. Sage Publications, New Delhi (1990).
- Messerschmidt, Donald, A.: Indigenous environmental management and adaptation: An introduction to four case studies from Nepal. *Mountain Research and Development*, 10: 3-4 (1990).
- Statistical Abstract of Chamba District 1973-74, 1975-76, 1981. Directorate of Economics and Statistics, Himachal Pradesh, Shimla (1973-74, 1975-76, 1981).
- Tucker, Richard, P.: The evolution of Transhumant grazing in the Punjab Himalayas. *Mountain Research and Development*, 6: 18 (1986).
- Working Plan for The Pangi Forest Division, 1964 to 1984. Forest Department, Shimla (1967).
- Working Plan for the Upper Ravi Forests 1954-55 to 1968-69. Forest Department, Shimla (1961).