

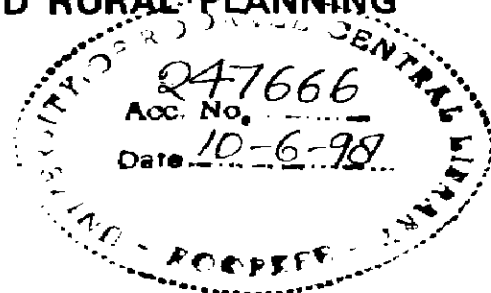
# PLANNING STRATEGIES FOR DEVELOPMENT OF KULLU TOWN

## A DISSERTATION

*submitted in partial fulfilment of the  
requirements for the award of the degree*

*of*

**MASTER OF URBAN AND RURAL PLANNING**



By

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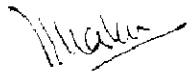
FEBRUARY, 1996

## CANDIDATE'S DECLARATION

I hereby certify that the work which is being presented in the Dissertation titled " **PLANNING STRATEGIES FOR DEVELOPMENT OF KULLU TOWN** " as the partial fulfilment of the requirements for the award of degree of **MASTER OF URBAN AND RURAL PLANNING** , in the Department of Architecture and Planning , **University of Roorkee, Roorkee** is an authentic record of my own work carried out for a period of eight months from July 1995 to February 1996 under the supervision of Mrs. Pushplata, Department of Architecture and Planning , University of Roorkee, Roorkee.


The matter embodied in the dissertation has not been submitted by me for the award of any other degree or diploma.

Place: Roorkee

  
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Date : 14<sup>th</sup> Feb., 1996.

This is to certify that the above statement made by the student is correct to the best of my knowledge.

  
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( JAGDEV THAKUR )

M. U. R. P. -II

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*Chapter 1:*  
**INTRODUCTION**

# CHAPTER-1

## INTRODUCTION

### 1.1 General:

Development is planned process in which all the nations of the world are submerged and there is yet no recognised end point-no final level of achievement. The more technologically advanced nations continue to seek new means for improving the utilization of natural resources for enhancing the conditions of the environment in which their people live. Less developed nations strive to reach levels of economic well being which the more advanced countries have already achieved. All nations are developing but at different rates and from different past levels of achievement. Thus 'Development' is a dynamic process, which encompasses multiple actions planned to affect the organisations, techniques, environment and community life in such a manner as to raise their standard of living and improve quality of life. Planning is an essential tool for the development of any system and is a complex process within which six planning elements operate i.e., Society, Products, Economics, Resources, Movements and Space with Time in perspective.

The hill areas are of special importance for the overall development of our nation. They are singular source of important resources such as water and power, forest produce and minerals. The approach to development of hill areas so far has remained piecemeal and restricted to only few sectors of development. Each hill area has its own unique problems and potentials because of its geo-physical setting and socio-economic conditions, yet they

have a common set of development problems. In view of the increasing emphasis given to the hill areas, the Planning Commission has set up a sub-group for delineation of hill areas and formulation of approach and strategy for development.

The Planning Commission defines a hill area as an area located more than 600 metres above the mean sea level. Accordingly, in addition to the nine hill states in the country - Arunachal Pradesh, Himachal Pradesh, Jammu & Kashmir, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura - there are designated hill areas in Assam, Goa, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal and the U.T. of Daman & Diu. The Planning Commission is aware of the problems of hill areas but the efforts since the 4th five year plan have been more policy than action oriented. A hill Area Development Programme was introduced in the 5th plan. The thrust of the 6th plan was on development of hill areas and promotion of the quality of life of the hill people. However, the development approach of the hill states was adhoc with little concern for eco-restoration, eco-preservation and eco-development. The 7th plan emphasised socio-economic growth and promotion of a secure basic life support system including judicious utilisation of land, minerals, water and biotic resources, development of infra-structure and preservation of ecology. The 8th plan, endorsing the 7th plan objectives has declared the hill states as 'special category states' for giving central assistance.

In India, the areas under mountains in hill states are as under :

Table-1.1

Area under mountains : India

S.No.	State	Area in Sq. Kms
1	J & K	2,22,236
2.	Assam	78,523
3.	Himachal Pradesh	55,673
4.	Meghalaya	22,489
5.	Manipur	22,356
6.	Nagaland	16,827
7.	Tripura	10,477
8.	Sikkim	7,299

The state of H.P. has a mountaineous terrain where its 55,673 sq.kms. of area is dominated by valley and rivers. The settlement pattern is traditional with location being concentrated along the river valleys. The hill towns all over the state are under constant pressure of urbanisation. The major factors contributing to urbanisation are administrative, tourism, industry, commercial, transportational points for agricultural and horticultural produce and religious activities. To support all these activities there has been a migration of people from rural to urban areas and from outside the state. Since these towns were not planned and had an organic growth, they are now under tremendous pressure to provide for the basic infrastructure to support the urban growth. This growth is so haphazard and unplanned that towns have decayed in the course of their transformation. There is not only a deterioration in the built

form but also in the environmental and service qualities. The general existing practice of planning is nearly the same for plains and hills where, as per the legal frame defined in the town and country planning act of the related state, population projection is made, economic base is worked out; consequential living recreation and transportation activities are outlined and land use zones based on physiography are defined. Such practice has not taken to satisfactory results. Contrarily, ecological conflicts and hazards are brought in. The development is getting unsustainable.

The balanced social and economic development of all parts of country being the avowed objective of our National Development plans, it is imperative that special efforts should be given to stimulate overall social and economic development of hill regions to make up in some measure for their comparative backwardness from development point of view.

## 1.2 IDENTIFICATION OF THE PROBLEM :

Hill regions in general are ecologically rich and economically less developed. The hill areas with natural endowments have large economic potentials but need to be utilised in rational and sustainable manner. From the snow clad tops of Himalayas to the denuded hills of Aravallis, the problems and potentials of hill areas vary from region to region based on their geo-physical setting and pace of development.

The severe problem in the hill area is of soil erosion caused by the high rainfall on the steep slopes coupled with scanty vegetation due to indiscriminate felling of forests.



Agricultural holdings are generally small and fragmented and there is acute pressure on cultivated land. The existing utilisation of land in the hill areas is not sound from ecological and economic considerations. Shifting cultivation is one of the major problems in hill areas which render large proportion of area as fallow and culturable waste. The area under forest in many hill tracts is much below the requirements of National Forest Policy.

The hill areas basically low density zone are, however, experiencing rapid increase in their population. Although hill areas are endowed with abundant renewable and non-renewable natural resources, by and large, they are dominated by subsistence agrarian economy. In fact, poverty thrives amidst resource plenty hill areas which suffer from lack of adequate means of irrigation and wasteful, faulty, and age old agricultural practices.

The hill regions, generally suffer from inadequacy of rural roads, marketing facilities and other supporting services which come in the way of proper development of agriculture and overall economic development. Though animal husbandary is next, in importance to crop husbandary, livestock, poultry and dairy farming are the least developed branches of agriculture in many hill tracts. Similarly, hill regions have rich resources of minerals but they are not exploited scientifically causing degradation of hill environment. The industrial development in the hill areas has by and large been very poor and what ever industrial development that has taken place, has remained confined to only few pockets leading to wide spatial imbalances.

Tourism although emerging as important economic activity has not been developed in an integrated manner. Forest is being used as the major fuel wood because of lack of alternative source of energy, substitute for fuelwood is causing large scale destruction of forests. Urban scenario is dominated by large number of small size settlements and there is a wide gap in the existing urban system leaving large tracts of hills, ill serviced.

In spite of poor state of hill development and large scale environmental and ecological problems, hill areas in India have vast potentials which need to be harnessed properly in order to have sustainable development of hill regions on a wider scale. By adopting proper land development measures there is large scope to bring more area under agriculture and forest. The hill slopes are specifically suitable for large scale plantation and horticulture crops. With good scope of fodder production, dairying has considerable scope for development in the region. A sound development of forest would not only help in eco-restoration but would also provide industrial timber if exploited scientifically and be also a good potential for bee-keeping, sericulture and minor forest produce. The optimal exploitation of minerals would help in setting up of mineral resource based industries thereby leading to diversification of economy. Hill areas endowed with vast natural assets have immense potential for tourism development as well.

### 1.3 STUDY AREA :

Formed by the river Beas and its tributaries, Kullu valley is located in the central Himalayas. Having a length of 80 kilometres and width of 3 to 5 kilometres, the valley has an altitude of 1,200 to 5,000 metres above the mean sea level. . The valley, being sandwiched by the snowclad Dhauladhar, Pir Panjal and the Greater Himalayan mountain ranges, has a picturesque setting. Evergreen forests and meadows on slopes, river Beas with its whispering waters flowing through the orchards, interspersed by agricultural fields, make the valley highly attractive. The valley has a salubrious climate. It has a diverse vegetation and rare fauna. Skiing slopes at Solang Nallah, hot water springs at Manikaran and Vashisht and numerous waterfalls add to the charm of the valley. Roeric Art Gallery at Naggar, numerous temples dotted all over the valley and historic Gurudwara at Manikaran attract the visitors from different walks of life.

Land use of the valley is undergoing a fast transformation. Major causes for the change are inter- and intra-state migration of people for settling. setting up of tourist-based business and push factor operational in adjoining states like Jammu and Kashmir, Punjab, Haryana and Delhi, including enhanced extremist activities, pollution and metropolitan stresses and strains. Migration from Lahaul and Spiti region is, however, to avail urban facilities in the valley.

#### 1.4 AIMS & OBJECTIVES :

1. The aim of the study is to propose a comprehensive planning approach for development of Kullu town and the region with emphasis on optimum utilisation of resources.
2. To recommend planning strategies for development keeping in view the constraints and potentials of the region.

#### 1.5 SCOPE & LIMITATIONS :

1. The scope of the study is limited to Kullu town and region in the hill district of H.P. and to the availability of data from primary and secondary sources within the available time.

#### 1.6 METHODOLOGY :

1. The methodology will consist of the following sequential steps:
  - (i) Collection of relevant information from books, journals and case studies.
  - (ii) Analysis of the literature and information gathered.
  - (iii) Identification of problem.
  - (iv) Formulation of guidelines for the planning of physical and social infrastructural development for the hill town and region.

*Chapter 2:*

**LITERATURE SURVEY**

## CHAPTER -2

### LITERATURE SURVEY

#### 2.1 NATIONAL COMMISSION ON URBANISATION, 1988

##### COMMISSIONS STUDY:

Commission tried to identify those towns which do not present economic growth but which are located in the region from which outmigration will occur and where there is a crying need to develop urban centres, so that migration from rural areas can be localised within the region itself.

- Commission looked at those districts where more than 30% of the population is urban and likely to be further increase in due to urbanisation in the near future.
- Commission felt that all state and union territory capitals must be developed, they number 30 (all over India)
- Development of identified 329 towns coupled with a revival of urban settlements would have following effects.
  - i) Essential harmony and equilibrium in the urban settlement system.
  - ii) With job opportunities being available locally in a large no. of urban centre, migration picture would alter,
  - iii) Revival of stagnating towns in densely populated districts and the improvement of their economic infrastructural would induce migration from the rural countryside into a more productive urban environment,
- Urbanisation strategy should be a part of bigger strategy of generating economic growth.

- Class for highly efficient system of planning at the district level which will integrate spatial planning with economic and social planning.
- Seek to bring about a balanced development of all regions in a phased manner, keeping in mind the over riding resource constraint and need for raising productivity and generating economic growth with equity.
- On the basis of census data the commission has attempted to identify 329 urban centres 49 Urbanisation regions where the limited resources available could be applied to the maximum advantage of the country as a whole.
- An urbanisation policy drafted by commission is based on growth rates.
- Identified those class I cities which have a potential of growth, city which are very large, reached almost at saturation point, and all metropolitan centres which is supposed to be a matter of national concern.
- Commission felt that the cities ranging from C4 to C6 are reaching a size which render them difficult to manage. Cities ranging from class C1 to Class C3 as also class II towns must be given a greater growth momentum.

#### IDENTIFIED

- National Priority Cities (NPC)
  - State Priority cities (SPC)
- NPC : All cities with population of 1 million (12 such cities as per 1981 census, 27 cities projected for 2001)

OBJECTIVE : Upgradation of so many cities to the million + level does not take place. Migration deviated to other growth centres, to bring more balanced pattern of urbanisation,

SPC : Headquarters of all districts excluding those, covered in the list of towns showing EGM (Economic Generator of Momentum).

OBJECTIVE: Discouraging migration from backward rural areas to the big cities and need to develop regional growth centres.

Development of Headquarters of all district with rural population more than 90%.

## **2.2 CONCEPTUAL APPROACH FOR PLANNING :**

### **2.2.1 The Concept of Growth Centres:**

The idea of growth is old in India, since fifties when Narielwala Commission envisaged development of small towns at the centre with a number of villages at the periphery. Then came the Karve committee report about bringing Industrialisation in group of villages having a natural industrial urban centre.

- The study team on 'Community Development Industrial Pilot Projects', recommended selection of what are known as 'frontier checkposts' - centres chosen on the basis of their commercial and industrial potential opening up employment opportunities for people in the surrounding areas.
- The IInd International Perspective Planning team on Small Scale Industries, in its report suggested development of industries in urban centres of intermediate size and



recommended selection for such centres of growth which show 'greatest promise and readiness to be developed into industrial growing points". The aim was to find sparks of incipient development and fan them into flame".

The criteria of selection of growth centres included: 'Indications that the people of the area are moving in the direction of modernisation ... , relatively good communications and transport; so that investment in this indispensable factor of industrial location need not be prohibitively large; a similar criterion regarding power resource; evidence of budding entrepreneurs; evidence of rising civic spirit and civic leaderships... , and a disposition towards initiative and self help in meeting civic needs".

- The community development programmes as also the programme of industrial estates adopted by the country aim at establishing similar focal points for economic activities. In recent years the concept of growth centres has been evolved as an important tool of development of the industrially backward regions.

- The stress is on the identification of nodal points of growth in each region which are to be consciously promoted. the idea being that every village with a thin population may not be an economical viable unit to absorb and sustain a wide variety of services. Also all villages cannot effectively use the higher educational, medical or transport facilities. Whereas one can conceive of a cluster of villages looking to a few choice locations for a wider range of functions. By locating the services in such centres and

concentrating investment efforts here the maximum impact of investment can be derived. These centres can become the focal points of development of surrounding areas.

#### THE GROWTH CENTRE POLICY

This policy is based on the fact 'developments' viewed as a process of innovation as well as growth, does not appear everywhere at the same time but manifests itself at favoured points, for which, depending on the circumstances it tends to propogate outwards.

In this context, growth centres can be assumed to perform different functions. Normally three-tiers are identified -

- At lower level there are service centres of market towns which are in more direct contact with rural areas, providing services to them.
- The growth centres come at some intermediate level servicing as Industrial Development Centres, which provide dynamic characteristics.
- At upper end, there are Growth Poles where large Industrial setups, complex function along with Administrative activities.
- There are various views over these concepts of growth centres. Few take these in terms of socio economic conditions or in 4 tier systems, i.e.
- 'Service Centres' occur at local level providing basic socio-economic facilities; then the 'growth points of micro-regional level with predominantly processing and marketing activities; then the 'Growth Centres'

characterised by the existence of manufacturing activities;

At top comes the 'Growth Poles' with predominantly organisational functions.

At a later stage the phenomenon of Inter-relationship of these places play vital role.

### 2.2.2 The Central Place Theory

Walter Christaller in his 'Die Zentralen-Orte in Suddentschland' at Germany, giving size, number and distribution of towns:

- The town is a centre of a regional community and functions as its central place providing goods and services to nearby areas. The centrality depends upon the size, the services offered, the greater the centrality of the place, the higher is the order.
- The size of the central place, the size of the surrounding areas it services, its population and income are interrelated. A crucial factor in determining the size of the area to which the central place is the centre is DISTANCE, economic distance measured in time and cost.
- There exists a hierarchy organised according to 'market or supply principles', complementary regions become hexagonal, and lower order centres and their complementary regions 'nest' within those of larger centres' according to rule of threes'.

Deviation from the marketing or supply principles, which is ,spatial, can be explained by the 'traffic principle' which is fundamentally linear. According to this the distribution of

central places is at an optimum where as many important places as possible lie on one traffic route between larger towns, the route being established as cheaply as possible', giving rise to 'nesting' of complementary regions' according to a rule of towns'.

- People criticised and later developed the Christaller's theory that it is not for all cities. or the hexagonal pattern of trade areas do not exist in reality, or 'there is no step like hierarchy but rather a continuum'. ('August Losch' gave that the supply, traffic and administrative principles are only 'special cases of whole series of feasible systems of central places'. He developed an 'economic landscape' characterised by 'six densely-developed and six sparsely-developed sectors radiating from the metropolis'. Brian Berry and William Garrison worked on Marketing Principles showing 'how a hierarchy can result whatever the distribution of material and purchasing power' using the concepts of threshold and range and also showed the 'arrangement of business centres within cities'.)

- Several countries have tried the concept of Growth-focii in their planning process.

e.g. BULGARIA-Created small and big service centres, also taken care for the provision for necessary services and equipment to the farmers in the nearby areas and have industries for processing local produce.

FRANCE : ' Poles of Growth' were developed to counter-balance the prominence of large metropolis.

### 2.3 NORMS AND SPATIAL STANDARDS FOR HILL AREAS

Various social, economic and physical infrastructure inputs have to be provided to initiate development process in any area. But in hill areas such inputs have to be provided with extreme care so as not to upset their ecological balance. Moreover, the pattern and structure of settlements in hill areas are such that they pose an entirely different set of challenges to the task of extending infrastructure, facilities and amenities for improving quality of life. The cost implications; whether of providing shelter, infrastructure or services, are also such that an entirely new set of norms and standards are called for while thinking about development in hill areas.

The hill areas are presently characterized by backwardness, inspite of being rich in resources such as water, power, minerals, forest produces, and a climate (in certain altitude zones) which is conducive for pursuit of various economic activities such as horticulture, sheep rearing for wool production, facilitation of tourism, tapping of non-conventional energy sources, promotion of industrial enterprises requiring dust free environment, and a host of forward and backward linked activities. What has been lacking is a coherent policy which will address specifically to the essential development requirements of hill areas. To start with, an appropriate policy has to be evolved for the development of infrastructure and for that purpose a viable set of norms and standards needs to be adopted.

### 2.3.1 Planning Norms For Various Facilities

#### (A) Education

Educational facilities are first assessed whether they are adequate or not in terms of quantity, quality and spatial distribution. For this certain norms suitable to local conditions are adopted. There are two sets of norms that are generally used, one is related to maximum distance and the other to the size of population. The norms adopted at national level with regard to distance should not be more than 1.5 km from a primary school; 5 km to a middle school and 8 km to a high school. Considering the local conditions, this can be suitably modified. For example in hill areas, the distance norms can be adjusted to 1, 3 , and 5 km in respect of primary, middle and high schools respectively, considering that children have not only to traverse horizontally but also negotiate height which increases the effective distance.

If the assessment of existing facilities reveals certain areas which are not adequately serviced, or additional increase in demand due to future increase in population can not be met by the existing level of facilities, then the improvement can be affected either by increasing the size of existing units or providing for new units. However, there are limits to which the existing units can be expanded from the point of its effective management. Moreover facilities like education should be decentralized to the extent possible to take them near to the homes of their prospective student population to minimize distance of travel. Particularly in hill areas, because the average size of village is small, population density is low and

pattern of settlement highly scattered, it is advisable to plant units at their minimum feasible level and meet deficiencies through provision of new units. Hence along with distance norms, the size of school is also to be taken into account. The following norms can be adopted for planning the educational facilities in rural areas.

Table -2.1  
Planning The Educational Facilities

S.No.	School	Class	No. of Student/School
1.	Primary School	I to V	75 (50)
2.	Middle School (Secondary)	VI to VIII	90 (60)
3.	Higher Secondary	IX to X	120 (80)

Note : Figures in brackets are suggested for hill areas

Along with the norms in respect of distance and size of school, minimum threshold populations associated with the level of an educational facility are also specified. The school going population which is dependent upon the age-sex structure of the prospective population in the service area and which ultimately determines the expected student load is an important consideration in planning educational facilities. A primary school in plains is generally provided for a population of 5,000 which means that given the existing age-sex structure of the

population, a population of 5,000 would yield enough number of children of primary school going ages to make such a facility economically viable in terms of minimum common requirements of staff and facilities. But in hilly areas, due to scattered nature of settlements, meeting the threshold population criterion may entail long travel distance for children in many situations. This may effectively discourage them from using the facility. As such be provided more on the basis of distance criterion rather than minimum threshold population.

(b) Health

The existing level of health facilities are computed by comparing them with expected norms in respect of distance. From this analysis, the settlements which are inadequately served can be easily identified. The distance standard for a primary health centre and sub-centre can be taken as 8 and 4 km respectively. Along with this, the population standards should also be taken into account so that within the prescribed limit, the service population does not exceed the maximum (5000 for a sub-centre and 30,000 for a primary health centre). Both the distance and population norms can be relaxed for hill areas to distance of 5 and 3 km and population of 3,000 and 20,000 for primary health centres and sub-centres respectively.

Whether a new health facility unit is required can be assessed locally. If only a few villages are located outside the standard distance and their distances from the facility do not exceed 1.5 times the prescribed limit, then the establishment of a new unit can be postponed for the present. Similarly, where



villages are units but population is 1.5 times the prescribed limit, then a new unit has to be established, otherwise it may be decided to meet the deficiency in a subsequent plan.

(c) Water Supply

The main job involved here is to identify villages lacking in water-supply facilities. According to the magnitude of the problem, villages which suffer from scarcity of water can be classified according to the following categories :

- (i) Villages do not have drinking water facilities within reasonable distance (say 200m);
- (ii) Village where there is water source but water is not potable; and
- (iii) Settlements which are being provided with protected water but supply is inadequate.

In a water supply scheme, items i and ii should get priority as compared to iii. Again, amongst all the categories of settlements, priority has to be fixed according to the size of the population being affected. In rural areas, demand for water is estimated on the basis of domestic use which is 250 lpcd for municipal areas and 100-150 lpcd for rural areas.

(d) Transportation

Road accessibility is the critical test for which norms have been evolved by the Government of India. These are as follows :

Plains:

1. Linking up all remaining villages with a population of 15000 and above on immediate priority basis.
2. Linking up 50 percent of the total number of village with population of 1000 to 15000 on immediate priority basis.

Hill Area:

1. Linkages to all settlements population of 500 within a period of ten years.
2. Linkages to fifty per cent of the settlement with a population of 200-500 within a period of ten years.

Norms for provision of facilities at District Level as suggested by Planning Commission in the Sixth Five Year Plan is shown as under.

Table - 2.2  
Norms For Provision Of Facilities at District level

S.No.	Facilities	Distance (km)	Other Norms
1.	Regulated Market	16-20 (12-16)	One for each taluk in the plains
2.	Godown	"	"
3.	Cold Storage	16-20 (5-7)	"
4.	Technical College	16-20	One for each taluk
5.	Hospital	"	One for each taluk
6.	Fertilizer and seeds depot	16-20 (2-4)	One for each taluk in the

			plains and for every 1500-3000 Population in the hills
7.	Primary Health centre	16-20	One for every 30,000 (20,000) Population
8.	Veterinary Hospital	-	Same as above
9.	Bank	16-20	One for every 17,000 Population
10.	College	15-20 (8-12)	One for every 30,000 (20,000) Population
11.	Vocational Training	12-16	-
12.	Dispensary	8-12	One for every 25,000(20,000) Population
13.	High School	8-12 (5-7)	One for every 20,000 -25,000 (10,000-15,000) Population
14.	Sub-post office with Telegraph Facility	"	Same as above
15.	Health Sub-Centre	4-5 (2-4)	One for every 5,000 (1,500-3,000) Population.
16.	Veterinary key Centre	4-5 (2-4)	One for every 5,000 (500-1,000) Population
17.	Middle School	4-5 (4-5)	One for every 5,000 (3,000) Population

18.	Branch Post-office	4-5 (2-4)	One for every 5,000(1,500-2,000) Population
19.	Bus stop	4-5 (1-2)	All villages with more than 5,000 (500-1,000) Population
20.	Bank Branch	4-5 (1-2)	One for every 3,000-5,000 (5,00-1,000) Population
21.	Fair Price Shop	2-4	-
22.	Link Road	-	All villages with more than 1,000(500) Population
23.	Community Health worker	2-4 (1-2)	same as above
24.	Primary School	1-3 (1-2)	-
25.	Minor Irrigation	-	For every 500-1,000 (100-500) ha of net sown area.
26.	Water supply	-	135(70) lpcd in urban areas and 70 lpcd in rural areas.

---

Note : Figures in brackets are suggested for hill areas.

### 2.3.2 Space Standards :

Comprehensive spatial standards for planning and development of hill areas have not yet been set by any professional and

research institution. In hill areas, the space standards are affected by the following and therefore these factors should be considered while setting spatial norms in such areas :

- a. Exposure to sunlight, degree of slope and accessibility in form of distance travelled.
- b. Minimum needs of the people and the conservation principle.
- c. Flexibility in norms and standards to accommo-date conditions guided by difficult hill terrain.
- d. Work-place and residence relationship.
- e. Energy needs.
- f. Alternative mode of transportation.
- g. Communication network.
- h. Mobile and emergency facilities.

The standards and norms presented in this compilation, from different sources, are suggestive and can be modi-fied suitably if necessary

Table -2.3  
Space Standards  
Table (A) Land Use Pattern Of Towns

Land use	Range of percentage of Developed Areas			
	General Pattern	Specific variations in related land use category when classified by function of the urban centre		
		Commerical	Industrial	State Capital
Residential	40-45	-	-	-
Commerical	2.5-4	6-7	-	-
Industrial	3-6	-	12-14	-
Public, Semi-pub.	10-16	-	-	18-20
Parks, Playfields	4-8	-	-	-
Roads, Streets	15-23	-	-	-

Table (B) Standards For Open Spaces in Hill Towns

TYPE	AREA RANGE IN HECTARES	AREA PER 1000 POPULATION (ha)	REMARKS
tot lot	0.03-0.05	-	Minimum width 15 m
Playgrounds	0.50-1.00	0.12 to 0.20	One for every 5000 may be combined with schools.
Parks	1.20-2.00	0.12-0.20	One for every 10,000populat ion.
City parks/ Playgrounds/ maidan/exhibition -grounds/cultural gathering grounds	-	0.12 to 0.20	For the entire town at one or more sites,de- pending upon design & space availability
Botanical garden	10-20	-	One for every town
Recreational complex including Zoo	10-12	-	One for every settlement with tourist potential

Table (C) Urban Road Widths In Hill Towns

Road types	width in metres in		
	Open areas	Built up areas	plains
Arterial roads	18-24	15-18	50-60
Sub-arterial road	15-18	12-15	30-40
Collector road	9-12	7.5-9	20-30
Local street	4.5-6	3-6	10-20
Loop street	4.5	4.5	9
(Max.Length = 500 m)			
Cul-de-Sac	4.5	4.5	7.5
(max length=150 m)			
Pedestrian path	1.5-2.5	1-1.5	1.5-4.5

Figure : Transect of Interrelationship between Land Use and Altitude in Easter Hills of Nepal

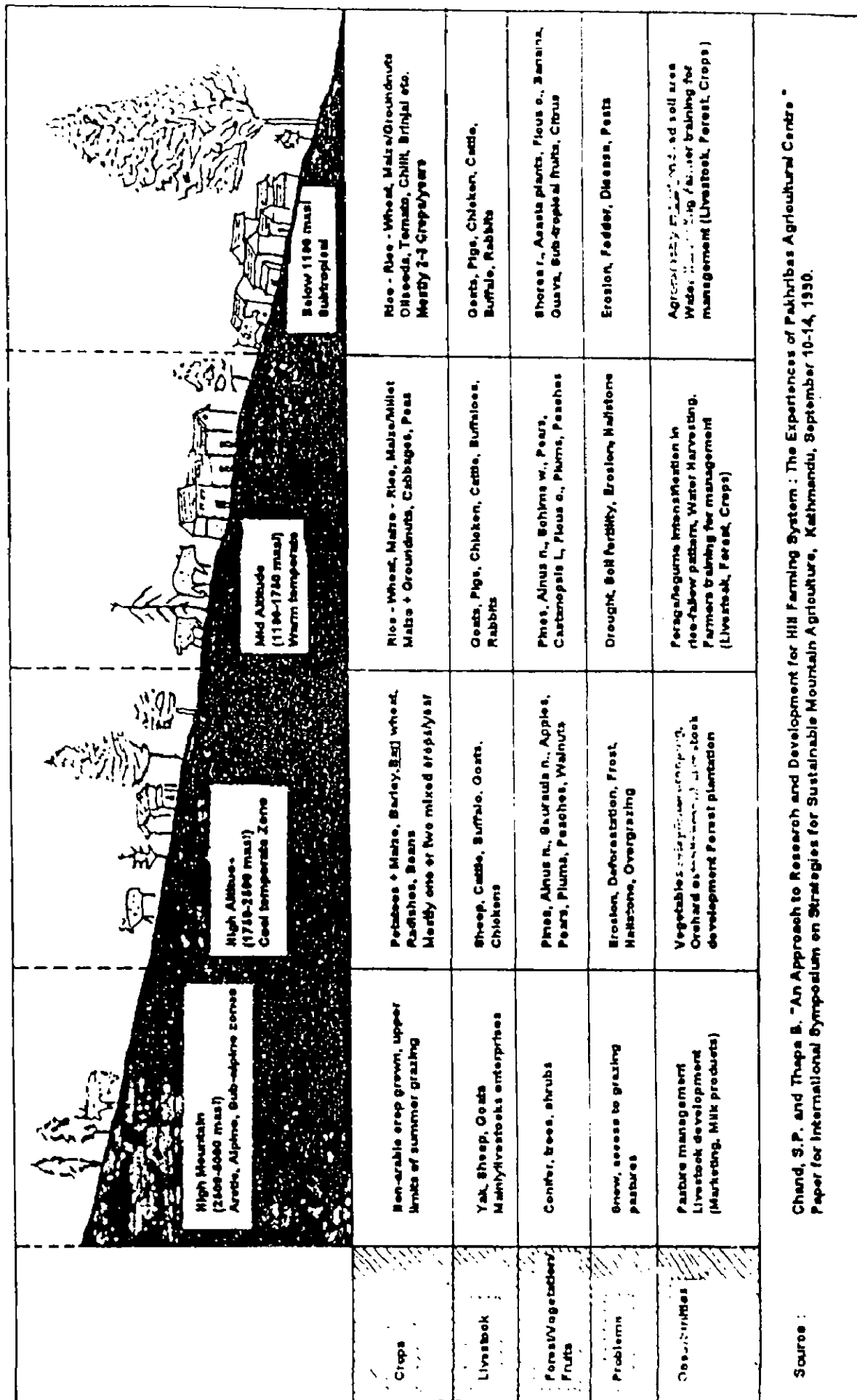


FIG-2.1

*Chapter 3:*  
**CASE STUDY-  
NEW TEHRI TOWN**



## CHAPTER 3 CASE STUDY-NEW TEHRI TOWN

### 3.1 INTRODUCTION :

The new Tehri Town is being developed as a district headquarter for the district Tehri and to rehabilitate a part of displaced persons from old Tehri, for a population of 25,000 persons with all the modern amenities just above the reservoir on the land of villages Kulna, Moldhar, Borari and Kutha. The altitude varies from 1000 metres in village Kutha to 1950 metres in village Kulna. The population of old Tehri was 5,480 and 12249 persons as per 1971 and 1981 census. In 1971 the population density within municipal limits of old Tehri was 1070 persons per sq.km.

### 3.2 PLANNING PROBLEMS :

On the regional level, planning problems, due to the submergence of many service villages around Tehri and the eventual coming up of new service centres, around the lake of the dam, and along Uttrakashi and Srinagar roads are to be solved. These centres would need planning so as to function as tourist centres. The creation of vast reservoir would result into the climatic changes requiring afforestation to check soil erosion due to increase in rainfall.

On the local front, the land purchased for new town is under private enterprenurship. The villagers are against the construction of town and obstruct the building activity on their land. The detail servey maps could not be made for preparing the master plan. In view of the above, as portion of forest land

adjoining the site of new town situated at the altitude of 1900m has been selected for the construction of Government offices and connected activities.

In view of implementation programme of rehabilitation, there is difficulty in acquiring the land. Therefore, only first phase of master plans accommodating a population of 10,000 was prepared. The final master plan of the whole town was possible only after the availability of detail survey map of the site.

Bhagirathi puram, a permanent colony of Irrigation Department to accommodate 18,000 people is coming up adjacent to the town, which will depend on the new town for higher order and specialized functions. This will require integrated approach for both the settlements, since development of single town is difficult because of the difference in altitude of 1, 000 m.

### 3.3 PLANNING POLICIES :

Planning policies deal with the various aspects of physical development, population and land use. The physical development of towns in hills tends to follow linear growth along the contours of hills and the pattern of development can be arterial (along the ridge or valley) or parallel or arterial and lateral or in a combination.

Under the population policy, the population of Tehri Town, Government employees in the town and villages which would be partially and fully submerged in the reservoir is taken into account. Tehri town witnessed the decennial increase of 21.6 percent during 1961-71, on the basis of which and other population projection methods, the future population is estimated

: 1971-5480, 1981-6674, 1991-8128 and 2001-9,900 population .

However, in the year 1977 and 1978 the population increased to 6341 and 7804 respectively, which has been much more than the estimated population. Instead of the figures of the population projections and actual census, a survey of 'Intending settlers ' in the new town was considered logical. According to this total estimated population for which the planning is undertaken comes to 13,393. Since a considerable proportion of rural population will take time to decide about shifting, for the first phase of development (year 1979-83) a population of 10,000 is considered. Accordingly, in the second(1983-91) and the third (1991-2001) phases, the planning was to be done for a total population of 15,000 and 20,000 respectively.

#### **3.4 PLANNING APPROACH :**

The economic base of the town is envisaged through the development of its administrative, commercial and educational base.

In light of various development possibilities an area of 306 hectares (850 acres) of land is available for New Tehri Town. Under the forced circumstances, first phase of Tehri Town is proposed for the area of 200 hectares(500 acres)covering villages of Baurori, Moldhar, Kulna and the adjoining forest area.

An approach to planning is based on relief configuration in the disposition of landuses, the development in the linear and dispersed forms. The Land slopes beyond 40 percent are considered unsuitable for building operations.

Slopes upto 10 percent are to be used for public buildings and between 10 to 40 percent for housing, roads etc. Higher terraces could be used for main functions and lower for residential areas. The movement of people and goods will have different gradients including short cuts of steeper gradient for pedestrians. The natural drainage lines will be maintained in the development. The periphery of the town will be within the 45 min of walk from the centre. Housing will have maximum coverage and will be allowed upto a height of 3 floors to save land and provide facilities specially to poor and middle income groups.

### **3.5 PLANNING STANDARDS :**

There is no 'Building Operation Act' in the state of U.P. for hill towns. There is a necessity of preparing separate standards for building in hills, since bye-laws of the plains cannot be applicable in hills. In view of the topography and climate, standards for the new town have been proposed for the development of various areas like residential , commercial, industrial and other areas in the draft master plan. Classification of roads with width and gradient are defined on the basis of importance and purpose of roads. Planning the community facilities, social and cultural institutions is based on the population to be served giving size of the plot. The planning standards for building operation for New Tehri are laid down in the draft master plan.

### **3.6 LAND USE PROPOSAL :**

In view of standards adopted for building operation in hills the requirement of the land for new town has been worked

out to 400 hectares(1,000 acres) for the population of 25,000 on the average density of 25 persons/acre. In the first phase of developmetn 10,000 persons, the 200 hectares(500 acres) land is available in villages Baurari,Kulna and Moldhar and the adjoining forest area. It is estimated that only 60 percent of this land i.e. only 120 hectares (300 acres) will be usable for development of first phase of town. The disribution of utilization land under diffferent land uses as proposed is given in the table 3.1. The 30 percent land is proposed under residential landuse to provide residential accommodation for government servants,whereas for the general public under rehabilitation programme, provision of plots row and group housing is suggested. For establishing the economic base of administration commerce education and tourism, the requirement of land is earmarked separately for government and semi government offices. The organization of commercial activity is designed. and it comprises of main commercial centre near administrative area and two sub district centres, one in Baurari and the other in Kulna along the main road for the proposed educational and medical facilities, an area of 8 hectares (20 acres) has been provided on the upper ridge of Baurari and near the office complex. About 4 hectares(10 acres) has been earmarked for the development of tourist infrastructure. Similarly land is proposed for stadium and industries based on locally available resources. The land under road is to the tune of 16.6 percent along with land required for bus and truck terminals.

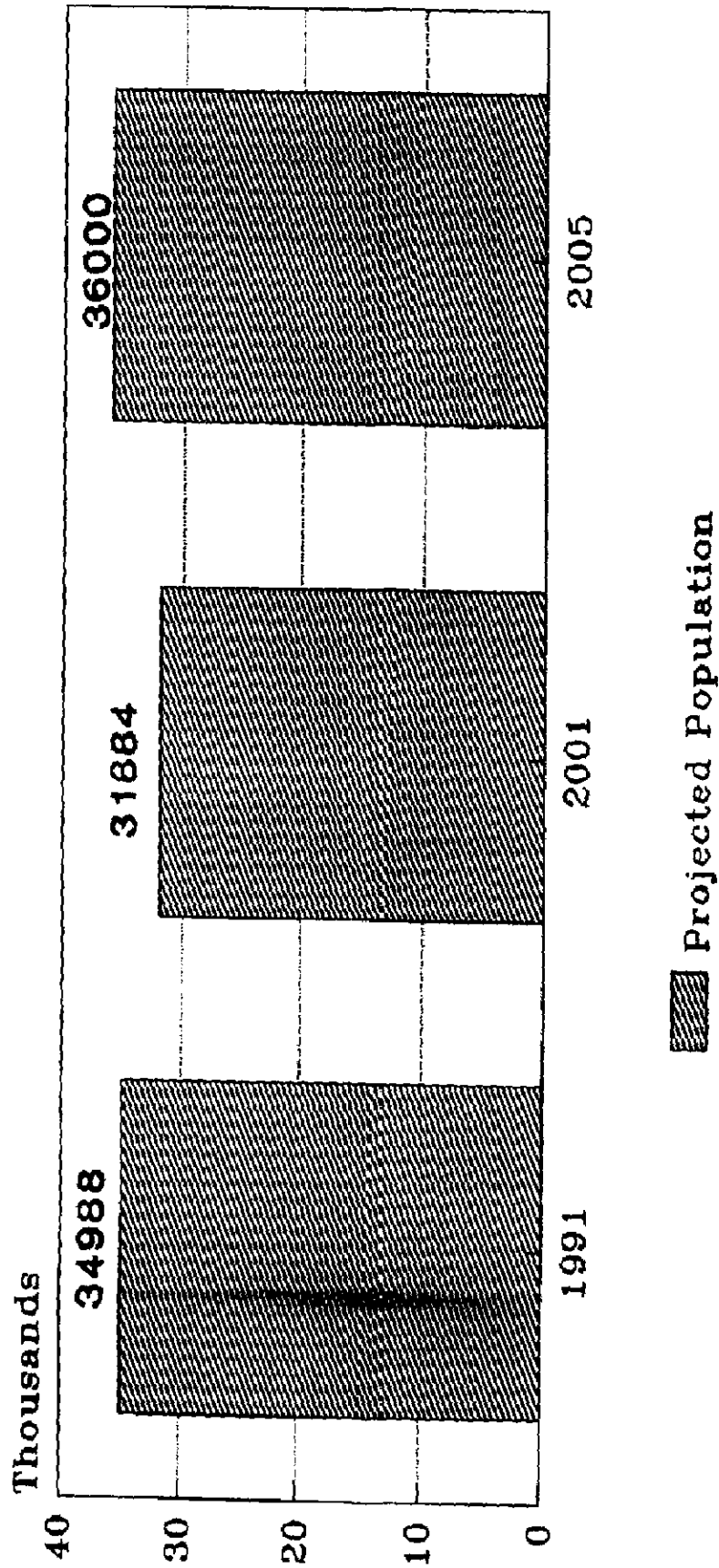
The proposed land allocation as per draft master plan is as under

Table - 3.1

## Proposed Land Use Distribution: New Tehri Town

Land Use	Percentage to total land use (1027.60 Ha)
Residential	30.69
Commercial	1.41
Community facilities	5.24
(a) Education	
(b) Medical	
(c) Religious places	
Govt./semi govt. offices	3.32
Industry	4.18
Tourism	4.58
Traffic and transportation	6.42
Entertainment	9.13
Utilities	1.91
Green area	33.12

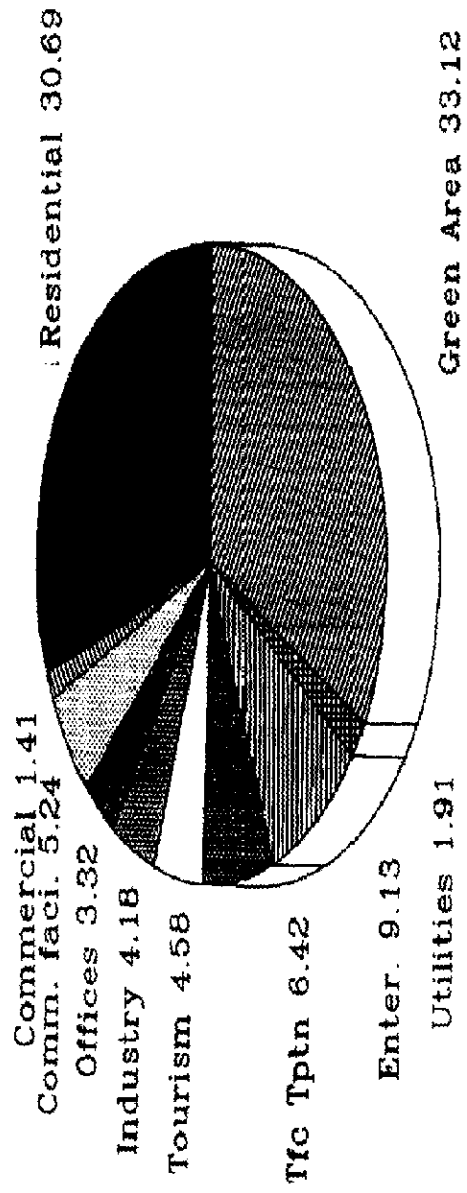
# Population Projection New Tehri Town



Source: Draft Master Plan,  
New Tehri Town (1985-2005)

**FIG-3.1**

# PROPOSED LAND USE New Tehri Town

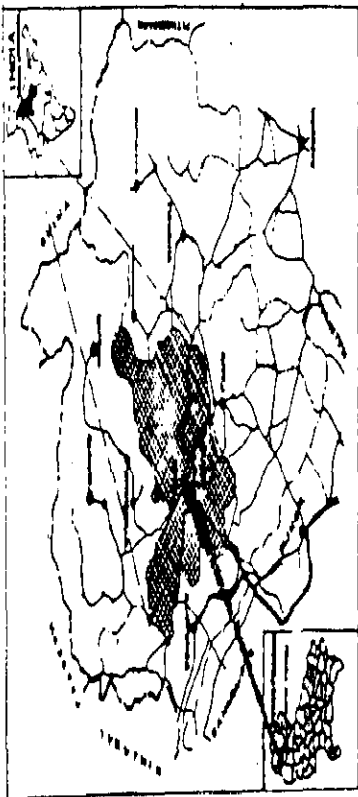


Percentage to total  
land use (1027.60 Ha.)

**FIG-3.2**

Source: Draft Master Plan, NTT. (1985-2006)





LOCATION OF NEW TEHRI TOWN  
IN RELATION TO GARHWAL REGION  
SCALE 1:125000



**LEGEND**

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- PUBLIC & SEMI PUBLIC
- TRANSPORTATION
- GREEN OPEN AREA
- LAND UPRIFT FOR DEVELOPMENT
- EXISTING ROADS
- NEW ROADS & FOOTPATHS
- VILLAGE BOUNDARY

**PLANNING STRATEGIES FOR DEVELOP-  
MENT OF KULLU TOWN**

NEW TEHRI MASTER  
PLAN (2001) NORTH  
SHEET NO. 3/1  
SCALE 1:12500  
DRAWN BY  
SARVJIT KUMAR  
MURTHY  
DEPARTMENT OF ARCHITECTURE  
AND PLANNING  
UNIVERSITY OF KURUKSHETRA

*Chapter 4:*  
**INTRODUCTION TO  
STUDY AREA**

## CHAPTER - 4

### INTRODUCTION TO STUDY AREA

#### 4.1 LOCATION

The Kullu district lies between  $31^{\circ}58'00''$  North latitude and  $77^{\circ}06'4''$  East longitude. On the North and North-East it is bounded by Lahaul and spiti and Kangra district, On the East and South-East by Kinnaur and Shimla districts and in the South-West by Mandi district. The total area of the district is 5,503 sq.kms. which constitutes 9.88 percent of the total areas of the state. Kullu was made into a separate district in 1963 prior to that it was a Tehsil of Kangra district. After formation of the district it comprised of 4 Tehsils and sub-tehsils namely Kullu, Banjar, Ani and Nermand while the first one was a Tehsil and later ones were sub-Tehsils. The area of the valley is 196 sq. miles in which there are 80 settlements, the rural settlements number 76 whereas 4 settlements are urban settlements.

#### 4.2 PHYSIOGRAPHY :

Physiographically, the greater part of Kullu region is that of hilly nature, which covers the hill sides of two mountains running parallel to each other on the Eastern and Western side of the valley. The average elevation of the region is 2100 metres but there are ranges in the valley which rise to 5000 metres or even a little more above sea level. Generally from geographical point of view the whole region can be further sub-divided into two distinct geographic units.

(a) The bottom of the valley

This unit is relatively a flat tract on either side of the river Beas. It extends from Aut or Bajaura on the Southern limit of the region to Marhi on the Northern end of the region just down below the Rohtang Pass. Upto Sultanpur (Kullu) the maximum portion of this unit is on the western side of the river Beas, but after Kullu the flat tract spreads on either side of the river, the maximum width of this tract varies between 3-4 kms. (near Bhuntar) and it goes on narrowing as we proceed towards the North. This tract has a gentle slope, big fields and fertile alluvial soil, hence the tract is of great economic importance.

(b) Hillside slopes

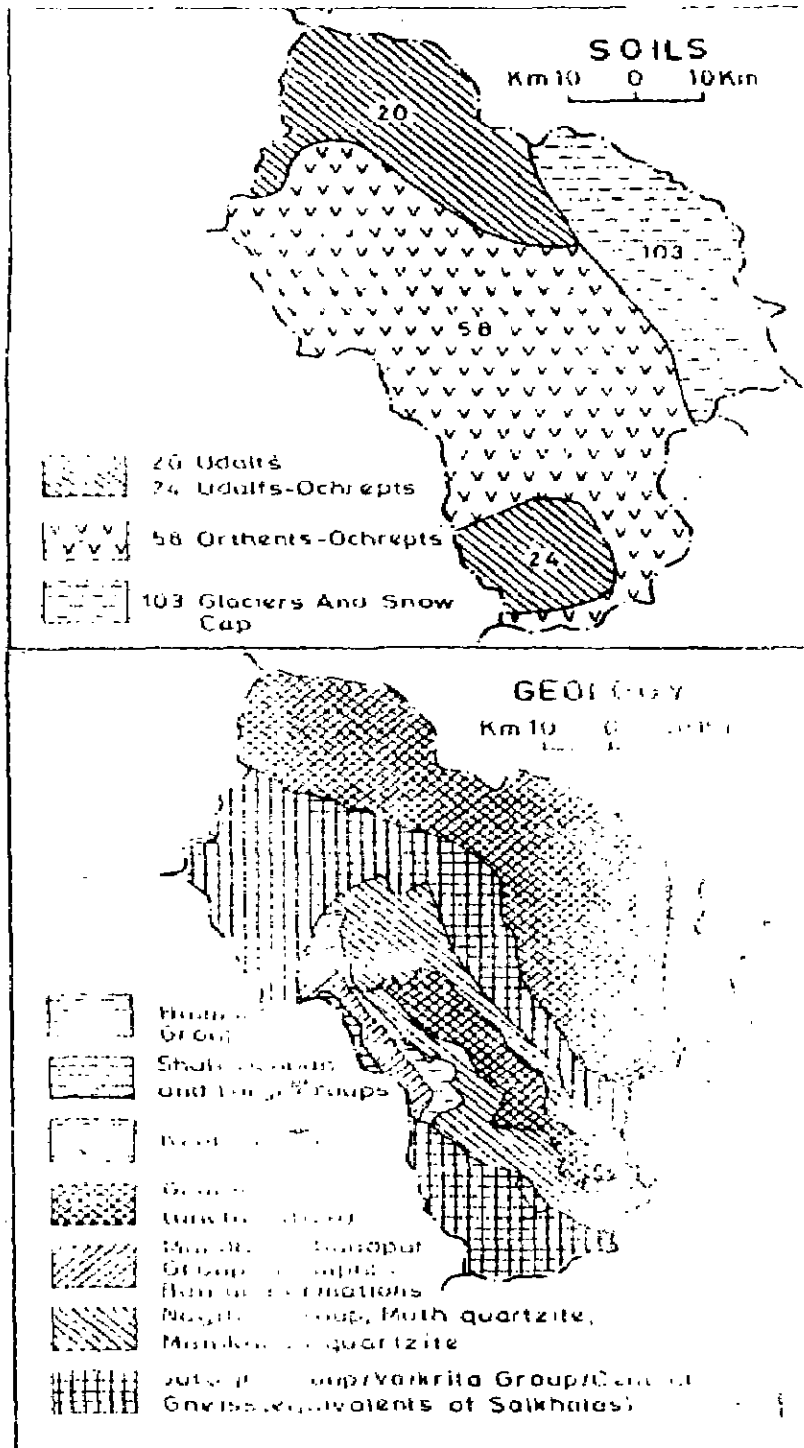
This geographic sub-region includes the western slopes of Kunzam ridge (which divides Lahaul from Spiti) and (Eastern slopes) Banghal Range which separates Kullu from the Kangra district, these two constituents of this sub-region lie on Eastern and Western sides of the region respectively. This part of the Kullu region is of somewhat hilly nature with moderately sloping spurs as well as sharp crests and deep ravines. These projecting spurs are occupied by the settlements owing to their agricultural value. The small spurs are segregated from each other by local nallahs. This tract covers approximately 94.6% area of the Kullu region. These mountains like other parts of the Himalayas are composed of long high ridges with sharp crests and steep sides. They are very lofty on North and Eastern sides of the tract.

**4.3 GEOLOGY :**

The geological features of the region are fairly constant throughout and the only exception to the general feature is a small belt of (metamorphic crystallin) sedimentary rocks limestone and quartzites which starts from Bajaura. The axis of Himalyas is formed by the metamorphic crystalline and unfossiliferous rocks. The crystalline partly consists of intrusive granite and partly of gneisses, and other metamorphic rocks resulting from the action of the granite on the cambrian slope and quartzites of the northern zone. The above stated rocks form the major part of the Kullu region. South of metamorphic is a system of unfossiliferous sedimentary rocks which constitute a small portion of region near Bajaura.

#### 4.4 SOILS

The soil throughout the region is of same type with slight variation in composition of profile owing to the spatial differentiations in topographical as well as geographical conditions. the soil of hill side is usually glistening with particles of micaceous rocks. The depth of the soil profile is less on hillsides due to sloppy nature of the land. The hillside which constitute a major portion of the region are subjected to rapid erosion due to sloppy nature of land and heavy rainfall particularly during monsoon period, hence, the depth of the soil profile is less in such areas of the region as compared to the lower parts. The rainwater washes away the rich nutrients from the soil and reduces the fertility of land. Owing to above the higher parts of the region are either barren slopes or under scattered natural vegetation. Intensive agriculture is not possible in such areas. In the proximity of forests where slope



**SOIL & GEOLOGICAL DETAILS  
OF DISTT. KULLU**

**FIG-4.1**

is comparative gentle more usually in the higher elevations, the soil contains much vegetable mould. The soil in such scattered pockets is useful for subsistence type of agriculture. In the upper part of the Beas valley, the alluvial slopes near the river and its tributaries are very much valuable as rice growing lands. The soil along river on either side is having fine texture, more compactness and rich nutrients. The soil profile is also enough deep in this part. Hence the bottom of the valley is of high agricultural value.

#### **4.5 NATURAL DRAINAGE:**

Owing to the hilly terrain, the region has a most beautiful and intricate natural drainage pattern. From this point of view the region has a catchment area of Beas river and its tributaries. The whole region is drained by the Beas and its tributaries.

#### **4.6 CLIMATE:**

Snowfall on the higher elevation is also a common phenomena during winter season. Hence the winter are sometimes severe in the higher lying tracts. Rainfall is generally excessive at the higher elevations on the slopes of the surrounding mountain ranges. The climate of the valley has its own economic significance because this climate suits best for the cultivation of all sorts of temperate fruits such as apples, plums, apricots etc. which support the economy of the region to a great extent. The monthly minimum and maximum temperature and average rainfall data has been shown in the table 4.1 and 4.2 respectively.

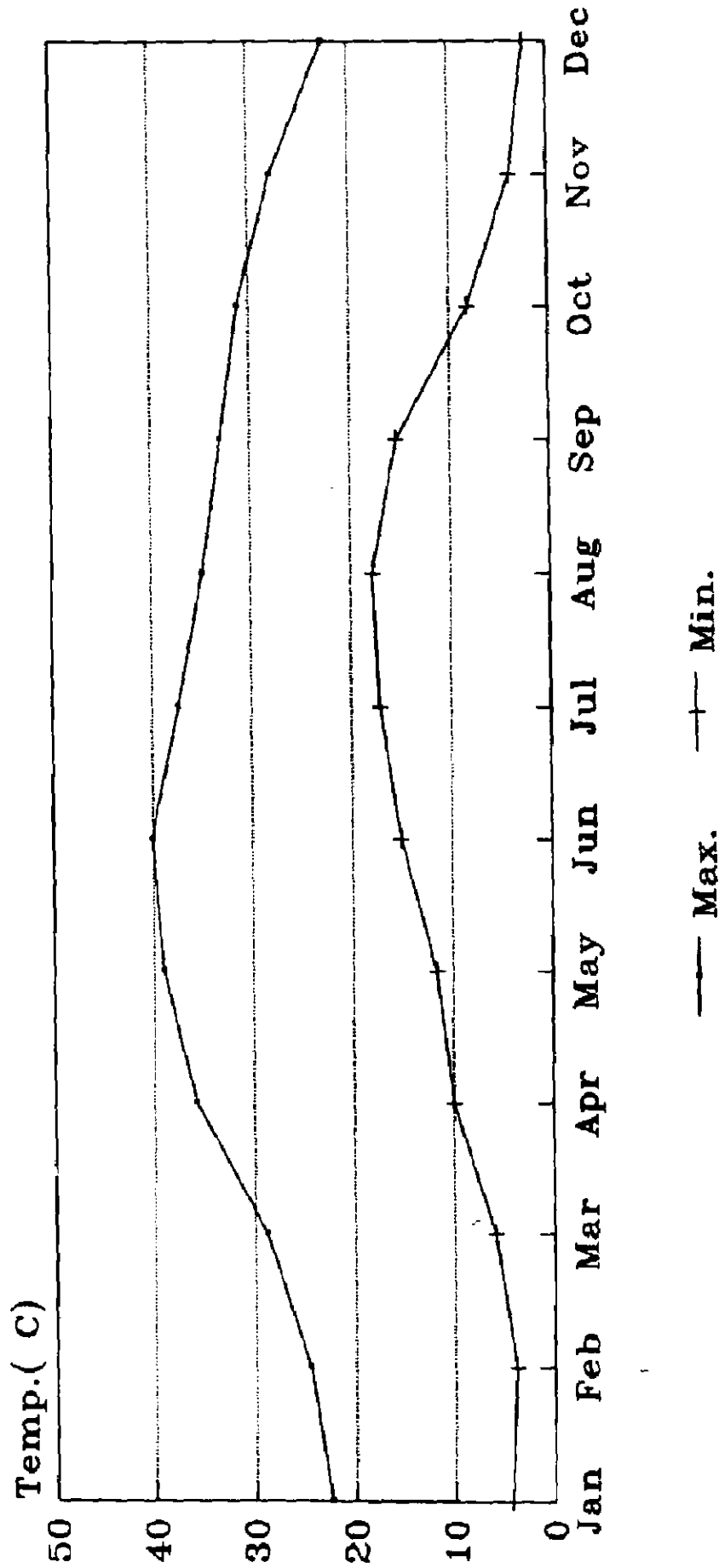
Table 4.1  
Monthly Maximum and Minimum Temperature (in °C)

NAME OF THE TOWN	ELEMENT	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
KULLU	MAX.	22.4	24.5	28.8	35.8	39.0	40.1	37.3	34.9	33.0	31.2	27.8	22.5
	MIN	4.2	3.8	5.9	10.0	11.7	15.2	17.2	17.9	15.4	8.10	3.8	2.3
MANALI	MAX	16.7	17.7	23.1	27.0	29.8	31.4	28.9	28.1	28.8	26.5	23.1	18.9
	MIN	-	2.3	0.1	2.2	5.0	8.3	11.6	11.4	6.9	2.5	0.5	0.2
BHUNTAR	MAX	23.4	25.5	30.9	36.7	39.7	40.9	38.1	35.3	34.0	32.3	28.9	23.7
	MIN	4.3	3.8	6.3	10.1	12.2	16.1	18.3	18.8	15.5	9.3	4.6	2.3

Sources : Revised Working Plan for Kullu Forest Division 1979 to 1993-94



# Average Temperature Data Of Kullu Town



Source: Revised Working Plan For Kullu  
Forest Division 1979 To 1993-94

FIG-4.2

Table 4.2

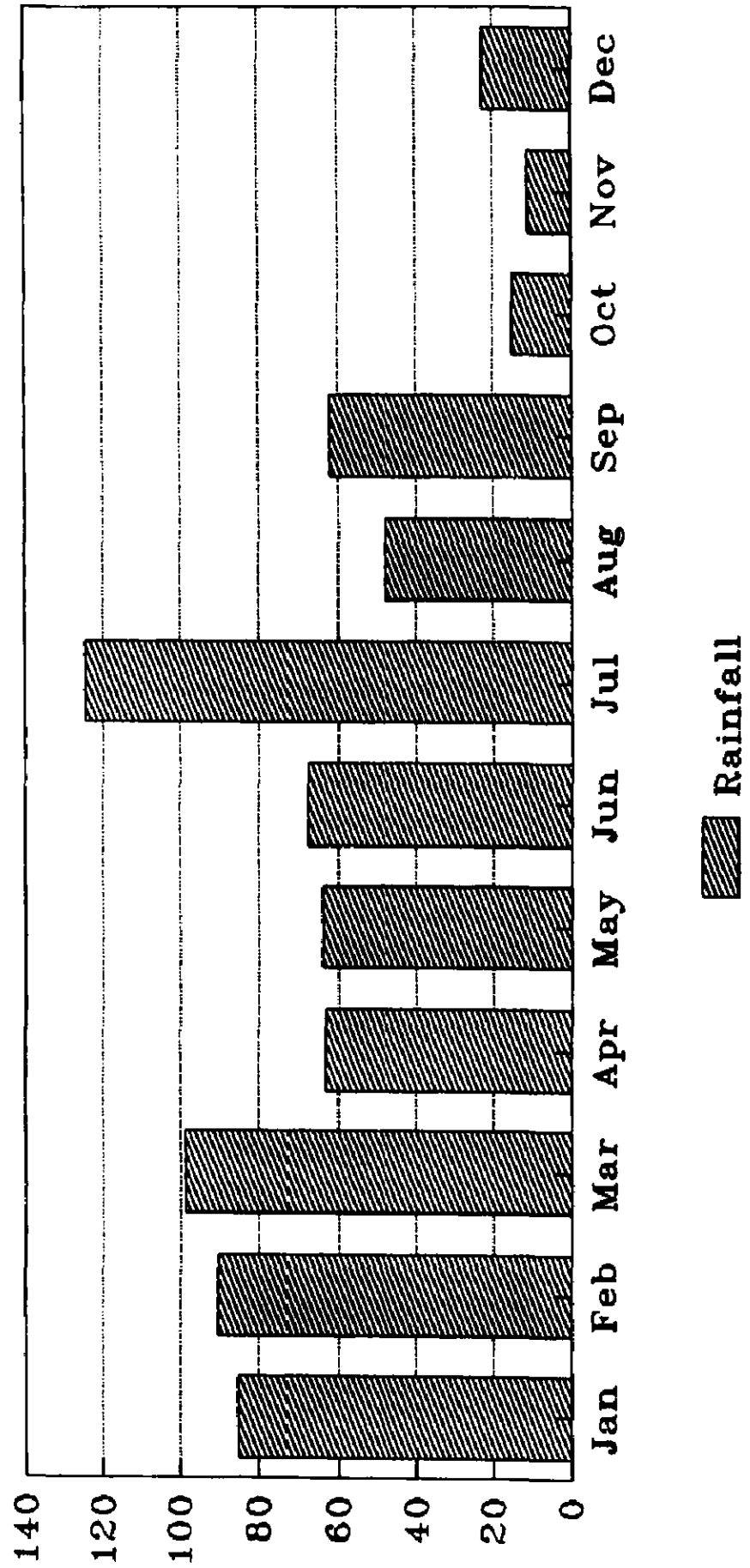
Average Rainfall Data (in mm.)

NAME OF THE TOWN	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
KHULLU	85.93	90.34	98.65	63.34	64.18	67.93	124.52	48.0	62.13	15.24	11.09	22.55
MANALI	45.30	75.00	145.0	106.2	57.08	88.08	212.50	274.6	103.3	46.30	27.8	39.0
BHUNTAR	77.02	53.74	53.51	52.15	30.33	21.62	87.34	96.04	23.93	18.71	17.64	15.12

Sources : Revised Working Plan for Kullu Forest Division 1979 to 1993-94

# Average Rainfall Data Of Kullu Town

Rainfall (in mm.)



Source: Revised Working Plan For Kullu  
Forest Division 1979 To 1993-94.

FIG-4.3

#### 4.7 LAND USE PATTERN

The total geographical area of this region is 1,94,768 Hectares, out of which 33,300 Hectares is utilised for agricultural purposes. Though there are few small tracts of agricultural land on the upper reaches yet, most of this agricultural land lie on the either side of river Beas in its lower reaches. The following table reflects the area under different uses.

Table - 4.3

##### Land Use Pattern : Regional Level

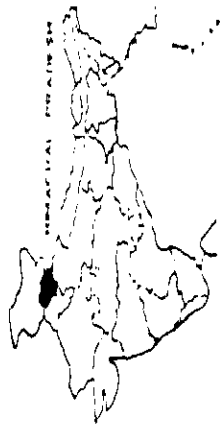
Category	% to total area (194768 Ha).
Agricultural Land	17.10
Residential	0.33
Brooks and Rivers	0.24
Transport and Communications	0.25
Forest	16.17
Barren	65.91

The following table reflects the area under different uses at town level

Table 4.4

##### Land Use Pattern: Kullu Town

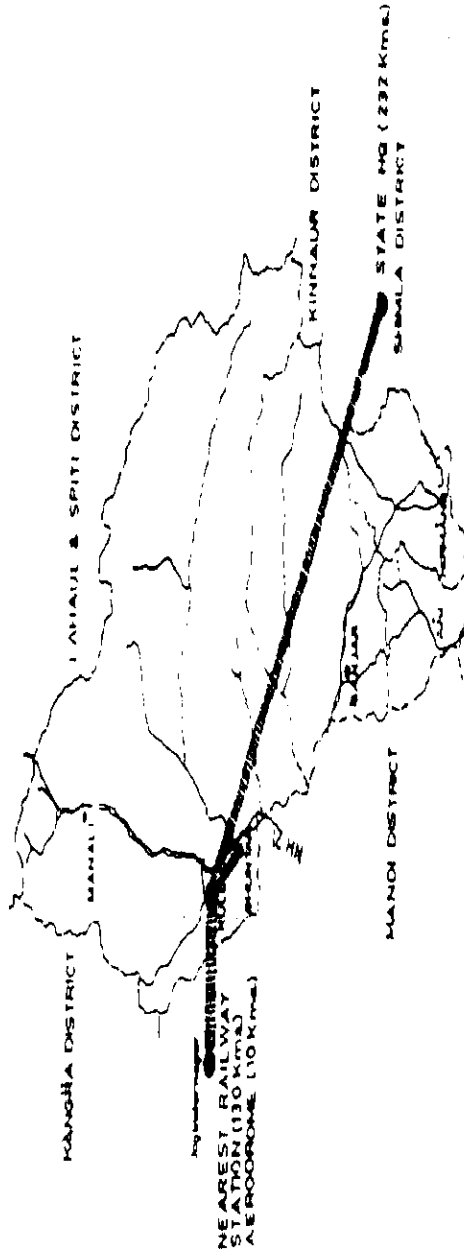
Category	% to total area (645.75 Acres)
Residential	21.00
Tourism	0.58
Commercial	1.13
Facilities	1.68
Govt. & Semi Govt.	0.89
Park & Open space	3.82
Traffic & Transportation	4.90
Agriculture Forest	0.48
Water bodies	17.05



INDIA  
SCALE 1:1,000,000



HIMACHAL PRADESH  
SCALE 1:250,000



DISTRICT KULLU  
SCALE 1:50,000

# PLANNING STRATEGIES FOR DEVELOPMENT OF KULLU TOWN

REGIONAL LOCATION	INDIA
SCALE	AS SHOWN
Author	Guided by
Submitted by	MR. PUSHPALATA
DATE	11.11.2022
DEPARTMENT OF ARCHITECTURE AND PLANNING	UNIVERSITY OF ROORKEE

TO MANALAY

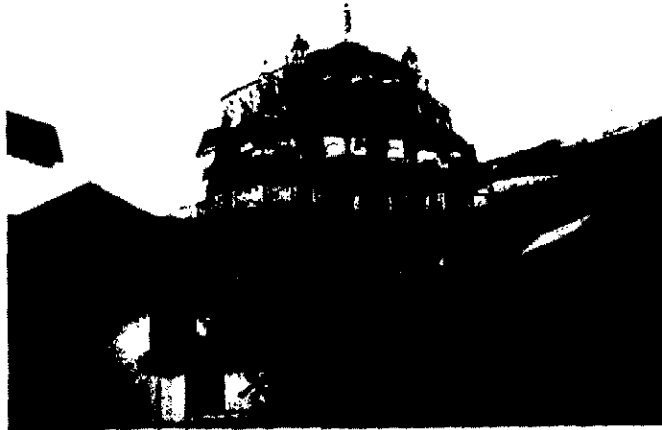


LEGEND

- RECREATIONAL
- COMMERCIAL/MIXED USE
- INDUSTRIAL
- PUBLIC & SEMI PUBLIC
- TRANSPORTATION
- GREEN/OPEN AREA
- RIVER/KYAD
- ROADS
- FOOTPATH
- MUNICIPAL BOUNDARY
- VACANT/CULTIVATED LAND

PLANNING STRATEGIES FOR DEVELOPMENT OF KULLU TOWN

EXISTING LAND-USE		DATE
KULLU TOWN		1978
SCALE	1:10,000	
PROJECT NO.	101	
DESIGNED BY	DR. J. S. SINGH	
CHECKED BY	DR. J. S. SINGH	
DEPARTMENT OF ARCHITECTURE		
UNIVERSITY OF ROORKEE		



Rupi Palace at Sultanpur  
Plate-1



Hanumanji Temple at Dhalpur

STRUCTURES OF ARCHITECTURAL IMPORTANCE

Plate-2



Dussehra Ground at Dhalpur  
Plate-3



Bus Stand

EXISTING LAND-USE

Plate-4





Mixed Traffic on NH 21  
Plate-5



Parking Lot at Dhalpur

Plate-6



247666



Inadequate Parking Space:Dhalpur  
Plate-7



Street on Pedestrian scale:Lower Dhalpur

Plate-8



Physical Development along Sarwari Khad  
Plate-9



Sub-Urban Ribbon Development along NH21

Plate-10



Wooden structures being replaced by  
RCC/Brick structures  
Plate-11



Pressure on Lower Slopes for Physical Development

Plate-12

*Chapter 5:*  
**ANALYSIS OF  
SOCIO-ECONOMIC  
CHARACTERISTICS**

CHAPTER-5  
ANALYSIS OF SOCIO-ECONOMIC CHARACTERISTICS

**5.1 DEMOGRAPHIC ANALYSIS :**

**5.1.1 Population Growth :**

There had been sharp increase in population between 1961 and 1971 which is attributed to its forming as a district headquarter. The table 5.1 below shows the decennial growth of population in Kullu town. The population growth at the District and State level is shown in Table 5.3.

Table - 5.1

Decennial Growth of Population in Kullu Town

Year	Male	Female	Total
1961	2760	2126	4886
1971	5276	3682	8958
1981	6976	4893	11869
1991	8071	6498	14569

**5.1.2 POPULATION PROJECTION :**

The population of Kullu town for 2011 has been projected as 31136 taking the geometric method. The following methods are considered for the population projection.

(a) Arithmetic increase method

$$P_n = P_0 + na_v$$

where

$P_n$  = Population after n decades

$P_0$  = Population at 0 decade

$a_v$  = average increase per decade

$n$  = number of decade

thus

$$P_{2001} = 14569 + 1(3227) = 17796$$

$$P_{2011} = 14569 + 2(3227) = 21023$$

(b) Incremental method

$$P_n = P_0 + n (a_v + I_n)$$

where

$I_n$  = Incremental increase per decade

thus.

$$P_{2001} = 14569 + 1 (3227 + (-686) ) = 17110$$

$$P_{2011} = 14569 + 2 (3227 + (-686) ) = 19651$$

(c) Geometric method

$$P_n = P_0 ( 1 + r/100 )^n$$

where

$r$  = Percentage increase (Ave/decade)

$$P_{2001} = 14569 ( 1 + 46.19/100 )^1 = 21298$$

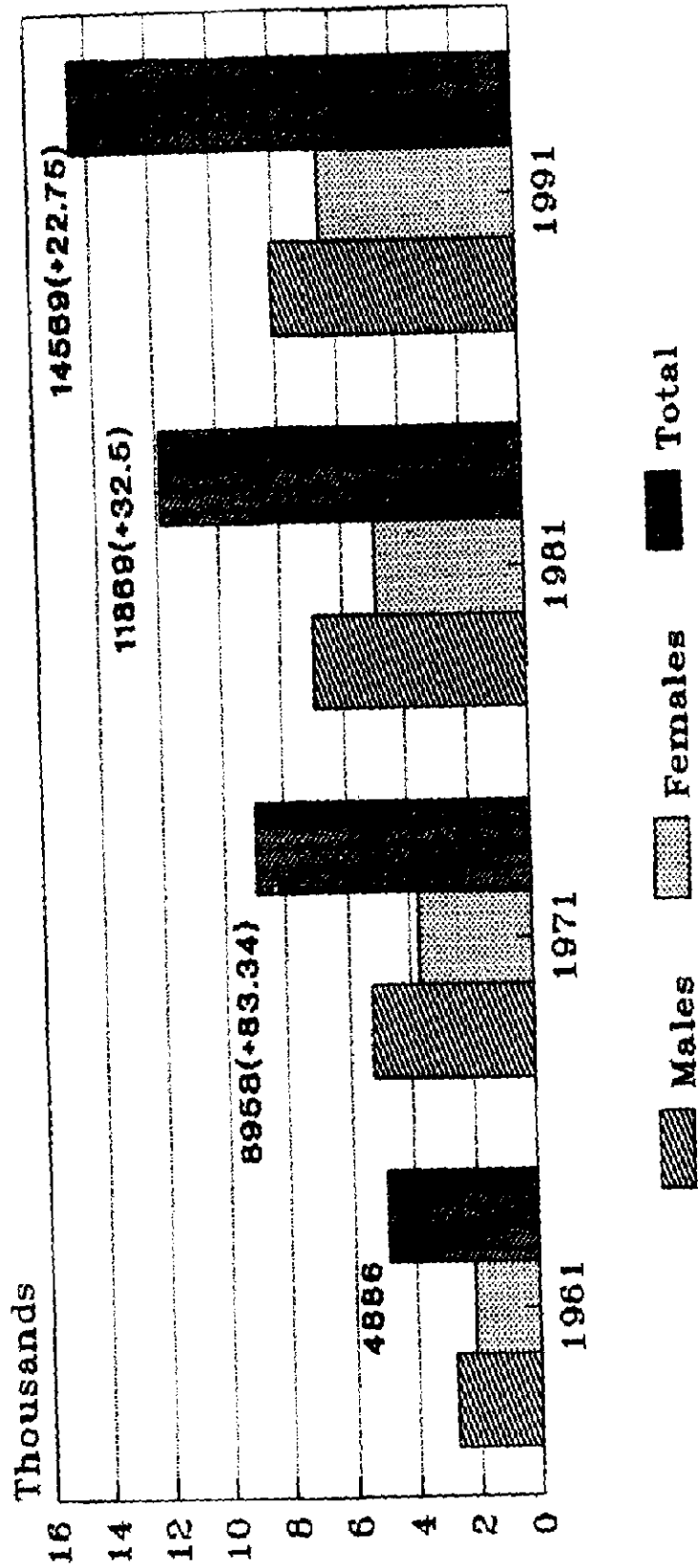
$$P_{2011} = 14569 ( 1 + 46.19/100 )^2 = 31136$$

Table - 5.2

Population Projections: Kullu Town

S.No.	YEAR	CENSUS POPULATION	DECADEL VARIATION	%AGE DECADEL VARIATION	INCREMENTAL INCREASE
1	1961	4886			
2	1971	8958	+4072	+83.34	
3	1981	11869	+2911	+32.5	-1161
4	1991	14569	+2700	+22.75	-211
5	TOTAL		9683	138.59	-1372
6	AVE. PER DECADE		3227	46.19	-686
7	AVE. PER YEAR		322.7	4.61	-68.6

# Population Growth Trend Of Kullu Town

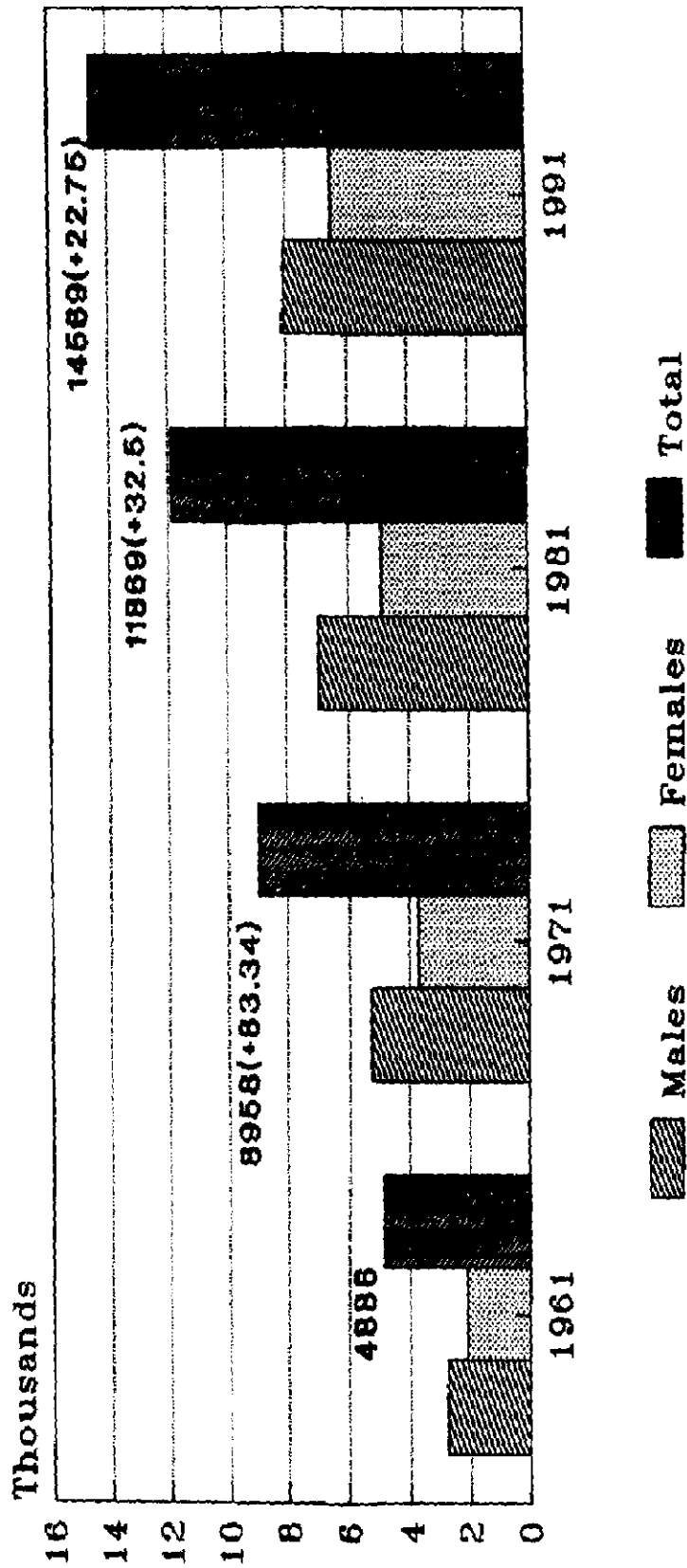


Source: District Census Handbook, 1981.

FIG-5.1



# Population Growth Trend Of Kullu Town



Source: District Census Handbook, 1961.

FIG-5.1

# Population Projection Kullu Town

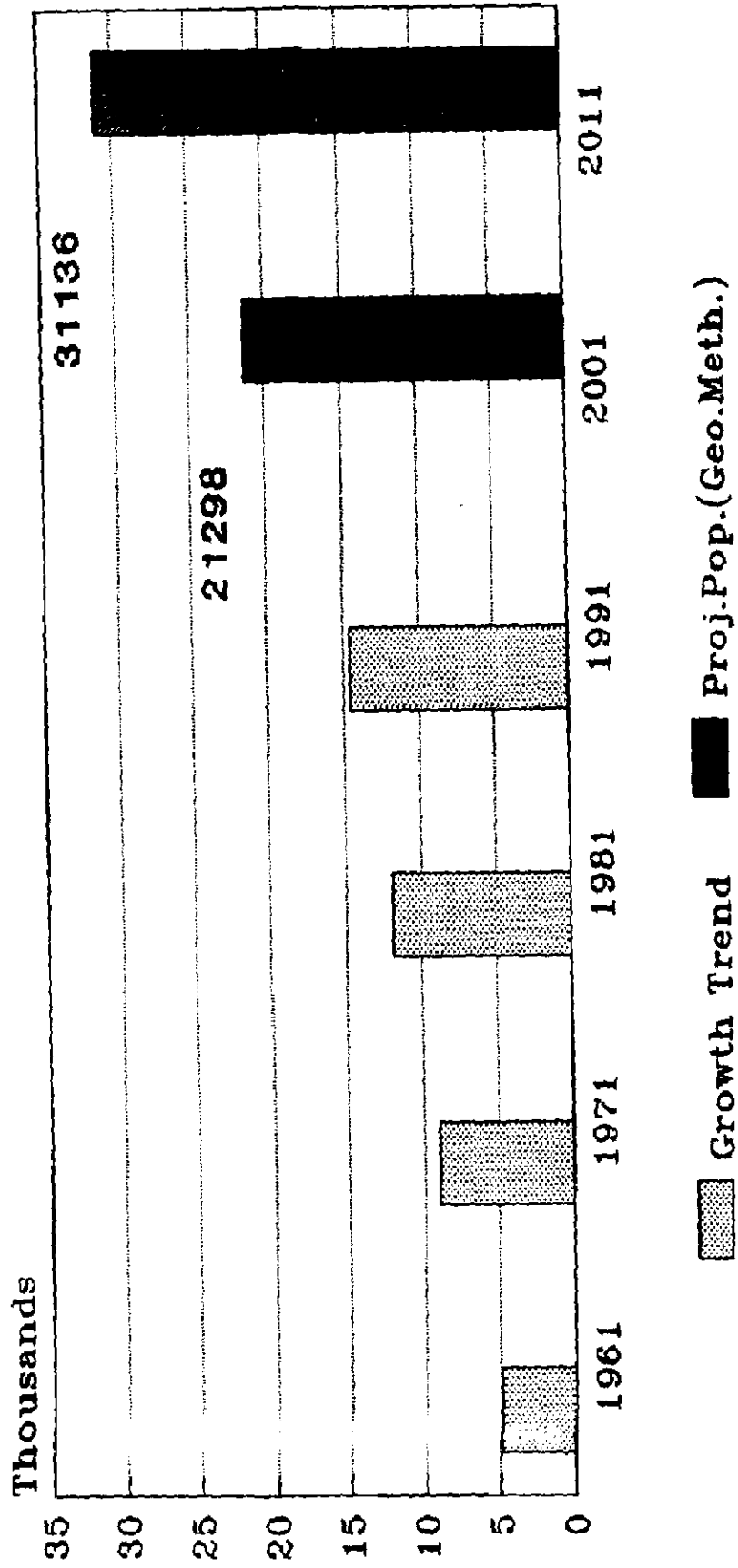


FIG-5.2

# Population Projection Kullu Town

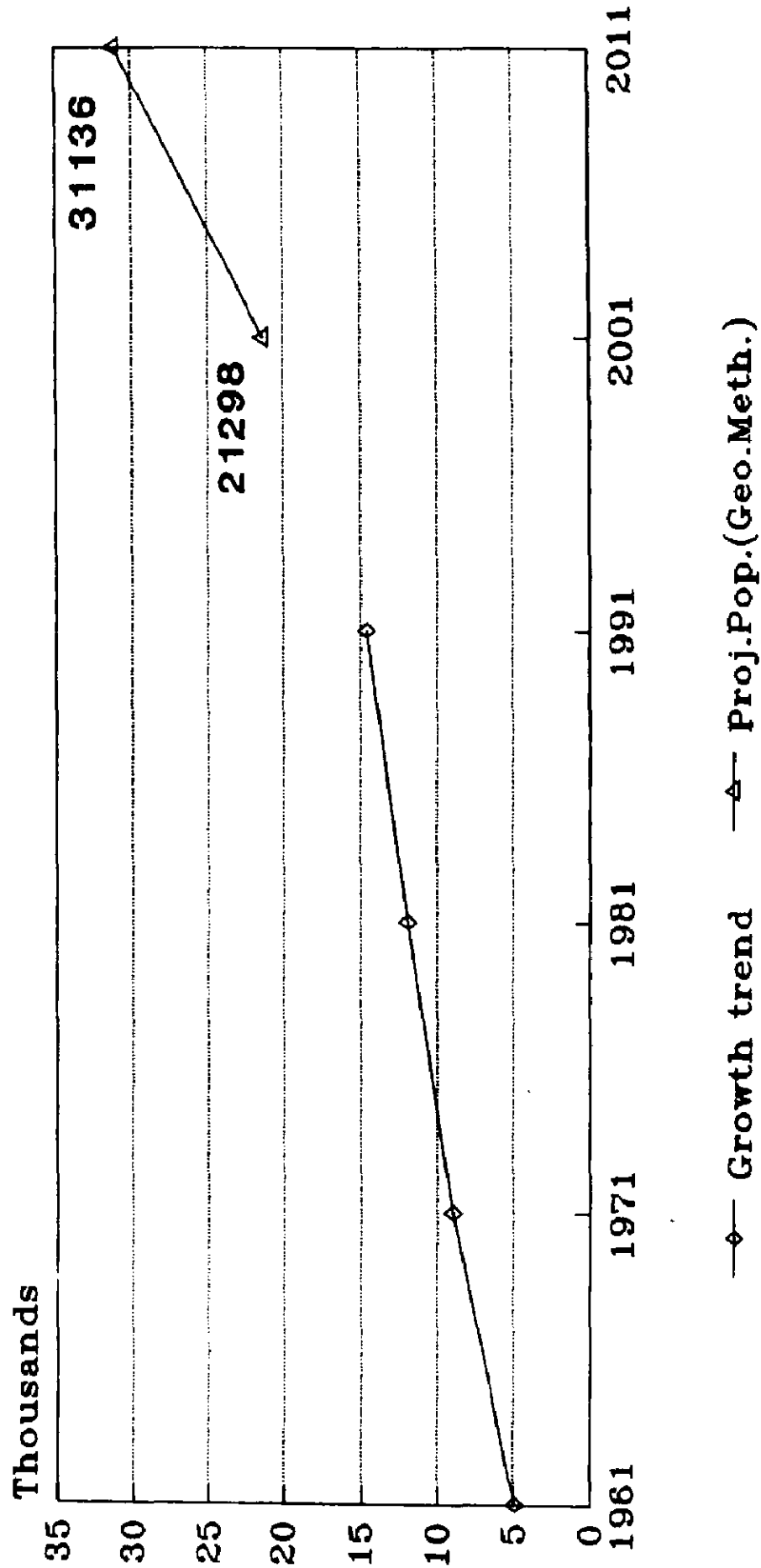
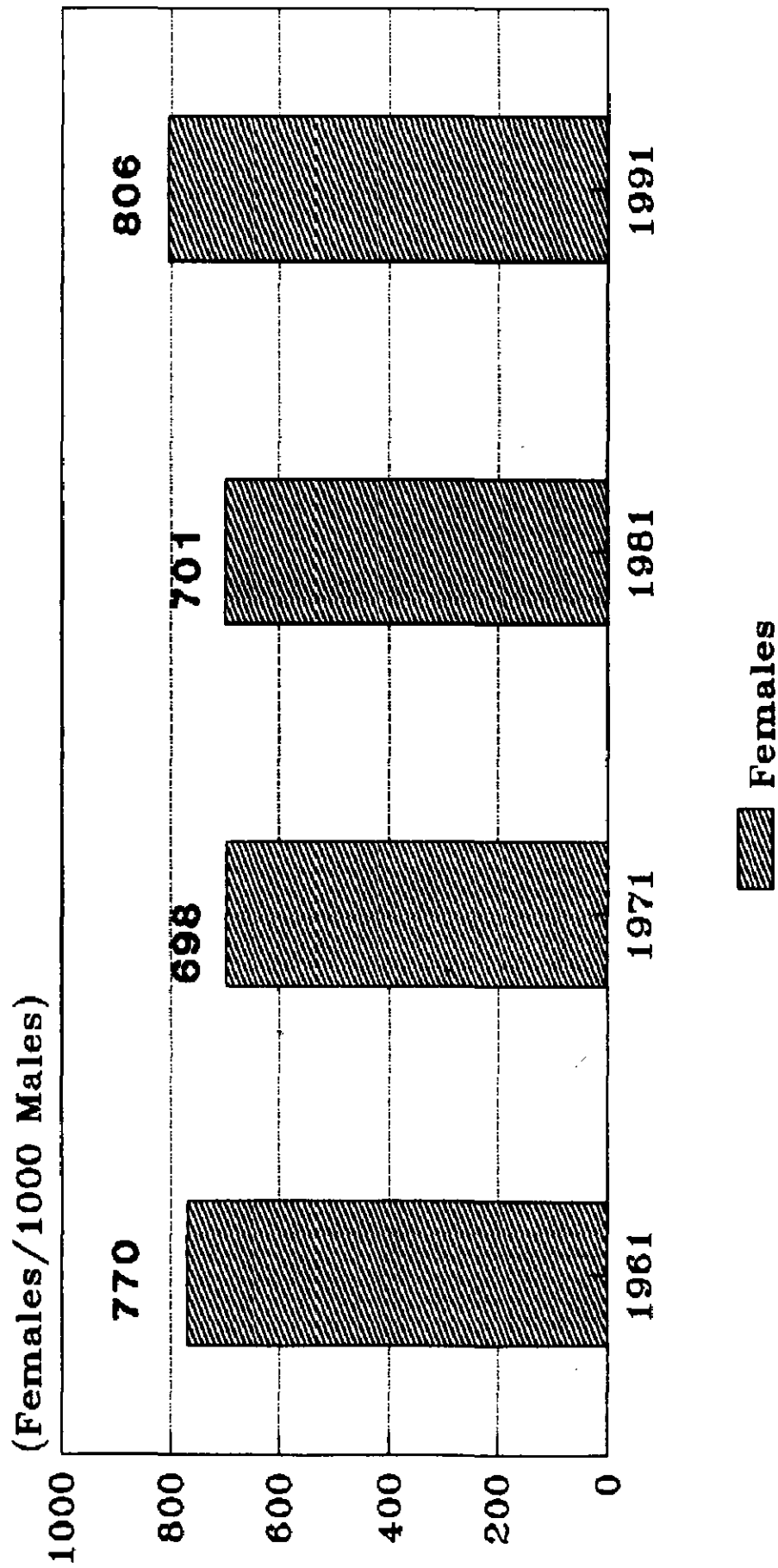


FIG-5.3

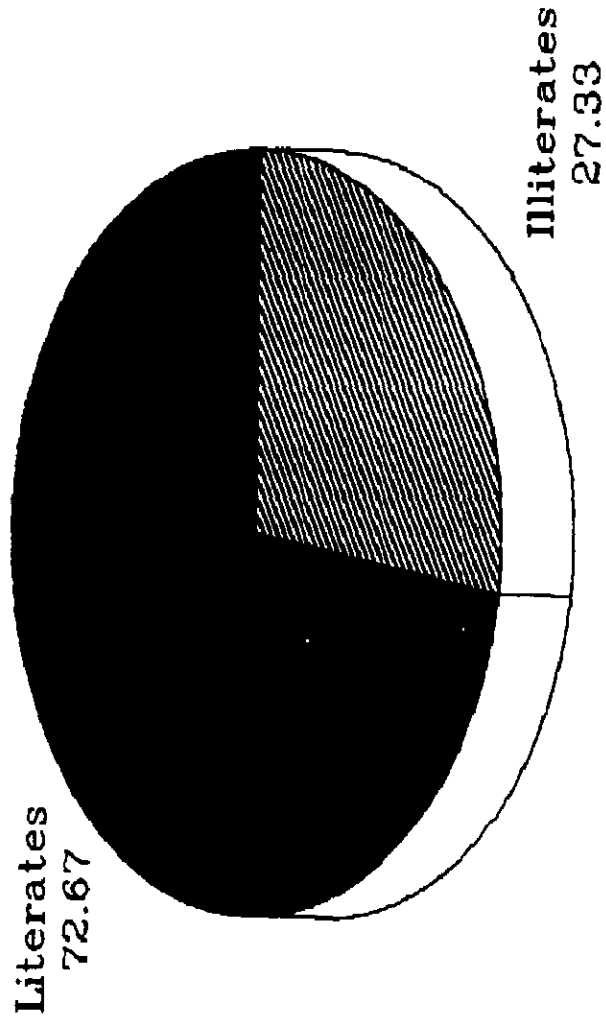
# Sex Ratio of Kullu Town



Source: District Census  
Handbook, 1981.

FIG-6.4

# Literacy Rate Of Kullu Town



Source: District Census  
Handbook, 1981.

**FIG-5.5**

Table - 5.3

Population growth : Kullu Valley (1971-91)

Growth rate ( in percentage)

YEAR	1971-81	1981-91
Distt Kullu	24.1	26.39
H.P.	23.71	19.39

### 5.1.3 Sex Ratio

The No. of females per 1000 males has been shown in the graph for the Kullu town. During 1981 the No. of females per 1000 males were 920 and 973 at the District and state level against 701 at the town level.

### 5.1.4 Literacy Rate

As per census handbook of 1981 the literacy rate of the town was 72.67% and for the state it was 42.48%.

## 5.2 ECONOMIC BASE :

### 5.2.1 Occupational Structure

Economic condition of the people of any region depends to considerable extent on the type of occupation they have, because per capita output varies considerably from one type of occupation to another. People who are engaged in manufacturing industries earn more than persons engaged in agriculture. The workforce distribution at town level and valley level is shown as per table below.

Table- 5.4

## Work Force Distribution : Kullu Valley

YEAR	1971	1981
Primary	73.9	71.8
Secondary	2.42	1.39
Tertiary	23.7	26.8

Table 5.5

## Percentage of main workers, marginal workers and non workers

MAIN WORKERS			MARGINAL WORKERS			NON WORKERS		
TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
37.72	88.25	11.75	0.72	37.65	62.35	61.56	40.96	59.04

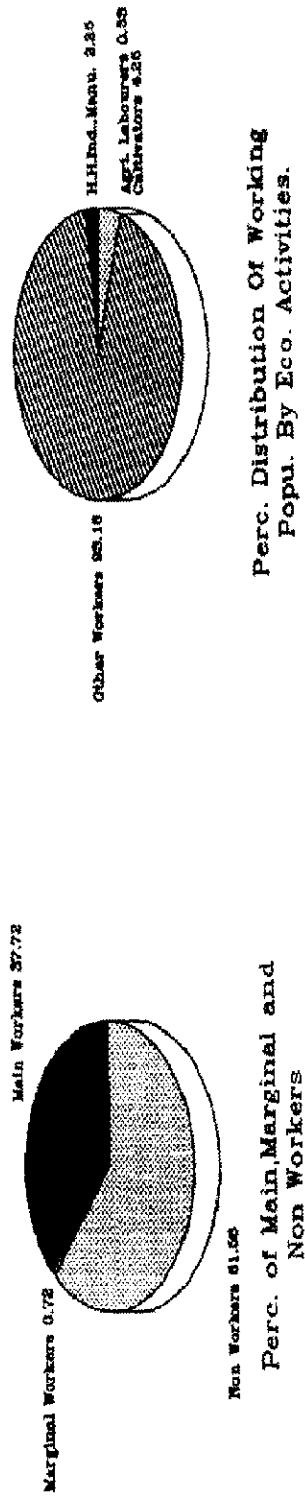
Table 5.6

## Percentage distribution of working population by economic activities

CULTIVATORS			AGRI. LABOURERS			HOUSE HOLD IND. MANUFACTURING PROCE- SSING SERVICING REPAIRS			OTHER WORKERS		
TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEM
4.25	63.15	36.85	0.33	66.66	33.34	2.25	75.24	24.76	93.18	89.78	10.

Source : District Census Handbook, 1981

# Occupational Structure of Kullu Town



Source: District Census Handbook, 1981.

FIG-5.6



# Work Force Distribution Kullu Valley



Source: District Census Handbook, 1981

FIG-6.7

### 5.2.2 Agricultural:

#### a) Land Holding

The following table shows the percentage wise population holding the land in the Kullu Valley.

Table - 5.7

Kullu valley : Size of Land Holding (1981)

Size of holding	(In percentage)
less than 1 Ha	63.9
1 - 2	32.1
2 - 4	3.25
4 - 10	0.75
10 Ha and above	-

The table reveals that most of the farmers are small and marginal thus as could be expected of a hilly terrain the size of holdings is very small, creating innumerable problems in agricultural operations. The holdings are fragmented to such an extent that an average holding remains uneconomic.

#### (b) Irrigation

Due to hilly terrain only 11% of the total cultivated area is irrigated the major source of irrigation in kuhl or diversion channels from the perennial Khads and streams. However in the recent past with the collaboration of the USAID, the state Govt. has undertaken various medium and small hill irrigation schemes and further progress is underway.

(c) Level of Productivity:

Table 5.8 shows the yield per hectare of the principle crops in Kullu for irrigated and unirrigated areas. Wide gaps can be identified in irrigated and unirrigated yields. The average yield of irrigated and unirrigated rice are 1229 kg/ha and 672 kg/ha. The corresponding figures for wheat are 1465 kg/ha and 1237 kg/ha respectively. The variation in productivity per hectare for different crops among the settlements are still greater.

Table - 5.8  
Yields of Crops (1981)

Crop	Yield	Yield
	kg/ha	kg/ha
	Irrigated	Non-irrigated
Rice	1229	672
Wheat	1465	1337
Barley	1391	-
Maize	1890	-
Millets	199	-
Potato	8660	-

The varying levels of productivity can be accounted for in the following manner.

- i) There are areas where specialisation in the production of some specific crops such as pulses and vegetables has been achieved and has paved way for commercial production.
- ii) Low level of productivity in other areas can be attributed to a large no. of factors such as variations in climatic conditions, soil differentiations, availability of irrigation facilities and the extent of utilisation of agricultural inputs.

Towards higher altitudes low level of productivity can also be attributed to the increasing operating expenses such as purchase of seeds, manures, and fertilizers, repair and maintenance of terraces and henceforth.

For further development there is a need for a well developed infrastructural facilities. The agricultural co-operatives, e.g. which plays a major role in provision of agricultural inputs and sale of outputs are confined to valley section while on the higher altitude adequate infrastructure to support effort to maximise the yields are missing. As a result development has more or less remained stagenent here.

### 5.2.3 Horticulture:

Kullu valley falls under temperate zone of H.P. here temperate fruits like apple, plum, peas, almonds, cherry, perssimon, walnut and apricots are grown successfully on commerical lines. Priority has been given to the production of fruits due to various reasons.

In the terrain and under agro-climatic conditions of Kullu valley, horticultural pursuits provide higher income per unit of land.

Marginal lands otherwise unsuitable for the production of field crops can be profitably utilised for growing horticultural crops. The latter helps in checking soil erosion as well.

- Horiculture provides more employment and thereby supplements the otherwise small income of the farmers.
- Activities of horticulture can even be adopted as supplementary occupation in temperate areas.

Table - 5.9

## Kullu Valley : Area Under Horticulture Fruits

Fruits name	1971	1991 (in %)
Apples	81.63	76
Stone fruits and nuts	15.94	16.65
others subtropical fruits	2.43	7.34

The percentages reveal diversification of area under different fruits. Though apple is the dominant fruit, crop area under stone fruits and sub tropical fruits has increased between 1971 to 1991.

These fruits are highly perishable and fragile there thus arises a need to review the development of horticulture infrastructure. These facilities can be divided into:

- Facilities for disposal e.g. grading, packing, transportation, storage, etc.
- Institutional facilities e.g. HPMC, co-operatives etc.
- Other such facilities.

Infrastructure facilities are not well developed to cater to a massive fruit production in the valley. The orchard and farm are located far from the road heads. as a result much of fruit production is wasted-it being perishable. There is thus a need for development of infrastructure facilities to supplement productions distribution and hence better returns.

#### 5.2.4 Animal Husbandry:

Animal husbandry is a supplementary means of livelihood for a large portion of the population in the valley. It serves as

an economic activity and supplement the income of small and medium farmers. However, over the past one decade considerable efforts have been made to commercialise this activity.

Livestock population in the district has been enumerated in table - 5.10

Table - 5.10

Kullu district : Livestock Population (1971-81)

Category	1971 No.	%	1981 No.	%
Cattle	69735	39.2	76559	37.2
Buffalo	656	0.4	1381	0.7
Sheep	68894	38.7	77192	37.5
Goat	31322	17.6	35353	17.2
Poultry	6227	3.5	13177	6.4
Other	1206	0.6	2008	1.0
Total	178040	100	205670	100

Between 1971-81 the livestock population has grown at the rate of 1.4% per year in the district. According to livestock distribution, cattle & sheep are most important of livestock species. They comprise nearly 77% of the total livestock population (1971) and the next important livestock is goat (17.2 percent of livestock population).

Average livestock population per household is 6.3 animals per household.

The Kullu valley has 35 veterinary hospitals and dispensaries functioning. Besides this there are number of sheeps and cattle breeding farms in the valley.

The proportion of area available for cultivation of fodder for livestock is very low, since mixed farming has not developed on a massive scale the problem of fodder has led for a decline in development of this activity.

#### 5.2.5 Industries:

The present structure of industries in valley despite wide potentialities is virtually in its early stage of development, small scale industries are scattered throughout the region and there are no medium or large scale units. The small scale units are basically engaged in shawl making, carpet weaving hosiery and knitting. Breakup of industrial units by type in valley has been given in table 5.11.

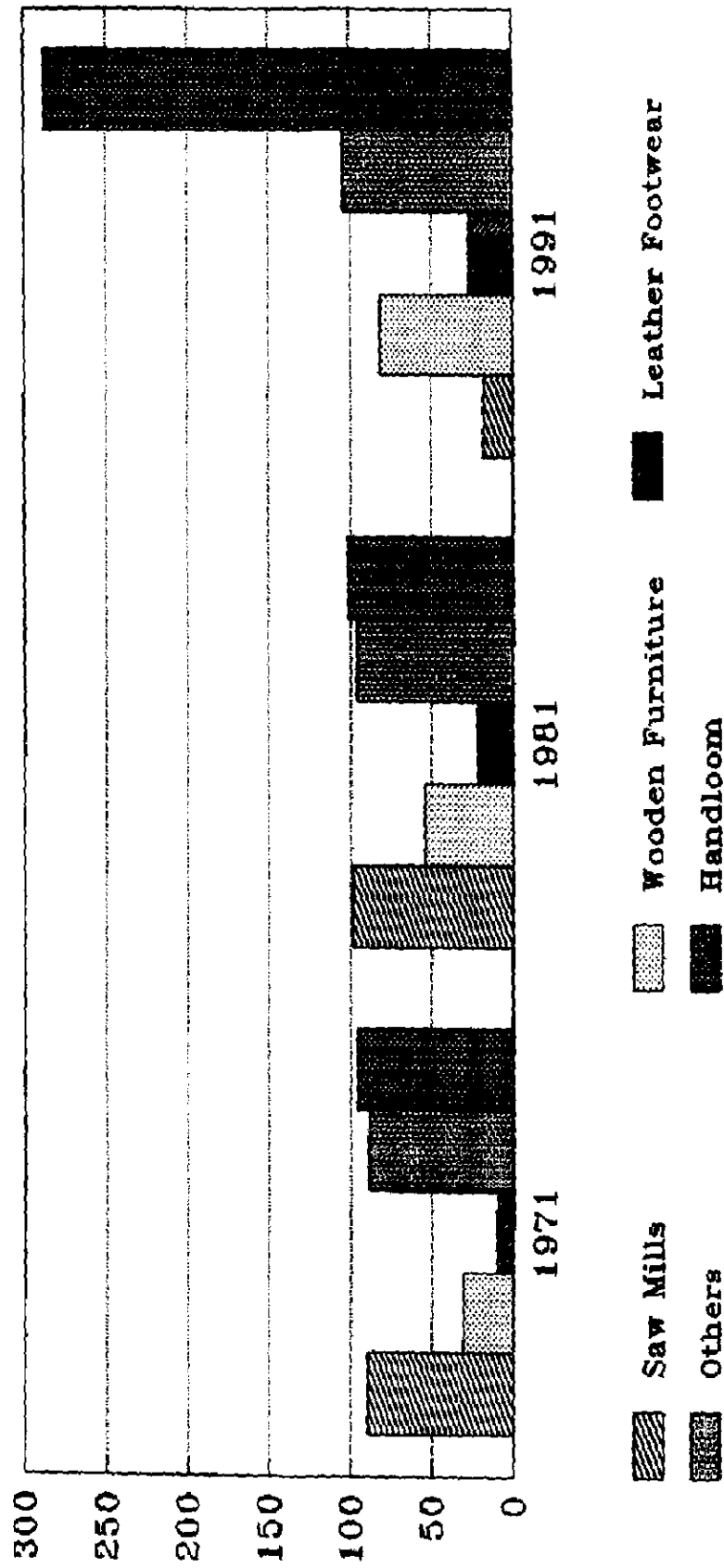
Table - 5.11

Kullu Valley : Distribution of industrial units by type  
No. of industrial units

Type/year	1971	1981	1991
Handloom	96	102	288
Saw mills	90	99	18
Wooden furniture	31	54	82
Leather footwear	10	22	27
Smithy	-	29	79
Wood and bamboo works	-	47	115
Household processing units	-	32	95
Others	89	96	104

As evident the no. of industrial units have grown at a rate of 7.78% per annum between 1971-91. All the units are either cottage or small scale units. 35% of the industrial units are

# Industrial Growth Trend In Valley



**FIG-5.6**



handloom units. Average employment offered by each units is about 3.5 persons.

However lately efforts have been made by the Khadi Village Industries Board to facilitate the setting up of small handloom units in the valley. Also industrial estate have been set up at Shamshi and Bandrol with provision of 35 electronic and optical units, and develop the traditional type of industries through this industrial development programme.

#### 5.2.6 Tourism

Tourism is one of the biggest industries in Kullu valley, this activity not only generates foreign exchange but also confers many other economic benefits to the natives such as generation of employment and thus increasing their purchasing capacity. This activity is considered to be a development paracea for the region having free and abundant resources of nature. A brief profile of the tourism activities in the valley are presented below:

##### a) Tourist Influx

Kullu valley receives 23.7% of the total influx to Himachanl Pradesh Tourist influx to the valley (Domestic and foreign) between 1975-1990 have been enumerated below:

Table - 5.12  
Tourist influx in valley

Year	Total	Domestic	Foreign
1975	11062	10497	565
1980	15306	14235	1071
1985	22959	19974	2985
1990	61596	50675	10921

. On an average per year 68.4% of the tourists arrivals are registered in Manali and only 31.6% are registered in Kullu.

(b) Expenditure Pattern

The expenditure pattern of domestic and foreign tourist is as per table given below . The average duration of stay is generally 2.5 days.

Table 5.13  
Expenditure pattern

Type	Domestic	Foreign
Accomodation	90	180
Food	65	90
Transportation	60	85
Others	20	50
Total	235	405

# Tourist Influx In Valley

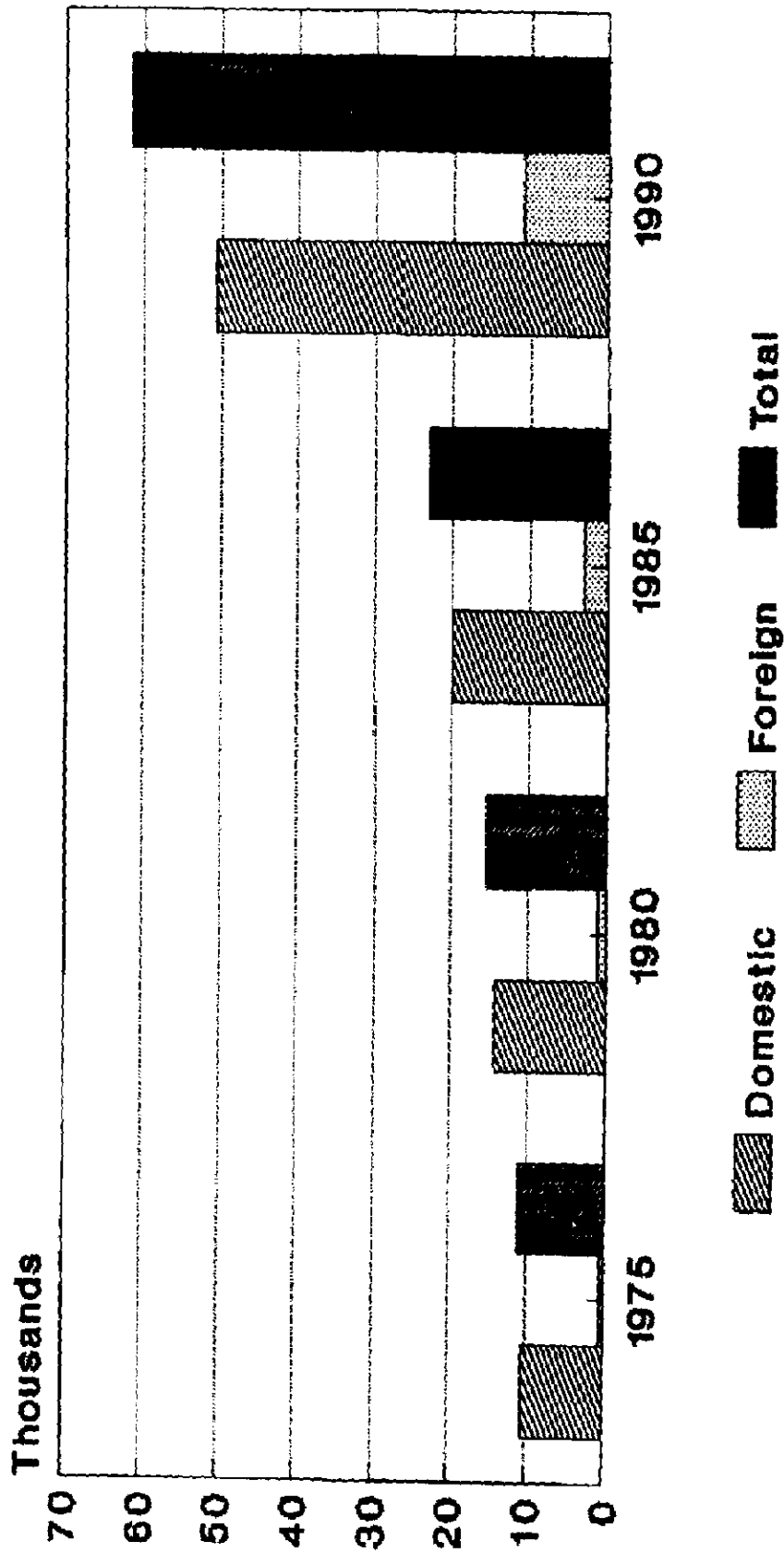
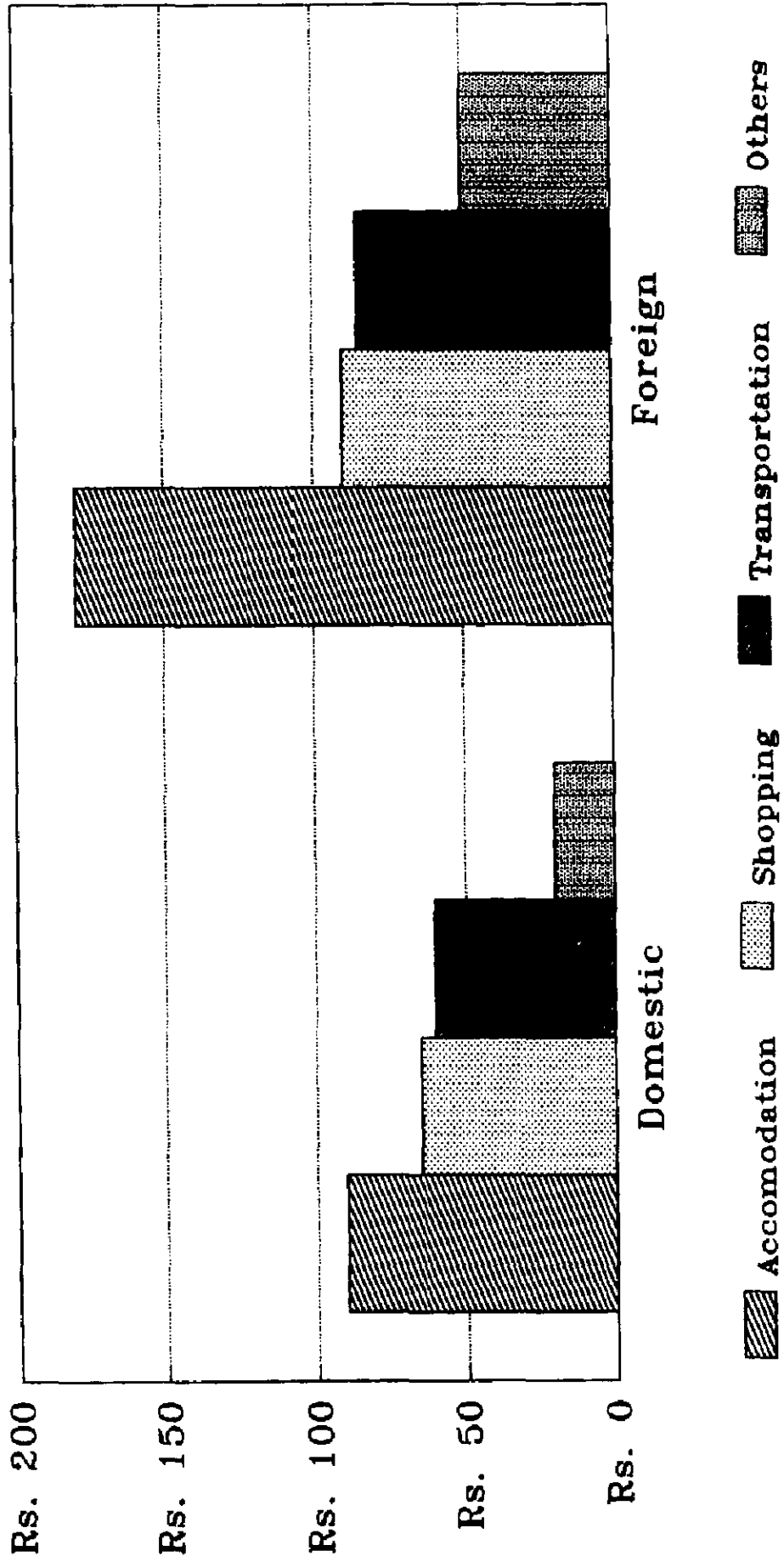


FIG-5.9

# Expenditure Pattern Of Tourists



**FIG-5.10**

*Chapter 6:*  
**CONSTRAINTS,ISSUES  
AND POTENTIALS**

## CHAPTER -6 CONSTRAINTS, ISSUES AND POTENTIALS

### 6.1 CONSTRAINTS:

In contrast to the plains, the hill areas vary vastly in terms of topography, climate, soils etc. Even more within a hill area there can be numerous variations. Development is related to accessibility and climate which are in turn governed by the parameters as mentioned above.

### 6.2 ISSUES:

Settlement related issues:

- Topography plays a major role in the location of and development of settlement. Transport has also influence on the pattern and development of settlements.
- The settlements are scattered and pose problems of providing facilities.
- All settlements of a population less than 500 persons are not viable settlements for provision of services and facilities.
- Hilly terrain restricts the interaction of settlements situated in higher altitudes.
- A systematic hierarchy of settlements is missing. Provision of facilities and infrastructure in many settlements appears to be adhoc as these are not related to the infrastructural facilities, population size & linkages.

## Activity Related issues:

### 1. Agriculture and Horticulture:

The topographic constraints allow little use of better technological inputs .The agricultural land per man is declining. The study reveals :

- 63% of the orchardists in the valley face problem in availability of packing material for fruits - especially apples.
- 74% of orchardist face problem of storage facilities.
- 72% of orchardist face problems related to transport i.e. lack of vehicles or the fact that the settlements are not linked by the metalled roads.

### 2. Animal Husbandary :

Non availability of fodder and access to the concentrate poses various problems in maintaining livestock.

### 3. Industries:

- Despite a sizeable production of fruits the no. of fruit processing units in the valley are low. Only 95 units of the total 808 units in the valley are engaged in fruit processing. These too are only household units, No Processing unit has come up in a big way till now.
- The industrial activity employs very low proportion of workers only 2.74 percent of total workforce.
- Despite the existing potentials offered by the livestock, horticulture and forest resources, not many industries have come up in the valley. Existing units are either household or small scale units.

#### 4. Tourism:

On the issue of tourism impact the question of threshold arises, threshold refers to effective saturation level of a resource, and negative effects begin to operate as soon as threshold is crossed. However seasonability is a crucial factor in the concept of saturation. It runs the risk of saturation during summer months particularly may\_june. Tourist peak influx per day is almost double of the resident population.

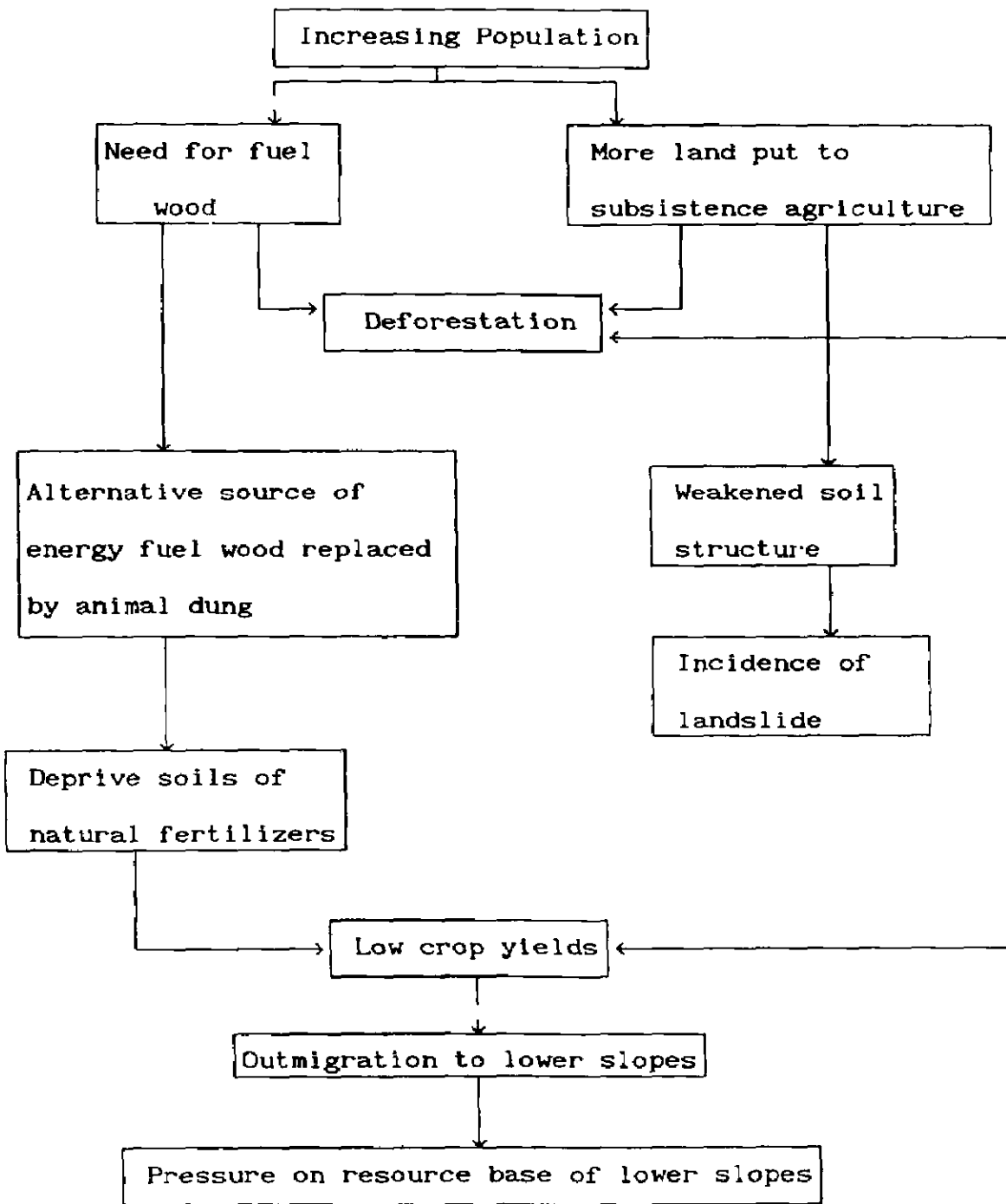
The hotel sector has been dominated by the people from out side Kullu. Natives offer accomodation largely in form of paying guest accomodation consequently a large proportion of income and employment goes to people coming from other places rather than the natives.

There is thus need to realise the significant impact of income generation, job creation and diversification of economy, offered by tourism. The benifits arising from the activity need to be channelised towards the local population through their active participation and investment .

### 6.3 POTENTIALS

Despite the existing problem and constraints offered by the physiographic setting, Kullu valley offers tremendous potentials for development. The valley has numerous potential for development of primary, secondary and tertiary sector.





**CAUSE AND EFFECT RELATIONSHIP**

*Chapter 7:*  
**RECOMMENDED  
STRATEGIES FOR  
DEVELOPMENT**

**CHAPTER -7**  
**RECOMMENDED STRATEGIES FOR DEVELOPMENT**

**7.1 REGIONAL LEVEL:**

**7.1.1. Settlement Development strategy.**

- Strong emphasis should be laid on development of transport and communication network in the region.
- Technical institutions and research laboratories should be established in the town to promote cultural development of the hill population.
- Development of other growth centres by assigning administrative functions.

**7.1.2 Activity Development Strategy:**

**A) Agriculture and Horticulture**

- The economic base of the region and town should be strengthened by laying greater emphasis on cash-crop farming, horticulture development, poultry and sheep breeding, floriculture, sericulture and forestry.
- Possibilities of growing herbs and medicinal plants and extraction of mineral should be fully explored and exploited.
- Land reforms and administrative reforms should be carried out conducive to accelerated development of the region.

B) Industry

- Development of agro industries, fruit based industries, forest based industries, wool weaving and other cottage industries having regard to the availability of the raw materials and potential for organised industrial development should be promoted.
- Electrical units should be set up in the industrial estates.
- Modernisation of the existing handicrafts and weaving units.

C) Tourism

- Strengthening the accomodation facilities in settlements along the trekking routes.
- Development of adventure tourism
- Development of tourist infrastructure
- Essential services, civic amenities and social services in adequate measure should be provided in the town and settlements for which ample subsidy should be arranged.

7.2 TOWN LEVEL

At the town level, strategy for future development and expansion should be so devised as to substitute the present uni-central structure of the hill town by a multi - nucleated urban

structure which, on one hand will attain a gradual and limited dispersal of central activities allowing them more scope of expansion in suitable environmental conditions, and on the other, will enable the sub urban sporadic development to be conceived as viable self-contained and semi-independent units for community living. While preparing the Development Plan for the hill town the existing suburban developments should accordingly be restructured to fit in this concept providing them with adequate road linkages with the main centre.

In the absence of such a foresight, this picturesque hill town will also become infected with substandard and slummy developments, similar to big cities in the plains, robbing them of their tourists popularity which will have adverse effects on their economy.

# APPENDICES

**POPULATION OF KULLU TOWN (1981)**  
(Ward-wise)

Ward no.	Block no.	Name of the ward	Population	Male	Female
1	1,2	Ramshila	992	547	445
2	3,4	Akhara Bazar	763	389	374
3	5,6	Akhara Bazar	870	459	371
4	7,8	Biasa Morh	1345	752	593
5	9,10	Lower Sultanpur	984	556	428
6	11,12	Upper Sultanpur	1116	621	495
7	13,14	Sarwari	765	449	316
8	15,16	Khori Ropa	1195	715	480
9	17,18,19	Shishamati	1065	635	430
10	20,21	Upper Dhalpur	1095	599	496
11	22,23	Dhalpur	1366	720	646
12	24,25,26	Kaludhar	1436	743	693
13	27,28,29	Shastrinagar	1614	883	731

Source: Municipal Corporation, Kullu.

Traffic Census Data on NH21 at count post Gandhi Nagar on 25-10-94  
(25-10-94 to 31-10-94)

			6 AM to 10 PM to		Avg. No. of Vehs./day in the week.
	UP	DN	10 PM to 6AM	6AM	
Cars/Jeeps	UP	748	128	1003	
Van/3wh/Taxi	DN	742	193	903	
Buses Laden	UP	371	66	525	
	DN	301	45	476	
Trucks Laden	UP	251	49	219	
	DN	243	45	186	
Trucks	UP	52	11	107	
Unladen	DN	70	51	111	
M/Cycle	UP	176	8	232	
2 wheeler	DN	200	11	227	
Other Vehs	UP	64	14	83	
Laden	DN	139	16	88	
Other Vehs	UP	123	10	69	
Unladen	DN	134	7	74	

Source: HPTMD KULLU (H.P.)



Traffic Census Data on NH21 at Count Post Ramshila on 25-10-94  
(25-10-94 to 31-10-94)

		6AM to 10PM		Ave.no.of veh./ day in the week
		10PM	6AM	
Cars/Jeeps/	UP	312	32	383
Taxi/3-Wh.	DN	301	34	369
Buses Laden	UP	137	22	169
	DN	144	16	141
Trucks Laden	UP	123	17	83
	DN	83	12	66
Trucks	UP	62	9	62
Unladen	DN	54	13	53
M/Cycle	UP	104	29	214
2 Wheeler	DN	95	9	194
Other veh.	UP	49	4	33
Laden	DN	38	4	31
Other veh.	UP	53	4	30
Unladen	DN	48	3	31

Source: HPPWD KULLU (H.P.)

# 'Development' is making the Himalayas disaster prone

NEW DELHI, December 29: Concerned at the ecological destruction of the Himalayas, experts are looking for ways to contain or mitigate any man-made or natural disaster.

The Himalayan region, ecologists say, is subject to frequent landslides due to heavy and prolonged rainfall, deforestation, deep excavation of the slopes for building roads, canals, etc and the occurrence of frequent earthquakes in the region.

Moreover, the region is also under intense pressure due to exploitation by human beings.

Cheap power generation, domestic and industrial water supply, with the help of rivers like Indus, Ganga and Brahmaputra are some good results of tapping the Himalaya's vast natural resources.

On the other hand, deforestation, which leads to soil erosion, slope failure, depletion of soil fertility, scarcity of fuel wood and fodder, increased overland flows, reduced ground water recharge and loss of biological diversity, are some negative fall-out of human activities.

Natural disasters have long been considered beyond human control. However, in the case of the Himalayas, natural disasters like floods, landslides etc, can be controlled

the ill-planned development activities. The degree of severity of these events increases due to other natural phenomena like earthquakes, over which man has no control.

Considering the importance of this unique ecosystem in the national perspective, experts today call for a balance between the activities between development and conservation.

Pointing to the vast potential the Himalayan river system has for the benefit of the entire sub-continent, Z Hasan, member, central water commission, says an objective assessment of the environmental impact of any water resources project is essential before embarking upon it.

Despite being the largest source of surface water resources in the sub-continent, the Himalayas, Hasan says, is the poorest region as far as water availability is concerned. Droughts are surprisingly frequent.

Building large storage dams, he says, is essential to control surface water which, unless otherwise run-down. However, moderation of flood and drought and management of land and water have to go hand in hand.

"Floods," Hasan says, "cannot be banished in Ganga-Brahmapu-

tra system due to peculiar hydro-meteorological and topographical features but can be moderated to a large extent by creating bulk storages in the upper reaches.

"Large sums being spent on disaster relief could be partly diverted to lands and water management programmes for better results," he says.

To build dams and reservoirs one must perforce submerge vast tracts of forests. It is essential, therefore, to rehabilitate the flora and fauna that would be affected.

Stressing on proper phased catchment area treatment, Hasan said compensatory afforestation was a must. Degraded forests in the area could be improved and this becomes part of the catchment area. In fact this is also an avenue for national parks, he adds.

To cope with the seismic impact, dams must be designed to cope with maximum credible earthquakes.

About half of India's total area of 3.3 million sq kms lies within a seismic zone and the most susceptible regions are the Himalayas.

Himalayas, as V K Sharma of the centre for disaster management said, is a vast resource of natural disaster, which needs to be properly tackled. (PTI)

DESIRABLE LIMITS OF SUN EXPOSURE	
1. Informal shopping, Public gathering, Major recreational areas (Outdoor), Sabzi Bazar, major vertical circulation areas.	6 hrs of sun exposure or 227K of December
2. Group discussion, Neighbour hood play area, squares major access, toilets, public conveyance areas.	6 hrs.
3. Commercial activity/service areas	4 hrs.
4. Residential and associated activities	3 hrs.
5. Storage, parking	Direct sun exposure is not required

## Himachal bid to check ecological degradation

The Times of India News Service SHIMLA, November 7: The State government has finally taken up to the environmental degradation that has taken place over the years in the state and is launching a Rs 18.50 crore programme to improve the environmental condition and regain the pristine glory of the affected areas. Shimla, Kasli, Manali, Dalhousie, Dharamshala and Palampur are among the tourist spots likely to be covered under the programme. Lack of proper drainage facilities, depletion of vegetation and mushrooming of ill-planned construction have been primarily responsible for the environmental damage suffered by these areas over the years. They have also resulted in extensive soil erosion and landslides in these areas. An official spokesman said almost Rs 2 crore had been earmarked for the setting up of bio-diversity centres or van vikas centres to preserve the genetic

diversity of these places. Besides, they will also contain recreational facilities like amusement parks for children, horse riding facilities, fish ponds, walking trails and even trekkers' tents.

The spokesman added that a sum of Rs 2.96 crore has been earmarked for the protection of forests. The forests will be fenced to prevent them from becoming a dumping ground for garbage and polythene bags.

A sum of Rs 1.49 crore will also be spent on a massive afforestation drive to be launched to regain the environmental balance and check pollution. Rs 2.88 crore has been set aside for landscaping and beautification while Rs 1.75 crore has been allocated for recycling of waste and improving garbage management.

The spokesman said the support of various sections of the populace including NGOs would be enlisted to create eco-literacy among the masses. Nearly Rs 58 lakh would be spent on this.

## Land availability declining in India

United News of India

NEW DELHI, November 15: The per capita availability of land in the country is declining at a very high rate because of population explosion.

According to official sources, with the projected rate of population growth it would decline to 0.33 hectares by the turn of the century as against 0.89 hectares in 1950.

Estimated per capita availability of land for animal population would go down from 0.51 hectares in 1950 to 0.24 hectares by the year 2000.

At present, rural and urban settlements, roads, railways, water supply, mines, defence and industrial installations use an estimated 21 million hectares. An additional area of two to three million hectares would be required for these diverse purposes by 2000 A.D.

Out of an estimated arable land of 166 million hectares in the country, at present 141 million hectares are used for cultivation purposes.

Sources noted that a vast population along with widespread poverty in India lead to degradation of environment in many ways by putting pressure on scarce resources like land, water and energy.

They noted that environmental protection and ecological balance were essential to ensure sustainable development in the long run.

Land abuse, water and air pollution, soil erosion, deforestation, siltation of rivers and loss of biological diversity over time pose threat to ecological security and human health.

The growing demand for food, fuel wood and fodder is leading to an unsustainable use of forest resources. Loss of valuable top soils due to reckless deforestation is affecting food productivity and thereby millions of rural and marginal farmers.

In addition to traditional domestic pollutants, there is contamination by chemicals, heavy metals and other toxic substances due to careless practices in industry and agriculture and unplanned urban growth.

The prevailing conditions of poverty also create a situation where people are forced to live in slums without basic amenities and further degrade the environment.

The sources said during 1988, 20 per cent of the urban population and 27 per cent of the rural population did not have access to safe drinking water.

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