Chapter I

INTRODUCTION

Right from the emergence of human being on earth, there have been some direct and indirect links between their broad physical milieu and mode of existence. There were always appreciable differences between inhabitants of tropical world and their counterparts living in arctic or temperate lands. Interaction between the physical environment and society has been an area for attention of social scientists and ecologists. Mountains form areas where role of environment is rather more direct and pronounced. Society apart from being shaped by environmental factors also modifies natural forces up to an extent.

Mountain regions span over about one-fifth of the earth’s surface and influence not only regional and continental atmospheric circulation patterns but also global water and energy cycles. These, in fact, provide vital link between water and air. These are among most significant ecosystems of the planet and are corridors through which ‘life’ evolved, emerged, prospered, and conquered newer territories. Mountains are lungs of the system called biosphere as these govern and modulate global temperature, precipitation and energy flow etc. Mountains are also curators of significant portion of global biodiversity. Due to greater technological expertise and inflating human demands for natural resources, mountains have become threatened ecological zones. Thus, many flora and fauna species indigenous to mountains have become either endangered or extinct. Whether in plains or in hills, human life has been invariably interwoven around surrounding ecosystems in the perpetuation and evolution of civilizations.

Apparenty, mountains across the globe resemble one another. However, a closer look brings out ample differences among high mountains of dry, tropical and temperate zones. The relationship between high regions and lowlands is significant. Height in cool and cold temperate latitude is definitely disadvantageous while it is advantageous in subtropics and tropics where mountain ranges are rain-catchers as well as have the advantage of being non-sultry in comparison to plains. However, observing the processes of socio-economic development, differences are remarkably unique.
Mountains are storehouse of many resources used by people living in lowlands. Demographic processes are main agents of direct interaction between lowland and mountains\(^2\). Hilly areas generally have low carrying capacity. This results in considerable out-migration to the lowlands, both seasonal as well as permanent. However, there is a good reverse seasonal flow from lowlands to mountains mainly of holiday makers, trekkers, mountaineers, skiers, pilgrims and traders, etc. Mountains have always served as the remote but safer asylums for people of many races and communities whose life and prosperity was endangered in lowlands. These waves of people towards the mountains have had considerable impact on highland economy, society and culture. Increasingly urbanized life-style is also having direct and indirect impact on the mountain ecosystem and their interaction with lowlands. These impacts are given below:

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<td>Land fragmentation, deforestation, physical damage to soil.</td>
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<td>Water-freshwater, hydroelectric power, sediment transportation.</td>
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• Risk of landslide, rock fall, slope failure, cloudburst, flash flood and related catastrophes.

With the inclusion of chapter thirteen of "Agenda 21" entitled "Managing Fragile Ecosystems: Sustainable Mountain Development," mountain regions were formally accorded equal priority by the United Nations in the global environment-development agenda with other vital topics such as global climatic-change, desertification, deforestation, etc.

Taking note of the steep slope and sharp altitudinal variations, mountains across world can be broadly clubbed together. Slope and topographic variations in mountains bring out the following related characteristics;

1. There are rapid and systematic variations in elements of climate such as precipitation, temperature etc. over short distances.

2. There is a systematic variation in soil profile and its chemistry, level of carbon dioxide, UV-rays etc.

3. Increased direct run-off and resulting erosion influences hydrological cycle.

Due to steep gradient, mountains serve as site of climate-change and are of significance in basic understanding of hydrological and ecological responses to global change. These are also important in comprehending the influence of climate-change, population-pressure and land utilization patterns. Though the process of global environmental change is very important in mountains, nevertheless, political and socio-economic factors have been equally significant and are interlinked. These interconnected processes encompass;

• Permanent and seasonal migration from mountains.

• Incorporation of mountain economies into wider national and global economies.

• Widening impact of urban lifestyle through process of urbanization in the nearby districts, which is reinforced by newer and efficient modes of communication.

The main difference between mountainous land across the globe lies in the fact that, in the developed countries, these are either centrally situated between dynamic industrial regions or industries have just sprung up adjacent to such places. Alps and Pyrenees are two such cases to be cited. These mountains are closely

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1 Agenda 21: A plan for action into 21st century; endorsed by most countries of the world at the UN Conference on Environment and Development (UNCED) held at Rio de Janeiro in June 1992.
intertwined with modern economy and society. Better management practices and availability of infrastructure here accounts for a vibrant tourism industry. There is negligible traditional farming and settlements in Scandinavian and Non-European high mountains of developed countries. Such mountains have been the domain of hunters and lumberjacks and possess a few tourist spots. As opposed to this, agriculture still plays dominant role in the economy of mountains of developing countries. Utilization of modern technological inputs has made it possible to undertake and expand agriculture and allied activities on regular basis. Whether this process will erode the rural societies and add to the problems of developing countries is not difficult to comprehend.

Though mountain regions in developing countries are trying to emulate development model of Alps and Pyrenees but it is delayed in time. Mountains across developed and developing countries differ because of their physical, social and infrastructural settings.

Traditionally, mountain communities have been connected to its ecosystem functioning. Therefore, a close relationship exists between ecological and social processes in its landscape. Human beings unlike animals, do not adapt himself to nature but interacts with it, modifies it and get transformed in the process.

**Importance of mountainous regions in research:**

1. In many mountain ranges, higher parts remain unaffected by direct human influence. Many such areas are designated as National Parks, Wildlife Sanctuaries or Biosphere Reserves etc, and these serve as a natural laboratory for atmospheric changes and their effects.

2. Meteorological, hydrological and ecological characteristics change very sharply over short distances in mountains due to steep gradient. This results in changes in ecosystem. Consequently, biodiversity is relatively high in mountains. Thus, mountains provide a good research opportunity to both natural and social scientist.

3. Global distribution of mountains allows comparative regional studies and to probe regional changes in environmental factors.

4. From Kosovo to Kashmir, Chechnya to Siachin, considerable chunks of global conflicts have taken its root in mountains and these also host large proportion of world’s poorest and malnourished people. Afghanistan has been a typical case in point. Simmering unrest in China’s Xinjiyang
province and in central Asian mountainous republics such as Tajikistan, Uzbekistan, Kazakhstan and Kyrgyzstan cry out for global attention towards various facets of mountains and the societies living therein.

**Himalayas**

Himalaya is the youngest and is also among most magnificent of mountain systems. It is not just a geographical entity but contains a series of mountain ranges which epitomise civilisational identity that goes back to the dawn of history. Hundreds of millions of people throughout Indian subcontinent and China, most of who live far from Himalayas, rely on water of rivers which have their perennial source of water in glaciers in Himalaya.

Indian Himalayas cover an area of 5,31,250 square kilometres, which accounts for about 16.16 percent of India's total geographical area. It is spread over the states of Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Northern most part of West Bengal, Sikkim and Arunachal Pradesh. Hills of Arunachal Pradesh, Nagaland, Manipur, Assam, Mizorum and Tripura are parts of south-east Himalayas (Purvanchal Himalaya). The Himalayas in Indian territory extend all along the northern border from the border with Pakistan on the west to Myanmar in the east having a total length of about 2500 km. Its average width is about 240 km.

About 4 per cent of India’s population lives in Himalayas. Population was 30,468,612 persons in 1991, which rose to 39,628,311 persons in 2001. Thus, decadal increase has been 30 per cent. Rate of growth of population in the region has been higher compared to the national growth rate. Total population and the growth rate is highest among all mountain regions of the world.

People living in urban areas have greater access to market and technology. Thus, they have better chances of experiencing upward economic mobility and use of resources. As opposed to this, people living in remote areas most often have inadequate food and other resources. Agricultural productivity in such areas is low. Soil erosion, landslides, degradation of land and water resources and loss of biodiversity has become common problems in most of such regions.

In most probability, Himalayas are the site of the largest deployment of armed forces and destructive weapons in a mountainous region anywhere in the world. The collective concentration of forces of China, India, Pakistan and a few other countries are putting tremendous pressure on the ecology of Himalayas. Unless all countries of the region realise this problem and join hands to reverse ecological
destruction, future generations of Chinese, Indians, Tibetans, Nepalese and Pakistanis will not have left much to fight over⁵.

Distinct environmental settings of mountain areas make these different from plains. Inaccessibility, fragility, marginality, diversity and ecological suitability are some distinct characteristics of these mountains⁶. Mountain specific characteristics are interrelated in terms of temperature, terrain, soil and vegetation. These also share the consequences of stress due to heightened human interventions. Implications of these mountain features put constraints on as well as provide opportunities for activities which are more specific to mountains. In fact, the whole range of activities in the mountains based on local resources are conditioned and moulded according to these specificities. Human intervention generally gets limited to carrying capacity. However, once human activities transcend the limits of natural resource base, environmental degradation sets in.

I.1 Introduction to Study Area:

Kinnaur is among the remote and high altitude districts of India. It has rugged mountainous terrain with altitude ranging from 1300m to 6000m above mean sea level. Previously, the district formed a part of erstwhile princely state of Bushair and was governed from Rampur which was the headquarters of the state. Kinnaur fell under Tibetan rule during 7th century A.D⁷. Upper Kinnaur continued to witness the influence of Ladakh until 1683 A.D. District of Kinnaur is situated in the eastern part of Himachal Pradesh. It lies between 31°05'55"N and 32°05' 20" North latitude and between 77°45'E and 79°00' 50"E longitude with an area of 6401 square kilometres and had a population of 77007 persons in 2001. It is bounded on its Northern and North-western side by spurs of snowy mountains which separate it from Spiti and in the east by similar terrain, which is in Tibet. Shimla district of Himachal Pradesh and Uttarkashi district of Uttarakhand are situated to its south. Its climate ranges from moist-temperate to cold-arid. Entire district is composed of a series of mountains, which are alternated with a succession of valleys. Satlej river and its tributaries traverse these mountains. Satlej originates beyond the Great Himalayan Range in Tibet and enters into India through the mountains of Kinnaur indicating this to be an antecedent river. Kinnaur has three parallel ranges namely Zanskar Range, Great Himalayan Range and Dhauladhar Range. Zanskar Range cuts off Kinnaur from Nagari region of Tibet. Great Himalayan Range lies to the south of Zanskar Range. Dhauladhar Range occupies the southern boundary of Kinnaur.
separating it from Uttarkashi district of Uttarakhand and Rohru tehsil of Shimla district. It merges with Great Himalayan Range at the south-eastern corner. Great Himalayan Range separates moist-temperate region of the district from cold-arid Trans-Himalayan region which occupies major area of Kinnaur district. On account of the high altitude and resultant cold-arid climate, it is among the environmentally very difficult regions to live in. Moreover, the society is still in early stages of development, therefore, influence of environment is pronounced. In response to environmental compulsions, Kinnaurese developed pastoral-cum-agricultural economy to basically meet local food requirements. It traditionally has been a self-subsistence region. Its relative isolation helped towards making of the culture and economy quite specific to this region.

Kinnaur remained isolated until recently. It was a restricted area where no foreigner was allowed till early 1990s and even Indians had to acquire permit to enter the district. Indo-China border conflict of October 1962 brought Kinnaur into focus. It acquired strategic importance and a large number of armed-force personnel moved into the district. This resulted in obvious and stepped up initiatives for socio-economic development. Main objective behind this was to broaden their social horizon and bring economic contentment among the people who till then were ‘backward’ and formed a ‘closed society’. Thus, followed the process of induced immigration, spread of educational facilities and construction of roads; most importantly NH-22 and initiation of many projects under the ‘Tribal Area Development Scheme’. Consequently, it helped the acceptance of new ideas and technology by the people and led to gradually opening up of the region.

Kinnaur district is entirely rural and is divided into three Community Development Blocks, which are further sub-divided into five Tehsils and one Sub-Tehsil. Nichar block had highest population of 26630 persons and Kalpa was the second most populous block with 17630 persons in 2001. Pooh block lies in Trans-Himalayan Zone with population of 7898 persons. Hangrang is the only Sub-Tehsil of Kinnaur district. It had a population of 4062 persons in 2001. Sex ratio in Kinnaur district was 884 females per thousand males in 2001. This was quite below the state average of 970 females per thousand males.
Kinnaurese constitute the third largest ethnic group of Himachal Pradesh. Though their existence is known since ancient times, yet they have been among most obscure ethnic groups of India. Kinnaurese form a mixed lot; Buddhism is quite prevalent but the majority of them are Hindus. However, irrespective of religion, everyone follows Buddhist rituals and practices due to strong influence of neighbouring Tibet.

I.2 Overview of Literature:

The U.N Earth summit in Rio de Janeiro has placed mountains prominently in the Agenda 21. Many scholars claim that a lot is known about high altitude areas of Himalayas. But these are less known areas and their complexity is frequently ignored, this has resulted in many sweeping generalisations made about these regions. Recently, there has been growing effort all over the world to understand mountain ecosystems. Inherent fragility of Himalayan ecology has placed it among the most critical zones in the world. Of late, a huge amount of scattered information has emerged due to individual efforts of scholars to understand Himalayas. However, holistic knowledge is still far from satisfactory. Specialized studies from different disciplines need to be made the basis for this holistic approach to comprehend Himalayas. Infact, this needs strong and effective networking among various aspects and individuals.

Kinnaur remains secluded due to inaccessible terrain and inhospitable climate. Of course, there exists a considerable amount of literature on various aspects of Himalayas but except for a few references in the form of travel accounts and mythological interpretations, systematic and comprehensive works on the district are far from adequate. Recent decades have seen some scholars taking up detailed study of Kinnaur. But only a few are relevant to the present study. One of the earliest references to the people of Kinnaur is found in Sanskrit literature.

In order to understand the nature of studies carried out on Kinnaur and to see their relevance to the present study, the available literature has been organized into three groups:
a) Historical Aspects

Currumooddeen\(^{11}\) (1815) in his paper brought out details of trade between Bushair and China. He has reported that Chinese trade node called Gartok, though named as a town but does not contain a single permanent structure. Along with describing the trade route, the study also talks about the movement of trade articles.

Frazer\(^{12}\) (1820) visited Bushair during the *Gorkha*\(^{ii}\) invasion. He was the first writer to write admiringly about Kinnaurese. He gave social and religious account of the society. Though he observed that *Kinnauri* language is different from Tibetan and Hindi, he could not make any significant study of it.

Labelling Bushair as the most remote part of the British dominion in Asia, Kennedy\(^{13}\) (1824) divides the former Bushair state into three divisions; Kinnaur forms one of these three divisions. He has made an attempt to describe almost every thing. The details pertain to revenue, property of people, absence of crime, petty chiefs, battles of Bushair and its political importance. He has also discussed villages, dress, minerals, Bushair’s trade with Ladakh and Tibet, rivers and links with Russians and tranquillity of the place.

Gerard\(^{14}\) (1840) gave an account of people, places and routes in an attempt to reach Gartok and Mansarover in Tibet. He accurately determined altitude of villages and passes of Kinnaur by using a modern barometer for the first time. In another study, Gerard\(^{15}\) (1841) has given a detailed account of topography, drainage and agriculture of Kinnaur. He has provided details about the inhabitants. This work appears to be very systematic that was undertaken during colonial period and still has relevance.

Thomson\(^{16}\) (1852) gave a brief narrative of people, place and vegetation. He travelled through Kinnaur, Spiti, Ladakh, Kashmir and some border areas in Tibet. In Chapter two of his travelogue, Thomson wrote about some places in lower Kinnaur. He dedicated chapter three to other places in Satlej valley and its sub-valleys. Hangrang valley of Kinnaur along with some other places of Spiti have been described in chapter four of his travelogue.

\(^{ii}\) *Gorkha*: people of Nepal
Wilson\textsuperscript{17} (1882) on his way to Tibet and Ladakh passed through Kinnaur. He documented places along old Hindustan-Tibet Road in chapters eleven to seventeen, while description of Hangrang area was given in chapters twenty one and twenty two.

Hedin\textsuperscript{18} (1909) gave description of Kinnaur in last five chapters. He not only gave description of people and places along old Hindustan-Tibet Road, but also of Catholic missionaries and Alexander Csoma de Koros, the father of Tibetology, who lived at and studied at Kanam monastery for a couple of years almost about seventy five years before Hedin’s arrival in Kinnaur. His narratives are well supplemented with photographic plates and sketches.

Ibbeston\textsuperscript{19} (1911) gave the distribution of Kanets\textsuperscript{iii} in Kinnaur based on the Census report of 1883. In the process, he has reflected upon birth, marriage and death customs, Lamaism and cults in Kinnaur. Fair and Festivals have also been discussed by him.

Francke\textsuperscript{20} (1914) described temples, monasteries and idols of the places he visited in north western Trans-Himalaya on his mission of Archaeological Survey. He passed through Kinnaur on his mission and wrote about the place in first two chapters.

Das\textsuperscript{21} (1954) has shown non-Aryan origin of the people in his article. His findings are based on Kinnauri dialects and culture. He noted that modern Kinnnaurese have retained many characteristics of their Kinnnaurese ancestors and gives the example of their sportive nature and their fondness for singing and dancing.

District Census Handbook\textsuperscript{22} (1991) provides some information about the ethnography of former Bushair state and gives an account of the administrative set up of Kinnauri villages and forest wealth.

Singh\textsuperscript{23} (1999) has based his study on the recent chance-discovery of the cist burials in Nesang village. He cites the closeness of cephalic index of Nesang skull to the Indo-Aryan stock. In his opinion, higher reaches of western Himalaya including

\textsuperscript{iii} Kanets': Members of Rajput caste.
Kinnaur were inhabited by people of different ethnic stock, probably nomadic Scythian/Shaka, who were marching southwards from Central Asia to India.

**b) Cultural and Socio-economic Aspects**

Sanskritayan\(^\text{24}\) (1956) discussed peopling of the area and gave an account of inhabitants in his travelogue. As he himself puts it "besides being the description of the journey, the book is also a book of introduction to a hitherto neglected part of the Himalayas". This is in no way an exaggeration as he set out on his Kinnaur journey right after about a year of India's independence. This is one of the earliest and most detailed books on Kinnaur by an Indian writer. The book not only makes an excellent reading but it also raises some pertinent issues related to development of the region.

Negi\(^\text{25}\) (1971) had done a study of tribes of Himachal Pradesh. He has given tribe-wise profile including that of Kinnaurese. This cannot be called a detailed work on the tribe. He throws light on extraneous social influences, which are very unsettling particularly in Kinnaur. Jeopardisation of tribal interests due to newly set-up communication links and associated forces have also been mentioned.

Kapoor\(^\text{26}\) (1972) talked about socio-cultural and religious attributes of Kinnaurese. He has also discussed dialect of Kinnaur and has made an attempt to bring out linkages between local geography and above factors of the district.

Bose\(^\text{27}\) (1973) while dealing with some Indian tribes gave introductory information about Kinnaurese. He has discussed their settlements, caste, livelihood, agricultural practices, trade, pastoral life, craft, history, religion and family etc.

Chandra\(^\text{28}\) (1973) has described the tribes and forms of marriage among Kinnaurese. He also described the trends of change in types and forms of marriages. In another article\(^\text{29}\) (1982), he has taken up the issue of surplus women in the system of polyandry and brings out the myth behind it as well as how different forms of marriages and Lamaistic Buddhism accommodates and absorbs 'surplus women'. On the basis of his study\(^\text{30}\) (1987) on Kinnaurese, he has presented the case for intrinsic quality of human beings/groups responding to harsh environmental conditions in best suiting manner to countervail the situation. This paper is an
attempt to explore the nature and extent of environmental adaptation in relation to a particular community in the perspective of geographical situation. Reflecting upon ecology and religion of Kinnaurese, Chandra\textsuperscript{31} (1981) underlined that geography of a particular area helps in shaping the society in its value system. Religion has played an important role in lives of Kinnaurese by providing a balanced approach to meet challenges of environment of the area. Chandra\textsuperscript{32} (1992) has focused on socio-cultural and religious perspectives. He has discussed ethnicity, inheritance, legitimacy of children and types of marriages including polyandry.

Chib\textsuperscript{33} (1977) has given a description of natural settings and social as well as economic characteristics of Himachal Pradesh. He also discusses people and places but this work provides only cursory information on Kinnaur. He talks about as to how Rajputs and other castes have been given tribal status. But his\textsuperscript{34} (1980) another work presents a detailed account of Kinnaurese where apart from socio-economic characteristics of the tribe, he describes religious make up and cultural traits as well as their physical character. He\textsuperscript{35} (1991) has attempted to portray changing demography of Kinnaur by identifying population regions of Kinnaur district.

Tribal Development Department\textsuperscript{36} (1980), Shimla, in its benchmark survey of Integrated Tribal Development Project in Kinnaur, has presented household level analysis of socio-economic conditions. The analysis has been done for agriculture and allied activities, artisans, hamlets and road transport as well as for communication; unfortunately, this has been clubbed at tehsil level. This could not bring out intricate regional variations within the district.

Mitra\textsuperscript{37} (1980) has written his travelogue with a perspective of little informed traveller who failed to delve deeper into Kinnaur's customs and traditions. His lack of understanding of Kinnaurese is exposed from his writing. Though, he attempted to write about whatever he experienced, this work is not of much use for research.

Bajpai\textsuperscript{38} (1981) tried a multi-disciplinary study of Kinnaur after his field experience. It is more related to social aspects in its approach. This book appears inspired by District Gazetteer of Kinnaur when he generates the picture of folklore, customs, beliefs, rites and rituals and superstitions, etc. He tried to trace Kinnaur from ancient age to the present giving various aspects of the society.
Nag\textsuperscript{39} (1981) studied racial composition of the tribes and has given religious account. Kinnaur has three distinct religious regions. Regions with the dominance of Indo-Aryan stocks have Hinduism while the people of Tibetan blood in upper area practice Buddhism. Central Kinnaur is influenced by both the religions.

Dasgupta and Danda\textsuperscript{40} (1984) studied tribal education in India. They have made passing references about educational scenario of Kinnaurese during 1961-71.

Raha and Mahto\textsuperscript{41} (1985) worked for Anthropological Survey of India. They have given a detailed account of sociological and economic characteristics of Kinnaur. Along with these, they have discussed historical, political and religious aspects and changes therein. This is a very detailed work on socio-economic characteristics.

Basu, et. al\textsuperscript{42} (1985) have attempted a detailed socio-economic evaluation of Kinnaur. They came up with an in-depth analysis of Integrated Rural Development Programme (I.R.D.P) implemented in the district. However, the study was not able to bring out regional variations as it was not based on village level data. They took tehsil as a unit of analysis which do not show intra-regional and intra-valley variations in Kinnaur.

Negi\textsuperscript{43} (1987) presented political dimensions of Kinnaur. He talked about tribal leadership and has given its socio economic reasons. According to him, there has been a significant shift in the existing leadership pattern among Kinnaurese due to implementation of various Welfare and Development Programmes and introduction of new organizations and institutions. Leadership is still dominated by males but it is no longer a monopoly of older people. This study also suggests that joint family continues to be strongly related to village leadership but there are signs of its decline. Further, he\textsuperscript{44} (1990) made an elucidating attempt to describe the social relations of village structure and network of mutual services and the patterns of their operations.

Raha\textsuperscript{45} (1987) in his edited book dealt with the \textit{khandan} system of Kinnaurese and gives an account of social institutions of Kinnaur. He discussed social stratification among people. He has studied traditional traits and contemporary changes in economy as well as religious rites and rituals in the region.
Parmer (1989) studied tribal development of Himachal Pradesh with special reference to Kinnaur. He focuses upon manpower and its utilization as well as economic infrastructure. His work is not a detailed one because he uses only block level data. However, he has emphasised population increase in Kinnaur, studied it with data of 80 years and also studied distribution of workers in different sectors of economy.

Moorti, et. al. (1990) have carried out their detailed scientific study of dry fruits, nuts and other fruits cultivation in Kinnaur. They have tried to identify superior strains, problems in production and income from dry fruits and nuts as well as the role of extension services to boost the production. This is a good study of Kinnaur.

Thakur et. al. (1991) looked at socio-economic impact of tribal development programmes in Himachal Pradesh. They assessed programmes and policies by evaluating farm situations and animal husbandry in Kinnaur and Lahual and Spiti. They have suggested measures to combat unfavourable conditions. According to them, the concrete achievements do not match financial expenditure incurred in the area.

Malhotra (1992) studied physical growth of Kinnaurese male Rajputs and compared the similarities and dissimilarities between them and with males of neighbouring as well as other Indian groups.

Tiwari, et. al. (1992) studied horticulture. They have focused on the role of management in horticulture and its potentials in the district. Their work suggests that horticulture commands a vital position in development of hill economies. The area is generally composed of valleys and ridges. Valleys with assured irrigation have been devoted mainly to cereal crops while ridges, without irrigation, have horticulture. They suggest that as horticulture is labour-intensive, it should be encouraged in labour- abundant but capital-scarce economies.

Bhatnagar (1992) has written genetical demography paper on Kinnaurese. He has concentrated on marriage and marriage rituals of different stocks of Kinnaurese. In this study, he discussed frequency of marriages across and within tehsils.
Sharma and Minhas\textsuperscript{52} (1993) took up the study of land-use and biophysical environment of Kinnaur. They have discussed pastures, health of forest, livestock, soil characteristics and cultivated land. This paper presents very systematic research attempted on Kinnaur.

Gupta\textsuperscript{53} (1998) has delved into handicrafts of Kinnaur. He finds out that, owing to limited land, tough terrain and scant industrialization, people in the tribal areas have been engaged in a variety of handicrafts to supplement their meagre agricultural earnings.

Monga\textsuperscript{54} (1998) tried to bring out the dynamics of family structure among Kinnaurese. He has given emphasis on marriage types and talked about status of women in the society. He also discussed shift from polyandry to monogamy and break down of joint family system.

The book by Sanan and Swati\textsuperscript{55} (1998) has been compiled after the experiences of the former’s field posting as an Indian Administrative Officer. This is more of a travelogue and trekking guide and it also gives the history and religion of two places. Nevertheless, it is one of the important publications on Kinnaur in recent times.

Sharma\textsuperscript{56} (1999) gave theoretical aspects of leadership and describes the traditional and emerging leaders, their socio-economic basis and roots, their family and age structure, social status, caste impact, occupation, education, land ownership and income status etc. While reflecting on tradition and culture, she explains the \textit{Khel} and \textit{Khandan} systems as well as their importance.

Singh\textsuperscript{57} in his short article has given an informative account of medicinal plant wealth of Kinnaur and its potentials. He highlights that apart from being suitable for horticulture, the agro-climatic conditions of the district are highly suitable for cash crops and off-season vegetables. He also brings out importance of \textit{chilgoza} pine, a wild tree whose nuts have value as cash crop. This has the advantage of not competing for land with other crops.

Rawat\textsuperscript{58} (2002) has based his studies on the alternative farming system in the dry temperate zone in Kinnaur. This book deals with the constraints on agriculture
and highlights the main problems faced by farmers. The author came up with some viable suggestions for the farmers in terms of input-output ratio in farming system.

Negi\textsuperscript{59} (2002) picked up folk-songs from different areas of Kinnaur. These folk-songs are based on marriages and tragedies that were set in different periods. He gave a vivid account of the society in order to interpret these songs.

Negi\textsuperscript{60} (2006) wrote about history, culture and beliefs of people. He also reflected upon governance system of erstwhile Bushair state and lineage of Bushair kings. Chapterisation of the study is haphazard, many chapters ends abruptly. Nevertheless, historical aspects in the study have been well discussed.

c) Adjacent and Similar Areas:

Literature available on Kinnaur is very limited especially in terms of its relevance to the present study. Therefore, some studies done on adjoining areas, which have resemblances to the study area in terms of topography, climate and socio-cultural aspects, have also been taken up.

Ladakh:

Singh\textsuperscript{61} (1976) talking about the roles of \textit{Gompas}\textsuperscript{iv} in Ladakh traces their hierarchical linkages as well as spacing. He brings out the organization of \textit{Gompas} and finds out that this is, in fact, the practical organization of space in Ladakh. While delving into the regional development of Ladakh under the dynamic framework of ‘triangle of forces’, Singh\textsuperscript{62} (1978) maintains that, nature, under low level of technological development has deterministic role. Human simply adapt themselves and shape-up their social institutions accordingly without altering much of it.

Raza and Singh\textsuperscript{63} (1983) have highlighted problems of regional development in Ladakh through identification of the degree and nature of limitations impeding developmental processes and spatial units for planned development. By taking the selected socio-economic indicators, they have worked out hierarchical structure of settlements and growth points for development.

\textsuperscript{iv}‘Gompa’. A Tibetan word for Buddhist Monastery.
Chatterjee\textsuperscript{64} (1987) studied traditional as well as contemporary systems and analysed social stratification and changes in socio-economic attributes of Zanskar Society.

Goldstein and Tsarang\textsuperscript{65} (1987) studied changes in polyandry and suggest that it has been traditional method of limiting population. However, de-encapsulation of Ladakh and resultant advancements has jolted the system of polyandry. This resulted into rapid population growth and economically unviable fragmentation of land.

Another article by Singh\textsuperscript{66} (1991) suggests that not only economic underdevelopment but also education underdevelopment is due to hostile natural environment. Inadequate infrastructure coupled with uneven terrain and resultant inaccessibility and unfavourable climate make the use of existing educational facilities by children quite difficult. In another work\textsuperscript{67} (1992), he concludes that harsh climate and rugged topography are main constraints on agriculture of Ladakh. Agricultural economy of subsistence type is underlined by lack of chemical inputs, use of local seeds and traditional agricultural techniques. He points out that four fifths of the total work force in Ladakh is engaged in agriculture. However, it is seasonal activity largely confined to summer months. Thus, is also hampered by low land use intensity and low carrying capacity and does not provide enough to fulfil basic needs of the people. Therefore, people resort to pastoral activities to supplement their subsistence necessities.

Pangi Valley, Lahaul and Spiti, etc.:

Kuldev\textsuperscript{68} (1984) shows that Lahaul & Spiti is rugged and mountainous having pronounced intra-regional physiographic variations. The area is predominantly cold and arid with scanty or no vegetation. Society prefers joint family system and people share their proximity to different racial stocks among themselves. Only valleys with gentler slope and milder climatic conditions are inhabited. Agriculture is prime economic activity. Milap Chand\textsuperscript{69} (1986) has reflected upon geology of Lahaul studying its relief, drainage and morphology. Based upon his analysis of altitude, geographic processes and vegetational correspondences, he identifies five geomorphic regions in the area.
Dhar and Mulye\textsuperscript{70} (1987) studied precipitation of Ladakh region. The study brings out that even though no month passes without precipitation yet its low magnitude renders Ladakh as worst arid region of India. They suggested for better utilisation of glacial melt streams in order to deal with problem of soil moisture stress in cultivation.

Negi et. al.\textsuperscript{71} (1992) studied Mongoloid, Kashmiris as well as Kanets and Indo-Aryan groups such as Koli, Lohar, Kolta etc. They conclude that these groups have maintained their ethnic identity owing to socio-cultural and geographic barriers. But to some extent, there has been an exchange of genes between the major racial strains owing to the processes mixing up. This has given rise to some intermediary mixed population in some cases and even obliteration of genetic variability in others.

Gupta\textsuperscript{72} (1992) conducted a study of central and Western Himalaya to assess ecological potentialities and limitations. He traced variations in physiography, drainage, climate, soils and flora & fauna of the two regions.

Singh\textsuperscript{73} (1999) has confined his study to the Pangi valley. He points out that the ‘primitive’ people have a greater sense of ecological consciousness compared to modern people who have ignored it under the spell of development. He argues that the matrix of relations between nature and culture have given rise to what may be termed as ‘folk-rationality’ of the ‘primitives’ which is opposed to the ‘scientific-rationality’ of modern people. This work put across the idea that development could take place within the parameters of natural environment without exploiting it beyond a point.

Hazra\textsuperscript{74} (2003) made an attempt to understand as to how two religious sections of a single tribe adjust to alien economic pursuits and a new way of life due to assigning of tribal status by Government of India. The author noticed that Hindu Gujjars responded to the new situation and changed their economic activities to experience development while their Muslim counterparts still practice nomadism.

The above reviewed literature shows many studies related to Kinnaur and the Kinnaurese. Barring a few scholars such as Manish Kumar Raha, Ramesh Chandra and S.S Chib who extensively wrote after their interaction with Kinnaurese, the
majority of works are sketchy. Lots of literary studies on Kinnaur are related to culture and are inspired by District Gazetteer of Kinnaur. Raha & Mahto’s work was for the Anthropological Survey of India. Studies by Moorti, Oberoi and Sharma are detailed work with sound field observations. These have a good methodological approach. However, the works are of limited nature as these are confined to developments in production of dry fruits and nuts. Agriculture is another area which attracted scholars. But in most of the cases its ambit is too limited. Most of the writings show great ecological variations across valleys and villages of Kinnaur. This has resulted in variations in rites and rituals and numerous other practices. Most scholars have worked taking Blocks or Tehsils as the unit of analysis in Kinnaur. Due to small number of such spatial units, these studies have not been able to reflect variations within the district and suffer from simplistic generalizations.

Limited publications on Kinnaur made the author look at studies on the adjacent and similar areas. This helped to draw some useful inferences for the present study after going through some systematic works.

1.3 Objectives:

Literature available on Kinnaur highlights the fact that the natural conditions in the district are harsh. Apparently, rough terrain and harsh climate play a prominent role in population distribution, economy, inter-valley interaction and contact with outside world. Due to remoteness, people largely depended on local natural resources for subsistence. In line with these facts, following objectives have been identified for the present study:

1. To understand the natural setting of the region and to assess problem of resource base.

2. To study the traditional mechanisms of human activities evolved over time in the given mountain resources. And to comprehend the cultural, economic and religious set-up emerging as a result of Human-Nature relationship.

3. To examine population characteristics to assess their association with environment and the recent processes of development.
4. To understand the food production system in terms of agriculture and livestock rearing and to study changes therein occurring over time and the factors of the same.

5. To understand the development of infrastructural facilities and their role in change/development and levels of development in the study area.

I-4 Research Question:

Earlier discussion shows difficulties due to inadequate resource base. Problems related to distribution and growth of population are because of environmental fragility. There is also a need to comprehend development processes which have altered the role of environmental constraints on one hand and have changed spatial variations on the other. In the light of this, the present study has following research questions:-

1. What is the nature of physical conditions? How have these acted as constraints on economic activities and influenced other socio-cultural aspects?

2. What are the traditional mechanisms those have evolved over time to offset the role of harsh environment?

3. How has socio-economic set-up particularly religion responded to harsh environmental conditions and geographical isolation?

4. What role do environmental conditions play on population parameters?

5. What is the extent of population pressure on economic resources especially agricultural land?

6. What are the characteristics of economic activities particularly farming and animal rearing?

7. What has been nature of recent changes and how have these influenced agriculture and livestock rearing?

8. What are the level of socio-economic and infrastructure development in different ecological zones? How has new development weakened the controlling role of harsh environment?
I.5 Database:

It is a prerequisite to procure quantitative and other information for a systematic and scientific study. Literature review makes it clear that availability of research material for present study on Kinnaur is limited. Thus, a lot of information was required to be generated for the study. Therefore, the researcher had to depend on both secondary as well as primary sources of information.

Secondary data:-

Traditionally, Kinnaur remained isolated with a small population. Its record keeping was never properly organised. Development works undertaken by British required huge forest resources in the last quarter of 19th century and beginning of last century. Thus, some information is present in the documents of British period. Part of Kinnaur formed former princely state of Rampur-Bushair. Information on the princely regime was in the settlement office at Rampur. Gazetteer of Kinnaur published in 1971 is another very important source of information.

Data on annual and seasonal crops and other agricultural parameters were procured from the Department of land records, Shimla. Patwari records give information about expansion of cultivated land and cropping pattern. Statistical outlines as well as occasional and special publications on Kinnaur published by Directorate of Economics and Statistics, Shimla were also consulted.

Village level information on population and other parameters was gathered from District Census Handbooks and other census publications. Information on institutional facilities was procured from the office of Deputy Commissioner, Reckong-Peo, Kinnaur.

Thematic maps published by NATMO, Kolkata, maps published under Indian Himalaya Map Series-Sheet-6 on the scale on 1:200000 by Leomann's Maps, London and Topographical sheet by the U.S Army Map services, Washington D.C on 1:250,000 scale have been used for the analysis of topography. Apart from these, satellite imageries have been used for this purpose.

Primary Data:

Most of secondary data available provide information at the Block level or village level. However, household level information was needed for this study. This
short coming was overcome through field-surveys for generating relevant data. Survey was conducted with help of two sets of questionnaires. One set was used to gather village-level information while the other for individual household. Field information was collected to comprehend socio-economic transformation and to understand the nuances of cold-arid landscape as well as hardships faced by inhabitants in their daily life.

Apart from this, a trek was undertaken through all villages of four sub-valleys of Satlej River. This trek was to villages selected for the study and to their pastures and nearby forestlands used by the locals. This helped in understanding the nature and extent of environmental constraints and factors of these. Important aspects of some more inaccessible areas have been shown through photographs. More information was acquired through discussion held with local people and government officials.

1.6 Methodology:

Data and other information are needed to achieve the objectives and answer research questions. Therefore, information needs to be gathered within the focus of the study. Thus, collection of information/data has purpose. Similarly, data needs to be interpreted. Both these aspects require methodology. In the light of above, methodology used for present research has been categorised into two groups;

(a): Methodology of data collection.
(b): Methodology of data analysis.

Methodology for data collection:

It is important to focus on objectives of study so that relevant data is collected. Sampling is very important in this regard. The method of sampling varies according to the objectives of the study and the nature of the region to be studied. It involves two steps in the present study. These are:-

-Selection of villages.
-Selection of households.

Selection of Villages:

Physiographic and climatic variations are significant to see population and land distribution as well as socio-economic setting in areas like Kinnaur. Altitude is
an important aspect of physiography and has bearing on climate. Therefore, sample villages have been chosen on the basis of altitudinal variations. Villages having less than twenty households were not taken up because such small villages blow up averages.

Lowest selected village is situated at an altitude of 1527 meters while the highest is at 3660 meters above mean sea level. Agricultural fields of Nako are located as high as above 3800 meters. Thus, the extent of human activity is divided into three altitudinal zones so that altitudinal variations in these activities can be captured. An attempt has been made to cover at least one-third of villages from each altitudinal zone and to have representation of each altitudinal zone from all the five valleys. However, the entire stretch of valleys of Ropa and Spiti are situated very high and none of villages of these two valleys falls in lower zone.

Following are the three altitudinal zones:
- The Lower Zone (Below 2200 mts)
- The Middle Zone (2200-2900 mts)
- The Higher Zone (2900-3900 mts)

Table 1.1

<table>
<thead>
<tr>
<th>Valleys</th>
<th>Total no of Prominent villages</th>
<th>Name of selected Villages with altitude (in mts.)</th>
<th>No of villages to be surveyed</th>
<th>Altitudinal zones of selected villages (in mts)</th>
<th>Mountain range.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baspa</td>
<td>17</td>
<td>Baltarang(1150) Sangla(2800) Chitkul (3435)</td>
<td>3</td>
<td>Lower, Middle, High</td>
<td>Dhauladhar-Great Himalayan</td>
</tr>
<tr>
<td>Ropa</td>
<td>6</td>
<td>Shia-asu(2645) Ropa(2925)</td>
<td>2</td>
<td>Middle, High</td>
<td>Great Himalayan</td>
</tr>
<tr>
<td>Spiti</td>
<td>14</td>
<td>Leo(2875), Nako(3600),</td>
<td>2</td>
<td>Middle, High</td>
<td>Zanskar</td>
</tr>
<tr>
<td>Tirung</td>
<td>4</td>
<td>Shilling(2186) Thangi,(2465) Charang (3660)</td>
<td>3</td>
<td>Lower, Middle, High</td>
<td>Great Himalayan</td>
</tr>
</tbody>
</table>
Thus, an attempt has been made to capture horizontal and vertical variations among different parts of Kinnaur.

The region is highly rugged with barely any flat area. Major features of Kinnaur consist of various river valleys along with conspicuous ridges. That is why whole of habitable part of Kinnaur is found in river valleys traversing mountain ranges. To some extent, each valley presents a geographical and socio-ecological identity of its own. An attempt has been made to include characteristics of various parts of Kinnaur by selecting villages from five valleys which have distinct socio-ecological characteristics. Almost eighty percent of geographical area of Kinnaur experiences cold, semi-arid to arid conditions. Therefore, four out of five valleys from which villages have been selected are from cold-arid zone. The Sangla valley outside Trans-Himalayan cold desert is representative of moist temperate zone. Rest of the valleys in the district are very small with few villages.

Selection of Households:
Available secondary data is not enough for the study, so primary data was generated. Moreover, it is not possible to interview the entire village population about identified questions; therefore, representative sample helps to draw the true socio-religious and economic picture. Primary data was generated from 464 households from thirteen selected villages. There are lot of variations in the size of villages; extremely small villages which have less than twenty households were left out. At least fifty percent of households were surveyed in small villages which have less than hundred households whereas in bigger villages with hundred or more households, minimum of thirty percent households were surveyed. Among above households surveyed in sample villages, it was attempted to include fifty percent of poor households in each case. However, Sangla and Karcham are extremely big villages, so ten percent of households were surveyed here. The idea is to cover more villages as representative rather than more households to avoid discrepancy in data generated across the villages. The primary data provide first hand detailed information on many aspects of the study.
Table 1.2

<table>
<thead>
<tr>
<th>s.no</th>
<th>Name of village</th>
<th>Altitude (in mts)</th>
<th>Total Households</th>
<th>Households surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Baltarang</td>
<td>1527</td>
<td>37</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Brelingi</td>
<td>2150</td>
<td>135</td>
<td>42</td>
</tr>
<tr>
<td>3</td>
<td>Shilling</td>
<td>2186</td>
<td>85</td>
<td>43</td>
</tr>
<tr>
<td>4</td>
<td>Jangi</td>
<td>2245</td>
<td>176</td>
<td>54</td>
</tr>
<tr>
<td>5</td>
<td>Thangi</td>
<td>2465</td>
<td>136</td>
<td>41</td>
</tr>
<tr>
<td>6</td>
<td>Shiashu</td>
<td>2645</td>
<td>25</td>
<td>14</td>
</tr>
<tr>
<td>7</td>
<td>Sangla</td>
<td>2800</td>
<td>463</td>
<td>48</td>
</tr>
<tr>
<td>8</td>
<td>Leo</td>
<td>2875</td>
<td>158</td>
<td>46</td>
</tr>
<tr>
<td>9</td>
<td>Ropa</td>
<td>2925</td>
<td>100</td>
<td>31</td>
</tr>
<tr>
<td>10</td>
<td>Namgia</td>
<td>3032</td>
<td>106</td>
<td>32</td>
</tr>
<tr>
<td>11</td>
<td>Chitkul</td>
<td>3435</td>
<td>100</td>
<td>30</td>
</tr>
<tr>
<td>12</td>
<td>Nako</td>
<td>3600</td>
<td>118</td>
<td>38</td>
</tr>
<tr>
<td>13</td>
<td>Charang</td>
<td>3660</td>
<td>48</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>1826</td>
<td>464</td>
</tr>
</tbody>
</table>

**Methodology for Data-analysis:**

Certain methods are required to infer meaningful information from the acquired data. These include both quantitative and qualitative methods of data analysis.

The quantitative techniques for the study of environmental setting include the following:

- Analysis of relief, slope and aspect
- Analysis of drainage
- Analysis of rainfall and temperature

Cartographic techniques are representative in nature. So these have been used to depict physical settings and some cultural phenomena. Role, relevance and rationale of socio-cultural and economic institutions as well as practices have been probed. Role of temples and monasteries and their spatial set up has been seen and location specific decadal population growth has also been worked out.
Variations in areas under food crops and fodder crops have been analysed using percentage figures. Temporal variations in average number of animals reared per household were examined. Ratio of persons engaged or employed to average number of animals per household and their swathe of transhumance has also been analysed. Changes in percentage of area under different crops were worked out to comprehend temporal changes. Site and extent of agricultural fields were studied. Spatial variations in socio-economic changes have been done by using class intervals of variables and its frequencies among villages. Finally, a composite index of all selected indicators has been prepared to know the regional variations as well as level of development.

The mathematical formulation of the method is:

\[ \text{Composite Index (C.I)} = \sum_{j=1}^{n} \frac{X_{ij}}{X_j} \]

Here, \( X_{ij} = \text{value if } j^{\text{th}} \text{ variate for } i^{\text{th}} \text{ village} \)

\( n = \text{number of variables.} \)

The values of index show the level of development of a village. Assumption is that higher the value of C.I., higher is level of development.

1.7 Organisation of Material:

The theoretical framework has been formulated in order to probe socio-economic development and assess its inherent problems in Kinnaur. Review of literature on the study area and adjacent areas with rather similar landscape and natural environment facilitates to comprehend the intricacies of physical and institutional constraints prevailing in the area. This provides insight into formulating objectives and research questions for the study. To pursue the study with certain degree of specificity and its analysis, certain methods are required. All these things have been discussed in the first chapter.

Nature plays a very important role in an underdeveloped area like Kinnaur. Therefore, it is imperative to understand environment because it is reflective of
natural resource base and associated natural checks and balances. So, aspects of natural environment have been brought out in the second chapter.

Social structure shows the adjustments to dictates of Nature, which are more pronounced in underdeveloped hilly regions. Cultural Ecology makes up the third chapter in which social structure and religious set up has been studied.

Demographic profile, too, is reflective of given natural setting. In the light of this, the fourth chapter has been devoted to social and demographic profile.

Main economic activities in relatively inaccessible mountainous area like Kinnaur are based on the utilization of limited local natural resources. Exploitation of environmental resources is linked to the dynamics of Man-Nature interaction. Various interlinkages between population and economic activities have been presented in the chapter. Pastoral and livestock resources have been discussed in chapter five. After assessing physical-social conditions, it becomes necessary to look into economy and developmental issues which form major objectives of the study. Agriculture, land-use and levels of development have been dealt in chapter six. This chapter along with chapter three and five presents the main scenario of Man-Nature interaction.

Finally, a summary of conclusions of the study has been given.
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3 Ibid. pg. xxv.


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