LAHAUL-SPITI – ANALYSIS OF ITS REGIONAL STRUCTURE

Dissertation Submitted to the School of Social Sciences, Jawaharlal Nehru University in partial fulfillment of the requirements for the award of the degree of

MASTER OF PHILOSOPHY

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CERTIFICATE

I, Vishal Warpa, certify that the dissertation entitled **"LAHAUL-SPITI – ANALYSIS OF ITS REGIONAL STRUCTURE"** for the degree of **MASTER OF PHILOSOPHY** is my bonafide work and may be placed before the examiners for evaluation.

Vishal.

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INTRODUCTION

"Tribal should develop along the lines of their own genius and we should avoid imposing anything on them. We should try to encourage in everyway their own traditional arts and culture. Tribal rights in land and forest should be respected."

---- Jawaharlal Nehru (1958)

The Himalayas are the mightiest mountain in the world and are also the object of fascination for millions of people. The word Himalaya means different things to different people. To some it evokes the vision of lush green forests, coniferous trees and dense foliage; to some a wide spectrum of bio-diversity, to people with an aesthetic sense it offers the most vivid breath-taking landscape changing its hues and moods with the solar and lunar positions. To the city dweller, it is an ultimate escape from the horrible pollution. For environmentalist, it perhaps is among the richest bio-geographic zones, source of universal rich water and alluvial soil. To the God-fearing, it is quintessentially, a pilgrim route and abode of the Gods, hence epitome of divine purity. Renunciates look upon it as a serene dwelling for meditation and the quest for 'Moksha' or Nirvana.

Philosophers view it is an epitome of unchanging time. For us Indians, it surely has something for everyone. Finally for the people who love nature it is a heaven for mountaineering, trekking and other adventures. However, the literal meaning of Himalayas pertains to 'Him' (snow) and 'alaya' (abode) i.e. abode of snow. The snow-clad magnificence of the Himalayan ranges offers the ultimate in visual aesthetics. These have a universal appeal and the mountaineers of the world achieve a divine sense of satisfaction after scaling its numerous peaks. Love for the Himalaya is a life long courtship.

Since the dawn of human civilization, man has been constantly changing the natural environment. But the diverse civilization, which evolved

in different places, is an indicator of the fact that changes have not been understood in the same way. The man has struggled to fight with nature through the ages with cultural and technological advancement.

The inaccessible, formidable and impassable mountain ranges have been presenting a challenge to mountaineers and mystic monks since long past. But presently with scientific, technical and military skills developing beyond imagination, the Himalayas have acquired greater importance for us from the viewpoint of security, strategy, integration and knowledge. Hence, an overall view of the Himalayan frontiers is essential. The regional concept refers to the segregation of phenomena on earth's surface in spatial groupings. To analyse regional structure is the prime concern of geographers. Its analysis includes the study of areal variations of total human environment both physical as well as cultural within a given region.

"The first thing observed about the regions is that these have location, secondly they have area and the third characteristic is their internal similarities or homogeneities".[1] Mountainous region remained devoid of technological development due to harshness and heterogeneity of natural environment.

"These earth bound phenomena fall into three categories; physical (or natural); biotic; and human, each leading into distinct, although inter-dependent field of enquiry".[2]

"A region has cultural – landscape which is superimposed on its natural landscape. Although, it is the natural landscape over which it is built, the details of former do not always coincide with the details of the latter".[3] In the process of the evolution of cultural landscape, there exits a marked variation with natural landscape.

"Regional structure, too, is the sum total of the extension and collection of human activity in a material setting".[4] Man not only acts on the environmental stage but also makes and shapes his own world. Being an element of ecosystem, man cannot conquer nature wholly but must learn to live in a system of interdepencies. Man and nature is based on "man as a natural being and nature as human reality".[5] This leads to the process of

modification of nature by man, hence enters into the phase of man-nature interaction.

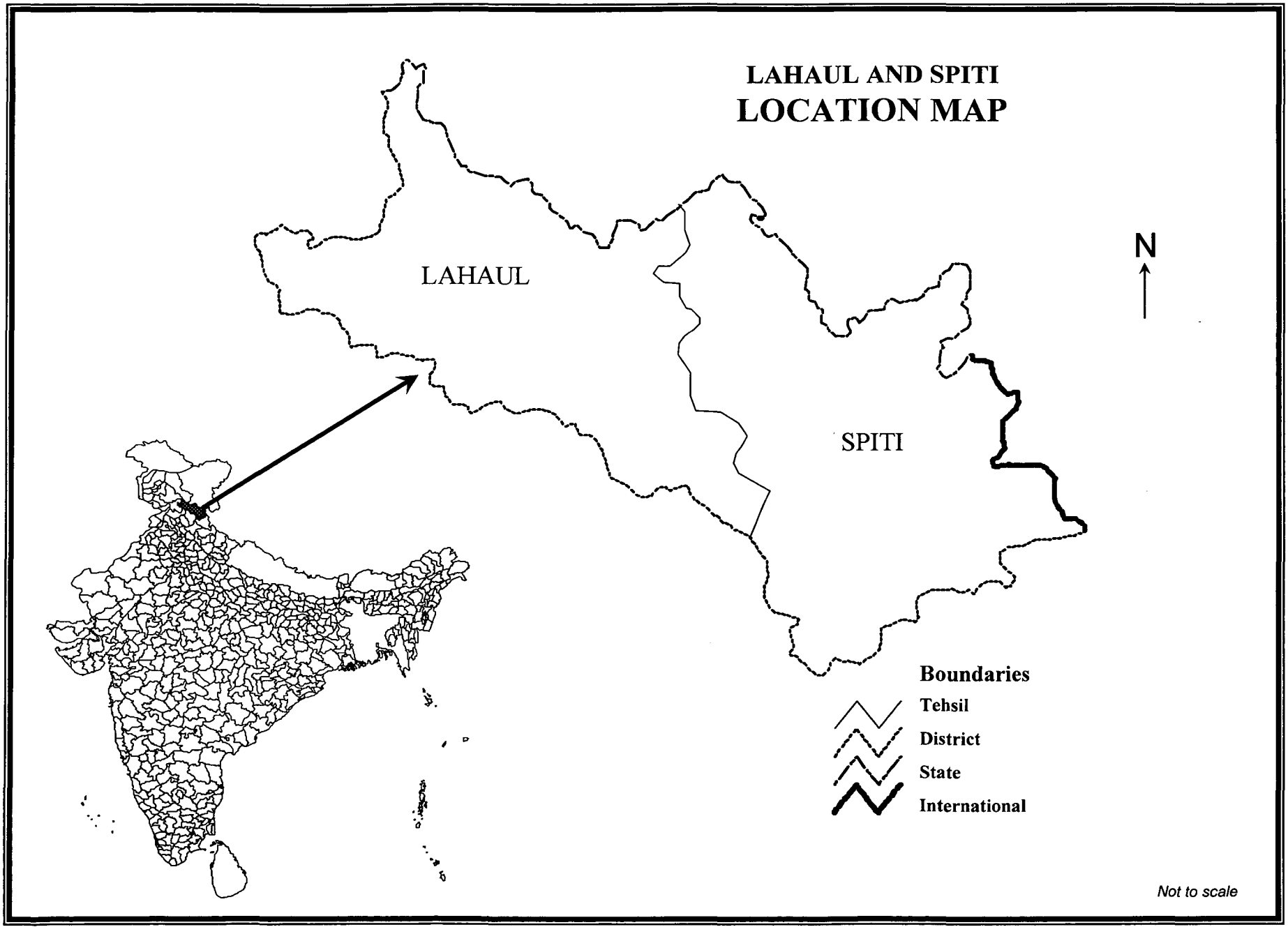
The sphere of man-nature interaction may be viewed as a 'triangle of forces'[6] in which nature, technology and institutions are placed at three apexes of the triangle. Nature provides the base, lays down the limits of freedom and indicates the direction along, which optimum appropriation through social labour in the long run is possible. Technology aids the process, bends to human purposes, modifies them and thus extends the range of freedom. Institutions are either conducive to or restrictive on man-nature interaction.

"Human response varies in space and is region specific depending upon the prevailing natural environmental conditions on the one hand and nature of available technology on the other".[7] A homogenous cultural group may alter different physical – landscapes into different cultural – landscapes whereas heterogeneous cultural groups alter the same physical – landscape into different cultural – landscapes. The main factor which plays dominant role in the culture - ecology interaction is their cultural territory i.e. evolution or level of technological development of the group.

Nature seems to be playing more of a deterministic role in mountainous regions as the natural environment is harsh and heterogeneous and level of technological development is low.[8] The Himalayas are characterized by high altitude, rugged terrain, extreme climate, immature mountain soils; poor accessibility coupled with low levels of technological development is one such underdeveloped region. This fact holds more truth in the higher parts of the Western Himalayas where small societies under harsh climatic conditions have remained encapsulated in isolated valleys. This encapsulation and relative isolation have provided a tribal character to these societies. They have adapted themselves to the requirements of the nature adopting subsistence means of livelihood.

The present study is an attempt to understand and comprehend the regional structure of Lahaul and Spiti district of Himachal Pradesh. The necessity of such study is even more significant in context of fast changing

Map 1.1


LAHAUL AND SPITI
LOCATION MAP
LAHAUL
SPITI
N
Boundaries
Tehsil
District
State
International
Not to scale

strategic and geo-political scenario of the area. Physical constraints kept the people relatively away from the mainstream of the nation for a long-time. Therefore, it is, important to analyse the socio-cultural, demographic and economic aspects of the society so as to incorporate them into the mainstream by properly appreciating their requirements. An attempt has also been made to look into the various interrelated aspects of man-environment interaction. Since the nature is hostile and physical constraints are severe on human freedom. The human response to the challenges imposed by nature have been positive since long past. In context of the above it is of great importance to understand the basic elements and characteristics of the physical and socio-economic structure prevalent in the area and its relationship with other factors such as settlement hierarchy etc.

1.1 **Study Area**

Lahaul and Spiti district is among the high, remote and inaccessible areas of the country. Earlier, it formed a part of Kullu sub-division of Kangra district. In 1960, it obtained the status of a border district with its administrative headquarter at Kyelang. The district is situated between $31^{\circ}44'57''$N and $32^{\circ}59'57''$ north latitude and between $76^{\circ}46'29''$E and $78^{\circ}41'34''$ east longitude. Lahaul and Spiti district covers an area of 13,835 square kilometres and is the largest district of the state, which accounts for 24.85 percent geographical area of Himachal Pradesh.

About 31,294 persons inhabited the district in 1991, forming density of 2 persons per square kilometres. The population was divided into 403 villages out of which only 272 were inhabited in 1991. There was no urban centre in the district. By the declaration of the President of India in November 1975, the people of Lahaul and Spiti were designated as scheduled tribe under fifth schedule and 341 and 342 articles of the constitution of India.[9] After the reorganisation of boundaries in 1966, the district was transferred from Punjab to the newly created state of Himachal Pradesh.

At that time, two tehsils were there; Lahaul and Spiti divided by Kunzum Range making both physical as well as administrative boundary between the two. Further, the area of the district extended in 1975 as a result of district level readjustments of the administrative boundaries with the transfer of Udaipur division of Pangi tehsil of Chamba district to Lahaul and Spiti and was given status of a separate tehsil. At present, the district comprises of three divisions, two tehsils and one sub-tehsil namely Spiti, Lahaul and Udaipur respectively. The district is bounded by Kinnaur, Kullu, Kangra and Chamba district on the south, south-west and north-west while Jammu and Kashmir state and Tibet lie on the north and east of the district.

Physiography of the area was considered the most important factor for adjustment and readjustment of the administrative boundaries. The southernmost boundary is constituted by Pir Panjal Range with an average elevation of about 5,000 metres. Rohtang Pass situated at 3978 metres provides the only communication link through south. The high range of Zanskar forms the northern boundary, while to the west the Great Himalayan Range separates it from Chamba district. Such pass situated at about 4,200 metres provides another communication link to the area. To the east, Rupi, Bhabeh, Lipi passes situated at around 5,100 metres in Zanskar Range separates it from Kinnaur district. Baralacha pass is situated at the main boundary between Lahaul and Spiti.

Due to inhospitable climate and stringent topographic configuration, the region historically remained largely isolated. At present, the area remains cut off from the rest of the country from mid Oct to April-May due to heavy snowfall on the passes linking the region with the outside world. These pass acts as the sole access to all possible spatial interaction. All economic activities except household activities comes to a standstill during long and severe winters. Living under such harsh environmental conditions, human beings try to modify the nature with available primitive technology and at the same time adapt to the needs of nature.

1.2 **Literature Review**

The region of Lahaul and Spiti and its people were neglected in the past due to the inaccessible terrain and inhospitable climate. Although, there exists a considerable amount of literature on the various aspects of the Himalayas but except for some references in the travel accounts, perhaps no systematic and comprehensive work on the region about the inhabitants is available. However, this segregation was thought not desirable for long. Hence, steps have been taken to integrate and develop the region.

Therefore, only a few studies are available and even fewer are relevant to the present study. One of the earliest references of the area is found in the Pali scriptures. The "Padma Thangyial" and "Mam-kambum" described about a country "Khasa", which seems to correspond with the present day Lahaul and Spiti.[10] This area is also mentioned in the writings of Huen Siang who in the course of his travels in India from 629 to 645 A.D. visited Kulu.[11]

Among the modern scholars, Alexander Cunningham[12] (1853) was the first person to make a scientific study of the area with systematic observations made with the help of then available meteorological and survey instruments. His treatise on the climatic conditions, physiography and drainage etc. is of vital importance as it is a pioneer work.

D.N. Wadia in 1919 systematically studied the geology of the area. He emphasized the significance of this Geosyncline in the creation of Himalayan and Tibetan region. In his work he observed that Mesozoic formations are found in the central part of the Spiti valley.[13]

Besides, few gazetteers and Census reports written before independence, the contribution of Bhatnagar[14] and his colleagues is worth mentioning.

First, R.S. Bhatnagar, "An evaluation study of Lahul and Spiti district", was the 1st ever attempt for collecting statistical data about this area. He collected data on land, people, agriculture, animal husbandry and rural employment etc. A.F.P. Harcourt's book entitled "The Himalayan District of

Koloo, Lahoul and Spiti", (1972) provides systematic information on history, religion, culture and economy of the region. The description of the natural attributes is an important feature of this study. Besides, he gave detailed analysis and the role of the Buddhist Monasteries. While, discussing about the local trade in Lahoul and Spiti and Kulu, he obseved that "the Kulu Zamindar are too lazy and effete to trouble himself with the chance of gain in trafficing."[15] He concludes that the lazy attitude of the Kulu under upper class can be ascribed to a great extent to the present socio-political set up of this area.

M. S. Gill's[16] book entitled "Himalayan wonderland" (1972) dealt with various customs, traditions, rituals and religious aspects of the social life of this area.

S. S. Charak's book entitled "History and Culture of Himalayan states" (1979) provides an insight into the culture and religion of the whole Himalayan region along with an analysis of physical and environmental set up in chapters 11 and 12 that specifically deals with Lahaul and Spiti[17].

P. Sharma[18] in his book entitled "Men and Mules on mission of Democracy" has dealt with the political structure. He focused on the process of conducting election and mentioned the hostilities and strains of environment.

Apart from these, other significant studies[19] are "History of Punjab Hill States" by J. Hutchison and J.P.L. Vogel, "On an Indian Border" by Pran Chopra "Himalayan Circuit" by G. D. Khosla. All these studies provide valuable information about the region. Pran Chopra mentioned about the routes of dialects and throw light on the history. "Himalayan Borderland" by Ram Rahul[20] presents simple and lucid information on the people, history, administration and development.

S. C. Bajpai (2000)[21] made a detailed study on the various physical and cultural aspects of Lahaul and Spiti in his book "Lahaul and Spiti - A Forbidden land in the Himalayas". V. Verma's (1997)[22] book entitled 'Spiti: A Buddhist Land in Western Himalayas' has described the Buddhist culture in

Spiti. S.S. Negi's (1995)[23] work on the cold desert of Western Himalayas provided an in-depth detail about the physical features in the region. The vivid account of history and culture of Lahaul can be seen in the work of Ram Nath Sahni (1994)[24]. The work of C. S. Panchani (1994)[25] throws light on the tribes of Himalayas.

Besides books, articles are also available that provide useful information for this study. It includes the work of Himanshu Kumar[26] on the soil, plants and land use pattern. He identified different soil types and related land use patterns in the area. Inder P. Singh[27] made very useful study from the socio-biological and anthropological viewpoint of the tribal society of Lahaul, especially Bodh. J. Gupta's[28] study on stratigraphic position of Tandi limestone has recognized many of the geographical features of the area in general. His work on mineral resources and fossils formation in Lahaul is of great importance, as it attempts to evaluate the future potentials of development of this area.

Kayastha studied the potentials and problems of development in his article on "Some Problems of Development in Lahul and Spiti". He focused on the problem of economic development. He argued "economic uplift is necessary in these areas of strategic importance."[29] Joshi, K. L.[30] attempted a factoral analysis of the evolution and problems of land use in Lahul. He discussed the U-shape glaciated valley with the climatic and the soil characteristics and the land use of the area. He concluded "Lahul region affords unique example of modification of restrictive natural environment by the ingenuity of tribal man's most rudimentary skills."[31]

Milap Chand[32] has made analysis of relief properties and drainage morphology of Lahul and has described about the geology of the region. He identified five geomorphic regions based on altitude, type of geomorphic processes and vegetational characteristics. D. S. Thakur, D. C. Thakur and A. S. Saini[33] have assessed the impact of Tribal Development programmes on socio-economic parameters in Lahaul. They found that the physical achievements do not seem to be in consonance with the financial expenditure in the area.

Rest of the sources of information include government gazetteers, census reports and other reports. First ever report on the revised settlement of the Kulu sub-division of the Kangra district in 1898 and latter in 1917 by A. H. Diach provides valuable statistical data. On account of the present problems, the study by Harjit Singh[34], "Ladakh-Problems of Regional Development in the Context of Growth Point Strategy" is a work of immense significance as it deals in depth with the formations of spatial framework of development for an area, which is similar and adjacent to Lahaul and Spiti. His work dealt with the aspects of physiography, demography, socio-economic characteristics and the amenities etc. It also highlighted the nature of natural constraints in the resources of Ladakh, which to a certain extent are comparable with those of Lahaul and Spiti area. Another important aspect, which has to be observed in the above study, is the effort to evaluate the socio-physiographical features of the area from a historical and materialistic approach.

It has been seen earlier that the literature available on various aspects like physiography, geology, culture, and economy etc. are very few of the area under study. At the same time, the census data and the available literature played a crucial role in our study.

1.3 **Objectives**

The purpose of this study is to understand regional structure of Lahaul and Spiti region. Main objectives of the present study are to analyse the spatial dynamics of natural environment in Lahaul and Spiti valleys. More specifically, the important objectives are as under:

1) To study the aspects of natural environment in order to understand the harshness of nature.

2) To analyse the relationship of the nature with the different aspects of culture.

3) To study the aspects of population and dynamics in it.

4) To understand the economic structure in order to access the role of physical environment on it.

5) To study the existing infrastructure and the variations among them.

6) To comprehend the role of state intervention and its role in the development of the region.

7) To identify the levels of development on the basis of socio-economic and development infrastructure variables.

1.4 **Database**

The required data for meeting the outlined objectives has been procured from secondary sources. These sources include:

1) Census of India, District Census handbooks, Lahul and Spiti district for 1961, 1971 and 1981 Director of Census Operations, Shimla-I.

2) Census of India, 1991, Himachal Pradesh District Profile, Registrar General and Census Commissioner of India.

3) Census of India, 1991, series – 9, H.P, Part VIII (II), Special Tables on Scheduled Tribes, Director of Census Operations, Shimla – I.

4) Lahul and Spiti, Himachal Pradesh, District Gazetteers, 1975.

5) Census of India, 1991, series – 9, Himachal Pradesh, Part XII-A and B, District census Handbook, Director of census operations, Shimla.

6) National Atlas and Thematic Mapping Organization, Department of Science and Technology, New Delhi, 1999.

7) Directorate of Economics and Statistics, 1981 and 1999-2000, Shimla.

1.5 **Methodology**

In order to accomplish the objectives of the study, certain methods are required. Therefore, a set of methods has been adopted. These are as under:

i) Cartographic methods,

ii) Statistical methods.

Cartographic techniques are representative in nature. Even laymen can have a look on the map and will be able to understand the result. Geographers have always used cartography to show the spatial variability in the occurrence of different physical and socio – economic phenomena. Among cartographic method, mainly maps of natural drainage have been prepared and analysed in terms of stream ordering and bifurcation ratio.

Statistical technique is used for calculating percentages, proportions and ratios in order to analyse the social, demographic and economic features of the area.

Composite index have been computed to see the existing levels of human resource development and infrastructure development separately and collectively in the villages and variations among them. The formula is given below:

$$C.I = \sum_{j=1}^{m} \frac{Xij}{\bar{X}j}$$

Xij = Value of the jth variate for ith village

m = Number of variables.

To analyse socio – economic development, following variables have been taken.

(a) Population density,

(b) Sex ratio (negative),

(c) Literacy level,

(d) Female literates,

(e) Non – agricultural workers.

Mean and standard deviation has been worked out. Standard deviation has been used to show the distribution of each variable. Variables have been made scale free by dividing the value of each variable from the mean. $X_i = x / \bar{X}$, where x_i is the derived value of 'scale free' variable, x represents actual value and $\bar{X}$ is the mean of different variables.

For analysing infrastructure development, the following variables have been taken

(a) Educational facilities,

(b) Medical facilities,

(c) Drinking water,

(d) Postal services,

(e) Transport,

(f) Power supply,

(g) Per capita land availability

Same method has been taken to compute infrastructure variables as it is done in earlier case.

1.6 **Organisation of material**

Any research material needs to be closely linked with empirical situation. The first chapter deals with the theoretical aspect of the problem, introduction to study area, viz. objectives, database and methods. It is substantiated by survey of literature, which helps us in developing the framework for our study.

Environment plays very important role in the underdeveloped areas like Lahaul and Spiti. The understanding of natural environment is important as it tells about the natural resource base and the natural constraints. The second chapter deals with the aspect of natural environment. This chapter has been divided under the sub-heads of geology, physiography, drainage, climate, soil and vegetation etc.

The social and demographic profile of Lahaul and Spiti district is dealt in third chapter. This chapter is of immense importance as it is well known that social structure itself shows certain adjustments that man makes in response to natural demands especially so in underdeveloped areas like Lahaul and Spiti. Simultaneously, the demographic profile of the area is indicative of the surrounding environment.

Human response to environmental constraints in backward areas eventually gets articulated in the economy of a given region. The fourth chapter describes the economic structure of Lahaul and Spiti. In the final analysis, it is the settlements, which emerge as centres of man - nature and man - man interaction. It is here that man built structure to protect him from unfavourable environmental conditions and carries on his economic and social activities. Chapter five has been devoted to development process and hierarchy of settlements. The study concludes with a brief note on the major findings of the study.

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Chapter: Two

THE NATURAL SETTING

For any comprehensive study of regional structure of an area, physiography is an important element. Lahaul and Spiti being located in the highlands of the Great Himalayan range and partly of Trans-Himalayan range, is a land of mystique and natural beauty. The district occupies grid location from 31°44'57" North to 32°59'57" North latitude and 76°46' 29" East to 78°41'34" East longitude. Area wise, it is the largest district of Himachal Pradesh state comprising an area of 13835 square kilometres. It is separated in the east from Tibet autonomous region of China that forms an international border. Ladakh, a mountainous district of Jammu and Kashmir lies in the north and Chamba district to its south-west and west. Towards, south and south-east it makes boundary with Kullu and Kinnaur districts. The mountains adorn its surroundings and the entire region has a hostile terrain.

Being a part of the Himalayas, it has witnessed important geological and physiographic changes. Thus, it becomes important to understand the following in order to comprehend the essential components of its physical environment:

- Geology of the area that provides the base for various natural forces to act on;
- Resultant landscape features, which emerged on the surface;
- Natural drainage that shows certain climatic conditions of this remote region and in turn gives the shape to various landscape features;
- Climate, which has a bearing in sculpturing the physiography and plays role in society;
- Soil and natural vegetation, which are largely the consequence of the interplay of natural agents.

2.1 Geology

In order to acquire a better understanding of the landforms and evolution, a basic knowledge about the geology of that area is very relevant as the landforms to an extent are dependent on the underlying lithology. The region displays considerable similarities with the Himalayas in general. The Himalayan ranges are the representatives of the most recent epoch in the orogenic history of the earth causing the uplift of Archean to Mesozoic accumulations in the geosyncline in about 60 millions years ago. The process of mountain building was shaped during the last phase in large parts of Lahaul and Spiti. Geologically, this region displays more or less existence of complete sequence of geological formations dating from the Pre-Cambrian to the Cretaceous with short breaks in Upper Carboniferous and Jurassic time. The stratigraphic arrangement of the area is as follows:

Table 2.1

Geological Succession

Recent	Soils, Scree, Valley fills
Pleistocene....	Moraines,
	Glacial tills etc.
Cretaceous...	Chikkim Series
	Giumal Series
Jurassic	Spiti Shales
Mesozoic	.... unconformity.
	Sulcacutus Beds
	....unconformity.
	Kioto limestone.
Triassic Lilang System.	Upper Triassic
	Middle Triassic
	Lower Triassic

Permian Kuling System.	Productus Shales Calcareous Sandstones	
Upper Carboniferous.	Conglomerate .... unconformity.... (short duration).	
Lower Carboniferous. Kanawar System.	Po Series.	Fenestella Shales Thabo Stage.
	Lipak Series.	
Devonian...	Muth Quartzites	
Silurian...	Silurian rocks	
Ordovician....	Ordovician rocks	
Cambrian Haimanta System	Upper Haimanta Middle Haimanta Lower Haimanta	
Pre-Cambrian....	Vaikrita System.	

Source: M.D. Mamgain (1975), Himachal Pradesh District Gazetteers, Lahaul and Spiti, pp.14 – 15.

The oldest formations of Pre-Cambrian era are found in Spiti. These occur in the form of hard crystalline rocks. The Main Central Thrust from the younger formations divides these. These consist of chiefly micaschists, slates, and phyllites etc, which are highly metamorphosed due to pressure exerted by folding. The Haimanta system of rocks belonging to Cambrian period occurs in the northern slope of Great Himalayan Range. It separates Spiti and Kullu and extends into Lahaul region towards North-west through Kado Tokpo valley. [1]

The Haimanta system consists of micaceous quartzites, slates, and shales that are highly folded in nature. This system contains various types of fossils including Trilobites, Brachiopods and echinoderms. The Cambrian rocks are covered by a thick series of shallow water deposits and these in turn by limestone and shales. This formation carries various types of Trilobites, lamellibranchs, gastropods, cephalopods and corals. In upper Spiti area, muth quartzites are dark fissile limestone overlain by a series of limestone, shales and quartzites known as Kanawar system, which is about 1210 meters thick. These are further sub-divided into Lipak and Po series characterized by fossils such as Brachiopods, Trilobites, and Cephalopods.[2]

The Upper Carboniferous formations of Spiti are marked by an unconformity at places. Conglomerates make it rest upon the Po Series or earlier rocks followed by Permian Strata constituting the Kuling System. This system is composed of grits, quartzites and calcareous sandstone. It contains various types of Brachiopods.[3] The Calcareous Sandstones are succeeded by a group of brown or black Carbonaceous and Siliceous Shales called the Productus Shales mainly occurring in Spiti region. The Lilang System comprises of the Triassic rocks formed mainly of limestone, intercalated shales and sandstones. These two contain a large number of fossils mainly of Corals, Cephalopods and Crinoids. The most complete section of the Triassic System is exposed in the Spiti - Kumaon belt of the Himalayas.

The rocks succeeding the Triassic rocks in Spiti area include the Kioto Limestone, Black Ferruginous Oolite called as Sulcacutus Beds and the Spiti Shales of Jurassic age. [4]

The Spiti Shales consist of Micaceous Shales with several intercalated layers of sandstone including numerous fossils mostly of Ammonites.[5] The Spiti Shales pass upwards into the Giumal Series of Cretaceous age, which also consist of yellow and brown sandstones and slaty quartzite. Chikkim Series comprising of grey or white limestone overlies the Guimal Series. The Chikkim shales comprising of calcareous, sandy and grey-green shales overlie the Chikkim limestone. The Chikkim Series is overlain by a group of sandstones and arenaceous shales, which are wholly unfossiliferous.

The formations of Cretaceous period are succeeded by those of Pleistocene period i.e., the period of glaciations. The main characteristics of this period are the processes such as advance and retreat of glaciers, minor movement, thrusting and uplifting of land to achieve the isostatic equilibrium. The glacio-fluvial processes are still operating their role in sculpturing the landforms. The richness in fossils and nearly continuous well-exposed sections has made Spiti world famous. Surprisingly, a large part of it still remains unstudied.

It is clear from the above discussion that Lahaul and Spiti district portrays a complete sequence of geological formations dating from the Pre Cambrian to the Cretaceous with short breaks in Upper Carboniferous and Jurassic times. Being situated in seismic zone, geologically it is sensitive region.

2.2 **Physiography**

The district of Lahaul and Spiti is a unique physical unit of Himachal Pradesh. It has highly uneven mountainous and rugged topography. High mountains on all sides surround the district. The Great Himalayan range criss-crosses the district and roughly divides it into Lahaul and Spiti. Zanskar range

forms the north-eastern border and Pir Panjal range forms the south -western and southern boundary of the district. Therefore, it makes a closed physical unit. Being a border district, it is an area of strategic and geo - political importance. The most significant features within Lahaul and Spiti are the high mountain ranges and narrow river valleys, which shows great deal of topographic diversity. The mean elevation of the ranges goes upto 5,480 meters above the mean sea level.

The entire area is much higher and rugged than its southern district of Kullu. Pinnacled topography is the Characteristic feature of high peaks in Lahaul and Spiti. These peaks remained covered with snow throughout the year. These peaks have altitude varying from 5,180 meters to over 6,400 meters. Vegetative cover is confined upto an elevation of 3350 meters. Beyond this, bare barren surfaces exist. The whole district is a cold desert. Spiti is more rugged than Lahaul. To the west of Lahaul, Udaipur has substantial cover of natural vegetation. The district has two distinct topographic units.

I. The Mountain Ranges;

II. The River Valleys:

The Mountain Ranges: Mountains and hills found in Lahaul and Spiti of Himachal Pradesh are a part of the Himalayan Mountains and associated ranges of the loftiest mountain chain of the world. Physiography of this region exhibits the striking intra-area variations from North to South than East to West. On account of these variations from the Mani Mahesh range in the North and the Zanskar range in the East, the mountain ranges alone have been separated into following sub-regions. The significant ones from south towards north are – Pir Panjal range, Great Himalayan range, and The Zanskar range.

Pir Panjal Range:

This range extends from north-west to south-east with an average altitude between 3,500 to 5,000 meters. However, many peaks rise above the level of 6,000 meters. The peaks that stood above 6,000 meters include Dara Goh, Khodo Goh and Makar-Beh. The range restricts the entry of monsoons, which results into lesser amount of precipitation and vegetation in Lahaul and Spiti. The amount of precipitation and vegetation is found more in north than south. The continuous wall of the Pir Panjal range restricts the accessibility only through one way, i.e., Rohtang Pass (3978 meters). The height of this pass puts serious constraints over its regular interaction with outside world. Due to heavy snowfall, it remains cut-off from rest of the world from December to April. Geologically, Pir Panjal range consists of a zone of highly compressed and altered rocks of various ages.

Great Himalayan Range

Himadri is other prominent name of the Great Himalayan range. The average elevation of this range is above 5,000 meters. The general direction is from north-west to south-east and it almost runs parallel to the Pir Panjal range in the west, which finally merges in the eastern part. Some minor ridges of this range run from north to south. These ridges divide different valleys. To its west and east, Drilbu and Gyephang ridges makes boundary of the Bhaga valley. The Gyephang ridge is situated to the west of Chandra valley and Kunzum ridge to the east surrounds Chandra valley. Chandra- Bhaga ridge lies to the north of this valley, and Bara-Bhangal ridge is in the south. Kunzum ridge in the west and Shilla and Khir ridges in the east bound the Spiti valley. The valleys divided by these ridges have most of the concentration of human activities. The Himadri or Great Himalayan range has more glaciers than Pir Panjal range. Important glaciers situated in the Great Himalayan range include Sonapani, Perad and Bhara Shigri etc.

Zanskar Range

To the north-east of the Great Himalayan range lies the Zanskar Range. This range separates the plateau of Tibet from the state of Himachal Pradesh. Being located in the Trans- Himalayas, the Zanskar range cuts through the north-eastern part of the Lahaul and Spiti. It extends in the central and north-western corners. The Spiti tehsil lies in Trans Himalayan zone. To the east, Shilla and Zanskar range is dominant which is also by and large parallel to Great Himalayan and Pir Panjal ranges. The altitude of these ranges varies between 5,000 to 6,000 meters above the mean sea level. Located in the direction of Great Himalayan range, these display climatic, physiographic and other differences with respect to other ranges. Many geological formations are found in the Spiti area.

THE RIVER VALLEYS

Geographically, the river valleys occupy the lower parts of the region. Located in narrow and relatively flat parts of the region, it performs very significant role in the settlement of the area as they offer land for economic activities. Being situated at lower elevation they experience relatively milder climate, which supports the maximum population. It is because of this that most of the human settlements are situated along the banks of the river valleys. The important river valleys are as follows.

I. Chandra Valley

ii. Bhaga Valley

iii. Pattan Valley

iv. Chenab Valley

v. Spiti Valley

Chandra Valley

Locally, it is known as Rangoli in the lower inhabited parts. It begins from the south-eastern base of Baralacha Pass (16047 Feet). A considerable part of this valley is just a snow bed near Baralacha Pass. Uninhabitation is the rule in the larger parts. The slopes are remarkably stony and bare. The Chandra valley contains mainly high mountain peaks, large glaciers and vast snowfields. It is an area of extreme climate. Monsoon season in Kullu affects the climate of this valley. The entire length of the valley is about 112 kilometres. High peaks divide it from Bhaga valley to its west. The branch of Great Himalayan range extends and passes through its east. Geyphang (5,856 Metres) is the highest peak. The valley becomes wider to the right side of the river, resulting in the settlements to occur in the region. The Bara Shigri glacier on the right bank of the river Chandra descends to the riverbed and is the largest in the Lahaul. The altitude varies between 3007 metres at the confluence to 4,877 metres at the source. Pastures are found in patches along the river channels. The river while following its course takes a western turn near Batal and makes confluence with Bhaga river at Tandi. The river is fed by a number of glaciated tributaries. The largest glaciers are Bara Shigri, Samundri and Dhaka etc., situated on the both sides of the river. Right hand tributaries include Gramphoo and Sissu, which originate from Sonapani glacier. Migrant shepherds practicing transhumance utilize most of the alpine meadows.

Bhaga Valley

The Bhaga river is locally called "Gara". This river valley starts from the south–western base of the Baralacha Pass situated at an altitude of about 4,800 metres. Like Chandra valley, the upper reaches of this valley are also barren, rocky and largely uninhabited. The general direction of the valley is from north-

west to south-west. The Pattan valley lies to its west while Chandra to its east. The average altitude of the ranges is about 5,000 metres. However, the valley is mostly barren, rocky and uninhabited upto Darcha, the first village in the valley approached from the north. The valley begins from the confluence of Yoche nullah and the Zanskarcha at an altitude of about 3,000 metres. The valley becomes wider from here onwards. The right bank offers tract of level and cultivable land. The valley is called by different names on account of ethno-cultural variations. Keylang, the administrative headquarter of the district is the largest settlement situated on the right bank of the river Bhaga. The left bank being characterized by precipitous cliffs has a danger of mass movements and is characterized by very few villages. The total length of the river is about 65 kilometres before its confluence at Tandi. It is marked by steep and rocky banks. One of the most important monasteries, viz. Kardang is also situated on the opposite side of Keylang. This side is steeper than other side. The Bhaga river is entirely fed by the tiny rivulets originating from glaciers. The important tributaries are Milang nullah and Biling nullah originating from the Mulkila and the Gangstang glaciers respectively.

Pattan Valley

Area beyond the confluence of river Chandra and Bhaga at Tandi to Thirot is popularly known as Pattan valley. The conspicuous differences among these valleys lie in terms of their altitude, width and other related factors such as settlement etc. Its average elevation is about 2500 metres and varies from 1.5 to 2.0 kilometres in its width. This valley is less hostile, rugged and desolate than all other valleys. The population is high due to fertile soil and less harsh climatic conditions. This valley is termed as orchard and granary house of Lahaul and Spiti. Generally, two crops are grown in a year as compared to one in the earlier valleys. Several high peaks surround the valley notably being Gangstang peak (5480 metres). Most of the villages are situated near the rivers while some

villages are also conspicuous on adjacent alluvial fans and talus cones depending over the suitability of soil for agriculture. The left bank is a continuation of Pir Panjal range is very narrow and steep. Very few villages are located on the left bank such as Jasrath and Nalda etc. All the right bank tributaries of river Chenab originate from the Gangstang glacier. The most important tributary valleys are those of Tholung, Lot, Shansha, Jhalma, Junda and Thirot. These small streams are the chief source of irrigation for most of the cultivable land. The flora present here is in the form of few planted Willow and Popular trees.

Chenab valley

The valley between Thirot and Such Pass is called Chenab valley. Prior to 1975, this valley constituted the part of Chamba district. After the readjustment of district administrative boundaries, this 1912 square kilometers of Chenab valley was handed over to the district of Lahaul and Spiti. It is situated between Such Pass and Naingar ridge to the north and Pir Panjal Range in the south. The Thirot river separates this valley from Pattan valley to its east and goes upto Tindi before its entry in the Chamba district. This valley is more productive and greener as compared to all other valleys. A larger part of the area is uninhabited. Chenab valley is endowed with maximum potential of unexploited forest wealth. But owing to certain climatic and socio-economic restrictions, the valley has not developed at par with other valleys. Recent developments, which took place in transportation, have changed the scenario considerably. The availability of irrigation and gentle slope supports maximum concentration of population. This valley is widest among all others (around two to three kilometres wide), but the average elevation is relatively low. The climatic condition is relatively less oppressive and hostile. It resembles the climatic condition of Kullu valley in summer season.

Than Pattan is an important pasture below the source of Miyar nullah above 4000 metres. It offers good grazing ground for seasonal migrant shepherds

during summers. Miyar nullah is the main tributary of Chenab and is the important source of irrigation for agricultural activities in the lower region. It passes through a deep gorge of about seven kilometres long to meet the Chenab river. Arat, Shogal, Dadh-Grah, Urgah, Lahoni, Kurchad nullah, etc., are important glacier fed tributaries and are perennial in nature.

Spiti Valley

The Spiti sub-division is relatively more oppressive than Lahaul in terms of terrain, climate and inhabitation[6]. The lofty Himalayan ranges lies to its north-west while gorges of Spiti river dissects it into two in the middle. Lingti plain with an area of 260 sq. kilometres, lies in its north-east. Spiti valley is less accessible and developed than Lahaul. Its average elevation is 5500 meters. The Zanskar range contains one peak, east of the Parang La that is over 7000 metres high. To the south in the Srikand range, Manirang peak have an altitude of 4600 metres. To the north of the Kaza is the Chocho- Lang Kilta peak (6400 meters). The valley begins near the Kunzum Pass and is 3 kilometres wide. The settlements are built around occasional springs on flat piece of land. They generally appear three to nine kilometres apart. Soil is extremely dry and barren to support plant life on its own. Irrigation is done on all cultivable land by diverting small rivulets through channels locally known as Khuls. Gete situated at an altitude of 4270 metres north of Kaza is one of the highest villages in the World. The local people divide Spiti into the following four units:

1. Sham (lower region), which lies on both sides of main river between its confluence with Lingti and its junction with the Pare Chu;

2. Pin valley, named after a local area, lies on both sides of the Pin river;

3. Bhar (middle region) which lies between the point where Shilla nullah meets the main river about three kilometers above Kaza and Sham; and

4. Tud (higher region), which includes all portions of the territory above Bhar.

Thus, like Lahaul, mountain ranges and river valleys mark the topography of Spiti valley. The arid climate, highly rugged relief and high altitude make the region difficult for habitation.

The Spiti river has its origin far north on the eastern slopes of the mountain ranges, which run between Lahaul and Spiti. It is formed at base of the Kunzum range due to the confluence of Kunzum La Togpo and the streams Kabzima and Pinglung. On the south- east, the length of the river is about 130 kilometers. It continues in Kinnaur district upto Khabo where it joins the Satluj. In its complex course, the river is joined by a number of tributaries from both sides. The right bank tributaries include; Chiomo, Gyundi, Rahtang, Ulah, Pin, Lungze, Mane, Sumra, Pomograng, and Mamdang, etc, and on the left bank tributaries are Thamar, Hanse, Shilla, kaza, Lingti, Poh, Tabo, Karati, Gimdo, and Parechu. etc. The Pin river is important right bank tributary of Spiti river. Its length is about fifty kilometers. Its main branch Kyoti that originates from Srikand range and the Gyundi and Rahtang rises from the Middle Himalayas. All tributaries are perennial in nature. The Lingti maidan, which offers good grazing ground during summers, suffer from overgrazing. The Lingti and Yunan rivers flow north-east to meet the Tsarab river before running north into Zanskar.

Map 2.2 reveals that the whole area of the district is very elevated and most of the land lies above an altitude of 4500 metres. The area can be divided into three altitudinal zones:

I. Above 4500: Under this zone comes all the area excluding the river valleys .It can be seen from the figure that its presence can be felt in almost all parts of the area. These are mostly the glaciated areas.

II. 3000-4500: Under this zone come the prominent river valleys of Chandra and Bhaga and its associated river valleys. This has characteristic pattern resembling the river valley and is mostly inhabited.

III. Below 3000: Under this zone there is very little area, which is confined to the river valley located in the western margin of the district. This area is forested and is inhabited.

From the above analysis it is seen that the most inhabited and vegetated area comes in the third category i.e. below 3000 metres. Altitudinal zones are also indicative of the availability of alpine pasturelands, which are very important for the villagers there as they depend on it for their cattle's fodder.

2.3 NATURAL DRAINAGE

The study of drainage network provides an idea about the topography, climate, geology, and hydrological features of the region. Drainage is the most important natural agent in sculpturing the landforms. They also give an idea about the identification of settlement patterns. Since Lahaul and Spiti is situated in Himalayan ranges, where settlements occur along the river valleys. Being, a mountainous area adverse climatic condition affects the entire population. Therefore, it becomes necessary to analyse the drainage network in order to access the role of natural environment and its impact on socio-cultural and economic aspects.

In Lahaul and Spiti, there are three major rivers namely Chandra, Bhaga, and Spiti along with numerous tributaries. River Chandra and Bhaga after their confluence at Tandi becomes the Chenab. These are the major drainage basin of the area.

Chandra river:

It originates from a huge snow bed on the south-eastern base of the Baralacha Pass. For the first 48 km, it flows in a south-westerly direction. Then it takes north westerly and western direction for further 64 km upto Tandi where it meets the Bhaga river. On its left bank, a beautiful glacial lake called Chandra Tal straddles between a low ridge and the main Kunzum range. It is a kilometre long and a half wide with an outlet into the river. Chandra river is fed by a number of glaciers. The biggest being the Shigri on its left bank and the Samundri, Sonapani on the right bank. It registers an average fall of about 12.5 metres per kilometre upto its confluence.

Bhaga river:

Bhaga river has its origin from the south-western side of the Baralacha Pass at an altitude of about 4800 metres. For almost 13 kilometres, it flows in a northwest direction and then takes south-westerly course. It has a total length of about 65 kilometres upto Tandi. The main tributaries are Barsi, Milang nullah and Billing nullah etc. It is barren and rocky upto Darcha. It has an average fall of about 28 metres per kilometres.

Chenab river:

After their confluence at Tandi, Chandra and Bhaga rivers are called Chandra Bhaga or Chenab. The River is entirely fed by a number of glaciated tributaries on either side. The right bank tributaries include Shansha nullah, Thirot nullah, Chokang nullah, Miyar nullah etc, and Lingar nullah, Rashil nullah, Nalda nullah, Ghor nullah, and Galigorh are the left bank tributaries. Among these, Miyar nullah is the largest tributary with a length of about 32 kilometres. It runs in a north-westerly direction about 75 kilometres until its exit to the border of

Chamba district. Chenab River has an average fall of about 6 metres per kilometre from a height of 2800 metres.

Yunan River in the north-eastern part of Lahaul does not flow into the river Chenab. It joins with Lingti Chu and further become the Tsarp chu, a tributary of the Indus river.

Spiti river:

The Spiti river originates from far north on the eastern slopes of the mountain ranges between Lahaul and Spiti. It is formed at the base of the Kunzum range by the confluence of Kunzum La Tagpo and the streams Kabzina and Pinglung. Broad and flat valleys bordered by high vertical cliff mark the Spiti river. The total length of the river is about 130 kilometres on the southeast within Spiti. It continues upto Khabo in Kinnaur district where it joins the Satluj. On both sides, several glaciated tributaries join Spiti River. On its right bank are Chiomo, Gyundi, Rahtang, Pin, Sumra etc, and Thanar, Hanse, Tagling, Shila, Kaza, Tabo, and Parechu are on the left bank. The Pin River is the most important right bank tributary of the Spiti River. The length of the Pin river is about 50 kilometres. Kyoti, originates from the Lasuma mountain in the Srikand range of the Middle Himalayas.

The Lingti river is about 40 kilometres long, which is an important left bank tributary of the Spiti river. These important tributaries contain large number of villages in their watershed. On agricultural front, they are an important source of irrigation. Since, whole of the area is semi arid and cold desert region, it receives scanty of precipitation during monsoon months. High mountain ranges impose a climatic barrier in the way of monsoons. Therefore, the entire area remains under rain shadow zone. Thus, the importance of natural drainage becomes even true in mountainous regions like Lahaul and Spiti.

The drainage pattern denotes the spatial arrangement of the streams in a particular region. It depends on a large number of factors; some of the important ones are the nature of slope, structural control, lithological characteristics, tectonic factors, vegetal characteristics etc. From the map 2.3, it becomes quite clear that the most prominent drainage pattern is the dendritic pattern. It can be seen in almost every river system. The second pattern discernible is that of herringbone pattern. It is well developed in the Chandra river between Sissu and Gramphu. The areas that are not having drainage pattern are the glaciated areas. Drainage patterns also give a general idea about settlements, as only the areas having suitable drainage are inhabited.

Stream ordering provides an idea regarding the dimension of the basin of each tributary and about the extent of water discharge. There is a positive correlation between water discharge and width of the valley with the stream order. In other words, higher the stream order wider will be the valley and higher will be the water discharge. It gives an indirect idea about the water resources of the area.

Map 2.4 and table 2.2 shows the stream ordering and bifurcation ratio in Lahaul and Spiti district. The Chenab river attains fifth order from its starting point at Tandi where Chandra and Bhaga meets (map2.4 and table 2.2). Miyar is the only one important tributary that attains fourth order before its confluence with the Chenab river. There are twenty six fourth order, thirty five third order and sixty three second order and one hundred eighty first order streams that joins directly with Chenab river. The overall bifurcation ratio between first and 2nd order is nearly two and is three between 2nd and 3rd order streams. The bifurcation ratio increases between 3rd and 4th order streams i.e. four, while it becomes 0.24 between fourth and fifth order streams respectively.

Miyar nullah is the only major stream which has fourth order constituted by 26 third order, 43 second order, 98 first order streams. The bifurcation ratio between 1st and 2nd order is two and between 2nd and 3rd order is nearly two. It is nearly three between 3rd and 4th order streams. The Bhaga river has ten 5th order streams, 26 sixth fourth order, 35 third order,63 second order, and 180 first order

streams. The bifurcation ratio between its first and second and fourth and fifth order is nearly three while it is nearly two between second and third order. It turns out to be one between third and fourth order streams. The Chandra river attains 44 fourth order, 31 third order, 60 second order 159 first order stream. The ratio between its successive streams stands nearly three between first and second order stream and between second and third order, it is nearly two while it is less than one between third and fourth order streams.

Table 2.2

Bifurcation Ratio

Main River	Major Streams	1 : 2	2 : 3	3 : 4	4 : 5	5 : 6
Chenab		1.90	3.52	4	0.24	
Chandra		2.65	1.93	0.70		
Bhaga		2.85	1.8	1.34	2.6	
	Miyar	2.28	1.65	2.89		
	Jankar	2.62	1.71	0.78		
Spiti		2.29	2.14	1.39	2.53	2.14
	Pin	2.71	1.88	1.24	1.75	
	Lingti	2.38	2.05	0.86		

Jankar nullah is the most important tributary of Bhaga river having 18 fourth order, 14 third order, 24 second order and 63 first order streams. The bifurcation ratio between first and second order is nearly three and between second and third order is around two while it is less than one for the next higher order streams.

Spiti, the main river in Spiti tehsil of Lahaul and Spiti district becomes sixth order stream. It has 14 sixth order, 30 fifth order, 76 fourth order, 106 third order, 227 second order, and 520 first order streams. The river is predominated by first and second order. It shows bifurcation ratio of 2 for first two successive

orders and it is 2 between fifth and sixth order. It is nearly 3 between fourth and fifth order streams. Pin is the important right bank tributary of Spiti river having 12 fifth order, 21 fourth order, 26 third order, 49 second order and 133 first order streams. It reflects bifurcation ratio of nearly 3 in first and second order and nearly 2 between second and third order and fourth and fifth order while, it is 1 between third and fourth order streams. Lingti is the left bank tributary having 93 first order, 39 second order, 19 third order, and 22 fourth order streams. It shows bifurcation ratio of two between first two successive orders, whereas it is less than one between third and fourth order.

The above analysis clearly indicates that Spiti valley is the widest of all other valleys and has highest water discharge. It is followed by Chenab valley, Pattan valley, Chandra valley and Bhaga valley. These valleys are situated in the Zanskar range, the Great Himalayan range and Pir Panjal range respectively.

2.4 CLIMATE

The entire tract falls in the rain-shadow areas of the Himalayas. The most important factors that control and influence the different aspects of climate are location and relief. The whole region exhibits extremes of temperature, precipitation and heavy snowfall. Being a smaller part of the Himalayas, its climate is totally different from rest of Himalayas. The Great Himalayan range in the north and Pir Panjal range in the south are the main contributing forces in the climatic situation in the region. The winter season begins from the middle of November to March followed by the spring that lasts upto the end of May. The next four months from June to September are summer months. October and the first half of November marks the transition season.

The Great Himalayan range cuts off the penetration of monsoon winds. The summer months are dry and invariably hot. Most of the precipitation occurs in the form of heavy snowfall during winters. Precipitation pattern is influenced

by the winds from Arabian sea. The region situated between the Main Himalayas and Trans Himalayas experiences invigorating climate.

PRECIPITATION

The amount of precipitation is largely governed by the altitude and topography of the area. This region can be aptly called semi-arid zone. The meteorological data for entire area are available until 1959. The data has been compiled at Keylang, the heart of the study area.

Table 2.3

Mean Monthly Precipitation in Millimetres at Keylang*

Months	Precipitation
January	58.7
February	63.7
March	101.9
April	78.7
May	55.9
June	22.9
July	33.3
August	33.0
September	32.1
October	20.8
November	7.4
December	26.2
Annual	55.46

Source: *Mamgain, M.D. (1975), Himachal Pradesh district gazetteers – Lahaul and Spiti, Greater Punjab press, Chandigarh, pp. 30-31.

It is evident from the table 2.3 that maximum precipitation occurs in the month of March, whereas the monsoon months from June to September do not

show any striking change. Except monsoon months, most of the precipitation falls in the form of snowfall.

TEMPERATURE:

There was no meteorological observatory in the study region till late 1970's. The temperature data is acquired from some very old records. It is clear from table 2.4 that the month of July and August has maximum temperature and that of February has minimum temperature.

Table 2.4

Mean Monthly Temperature in Degree Celsius at Keylang*

Months	Maximum Temperature (in degree Celsius)	Minimum Temperature (in degree Celsius)	Mean Temperature (in degrees Celsius)
January	6.7	-16.5	-4.9
February	6.1	-17.8	-5.85
March	9.8	-13.8	-2.0
April	14.8	-7.4	3.7
May	22.1	-0.9	10.6
June	25.9	2.9	14.4
July	26.8	5.3	16.05
August	26.7	6.7	16.7
September	25.6	1.3	13.45
October	21.8	-4.1	8.86
November	16.3	-7.7	4.3
December	12.1	-14.1	-1.0
Annual	17.9	-5.5	6.2

Source: *Mamgain, M.D. (1975), Himachal Pradesh district gazetteers – Lahaul and Spiti, Greater Punjab press, Chandigarh, pp. 30-31.

It is closely noticed from the given table that monsoon months are the warmest months. Thus, summer months are almost deficient in the precipitation. Proximity to the glaciers and high altitude plays a vital role in making the temperature below freezing point. Generally, north-western part of the region remains relatively hotter than the eastern parts. Summers are pleasant and warm,

but winters are excessively severe. The transitional months in which wind blows with high speed are October and November. The relative humidity also remains the lowest (52%) in the month of October. Western disturbances affects the region during the period December to May, while rest of the Indian subcontinent experiences it during the month of June to September. The average annual precipitation days are 50 at Keylang (i.e. days with precipitation of 2.5 mm or more). During the early months of monsoon, 25 to 30 percent of total precipitation is received in the region. These are the months of agricultural activities. It coincides with very low temperature values that make the seed impossible to germinate and plants to grow.[7] The eastern part of the region receives more precipitation and snowfall than the western parts.

2.5 SOIL AND VEGETATION

Like the other Himalayan regions, the soils of Lahaul and Spiti also fall under mountainous type of soils. Being so, it is influenced by several factors notably altitude, vegetation, temperature and slope etc. In higher reaches glacial actions of past and present have made tremendous effect on the soil formation process. Boulder clay and outwash soils are main types of soil in fluvio - glacial terraces. Above snowline, the soils are immature.

Regarding soil the depth of soil cap in the upland area is generally shallow, gravelly and limited in soil development. It occurs due to lack of alluviation by low precipitation and frigid to mesic temperature regimes. Therefore, the soil in this dry terrain neither reveals well developed soil horizons nor any feature of profile development. They represent the semi-arid and sub-tropical situations under which they have developed.

Most of the soils are sandy clayey in texture and generally acidic in nature. However, there are marked differences in the soils between valleys and uplands. The former category of soils are fine clay and less stony as well as rich in fertility, because it is formed of deposits of sediments, detritus carried by a number of

small rivulets. In upper parts, the soils are shallow and stony which in turn impedes the fertility of the soil, whereas in steeper slopes shrubs and grasses are main features of the soil. The main characteristic that marks the mountainous type of soil are immaturity, shallowness, thinness and poverty on account of leaching and erosion. Therefore, the Lahaul and Spiti form the mountainous types of soil due to above-mentioned factors.

Owing to severe climate and high altitude, there is scanty natural vegetation. It seems that the flora is not uniformly distributed throughout the region and is mostly confined to the south-western parts. Eastern parts are devoid of vegetation due to severity of climate .The vegetation of the area are of Central Asian or Siberian character.

At lower elevations, some vegetation of alpine nature is found on account of the limited amount of precipitation and humidity[8]. Mostly all of the vegetation is confined to lower altitudes i.e. near the river valleys. Virtually, whole of the area remain under snow bed for more than six months in a year. Places upto an elevation of 3350 metres have greenery during summers. Above this, the amount of the vegetation sharply decreases with increasing elevation. The lower parts, especially Udaipur sub-tehsil of Lahaul division has different types of trees and bushes. Both the amount of vegetation and precipitation becomes lesser and lesser extending from west to east towards Spiti.

The topographic configuration is the major factor in making the region, a dry, rugged and barren land with deep valleys. The flora of the area is chiefly influenced by climatic and other factors. Based on altitude, Lahaul vegetation can be divided into three zones:

- The first zone extends from 2540 metres to 3550 metres contains maximum amount of vegetation. It is characterized by the presence of nearly all the trees viz. juniper, blue pine, birch, hippophae, willow, poplar, spruce, pyrus and walnuts etc. Among these the first three species forms the main natural forests in the region.

- The second zone begins from 3550 metres to 4850 metres supporting alpine type of vegetation. The characteristic feature is the absence of trees. Junipers, birch, andromeda, and rhododendron are found in the form of shrubs and extend upto an altitude of 4270 metres. Here, large patches of rich green grass and wild flowers occur frequently in extensive beds, which is visible from far off.

- The third zone scales from 4850 metres upward containing practically no vegetation. The plant, rheum moorcroftianum that doesn't survive below the height of 4875 metres, characterizes this zone.

The flora of the Spiti sub division can be divided into three zones. These are:

- Dry temperate zone (3275-4000 metres):- This zone is predominated by scattered herbs and shrubs growing over woody species. The importance of this zone lies in their leafy fodder, fuel wood and secondary timber. The important species is juniper, macropoda, wild species of salix and betula utilis species. Juniper and birch are almost on the verge of extinction. However, a few trees may be seen near Lalung, Silung, and periphery of Khukha Nullah. The scattered juniper trees in the Lingti plain stands testimony to existence of one time natural forest of juniper in the cold desert region. Among the shrubs that grow in the area are wild roses, hippophae rhamnoides, juniperus, recurba, accompanied by epherda and lonicera etc. Local people have been cutting and digging roots of these plants for construction and fuel wood purposes. Due to these practices, already scant vegetation has been further degraded.

- Alpine zone (4000 to5000 metres): - This zone is characterized by absence of trees .The junipers; birch and rhododendrons are found in shrub forms. Other species of this zone are epherda spp., caragana spp., lindelofia spp. etc. The common grasses frequently seen are poa spp., and agropyron spp. etc. These

grasses are rich in nutritive value. They also attract migrant shepherds from neighbouring districts during summers.

- Zone of perpetual snow (above 5000 metres):- This zone differentiates between two belts , namely the glaciers and the tundra. The former belt is a huge glaciated ice sheet enveloping the high lands, where no vegetation has so far adapted due to the worst impact of cold climate. On the other hand, tundra is a narrow belt below the glacial zone extending throughout the length of the mountain chain. Soil is permanently frozen upto over one meter to several meters. Some lichens, mosses, and few grasses capable of surviving on poor soil and intense cold are the only vegetation life confined to this zone.

It is clear from the above discussion, vegetation of Lahaul and Spiti is characterized by scanty vegetation cover except in the river valleys. It is of Central Asian type.

To conclude, the district of Lahaul and Spiti exhibits a complete sequence of geological formations dating from the Pre Cambrian to the Cretaceous with short breaks in Upper Carboniferous and Jurassic times. This region is hemmed between the Trans Himalayan and Pir Panjal range. Geologically, the region is world famous for its fossil rich rocks. The shallow water deposits of conglomerates and quartzites and grits of Palaeozoic times overlie the Cambrian layers. Lahaul and Spiti being situated on the seismic zone is a geologically sensitive region.

Characteristically, the district has highly uneven topography with snow clad summits of altitude varying from 5000 metres to above 6000 metres. Scarcity of vegetation is the rule mainly due to low amount of precipitation, humidity, temperature and the excessive cold climate. Vegetation is of Central Asian or Siberian character confined to the lower slopes upto an elevation of 3000 metres. The region can be divided into two distinct closed physical units viz. mountain ranges and river valleys. Mountain ranges consist of Pir Panjal range, Great Himalayan range and Trans Himalayan range. The river valleys situated relatively

at lower altitudes, having benign climate and availability of cultivable land supports maximum population and are the points of economic pursuits.

It is quite clear that the high altitudinal character and harsh climate has hampered the growth of economic activity. It is well reflected through vegetative growth and several other processes. In comparison to Lahaul, Spiti receives less precipitation due to climatic barrier imposed by the Great Himalayan range. Consequently, Spiti is drier and desolate than Lahaul. The bulk of the precipitation i.e. around ¾th falls in the form of snow. Around six to eight months in a year remain encapsulated under snow bed. Thus, the area has least vegetation confined to lower parts near the riverbanks. Shallowness and immaturity is the important feature of the soil, which impedes the growth of vegetation in higher altitudes and puts a hindrance over the suitability of arable land.

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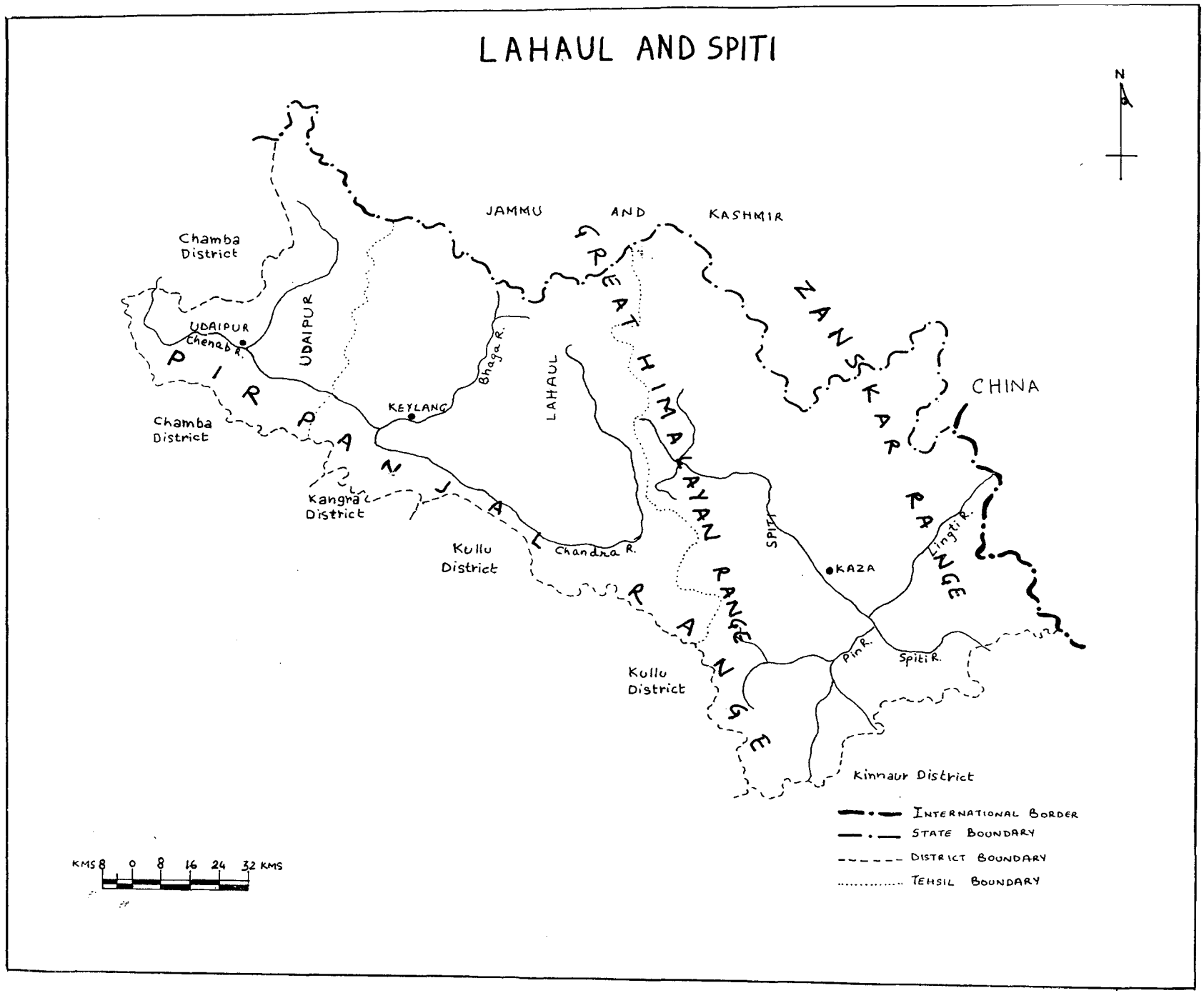
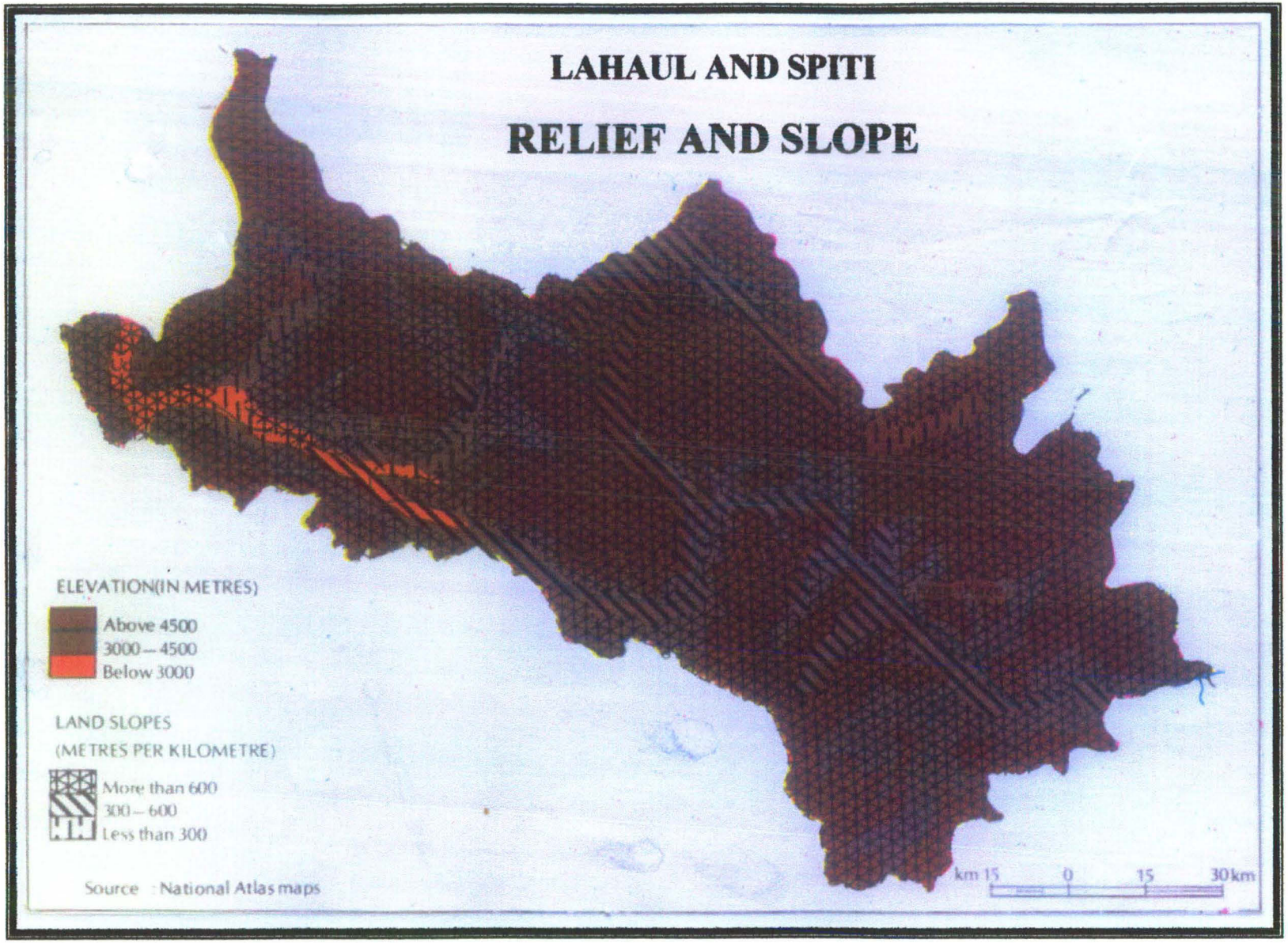
Map 2.1


LAHAUL AND SPITI
N
JAMMU AND KASHMIR
CHINA
Chamba District
UDAIPUR
Chenab R.
UDAIPUR
PIR PANJAL RANGE
Bhaga R.
KEYLANG
LAHAUL
GREAT HIMALAYAN RANGE
ZANSKAR RANGE
Chamba District
Kangra District
Kullu District
Chandra R.
SPITI
KAZA
Lingti R.
Pin R.
Spiti R.
Kullu District
Kinnaur District
KMS 8 0 8 16 24 32 KMS
INTERNATIONAL BORDER
STATE BOUNDARY
DISTRICT BOUNDARY
TEHSIL BOUNDARY

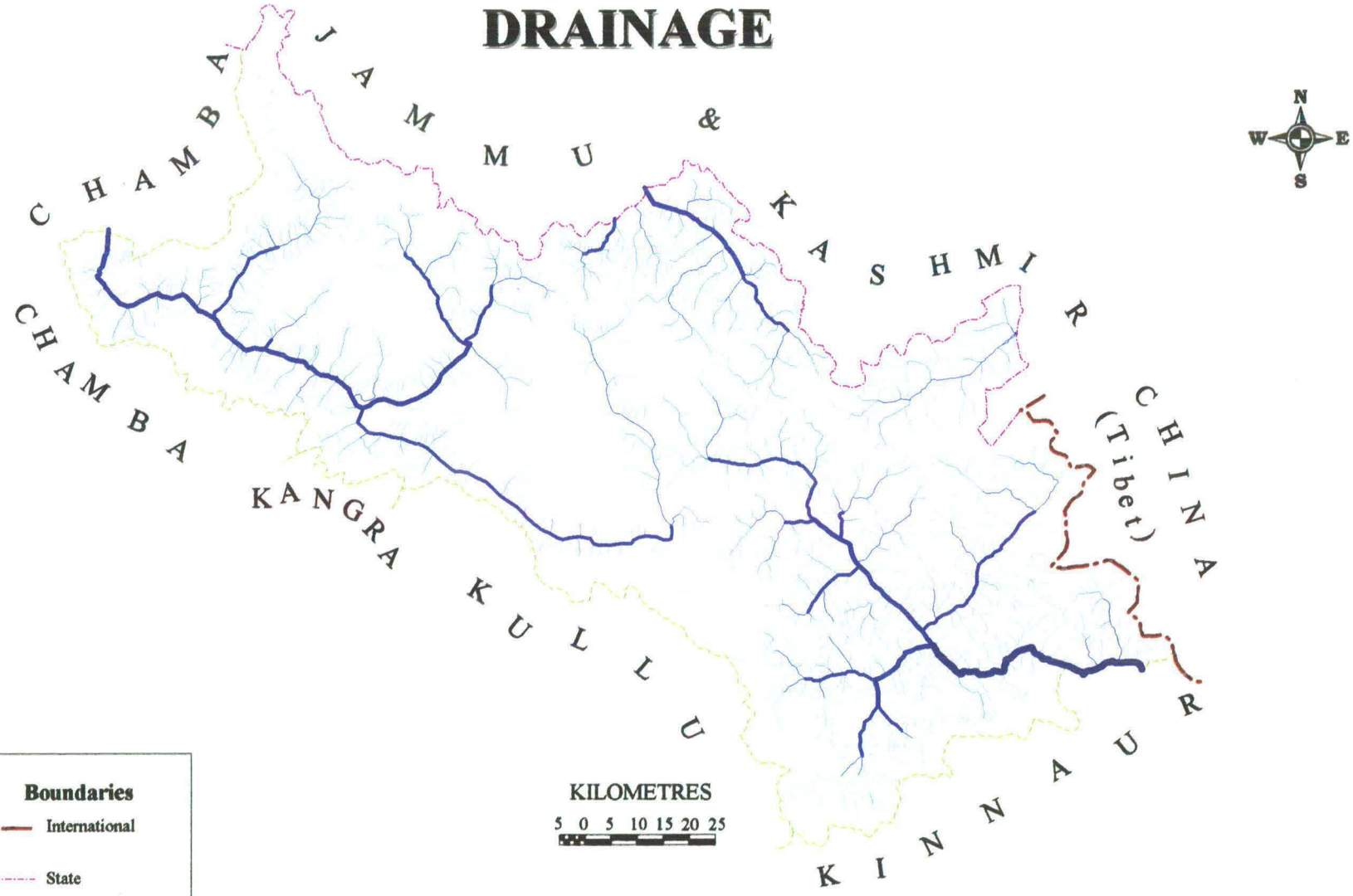
Map 2.2


LAHAUL AND SPITI
RELIEF AND SLOPE
ELEVATION(IN METRES)
Above 4500
3000 – 4500
Below 3000
LAND SLOPES
(METRES PER KILOMETRE)
More than 600
300 – 600
Less than 300
Source : National Atlas maps
km 15 0 15 30 km

Map 2.3

LAHAUL AND SPITI

DRAINAGE



Map 2.4

LAHAUL AND SPITI

STREAM ORDERING

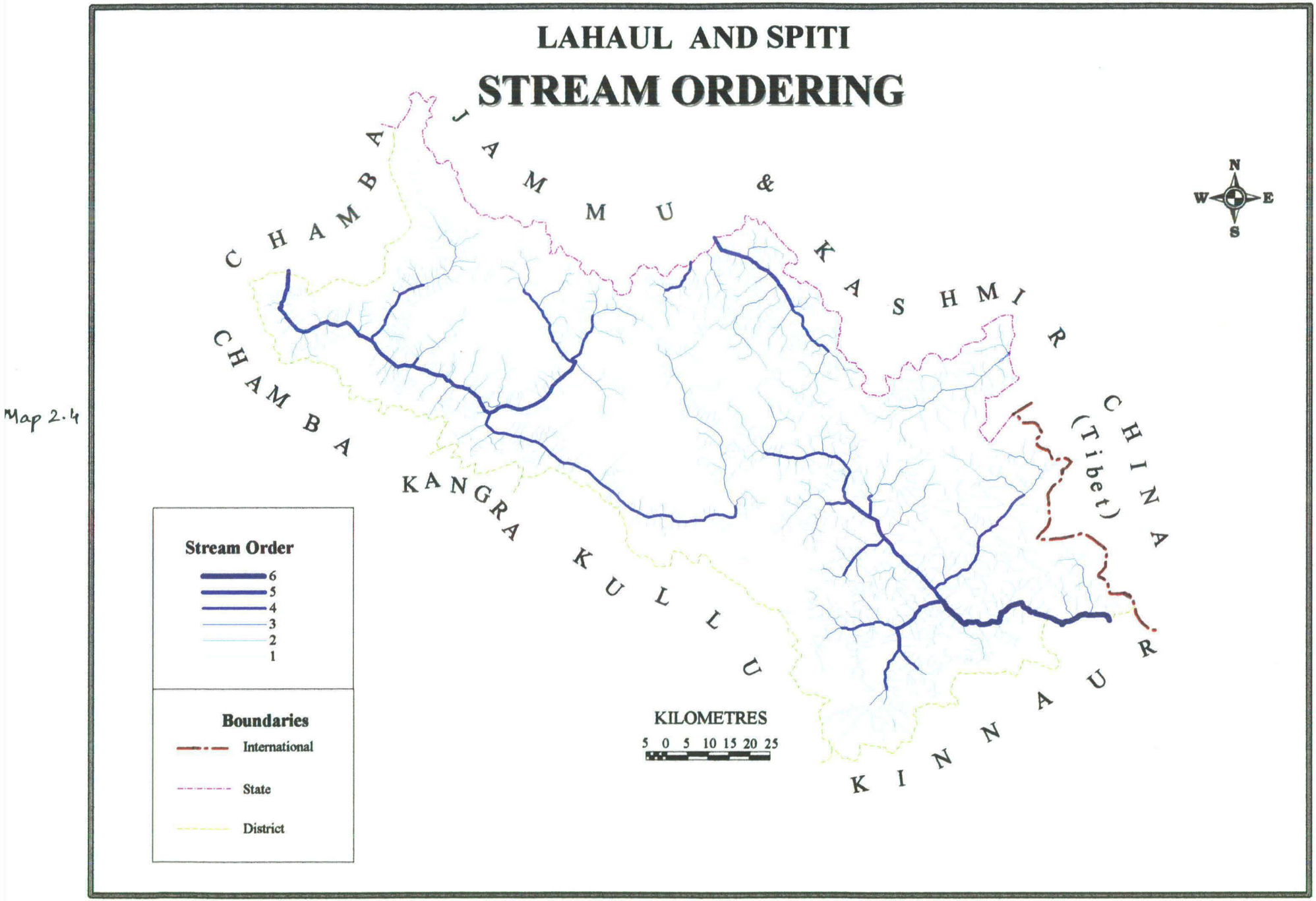
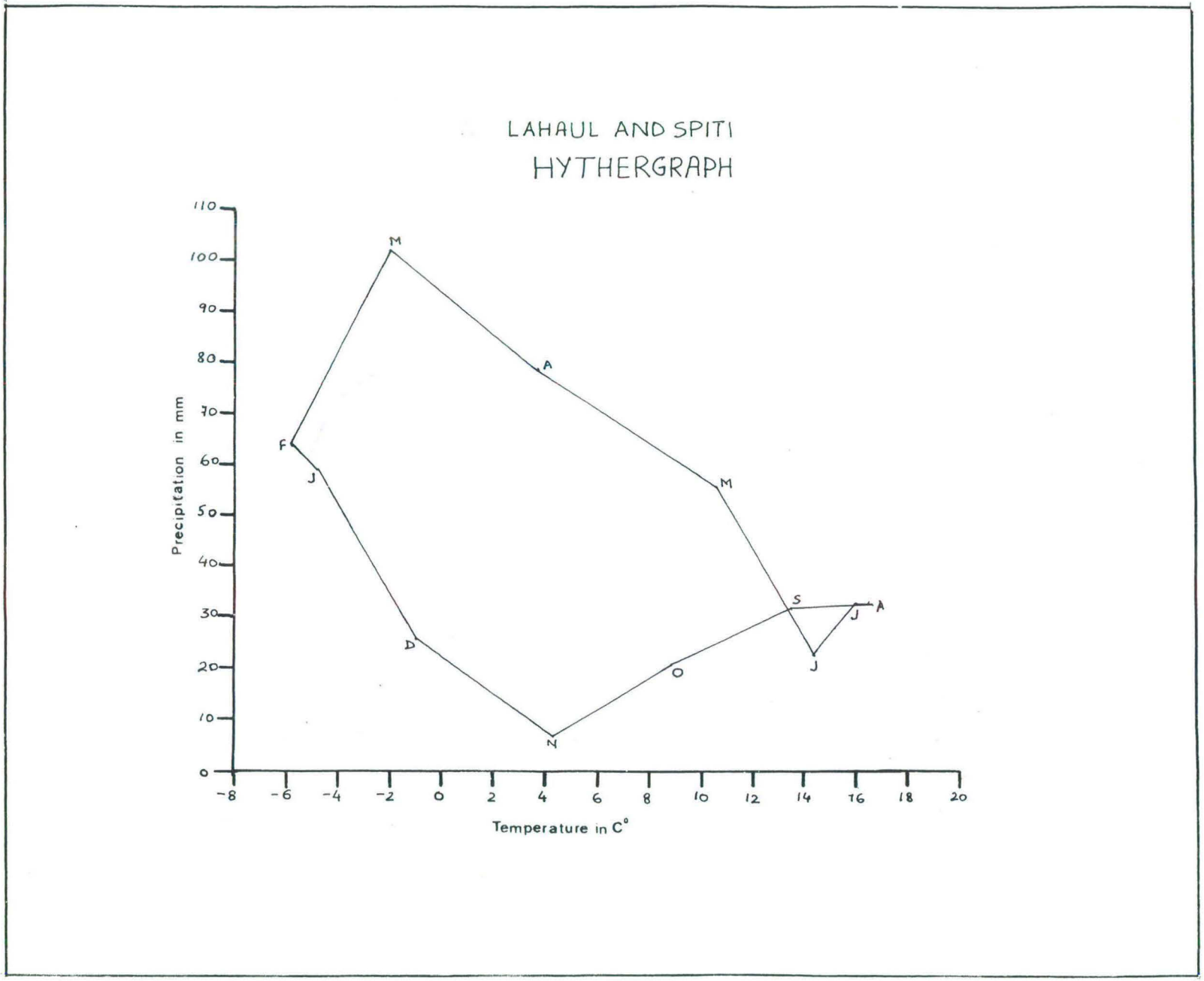


Figure 2.1


LAHAUL AND SPITI
HYTHERGRAPH
Precipitation in mm
110
100
90
80
70
60
50
40
30
20
10
0
M
A
M
J
J
A
S
O
N
D
J
F
-8
-6
-4
-2
0
2
4
6
8
10
12
14
16
18
20
Temperature in C°

Chapter: Three

SOCIAL AND DEMOGRAPHIC PROFILE

An attempt has been made to highlight the social and demographic characteristics of the district of Lahaul and Spiti. The social and demographic structure of such regions is largely shaped and governed by the physical factors and the economic base. The socio-cultural traits of a society or group are the direct manifestation of the prevailing environment in such areas. These in turn influence the inhabitants, viz, history of settlements, type of economy, and advancement in technology, political decisions, and social organizations.[1]

The culture of a society or group consists of beliefs, values, norms, customs, perceptions and behaviour, etc. Every community practices and possesses certain cultural traits differentiated generally from other groups. A particular community practising a homogenous culture may exist over single isolated place, or it may spread to a vast area. In order to get a clear picture regarding the culture, it becomes important to study the following: (i) ethnicity (ii) language (iii) religion (iv) social stratification and organization (v) food habits and dress (vi) birth and death rates (vii) marriage system (viii) house types and (ix) fairs and festivals.

The physical and economic base dictates the spatial spread of population and other demographic aspects in many mountain regions. The regions having favourable natural environment and economic opportunities support dense population. On the other hand, if these two factors are negative they act as a constraint. This fact is true even in mountainous regions like Lahaul and Spiti district of Himachal Pradesh. The economic viability of an area not only affects the size of population but also its spacing as most of the settlements are confined to river valleys and in mountainous regions. Since the land for settlement and cultivation is scarce in hilly and mountainous regions these are located on gentler slope.

The role of harsh natural environment in Lahaul and Spiti has already been discussed in the earlier chapter. It imposes a major impediment on the interaction of population with outside world. Therefore, the region has experienced isolation and underdevelopment regarding the culture and demographic set up of the inhabitants.

3.1 SOCIAL COMPOSITION

3.1.1 **Ethnicity**

People of Lahaul and Spiti are Swanglas, Lahaulas, Thakurs, and Bodhs along with several scheduled castes communities of Chahan, Dombas, Hessis and Lohars, etc. Among all these, Bodhs, Lahaulas and Swanglas constitute the main tribal groups. Bodhs belong to Tibeto - Mongoloid Stock while Swanglas and Lahaulas are to Indo-Aryan stock. The people are of pure Tibeto - Mongoloid stock and they believe in Buddhism in Spiti subdivision. They are of mixed origin professing both Hinduism and Buddhism in Lahaul.

Different kingdoms have shaped the history of this district over different periods of time. This fact is well reflected by the mixed race of the people. The society in the district is formed of various ethnic groups. They came from different directions over different period of times and got accustomed to the needs of the physical environment. A number of beliefs prevail regarding the peopling of this region. According to one saying they are the descendants of the mythological Jamdagni and Renuka, the parents of Rishi Parshuram, whose rule extended up to upper Beas valley in Kullu or the descendents of Shakya clan, who were the original ruler of Ladakh. Some believe them to be of the Khasa tribe driven out from the Central Asia by the Hunas, who had settled down between Kumaon and Ladakh in the Himalayan valleys. All the migrants might have landed in this remote land for agriculture.

3.1.2 **Language**

Apart from Lahauli three other dialects are spoken in Lahaul. These are Bunan, Tinan and Manchad. Most of the population speaks Lahauli. The people of Chandra - Bhaga valley speak Bunan and those of Chandra valley speak Tinan. Manchad is spoken in the Chandra - Bhaga valley up to Thirot. It is believed that all these dialects have strong affinity with the dialects spoken by Munda tribe of Pre-Aryan times. Bhotia is the only dialect spoken in Spiti subdivision. It has its own script. It is also spoken in the upper region of Chandra and Bhaga valleys of Lahaul. This language has close relation with Tibetan language.

Table 3.1

Language Composition – 1991

Language	Total users	Percentage to total population
Lahauli	14333	45.8
Bhotia	10144	32.42
Hindi	3634	11.61
Nepali	2290	7.32
Other languages	893	2.86
All languages total	31294	100

Source: Computed from Census of India, 1991, H.P, District Profile, Registrar General and Census, Commissioner, India.

Table 3.1 clearly depicts that majority of the population speak Lahauli language (45.8 percent). The second major spoken language is Bhotia (32.42 percent). The languages of Hindi and Nepali are also spoken by people doing various types of agricultural and construction works. Rest of the population speaks different languages in small proportion. They are traders and employees in government offices and institutions and agricultural workers. These languages include other languages. The area remains no more formidable due to ongoing developmental processes and advent of modern civilization. Major chunk of the younger generation speaks both Hindi and English. This has facilitated an easy exchange of ideas having common language for the purpose of better communication within and outside the region. The region portrays its richness in poetical gifts and folklore. Unfortunately, there does not exist any literature in Lahauli language except in the form of Bible.

3.1.3 **Religion**

Lahaul and Spiti have two main religious groups i.e., Hindus and Buddhists. A large number of the people in Lahaul follow Hinduism while those of Spiti are the followers of Lamaistic Buddhism. More than one fourth of the population is Hindu i.e., 28.30 percent of the total population and around three fourth of the total population is Buddhist (71.54 percent). Rest of the religions have very negligible representation. Among these other religions account for 0.09 per dent of total population (Table 3.2).

The people of Pattan valley follow Hinduism; elsewhere in all other valleys it is a mixture of both Hinduism and Buddhism. As in other parts of the country, people worship Shiva and Durga. Apart from these, they are the followers of many animistic deities in the shape of caves, trees, boulders and bushes, etc. Beside these, there are several travelling deities who travel with fixed dates to different villages. People in large numbers follow this religious procession along with musical instruments. Geyphang and Dabla are the most important travelling deities in Lahaul. In every household there is a family deity represented by a stone slab or a pillar. Juniper leaves are used to worship the deities every day.

Table 3.2

Religious Composition, 1991

Religion	Total Population	Percentage to total Population
Buddhists	17233	71.54
Hindus	6817	28.30
Christians	7	0.00
Jains	1	0.00
Muslims	4	0.00
Religion not stated	4	0.00
Other religion and persuasions	22	0.09
All Religions	24088	100.00

Source: Computed from Census of India, 1991, series 9, H.P, Part VIII (11), Special Tables on Scheduled Tribes, Directorate of Census Operations, Shimla.

Buddhism is followed in Spiti and Pin valley and in upper reaches of Chandra and Bhaga rivers. Mainly, four Buddhist sects are found in the region namely Nyingmapa, Kagyudpa, Shakya and Buzhens, etc. Nyingmapa sect is followed by the Lamas of Kungri, Damphug, Karchod and Sakeling monasteries. Kagyudpa sect is professed by the Lamas of Gemur, Tayul, Bokar Shashur, kardang, etc. Lamas of Kye, Dhankar, Tabo and Othang worship the Shakya sect. Lamas of this sect wear yellow caps and are also called yellow sects.

The Buzhen sect entertains the people by playing plays and chanting legends. In this sect, Lamas are allowed to marry and live in monasteries while their families reside in adjacent villages. They perform various religious rituals. In Lahaul valley, both Lamas as well as Bhats perform religious rituals, while in Spiti valley only Lamas perform. There are around 18 monasteries in the region noted among them are: Kardang, Guru Ghantal, Shashur, Tayul, Kye and Tabo, etc. Besides monasteries, temples are also found in the region. Trilokinath and Mrikula are among the two important temples in Chenab valley. Monasteries also act as a centre of learning and serve various religious purposes.

3.1.4 **Social Stratification and Organization**

As is the case in other Himalayan valleys, Lahaul and Spiti is also divided into hierarchical order of caste. However, the caste rigidities, social restriction and untouchability do not prevail in its acute and prohibited form. Society is generally separated into two sections comprising upper and lower sections. Lahaulas, Swanglas, Brahmins, Thakurs and Bodhs come under upper strata of society, and lower strata consist of Lohars, Chahans, Dagis and Hessis etc. Both upper and lower sections are found in the entire region. The upper castes of Brahmins, Swanglas, Lahaulas, Thakurs and Bodhs are included in the scheduled tribes while scheduled caste includes Lohars, Chahans, Dagis and Hessis. Bodhs constitute three fourth of the total population. The Thakurs of Lahaul and Nonos of Spiti are at the top of caste hierarchy except Swanglas of Lahaul. There exits prohibition of inter - marrying and inter - dining between upper and lower caste groups as well as subgroups. Caste system is more or less non- existent in Spiti.

Every society faces certain problems and develops itself a benign living atmosphere. The role of social organisation becomes even more significant in such tribal and traditional societies of isolated areas like Lahaul and Spiti. It solves social problems and thereby enhances social interaction. The society is pre-dominated by joint family system. It is because of natural environment and limited availability of arable land. Little variations can be seen in different valleys. The eldest male member holds

chief position and his decisions are followed by all other members of a family. Joint family system is more strong and rigid in Chandra and Bhaga valleys.

Both Lahaul and Spiti regions differ with each other in rule of inheritance. Male line of decent with equality among all brothers is followed in Lahaul and the rule of primogeniture is observed in Spiti. In the absence of sons, daughters have the right to take the property of the father. If she is married she has to return her father's place along with the husband. If she is unmarried she can marry but again she has to live with her husband in her father's home. In Spiti, a distinct system is found in which when eldest son in a family gets married his parents start living in a separate home called as Khangchhang by renouncing their whole property except a small part for their age-old maintenance.

With the influence of modern civilization and developmental activities undertaken by governmental agencies, joint family system has gradually started disappearing. The influence of neighbouring district Kullu can be clearly seen with the increasing tendency to live in a nuclear family. Therefore, living under harsh climatic conditions the people have developed a distinct social organisation that further enhances social interaction.

3.1.5 **Food**

Lahaul, Kathu (buckwheat) and Barley are the staple food of the people and in Spiti it is called Tsampa that is made of parched barley. Besides, barley, potato, wheat and buckwheat constitute the main cereal of food. Rice is also consumed. Various pulses like masar and rajmash are also grown and consumed. The entire population is non-vegetarian mainly due to severe climate. People consume meat of goat, sheep, wild animals and few birds. Every household slaughters one or more animals before the onset of winter. The number of animals being slaughtered depends upon the economy of the family. After slaughtering meat is kept hanging in an airy room for drying. It is believed that dried meat becomes tastier with the passage of time. They consume dried meat in parts every day during winter. Turnips, potatoes, cabbage, peas, raddish, carrot etc, are also grown and consumed during summer. Among beverages, people consume Lugri, Chhang (a king of bear) and Sara (a distilled local wine) and salted tea mixed

with butter. These beverages are consumed daily as well as on all other important occasions. Smoking is a common fashion among males, but it is prohibited for females. Meat and alcohol is consumed in large quantities mainly because it keeps them warm to fight against harsh (cold) climate.

3.1.6 **Dress**

Cold climate necessitates the wearing of thick cotton and woollen clothes. The main dress of people consists of loose trouser and a woollen coat in Lahaul. Male adorns a Kullu cap, a cotton shirt called Cholu and tight pajamas. They use belt to tighten Cholu made of a cloth called Gachi. Women wear Cholu and churidar pajamas. Male adorns a far-lined skullcap called Lingzima, a coat of wool called Righoay and tight woollen trouser in Spiti valley. The belts they use are called Sash. Female dresses includes a full sleeves cotton shirt known as Hoojuk, a loose frock of cotton called Tochay and a dome cap called Shamo made of fir. The footwear consists of shoes without soles, canvas shoes, sleepers, hunter shoes and locally made shoes called Paulah made from barley straw, which are very warm. The female folk are very fond of ornaments mostly made up of gold, silver and brass etc. Various types of ornaments are Dungkri, Terka, Poshel, Mutig Kanti, Shamsham, Baraphuli, Chotaphuli and Guithah, etc. Ornaments are also common among male's especially old age people.

The use of thick woollen clothes is to protect them against cold climate. Various kinds of footwear and ornaments used reflect the social status of the people.

3.1.7 **Birth and Death Rites**

There is absence of birth customs except Gotsi in Chandra and Bhaga valleys. However, in Pattan valley, when first son is born all relatives and villagers offer flowers or Sara. The parents of a newly born child invite all villagers for feast. After one year, Mundan ceremony takes place, which is performed by the maternal uncle of the wife. On this ceremony lamp is kept burning before the village God. The women from the house of landed class perform it in Kangchan family. This custom is not in fashion among lower classes.

As regard to death custom, different type of funeral customs takes place in both the tehsils. Lama performs the transmigration of soul by chanting sacred saying called Phua at the death of followers of Buddhism. The person is taken into an iron tripod or on a wooden chair to the cremation ground followed by praying of Lama and villagers along with beating of the drums by Garas. After cremation ceremony is over, the bereaved family serve villagers with food. Lamas and Garas are offered money on the last day of prayer. On the 49th day, Puja is held in which villagers are also invited. They are served with Geva and a cake of Sattu on the first death anniversary. After 8th day of praying ashes are immersed at Tandi.

Bhats and Shipi perform the death ceremony of Swanglas. They bring conch-shell and place it before the corpse. At the time of procession a line is drawn by bhat from head of the corpse to the door with barley flour. All the relatives sprinkle milk on the cow. The cow takes three rounds anti clockwise and three rounds clockwise around the person. Then the arthi is lifted and taken to the cremation ground along with the beating of drums by Shipis. The son of the dead person gives fire. Afterward, Bhats and Shipis are offered some money and clothes. The next day ashes are collected by Bhats and relatives and are immersed at Tandi. On the 13th day a Havan is performed. For the first seven days relatives are fed by bereaved family.

The Shipis and Lohars follow same death rites. They do not fed the villagers and invite only Shipis instead of a Bhat. Besides these, death customs are very peculiar and distinct in Spiti valley. They consult Jhova (an astrologer) who gives direction regarding the performance of death rituals. Whether body should be burnt or thrown into river or cut up and should be exposed on hill slopes for wild birds. However, Khangchanpas call Lamas who recite scriptures and pray for corpse. Villagers are served with salted tea and milk. Superstition does prevails regarding corpse, as it is believed that if dead body is left without vigil an evil spirit will enter the body and create harm for the living human beings.

3.1.8 Marriage System

Marriages also take place like in other parts of the country. It is considered as an important social institution. Two types of marriages namely Ta-Bhagston and Kunmai-

Bhagston are found in Lahaul. The former is an arranged form of marriage and held in a grand way and latter form of marriage takes place by theft, mainly in Gahar and Chandra valleys. Marriages are held under complicated rituals and are very expensive in Spiti valley. It is generally avoided by lower class due to economic and other reasons. In Kangchan families marriages are performed only for eldest son and daughter.

Polyandry, polygamy and monogamy are the various types of marriage found in the district. With the advent of modernisation, polyandry and polygamy is gradually disappearing from the entire region.

Isolation and poor economic condition forces them to perform marriages in different way from those of adjacent districts of Kullu and Chamba. Modern type of marriages takes place only among richer section. There is complete restriction in inter - caste and inter - tribe unions. Divorce and remarriage is also in fashion, which has attained social favour.

3.1.9 **House Type**

The climatic condition and availability of construction materials are the deciding factors for the house type in this region. Settlements are built along the riverbanks in Lahaul and in Spiti on big alluvial tracts along the river. Generally, the houses in both valleys are built on river tracts and consist of three storeys with flat roofs. Lahaul houses are relatively smaller than Spiti. In both valleys, the livestock resources occupy ground floor of the house. Houses act as a sole access of all activity during winter when the area remains under two meters of snow. The upper floor contains living room with one interior room, and summer room and a verandah.

Houses of lower parts are bigger and better ventilated while in upper parts they are small and ill - ventilated. The entire villages are constructed in one block for communication during winter. Each house is attached with small house in Spiti valley. The main house is called Kangchimpa and smaller one is called Kangchungpa. The parents shift to smaller house as soon as their son gets married.

People have started constructing houses on modern lines with the passage of time. Therefore, it can be seen that climate has a great bearing on the house types of Lahaul and Spiti district.

3.1.10 **Fair and Festivals**

Fair and festivals reflect the socio-cultural and economic status of the society. It becomes more significant in isolated and mountainous regions like Lahaul and Spiti , where all other means of entertainment are absent. In Lahaul region, the important festivals are Halda, Phagli (Kunh) and Gotsi, etc. Halda is an important festival in Chandra and Bhaga valley and Phagli is celebrated in Pattan valley, which heralds beginning of a new year. The celebration takes place in the months of January or February; the Lamas fix the exact date. Gotsi is held in houses to celebrate the birth of a son, who is born in previous year. The dough of Sattu is broken to pacify the Gods after the religious ceremonies are over.

In Spiti region, the important festival is Gutor celebrated widely in the monasteries of Kye, Tabo, Dhankar and Pin, etc. The purpose of this festival is to protect the people from disease and evils spirits throughout the year. It takes place in the month of September, October or November once in a year, exact date is confirmed by the Lamas. People worship the God together for two or three days. On the fourth day, evil dance is performed which depicts the victory of good over evil. Drinking, eating, singing and dancing accompany this festival. Gyatto is celebrated to mark the end of the year. On the tenth day of every month, Shishu is celebrated to observe good time. Thon Thon marks the completion of end of the winter. Namgan is celebrated on the occasion of the harvest in the month of the September followed by horse race. On the festival of Chhothong, Lama comes for reading Tanjures consisting of 108 scriptures. When first son or daughter is born, the festival of Bhingri is celebrated. During summer important festivals are Labsol in which cultivators worship their deities after sowing their fields. Namkhar is held in the month of September and October each year followed by horse riding and hitting of targets of a sun, a lamb and a shoulder-bone made of barley flour with stones.

Table 3.3

Fair and Festivals of Lahaul and Spiti

FAIR/FESTIVAL	MONTH
HALDA	JAN.
PHAGLI	JAN.-FEB.
NYAINAY	JAN.-FEB.
GOTSI	FEB.
DA CHANG	FEB.
THON THON	APR.
LAPSOL	APR.-MAY
YANE	JUNE
LADARCHA	JULY
PORI	AUG.
NAMGAN	SEPT.
NAMKHAR	SEPT.-OCT.
GUTOR	NOV.
LOSAR	NOV.-DEC.
GYALTO	DEC.
CHHISHU/SHISHU	10^{TH} DAY OF EVERY MONTH
BHINGRI*	
SONCHOK**	
CHAKHAR***	
SISSU****	

* BIRTH OF FIRST CHILD

** POST DEATH CEREMONY AFTER EVERY SIX O SEVEN YEARS

*** IT COMES AFTER EVERY FOUR YEARS

**** IT IS CELEBRATED IN THE MONTH OF JUNE, JULY AND AUGUST IN DIFFERENT MONASTARIES

Source: Lahaul and Spiti, Himachal Pradesh District Gazetteers, 1975

In place of Gutor festival, Chakkar festival is celebrated in Tabo monastery after every four years, which is attended by all population. In Pin valley, a peculiar festival

called Sonchok (post-death ceremony) is held in every Khangchan family ones in every six or seven years. It lasts for three or four days, accompanied by the praying of Lamas for the welfare of the people.

Beside these, an annual trade fair called Ladarcha is held near Kibber village in the month of July. However, with the end of trade with Tibet it has lost its popularity. Government on various important occasions like the Republic Day, the Independence Day, etc organizes various fairs and exhibitions. Apart from this, community fairs are also popular in the district. All these abovementioned festivities are followed by consumption of meat and alcohol accompanied by dancing and singing.

The above study of social aspects reveals the influence of harsh natural climate upon its various aspects. It is well reflected through social organization, food habits, dresses, house types and their fairs and festivities etc.

3.2 DEMOGRAPHIC CHARACTERISTICS

Following are the demographic characteristics, which have been taken into account in this study. They are population distribution, population density, population growth, sex ratio and literacy rate, etc.

3.2.1 **Population Distribution**

There are 403 villages in the districts as per 1991 census. Out of these, 272 villages are inhabited and 131 are uninhabited. During 1981 census, the total number of villages stood as 337. This increase can be attributed to settlement operations carried out during the intervening period as a result of which smaller units have been carved out by bifurcating or even trifurcating the bigger and scattered villages.[2]

The number of villages has come down because of reorganization of villages in the settlement operations carried out by the state government during the decade. It appears that scattered villages that previously constituted separate revenue units have been clustered and assigned a revenue hadbast number conversely. This was the main reason for increase in the number of villages in 1991 census.[3]

Table 3.4

Population distribution by villages, 1991 - 2001

Name of C.D Block*	Persons	Percentage males	Percentage females	Number of Inhabited	Villages total
Lahaul	21703	54.35	45.65	191	290
Spiti	9591	56.59	43.41	81	113
District	31294	55.04	44.96	272	403
District	33224	55.42	44.58	272	403

* Community Development Blocks.

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A and B, District Census Handbooks.

Data in the table (3.4) reveals that out of 403 villages in the districts 290 fall in the Lahaul block and 113 in Spiti block. In Lahaul block, 191 villages are inhabited whereas it is 81 in Spiti block.

Table 3.5

Percentage distribution of villages by population range, 1991

NO OF PERSONS	Less than 100	101-200	201-400	401-800	More than 800
NO. OF VILLAGES	180	47	32	12	1
PERCENT OF VILLAGES	66.2	17.3	11.8	4.4	0.4

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A and B, District Census Handbooks.

Table 3.5 shows that out of 272 inhabited villages in Lahaul-Spiti district, 180 (66.2 %) villages fall in the population size of less than 100. Villages like Muchhling, Gemu-Gompa, Piyur and Dupuk have the lowest population size of only two persons. The villages located in higher altitude and difficult terrain has the least population concentration. About seventeen percent villages have the population size ranging between 101 and 200 persons. Population size of 201-400 is observed in 11.8 percent villages while population size of 401-800 and more than 800 comprises of 4.4 and 0.4

percent respectively. Udaipur, Trilokinath, Kaza Khas, Keylang have the highest population concentration which is 683, 713, 781 and 1797 respectively. Keylang being the administrative headquarter of Lahaul and Spiti district. Udaipur and Kaza Khas are the administrative centres of Udaipur sub-tehsil and Spiti tehsil respectively. Trilokinath is the important religious centre in Udaipur sub-tehsil.

Table 3.6 shows the population distribution in the valleys of Lahaul and Spiti according to 1991 census. In Chenab valley, the population size is very low as only 15 percent villages falls under the population size of more than 401persons. On the other hand, 50 percent of villages are distributed in the population size of less than 100.

Table 3.6

Valley-wise distribution of population, 1991

VALLEY	Less than 100	101-200	201-400	More than 401	TOTAL
CHENAB	20	8	6	6	40
Percentage	50	20	15	15	100
PATTAN	49	8	7	1	65
Percentage	75.4	12.3	10.8	1.5	100
BHAGA	28	7	5	1	41
Percentage	68.3	17.1	12.2	2.4	100
CHANDRA	36	4	4	1	45
Percentage	80	8.9	8.9	2.2	100
SPITI	47	20	10	4	81
Percentage	58	24.7	12.3	4.9	100

Source: Computed from Census of India, 1991, series-9, H.P,Part XII-A and B, District Census Handbooks.

Apart from these two extremes, rest of the villages comes under the population size of 101-400 persons respectively. It may be largely due to the unsuitability of soil for cultivation and restricted economic opportunities. In Pattan valley, 75 percent villages falls under the population size of less than 100 while the higher population size of more than 401 has only 1.5 percent of villages. Rest of population size is distributed between 101-200 to201-400 respectively. It is merely because of the small size of villages and least availability of economic activity. The

only village that has a high population size is in Bhaga valley. Almost same data appears as in earlier valleys that 68.3 percent of villages have population size of less than 100. Keylang is the administrative headquarter and heart of the study area.

It has population size of 1797 persons mainly because of influx of employees in various governmental jobs and agricultural labourers etc. Rest of the villages are concentrated in the population range of 101-200 to 201-400 persons i.e. 17.1 percent in 7 villages and 12.2 percent in 5 villages respectively. Chandra valley represents more uneven results in respect of villages distributed in different population classes. It has 36 villages (80%) in the population size of less than 100 persons while 4 villages each having population size varying between 101-200 and 201-400 persons. There is only one village in the population size of more than 401 persons i.e., Gushal. This village has peculiar location on the opposite side of Tandi on an alluvial tract.

In Spiti valley, 58 percent of villages have less than 100 persons in 47 villages while 20 villages have nearly 25 percent of villages in the population size of 101-400 persons. Ten villages having population size of 201-400 persons comprising 12.3 percent of villages. Only four villages fall under the population size of more than 401 persons having 4.9 percent of total villages. These are Marango Rangrik (545), Kaza khas (781), Kaza soma (611) and Tabo (540) respectively. All these villages are administrative and religious canters that support large proportion of population.

The distribution of population shows a positive correlation with the physiographic factors. It is generally seen that the population is concentrated in the low lying river valleys and alluvial fans of Chandra, Bhaga and Spiti River and their tributaries.

3.2.2 **Density Distribution of Population**

Table 3.7 shows that out of total 272 inhabited villages, 64 villages having less than 50 persons per sq. km. i.e. 23.5 per cent whereas 141 villages have more than 200 persons per sq. km constituting 51.84 per cent respectively. Remaining 67 villages falls under the 50 to 200 persons per sq. km. (24.6 per cent of the total inhabited villages). However, overall density is just two persons per sq. km in Lahaul and Spiti. A great amount of variation can be seen in the valley wise density distribution of population.

Table 3.7

Population density by villages, 1991

No of persons / sq. km	< 50	50 – 100	100 - 150	150 - 200	> 200
No of inhabited villages	64	22	23	22	141
% age of inhabited villages	23.5	8.1	8.4	8.1	51.84

Source: Computed from Census of India, 1991, series-9, H.P,Part XII-A and B, District Census Handbooks.

Table 3.8 shows the valley-wise density of population. Fourty percent villages shows the density of less than 50 person / sq km. in Chenab valley, whereas 30 percent villages fall under the density range of more than 200 persons / sq. km. Density range of 50 -200 has 30 percent of villages.

Table 3.8

Valley-wise density of population, 1991

No of persons / sq. km	< 50	50 – 100	100 - 150	150 – 200	> 200	TOTAL
CHENAB	16	1	7	4	12	40
Percentage	40.0	2.5	17.5	10.0	30.0	100
PATTAN	1	2	7	7	48	65
Percentage	1.5	3.1	10.8	10.8	73.8	100
BHAGA	1	1	-	2	37	41
Percentage	2.4	2.4	-	4.9	90.2	100
CHANDRA	1	-	2	3	39	45
Percentage	2.2	-	4.4	6.7	86.7	100
SPITI	45	18	7	6	5	81
Percentage	55.6	22.2	8.6	7.4	6.2	100

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A and B, District Census Handbooks.

In Pattan valley, one village was below the range of fifty i.e. 1.5 percent while, only 3.1 percent villages fall in the category of less than 50 persons. On the other hand,

73.8 percent villages fall under more than 200person / sq. km. In the density range of 50 - 200, there are 24.7 percent villages out of the total inhabited villages. In Bhaga valley, only 2.4 percent villages has less than 50 whereas 90.2 percent villages more than 200 person / sq km. Rest of the 7.3 per cent villages fall in the density range of 50 - 200 persons / sq. km. In Chandra valley, 2.2 percent villages fall under less than 50 whereas 86.7 percent villages fall in the density range of more than 200. Only 11.1 percent villages have density range of 100 – 200 persons per sq. km. In Spiti valley, nearly 56 percent villages having less than 50 persons whereas only 6.2 percent villages have more than 200 density range. Rest of the 38.2 percent villages comes under the density category of 50 - 200 persons / sq. km respectively.

The over all analysis shows that the density is quite low which may be due to the fact it is semi arid desert with rugged topography and adverse climatic conditions coupled with non availability of agricultural land.

3.2.3 **Population Growth**

Total population of Lahaul and Spiti was 31294 persons comprising 17224 males and 14070 females as per 1991 census. Lahaul and Spiti registered a negative growth during the decade 1981-91. This decline in population may be attributed to two factors namely completion of road projects and out migration of tribal population in the adjacent districts of Kullu especially to the towns like Kullu and Manali.[4]

Table 3.9

Population growth, 1981- 91

Year	Persons	Year	Growth
1981	32100	1971-1981	2.51
1991	31294	1981-1991	-2.5
2001	33224	1991-2001	6.17

Source: Computed from Census of India, 1991, Series-9, H.P, Part XII-A and B, District Census Handbooks.

Most of the migrants have started their business there or have been employed in various governmental and other jobs and have also acquired agricultural land and settled there. Besides, some people have also migrated to other places in the state and also outside the state in search of better economic opportunity. However, the district observed a positive growth (6.17) during the decade of 1991 – 2001.

Table 3.9 shows, Lahaul tehsil observed a decrease of 5.5 percent during the 1981-91 while Spiti tehsil observed a decline of 7.44 percent in the same period. However, Udaipur sub-tehsil observed a increase of 9.2 percent. Lahaul and Spiti district in general observed a decline of 2.5 percent. During 1991 - 2001 an increase in population of 6.17 percent was observed.

Table 3.10

Decadal variation in population growth, 1981-91

Tehsil / sub-tehsil	Population		Percentage Decadal Variation
	1981	1991	1981-91
Lahaul	7937	13030	64.16
Spiti	10362	9591	-7.4
Udaipur	7937	8673	9.3
Districts	32100	31294	-2.5

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A and B, District Census Handbooks.

It is seen that the population growth of Lahaul and Spiti is generally higher than the national average. This may be due to the traditional practice of polyandry. In addition, influx of migrant labourers and employees in various developmental schemes and institutions also had its effects in the overall increase in the population growth.

3.2.3 **Sex Ratio**

In 1991, the district registered sex ratio of 817 females per thousand males as against the state sex ratio of 976, which was lesser by 159 females. Taking account of the tribal population the situation is quite different, 1005 female for every 1000 tribal males in the region. Table 3.11 shows that Lahaul tehsil has sex ratio of 814 females

per thousand males, whereas the Spiti tehsil has a very low sex ratio of 767 females per thousand males.

Table 3.11

Sex ratio for Community development Blocks, 1991 - 2001

Name of C.D block	Numbers of females per 1,000 males
Lahaul	840
Spiti	767
District	817
District (2001)	804

Source: Computed from Census of India, 1991, Series-9, H.P, Part XII-A and B, District Census Handbooks

The sex ratio has declined from 817 in 1991 to 804 in 2001. This clearly shows that the district is having lesser number of females as compared to other areas of the state. In Lahaul and Spiti district, due to highly uneven male-female composition, the sex ratio is highly varied in the villages of Lahaul and Spiti. Kunge, D.P.F. Ramsan, Lapcha, R.F. Rumas and Yari-Khoksar have highly imbalanced sex ratio which is 44, 77, 91, 167 and 174 females per 1000 males.

Table 3.12

Distribution of villages by sex ratio, 1991

Sex Ratio (Range)	No. Of Villages	Percentage
800	62	22.8
801-900	33	12.1
901-1000	47	17.3
1001-1100	27	9.9
1101-1200	31	11.4
1201 +	72	26.5
Total	272	100

Source: Computed from Census of India, 1991, series-9, H.P,Part XII-A and B, District Census Handbooks.

Harsar, R.F. Riodhan, Chogjing, Muchhling, Baring, Gumling, Kingle, Raig, Thola-Pyasu, Gompathan, Kathal, Yarango-Rangrik, Chavrang-khas, Kaley, Lari, and Mikim are the only villages where the proportion of females and males are equal. On the other extremes, where females out number males are Phukchung (3714), Tulse-Pena (5000) and Galing with 5000 females. This may be due to excessive sex selective out migration (Table 3.12).

3.2.3.1 **Valley wise sex-ratio**

There are many factors that influence the sex ratio of a region, importantly being social, religious, biological and economic. Among these, economic factor is the most effective one as it brings changes in both the source as well destination. The sex ratio has remained at low level.

Table 3.13 shows the valley wise distribution of sex ratio. In Chenab valley 16 villages registered sex ratio of less than 800 females per 1000 males while 11 villages have sex ratio of more than 1000 females per 1000 males (28 percent). Rest of villages i.e. 13 have sex ratio ranging between 801 –1000 females. There are 3 villages having more than 1201 females. Pattan valley shows that nearly 39 percent villages i.e. 25 villages have sex ratio of more than 1201 females per 1000 males. On the other extreme, 9 villages have less than 800 females per 1000 males. Rest of the ratio varies between 801-1200 females in 31 villages. In Bhaga valley , 22 percent of villages registered less than 800 females whereas nearly 27 percent villages have more than 1201 females per 1000 males while 21 villages has varying sex ration of 801-1200 females making 51 percent of total villages. In Chandra valley, 11 villages registered low sex ratio of less than 800 females. On the other hand, 11 villages recorded more than 1201 females while rest of the percentages registered sex ratio between 801-1200 females. In Spiti valley, 17 villages recorded less than 800 females (21 percent) while 22 villages registered more than 1201 females (27.2%). Rest of the villages comes under the sex ratio varying between 801-1200 females per thousand males respectively.

The general sex ratio shows a declining trend. This may be due to male selective out migration in search of better opportunities. In addition, as the general income level goes up people out migrate to other valleys like Kullu having more benign climate. As

the awareness increases due to higher education among the new generation they prefer to migrate to other parts of the state. Influx of migrant labourers is also a cause for the imbalance in the sex ratio.

Table 3.13

Distribution of villages in the Valleys of Lahaul and Spiti according to sex ratio, 1991

VALLEY	Less than 800	801-900	901-1000	1001-1100	1101-1200	More than1201	TOTAL
CHENAB	16	5	8	4	4	3	40
Percentage	40	12.5	20	10	10	7.5	100
PATTAN	9	6	9	7	9	25	65
Percentage	13.8	9.2	13.8	10.8	13.8	38.5	100
BHAGA	9	4	6	5	6	11	41
Percentage	22	9.8	14.6	12.2	14.6	26.8	100
CHANDRA	11	6	8	4	5	11	45
Percentage	24.4	13.3	17.8	8.9	11.1	24.4	100
SPITI	17	12	16	7	7	22	81
Percentage	21	14.8	19.8	8.6	8.8	27.2	100

Source: Computed from Census of India, 1991, series-9, H.P,Part XII-A and B, District Census Handbooks.

3.2.4 **Literacy Rate**

Literacy is one of the most important factors in the development of a region. It is considered as a movement of ideas, as an instrument to cultural diffusion and social integration that results into more meaningful distribution of population. The literacy rate of Lahaul and Spiti was 56.82 percent during 1991 census. Lahaul C. D. Block recorded 56.24 percent literacy while, 57.08 percent was recorded in Spiti C.D. Block. Male literacy is almost double than female literacy. Table 3.15 shows the literacy rates in the district. The literacy rate in 2001 census was 73.17 percent for total literacy. The figures for male and female literacy in the same period were 82.76 percent and 60.94 percent respectively.

Table 3.16 shows the village-wise distribution on the basis of total literates. Bar Gompa, Minser, D.P.F. Tumru and Yansa recorded lowest literacy, 7.69, 7.69, 8.33 and

10 percent respectively. The highest literacy was recorded in Kauirik (97.8 percent), Kathan (100 percent) and Piyur (100 percent). The overall literacy of male population in Lahaul and Spiti is high. Out of 272 villages, 67 villages (24.6 percent) have more than 80 percent literacy for males. Around 42.3 percent villages fall in the category where the male literacy is between 60 to 80 percent. About 5 percent of villages have male literacy less than 20 percent (Table 3.14, 3.15).

Table 3.14

Literacy Rate, 1991 - 2001

Name of *C.D block	Percentage Persons	Of Males	Literates Females
Lahaul	57.08	71.37	39.66
Spiti	56.24	72.74	34.08
District	56.82	71.79	38.05
District	73.17	82.76	60.94

*Community Development Block

Source: Computed from census of India, 1991, series-9, H.P, Part XII-A and B, District Census Handbook.s

Table 3.15

Distribution of Villages According to Percent Literacy, 1991

LITERATES (percentage)	Less than 10	10.1 -20	20.1 -40	40.1 -60	60.1 – 80	More than 80.1
NO. OF VILLAGES	11	7	35	130	80	9
PERCENT OF VILLAGES	4	2.6	12.9	47.8	29.4	3.3

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A and B, District Census Handbooks.

Table 3.16

Distribution of villages according to Percent MaleLiteracy,1991

MALE LITERATES (% age)	less than 10	10.1 –20	20.1 -40	40.1 -60	60.1 – 80	more than 80.1
NO. OF VILLAGES	11	3	18	57	115	67
PERCENT OF VILLAGES	4	1.1	6.6	21	42.3	24.6

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A and B, District Census Handbooks.

Table 3.17

Distribution of Villages According to Percent Female Literacy, 1991

FEMALE LITERATES (percentage)	less than 10	10.1 –20	20.1 –40	40.1 -60	60.1 - 80	more than 80.1
NO. OF VILLAGES	28	29	97	93	16	6
PERCENT OF VILLAGES	10.3	10.7	35.7	34.2	5.9	2.2

Source: Computed from Census of India, 1991, series-9, H.P,Part XII-A and B, District Census Handbooks.

Table 3.17 shows the distribution of villages in Lahaul and Spiti according to female literacy. Female literacy is low in comparison to male literacy. About 31 percent villages recorded less than 20 percent female literacy rate in 1991. About 37 percent of villages were in the category varying between 20 to 40 percent literacy. Thirty five percent of villages recorded female literacy in between 40-60 percent literacy level.

3.2.4.1 Valley-wise literacy rate

Table 3.18

Valley-wise Literacy in villages, 1991

Literacy rate (%)	Less than 10	10.1-20	20.1-40	40.1-60	60.1-80	More than 80.1	TOTAL
CHENAB	1	1	12	21	5		40
Percentage	2.5	2.5	30	52.5	12.5		100
PATTAN	1	1	3	23	35	2	65
Percentage	1.5	1.5	4.6	35.4	53.8	3.1	100
BHAGA	2	1	10	21	6	1	41
Percentage	4.9	2.4	24.4	51.2	14.6	2.4	100
CHANDRA			1	25	17	2	45
Percentage			2.2	55.6	37.8	4.4	100
SPITI	7	4	9	40	17	4	81
Percentage	8.6	4.9	11.1	49.4	21	4.9	100

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A and B, District Census Handbooks.

Table 3.18 presents valley-wise literacy rate. Only one village has less than 10 percent literacy while five villages have 60.1-80 percent literates in Chenab valley. Rest of the villages varies between 10.1-60 percent levels. There is no village in the category of more than 80 percent. Pattan valley registered only one village having less than 10 percent literacy rate whereas two villages recorded more than 80.1 percent literacy. Rest of the literacy rate varies between 10.1-80 percent comprising 62 villages. In Bhaga valley, there are two villages having less than 10 percent literates whereas only one village has more than 80.1 percent literacy rate. Rest of the 38 villages have come under the 10.1 to 80 percent category. In Chandra valley, there are no villages having less than 20 percent literacy rate. Only one village has 20.1 - 40 percent literacy rate whereas two villages have more than 80.1 percent literates to total population. Apart from these two extremes, 40.1 – 80 percent literacy is observed in 42 villages. In Spiti valley, there are 7 villages registering less than 10 percent literacy rate where as 4 villages recorded more than 80 percent literacy rate. Against these two extremes, 70 villages recorded literacy rates varying between 10.1-80 percent respectively.

Table 3.19

Valley-wise male literacy in villages, 1991

VALLEY	Less than 10	10.1-20	20.1-40	40.1-60	60.1-80	More than80.1	TOTAL
CHENAB	3		3	13	18	3	40
Percentage	7.5		7.5	32.5	45	7.5	100
PATTAN	2		2	8	28	25	65
Percentage	3.1		3.1	12.3	43.1	38.5	100
BHAGA	2	1	4	7	20	7	41
Percentage	4.9	2.4	9.8	17.1	48.8	17.1	100
CHANDRA			1	12	20	12	45
Percentage			2.2	26.7	44.4	26.7	100
SPITI	4	3	8	17	29	20	81
Percentage	5	2	10	21.3	36.3	25	100

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A and B, District Census Handbooks.

In Chenab valley 3 villages registered less than 10 percent male literacy (Table: 3.19). On the other hand, 3 villages registered more than 80.1 percent male literacy. Against these two extremes, 34 villages recorded male literacy varying between 10.1-80 percent. In Pattan valley , 2 villages has less than 10.1 male literates whereas 25 villages has more than 80.1 percent while rest of the 38 villages registered male literacy varying between 10.1 - 80 percent. In Bhaga valley, only 2 villages have less than 10 percent while 7 villages have more than 80 percent male literacy. Thirty-one villages have varying ratio of male literates between 10.1 and 80 percent.

In Chandra valley, there are no villages having less than 20.1 percent male literacy. There is only one village having 20.1 - 40 percent literacy whereas 12 villages registered more than 80 percent male literates. Rest of the 32 villages fall under the category, which varies between 40.1 and 80 percent of literacy. In Spiti valley, 4 villages accounted less than 10.1 percent male literates whereas 20 villages enumerated more than 80.1 percent. Against these two extremes, 56 villages show literacy rate varying between 10.1-80 percent.

Table 3.20

Valley-wise female literacy in villages, 1991

VALLEY	Less than 10	10.1-20	20.1-40	40.1-60	60.1-80	More than80.1	TOTAL
CHENAB	4	9	19	5	1	2	40
Percentage	10	22.5	47.5	12.5	2.5	5	100
PATTAN	3		14	40	7	1	65
Percentage	4.6		21.5	61.5	10.8	1.5	100
BHAGA	3	8	17	12	1		41
Percentage	7.5	20	40	30	2.5		100
CHANDRA	2	1	17	18	5	2	45
Percentage	4.4	2.2	37.8	40	11.1	4.4	100
SPITI	16	11	32	19	2	1	81
Percentage	20.3	13.9	39.2	22.8	2.5	1.3	100

Source: Computed from Census of India, 1991, series-9, H.P,Part XII-A and B, District Census Handbooks.

As far as the female literacy is concerned, wide inter - valley variations can be seen. In Chenab valley, only 4 villages registered less than 10 percent female literacy whereas only 2 villages registered more than 80.1 percent. Rest of the 34 villages registered literacy between 10.1 - 80 percent. In Pattan valley, 3 villages have less than 10 percent whereas only one village has more than 80.1 percent female literacy. Rest of the 61 villages registered female literacy varying between 20.1-80 percent. In Bhaga valley, 3 villages accounted less than 10 percent while there is only one village that accounted 60.1 - 80 percent. There are no villages in the category of more than 80.1 per cent. Thirty-seven villages recorded female literacy of 20.1-60 percent. In Chandra only 2 villages on upper extreme and 2 villages on the lower extreme recorded literacy rate less than 10 and more than 80.1 percent female literates. Forty one villages observed female literacy rate of 10.1-80 percent. In Spiti valley, 16 villages recorded less than 10 percent while only one village registered more than 80.1 percent literacy. Rest of the 64 villages comes under the literacy rate of 10.1 - 80 percent respectively.

The above analysis shows that there is a wide gap between male and female literacy rates. Total literacy rate is quite low, as it is a remote area and there is lack of adequate educational infrastructure like schools, colleges etc. People are forced to pursue agricultural practices since childhood to support the family.

The over all demographic dynamics show that the region of Lahual and Spiti has a great deal of influence of environment in every aspect of life. Right from the distribution of population, literacy and other spheres of life of common man is affected by it .The over all demographic structure shows that the region under study is of rural nature with lack of fundamental infrastructural facilities. This is despite the fact that the region comes under tribal area development plan.

To sum up, the analysis of socio-demographic structure clearly depicts that harsh natural environment and poor economic base of the region puts major impediments on the various socio-demographic aspects. This is well reflected through their food habits, dresses and house types etc. As people consume lot of alcohol and wear thick woollen clothes to protect them against unpleasant climate. They construct

houses in such design to maintain the inside temperature and animals too dwell in the same house. Their fair and festivals also show the influence of physical conditions as festivities are celebrated during free time.

The demographic profile of the region is also greatly influenced by natural environment and availability of economic resources. Most of the population is confined near river valleys and water resources. Owing to the scarcity of arable land and cold-climate, Lahaul and Spiti region had registered a negative growth rate (-2.5 percent) during 1981-91.The population density is just two persons per sq.kms. In Spiti sub-division, it is just one. The density distribution of population lies at the bottom as compared to state average. Their sex ratio has also been changed in the wake of ongoing developmental processes due to sex selective migration. Consequently, literacy rate has started increasing which further helps in enhancing the job opportunities apart from agriculture. Thus, the above analysis of socio-demographic factors shows the direct manifestations of natural environment and availability of job opportunities in Lahaul and Spiti region.

References:

[1] R. C. Chandna (2000): *Geography of Population*, Kalyani Publishers New Delhi.
[2] Census of India (1991), Himachal Pradesh, District Census Handbook, Lahaul and Spiti, Part XII-A and B, Series-9.
[3] ibid, p 27.
[4] ibid, p 25.

Chapter: Four

ECONOMIC STRUCTURE

"In every progressive economy, there has been a steady shift of employment and investment from the essential primary activities . . . to secondary activities of all kinds and to a still greater extent into tertiary production."

- - A.G.B. Fisher

The economy of a region shows the level of development and interaction with other regions. This is particularly significant for high, remote and inaccessible mountainous areas like Lahaul and Spiti, where natural milieu restricts man's role to alter nature. The people are forced to survive on the limited available resources. The resources of mountain regions are composed of both natural and human resources. The level of their utilization depends upon a number of factors including technology, institutions and spatial interrelationships etc. However, the harsh climatic conditions put a serious impediment over the man's capacity to use natural resources and impede communication with surrounding regions. In the process of man-nature interaction, the society generally receives the low level of economic output and is characterized by subsistence economy.

Economic structure of a mountainous region is influenced by the human power rather than by technology. It has been mainly analyzed in respect of human resources and to some extent natural resources. The complex role of human labour makes the socio-economic survival possible in the hostile environment. The division of workforce among various categories, the dependency ratio etc. becomes important in this chapter. The natural resources have been analyzed in terms of land uses under different categories like land not available for cultivation, forests and other economic purposes such as pastures and grazing land and net area sown etc. The interrelationship between the various components of economic structure has been studied in this chapter.

4.1 Occupational structure

Table 4.1

Work participation rates, 1961 - 91

Population	1961	1971	% change 1961 - 71	1981	1991	% change 1981 - 91
Total	20453	23538	15.08	32100	31294	-2.51
Male	11519	12975	12.64	18171	17224	-5.2
Female	8934	10563	18.23	13929	14070	1.01
WORKERS						
Total	14353 (70.17)	15240 (64.75)	6.18	18967 (59.09)	16954 (54.18)	-10.81
Male	8196(71.15)	8760 (67.51)	6.88	12003 (66.05)	10955 (63.60)	-8.73
Female	6157 (68.92	6480 (61.35)	5.25	6964 (49.10)	5999 (42.63)	-13.85
PRIMARY SECTOR						
Total	9808(68.33)	9103(59.73)	-7.2	D.N.A.	10292 (60.70)	
Male	4355(53.13)	3741(42.70)	-14.09	D.N.A.	5120 (46.74)	
Female	5453(88.56)	5362(82.75)	-1.7	D.N.A.	5172 (86.21)	
SECONDARY SECTOR						
Total	3506(24.43)	3415(22.41	-2.6	D.N.A.	2323 (13.70)	
Male	2843(34.69)	2507(28.62)	-8.7	D.N.A.	1910 (17.43)	
Female	663 (10.77)	908(14.01)	36.95	D.N.A.	413 (6.88)	
TERTIARY SECTOR						
Total	1039 (7.24)	2722(17.86)	161.98	D.N.A.	4339 (25.59)	
Male	998 (12.18)	2512(28.67)	151.7	D.N.A.	3925 (35.83)	
Female	41 (0.66)	210 (3.24)	412.19	D.N.A.	414 (6.90)	

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

Work participation is a primary factor of production. The proportion of workers engaged in various sectors of economy throw light on economic and cultural facets of the society especially in remote and mountainous areas where culture plays a dominant role in people's livelihood. The various economic, technological, and geographical factors determine the occupational structure of a region. High work participation rates and low levels of diversification generally characterize the less developed regions.

A higher proportion, that is, 70.17 percent of the total population of Lahaul and Spiti was active economically in 1961(Table4.1) Male work participation rate was 71.15 percent as against 68.96 percent of females in various economic activities. A very significant proportion of workers accounting for 68.3 percent were employed in the primary sector. The proportion of female workers, that is, 88.5 percent was higher than male workers, that is, 53.13 percent. In secondary sector, the total work participation rate was 24.4 percent. Male workers accounted for 34.69 percent of the total male workers as against 10.7 percent of female workers in this sector. A small proportion of workers accounting for 7.24 percent were engaged in the tertiary sector. Male workers accounted for 12.18 percent of the total male workers as against 0.66 percent of female work participation rate. Due to some change in the workers classification in 1981 participation rates are not directly comparable but 1971 data shows that work participation rate increased in this year. The total workers accounted for 64.7 percent of the total population of Lahaul and Spiti while the male work participation rate was 67.5 percent as against 61.3 percent of females.

The predominance of primary sector was observed in which female participation rate was higher than that of males. The proportion of workers in secondary sector remained insignificant having 22.4 percent of total workers. Male workers accounted for 28.6 percent as against 14.01 percent of females. Tertiary sector comprised of low percentage of total workers in which male participation rate was much higher than females. The total work participation rate increased by 6.18 percent in 1981. Male workers registered a increase of 6.88 percent, while female workers increased by 5.25 percent respectively. Since 1981

census there was inclusion of new category of marginal workers, which could be a reason for the decline of workers. After the reorganization of the district during the 1974-75, the major developmental works started.

The 1991 census also registered significant decline of -10.81 percent in the work participation rate, with only 54.18 percent of total population as workers of which 63.60 percent were males and 42.63 percent were females. Such a decline may be ascribed to various ongoing developmental processes, which absorbed mostly males. Apart from this, people started diverting from primary to non-primary activities resulting into cash income. In addition, with the rise in income people started venturing outside the region for better education and employment opportunities. The primary sector shows its predominance in the economy of the region. Around 61 percent of the total workers were enumerated as primary workers of which 46.74 percent were males and 86.21 percent were females who significantly outnumbered the males. Secondary sector remained less important by recording 13.70 percent of the total main workers. There was a rise in the tertiary sector having 25.59 percent of the total main workers. It recorded 35.83 percent of males and 6.90 percent of female main workers. It may be due to establishment of various socio-economic amenities like schools, hospitals etc, and also due to development of infrastructure like pucca roads, bridges etc.

Table 4.2 shows that cultivators had largest share among the total main workers accounting for 51.69 percent. The distinct characteristics of cultivators were the higher proportion of females than males. The second important category in primary sector consists of workers engaged as agricultural labourers. The proportions of female were higher accounting for 7.98 percent as against male participation of 3.60 percent. The third category consists of workers engaged in livestock, forestry, fishing, hunting and plantation orchards and allied activities. Female participation was lower than males in this category. Mining and quarrying constitutes the last category of primary sector, which recorded negligible proportion. Manufacturing sector remained largely undeveloped in secondary sector, whereas construction labourers accounted for 12.29 percent of total main workers. A small proportion of workers were employed in trade and commerce

and transport, storage and communication due to isolation and inaccessibility of the area. Other services comprised of 22.39 percent of total main workers. Various governmental workers employed come under this category.

From the above analysis it can be said that primary sector is growing along with a significant growth in tertiary sector. Females have outnumbered males in the primary sector.

Table 4.2

Work participation rates – 1991

MAIN WORKERS	TOTAL	I	II	III	IV	VA	VB	VI	VII	VIII	IX
MALE	10955	4209	394	516	1	79	73	1758	299	195	3431
Percentage	100.00	38.42	3.60	4.71	0.01	0.72	0.67	16.05	2.73	1.78	31.32
FEMALE	5999	4554	479	139	0	51	36	326	45	4	365
Percentage	100.00	75.91	7.98	2.32	0.00	0.85	0.60	5.43	0.75	0.07	6.08
TOTAL	**16954**	**8763**	**873**	**655**	**1**	**130**	**109**	**2084**	**344**	**199**	**3796**
Percentage	**100.00**	**51.69**	**5.15**	**3.86**	**0.01**	**0.77**	**0.64**	**12.29**	**2.03**	**1.17**	**22.39**

Note : (I) Cultivators ; (II) Agricultural labourers ; (III) Livestock , forestry , fishing , hunting and plantation orchards and allied activities ; (IV) Mining and quarrying ; (Va) Manufacturing , processing servicing and repairs in household industry ; (Vb) Manufacturing , processing , servicing and repairs in other than household industry ; (VI) Constructions ; (VII) Trade and commerce ; (VIII) Transport , storage and communication ; (IX) Other services.

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

Table 4.3 shows seventy eight villages have less than 20 percent work participation rate. These are Tishu, Tulse Pena, Jholing, Gemur Gompa, and R. F. Riodhan etc. Whereas 94 villages i.e. 34.6 percent villages have more than 60 percent including Udaipur, Thirot, Trilokinath, Tandi, Kyelang, Tabo, Kaza Soma (Appendix 1) respectively out of the total 272 villages. Rest of the 100 villages have work participation rate between 20 and 60 percent i.e. 36.5 percent of the total villages respectively.

Table4.3

Share of total workers in villages – 1991

Participation Rate (percent)	No. of villages	Percent to total villages
<20	78	28.7
20-30	36	13.2
30-40	27	9.9
40-50	23	8.5
50-60	14	5.1
>60	94	34.6
Total	272	100

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

The villages having low work participation rate are either situated in the interior of the valleys or in the uplands. On the contrary, villages having higher work participation rate are either administrative units or major halting stations. The villages with medium level of work participation rate are spread out in the entire district.

The preponderance of primary activities is the chief feature of total work participation rate in the villages of Lahaul and Spiti region. Workers are mostly engaged in agro – pastoral activities. This is mainly because of the entire rural character of the district.

The table 4.4 reveals that male work participation rate in 141 villages i.e. 51.8 percent of the total villages having work participation rate of less than 40 percent including Sulche, Piyur, Muchhling, Kathal, Galing while 94 villages i.e. 34.6 percent have more than 60 percent male work participation rate including Tindi, Shakoli, Madgaraon, Thirot, Kyelang, Stingri, Tabo and Kaza Soma respectively. Remaining 37 villages i.e. 13.6 percent of the total villages have work participation rate varying between 40 to 60 percent respectively.

Table 4.4

Male work participation rates in villages – 1991

Participation Rate (percent)	No. of villages	Percent to total villages
< 40	141	51.8
40-50	23	8.5
50-60	14	5.1
> 60	94	34.6
Total	272	100

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

Table 4.5

Female work participation rates in villages – 1991

Participation Rate (percent)	No. of villages	Percent to total villages
< 40	205	75.4
40-50	20	7.4
50-60	8	2.9
> 60	39	14.3
Total	272	100

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

Table 4.5 reveals that, 205 villages i.e. 75.4 percent of the total villages have less than 40 percent female work participation rate including Shenwar, D.P.F. Sindwari, Muchhling, Tulse Pena, and Gemur Gompa. Whereas in 39 villages i.e. 14.3 percent of total villages have more than 60 percent of females are in workforce including Tindi, Udaipur, Jhalma, Kirting, Kyelang. Twenty-

eight villages i.e. about 10.3 percent of the total villages have female workers from 40 to 60 percent.

It is apparent from the above analysis that in Lahaul and Spiti, females have been engaged in workforce. Moreover, the females make the cultivation possible in this highly rugged mountainous terrain. Male folk generally do some tertiary activities or migrate outside the region to meet their requirements.

Table 4.6

Valley-wise work participation rate – 1991

Valley		Total Work Participation Rate					
		<20	20-30	30-40	40-50	50-60	>60
Chenab	Villages	11	2	1	4		22
	% of villages	27.50	5.00	2.50	10.00		55.0
Pattan	Villages	16	16	4	6	5	18
	% of villages	24.60	24.60	6.20	9.20	7.70	27.70
Bhaga	Villages	7	4	9	5	2	14
	% of villages	17.10	9.80	22.00	12.20	4.90	34.10
Chandra	Villages	15	10	7	2		11
	% of villages	33.30	22.20	15.60	4.40		24.40
Spiti	Villages	29	4	6	6	7	29
	% of villages	35.80	4.90	7.40	7.40	8.60	35.80
Total	Villages	78	36	27	23	14	94
	% of villages	28.70	13.20	9.90	8.50	5.10	34.60

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

Table 4.6 shows that villages having 40 to 50 percent workers are more in Bhaga valley i.e. 12.2 percent of the total villages followed by Chenab (10 %), Pattan (9.2 %), Spiti (7.4 %), and Chandra valley with 4.4 percent of villages. As against these there are around 32.5 percent villages in Chenab, 49.6 percent in Pattan, 26.9 percent in Bhaga, 55.5 percent in Chandra and 39.8 percent in Spiti valley having less than 30 percent of population accounted as workers.

Table 4 .7

Valley-wise male work participation rate - 1991

Valley		Total Male Participation rate				Total
		< 40	40-50	50-60	> 60	
Chenab	Villages	14	4		22	40
	% of villages	35.0	10.0		55.0	100.0
Pattan	Villages	36	6	5	18	65
	% of villages	55.40	9.20	7.70	27.70	100.0
Bhaga	Villages	20	5	2	14	41
	% of villages	48.80	12.20	4.90	34.10	100.0
Chandra	Villages	32	2		11	45
	% of villages	71.10	4.40		24.40	100.0
Spiti	Villages	39	6	7	29	81
	% of villages	48.10	7.40	8.60	35.80	100.0
Total	Villages	141	23	14	94	272
	% of villages	51.80	8.50	5.10	34.60	100.0

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

The valley of Chenab has a maximum number of villages i.e. 55 percent, Spiti (44.4 %), Bhaga (39 %), Pattan (35.4 %), and Chandra with 24.4 percent of villages having more than 50 peer cent of the total population as workers.

The most obvious reason for varying figures are its topographic constraints and socio – economic setting. The villages having lower percentage of workers to total population are situated in the higher altitudes. On the contrary, the villages having higher percentage of workers to total population are located near river valleys and are smaller in size. However, there are few villages in the valleys having high share of workers as well as large size of population. It can be due to the availability of water for irrigation and high fertility of land that generates better opportunities for workers to employ themselves in agricultural pursuits. The higher share of workers in higher altitudes would be due to the limited possible sources of livelihood.

Table 4.7 states that of all the valleys, Chandra valley has largest proportion of male work participation rate i.e. 71.10 percent followed by Pattan (55.40 %), Bhaga (48.80 %), Spiti (48.10 %) and Chenab with 35 percent of total male population enumerated less than 40 percent as male workers. On the other hand , Chenab valley have largest villages i.e. 55 percent , Spiti (35.80 %) , Bhaga (34.10 %) , Pattan (27.70 %) , and Chandra with 24.40 percent accounted more than 60 percent of total male population as male workers. Rest of the villages in different valleys accounted insignificant proportion as male workers to total male population

Table 4.8 shows that Chandra valley have largest proportion of female workers to total female population i.e. 91.10 percent followed by Pattan (78.50 %), Spiti (74.10 %), Bhaga (68.30 %) and Chenab valley (62.50 %) having less than 40 percent, whereas Chenab valley have largest villages 27.50 percent, Bhaga (19.5) Spiti (17.3 %), Pattan (16.9 %), and Chandra with 6.7 percent of total female population as female workers with more than 50 percent work participation rate respectively.

The above analysis of workforce suggests that it is both male and female labour that actively participates in all-agricultural and related activities.

Table 4.8

Valley-wise female workers to total female population, 1991

Valley		Female work Participation rate				Total
		< 40	40-50	50-60	> 60	
Chenab	Villages	25	4		11	40
	% of villages	62.50	10.00		27.50	100.0
Pattan	Villages	51	3	2	9	65
	% of villages	78.50	4.60	3.10	13.80	100.0
Bhaga	Villages	28	5	3	5	41
	% of villages	68.30	12.20	7.30	12.20	100.0
Chandra	Villages	41	1		3	45
	% of villages	91.10	2.20		6.70	100.0
Spiti	Villages	60	7	3	11	81
	% of villages	74.10	8.60	3.70	13.60	100.0
Total	Villages	205	20	8	39	272
	% of villages	75.40	7.40	2.90	14.30	100.0

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

Table 4.9 describes the proportion of workers in household industry to total workers in the villages of Lahaul and Spiti region. Most of the villages i.e. 85.3 percent to the total workers have no workers in the household industry, whereas 24 villages including Bhar, Gushal, Kirting, Telangbe, and Wargul with 8.8 percent of workers in household industry having less than 2 percent work participation rate. On the other hand, there are 11 villages i.e. about 4 percent of the villages have 2 to 5 percent of total workers as household workers. These include Biling, Darcha – Dangma, Kawaring, Kolang, Lidang, Lot, Maragaraon, Muling, Sindwari and Thorang respectively. The proportion of workers having

more than 5 percent as household workers is low i.e. 1.8 percent to the total workers in the villages of Kaza Soma, Kyelang, Tabo, Tinno and Trilokinath respectively.

Table 4.9

Workers in household industry to total workers in villages, 1991

Percentage of workers in Household Industry to total workers	No. of Villages	Percentage of Villages
0	232	85.3
< 2	24	8.8
2-5	11	4
> 5	5	1.8
Total	272	100

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

Table 4.10 Shows that Chenab valley has largest proportion of the villages i.e. 90 percent having no household workers. It was followed by Spiti (87.70 %), Pattan (86.20 %), Chandra (84.40 %), and Bhaga (75.60 percent). In the class size of less than 2 percent, Pattan valley has largest proportion i.e. 12.30 percent, Chandra (11.10 %), Spiti (8.60 %), Bhaga (7.30 %) and Chenab with 2.50 percent as household workers to total workers. Bhaga valley has largest proportion i.e. 17.1 percent followed by Chenab (7.5 %), Chandra (4.40 %), Spiti (3.7 %) and Pattan with dismal 1.5 percent as household workers to total workers in the category of more than 5 percent work participation rate.

Table 4.10

Valley-wise share of household workers to total workers – 1991

Valley		Work Participation in Household Industry				Total
		0	<2	2 – 5	> 5	
Chenab	Villages	36	1	2	1	40
	% of villages	90.0	2.50	5.0	2.50	100.0
Pattan	Villages	56	8	1		65
	% of villages	86.20	12.30	1.50		100.0
Bhaga	Villages	31	3	5	2	41
	% of villages	75.60	7.30	12.20	4.90	100.0
Chandra	Villages	38	5	2		45
	% of villages	84.40	11.10	4.40		100.0
Spiti	Villages	71	7	1	2	81
	% of villages	87.70	8.60	1.20	2.50	100.0
Total	Villages	232	24	11	5	272
	% of villages	85.30	8.80	4.0	1.80	100.0

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

The above discussion shows that household industries are mostly concentrated either in the administrative centers or near these centers. It mainly consists of carpet weaving, wool spinning and weaving, dyeing, black smithy, poultry farming, clay modeling etc. For the development of these industries, since fifth five-year plan, several programmes have been implemented and many are under consideration. With appropriate assessment of available natural resources, they may develop far better standard than the exiting level with the adoption of modern scientific techniques.

Table 4.11

Distribution of other workers to total workers – 1991

Percentage of other workers to total workers	No. of villages	Percentage of villages
<20	211	77.6
20-40	24	8.8
40-60	14	5.1
>60	23	8.5
Total	272	100

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

Table 4.11 depicts the share of other workers to total workers in the villages of Lahaul and Spiti district. Most of the villages i.e. 77.6 percent having less than 20 percent of total population as other workers including Tulse Pena, Rangyo, Piyur, Lara khas, Kaley, Gete, Tayul Gompa etc. whereas 13.6 percent of total population having more than 40 percent including Udaipur, Thirot, Kyelang, Stingri, Kaza Soma and Kaza Khas etc.(Appendix-1). Remaining 8.8 percent of villages have other workers varying between 20 and 40 percent of total workers. Most of the other workers are engaged in governmental jobs and infrastructure developmental activities. In this category, male population outnumbers female population. The males have also come from other regions. The share of natives is lower than the migrants particularly in higher administrative services.

Table 4.12 depicts that Pattan valley having largest villages i.e. 89.20 percent followed by Bhaga 82.90 percent, Chandra 77.80 percent, Chenab 72.50 percent and Spiti with 67.90 percent of total population as other workers in the class size of less than 20 percent participation rate. On the other extreme, Chenab valley having largest proportion i.e. 17.5 percent, Spiti 16.1 percent, Chandra 15.5 percent, Bhaga 12.2 percent and Pattan with 7.7 percent of total population as other workers having more than 60 percent work participation rate. In the class size of 20 – 40 percent, Spiti valley having maximum proportion i.e. 16 percent

followed by Chenab 10 percent, Chandra 6.70 percent, Bhaga 4.90 percent and Pattan with 3.10 percent of total workers as other workers respectively.

Table 4 .12

Valley-wise proportion of other workers to total workers – 1991

Valley		Other Worker				Total
		< 20	20-40	40-60	>60	
Chenab	No. of Villages	29	4	1	6	40
	% of villages	72.50	10.00	2.50	15.00	100.0
Pattan	No. of Villages	58	2	3	2	65
	% of villages	89.20	3.10	4.60	3.10	100.0
Bhaga	No. of Villages	34	2	3	2	41
	% of villages	82.90	4.90	7.30	4.90	100.0
Chandra	No. of Villages	35	3	2	5	45
	% of villages	77.80	6.70	4.40	11.10	100.0
Spiti	No. of Villages	55	13	5	8	81
	% of villages	67.90	16.0	6.20	9.90	100.0
Total	No. of Villages	211	24	14	23	272
	% of villages	77.60	8.80	5.10	8.50	100.0

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

It is evident from the following analysis that valleys with more developed agricultural base are having less share of other workers as against those of comparatively less developed agriculture i.e. Pattan and Spiti valley.

The overall analysis of occupational structure reveals the predominance of primary activities particularly cultivation in the entire district. The transition from primary to secondary is almost insignificant as the region is lacking in adequate infrastructure for their growth. The share of workers in tertiary sector is

significant with the participation in various tertiary activities mainly due to the harsh climatic conditions and to substitute agriculture for their livelihood. Another significant aspect of occupational structure is large proportion of female cultivators than those of male cultivators. In this remote, harsh, and inaccessible region of Lahaul and Spiti located in the Western Himalayas, it is chiefly the physical power of people rather than the technology, which determines the nature of occupational structure and its transformation. With the addition of modern inputs especially in agriculture front, the productivity has raised manifolds.

4.2 LAND USE

Land use is the spatial expression of natural environment of the region. The natural environment of Lahaul and Spiti is hostile having great influence on the land use pattern. Due to readjustment of administrative boundaries during 1974-75, Lahaul and Spiti recorded increase in its area. In the year 1979-80, a large proportion i.e. 90.76 percent of total geographical area was under permanent pastures and grazing lands. Forests covered the next largest proportion of 6.28 percent of total geographical area. The land available for cultivation was mere 1.50 percent of total geographical area. The remaining proportion i.e. 1.46 percent of total geographical area was under other categories like barren and un-cultivable land; land not suitable for cultivation, culturable waste and land under miscellaneous trees, crops and groves and lastly fallow land.

The largest increase of 59.5 percent occurred in the area under land put to non-agricultural uses and became 60.38 percent from 0.88 percent of the total area. It could be ascribed to the establishment of various infrastructural facilities in the region. The area under forests increased by 8.57 percent and became 14.85 percent from 6.28 percent. The major negative changes i.e. –66.6 percent were in the area under permanent pastures and grazing land. The area under cultivated land changed by –1.14 percent and became 0.36 percent from 1.50 percent. Remaining area under different uses also noticed negative change over the period.

Table 4.13

Land Use – 1979– 80 to 1999 – 2000 (in ha.)

Category of Land	1979-80	1999-00	Change in Proportion
Forests	6.28	14.85	8.57
Barren and un-cultivable land	0.28	0.15	-0.13
Land put to non-agricultural use	0.88	60.38	59.5
Culturable waste	0.11	0.06	-0.05
Permanent pastures and grazing lands	90.76	24.16	-66.6
Land under miscellaneous trees, crops and groves	0.05	0.01	-0.04
Current fallow	0.14	0.01	-0.13
Other fallow	-	Negligible	Negligible increase (0.0009)
Net area sown	1.50	0.36	-1.14

Source: Computed from Directorate of Economics and Statistics, Himachal Pradesh, Shimla

The land use pattern clearly shows that a very large part of total area of Lahaul and Spiti was covered under forests. Apart from this, a proportion of land is not available for cultivation as it has been covered by permanent pastures and grazing lands. A small proportion of land was available for cultivation, which suggests the scarcity of cultivated land. It is, therefore imperative to study the distributional pattern of scarce cultivated land.

It has been earlier seen that cultivated land constitute a very small proportion i.e. 0.36 percent during 1999-2000 of the total area. Table 4.14 shows significant variations in its distributional pattern. Eight villages have no cultivated land including D.P.F.Ransar, Dupuk, Lingti, R.F.Riodhan, R.F.Rumas, R.F.Krakun, Samdo and Tayul Gompa constituting 2.9 percent of the total villages (Appendix-1).

Table 4.14

Proportion of cultivated land in villages – 1991

Land available for cultivation in Ha.	No. of Villages	Percentage of villages
Not available	8	2.9
< 10	149	54.4
10 – 20	55	20.4
20 – 30	35	12.8
30 – 50	21	7.7
> 50	4	1.8
Total	272	100.0

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

There are 149 villages i.e. 54.4 percent of the total villages that has less than 10 hectares of land including Tulse Pena , To – Karing , Tibok , Sulche , Lapcha , Labrang , Kiangcha , Kharchud Gompa , Bokar , Bha Chewar , and Bar Gompa etc. On the other hand 4 villages i.e. 1.8 percent have more than 50 hectares of total cultivated land including Gushal, Kyelang, Trilokinath and Salgaraon respectively. Rest of the 111 villages has cultivated land varying between 10 to 50 hectares i.e. 40.9 percent of the total cultivated land. These villages are situated on the upper parts of the region whereas villages having more than 50 hectares are situated along river valleys and relatively flat areas.

Table 4.15 shows that four villages have no cultivated land in Chenab valley. Seventeen villages have less than ten hectares i.e.42.5 percent of the total cultivated land whereas only two villages have more than 50 hectares of cultivated land i.e. 5 percent respectively. Rest of the total cultivated land varies between 10 to 50 hectares i.e. 42.5 percent. 43 villages shows less than five hectares of cultivated land constituting 66.2 percent in Pattan valley, while 22 villages have proportion of cultivated land varying between 10 to 50 hectares i.e. 33.9 percent of the total cultivated land. One village in Bhaga valley has no

cultivated land whereas 25 villages i.e. 61 percent of total cultivated land have less than 10 hectares. Only one village has more than 50 hectares (2.4%) respectively.

Table 4.15

Valley-wise land available for cultivation – 1991

Valleys/ Villages		Land Available for Cultivation (in Ha.)					
		Not available	< 10	10 - 20	20 - 30	30 - 50	>50
Chenab	**Villages**	4	17	7	6	4	2
	% of villages	10.0	42.5	17.5	15.0	10.0	5.0
Pattan	**Villages**		43	15	4	3	-
	% of villages		66.2	23.1	6.2	4.5	-
Bhaga	**Villages**	1	25	9	5	-	1
	% of villages	2.40	61.0	22.0	12.2	-	2.4
Chandra	**Villages**		32	8	3	1	1
	% of villages		71.1	17.8	6.7	2.2	2.2
Spiti	**Villages**	3	32	16	17	13	-
	% of villages	3.7	39.5	19.8	21.0	16.0	-
Total	**% of villages**	8	149	55	35	21	4
	% within valley	2.9	54.4	20.4	12.8	7.7	1.8

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

32 villages have less than 10 hectares i.e. 71.1 percent in Chandra valley, while one village has more than 50 hectares of cultivated land. Rest of the 12 villages has 10 to 50 hectares of arable land i.e. 26.7 percent. Only 3 villages having no cultivated land in Spiti valley, whereas 32 villages have less than 10

hectares i.e. 39.5 percent of the total cultivated land. On the other hand, 46 villages have arable land ranging between 10 to 50 hectares respectively.

Villages having no cultivated land in the entire district are those inhabited by the seasonal in-migrants engaged in labour and forest cutting and some run dhabas at halting stations. The villages in the respective valleys where area under cultivation is less than 5 hectares are situated at higher altitudes whereas maximum of cultivated land is found near the river valleys and relatively flat areas. The size of cultivated land alone has no use, unless it has been analyzed in relation to population.

4.2.1 POPULATION PRESSURE ON LAND

Land distribution is affected by various physical factors like climate, altitude, and soil-fertility. The man land ratio is generally high in fertile and plain regions. These factors are on negative side influencing the population pressure on cultivated land in Lahaul and Spiti district of Himachal Pradesh.

Table 4.16

Population pressure on cultivated land, 1991

Persons per hectare land	No. of Villages	Percentage of villages
< 10	178	65.4
10-20	68	25.0
20-30	7	2.6
30-40	1	0.4
> 40	5	1.9
Not available	13	4.7
Total	272	100

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

Table 4.16 shows that out of 272 villages, 178 villages (about 65 percent) have less than 10 persons per hectare of cultivated land. Piyur, Neked, Gemur –

Gompa, Muchhling, Samling, Kathal are some of the villages which belong to this category. It becomes 10 to 20 persons per hectare of land in next 68 villages (about 25%). Only thirteen villages have more than 20 persons per hectare of cultivated land which include Trilokinath, Kaza Khas, Udaipur, Stingrti, Thirot, Kyelang, and Kaza Soma (Appendix-2). The discussion reveals that population pressure on land is not high as; only six villages have more than 30 people per hectare of land. However, this analysis does not bring out interpersonal distribution of land within a village.

4.2.2 IRRIGATION

In the predominantly agrarian economy of Lahaul and Spiti, irrigation assures the agriculture and crop productivity and thus, the prosperity of the region. It is of vital importance in rainfall deficient region like Lahaul and Spiti. Crops cannot grow without irrigation in this cold and dry climatic area. Irrigation is done by constructing small channels known as Kuhls. Water has been diverted from streams as well as reservoirs through Kuhls into cultivated fields. As mentioned earlier that most of the settlements are situated in the river valleys but topography still plays its role in the construction of channels resulting into low irrigation.

Table 4.17

Percentage irrigated land in villages – 1991

Percent Irrigated Land (in Ha.)	No. of villages	Percentage of villages
Not Available	8	2.94
< 75	46	16.91
>75	218	80.15
Total	272	100

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

Table 4.17 shows that 8 villages have no irrigation facility including Bharaur, Chaling, D.P.F.Tumru, Ghari, Tingrat Etc. Most of these villages are situated on higher slopes of the Chenab and Spiti valleys. Forty - six villages have less than 75 percent irrigated culturable land including Kibri (16.67 percent), Neked (6.25 %), Phukchung (22.22 %) Pomrang (24 %), Samling (14.29 %). On the other hand, 218 villages out of the total inhabited villages having more than 75 percent irrigated area include Arat, Bagche, Bar Gompa, Biling, Chokang, Ka and Minser (Appendix-1). Nearly, entire agricultural lands have some sort of irrigation facilities.

Furthermore, valley-wise distribution of irrigation will provide the precise idea about irrigation facilities available in the entire region.

Table 4.18

Valley-wise irrigated land – 1991

Valley		Percent Irrigated land (in Ha.)			Total
		Not Available	< 75	>75	
Chenab	Villages	4	11	25	40
	% of villages	10	27.5	62.5	100.0
Pattan	Villages				65
	% of villages				100.0
Bhaga	Villages	1		40	41
	% of villages	2.44		97.56	100.0
Chandra	Villages			45	45
	% of villages			100	100.0
Spiti	Villages	3	35	43	81
	% of villages	3.7	43.21	53.08	100.0

Source: Computed from Census of India, 1991, series-9, H.P, Part XII-A & B, District Census Handbook, Director of census operations, H. P, Shimla

It is apparent from table 4.18 that Chenab valley has largest villages with no irrigation i.e. 10 percent including Bharaur, Chamrat, Tingrat and Khanjar. It is closely followed by Spiti valley in villages Kaza Soma and Kauiri i.e. 3.7 percent of total villages respectively (Appendix-1). Most of these villages are either situated on higher altitude or devoid of stream channels. Spiti valley has comparatively poor irrigation due to arid climate.

On the other extreme, Pattan and Chandra valley have cent percent villages under irrigation out of total cultivated land closely followed by Bhaga and Chenab valleys with 97.56 percent and 62.5 percent area under irrigation. The valleys having cent percent irrigation are located in the Pir Panjal Range and Great Himalayan range usually irrigated by Chandra- Bhaga watershed.

The above discussion clearly shows that irrigation has great bearing on the agriculture of monsoon deficit region of Lahaul and Spiti. Most of the villages are covered by irrigation facilities except few villages in Zanskar range. Minor irrigation projects are still under construction by irrigation department in various parts.

4.3 Crops

Agriculture is the largest and principal occupation of the people in hilly and tribal areas like Lahaul and Spiti district of Himachal Pradesh. The type of farming is highly agro-pastoral. Due to severe winters, cultivation is practiced mainly during summer. The main food crops of Lahaul and Spiti consist of wheat, buckwheat, barley, maize, millets and pulses among food crops. Non-food crops are mainly commercial crops including potato, peas, kuth (a medicinal herb), hops and oilseeds etc. Besides these, vegetables like radish, carrot, turnip, cabbage, beetroot, cauliflower and tomato are also grown in the region.

The agro-climatic conditions prevailing in this region are conducive to the growth of horticultural crops especially apple which is fastly gaining ground particularly in Pattan and Chenab valley. Wheat is sown in two months of April and May and harvested in the months of September and October in various

valleys at varying altitudes. The sowing time for maize is May and June and reaped during October. Buchwheat is immediately sown after the harvest of Barley in the month of July only in Pattan valley and harvested in September. Kuth is sown before the snowfall in the month of November and also during April and reaped in August. The November sowing is preferred as the seeds get more time for stratification, which is essential for germination.[1]

Table 4.19

Area under different crops: 1979 – 1980 to 1999 – 2000 (in Hectares)

Crops	Area in hectares		% age of total cropped area		% age change
Years	1979 - 80	1999 - 00	1979 – 80	1999 – 00	1979 – 80 to 1999 – 00
Wheat	342	141	10.70	3.05	-71.49
Buckwheat	-	160	-	3.46	-
Barley	1053	592	32.96	12.82	-61.10
Maize	19	38	0.59	0.82	38.98
Millets	230	-	7.20	-	-
Pulses	176	1437	5.51	31.11	464.61
Potato	1343	818	42.03	17.71	-57.86
Fruit and vegetables	5	1415	0.16	30.63	19043.75
Oilseed	12	18	0.37	0.39	5.40
Kuth	15	-	0.47	-	-
Total	3195	4619			

Source: Computed from Directorate of Economics and Statistics, Himachal Pradesh, Shimla

Potato is sown in the months of April and June and reaped during September and October in different valleys. It is popular for its disease free seeds. Peas are sown in April and June and are harvested in the monsoon months of

August and September. Pulses like Mash and Rajmash are sown during June and are reaped in September and October. Besides, vegetables are also sown in months of May and June and are harvested in August, September and October. Lahaul development block enjoys better agro-climatic conditions as compared to Spiti block.

Before potato, kuth was a commercial crop in the region. Now there are three main commercial crops namely potato, peas and hops cultivated over large areas. Cultivation of various crops highly depends upon irrigation facilities mainly because of erratic nature and deficiency of rainfall. The principal sources of irrigation are numerous small streams flowing through the region. Water is diverted from streams through tiny channels locally known as Kuhls into agricultural fields. As mentioned in district gazetteer "The entire area both under fields and pastures is irrigated by nearly 326 small as big Kuhls which are laboriously brought along the contours of the mountains from the snow or glaciated nullahs that pour into the main rivers."[2]

The irrigation channels require maintenance every year due to heavy snowfall. Villagers repair irrigation channels in collective way and it is considered the responsibility of every member. Main rivers offer almost negligible scope for irrigation because most of the cultivated lands are situated at quite higher altitudes than the river course. But still many unirrigated areas could be directly brought under irrigation by using both lift and flow irrigation listed as a key element during the eight-plan period.

Table 4.19 shows that total cropped area was 3195 hectares during 1979-80. A large proportion i.e. 42.03 percent of total cultivated area was under potato. It reflects the significance of potato as cash crop in the region. The next largest area accounting for 32.96 percent of total cropped area was covered by barley. The proportion of wheat, millets, and pulses were 10.70, 7.20 and 5.51 percent of the total cultivated area. Rest of the crops constituted 1.59 percent of the total cropped land.

There were significant changes in the proportion of different crops during the year 1999-2000. The largest proportion i.e. 30.63 percent of total cultivated

land was under fruit and vegetables, which registered significant increase. The proportion of pulses registered second largest rise i.e. 464.61 percent and became 31.11 percent from 5.51 percent respectively. Potato came to third position by recording –57.86 percent decrease and became 17.71 percent from 42.03 percent during the period 1979-80 to 1999-00 respectively. It may be mainly due to the higher price gained by other cash crops including peas, hops etc. Wheat had shown major decline of –71.49 percent and became 3.05 percent from 10.70 percent followed by barley. The proportion of area under maize had comparatively increased by 38.98 percent respectively. Oilseed also registered an increase of 5.40 percent of total cropped area and turned 0.39 from 0.37 percent.

Table 4.20

Production of different crop, 1979 – 80 to 1999 – 00 (in tonnes)

Crops	Total production		Production tonnes / hectares		% age change
Year	1979 - 80	1999 – 00	1979 – 80	1999 - 00	1979 – 80 to1999 - 00
Wheat	816	234	2.38	1.66	-30.25
Buckwheat	-	-	-	-	-
Barley	2333	671	2.21	1.13	-48.87
Maize	17	77	0.89	2.03	128.09
Millets	366	73	1.59	-	-
Pulses	476	6704	2.70	4016	54.07
Potato	10936	20123	8.14	24.60	202.21
Fruit and vegetables	-	6694	-	4.73	-
Oilseed	-	-	-	-	-
Kuth	127	-	8.47	-	-
Total	15071				

Source: Computed from Directorate of Economics and Statistics, Himachal Pradesh, Shimla

These changes occurred due to diversification of area under food crops to commercial crops, which fetched higher remunerative prices. In the year 1979-80, the total production was 15071 tonnes (table 4.20). Kuth accounted largest production i.e. 8.47 tonnes per hectare. The second largest production was under potato of 8.14 tonnes per hectare respectively. Remaining crops had production rate carrying between 0.89 to 2.70 tonnes per hectare.

During 1999-00, potato accounted largest production of 24.60 tonnes per hectare and registered an increase of 202.21 percent respectively. At this time potato replaced the position of kuth as a cash crop. The next largest production was under fruit and vegetables mainly peas of 4.73 tonnes per hectare. Barley registered a decline of –48.87 percent and became 1.13 from 2.21 tonnes per hectare followed by the production of wheat. The production of pulses also increased by 54.07 percent and became 4.16 percent from 2.70 tonnes per hectare respectively.

It is clear that agro-climatic conditions prevailing in the tribal areas are suitable for the production of food crops as well as cash crops like seed potato, vegetables, medicinal and beverage herbs etc. Here, crops are less prone to fungal diseases due to its semi - arid climate. With the establishment of infrastructure and modernization of agricultural techniques mainly the use of hybrid seeds, fertilizers, and implements, production of crops witnessed manifold increase. Further, proper appreciation of resource endowment and diversification of area under uneconomical crops to cash crops will definitely boost the agricultural economy of the region.

1.4 LIVESTOCK RESOURCE

Livestock forms an integral part of agriculture, which can be visualized from the fact that tribal families rear one livestock or other. Besides providing additional income, it also gives nutrition and wool to protect the people against the extreme winter in remote and inaccessible mountainous regions.

Table 4.21

Livestock resources and poultry, 1992

Livestock	Cattle	Goats	Sheep	Others	Total	Poultry
Number	8117	11180	38776	5367	63440	4361
% of total	12.79	17.62	61.12	8.46	100.0	

Source: Computed from Directorate of Economics and Statistics, Himachal Pradesh, Shimla

Table 4.21 shows that there were 8117 cattle in 1992 livestock census in Lahaul and Spiti region. They are known as Yak, cow locally called Rad, Churu and Churi etc. Yak is used for breeding and ploughing purposes. People rear it collectively and there are only few Yaks in a group of villages. Churu is hybrid progeny of cow and Yak, which is used for ploughing, whereas Churi is the same crossbreed female reared for milk. However, Churi is not a high yielder of milk but is capable of surviving in severe winters. People do not rear Yaks in Spiti valley and they borrow it from adjacent region of Ladakh. Government has provided Yaks to various panchayats in the district. The goats numbered for 11180 i.e. 17.62 percent of the total livestock resources, whereas sheep's outnumbered the goats i.e. 38776 by constituting 61.12 percent respectively. These are reared for wool, nutrition, and slaughtering during winters. Every household slaughters one or more sheep depending upon the economy of household. Earlier they were widely used as pack animals. Others accounted 5367 i.e. 8.46 percent of the total livestock comprising horses, mules, dogs and pigs etc. There were 4361 poultry birds in the whole area. During summer, livestock is sent to the hills and pastures for grazing. People employ shepherds and graziers called 'Phohala' locally and in wage gets one kilogram of grain from every household beside everyday meals.

However, with the advent of modernization, livestock population is declining particularly after the emergence of road networks. There is shortage of fodder due to semi-arctic climate. The bare, stoney and coarse nature of soil restricts the growth of grasses in higher parts. Every household spares certain

portion of agricultural land for growing fodder crops, which is known as Dang area. Due to the overgrazing problem, permanent pastures and grazing lands are fastly converting into land not suitable for agriculture and has accelerated soil erosion. Keeping in view the health of livestock resources and poultry, a number of veterinary services were made available by the government since independence.

Table 4.22 shows that there were 13 veterinary hospitals, 39 veterinary dispensaries including one mobile veterinary dispensary out of total 54 veterinary services. During 1999-00, the number of animals treated was 50604. Contagious diseases have decreased while other diseases rose sharply from 79 to 87687. There were 3612 animals over whom castration were performed either on hospitals or on tour. The activities of department have created a visible impact on animal husbandry front.

Table 4.22

Veterinary services, 1999-2000

I Veterinary services/dispensaries/mobile dispensaries	54
II Animal treated in hospitals/dispensary in outdoor	50604
III On tour a) contagious diseases\	a) 79
b) Other diseases	b) 87687
IV Castration performed in hospital/dispensary and on tour	3612

Source: Computed from Directorate of Economics and Statistics, Himachal Pradesh, Shimla

The overall analysis of economic structure reveals that preponderance of agricultural activities as the mainstay of economy as most of the population is engaged in primary sector for their livelihood. The rugged mountains and topographic conditions of the area pose major restrictions over the suitability and availability of arable land. A small proportion of total is suitable for agriculture. The extremely difficult working conditions, limited infrastructure facilities coupled with natural vagaries poses a major challenge for agricultural operations

to compete with the global standard. Consequently, the rising trends are the diversification of traditional uneconomical crops to cash crops that raised the income and living standard of the inhabitants. Rapid advance in the crop production is also vital with the aid of essential infrastructure facilities. People have started rearing cross-breed animals to enhance the yield and quality of various produces. Government schemes are promoting these programmes through various aids. Populace is also employed in governmental jobs to substitute agriculture. All these efforts will certainly lead the region towards more dynamic economic structure.

References:

[1] M.D.Mamgain, District Gazetteers-Lahul and Spiti, Himachal Pradesh, 1975, p.104.
[2] Ibid. p. 102.

Chapter: Five

DEVELOPMENT PROCESS AND HIERARCHY OF SETTLEMENTS

Development in general is a complex process based on socio–cultural, demographic, economic and infrastructure variables. It refers to the understanding of development in the sense of economic efficiency, inequality, disparities and environmental management in a geographical area.

The mountainous regions characterized by relative isolation and rugged topography, remain backward as compared to plain regions in context of developmental processes. It is difficult to establish and maintain infrastructural facilities in these regions. At the same time, here, availability of the infrastructural facilities is not always sufficient because inhabitants find it difficult to make use of these due to inaccessibility. Because of these factors, it becomes essential to put concerted efforts to meet the needs of development through proper planning.

The analysis in previous chapters clearly shows the deterministic role of harsh environment in keeping the area isolated and underdeveloped. It has immensely influenced the various aspects of culture, demographic structure and the economy of Lahaul and Spiti. It is, therefore, important to analyse the efforts made toward breaking the age – old isolation of the area and linking the society with the mainstream of the nation on the way of economic growth. Various components of the development processes including administration, finance, road network and other means of communication are the basic requirements to initiate the process of development. It require finances to assure the immediate needs of the society and can be seen in the availability of social amenities and facilities like health – care, postal and communication facilities and electrification etc. These are indicators of the level of development in a region. Thus, these aspects become important to analyse and assess the advancement of the region as par with other regions.

Lahaul formed part of Kullu sub-division of Kangra district between 1846 and 1940. A separate sub-tehsil comprising of Lahaul and Spiti was formed in 1941 and this arrangement continued till it took the shape of a district. A separate district of Lahaul and Spiti was created with headquarter at Kyelang in 1960. This district was divided into tehsils – cum – sub divisions after the reorganization of Punjab in 1966. The Lahaul and Spiti district came over to Himachal Pradesh as a new district. Four panchayats viz. Tindi, Udaipur, Trilokinath and Miyar Nala of Pangi tehsil of Chamba district were transferred from Chamba and amalgamated in Lahaul sub division in 1975. Lahaul and Spiti is the largest district of Himachal Pradesh in area but is smallest in terms of population in the state.

The entire district was declared as a tribal area due to its isolation and inaccessibility. It is sparsely populated and needs continuous special attention of policy makers primarily because of strategic location and comparatively economic backwardness. With launching of the new approach to tribal development at the time of the fifth five-year plan, the whole area was covered under it. A fundamental change in the process of formulating the tribal sub-plan strategy has been introduced at the end of the eighth five-year plan. The flow of funds from state plan to Tribal sub-plan have considerably been increased over a period of time from 3.65 per cent of total plan layout in 1974 – 75 to about 9 per cent in the eighth / ninth five year plan. The amount assigned to the district during the 9th five-year plan has been Rs 495 crores, out of which 18 percent as normative share has been earmarked for the socio–economic development of Lahaul and Spiti district. An amount of 24.29 crores was spent in the development of the region during 2000-01.[1]

The past practice of planning process from top to bottom exercise has been reversed and the decentralized planning process with integrated tribal development project for Lahaul and Spiti as a planning unit has been started. The formulation and implementation of tribal sub-plan at the level of Integrated Tribal Development Project (I.T.D.P), has been made need based, more practical, and result oriented. The people's participation in the formulation and implementation of sub- plan at I.T.D.P. level has also been ensured.

5.1 LEVELS OF DEVELOPMENT

Various efforts have been prepared to bring out the people of Lahaul and Spiti from their existing state of underdevelopment. It is, therefore, essential to analyse the level to which the government has succeeded in meeting the objectives of development for all.

Physical factors have been responsible in keeping the entire region as underdeveloped. However, in this analysis, their effect has not been seen in a 'cause-effect framework' on the process of development, rather it has been attempted to look at the various developmental variables and their relative levels.

Development is a multi–dimensional concept encompassing socio–cultural, demographic, economic and infrastructure variables, and is difficult to see it in terms of single parameter.[2] It becomes necessary to select the development variables carefully keeping in view the type and nature of the study area. It is needless to mention that the selection of indicators must depend on the analytical frame and these should be relevant in view of the objectives of the study. Thus, "the justification of the selection of an indicator must be sought not through the abstract logic of mathematics but in the underlying conceptualisation of social reality."[3]

A large number of development variables have been used to compute the levels of development. As far as hilly and mountainous regions like Lahaul and Spiti, are concerned, only certain variables are of import, while others have limited significance. Thus, an attempt has been made to select relevant variables in this region. A total of twelve variables have been chosen, which have been grouped into two sets: (i) socio – economic variables and (ii) infrastructure variables.

Socio – economic Variables: -

(a) Population density – persons per square kilometres.

(b) Sex ratio (negative)

(c) Literacy level – percentage of literate to total population.

(d) Female literates- percentage of female literate to total female population.

(e) Non–agricultural workers – proportion of workers engaged in non-agricultural activities to total workers.

The first set of variables deals with the human resource development of each village. High density of the people, available opportunities and services influences the number and nature of economic and social contacts.[4] Density is often defined as the index of concentration of population per square kilometre. It is related to the overall growth of population in a region. Population density of a settlement is a direct indicator of nodality as it reflects the carrying capacity of land and influences nodality in two ways. Firstly, they attract varied functions due to their large size and secondly, a settlement with manifold functions is instrumental in exercising a pull factor form adjoining settlements thereby resulting in an increase in the size. Thus, population density of a settlement determines the level of functions and services it provides.

Sex–ratio denotes the incidence of female mortality rate but also indicates the incidence of sex-selective migration in the region. Changes are noticed in sex ratio as a result of migration. It is due to migration being male specific in backward region. It is generally observed that young males out-migrate from backward areas to developed regions. This leads to an excess of females in the villages suffering from out-migration and that of males in economically more developed settlements. It is particularly true in the case of Lahaul and Spiti in the light of limited carrying capacity of land. The male population, therefore, migrates to more developed settlements in search of jobs. The sex ratio, hence, is an important variable for this study. Literacy "a general index of cultural and technological advance"[5] is both an outcome and agent of awareness and development. The literacy level is low in the district of Lahaul and Spiti. There are however, villages which have relatively higher literacy level and it is in these settlements that the forces of change are felt more markedly. Literacy growth rate

suggests the pace at which changes are taking place. Female literacy is generally low in backward regions. Thus, the percentage of literate females to total females and its growth rate indicate social awareness both a consequence and a cause of progress. Literacy plays a decisive role in determining the demographic outcomes of a society by reducing mortality and fertility rates.

In the traditional rural society of India, it can be taken as a measure of the degree to which the people are bound by tradition and superstition operating within the environment of primary production.[6] Moreover, female literacy is more strong and important instrument for the betterment of a family and thereby enhances the development of the whole society. The proportion of workers in 'non-agricultural' activities indicates the diversification of economy. The growth of secondary and tertiary activities indicates development. The percentage of workers in the non-agricultural activities and that in the secondary activities thus are directly linked with development. Since, manufacturing activities are not significant in Lahaul and Spiti, the percentage of workers engaged in the household industry has been taken into consideration because of their great significance in the economy of Lahaul and Spiti.

The percentage of workers engaged in 'other services' indicates the development of services like education, medical and administrative, in a village. Settlements having government offices and other amenities tend to show high percentage of workers in this sector.

Development Infrastructure Variables: -

(a) Educational facilities,

(b) Medical facilities,

(c) Drinking water,

(d) Postal Services,

(e) Transport - Pucca road,

(f) Power supply - Percentage of electrified household,

(g) Per capita land availability

The relevance of second set of variables is self explanatory as the availability of various infrastructure facilities are indicators of better development. A total of seven variables have been chosen for this purpose. These include availability of education, and health facilities, drinking water, postal services, transport, electricity and per capita availability of agricultural land. Percentage of electrified households shows the diversification of economy. As analysed in earlier chapter that agriculture is the mainstay of economy in Lahaul and Spiti, whereas arable land is scarce. Hence, per capita availability of cultivated land reflects the import of this scarce resource in backward region. The type of information in case of some variables was available in the form of attributes i.e. the availability and non-availability of particular facility in case of first five variables. Moreover, there are different kinds of facilities in the case of education and health. On the basis of their importance and level of scarcity in a region, weightages have been assigned to the various factors of performance as listed below:

Educational Facilities:

Primary School	-	1
Middle School	-	2
High School	-	3

Medical Facilities:

Dispensary	-	1
Primary health sub centre	-	2
Primary health centre	-	3
Health centre	-	4

Hospital - 5

Drinking Water

Tap water - 1

Postal Services

Post office - 1

Transport

Accessibility to Pucca road - 1

Composite index has been worked out for both sets of variables separately as well as jointly to see the rank of a village in terms of these amenities. The values were made scale free by dividing values of each variable by their respective mean for all variables except sex ratio because it has negative relation with development. Therefore, the mean has been divided by values of each row. After this, the scale free values were added to obtain a composite index of development. The value of each column shows the relative position of different village in the related aspect.

The formula is given below:

$$C.I = \sum_{j=1}^{m} \frac{Xij}{\bar{X}j}$$

Xij = Value of the jth variate for ith village

m = Number of variables.

The final step of this exercise is to categorize the settlements in hierarchical order. Categories have been made by taking Standard Deviation (s.d.) as interval from mean.[7] Cross–comparison has also been done to see the relative

position of villages between socio-economic variables and infrastructure variables. After this, composite index of development has been analysed.

Position of villages in respect of each set of variables has been discussed separately before looking at the composite scores. Out of 272 inhabited villages, 6 villages have been excluded from this analysis due to non–availability of data in these villages for different variables.

Basic Demographic and Socio-economic variables

The first set of variables i.e. socio-economic guides the level of human resource development in the villages that are situated in the inaccessible regions like Lahaul and Spiti. Socio–economic variables consists of population density, sex ratio (negative), literacy, female literacy and non-agricultural workers, which reflects the level of human resource development in a region / country.

Table 5.1

Composite index of socio – economic characteristics

Category	Value of C.I.	Rank	No. of Villages
More than mean + 2 S.D.	> 8.79	I	13
Mean + 1 S.D. To Mean – 2 S.D.	6.58 – 8.79	II	15
Mean To Mean + 1 S.D.	4.37 – 6.58	III	88
Mean – 1 S.D. To Mean	2.16 – 4.37	IV	125
Less than Mean – 1 S.D.	< 2.16	V	25

Source: Computed from the data of town and village directories and Census of India, Director of census operations, Shimla, 1991

Table 5.1 and 5.2 shows that 13 villages have index value of more than mean + 2 S.D. and ranked first. These include Thirot, Khoksar, Stingri, Kunge, Udaipur, Lapcha, Tandi, Lingkyam, Kaza Soma, Tupchiling, Samdo, Tayul Gompa and Kaza Khas etc. This is followed by fifteen villages having index value from 6.58 to 8.79 and ranked second including the villages of Kyelang, D.P.F.Ransani, Gemur, Darcha-Sumdol, Yang Kirting, Thorang, Gushal and Tabo etc. The next 88 villages shows index value of mean to mean + 1 S.D i.e. 4.37 to 6.58 and ranked third including Yari Khoksar, Phura, Lingti, Jahlma, Marango Rangarik, D.P.F.Phatgahar, Bha Chewar, R.F.Krakun, Jispa, Gompathan, Ki, Tozing and Gondhla etc. The fourth category has 125 villages showing index value of mean – 1 sd. to mean. It reflects the development in the villages including Shansha, Tulse Pena, Kolang, Lingos, Phugtal, Kibar Khas, D.P.F. Gilding, Dankar, Arat, Piukar and Guari etc. The last category i.e. less than mean – 1 s.d. having 25 villages and ranked fifth reflects very low levels of human resource development. These are Salgaraon, Guari, Tangti Yogma, Bokar, D.P.F. Bhiyari, Tangti Kogma, Khar, Landupdhin, Harsar, Tingal, D.P.F. Lobar, Sanglung, YangThang, D.P.F. Shiling, Minser, Chabrang Khas, Tashi Gang, Kakti, Ka, D.P.F.Tumru, Sulche, Yansa, Muchhling, Chidang and Kibri etc. respectively.

The villages having first rank in context of socio-economic variables are generally administrative centres, adjoining villages and villages centrally situated in the dispersed settlements, while villages having middle values are scattered over the entire region particularly near river valleys and relatively level lands.

On the other hand, villages showing low development of socio-economic variables are generally situated in the interior and remoter parts of the district in rugged and higher altitudes and a few of these villages are inhabited by seasonal in-migrants from the neighbouring states.

It is clear from the above discussion that very few villages are better developed mainly due to the nodality and comparatively better opportunities as compared to less developed villages of Lahaul and Spiti region. Villages

reflecting moderate level of development are mostly adjoining villages and major stations being situated in river valleys and areas of milder climate.

Infrastructural variables

Infrastructure here comprises of education, health-care, drinking water, postal facilities, transport network, electricity and per capita availability of agricultural land. These all collectively reflects the overall development of a region. The presence of infrastructural amenities is of vital importance in a predominantly agrarian economic society like Lahaul and Spiti situated in high, isolated and inaccessible region in the western Himalayas. The government has made enormous efforts in the establishment of various infrastructural amenities since the inception of Tribal sub-plan in the year 1974-75 during fifth five–year plan period.

Table 5.3

Composite index of infrastructure amenities

Category	Value of C.I.	Rank	No. of villages
More than mean + 2 S.D.	> 18.92	I	9
Mean + 1 S.D. To Mean + 2 S.D.	12.96 – 18.92	II	28
Mean To Mean + 1 S.D.	7 – 12.96	III	69
Mean – 1 S.D. To Mean	1.04 – 7	IV	154
Less than Mean – 1 S.D.	< 1.04	V	6

Source: Computed from the data of town and village directories and Census of India, Director of census operations, Shimla, 1991

Table 5.3 and 5.4 shows the relative position of each settlement in respect of development infrastructure variables. The composite index of development infrastructual variables had a mean of 7 and standard deviation worked out to be 5.96 respectively. Nine villages ranked first having index value of more than mean + 2 S.D. including Kyelang, Kawagling, Gondhla, Udaipur, Shansha, Gushal, Lot, Kolang and Tingrat. These are mainly administrative centres and nodal villages and are centrally located. The second category of score i.e. mean + 1 S.D to mean + 2 S.D. comprises of 28 villages. These are Tabo, Tindi, Shashin, Sharhin, Morango Rangrik, Tholung, Gemur, Jispa, Trilokinath, Thirot, Tandi and Jhalma and so on. Majority of these villages are important religious centres and a number of settlements host various developmental projects like hydro electric projects etc. Almost all the villages in this category are located in river valleys and have milder climatic conditions. Sixty–nine villages have index value between men to mean + 1 S.D. and ranked third including Kaza Khas, Kawaring Sindwari, Samdo, Kibar Khas, Gajang, Khoksar, Shipting, Puring, Tozing, Ki, Nalda and Rarig etc., are characterised by moderate level of infrastructural amenities. The fourth category i.e. mean – 1 S.D. to mean have largest number of settlements i.e. 154 villages including D.P.F. Lohni, Bujund, Piukar, Telangbe, Yang Tang, Qurit, Shortang, Othang, Lingar, Wari, Rape, D.P.F. Lobar and Lingti etc. reflecting low and inadequate presence of infrastructural amenities. These villages are situated in higher attitudes and have rugged terrain. These two physical conditions make it comparatively difficult to lay down good infrastructural facilities. As, certain spatial infrastructure facilities like railway need plain topography at a lower altitude. There are only 6 villages that falls in the fifth category having index value of less than mean – 1 S.D. including Minser, Sulche, Lapcha, R.F. Krakun, D.P.F. Ransani and R.F. Rumas etc. occupied by seasonal – immigrants and situated in the interior parts of the district.

The discussion reveals that administrative centres and adjoining villages along with those occupying valleys are more developed in context of various infrastructural facilities. Second and third ranking settlements are generally located in river valleys and are characterized by moderate availability of these

facilities. Fourth and fifth ranking villages occupy remote and higher altitudinal areas and are characterized by low and inadequate presence of development infrastructural facilities. A few of these settlements are also inhabited by seasonal in-migrants practicing various sources of livelihood like agricultural labourers.

Comparison of villages in terms of socio-economic and infrastructure Indices for development

A cross-comparison has been done between socio-economic variables and infrastructural variables to understand the relative position of each settlement. It has been done to see whether infrastructural facilities in the hilly region affect the distribution of socio-economic variables or villages with high score in socio-economic variables enjoys a better availability of infrastructure.

These variables of development are not homogeneously distributed over the region, which put settlements at different levels. The position of Thirot, Khoksar, Stingri, Kunge, Udaipur, Lapcha, Tandi, Lingkyam, Kaza Soma, Tupchiling, Samdo, Tayul Gompa, and Kaza Khas were at the top in terms of socio-economic variables while, these villages have a lower position in terms of infrastructure variables. It indicates that these settlements were more developed in terms of first set of variables, whereas they were less developed in terms of infrastructure both physical and social. It suggests that these are still underdeveloped in context of overall levels of development.

There were 15 villages falling in the second category in socio-economic variables while in infrastructural variables, the number became 28. It reflects that some of the villages in this group are developed in demographic and social sense but they are denied access to better infrastructure

88 villages belonged to the third category in terms of socio-economic variables, whereas only 69 villages are there in infrastructure variables. This reflects that majority of settlements those are developed socio-economically, have low level of infrastructure variables showing the imbalanced levels of

development. In the fourth category, 125 villages and 154 villages were in both set of variables displaying the inadequate and low levels of overall development. It shows the intra-village disparities and uneven development of settlements in the entire region. The last category shows the differences in the number of settlements falling in respective variables i.e. 25 and 6 villages.

It is clear from the above discussion that settlements exhibit disparities in the growth of both set of variables i.e. one set belonging to human resource and other to the infrastructure of the area. The factors influencing the concentration of the index values of socio-economic variables and infrastructure variables are same as those observed in the earlier analysis. The settlements, which obtained higher score, include administrative centres and adjoining settlements occupying relatively better sites and locations in lower flat areas with milder climate.

5.2 **Hierarchy of Settlements**

Composite Indices for development

Table 5.5

Composite Index of Development

Category	Value of C.I.	Rank	No. of villages
More than mean + 2 S.D.	> 25.23	I	9
Mean + 1 S.D. To Mean + 2 S.D.	18.3 – 25.23	II	29
Mean To Mean + 1 S.D.	11.37 – 18.3	III	68
Mean – 1 S.D. To Mean	4.44 – 11.37	IV	145
Less than Mean – 1 S.D.	< 4.44	V	15

Source: Computed from the data of town and village directories and Census of India, Director of census operations, Shimla, 1991

The mean value of the composite index for all settlements was 11.37 while standard deviation worked out to be 6.93 in respect of final composite index. Table 5.5 shows the rank of villages in terms of composite score in Lahaul and Spiti region. There are only 9 villages having composite value of more than mean – 2 S.D and are falling in the first category. These include Kyelang, Khawagling, Gondla, Udaipur, Thirot, Gushal, Lot, Tabo and Khoksar etc. Their higher rank is attributed to high participation ratio of non-agricultural workers, high literacy rate and so on.

Twenty-nine villages having index value of mean + 1 S.D to mean + 2 S.D belonged to second category. These include Shansha, Shashin, Gemur, Tindi, Kolang, Tandi, Marango Rangrik, Bog, Tingrat, Damphug, Stingri, Magwan, Jispa, Kaza Khas, Tholung, Samdo, Hanse, Chaamrat, Losar Khas, Hikim, Jhalma, D.P.F.Phatgahar and Trilokinath etc. It was accounted that 68 villages of total villages have recorded mean + 1 S.D. respectively. There are 145 villages accounted index value of mean – 1 S.D. to mean of total villages and fall in fourth category. It has remained more or less same in the case of socio-economic and development infrastructure index. The fifth category with index value of less than mean – 1 s. d had 15 villages of the total villages. These are Guari, Sanglung, Tashigang, D.P.F. Lobar, D.P.F. Bhiyari, Harsar, Chidang, Kakti, Ka, D.P.F.Tumru, Yansa, R.F.Rumas, Kibri, Minser and Sulche etc. The factors influencing the values of composite index are same as those seen in previous indexes. Villages with high scores generally include headquarters (administrative) occupying relatively better sites in lower flat areas with milder climate. The settlements with moderate composite score generally include adjoining villages and settlements situated in river valleys. These shows comparatively better development of settlements in terms of overall levels of development. On the contrary, settlements with lower composite score generally are located in the higher altitudes and interiors of the district. Hence, these settlements are characterised by low and inadequate levels of overall development.

To sum up, the analysis of composite index reveals that the facilities in the villages of Lahaul and Spiti are unevenly strewn. Certain geographical factors

have been responsible for this uneven distributional pattern of settlements. Most of the nodal places are concentrated in valleys, which provide level land for economic activities. On the other hand, rugged mountain ranges and areas of steep slope have low density of population had near absence of various facilities.

Objective of planning should include the natural harshness in terms of topography and climate. However, in case of Lahaul and Spiti, the planning process seems to leave this consideration because the regions with tough natural conditions have not developed in terms of basic infrastructural facilities like health and communication. Out of 266 villages, only 9 villages fall in the first category and 29 in the second category. They two together share about 14 percent of the total villages. This reflects that development of infrastructural and socio-economic variables has been limited in this region. At the same time, only 5 percent of the villages in Lahaul and Spiti have value less than mean value. This demonstrates that efforts have been made to bring up the low level of development. The maximum proportion of village near mean value (80 percent) reflects that there is a comparatively equitable level of development (Table. 5.5).

Due to poor accessibility, the occurrence of nodal places has been restricted. Thus, factors like population density, sex ratio, literacy, female literacy, and non-agricultural workers, (socio-economic variables); and infrastructure variables including education, healthcare, drinking water, postal, transport, electricity and cultivable land etc. are determining and governing forces in the distribution of nodal places in Lahaul and Spiti which by themselves are greatly influenced by physical factors.

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Table: 5.2

RANK OF VILLAGES ACCORDING TO SOCIO-ECONOMIC CHARACTERISTICS, 1991

Rank	Village	Rank	Village	Rank	Village	Rank	Village
15.78	Thirot	5.23	Khuruti	4.08	Kiato	3.09	Yangrang
15.09	Khoksar	5.17	Poh	4.08	Kuang Khas	3.07	Margaraon
14.76	Stingiri	5.17	Kawaring	4.05	Karing	3.05	Rama Khas
11.79	Kunge	5.11	Kamri	4.03	Shego	3.03	Langja
9.85	Udaipur	5.11	Sakar	4.03	Lapshak	3.01	Haruka
9.73	Lapcha	5.10	Kongkong	4.00	Kardang	3.00	Murticha
9.36	Tandi	5.10	Kuang	3.95	Dreldra	2.92	Lalung Khas
9.28	Lingkyam	5.09	Sindwari	3.93	Othang	2.89	Jholing
9.26	Kaja Soma	5.08	Rangcha	3.93	Khangsar	2.87	Chichimkhas
9.03	Tupchiling	5.05	Hikim	3.92	Phugthal	2.85	Bhar
8.96	Samdo	5.04	Chambak	3.91	Kiangcha	2.85	Kothi
8.92	Tayul Gompa	5.04	Galing	3.88	Ghari	2.84	Pangmo Khas
8.87	Kaja Khas	5.02	Dandak	3.88	Guling	2.78	Jholang
8.51	Kyelang	5.02	Khangsar	3.86	Gumrang	2.76	Karpat
8.47	D.P.F.Ransani	5.00	Malang	3.85	Mai	2.73	Cheling
7.93	Gemur	4.97	Kurched	3.85	Kyor	2.72	Mud
7.39	Darcha-Sumdol	4.89	Giu	3.80	D.P.F.Lohni	2.72	Todnam
7.36	Yang Kirting	4.88	Khorpani	3.80	To-Karing	2.70	Jagle
7.18	Thorang	4.88	Jamyaling	3.79	Qurit	2.68	Bar Gompa
7.14	Gushal	4.88	Rangyo	3.77	Khurik	2.64	Yurnath
7.05	Magwan	4.86	Hanse	3.76	Yarango Rangarik	2.63	Pasprag
6.99	Damphug	4.86	Kharchud-Yongma	3.76	D.P.F. Gilding	2.61	Leh-Sumnam
6.92	Kirting	4.86	Chhogjing	3.75	Laling	2.60	Chamrat
6.92	Keuling	4.85	Jasrath	3.75	Raling	2.59	Shakoli
6.83	Shashin	4.84	Bha Baring	3.74	Kelad	2.55	Piukar
6.83	Tabo	4.83	Khangsar	3.73	Gajang	2.52	D.P.F. Dhanwani
6.76	Bog	4.81	Nalda	3.71	Thapak	2.46	Arat
6.74	R.F. Riodhan	4.77	Sumling	3.70	Sagnam	2.37	R.F. Rumas
6.55	Yari Khoksar	4.74	Wari	3.69	Dankar	2.36	Chaling
6.48	Phura	4.72	Losar Khas	3.66	Girmus	2.33	Lapchang
6.41	Lingti	4.72	Tulse Pena	3.65	Salpat	2.33	Lara Khas
6.36	Jahlma	4.70	Krozing	3.65	Khinang	2.31	Uperla Guling
6.36	Marango Rangarik	4.68	Bha-Sumnam	3.64	Nidand	2.30	Ghambari
6.32	D.P.F. Phatgahar	4.66	Rashil	3.62	Sheling	2.26	Samling
6.26	Bha Chewar	4.65	Mane Gogma	3.61	Chichong	2.26	Khanjar
6.24	R.F.Krakun	4.65	Rualing	3.60	Kewak	2.22	Gungri
6.24	Jispa	4.65	Lari	3.56	Mane Yogma	2.21	D.P.F. Sindwari
6.21	Gompathan	4.62	Labrang	3.55	Goruma	2.19	Parak
6.20	Ki	4.58	Rape	3.53	Trilok Nath	2.18	Gangdo Demul
6.20	Kharchudkonma	4.58	Rapring	3.48	Hal	2.18	Tibok
6.17	Hurling	4.55	Baryo	3.48	Thola-Pyasu	2.15	Salgaraon
6.14	Lot	4.53	Nain Gahar	3.47	Tingrat	2.15	Guari
6.07	Shichling	4.46	Yoche	3.47	Bharaur	2.12	Tangti Yogma
6.00	Morang	4.46	Wargul	3.46	Gete	1.86	Bokar
5.99	Bokta	4.46	Duansha	3.45	Shurtang	1.83	D.P.F. Bhiyari
5.94	Khawagling	4.45	Bagche	3.45	Kiamo	1.67	Tangti Kogma
5.93	Rangbe	4.43	Gumling	3.42	Teling	1.66	Khar
5.80	Taljon	4.42	Tinno	3.39	Shugu	1.66	Landupdhin
5.77	Leh Baring	4.39	Dalang	3.38	Dape-Marang	1.61	Harsar
5.72	Kathal	4.37	Kolang	3.35	Ropsang	1.42	Tingal
5.66	Biling	4.37	Shuiling	3.30	Domal Khas	1.33	D.P.F. Lobar
5.64	Junde	4.37	Shipting	3.27	Shenwar	1.26	Sanglung
5.62	Chokhang	4.33	Shansha	3.27	Jagdang	1.14	Yang Thang
5.56	Bha-Garang	4.31	Phukchung	3.26	Retil	1.12	D.P.F. Shiling
5.49	Gondhla	4.30	Kibar Khas	3.26	Bhujund	0.99	Minser
5.48	Tozing	4.30	Lidang	3.23	Sarkhang	0.89	Chabrang Khas
5.45	Chokhur	4.28	Marbaj	3.22	Lindur	0.86	Tashi Gang
5.41	Phunkiyar	4.24	Mikim	3.21	Yang Tozing	0.83	Kakti
5.38	Murang	4.21	Pomrang	3.21	Barbog	0.76	Ka
5.38	Muling	4.14	Chhika-Be	3.20	Jungling	0.56	D.P.F. Tumru
5.37	Tholung	4.12	Shilling	3.18	Kaley	0.55	Sulche
5.34	Leh-Garang	4.12	Meling	3.16	Ruring	0.49	Yansa
5.32	Komik	4.11	Lingar	3.14	Shiluk	0.46	Muchhling
5.31	Lomach	4.11	Telangbe	3.13	Purd	0.28	Chhidang
5.29	Guskyar	4.09	Jobrang	3.11	Tiling	0.20	Kibri
5.27	Darcha-Dangma	4.08	Rarig	3.11	Tiling		
5.25	Tindi	4.08	Baring	3.10	Kishori		

Table:5.4

RANK OF VILLAGES ACCORDING TO INFRASTRUCTURAL FACILITIES, 1991

RANK	Village	RANK	Village	RANK	Village	RANK	Village
50.55	Kyelang	8.90	Darcha-Sumdol	4.24	Othang	3.23	Karing
35.65	Khawagling	8.89	Arat	4.23	Bha-Sumnam	3.22	Kothi
35.29	Gondhla	8.87	Jagle	4.21	Tangti Kogma	3.22	Todnam
25.42	Udaipur	8.82	Tozing	4.20	Lari	3.19	Dape-Marang
20.89	Shansha	8.82	Thorang	4.18	Morang	3.19	Sarkhang
20.86	Gushal	8.81	Yari Khoksar	4.16	Marbaj	3.09	Retil
20.18	Lot	8.81	Khinang	4.13	Lidang	3.08	Dreldra
19.20	Kolang	8.77	Dalang	4.12	Ghari	3.07	Kaja Soma
19.02	Tingrat	8.74	Rangbe	4.11	Khurik	3.05	To-Karing
18.70	Tabo	8.62	Biling	4.11	Tangti Yogma	3.05	Bokar
18.54	Tindi	8.60	Murticha	4.11	Gungri	3.05	Kharchudkonma
18.25	Shashin	8.58	Girmus	4.10	Hurling	3.03	Sanglung
17.69	Chamrat	8.53	Khorpani	4.10	Lingar	3.00	Khuruti
16.84	Marango Rangarik	8.47	Guskyar	4.08	Mikim	2.99	Thapak
16.26	Tholung	8.36	Dandak	4.07	Mai	2.98	Krozing
15.91	Gemur	8.34	Laling	4.06	Rapring	2.95	Chhidang
15.87	Bog	8.29	Purd	4.03	Rualing	2.92	Kelad
15.85	Jispa	8.17	Lapchang	3.99	Sheling	2.90	Thola-Pyasu
15.79	Trilok Nath	8.09	Murang	3.96	Lindur	2.89	Phunkiyar
15.62	Samling	8.07	Ki	3.95	Ghambari	2.89	Barbog
15.60	Hanse	7.97	Tupchiling	3.94	Goruma	2.84	Yang Kirting
15.43	Losar Khas	7.94	Muchhling	3.93	Tinno	2.84	Bha-Garang
15.35	Thirot	7.93	Gompathan	3.93	Kyor	2.84	Kewak
15.26	Damphug	7.93	Muling	3.92	Bagche	2.81	Baring
15.15	Teling	7.93	Shuiling	3.90	Bhar	2.81	Shiluk
15.07	Magwan	7.93	Sumling	3.90	Yoche	2.74	Tiling
14.98	Hal	7.92	Phugthal	3.89	Cheling	2.74	D.P.F. Lobar
14.92	Guling	7.90	Shichling	3.88	Wargul	2.72	Pasprag
14.84	Sagnam	7.88	Jamyaling	3.88	D.P.F. Dhanwani	2.71	Uperla Guling
14.83	Hikim	7.87	Chokhur	3.88	Gete	2.70	Taljon
14.72	Dankar	7.86	Raling	3.87	Duansha	2.70	Lomach
13.97	Tandi	7.82	Shugu	3.85	D.P.F. Shiling	2.70	Gumling
13.67	Salgaraon	7.68	Sakar	3.85	Shilling	2.70	Kharchud-Yongma
13.55	Malang	7.65	Kiangcha	3.82	Jagdang	2.69	Komik
13.35	Haruka	7.45	Stingiri	3.80	Wari	2.68	Bar Gompa
13.12	Jahlma	7.41	Bha Baring	3.77	Khangsar	2.62	Tibok
13.02	D.P.F. Phatgahar	7.33	Nalda	3.76	Keuling	2.62	Baryo
12.95	Kaja Khas	7.26	Leh Baring	3.76	Rashil	2.59	Rangcha
12.53	Kawaring	7.26	Rarig	3.76	Leh-Garang	2.58	Khangsar
12.30	Sindwari	6.62	D.P.F.Lohni	3.73	Rama Khas	2.57	Lingkyam
11.76	Samdo	6.55	Bhujund	3.72	Shego	2.55	Chaling
11.71	Kibar Khas	6.04	Galing	3.72	Poh	2.53	D.P.F. Sindwari
11.64	Mud	5.95	Darcha-Dangma	3.70	Leh-Sumnam	2.50	Chhika-Be
11.41	Gajang	5.64	Piukar	3.70	Kurched	2.48	Labrang
11.37	Giu	5.50	Jobrang	3.69	Junde	2.25	Kakti
10.99	Karpat	5.44	Kuang Khas	3.69	Nidand	2.24	Tayul Gompa
10.97	Lalung Khas	5.32	Chichimkhas	3.67	Lapshak	2.19	Guari
10.87	Domal Khas	5.29	Langja	3.65	Kardang	2.19	Yansa
10.66	Tiling	5.28	Phura	3.64	Jungling	2.14	D.P.F. Tumru
10.53	Margaraon	5.14	Telangbe	3.61	Rangyo	2.06	Tulse Pena
10.41	Khangsar	5.10	R.F. Riodhan	3.60	Nain Gahar	2.03	Harsar
10.34	Kamri	4.87	Kiato	3.59	Khanjar	1.98	Ka
10.24	Khoksar	4.83	Gangdo Demul	3.53	Rape	1.98	D.P.F. Bhiyari
10.22	Lara Khas	4.80	Yarango Rangarik	3.51	Yangrang	1.84	Chhogjing
10.16	Kathal	4.77	Shenwar	3.51	Kaley	1.80	Kibri
9.99	Yumath	4.65	Yang Thang	3.50	Jasrath	1.60	Kunge
9.98	Shipting	4.60	Khar	3.45	Chambak	1.55	Phukchung
9.45	Mane Gogma	4.59	Chichong	3.39	Salpat	1.42	Kongkong
9.39	Gumrang	4.59	Qurit	3.38	Tingal	1.13	Lingti
9.29	Pangmo Khas	4.53	D.P.F. Gilding	3.37	Kuang	1.01	Minser
9.14	Ropsang	4.52	Jholing	3.34	Tashi Gang	0.81	Sulche
9.14	Kishori	4.49	Kiamo	3.31	Kirting	0.47	Lapcha
9.14	Mane Yogma	4.47	Jholang	3.28	Parak	0.00	R.F.Krakun
9.02	Pomrang	4.43	Bharaur	3.28	Bokta	0.00	D.P.F.Ransani
8.99	Chokhang	4.38	Chabrang Khas	3.25	Landupdhin	0.00	R.F. Rumas
8.97	Ruring	4.35	Meling	3.25	Yang Tozing		
8.96	Shakoli	4.31	Shurtang	3.24	Bha Chewar		

Table:5.6

RANK OF VILLAGES ACCORDING TO COMPOSITE INDEX, 1991

Rank	Village	Rank	Village	Rank	Village	Rank	Village
59.07	Kyelang	13.31	Muling	8.40	Muchhling	6.37	Thola-Pyasu
41.60	Khawagling	13.25	Gumrang	8.38	Qurit	6.36	Retil
40.79	Gondhla	13.23	Pomrang	8.37	Yoche	6.33	Gungri
35.27	Udaipur	13.16	Dalang	8.37	Bagche	6.32	Leh-Sumnam
31 12	Thirot	13.03	Leh Baring	8.35	Jasrath	6.26	Khar
27.99	Gushal	12.79	Sakar	8.35	Tinno	6.25	Ghambari
26.32	Lot	12.76	Jamyaling	8.34	Wargul	6.24	R.F.Krakun
25.53	Tabo	12.70	Mane Yogma	8.33	Duansha	6.23	Tangti Yogma
25.32	Khoksar	12.69	Sumling	8.33	Langja	6.10	Barbog
25.23	Shansha	12.63	Yurnath	8.31	Mikim	6.07	Kothi
25.08	Shashin	12.55	Lara Khas	8.30	Phunkiyar	5.95	Shiluk
23.85	Gemur	12.49	Ropsang	8.29	D.P.F. Gilding	5.93	Todnam
23.79	Tindi	12.46	Khinang	8.23	Khuruti	5.88	Tangti Kogma
23.57	Kolang	12.33	Kaja Soma	8.21	Chichong	5.87	Phukchung
23.33	Tandi	12.30	Shuiling	8.21	Lingar	5.85	Tiling
23.20	Marango Rangarik	12.25	Bha Baring	8.19	Chichimkhas	5.84	Khanjar
22.63	Bog	12.24	Girmus	8.18	Piukar	5.79	Yang Thang
22.49	Tingrat	12.24	Kishori	8.16	Othang	5.46	Parak
22.25	Damphug	12.14	Nalda	8.13	Nain Gahar	5.35	Bar Gompa
22.22	Stingiri	12.13	Pangmo Khas	8.12	Rape	5.35	Pasprag
22.13	Magwan	12.13	Ruring	8.05	Shenwar	5.26	Chabrang Khas
22.08	Jispa	12.09	Laling	8.02	Komik	5.02	Uperla Guling
21.82	Kaja Khas	11.84	Lingkyam	8.01	Lomach	4.97	D.P.F. Shiling
21.63	Tholung	11.84	Phugthal	8.00	Ghari	4.91	Bokar
20.73	Samdo	11.83	R.F. Riodhan	7.98	Shilling	4.91	Chaling
20.46	Hanse	11.75	Phura	7.94	Kiamo	4.91	Landupdhin
20.29	Chamrat	11.61	Raling	7.92	Mai	4.80	Tingal
20.15	Losar Khas	11.60	Murticha	7.90	Bharaur	4.80	Tibok
19.89	Hikim	11.58	Jagle	7.88	Khurik	4.74	D.P.F. Sindwari
19.48	Jahlma	11.56	Kiangcha	7.78	Kyor	4.34	Guari
19.34	D P.F. Phatgahar	11.56	Shakoli	7.76	Shurtang	4.28	Sanglung
19.32	Trilok Nath	11.41	Purd	7.75	Shego	4.20	Tashi Gang
18.80	Guling	11.35	Arat	7.70	Lapshak	4.06	D.P.F. Lobar
18.58	Teling	11.34	Rarig	7.69	Khangsar	3.80	D.P.F. Bhiyari
18.55	Malang	11.22	Darcha-Dangma	7.68	Krozing	3.64	Harsar
18.54	Sagnam	11.21	Shugu	7.66	Rangcha	3.23	Chhidang
18.46	Hal	11.16	Tayul Gompa	7.65	Kardang	3.08	Kakti
18.42	Dankar	11.08	Galing	7.61	Sheling	2.74	Ka
17.89	Samling	10.68	Keuling	7.59	Khangsar	2.70	D.P.F. Tumru
17.70	Kawaring	10.50	Lapchang	7.56	Kharchud-Yongma	2.68	Yansa
17.39	Sindwari	10.42	D.P.F.Lohni	7.53	Lingti	2.37	R.F. Rumas
17.00	Tupchiling	10.27	Hurling	7.49	Goruma	2.00	Kibri
16.36	Haruka	10.23	Kirting	7.41	Jholing	1.99	Minser
16.29	Darcha-Sumdol	10.20	Lapcha	7.33	Gete	1.37	Sulche
16.26	Giu	10.20	Yang Kirting	7.33	Nidand		
16.02	Kibar Khas	10.18	Morang	7.28	Karing		
16.00	Thorang	9.80	Bhujund	7.25	Jholang		
15.88	Kathal	9.59	Jobrang	7.18	Lindur		
15.81	Salgaraon	9.51	Kuang Khas	7.17	Baryo		
15.46	Kamri	9.50	Bha Chewar	7.13	Gumling		
15.37	Yari Khoksar	9.33	Junde	7.10	Labrang		
15.24	Khangsar	9.27	Bokta	7.09	Jagdang		
15.14	Gajang	9.25	Kharchudkonma	7.04	Salpat		
14.67	Rangbe	9.25	Telangbe	7.04	Dreldra		
14.60	Chokhang	9.10	Leh-Garang	7.01	Gangdo Demul		
14.36	Mud	8.94	Kiato	6.89	Baring		
14.35	Shipting	8.91	Bha-Sumnam	6.85	To-Karing		
14.31	Tozing	8.90	Poh	6.84	Jungling		
14.28	Biling	8.85	Lari	6.78	Tulse Pena		
14.27	Ki	8.68	Rualing	6.78	Rama Khas		
14.17	Domal Khas	8.67	Kurched	6.76	Bhar		
14.14	Gompathan	8.63	Rapring	6.70	Chhogjing		
14.11	Mane Gogma	8.56	Yarango Rangarik	6.69	Thapak		
13.97	Shichling	8.54	Wari	6.69	Kaley		
13.90	Lalung Khas	8.51	Taljon	6.66	Kelad		
13.78	Tiling	8.49	Chambak	6.65	Chhika-Be		
13.77	Guskyar	8.49	Rangyo	6.62	Cheling		
13.75	Karpat	8.47	D.P.F.Ransani	6.59	Yangrang		
13.59	Margaraon	8.46	Meling	6.57	Dape-Marang		
13.48	Murang	8.46	Kuang	6.52	Kongkong		
13.42	Khorpani	8.44	Marbaj	6.46	Yang Tozing		
13.38	Dandak	8.43	Lidang	6.44	Kewak		
13.38	Kunge	8.42	Rashil	6.42	Sarkhang		
13.32	Chokhur	8.40	Bha-Garang	6.40	D.P.F. Dhanwani		

Chapter: Six

CONCLUSIONS

1.1 Lahaul and Spiti is one of the most backward regions of India. The problems of its backwardness can be properly understood if they are viewed, not in isolation, but as a component of the system of inequalities in a developing country. Geographically the Lahaul and Spiti district is more or less representation of higher parts of the Himalayan and Trans-Himalayan areas.

2.1 The formation of the major part of Lahaul and Spiti area occurred during the later phase of mountain building, which continued from mid-Miocene to Tertiary period. It is clear that Lahaul and Spiti district portrays a complete sequence of geological formations dating from the Pre Cambrian to the Cretaceous with short breaks in upper Carboniferous and Jurassic times.

2.2 The district of Lahaul and Spiti is a unique physical unit with wide intra-regional physiographic variations. Parts above 5180 metres are completely snowclad and are bare barren. Vegetative cover remains confined below 3350 metres. The whole area can be divided into two distinct physical units. The main mountain ranges of the district are Pir Panjal Range, the Great Himalayan Range and the Zanskar Range. The main river valleys include Chandra, Bhaga, Pattan, Chenab and Spiti and Miyar.

2.3 In Lahaul and Spiti, there are three major rivers namely Chandra, Bhaga, and Spiti along with numerous tributaries. River Chandra and Bhaga after their confluence at Tandi becomes the Chenab. These are the major drainage basin of the area.

2.4 The climate of Lahaul and Spiti is unique due to the location of mountain ranges, which has an important bearing on it. The district receives precipitation both during monsoons as well as winter months. However, the amount of precipitation is low as most of the district is situated in the rain-shadow zone.

2.5 Owing to severe climate and high altitude, there is scanty natural vegetation. Most of the vegetation is confined to the southern slopes of the Great Himalayas and Pir Panjal Range at the lower elevation. As large part of the area remain under perpetual snow cover for 6 to 8 months, some green patches comes up in the higher parts only during short summer season.

2.6 The soil of Lahaul and Spiti like other Himalayan regions falls under mountainous type and is characterized by clayey in texture and acidic in nature. A marked difference in soil between valley and upland is seen.

3.1 The people of Lahaul and Spiti at present are mixture of different racial groups who entered the area at different points of time. Most of the people came from Tibet, Kashmir, Ladakh, and some parts of central India.

Broadly two groups can be found viz. Tibeto-Mongoloid and Indo-Aryan. The former one is dominant in Spiti while later one is found in Lahaul. Like many other Himalayan states a number of dialects are spoken in this area. The dialect of Spiti has close affinity with Tibetan language. Besides Lahauli, three other dialects namely Bunan, Tinan and Manchad are spoken in Lahaul. Buddhism is dominant religion in Spiti, while Hinduism is prevalent in many parts of Lahaul. Buddhism in this area has assimilated many of Hindu rituals like animal sacrifice, idol worshiping etc. Buddhist monasteries (Gompas) are powerful institutions, which play important role in the society. The Indo-Aryan influx in Lahaul led to the introduction of Hinduism in this area.

3.2 Joint family system was common in Lahaul and Spiti area. A family consists of around seven members. Polyandry was a common social practice. The polyandry has started declining in the recent years.

3.3 Only two river valleys with milder climate and less rugged terrain are densely populated. People are settled only in an area of 1964 square kilometres out of the geographical area of 13835 square kilometres.

The average density comes to 2 persons per square kilometres. The total population in 1991 was 31294 persons against 32100 in 1981. Most of the settlement in Lahaul and Spiti are small with a population of less than 100 persons. Larger settlements are mainly concentrated in Chenab, Bhaga and Spiti valleys.

3.4 About 22.8 percent of villages in this area have low sex-ratio i.e. less than 800, while another 26.5 percent of villages have high sex ratio of more than 1201 females per 1000 males. The remaining 49.5 percent of villages have a sex ratio of 800-1000 females/1000 males.

3.5 The area with limited resources, low level of technology; age-old institutions, low economic diversification and male selective out-migration etc. are the causes for the peculiar characteristics of the area.

3.6 Lahaul and Spiti have lower literacy level than that of state. A gradual increase in literacy has been observed, which is mainly due to government plans, massive influx of government employees to the district etc. Female literacy is very low even now.

4.1 About 54.18 percent of population have been enumerated as workers in 1991. The increase in the share of workers in the total population is due to the influx of workers for construction activities and other services. Moreover, in remote areas more people get engaged in primary activities. The share was highest in Bhaga valley as it has the head quarter of the district and most government servants are concentrated here.

4.2 Of the total workforce, 60.7 percent is engaged in agriculture and allied activities. Agricultural land availability per worker is comparatively low. Industry, the only point of secondary sector in the district engages insignificant proportion of total workers. The preponderance of primary activities is the chief feature of occupational structure in the villages of Lahaul and Spiti region. The physiographic constraints, small land holdings and scarcity of cultivable land adversely affect the economy. Land use is the spatial

expression of natural environment of the region. Less than 1 percent of the total geographical area is used for agricultural purposes. A large proportion of cultivable land is left unused around villages mainly due to the inefficiency of present technology and lack of workers.

4.3 The agriculture is mainly devoted to the production of food for self-consumption in the district. Barley and wheat are main agricultural crops grown in the district. Area under potato and peas cultivation – the main cash crops, has increased many folds during recent times. Horticulture is also gaining rapid ground in the region.

5.1 The availability of amenities and functions has put the settlements at different levels. The hierarchy among settlements exist in the region due to variations in facilities like education, health-care, drinking water, communication, power supply etc. Composite index has been worked out on the basis of these variables.

5.2 Final composite index based on the two indices shows nine villages in the 1st rank, 29 villages in the 2nd category, 68, 145, and 15 villages in the 3rd, 4th and 5th categories respectively. Most of the variations in the ranking are largely due to certain physical and historical factors. Most of the higher-ranking settlements are concentrated in the valleys and are generally administrative centres situated along the rivers. The transport infrastructure and the size of settlements seem to have played major role in determining the rank of settlements. The availability of suitable land for economic pursuits and its accessibility also played important role in the ranking of settlements.

The region still continues to be underdeveloped mainly on account of certain physical and historical factors. Though, social and economic betterment of the society has gone up. The diversification of economy has started gaining enormous ground as commercial crops are replacing the self subsistence crops. Modernisation of agricultural techniques is restricted to relatively flat areas. This has been limited because most of the arable land is available on the steep slopes. Lahaul and Spiti district being situated in the

Himalayan and Trans-Himalayan ranges have perennial rivers. Therefore, the region could be developed for the generation of electricity. The tourism sector could be developed as it has high scope for the growth of tourism in its various forms. The central government has granted construction of Rohtang tunnel keeping in view the strategic as well as economic potential of the district. This will surely herald a new era in the lives of people. But, before the execution of these plans, geological sensitivity of the region should be kept in close consideration. Thus, all these efforts will certainly enhance the economic as well as social personality of the region and take out the people from underdevelopment.

Appendix- 1

Socio-economic charecteristics

NAME	T_POPLN	density	sex_ratio	Mlitt_per	Flitt_per	Litt_per	Perm_wor	Perf_wor	per_wor	Wor_5Aper	Twor_9	Ag_land	pop press	per_Irrig
Bhujund	130	148	1031	64.06	27.27	45.38	56.25	19.70	37.69	0.00	14.29	19	6.84	100.0(
R.F.Krakun	108	200	459	35.14	8.82	26.85	71.62	61.76	68.52	0.00	0.00	0	#DIV/0!	#DIV/0!
D.P.F.Ransani	14	5	77	7.69	100.00	14.29	76.92	0.00	71.43	0.00	0.00	0	#DIV/0!	#DIV/0!
D.P.F.Lohni	78	35	1053	47.37	20.00	33.33	57.89	35.00	46.15	0.00	5.56	49	1.59	0.00
Bharaur	86	176	870	58.70	27.50	44.19	47.83	37.50	43.02	0.00	2.70	21	4.10	0.00
Tindi	434	505	779	69.26	17.89	46.77	52.87	58.42	55.30	0.00	20.83	44	9.86	100.00
Harsar	14	26	1000	57.14	14.29	35.71	71.43	71.43	71.43	0.00	0.00	5	2.80	40.00
D.P.F. Dhanwani	34	18	889	55.56	25.00	41.18	50.00	62.50	55.88	0.00	10.53	5	6.80	100.00
Kurched	69	21	971	48.57	52.94	50.72	45.71	50.00	47.83	0.00	0.00	8	8.63	100.00
R.F. Rumas	7	5	167	33.33	0.00	28.57	50.00	100.00	57.14	0.00	0.00	0	#DIV/0!	#DIV/0!
Salgaraon	229	91	862	47.15	12.26	31.00	55.28	57.55	56.33	0.00	3.88	210	1.09	100.00
Shakoli	549	302	954	46.98	13.81	30.78	58.72	66.42	62.48	0.00	2.62	50	10.98	100.00
D.P.F. Lobar	23	5	533	20.00	12.50	17.39	53.33	62.50	56.52	0.00	0.00	2	11.50	100.00
Salpat	130	351	688	50.65	24.53	40.00	49.35	60.38	53.85	0.00	8.57	8	16.25	100.00
Udaipur	683	962	538	83.11	36.40	66.76	78.60	38.91	64.71	0.23	45.25	16	42.69	100.00
R.F. Riodhan	4	2	1000	0.00	50.00	25.00	50.00	50.00	50.00	0.00	0.00	0	#DIV/0!	#DIV/0!
Margaraon	545	172	1121	53.70	26.74	39.45	51.75	59.03	55.60	1.32	5.28	46	11.85	100.00
Tingrat	277	133	799	59.09	34.96	48.38	52.60	60.98	56.32	0.00	10.90	28	9.89	0.00
Khanjar	51	17	1040	60.00	26.92	43.14	60.00	65.38	62.75	0.00	3.13	15	3.40	0.00
Chaling	134	206	914	44.29	17.19	31.34	55.71	67.19	61.19	0.00	2.44	15	8.93	0.00
Karpat	270	105	776	57.89	23.73	42.96	53.29	59.32	55.93	0.00	7.95	24	11.25	0.00
D.P.F. Shiling	21	15	1100	40.00	9.09	23.81	50.00	63.64	57.14	0.00	0.00	3	7.00	0.00
Chamrat	169	132	1113	47.50	28.09	37.28	51.25	53.93	52.66	0.00	4.49	21	8.05	0.00
D.P.F. Tumru	16	4	2200	0.00	9.09	6.25	60.00	45.45	50.00	0.00	0.00	6	2.67	0.00
Ghari	205	181	767	27.59	14.61	21.95	63.79	55.06	60.00	0.00	2.44	10	20.50	0.00
Sindwari	361	122	656	61.47	29.37	48.75	68.81	60.14	65.37	2.12	12.29	23	15.70	100.00
D.P.F. Sindwari	9	3	1250	25.00	40.00	33.33	0.00	40.00	22.22	0.00	0.00	4	2.25	100.00
Arat	53	104	963	40.74	7.69	24.53	48.15	80.77	64.15	0.00	8.82	7	7.57	100.00
D.P.F. Phatgahar	121	11	274	64.21	15.38	53.72	89.47	84.62	88.43	0.00	50.47	3	40.33	100.00
Haruka	80	49	818	50.00	5.56	30.00	63.64	61.11	62.50	0.00	22.00	17	4.71	100.00
Kishori	277	289	1147	54.26	22.30	37.18	61.24	58.11	59.57	0.00	6.67	27	10.26	100.00
Trilok Nath	713	379	1103	59.88	21.66	39.83	50.74	60.96	56.10	1.75	6.25	63	11.32	100.00
D.P.F. Bhiyari	33	18	833	50.00	20.00	36.36	61.11	46.67	54.55	0.00	0.00	5	6.60	100.00
D.P.F. Gilding	10	4	429	71.43	33.33	60.00	42.86	100.00	60.00	0.00	0.00	6	1.67	100.00
Jholang	127	202	954	52.31	20.97	37.01	46.15	64.52	55.12	0.00	7.14	14	9.07	100.00
Nain Gahar	81	476	1314	48.57	43.48	45.68	77.14	67.39	71.60	0.00	5.17	8	10.13	100.00
Guari	16	133	600	40.00	16.67	31.25	40.00	100.00	62.50	0.00	0.00	3	5.33	100.00

NAME	T_POPLN	density	sex_ratio	Mlitt_per	Flitt_per	Litt_per	Perm_wor	Perf_wor	per_wor	Wor_5Aper	Twor_9	Ag_land	pop press	per_irrig
Chhogjing	24	480	1000	58.33	41.67	50.00	83.33	58.33	70.83	0.00	0.00	3	8.00	100.0
Chokhang	126	360	726	57.53	45.28	52.38	67.12	64.15	65.87	0.00	13.25	12	10.50	100.0
Thirot	538	2339	275	66.59	43.10	61.52	87.91	58.62	81.60	0.00	6.61	6	89.67	100.0
Kamri	130	542	1167	73.33	32.86	51.54	63.33	50.00	56.15	0.00	17.81	7	18.57	100.0
Dandak	27	540	1455	81.82	43.75	59.26	36.36	68.75	55.56	0.00	6.67	2	13.50	100.0
Murang	49	213	750	82.14	47.62	67.35	64.29	57.14	61.22	0.00	10.00	9	5.44	100.0
Chambak	69	531	1464	75.00	48.78	59.42	42.86	29.27	34.78	0.00	4.17	5	13.80	100.00
Shenwar	9	129	3500	0.00	57.14	44.44	50.00	28.57	33.33	0.00	0.00	4	2.25	100.00
Sheling	54	270	929	67.86	38.46	53.70	46.43	30.77	38.89	0.00	0.00	9	6.00	100.00
Bha Baring	30	500	1308	76.92	41.18	56.67	69.23	17.65	40.00	0.00	8.33	3	10.00	100.00
Leh Baring	82	683	1343	45.71	40.43	42.68	57.14	31.91	42.68	2.86	2.86	6	13.67	100.00
Kuang	35	500	944	72.22	35.29	54.29	61.11	35.29	48.57	0.00	11.76	2	17.50	100.00
Dreldra	27	386	1250	66.67	33.33	48.15	66.67	46.67	55.56	0.00	0.00	4	6.75	100.00
Bha Chewar	28	933	867	93.33	38.46	67.86	40.00	23.08	32.14	0.00	0.00	1	28.00	100.00
Khuruti	15	300	1500	66.67	44.44	53.33	33.33	44.44	40.00	0.00	16.67	2	7.50	100.00
Nalda	278	525	1059	62.22	42.66	52.16	51.85	62.24	57.19	0.00	5.03	24	11.58	100.00
Jasrath	125	521	866	73.13	36.21	56.00	43.28	75.86	58.40	0.00	6.85	10	12.50	100.00
Galing	6	60	5000	100.00	60.00	66.67	100.00	40.00	50.00	0.00	0.00	4	1.50	100.00
Junde	140	583	1154	76.92	49.33	62.14	58.46	60.00	59.29	1.20	8.43	16	8.75	100.00
Taljon	98	516	885	84.62	41.30	64.29	59.62	56.52	58.16	1.75	3.51	8	12.25	100.00
Lomach	37	617	1056	83.33	47.37	64.86	55.56	57.89	56.76	0.00	0.00	3	12.33	100.00
Tibok	15	375	667	33.33	0.00	20.00	33.33	66.67	46.67	0.00	0.00	1	15.00	100.00
Othang	62	155	1385	50.00	52.78	51.61	65.38	69.44	67.74	0.00	9.52	13	4.77	100.00
Yang Thang	26	96	1167	25.00	7.14	15.38	83.33	100.00	92.31	0.00	0.00	11	2.36	100.00
Jahlma	363	465	952	83.87	55.93	70.25	62.90	58.19	60.61	0.00	15.91	34	10.68	100.00
Phura	119	850	919	75.81	36.84	57.14	58.06	68.42	63.03	0.00	17.33	7	17.00	100.00
Jobrang	186	305	1296	70.37	39.05	52.69	55.56	60.00	58.06	0.00	10.19	28	6.64	100.00
Rape	139	496	1075	62.69	37.50	49.64	59.70	51.39	55.40	0.00	6.49	12	11.58	100.00
Ghambari	10	125	667	33.33	25.00	30.00	50.00	75.00	60.00	0.00	0.00	3	3.33	100.00
Rashil	103	412	1641	61.54	45.31	51.46	58.97	42.19	48.54	0.00	12.00	13	7.92	100.00
Lingar	54	300	1455	68.18	43.75	53.70	36.36	56.25	48.15	0.00	7.69	10	5.40	100.00
Lindur	99	230	1020	51.02	32.00	41.41	67.35	46.00	56.57	0.00	5.36	16	6.19	100.00
Kothi	35	140	944	55.56	29.41	42.86	61.11	58.82	60.00	0.00	4.76	6	5.83	100.00
Rapring	56	267	1667	76.19	42.86	55.36	61.90	42.86	50.00	0.00	21.43	10	5.60	100.00
Goruma	216	260	1139	60.40	35.65	47.22	60.40	66.96	63.89	0.00	5.07	34	6.35	100.00
Shansha	389	291	1137	57.69	40.10	48.33	54.95	57.97	56.56	0.00	8.64	48	8.10	100.00
Parak	11	122	833	50.00	20.00	36.36	66.67	80.00	72.73	0.00	0.00	2	5.50	100.00
Thapak	61	161	1440	72.00	41.67	54.10	52.00	66.67	60.66	0.00	10.81	8	7.63	100.00
Duansha	82	283	1103	69.23	39.53	53.66	43.59	60.47	52.44	2.33	13.95	12	6.83	100.00
Yang Kirting	57	335	629	91.43	54.55	77.19	65.71	63.64	64.91	0.00	21.62	6	9.50	100.00

NAME	T_POPLN	density	sex_ratio	Mlitt_per	Flitt_per	Litt_per	Perm_wor	Perf_wor	per_wor	Wor_5Aper	Twor_9	Ag_land	pop press	per_irrig
Kirting	343	1009	724	57.29	34.03	47.52	67.84	60.42	64.72	0.90	10.81	16	21.44	100.0(
Rualing	46	230	1300	65.00	53.85	58.70	50.00	61.54	56.52	3.85	3.85	8	5.75	100.0(
Telangbe	38	136	1714	50.00	37.50	42.11	42.86	66.67	57.89	9.09	22.73	14	2.71	100.0(
Meling	48	178	1526	84.21	37.93	56.25	63.16	58.62	60.42	0.00	17.24	11	4.36	100.0(
Ruring	43	165	1150	75.00	26.09	48.84	70.00	65.22	67.44	0.00	3.45	9	4.78	100.0(
Muchhling	2	50	1000	0.00	0.00	0.00	100.00	100.00	100.00	0.00	0.00	2	1.00	100.00
To-Karing	7	233	750	100.00	33.33	71.43	50.00	66.67	57.14	0.00	0.00	1	7.00	100.00
Lot	221	567	1085	77.36	38.26	57.01	66.04	62.61	64.25	3.52	14.79	17	13.00	100.00
Karing	46	288	1190	71.43	40.00	54.35	38.10	60.00	50.00	0.00	8.70	8	5.75	100.00
Lapshak	99	309	1200	64.44	42.59	52.53	60.00	51.85	55.56	1.82	3.64	11	9.00	100.00
Yangrang	45	150	1813	68.75	41.38	51.11	56.25	65.52	62.22	0.00	0.00	10	4.50	100.00
Rangbe	141	427	958	76.39	53.62	65.25	56.94	55.07	56.03	0.00	24.05	15	9.40	100.00
Yang Tozing	17	213	1429	57.14	40.00	47.06	71.43	40.00	52.94	0.00	0.00	3	5.67	100.00
Tozing	58	414	1231	69.23	56.25	62.07	61.54	46.88	53.45	0.00	9.68	7	8.29	100.00
Wari	75	208	1083	66.67	53.85	60.00	51.11	46.15	53.33	0.00	17.50	10	7.50	100.00
Marbaj	66	189	1538	76.92	50.00	60.61	69.23	52.50	59.09	0.00	12.82	13	5.08	100.00
Baring	20	222	1000	40.00	50.00	45.00	80.00	10.00	45.00	0.00	11.11	2	10.00	100.00
Bha-Garang	19	317	727	90.91	62.50	78.95	45.45	75.00	57.89	0.00	9.09	2	9.50	100.00
Krozing	54	360	862	68.97	40.00	55.56	55.17	16.00	37.04	0.00	10.00	7	7.71	100.00
Malang	89	278	1472	77.78	54.72	64.04	52.78	52.83	52.81	0.00	14.89	15	5.93	100.00
Leh-Garang	15	150	1500	50.00	66.67	60.00	50.00	44.44	46.67	0.00	28.57	4	3.75	100.00
Dape-Marang	18	200	1571	57.14	45.45	50.00	57.14	27.27	38.89	0.00	0.00	3	6.00	100.00
Tholung	225	469	1273	70.71	43.65	55.56	62.63	42.86	51.56	0.00	18.97	27	8.33	100.00
Phunkiyar	35	583	944	77.78	47.06	62.86	50.00	52.94	51.43	0.00	0.00	4	8.75	100.00
Bokta	11	275	833	50.00	100.00	72.73	66.67	60.00	63.64	0.00	0.00	2	5.50	100.00
Bha-Sumnam	48	209	778	66.67	52.38	60.42	66.67	76.19	70.83	0.00	11.76	10	4.80	100.00
Leh-Sumnam	35	159	1059	41.18	27.78	34.29	58.82	83.33	71.43	0.00	4.00	9	3.89	100.00
Tandi	472	983	384	62.17	30.53	53.39	85.34	61.83	78.81	0.00	23.66	24	19.67	100.00
Biling	281	511	790	66.88	37.90	54.09	69.43	58.06	64.41	1.66	6.08	24	11.71	100.00
Kyelang	1797	728	490	76.62	36.55	63.44	77.11	38.92	64.55	2.16	51.38	70	25.67	100.00
Bokar	7	233	2500	0.00	20.00	14.29	100.00	100.00	100.00	0.00	0.00	1	7.00	100.00
Gumrang	134	335	887	57.75	31.75	45.52	69.01	65.08	67.16	0.00	8.89	19	7.05	100.00
Girmus	64	582	829	51.43	10.34	32.81	51.43	58.62	54.69	0.00	2.86	5	12.80	100.00
Guskyar	68	680	889	69.44	34.38	52.94	66.67	68.75	67.65	0.00	8.70	4	17.00	100.00
Yurnath	54	235	1077	61.54	14.29	37.04	80.77	82.14	81.48	0.00	6.82	10	5.40	100.00
Gumling	50	500	1000	52.00	36.00	44.00	40.00	68.00	54.00	0.00	7.41	4	12.50	100.00
Magwan	40	800	429	82.14	25.00	65.00	64.29	83.33	70.00	0.00	32.14	3	13.33	100.00
Kyor	45	300	1368	36.84	38.46	37.78	63.16	69.23	66.67	0.00	13.33	7	6.43	100.00
Tayul Gompa	16	1600	455	72.73	20.00	56.25	27.27	40.00	31.25	0.00	0.00	0	#DIV/0!	#DIV/0!
Bar Gompa	13	650	1167	16.67	0.00	7.69	50.00	85.71	69.23	0.00	0.00	1	13.00	100.00

NAME	T_POPLN	density	sex_ratio	Mlitt_per	Flitt_per	Litt_per	Perm_wor	Perf_wor	per_wor	Wor_5Aper	Twor_9	Ag_land	pop press	per_irrig
Stingiri	395	2469	238	40.44	9.21	34.43	89.03	68.42	85.06	0.00	90.48	8	49.38	100.0
Kawaring	173	320	1136	28.40	29.35	28.90	72.84	44.57	57.80	3.00	9.00	18	9.61	100.0
Tinno	160	296	1133	69.33	41.18	54.38	52.00	62.35	57.50	10.87	4.35	25	6.40	100.0
Kolang	160	254	1254	53.52	38.20	45.00	56.34	53.93	55.00	5.68	17.05	20	8.00	100.0
Kelad	50	263	1778	44.44	40.63	42.00	50.00	56.25	54.00	0.00	7.41	6	8.33	100.0
Khangsar	220	306	1136	54.37	38.46	45.91	56.31	68.38	62.73	0.00	8.70	28	7.86	100.0
Mai	61	305	1259	70.37	38.24	52.46	59.26	64.71	62.30	0.00	5.26	11	5.55	100.00
Gemur	51	729	962	46.15	12.00	29.41	73.08	56.00	64.71	0.00	9.09	3	17.00	100.00
Bog	139	927	1075	56.72	43.06	49.64	65.67	59.72	62.59	2.30	8.05	7	19.86	100.00
Jispa	202	439	757	66.96	52.87	60.89	71.30	64.37	68.32	2.17	14.49	20	10.10	100.00
Tingal	10	200	1000	40.00	0.00	20.00	60.00	80.00	70.00	0.00	0.00	2	5.00	100.00
Chhika-Be	43	860	1263	21.05	16.67	18.60	42.11	54.17	48.84	0.00	0.00	2	21.50	100.00
Rarig	82	586	1000	41.46	26.83	34.15	65.85	53.66	59.76	0.00	2.04	6	13.67	100.00
Rangyo	40	500	1500	62.50	50.00	55.00	62.50	54.17	57.50	0.00	4.35	4	10.00	100.00
Baryo	15	750	875	87.50	14.29	53.33	75.00	71.43	73.33	0.00	0.00	1	15.00	100.00
Lingkyam	52	743	926	81.48	64.00	73.08	66.67	40.00	53.85	0.00	7.14	3	17.33	100.00
Darcha-Sumdol	90	900	1093	60.47	29.79	44.44	65.12	59.57	62.22	1.79	12.50	5	18.00	100.00
Darcha-Dangma	146	384	1212	74.24	43.75	57.53	54.55	51.25	52.74	5.19	10.39	13	11.23	100.00
Yoche	86	374	1205	56.41	36.17	45.35	41.03	57.45	50.00	4.65	2.33	13	6.62	100.00
Barbog	35	269	522	30.43	33.33	31.43	91.30	100.00	94.29	0.00	0.00	4	8.75	100.00
Pasprag	47	427	1043	47.83	8.33	27.66	56.52	75.00	65.96	0.00	0.00	4	11.75	100.00
Lapchang	60	182	1609	39.13	24.32	30.00	69.57	67.57	68.33	0.00	2.44	14	4.29	100.00
Cheling	54	257	688	53.13	18.18	38.89	62.50	68.18	64.81	0.00	0.00	8	6.75	100.00
Thola-Pyasu	52	400	1000	46.15	30.77	38.46	53.85	61.54	57.69	0.00	0.00	6	8.67	100.00
Jholing	5	100	1500	100.00	33.33	60.00	50.00	66.67	60.00	0.00	0.00	2	2.50	100.00
Piukar	180	321	1045	38.64	14.13	26.11	56.82	79.35	68.33	0.00	3.25	22	8.18	100.00
Gajang	96	384	1133	55.56	33.33	43.75	60.00	66.67	63.54	0.00	3.28	13	7.38	100.00
Kardang	205	273	1158	64.21	40.00	51.22	58.95	58.18	58.54	0.00	9.17	22	9.32	100.00
Gushal	530	353	840	70.14	38.02	55.47	42.01	9.50	27.17	1.39	31.94	62	8.55	100.00
Tupchiling	91	1138	784	31.37	5.00	19.78	74.51	47.50	62.64	0.00	24.56	3	30.33	100.00
Shipting	57	204	1478	60.87	52.94	56.14	60.87	23.53	38.60	4.55	9.09	14	4.07	100.00
Wargul	142	273	1029	68.57	40.28	54.23	47.14	45.83	46.48	3.03	12.12	21	6.76	100.00
Muling	205	500	1135	71.88	33.94	51.71	46.88	28.44	37.07	3.95	18.42	21	9.76	100.00
Dalang	81	450	723	61.70	32.35	49.38	46.81	47.06	46.91	0.00	7.89	9	9.00	100.00
Thorang	84	400	1270	78.38	42.55	58.33	56.76	2.13	26.19	18.18	27.27	10	8.40	100.00
Gondhla	360	429	885	50.79	37.28	44.44	56.02	14.79	36.67	0.00	17.42	32	11.25	100.00
Phugthal	39	355	950	75.00	36.84	56.41	60.00	73.68	66.67	0.00	0.00	4	9.75	100.00
Tiling	37	264	1846	46.15	33.33	37.84	69.23	66.67	67.57	0.00	4.00	6	6.17	100.00
Purd	42	135	909	59.09	40.00	50.00	54.55	80.00	66.67	0.00	0.00	7	6.00	100.00
Khinang	93	300	1114	70.45	30.61	49.46	61.36	59.18	60.22	0.00	7.14	11	8.45	100.00

NAME	T_POPLN	density	sex_ratio	Mlitt_per	Flitt_per	Litt_per	Perm_wor	Perf_wor	per_wor	Wor_5Aper	Twor_9	Ag_land	pop press	per_irrig
Khangsar	119	270	1052	68.97	52.46	60.50	63.79	57.38	60.50	0.00	11.11	14	8.50	100.0(
Sakar	50	455	1083	62.50	50.00	56.00	58.33	50.00	54.00	0.00	7.41	3	16.67	100.0(
Shugu	47	362	808	50.00	28.57	40.43	73.08	66.67	70.21	0.00	0.00	4	11.75	100.0(
Jagle	62	182	1214	57.14	29.41	41.94	67.86	52.94	59.68	0.00	0.00	8	7.75	100.0(
Kiangcha	18	360	2000	83.33	41.67	55.56	50.00	41.67	44.44	0.00	0.00	1	18.00	100.00
Murticha	49	327	815	48.15	22.73	36.73	48.15	50.00	48.98	0.00	0.00	4	12.25	100.00
Raling	54	318	929	42.86	30.77	37.04	64.29	19.23	42.59	0.00	8.70	5	10.80	100.00
Khorpani	43	391	870	60.87	40.00	51.16	60.87	35.00	48.84	0.00	9.52	3	14.33	100.00
Shuiling	202	430	906	64.15	33.33	49.50	59.43	47.92	53.96	0.00	6.42	21	9.62	100.00
Ropsang	85	213	1297	64.86	31.25	45.88	51.35	4.17	24.71	0.00	9.52	15	5.67	100.00
Jungling	38	380	1533	40.00	30.43	34.21	53.33	4.35	23.68	0.00	0.00	4	9.50	100.00
Khangsar	34	680	1125	56.25	33.33	44.12	68.75	0.00	32.35	0.00	9.09	2	17.00	100.00
Gompathan	48	400	1000	75.00	62.50	68.75	66.67	0.00	33.33	0.00	12.50	5	9.60	100.00
Shashin	120	400	967	80.33	45.76	63.33	63.93	3.39	34.17	0.00	29.27	12	10.00	100.00
Jagdang	66	287	1063	46.88	23.53	34.85	46.88	55.88	51.52	0.00	5.88	9	7.33	100.00
Khawagling	81	405	929	78.57	56.41	67.90	57.14	51.28	54.32	0.00	9.09	13	6.23	100.00
Retil	40	250	1105	68.42	33.33	50.00	36.84	66.67	52.50	0.00	0.00	6	6.67	100.00
Labrang	24	400	600	73.33	44.44	62.50	40.00	66.67	50.00	0.00	0.00	1	24.00	100.00
Shurtang	27	135	1250	41.67	40.00	40.74	75.00	33.33	51.85	0.00	14.29	6	4.50	100.00
Kathal	4	40	1000	100.00	100.00	100.00	50.00	50.00	50.00	0.00	0.00	5	0.80	100.00
Kewak	19	271	1111	66.67	40.00	52.63	55.56	60.00	57.89	0.00	0.00	2	9.50	100.00
Chokhur	32	800	1667	58.33	45.00	50.00	66.67	45.00	53.13	0.00	0.00	3	10.67	100.00
Sarkhang	12	171	500	75.00	25.00	58.33	25.00	75.00	41.67	0.00	0.00	2	6.00	100.00
Rangcha	33	660	737	52.63	42.86	48.48	52.63	57.14	54.55	0.00	0.00	2	16.50	100.00
Bagche	13	260	2250	50.00	66.67	61.54	75.00	33.33	46.15	0.00	0.00	2	6.50	100.00
Kharchudkonma	7	233	400	60.00	100.00	71.43	60.00	50.00	57.14	0.00	0.00	1	7.00	100.00
Kharchud-Yongma	25	500	667	53.33	50.00	52.00	46.67	40.00	44.00	0.00	0.00	2	12.50	100.00
Jamyaling	21	525	500	71.43	28.57	57.14	50.00	85.71	61.90	0.00	7.69	2	10.50	100.00
Laling	17	243	889	44.44	50.00	47.06	55.56	50.00	52.94	0.00	0.00	3	5.67	100.00
Teling	67	203	1310	58.62	39.47	47.76	62.07	55.26	58.21	0.00	5.13	19	3.53	100.00
Damphug	188	606	580	49.58	13.04	36.17	82.35	57.97	73.40	0.72	18.12	16	11.75	100.00
Khoksar	283	1887	367	88.41	59.21	80.57	91.79	53.95	81.63	0.43	92.64	10	28.30	100.00
Yari Khoksar	27	180	174	56.52	0.00	48.15	100.00	0.00	85.19	0.00	0.00	7	3.86	100.00
Losar Khas	242	67	921	69.05	32.76	51.65	59.52	11.21	36.36	0.00	35.23	40	6.05	87.50
Chichong	110	22	1292	54.17	45.16	49.09	50.00	3.23	23.64	0.00	19.23	30	3.67	53.33
Kiamo	114	32	1111	59.26	46.67	52.63	57.41	53.33	55.26	0.00	11.11	29	3.93	79.31
Hanse	215	86	937	70.27	35.58	53.49	58.56	24.04	41.86	2.22	40.00	42	5.12	92.86
Kiato	103	24	839	67.86	29.79	50.49	69.64	8.51	41.75	0.00	34.88	33	3.12	75.76
Pangmo Khas	112	38	1605	41.86	27.54	33.04	53.49	0.00	20.54	0.00	17.39	14	8.00	92.86
Hal	160	42	951	60.98	28.21	45.00	56.10	7.69	32.50	0.00	25.00	28	5.71	78.57

NAME	T_POPLN	density	sex_ratio	Mlitt_per	Flitt_per	Litt_per	Perm_wor	Perf_wor	per_wor	Wor_5Aper	Twor_9	Ag_land	pop press	per_irrig
Morang	30	8	1727	81.82	42.11	56.67	54.55	10.53	26.67	0.00	62.50	6	5.00	100.00
Sumling	84	16	1270	67.57	38.30	51.19	56.76	14.89	33.33	0.00	46.43	16	5.25	100.00
Khurik	154	56	1110	60.27	29.63	44.16	47.95	28.40	37.66	1.72	24.14	29	5.31	96.55
Yarango Rangarik	80	19	1000	57.50	32.50	45.00	42.50	57.50	50.00	0.00	27.50	36	2.22	97.22
Marango Rangarik	545	114	823	57.19	31.71	45.69	70.90	9.76	43.30	0.00	28.81	43	12.67	97.67
Ki	255	52	425	81.56	30.26	66.27	60.34	5.26	43.92	0.00	66.96	19	13.42	100.00
Gete	34	34	789	26.32	53.33	38.24	47.37	0.00	26.47	0.00	11.11	5	6.80	100.00
Tashi Gang	20	29	667	25.00	0.00	15.00	41.67	0.00	25.00	0.00	0.00	5	4.00	100.00
Kibar Khas	339	73	960	69.94	28.92	49.85	43.93	4.82	24.78	1.19	38.10	45	7.53	100.00
Chichimkhas	303	127	1034	48.99	28.57	38.61	50.34	46.75	48.51	0.00	9.52	36	8.42	94.44
Kaja Khas	781	394	395	76.43	47.96	68.37	81.61	18.55	63.76	1.81	54.22	50	15.62	96.00
Kaja Soma	611	453	370	76.68	41.82	67.27	82.51	22.42	66.28	0.00	49.88	3	203.67	0.00
Kakti	5	56	1500	50.00	0.00	20.00	100.00	0.00	40.00	0.00	0.00	1	5.00	100.00
Kuang Khas	19	11	1375	50.00	27.27	36.84	50.00	0.00	21.05	0.00	25.00	8	2.38	75.00
Keuling	87	45	1231	69.23	54.17	60.92	35.90	25.00	29.89	0.00	76.92	28	3.11	57.14
Komik	104	81	825	73.68	29.79	53.85	59.65	6.38	35.58	2.70	56.76	14	7.43	85.71
Hikim	161	155	809	57.30	23.61	42.24	41.57	4.17	24.84	0.00	52.50	24	6.71	83.33
Langja	153	36	913	52.50	16.44	35.29	32.50	5.48	19.61	3.33	26.67	39	3.92	64.10
Lara Khas	59	27	967	53.33	24.14	38.98	30.00	13.79	22.03	0.00	0.00	17	3.47	88.24
Shego	75	21	1083	38.89	33.33	36.00	55.56	20.51	37.33	0.00	3.57	9	8.33	55.56
Lidang	110	31	930	40.35	30.19	35.45	54.39	9.43	32.73	8.33	22.22	21	5.24	80.95
Domal Khas	265	161	1120	45.60	12.14	27.92	48.00	5.00	25.28	0.00	26.87	18	14.72	83.33
Gangdo Demul	20	11	818	72.73	22.22	50.00	45.45	0.00	25.00	0.00	0.00	13	1.54	84.62
Sulche	7	7	1333	33.33	0.00	14.29	66.67	0.00	28.57	0.00	0.00	1	7.00	100.00
Chabrang Khas	8	14	1000	50.00	0.00	25.00	75.00	0.00	37.50	0.00	0.00	3	2.67	66.67
Lingti	16	107	333	50.00	0.00	37.50	75.00	0.00	56.25	0.00	0.00	0	#DIV/0!	#DIV/0!
Sanglung	12	17	1400	40.00	14.29	25.00	60.00	0.00	25.00	0.00	0.00	4	3.00	75.00
Rama Khas	58	62	871	51.61	25.93	39.66	51.61	18.52	36.21	0.00	19.05	7	8.29	85.71
Tulse Pena	6	43	5000	100.00	40.00	50.00	100.00	20.00	33.33	0.00	0.00	1	6.00	100.00
Kunge	47	35	44	40.00	0.00	38.30	95.56	50.00	93.62	0.00	0.00	4	11.75	50.00
Lalung Khas	260	163	970	45.45	14.06	30.00	44.70	17.19	31.15	1.23	17.28	36	7.22	94.44
Kibri	19	20	2167	0.00	0.00	0.00	66.67	0.00	21.05	0.00	0.00	6	3.17	16.67
Landupdhin	7	11	1333	33.33	0.00	14.29	100.00	25.00	57.14	0.00	25.00	4	1.75	100.00
Shichling	80	63	633	77.55	41.94	63.75	77.55	38.71	62.50	0.00	20.00	6	13.33	66.67
Shiluk	20	29	1500	50.00	25.00	35.00	37.50	58.33	50.00	0.00	30.00	2	10.00	100.00
Samling	11	5	1750	100.00	28.57	54.55	25.00	57.14	45.45	0.00	0.00	28	0.39	14.29
Dankar	262	41	782	57.14	21.74	41.60	51.02	29.57	41.60	0.00	35.78	34	7.71	94.12
Mane Gogma	144	28	895	43.42	23.53	34.03	48.68	22.06	36.11	0.00	15.38	22	6.55	77.27
Kaley	18	5	1000	77.78	22.22	50.00	44.44	0.00	22.22	0.00	25.00	4	4.50	75.00
Mane Yogma	222	98	1037	55.05	22.12	38.29	51.38	26.55	38.74	0.00	17.44	27	8.22	96.30

NAME	T_POPLN	density	sex_ratio	Mlitt_per	Flitt_per	Litt_per	Perm_wor	Perf_wor	per_wor	Wor_5Aper	Twor_9	Ag_land	pop press	per_irrig
Poh	184	163	1140	62.79	38.78	50.00	48.84	32.65	40.22	0.00	16.22	22	8.36	95.45
Pomrang	21	11	2000	85.71	42.86	57.14	0.00	21.43	14.29	0.00	0.00	25	0.84	24.00
Nidand	44	39	1750	50.00	35.71	40.91	31.25	28.57	29.55	0.00	7.69	5	8.80	80.00
Qurit	11	13	2667	33.33	50.00	45.45	66.67	25.00	36.36	0.00	0.00	3	3.67	66.67
Tabo	540	234	414	62.04	23.42	50.74	67.28	20.89	53.70	2.07	35.52	39	13.85	71.79
Lari	152	68	1000	57.89	25.00	41.45	39.47	14.47	26.97	0.00	34.15	31	4.90	77.42
Lapcha	12	109	91	90.91	0.00	83.33	100.00	0.00	91.67	0.00	100.00	1	12.00	100.00
Giu	187	101	851	73.27	33.72	55.08	59.41	8.14	35.83	0.00	40.30	29	6.45	68.97
Hurling	145	154	726	61.90	29.51	48.28	78.57	49.18	66.21	0.00	25.00	27	5.37	40.74
Samdo	137	62	317	71.15	63.64	69.34	84.62	6.06	65.69	0.00	62.22	0	#DIV/0!	#DIV/0!
Shilling	28	27	1333	58.33	37.50	46.43	66.67	0.00	28.57	0.00	37.50	4	7.00	100.00
Chhidang	16	15	1286	0.00	0.00	0.00	57.14	11.11	31.25	0.00	0.00	2	8.00	100.00
Guling	85	131	848	65.22	23.08	45.88	58.70	12.82	37.65	0.00	15.63	14	6.07	50.00
Bhar	132	108	859	54.93	18.03	37.88	46.48	40.98	43.94	1.72	5.17	20	6.60	75.00
Mikim	22	79	1000	63.64	36.36	50.00	45.45	9.09	27.27	0.00	16.67	4	5.50	50.00
Tangti Yogma	80	54	1162	59.46	20.93	38.75	70.27	51.16	60.00	0.00	2.08	15	5.33	73.33
Tangti Kogma	83	27	886	43.18	12.82	28.92	43.18	51.28	46.99	0.00	5.13	17	4.88	41.18
Khar	106	29	927	50.91	11.76	32.08	45.45	49.02	47.17	0.00	4.00	29	3.66	48.28
Uperla Guling	51	94	1040	68.00	11.54	39.22	68.00	3.85	35.29	0.00	11.11	7	7.29	100.00
Kongkong	44	39	375	34.38	0.00	25.00	78.13	50.00	70.45	0.00	0.00	11	4.00	54.55
Gungri	96	54	1043	59.57	10.20	34.38	61.70	44.90	53.13	0.00	11.76	18	5.33	55.56
Phukchung	33	22	3714	28.57	57.69	51.52	71.43	7.69	21.21	0.00	28.57	9	3.67	22.22
Ka	23	13	1091	9.09	8.33	8.70	63.64	0.00	30.43	0.00	0.00	8	2.88	37.50
Minser	17	16	1125	12.50	0.00	5.88	50.00	44.44	47.06	0.00	0.00	3	5.67	33.33
Sagnam	339	269	960	52.02	13.86	33.33	47.98	2.41	25.66	0.00	25.29	21	16.14	80.95
Todnam	35	54	944	27.78	23.53	25.71	66.67	11.76	40.00	0.00	21.43	8	4.38	75.00
Tiling	124	86	879	42.42	25.86	34.68	56.06	1.72	30.65	0.00	21.05	18	6.89	66.67
Yansa	13	21	1167	16.67	0.00	7.69	66.67	0.00	30.77	0.00	0.00	5	2.60	60.00
Mud	179	229	1034	42.05	10.99	26.26	51.14	3.30	26.82	0.00	16.67	12	14.92	91.67

Appendix-2

Composite index

NAME	X_1	$X_1/\bar{X}_1$	X_2	$X_2/\bar{X}_2$	X_3	$X_3/\bar{X}_3$	X_4	$X_4/\bar{X}_4$	X_5	$X_5/\bar{X}_5$	X_6	$X_6/\bar{X}_6$
Bhujund	148	0.51	1031	0.28	27.27	0.84	45.38	1.00	14.29	0.62	1	0.80
R.F.Krakun	200	0.70	459	0.63	8.82	0.27	26.85	0.59	93.24	4.05	0	0.00
D.P.F.Ransani	5	0.02	77	3.74	100.00	3.09	14.29	0.31	30.00	1.30	0	0.00
D.P.F.Lohni	35	0.12	1053	0.27	20.00	0.62	33.33	0.73	47.22	2.05	1	0.80
Bharaur	176	0.61	870	0.33	27.50	0.85	44.19	0.97	16.22	0.70	1	0.80
Tindi	505	1.75	779	0.37	17.89	0.55	46.77	1.03	35.42	1.54	7	5.61
Harsar	26	0.09	1000	0.29	14.29	0.44	35.71	0.79	0.00	0.00	0	0.00
D.P.F. Dhanwani	18	0.06	889	0.32	25.00	0.77	41.18	0.91	10.53	0.46	1	0.80
Kurched	21	0.07	971	0.30	52.94	1.64	50.72	1.12	42.42	1.84	1	0.80
R.F. Rumas	5	0.02	167	1.73	0.00	0.00	28.57	0.63	0.00	0.00	0	0.00
Salgaraon	91	0.31	862	0.33	12.26	0.38	31.00	0.68	10.08	0.44	3	2.40
Shakoli	302	1.05	954	0.30	13.81	0.43	30.78	0.68	3.21	0.14	3	2.40
D.P.F. Lobar	5	0.02	533	0.54	12.50	0.39	17.39	0.38	0.00	0.00	0	0.00
Salpat	351	1.22	688	0.42	24.53	0.76	40.00	0.88	8.57	0.37	1	0.80
Udaipur	962	3.34	538	0.53	36.40	1.13	66.76	1.47	77.60	3.37	6	4.81
R.F. Riodhan	2	0.01	1000	0.29	50.00	1.55	25.00	0.55	100.00	4.35	0	0.00
Margaraon	172	0.60	1121	0.26	26.74	0.83	39.45	0.87	11.88	0.52	5	4.01
Tingrat	133	0.46	799	0.36	34.96	1.08	48.38	1.07	11.54	0.50	6	4.81
Khanjar	17	0.06	1040	0.28	26.92	0.83	43.14	0.95	3.13	0.14	1	0.80
Chaling	206	0.72	914	0.31	17.19	0.53	31.34	0.69	2.44	0.11	1	0.80
Karpat	105	0.37	776	0.37	23.73	0.73	42.96	0.95	7.95	0.35	1	0.80
D.P.F. Shiling	15	0.05	1100	0.26	9.09	0.28	23.81	0.52	0.00	0.00	1	0.80
Chamrat	132	0.46	1113	0.26	28.09	0.87	37.28	0.82	4.49	0.20	2	1.60
D.P.F. Tumru	4	0.02	2200	0.13	9.09	0.28	6.25	0.14	0.00	0.00	0	0.00
Ghari	181	0.63	767	0.37	14.61	0.45	21.95	0.48	44.72	1.94	2	1.60
Sindwari	122	0.43	656	0.44	29.37	0.91	48.75	1.07	51.69	2.25	1	0.80
D.P.F. Sindwari	3	0.01	1250	0.23	40.00	1.24	33.33	0.73	0.00	0.00	0	0.00
Arat	104	0.36	963	0.30	7.69	0.24	24.53	0.54	23.53	1.02	1	0.80
D.P.F. Phatgahar	11	0.04	274	1.05	15.38	0.48	53.72	1.18	82.24	3.57	0	0.00
Haruka	49	0.17	818	0.35	5.56	0.17	30.00	0.66	38.00	1.65	6	4.81
Kishori	289	1.00	1147	0.25	22.30	0.69	37.18	0.82	7.88	0.34	1	0.80
Trilok Nath	379	1.32	1103	0.26	21.66	0.67	39.83	0.88	9.25	0.40	7	5.61
D.P.F. Bhiyari	18	0.06	833	0.35	20.00	0.62	36.36	0.80	0.00	0.00	0	0.00
D.P.F. Gilding	4	0.01	429	0.67	33.33	1.03	60.00	1.32	16.67	0.72	0	0.00
Jholang	202	0.70	954	0.30	20.97	0.65	37.01	0.82	7.14	0.31	2	1.60
Nain Gahar	476	1.66	1314	0.22	43.48	1.34	45.68	1.01	6.90	0.30	1	0.80
Guari	133	0.46	600	0.48	16.67	0.52	31.25	0.69	0.00	0.00	0	0.00

NAME	X_1	$X_1/\bar{X}_1$	X_2	$X_2/\bar{X}_2$	X_3	$X_3/\bar{X}_3$	X_4	$X_4/\bar{X}_4$	X_5	$X_5/\bar{X}_5$	X_6	$X_6/\bar{X}_6$
Chhogjing	480	1.67	1000	0.29	41.67	1.29	50.00	1.10	11.76	0.51	0	0.00
Chokhang	360	1.25	726	0.40	45.28	1.40	52.38	1.15	32.53	1.41	3	2.40
Thirot	2339	8.13	275	1.05	43.10	1.33	61.52	1.36	89.98	3.91	3	2.40
Kamri	542	1.88	1167	0.25	32.86	1.02	51.54	1.14	19.18	0.83	1	0.80
Dandak	540	1.88	1455	0.20	43.75	1.35	59.26	1.31	6.67	0.29	0	0.00
Murang	213	0.74	750	0.38	47.62	1.47	67.35	1.48	30.00	1.30	6	4.81
Chambak	531	1.84	1464	0.20	48.78	1.51	59.42	1.31	4.17	0.18	1	0.80
Shenwar	129	0.45	3500	0.08	57.14	1.77	44.44	0.98	0.00	0.00	0	0.00
Sheling	270	0.94	929	0.31	38.46	1.19	53.70	1.18	0.00	0.00	1	0.80
Bha Baring	500	1.74	1308	0.22	41.18	1.27	56.67	1.25	8.33	0.36	1	0.80
Leh Baring	683	2.38	1343	0.21	40.43	1.25	42.68	0.94	22.86	0.99	1	0.80
Kuang	500	1.74	944	0.30	35.29	1.09	54.29	1.20	17.65	0.77	1	0.80
Dreldra	386	1.34	1250	0.23	33.33	1.03	48.15	1.06	6.67	0.29	0	0.00
Bha Chewar	933	3.24	867	0.33	38.46	1.19	67.86	1.49	0.00	0.00	1	0.80
Khuruti	300	1.04	1500	0.19	44.44	1.37	53.33	1.17	33.33	1.45	0	0.00
Nalda	525	1.82	1059	0.27	42.66	1.32	52.16	1.15	5.66	0.25	1	0.80
Jasrath	521	1.81	866	0.33	36.21	1.12	56.00	1.23	8.22	0.36	1	0.80
Galing	60	0.21	5000	0.06	60.00	1.85	66.67	1.47	33.33	1.45	0	0.00
Junde	583	2.03	1154	0.25	49.33	1.53	62.14	1.37	10.84	0.47	1	0.80
Taljon	516	1.79	885	0.33	41.30	1.28	64.29	1.42	22.81	0.99	0	0.00
Lomach	617	2.14	1056	0.27	47.37	1.46	64.86	1.43	0.00	0.00	0	0.00
Tibok	375	1.30	667	0.43	0.00	0.00	20.00	0.44	0.00	0.00	0	0.00
Othang	155	0.54	1385	0.21	52.78	1.63	51.61	1.14	9.52	0.41	1	0.80
Yang Thang	96	0.33	1167	0.25	7.14	0.22	15.38	0.34	0.00	0.00	0	0.00
Jahlma	465	1.62	952	0.30	55.93	1.73	70.25	1.55	26.82	1.17	6	4.81
Phura	850	2.95	919	0.31	36.84	1.14	57.14	1.26	18.67	0.81	1	0.80
Jobrang	305	1.06	1296	0.22	39.05	1.21	52.69	1.16	10.19	0.44	3	2.40
Rape	496	1.73	1075	0.27	37.50	1.16	49.64	1.09	7.79	0.34	1	0.80
Ghambari	125	0.43	667	0.43	25.00	0.77	30.00	0.66	0.00	0.00	0	0.00
Rashil	412	1.43	1641	0.18	45.31	1.40	51.46	1.13	12.00	0.52	1	0.80
Lingar	300	1.04	1455	0.20	43.75	1.35	53.70	1.18	7.69	0.33	1	0.80
Lindur	230	0.80	1020	0.28	32.00	0.99	41.41	0.91	5.36	0.23	1	0.80
Kothi	140	0.49	944	0.30	29.41	0.91	42.86	0.94	4.76	0.21	0	0.00
Rapring	267	0.93	1667	0.17	42.86	1.32	55.36	1.22	21.43	0.93	1	0.80
Goruma	260	0.90	1139	0.25	35.65	1.10	47.22	1.04	5.80	0.25	1	0.80
Shansha	261	0.91	1137	0.25	40.10	1.24	48.33	1.06	20.00	0.87	6	4.81
Parak	122	0.42	833	0.35	20.00	0.62	36.36	0.80	0.00	0.00	0	0.00
Thapak	161	0.56	1440	0.20	41.67	1.29	54.10	1.19	10.81	0.47	0	0.00
Duansha	283	0.98	1103	0.26	39.53	1.22	53.66	1.18	18.60	0.81	1	0.80
Yang Kirting	335	1.17	629	0.46	54.55	1.69	77.19	1.70	54.05	2.35	0	0.00

NAME	X_1	$X_1/\bar{X}_1$	X_2	$X_2/\bar{X}_2$	X_3	$X_3/\bar{X}_3$	X_4	$X_4/\bar{X}_4$	X_5	$X_5/\bar{X}_5$	X_6	$X_6/\bar{X}_6$
Kirting	1009	3.51	724	0.40	34.03	1.05	47.52	1.05	21.17	0.92	1	0.80
Rualing	230	0.80	1300	0.22	53.85	1.66	58.70	1.29	15.38	0.67	1	0.80
Telangbe	136	0.47	1714	0.17	37.50	1.16	42.11	0.93	31.82	1.38	1	0.80
Meling	178	0.62	1526	0.19	37.93	1.17	56.25	1.24	20.69	0.90	1	0.80
Ruring	165	0.57	1150	0.25	26.09	0.81	48.84	1.08	10.34	0.45	0	0.00
Muchhling	50	0.17	1000	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
To-Karing	233	0.81	750	0.38	33.33	1.03	71.43	1.57	0.00	0.00	0	0.00
Lot	567	1.97	1085	0.27	38.26	1.18	57.01	1.26	33.80	1.47	6	4.81
Karing	288	1.00	1190	0.24	40.00	1.24	54.35	1.20	8.70	0.38	0	0.00
Lapshak	309	1.08	1200	0.24	42.59	1.32	52.53	1.16	5.45	0.24	1	0.80
Yangrang	150	0.52	1813	0.16	41.38	1.28	51.11	1.13	0.00	0.00	0	0.00
Rangbe	427	1.49	958	0.30	53.62	1.66	65.25	1.44	24.05	1.05	1	0.80
Yang Tozing	213	0.74	1429	0.20	40.00	1.24	47.06	1.04	0.00	0.00	0	0.00
Tozing	414	1.44	1231	0.23	56.25	1.74	62.07	1.37	16.13	0.70	1	0.80
Wari	208	0.72	1083	0.27	53.85	1.66	60.00	1.32	17.50	0.76	1	0.80
Marbaj	189	0.66	1538	0.19	50.00	1.55	60.61	1.33	12.82	0.56	1	0.80
Baring	222	0.77	1000	0.29	50.00	1.55	45.00	0.99	11.11	0.48	0	0.00
Bha-Garang	317	1.10	727	0.40	62.50	1.93	78.95	1.74	9.09	0.40	0	0.00
Krozing	360	1.25	862	0.33	40.00	1.24	55.56	1.22	15.00	0.65	0	0.00
Malang	278	0.97	1472	0.20	54.72	1.69	64.04	1.41	17.02	0.74	6	4.81
Leh-Garang	150	0.52	1500	0.19	66.67	2.06	60.00	1.32	28.57	1.24	0	0.00
Dape-Marang	200	0.70	1571	0.18	45.45	1.41	50.00	1.10	0.00	0.00	0	0.00
Tholung	469	1.63	1273	0.23	43.65	1.35	55.56	1.22	21.55	0.94	1	0.80
Phunkiyar	583	2.03	944	0.30	47.06	1.45	62.86	1.38	5.56	0.24	0	0.00
Bokta	275	0.96	833	0.35	100.00	3.09	72.73	1.60	0.00	0.00	0	0.00
Bha-Sumnam	209	0.73	778	0.37	52.38	1.62	60.42	1.33	14.71	0.64	1	0.80
Leh-Sumnam	159	0.55	1059	0.27	27.78	0.86	34.29	0.76	4.00	0.17	0	0.00
Tandi	983	3.42	384	0.75	30.53	0.94	53.39	1.18	70.70	3.07	1	0.80
Biling	511	1.78	790	0.36	37.90	1.17	54.09	1.19	26.52	1.15	1	0.80
Kyelang	728	2.53	490	0.59	36.55	1.13	63.44	1.40	66.03	2.87	9	7.21
Bokar	233	0.81	2500	0.12	20.00	0.62	14.29	0.31	0.00	0.00	0	0.00
Gumrang	335	1.16	887	0.32	31.75	0.98	45.52	1.00	8.89	0.39	1	0.80
Girmus	582	2.02	829	0.35	10.34	0.32	32.81	0.72	5.71	0.25	1	0.80
Guskyar	680	2.36	889	0.32	34.38	1.06	52.94	1.17	8.70	0.38	1	0.80
Yurnath	235	0.82	1077	0.27	14.29	0.44	37.04	0.82	6.82	0.30	2	1.60
Gumling	500	1.74	1000	0.29	36.00	1.11	44.00	0.97	7.41	0.32	0	0.00
Magwan	800	2.78	429	0.67	25.00	0.77	65.00	1.43	32.14	1.40	6	4.81
Kyor	300	1.04	1368	0.21	38.46	1.19	37.78	0.83	13.33	0.58	1	0.80
Tayul Gompa	1600	5.56	455	0.63	20.00	0.62	56.25	1.24	20.00	0.87	0	0.00
Bar Gompa	650	2.26	1167	0.25	0.00	0.00	7.69	0.17	0.00	0.00	0	0.00

NAME	X_1	$X_1/\bar{X}_1$	X_2	$X_2/\bar{X}_2$	X_3	$X_3/\bar{X}_3$	X_4	$X_4/\bar{X}_4$	X_5	$X_5/\bar{X}_5$	X_6	$X_6/\bar{X}_6$
Stingiri	2469	8.58	238	1.21	9.21	0.28	34.43	0.76	90.48	3.93	0	0.00
Kawaring	320	1.11	1136	0.25	29.35	0.91	28.90	0.64	52.00	2.26	1	0.80
Tinno	296	1.03	1133	0.25	41.18	1.27	54.38	1.20	15.22	0.66	1	0.80
Kolang	254	0.88	1254	0.23	38.20	1.18	45.00	0.99	25.00	1.09	7	5.61
Kelad	263	0.91	1778	0.16	40.63	1.26	42.00	0.93	11.11	0.48	0	0.00
Khangsar	306	1.06	1136	0.25	38.46	1.19	45.91	1.01	9.42	0.41	1	0.80
Mai	305	1.06	1259	0.23	38.24	1.18	52.46	1.16	5.26	0.23	1	0.80
Gemur	729	2.53	962	0.30	12.00	0.37	29.41	0.65	93.94	4.08	1	0.80
Bog	927	3.22	1075	0.27	43.06	1.33	49.64	1.09	19.54	0.85	1	0.80
Jispa	439	1.53	757	0.38	52.87	1.63	60.89	1.34	31.16	1.35	3	2.40
Tingal	200	0.70	1000	0.29	0.00	0.00	20.00	0.44	0.00	0.00	0	0.00
Chhika-Be	860	2.99	1263	0.23	16.67	0.52	18.60	0.41	0.00	0.00	0	0.00
Rarig	586	2.04	1000	0.29	26.83	0.83	34.15	0.75	4.08	0.18	1	0.80
Rangyo	500	1.74	1500	0.19	50.00	1.55	55.00	1.21	4.35	0.19	1	0.80
Baryo	750	2.61	875	0.33	14.29	0.44	53.33	1.17	0.00	0.00	0	0.00
Lingkyam	743	2.58	926	0.31	64.00	1.98	73.08	1.61	64.29	2.79	0	0.00
Darcha-Sumdol	900	3.13	1093	0.26	29.79	0.92	44.44	0.98	48.21	2.10	1	0.80
Darcha-Dangma	384	1.34	1212	0.24	43.75	1.35	57.53	1.27	24.68	1.07	4	3.20
Yoche	374	1.30	1205	0.24	36.17	1.12	45.35	1.00	18.60	0.81	1	0.80
Barbog	269	0.94	522	0.55	33.33	1.03	31.43	0.69	0.00	0.00	0	0.00
Pasprag	427	1.49	1043	0.28	8.33	0.26	27.66	0.61	0.00	0.00	0	0.00
Lapchang	182	0.63	1609	0.18	24.32	0.75	30.00	0.66	2.44	0.11	1	0.80
Cheling	257	0.89	688	0.42	18.18	0.56	38.89	0.86	0.00	0.00	1	0.80
Thola-Pyasu	400	1.39	1000	0.29	30.77	0.95	38.46	0.85	0.00	0.00	0	0.00
Jholing	100	0.35	1500	0.19	33.33	1.03	60.00	1.32	0.00	0.00	0	0.00
Piukar	321	1.12	1045	0.28	14.13	0.44	26.11	0.58	3.25	0.14	1	0.80
Gajang	384	1.33	1133	0.25	33.33	1.03	43.75	0.96	3.28	0.14	1	0.80
Kardang	273	0.95	1158	0.25	40.00	1.24	51.22	1.13	10.00	0.43	1	0.80
Gushal	353	1.23	840	0.34	38.02	1.18	55.47	1.22	72.92	3.17	6	4.81
Tupchiling	1138	3.95	784	0.37	5.00	0.15	19.78	0.44	94.74	4.12	0	0.00
Shipting	204	0.71	1478	0.19	52.94	1.64	56.14	1.24	13.64	0.59	1	0.80
Wargul	273	0.95	1029	0.28	40.28	1.25	54.23	1.19	18.18	0.79	1	0.80
Muling	500	1.74	1135	0.25	33.94	1.05	51.71	1.14	27.63	1.20	4	3.20
Dalang	450	1.56	723	0.40	32.35	1.00	49.38	1.09	7.89	0.34	1	0.80
Thorang	400	1.39	1270	0.23	42.55	1.32	58.33	1.28	68.18	2.96	1	0.80
Gondhla	429	1.49	885	0.33	37.28	1.15	44.44	0.98	35.61	1.55	6	4.81
Phugthal	355	1.23	950	0.30	36.84	1.14	56.41	1.24	0.00	0.00	0	0.00
Tiling	264	0.92	1846	0.16	33.33	1.03	37.84	0.83	4.00	0.17	3	2.40
Purd	135	0.47	909	0.32	40.00	1.24	50.00	1.10	0.00	0.00	0	0.00
Khinang	300	1.04	1114	0.26	30.61	0.95	49.46	1.09	7.14	0.31	1	0.80

NAME	X_1	$X_1/\bar{X}_1$	X_2	$X_2/\bar{X}_2$	X_3	$X_3/\bar{X}_3$	X_4	$X_4/\bar{X}_4$	X_5	$X_5/\bar{X}_5$	X_6	$X_6/\bar{X}_6$
Khangsar	270	0.94	1052	0.27	52.46	1.62	60.50	1.33	15.28	0.66	3	2.40
Sakar	455	1.58	1083	0.27	50.00	1.55	56.00	1.23	11.11	0.48	0	0.00
Shugu	362	1.26	808	0.36	28.57	0.88	40.43	0.89	0.00	0.00	0	0.00
Jagle	182	0.63	1214	0.24	29.41	0.91	41.94	0.92	0.00	0.00	1	0.80
Kiangcha	360	1.25	2000	0.14	41.67	1.29	55.56	1.22	0.00	0.00	0	0.00
Murticha	327	1.14	815	0.35	22.73	0.70	36.73	0.81	0.00	0.00	1	0.80
Raling	318	1.10	929	0.31	30.77	0.95	37.04	0.82	13.04	0.57	0	0.00
Khorpani	391	1.36	870	0.33	40.00	1.24	51.16	1.13	19.05	0.83	1	0.80
Shuiling	430	1.49	906	0.32	33.33	1.03	49.50	1.09	10.09	0.44	0	0.00
Ropsang	213	0.74	1297	0.22	31.25	0.97	45.88	1.01	9.52	0.41	1	0.80
Jungling	380	1.32	1533	0.19	30.43	0.94	34.21	0.75	0.00	0.00	1	0.80
Khangsar	680	2.36	1125	0.26	33.33	1.03	44.12	0.97	9.09	0.40	0	0.00
Gompathan	400	1.39	1000	0.29	62.50	1.93	68.75	1.51	25.00	1.09	0	0.00
Shashin	400	1.39	967	0.30	45.76	1.41	63.33	1.39	53.66	2.33	6	4.81
Jagdang	287	1.00	1063	0.27	23.53	0.73	34.85	0.77	11.76	0.51	1	0.80
Khawagling	405	1.41	929	0.31	56.41	1.74	67.90	1.50	22.73	0.99	1	0.80
Retil	250	0.87	1105	0.26	33.33	1.03	50.00	1.10	0.00	0.00	0	0.00
Labrang	400	1.39	600	0.48	44.44	1.37	62.50	1.38	0.00	0.00	0	0.00
Shurtang	135	0.47	1250	0.23	40.00	1.24	40.74	0.90	14.29	0.62	1	0.80
Kathal	40	0.14	1000	0.29	100.00	3.09	100.00	2.20	0.00	0.00	1	0.80
Kewak	271	0.94	1111	0.26	40.00	1.24	52.63	1.16	0.00	0.00	0	0.00
Chokhur	800	2.78	1667	0.17	45.00	1.39	50.00	1.10	0.00	0.00	0	0.00
Sarkhang	171	0.60	500	0.58	25.00	0.77	58.33	1.28	0.00	0.00	0	0.00
Rangcha	660	2.29	737	0.39	42.86	1.32	48.48	1.07	0.00	0.00	0	0.00
Bagche	260	0.90	2250	0.13	66.67	2.06	61.54	1.36	0.00	0.00	1	0.80
Kharchudkonma	233	0.81	400	0.72	100.00	3.09	71.43	1.57	0.00	0.00	0	0.00
Kharchud-Yongma	500	1.74	667	0.43	50.00	1.55	52.00	1.15	0.00	0.00	0	0.00
Jamyaling	525	1.82	500	0.58	28.57	0.88	57.14	1.26	7.69	0.33	0	0.00
Laling	243	0.84	889	0.32	50.00	1.55	47.06	1.04	0.00	0.00	0	0.00
Teling	203	0.71	1310	0.22	39.47	1.22	47.76	1.05	5.13	0.22	3	2.40
Damphug	606	2.11	580	0.50	13.04	0.40	36.17	0.80	73.19	3.18	0	0.00
Khoksar	1887	6.56	367	0.78	59.21	1.83	80.57	1.77	95.24	4.14	1	0.80
Yari Khoksar	180	0.63	174	1.65	0.00	0.00	48.15	1.06	73.91	3.21	0	0.00
Losar Khas	67	0.23	921	0.31	32.76	1.01	51.65	1.14	46.59	2.03	6	4.81
Chichong	22	0.08	1292	0.22	45.16	1.40	49.09	1.08	19.23	0.84	1	0.80
Kiamo	32	0.11	1111	0.26	46.67	1.44	52.63	1.16	11.11	0.48	1	0.80
Hanse	86	0.30	937	0.31	35.58	1.10	53.49	1.18	45.56	1.98	6	4.81
Kiato	24	0.08	839	0.34	29.79	0.92	50.49	1.11	37.21	1.62	1	0.80
Pangmo Khas	38	0.13	1605	0.18	27.54	0.85	33.04	0.73	21.74	0.94	1	0.80
Hal	42	0.14	951	0.30	28.21	0.87	45.00	0.99	26.92	1.17	3	2.40

NAME	X_1	$X_1/\bar{X}_1$	X_2	$X_2/\bar{X}_2$	X_3	$X_3/\bar{X}_3$	X_4	$X_4/\bar{X}_4$	X_5	$X_5/\bar{X}_5$	X_6	$X_6/\bar{X}_6$
Morang	8	0.03	1727	0.17	42.11	1.30	56.67	1.25	75.00	3.26	1	0.80
Sumling	16	0.06	1270	0.23	38.30	1.18	51.19	1.13	50.00	2.17	1	0.80
Khurik	56	0.20	1110	0.26	29.63	0.92	44.16	0.97	32.76	1.42	1	0.80
Yarango Rangarik	19	0.07	1000	0.29	32.50	1.00	45.00	0.99	32.50	1.41	0	0.00
Marango Rangarik	114	0.40	823	0.35	31.71	0.98	45.69	1.01	83.47	3.63	6	4.81
Ki	52	0.18	425	0.68	30.26	0.94	66.27	1.46	67.86	2.95	2	1.60
Gete	34	0.12	789	0.36	53.33	1.65	38.24	0.84	11.11	0.48	1	0.80
Tashi Gang	29	0.10	667	0.43	0.00	0.00	15.00	0.33	0.00	0.00	1	0.80
Kibar Khas	73	0.25	960	0.30	28.92	0.89	49.85	1.10	40.48	1.76	3	2.40
Chichimkhas	127	0.44	1034	0.28	28.57	0.88	38.61	0.85	9.52	0.41	3	2.40
Kaja Khas	394	1.37	395	0.73	47.96	1.48	68.37	1.51	86.95	3.78	6	4.81
Kaja Soma	453	1.57	370	0.78	41.82	1.29	67.27	1.48	95.06	4.13	1	0.80
Kakti	56	0.19	1500	0.19	0.00	0.00	20.00	0.44	0.00	0.00	0	0.00
Kuang Khas	11	0.04	1375	0.21	27.27	0.84	36.84	0.81	50.00	2.17	1	0.80
Keuling	45	0.16	1231	0.23	54.17	1.67	60.92	1.34	80.77	3.51	1	0.80
Komik	81	0.28	825	0.35	29.79	0.92	53.85	1.19	59.46	2.58	1	0.80
Hikim	155	0.54	809	0.36	23.61	0.73	42.24	0.93	57.50	2.50	3	2.40
Langja	36	0.13	913	0.32	16.44	0.51	35.29	0.78	30.00	1.30	2	1.60
Lara Khas	27	0.09	967	0.30	24.14	0.75	38.98	0.86	7.69	0.33	1	0.80
Shego	21	0.07	1083	0.27	33.33	1.03	36.00	0.79	42.86	1.86	1	0.80
Lidang	31	0.11	930	0.31	30.19	0.93	35.45	0.78	50.00	2.17	1	0.80
Domal Khas	161	0.56	1120	0.26	12.14	0.38	27.92	0.62	34.33	1.49	1	0.80
Gangdo Demul	11	0.04	818	0.35	22.22	0.69	50.00	1.10	0.00	0.00	0	0.00
Sulche	7	0.02	1333	0.22	0.00	0.00	14.29	0.31	0.00	0.00	0	0.00
Chabrang Khas	14	0.05	1000	0.29	0.00	0.00	25.00	0.55	0.00	0.00	0	0.00
Lingti	107	0.37	333	0.86	0.00	0.00	37.50	0.83	100.00	4.35	0	0.00
Sanglung	17	0.06	1400	0.21	14.29	0.44	25.00	0.55	0.00	0.00	0	0.00
Rama Khas	62	0.21	871	0.33	25.93	0.80	39.66	0.87	19.05	0.83	1	0.80
Tulse Pena	43	0.15	5000	0.06	40.00	1.24	50.00	1.10	50.00	2.17	0	0.00
Kunge	35	0.12	44	6.47	0.00	0.00	38.30	0.84	100.00	4.35	0	0.00
Lalung Khas	163	0.56	970	0.30	14.06	0.43	30.00	0.66	22.22	0.97	3	2.40
Kibri	20	0.07	2167	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
Landupdhin	11	0.04	1333	0.22	0.00	0.00	14.29	0.31	25.00	1.09	0	0.00
Shichling	63	0.22	633	0.45	41.94	1.30	63.75	1.40	62.00	2.69	1	0.80
Shiluk	29	0.10	1500	0.19	25.00	0.77	35.00	0.77	30.00	1.30	0	0.00
Samling	5	0.02	1750	0.16	28.57	0.88	54.55	1.20	0.00	0.00	0	0.00
Dankar	41	0.14	782	0.37	21.74	0.67	41.60	0.92	36.70	1.60	3	2.40
Mane Gogma	28	0.10	895	0.32	23.53	0.73	34.03	0.75	63.46	2.76	1	0.80
Kaley	5	0.02	1000	0.29	22.22	0.69	50.00	1.10	25.00	1.09	0	0.00
Mane Yogma	98	0.34	1037	0.28	22.12	0.68	38.29	0.84	32.56	1.42	3	2.40

NAME	X_1	$X_1/\bar{X}_1$	X_2	$X_2/\bar{X}_2$	X_3	$X_3/\bar{X}_3$	X_4	$X_4/\bar{X}_4$	X_5	$X_5/\bar{X}_5$	X_6	$X_6/\bar{X}_6$
Poh	163	0.57	1140	0.25	38.78	1.20	50.00	1.10	47.30	2.06	1	0.80
Pomrang	11	0.04	2000	0.14	42.86	1.32	57.14	1.26	33.33	1.45	0	0.00
Nidand	39	0.13	1750	0.16	35.71	1.10	40.91	0.90	30.77	1.34	1	0.80
Qurit	13	0.05	2667	0.11	50.00	1.55	45.45	1.00	25.00	1.09	1	0.80
Tabo	234	0.81	414	0.70	23.42	0.72	50.74	1.12	80.00	3.48	6	4.81
Lari	68	0.23	1000	0.29	25.00	0.77	41.45	0.91	56.10	2.44	1	0.80
Lapcha	109	0.38	91	3.16	0.00	0.00	83.33	1.84	100.00	4.35	0	0.00
Giu	101	0.35	851	0.34	33.72	1.04	55.08	1.21	44.78	1.95	1	0.80
Hurling	154	0.54	726	0.40	29.51	0.91	48.28	1.06	75.00	3.26	1	0.80
Samdo	62	0.21	317	0.91	63.64	1.97	69.34	1.53	100.00	4.35	0	0.00
Shilling	27	0.09	1333	0.22	37.50	1.16	46.43	1.02	37.50	1.63	1	0.80
Chhidang	15	0.05	1286	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
Guling	131	0.45	848	0.34	23.08	0.71	45.88	1.01	31.25	1.36	3	2.40
Bhar	108	0.38	859	0.33	18.03	0.56	37.88	0.83	17.24	0.75	1	0.80
Mikim	79	0.27	1000	0.29	36.36	1.12	50.00	1.10	33.33	1.45	1	0.80
Tangti Yogma	54	0.19	1162	0.25	20.93	0.65	38.75	0.85	4.17	0.18	1	0.80
Tangti Kogma	27	0.09	886	0.32	12.82	0.40	28.92	0.64	5.13	0.22	1	0.80
Khar	29	0.10	927	0.31	11.76	0.36	32.08	0.71	4.00	0.17	1	0.80
Uperla Guling	94	0.33	1040	0.28	11.54	0.36	39.22	0.86	11.11	0.48	1	0.80
Kongkong	39	0.13	375	0.77	0.00	0.00	25.00	0.55	83.87	3.65	0	0.00
Gungri	54	0.19	1043	0.28	10.20	0.32	34.38	0.76	15.69	0.68	1	0.80
Phukchung	22	0.08	3714	0.08	57.69	1.78	51.52	1.13	28.57	1.24	0	0.00
Ka	13	0.05	1091	0.26	8.33	0.26	8.70	0.19	0.00	0.00	0	0.00
Minser	16	0.06	1125	0.26	0.00	0.00	5.88	0.13	12.50	0.54	0	0.00
Sagnam	269	0.94	960	0.30	13.86	0.43	33.33	0.73	29.89	1.30	6	4.81
Todnam	54	0.19	944	0.30	23.53	0.73	25.71	0.57	21.43	0.93	1	0.80
Tiling	86	0.30	879	0.33	25.86	0.80	34.68	0.76	21.05	0.92	1	0.80
Yansa	21	0.07	1167	0.25	0.00	0.00	7.69	0.17	0.00	0.00	0	0.00
Mud	229	0.80	1034	0.28	10.99	0.34	26.26	0.58	16.67	0.72	1	0.80
MEAN	288	1	1076	0	32	1	45	1	23	1	1	1

NAME	X_7	$X_7/\bar{X}_7$	X_8	$X_8/\bar{X}_8$	X_9	$X_9/\bar{X}_9$	X_{10}	$X_{10}/\bar{X}_{10}$	X_{11}	$X_{11}/\bar{X}_{11}$	X_{12}	$X_{12}/\bar{X}_{12}$
Bhujund	2	3.80	1	1.11	0	0.00	0	0.00	0	0.00	0.15	0.83
R.F.Krakun	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
D.P.F.Ransani	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
D.P.F.Lohni	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.63	3.58
Bharaur	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.24	1.39
Tindi	3	5.70	1	1.11	1	5.54	0	0.00	0	0.00	0.10	0.58
Harsar	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.36	2.03
D.P.F. Dhanwani	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.15	0.84
Kurched	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.12	0.66
R.F. Rumas	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.00	0.00
Salgaraon	2	3.80	1	1.11	0	0.00	0	0.00	1	1.13	0.92	5.22
Shakoli	2	3.80	1	1.11	0	0.00	0	0.00	1	1.13	0.09	0.52
D.P.F. Lobar	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.09	0.50
Salpat	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.06	0.35
Udaipur	4	7.60	1	1.11	1	5.54	1	5.10	1	1.13	0.02	0.13
R.F. Riodhan	0	0.00	0	0.00	0	0.00	1	5.10	0	0.00	0.00	0.00
Margaraon	2	3.80	1	1.11	0	0.00	0	0.00	1	1.13	0.08	0.48
Tingrat	6	11.40	1	1.11	0	0.00	0	0.00	1	1.13	0.10	0.58
Khanjar	0	0.00	1	1.11	0	0.00	0	0.00	0	0.00	0.29	1.68
Chaling	0	0.00	1	1.11	0	0.00	0	0.00	0	0.00	0.11	0.64
Karpat	1	1.90	1	1.11	1	5.54	0	0.00	1	1.13	0.09	0.51
D.P.F. Shiling	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.14	0.81
Chamrat	4	7.60	1	1.11	1	5.54	0	0.00	1	1.13	0.12	0.71
D.P.F. Tumru	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.38	2.14
Ghari	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.05	0.28
Sindwari	2	3.80	1	1.11	0	0.00	1	5.10	1	1.13	0.06	0.36
D.P.F. Sindwari	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.44	2.53
Arat	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.13	0.75
D.P.F. Phatgahar	0	0.00	1	1.11	1	5.54	1	5.10	1	1.13	0.02	0.14
Haruka	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.21	1.21
Kishori	0	0.00	1	1.11	1	5.54	0	0.00	1	1.13	0.10	0.56
Trilok Nath	1	1.90	1	1.11	1	5.54	0	0.00	1	1.13	0.09	0.50
D.P.F. Bhiyari	0	0.00	1	1.11	0	0.00	0	0.00	0	0.00	0.15	0.86
D.P.F. Gilding	0	0.00	1	1.11	0	0.00	0	0.00	0	0.00	0.60	3.42
Jholang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.11	0.63
Nain Gahar	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.10	0.56
Guari	0	0.00	0	0.00	0	0.00	0	0.00	1	1.13	0.19	1.07

NAME	X_7	$X_7/\bar{X}_7$	X_8	$X_8/\bar{X}_8$	X_9	$X_9/\bar{X}_9$	X_{10}	$X_{10}/\bar{X}_{10}$	X_{11}	$X_{11}/\bar{X}_{11}$	X_{12}	$X_{12}/\bar{X}_{12}$
Chhogjing	0	0.00	0	0.00	0	0.00	0	0.00	1	1.13	0.13	0.71
Chokhang	2	3.80	1	1.11	0	0.00	0	0.00	1	1.13	0.10	0.54
Thirot	0	0.00	1	1.11	1	5.54	1	5.10	1	1.13	0.01	0.06
Kamri	1	1.90	1	1.11	0	0.00	1	5.10	1	1.13	0.05	0.31
Dandak	3	5.70	1	1.11	0	0.00	0	0.00	1	1.13	0.07	0.42
Murang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.18	1.05
Chambak	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.07	0.41
Shenwar	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.44	2.53
Sheling	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.17	0.95
Bha Baring	2	3.80	1	1.11	0	0.00	0	0.00	1	1.13	0.10	0.57
Leh Baring	2	3.80	1	1.11	0	0.00	0	0.00	1	1.13	0.07	0.42
Kuang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.06	0.33
Dreldra	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.15	0.84
Bha Chewar	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.04	0.20
Khuruti	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.13	0.76
Nalda	2	3.80	1	1.11	0	0.00	0	0.00	1	1.13	0.09	0.49
Jasrath	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.08	0.46
Galing	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.67	3.80
Junde	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.11	0.65
Taljon	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.08	0.46
Lomach	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.08	0.46
Tibok	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.07	0.38
Othang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.21	1.19
Yang Thang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.42	2.41
Jahlma	0	0.00	1	1.11	1	5.54	0	0.00	1	1.13	0.09	0.53
Phura	1	1.90	1	1.11	0	0.00	0	0.00	1	1.13	0.06	0.34
Jobrang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.15	0.86
Rape	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.09	0.49
Ghambari	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.30	1.71
Rashil	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.13	0.72
Lingar	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.19	1.05
Lindur	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.16	0.92
Kothi	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.17	0.98
Rapring	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.18	1.02
Goruma	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.16	0.90
Shansha	4	7.60	1	1.11	1	5.54	0	0.00	1	1.13	0.12	0.70
Parak	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.18	1.04
Thapak	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.13	0.75
Duansha	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.15	0.83
Yang Kirting	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.11	0.60

NAME	X_7	$X_7/\bar{X}_7$	X_8	$X_8/\bar{X}_8$	X_9	$X_9/\bar{X}_9$	X_{10}	$X_{10}/\bar{X}_{10}$	X_{11}	$X_{11}/\bar{X}_{11}$	X_{12}	$X_{12}/\bar{X}_{12}$
Kirting	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.05	0.27
Rualing	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.17	0.99
Telangbe	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.37	2.10
Meling	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.23	1.31
Ruring	0	0.00	1	1.11	1	5.54	0	0.00	1	1.13	0.21	1.19
Muchhling	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	1.00	5.70
To-Karing	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.14	0.81
Lot	4	7.60	1	1.11	0	0.00	1	5.10	1	1.13	0.08	0.44
Karing	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.17	0.99
Lapshak	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.11	0.63
Yangrang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.22	1.27
Rangbe	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.11	0.61
Yang Tozing	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.18	1.01
Tozing	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.12	0.69
Wari	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.13	0.76
Marbaj	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.20	1.12
Baring	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.10	0.57
Bha-Garang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.11	0.60
Krozing	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.13	0.74
Malang	0	0.00	1	1.11	1	5.54	0	0.00	1	1.13	0.17	0.96
Leh-Garang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.27	1.52
Dape-Marang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.17	0.95
Tholung	1	1.90	1	1.11	1	5.54	1	5.10	1	1.13	0.12	0.68
Phunkiyar	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.11	0.65
Bokta	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.18	1.04
Bha-Sumnam	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.21	1.19
Leh-Sumnam	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.26	1.46
Tandi	0	0.00	1	1.11	1	5.54	1	5.10	1	1.13	0.05	0.29
Biling	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.09	0.49
Kyelang	13	24.70	1	1.11	2	11.08	1	5.10	1	1.13	0.04	0.22
Bokar	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.14	0.81
Gumrang	0	0.00	1	1.11	1	5.54	0	0.00	1	1.13	0.14	0.81
Girmus	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.08	0.44
Guskyar	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.06	0.34
Yurnath	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.19	1.05
Gumling	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.08	0.46
Magwan	4	7.60	1	1.11	0	0.00	0	0.00	1	1.13	0.08	0.43
Kyor	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.16	0.89
Tayul Gompa	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.00	0.00
Bar Gompa	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.08	0.44

NAME	X_7	$X_7/\bar{X}_7$	X_8	$X_8/\bar{X}_8$	X_9	$X_9/\bar{X}_9$	X_{10}	$X_{10}/\bar{X}_{10}$	X_{11}	$X_{11}/\bar{X}_{11}$	X_{12}	$X_{12}/\bar{X}_{12}$
Stingiri	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.02	0.12
Kawaring	2	3.80	1	1.11	0	0.00	1	5.10	1	1.13	0.10	0.59
Tinno	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.16	0.89
Kolang	0	0.00	1	1.11	1	5.54	1	5.10	1	1.13	0.13	0.71
Kelad	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.12	0.68
Khangsar	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.13	0.72
Mai	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.18	1.03
Gemur	1	1.90	1	1.11	1	5.54	1	5.10	1	1.13	0.06	0.34
Bog	1	1.90	1	1.11	1	5.54	1	5.10	1	1.13	0.05	0.29
Jispa	0	0.00	1	1.11	1	5.54	1	5.10	1	1.13	0.10	0.56
Tingal	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.20	1.14
Chhika-Be	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.05	0.26
Rarig	2	3.80	1	1.11	0	0.00	0	0.00	1	1.13	0.07	0.42
Rangyo	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.10	0.57
Baryo	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.07	0.38
Lingkyam	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.06	0.33
Darcha-Sumdol	0	0.00	1	1.11	1	5.54	0	0.00	1	1.13	0.06	0.32
Darcha-Dangma	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.09	0.51
Yoche	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.15	0.86
Barbog	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.11	0.65
Pasprag	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.09	0.48
Lapchang	2	3.80	1	1.11	0	0.00	0	0.00	1	1.13	0.23	1.33
Cheling	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.15	0.84
Thola-Pyasu	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.12	0.66
Jholing	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.40	2.28
Piukar	1	1.90	1	1.11	0	0.00	0	0.00	1	1.13	0.12	0.70
Gajang	4	7.60	1	1.11	0	0.00	0	0.00	1	1.13	0.14	0.77
Kardang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.11	0.61
Gushal	4	7.60	1	1.11	1	5.54	0	0.00	1	1.13	0.12	0.67
Tupchiling	0	0.00	1	1.11	1	5.54	0	0.00	1	1.13	0.03	0.19
Shipting	0	0.00	1	1.11	1	5.54	0	0.00	1	1.13	0.25	1.40
Wargul	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.15	0.84
Muling	1	1.90	1	1.11	0	0.00	0	0.00	1	1.13	0.10	0.58
Dalang	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.11	0.63
Thorang	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.12	0.68
Gondhla	9	17.10	1	1.11	1	5.54	1	5.10	1	1.13	0.09	0.51
Phugthal	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.10	0.58
Tiling	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.16	0.92
Purd	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.17	0.95
Khinang	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.12	0.67

NAME	X_7	$X_7/\bar{X}_7$	X_8	$X_8/\bar{X}_8$	X_9	$X_9/\bar{X}_9$	X_{10}	$X_{10}/\bar{X}_{10}$	X_{11}	$X_{11}/\bar{X}_{11}$	X_{12}	$X_{12}/\bar{X}_{12}$
Khangsar	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.12	0.67
Sakar	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.06	0.34
Shugu	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.09	0.48
Jagle	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.13	0.73
Kiangcha	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.06	0.32
Murticha	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.08	0.46
Raling	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.09	0.53
Khorpani	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.07	0.40
Shuiling	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.10	0.59
Ropsang	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.18	1.01
Jungling	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.11	0.60
Khangsar	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.06	0.34
Gompathan	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.10	0.59
Shashin	0	0.00	1	1.11	1	5.54	1	5.10	1	1.13	0.10	0.57
Jagdang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.14	0.78
Khawagling	14	26.60	1	1.11	0	0.00	1	5.10	1	1.13	0.16	0.91
Retil	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.15	0.85
Labrang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.04	0.24
Shurtang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.22	1.27
Kathal	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	1.25	7.12
Kewak	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.11	0.60
Chokhur	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.09	0.53
Sarkhang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.17	0.95
Rangcha	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.06	0.35
Bagche	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.15	0.88
Kharchudkonma	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.14	0.81
Kharchud-Yongma	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.08	0.46
Jamyaling	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.10	0.54
Laling	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.18	1.01
Teling	2	3.80	1	1.11	0	0.00	1	5.10	1	1.13	0.28	1.62
Damphug	1	1.90	1	1.11	1	5.54	1	5.10	1	1.13	0.09	0.48
Khoksar	1	1.90	1	1.11	0	0.00	1	5.10	1	1.13	0.04	0.20
Yari Khoksar	0	0.00	1	1.11	0	0.00	1	5.10	1	1.13	0.26	1.48
Losar Khas	1	1.90	1	1.11	1	5.54	0	0.00	1	1.13	0.17	0.94
Chichong	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.27	1.55
Kiamo	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.25	1.45
Hanse	1	1.90	1	1.11	1	5.54	0	0.00	1	1.13	0.20	1.11
Kiato	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.32	1.82
Pangmo Khas	0	0.00	1	1.11	1	5.54	0	0.00	1	1.13	0.13	0.71
Hal	2	3.80	1	1.11	1	5.54	0	0.00	1	1.13	0.18	1.00

NAME	X_7	$X_7/\bar{X}_7$	X_8	$X_8/\bar{X}_8$	X_9	$X_9/\bar{X}_9$	X_{10}	$X_{10}/\bar{X}_{10}$	X_{11}	$X_{11}/\bar{X}_{11}$	X_{12}	$X_{12}/\bar{X}_{12}$
Morang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.20	1.14
Sumling	2	3.80	1	1.11	0	0.00	0	0.00	1	1.13	0.19	1.08
Khurik	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.19	1.07
Yarango Rangarik	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.45	2.56
Marango Rangarik	2	3.80	1	1.11	1	5.54	0	0.00	1	1.13	0.08	0.45
Ki	2	3.80	1	1.11	0	0.00	0	0.00	1	1.13	0.07	0.42
Gete	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.15	0.84
Tashi Gang	0	0.00	1	1.11	0	0.00	0	0.00	0	0.00	0.25	1.42
Kibar Khas	1	1.90	1	1.11	1	5.54	0	0.00	0	0.00	0.13	0.76
Chichimkhas	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.12	0.68
Kaja Khas	0	0.00	1	1.11	1	5.54	0	0.00	1	1.13	0.06	0.36
Kaja Soma	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.00	0.03
Kakti	0	0.00	1	1.11	0	0.00	0	0.00	0	0.00	0.20	1.14
Kuang Khas	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.42	2.40
Keuling	0	0.00	0	0.00	0	0.00	0	0.00	1	1.13	0.32	1.83
Komik	0	0.00	0	0.00	0	0.00	0	0.00	1	1.13	0.13	0.77
Hikim	2	3.80	1	1.11	1	5.54	0	0.00	1	1.13	0.15	0.85
Langja	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.25	1.45
Lara Khas	0	0.00	1	1.11	1	5.54	0	0.00	1	1.13	0.29	1.64
Shego	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.12	0.68
Lidang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.19	1.09
Domal Khas	1	1.90	1	1.11	1	5.54	0	0.00	1	1.13	0.07	0.39
Gangdo Demul	0	0.00	0	0.00	0	0.00	0	0.00	1	1.13	0.65	3.70
Sulche	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.14	0.81
Chabrang Khas	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.38	2.14
Lingti	0	0.00	0	0.00	0	0.00	0	0.00	1	1.13	0.00	0.00
Sanglung	0	0.00	0	0.00	0	0.00	0	0.00	1	1.13	0.33	1.90
Rama Khas	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.12	0.69
Tulse Pena	0	0.00	1	1.11	0	0.00	0	0.00	0	0.00	0.17	0.95
Kunge	0	0.00	1	1.11	0	0.00	0	0.00	0	0.00	0.09	0.48
Lalung Khas	0	0.00	1	1.11	1	5.54	0	0.00	1	1.13	0.14	0.79
Kibri	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.32	1.80
Landupdhin	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.57	3.25
Shichling	0	0.00	0	0.00	1	5.54	0	0.00	1	1.13	0.08	0.43
Shiluk	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.10	0.57
Samling	0	0.00	0	0.00	0	0.00	0	0.00	1	1.13	2.55	14.50
Dankar	2	3.80	1	1.11	1	5.54	0	0.00	1	1.13	0.13	0.74
Mane Gogma	0	0.00	1	1.11	1	5.54	0	0.00	1	1.13	0.15	0.87
Kaley	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.22	1.27
Mane Yogma	2	3.80	1	1.11	0	0.00	0	0.00	1	1.13	0.12	0.69

NAME	X_7	$X_7/\bar{X}_7$	X_8	$X_8/\bar{X}_8$	X_9	$X_9/\bar{X}_9$	X_{10}	$X_{10}/\bar{X}_{10}$	X_{11}	$X_{11}/\bar{X}_{11}$	X_{12}	$X_{12}/\bar{X}_{12}$
Poh	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.12	0.68
Pomrang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	1.19	6.78
Nidand	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.11	0.65
Qurit	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.27	1.55
Tabo	3	5.70	1	1.11	1	5.54	0	0.00	1	1.13	0.07	0.41
Lari	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.20	1.16
Lapcha	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.08	0.47
Giu	1	1.90	1	1.11	1	5.54	0	0.00	1	1.13	0.16	0.88
Hurling	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.19	1.06
Samdo	0	0.00	0	0.00	1	5.54	1	5.10	1	1.13	0.00	0.00
Shilling	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.14	0.81
Chhidang	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.13	0.71
Guling	2	3.80	1	1.11	1	5.54	0	0.00	1	1.13	0.16	0.94
Bhar	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.15	0.86
Mikim	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.18	1.04
Tangti Yogma	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.19	1.07
Tangti Kogma	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.20	1.17
Khar	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.27	1.56
Uperla Guling	0	0.00	0	0.00	0	0.00	0	0.00	1	1.13	0.14	0.78
Kongkong	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.25	1.42
Gungri	0	0.00	1	1.11	0	0.00	0	0.00	1	1.13	0.19	1.07
Phukchung	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.27	1.55
Ka	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.35	1.98
Minser	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.18	1.01
Sagnam	1	1.90	1	1.11	1	5.54	0	0.00	1	1.13	0.06	0.35
Todnam	0	0.00	1	1.11	0	0.00		0.00	0	0.00	0.23	1.30
Tiling	0	0.00	1	1.11	0	0.00	0	0.00	0	0.00	0.15	0.83
Yansa	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0.38	2.19
Mud	2	3.80	1	1.11	1	5.54	0	0.00	0	0.00	0.07	0.38
MEAN	1		1		0		0		1		0.18	

X_1 Population Density

X_2 Sex Ratio (Negative)

X_3 Literacy

X_4 Female Literacy

X_5 Non-Agricultural Workers

X_6 Educational Facilities

X_7 Medical Facilities

X_8 Drinking Water (Tap Water)

X_9 Postal Services (Post Office)

X_{10} Transport (Pucca Road)

X_{11} Electricity (Percentage of Electrified Households)

X_{12} Per Capita Land Availability

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