Environment Master Plan Infrastructure Sector (Baseline)

Government of Himachal Pradesh
Department of Environment, Science & Technology

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Abbreviations

ABVIMAS	Atal Bihari Vajpayee Institute of Mountaineering and Allied Sports
AC	Amchi Clinic
ACSR	Aluminium Conductor Steel Reinforced
AEZ	Agri Export Zones
AGMARKNET	Agricultural Marketing Information Network
AHC	Ayurvedic Health Centre
APMC	Agricultural Produce Market Committee
ARWSP	Accelerated Rural Water Supply Programme
AUWSP	Accelerated Urban Water Supply Programme
BA	Beds Available
BMO	Block Medical Officers
BMW	Bio Medical Waste
BR	Beds Required
CAD	Command Area Development
CADP	Command Area Development Programme
CBET	Community Based Eco-tourism
CBWTF	Common Bio-medical Waste Treatment Facility
CD	Civil Dispensaries
C-DAP	Comprehensive District Agriculture Plan
CEPI	Comprehensive Environment Pollution Index
CETP	Common Effluent Treatment Plant
CHCs	Community Health Centres
COPD	Chronic Obstructive Pulmonary Disease
CPCB	Central Pollution Control Board
CPSUs	Central Public Sector Undertakings
CRF	Central Roads Fund
CRSP	Central Rural Sanitation Programme
CSC	Common Service Centers
CST	Central Sales Tax
CTF	Centralized Treatment Facility
CVEI	Creation of Village Electrification Infrastructure
CWPRS	Central Water & Power Research Station
DALY	Disability Adjusted Life Years
DAP	District Agriculture Plan
DDG	Decentralised Distributed Generation
DIC	District Industries Centre
DOTS	Directly Observed Treatment Short course
EIRR	Economic Internal Rate Return
EIUS	Environmental Improvement of Urban Slums
ERA	Environmental and Rural Awakening

FAB	Fluidized Aerobic Bioreactors
FC	Fully Covered
FYPs	Five Year Plans
HDPE	High Density Polyethylene
HHC	Homeopathy Health Centre
HIFCOM	Hospital Infection Control Committee
HIMCON	Himachal Pradesh Consultancy Organization
HIMUDA	Himachal Pradesh Housing & Urban Development Authority
HIS	Hydrological Information System
HMS	Hospital Management Society
HPC	High Powered Committee
HPMC	Horticulture Produce Marketing & Processing
HPPWD	Himachal Pradesh Public Works Department
HPRIDC	Himachal Pradesh Road and Other Infrastructure Development Corporation Limited
HPSEB	Himachal Pradesh State Electricity Board
HPTDC	Himachal Pradesh Tourism Development Corporation
HRTC	Himachal Road Transport Corporation
HSD	High Speed Diesel
HT	High Tension
HW	Hazardous Waste
IABSE	International Association for Bride & Structural Engineers
ICD	Inland Container Depot
ICT	Information and Communication Technology
IDA	Iron Deficiency Anaemia
IEC	Information, Education and Communication
IHHS	Individual House Hold Sanitation
IHSDP	Integrated Housing & Slum Development Program
IIDC	Integrated Infrastructure Development Centre
IMR	Infant Mortality Rate
IPH	Irrigation and Public Health
IPHS	Indian Public Health Standards
IRQP	Improvement of Riding Quality
ISMH	Indian System of Medicine and Homoeopathy
IWDP	Integrated Wastelands Development Programme
JNNURM	Jawahar Lal Nehru Urban Renewal Mission
JSY	Janani Surksha Yojna
KVIB	Khadi & Village Industries Board
KVIBs	Khadi and Village Industries Boards
L&M	Large & Medium
LOS	Level of Service
LT	Low Tension
MFI	Micro Finance Institution

MGPSS	Mahila Gram Panchayat Swasthya Sahayika Schem
MINARS	Monitoring of National Aquatic Resources
MIS	Market Intervention Scheme
MMR	Maternal Mortality Ratio
MMSME	Micro, Small and Medium Enterprises
MORTH	Ministry of Road Transport & Highways
MOU	Memorandum of Understanding
MSW	Municipal Solid Waste
MVSSP	Maharishi Valmiki Sampoorna Swachata Puraskar
NC	Not Covered
NCC	Nature Cure Centre
NCMP	National Common Minimum Programme
NGP	Nirmal Gram Puraskar
NH	National Highway
NITHE	National Institute for Training of Highway Engineers
NPAG	Nutritional Program for Adolescent Girls
NREGS	National Rural Employment Guarantee scheme
NRHM	National Rural Health Mission
NRRDA	National Rural Road Development Agency
NSDP	National Slum Development Programme
NVDCP	National Vector Borne Disease Control Program
OUI	Other Unintentional Injuries
PAPN	People's Action for People in Need
PARIKAS	Parivar Kalyan Salahkar Samiti
PC	Partially Covered
PCDOs	Progeny-cum Demonstration Orchards
PHCs	Primary Health Centres
PMEGP	Prime Minister's Employment Generation Programme
PMGSY	Pradhan Mantri Gram Sadak Yojana
PMRY	Prime Minister's Rozgar Yojana
PMS	Pavement Management System
PVC	Poly Vinyl Chloride
R & D	Research & Development
RAP	Resettlement Action Plan
RCH	Reproductive and Child Health
REC	Rural Electrification Corporation
REDB	Rural Electricity Distribution Backbone
REGP	Rural Employment Generation Programme
RF	Reserved Forest
RGGVY	Rajiv Gandhi Grameen Vidyutikaran Yojna
RGNDWM	Rajiv Gandhi National Drinking Water Mission
RGURF	Rajiv Gandhi Urban Renewal Facility

RH	Relative Humidity
RIDF	Rural Infrastructure Development Fund
RKS	Rogi Kalyan Samiti
RNFS	Rural Non Farm Sector
RNTCP	Revised National TB Control Program
RRB	Regional Rural Banks
RWSS	Rural Water Supply Schemes
SAP	State Agriculture Plan
SC	Sub Centres
SEIAA	State Level Environmental Impact Assessment Authority
SEZ	Special Economic Zones
SGSY	Swarnjayanti Gram Swarozgar Yojana
SH	State Highways
SHE	Sanitation and Hygiene Education
SIDBI	Small Industries Development Bank of India
SJSRY	Swaran Jayanti Shahari Rojgar Yojana
SOER	State of Environment Report
SPCB	State Pollution Control Board
SSI	Small Scale Industries
SUTMS	Shimla Urban Transport Management Society
SUTRA	Social Uplift Through Rural Action
SWM	Solid Waste Management
TPA	Tonnes per Annum
TPD	Tonnes Per Day
TSC	Total Sanitation Campaign
UHC	Unani Health Centre
UIDSSMT	Urban Infrastructure Development Scheme for Small and Medium Towns
UK	United Kingdom
US	United States
VKVNY	Vidhayak Keshetra Vikas Nidhi Yojna
WHO	World Health Organisation
YLL	Years Life Lost

Introduction

The key objectives of the Environment Master Plan are to enable the State of Himachal Pradesh to:

1. Simultaneously address issues of ecological and environment restoration and bring convergence along with the development activities taking place in the state;
2. Engage and ensure close coordination with all the concerned development departments, both at the state and Government of India level;
3. Decide future financing of investments for development in a sustainable manner, and
4. Develop suitable institutional arrangements in order to implement the Government of Himachal Pradesh's policies and strategies.

Seven tasks have been undertaken for preparation of EMP. The major tasks to achieve these objectives are as follows:

Task 1: Establish Baseline conditions
Task 2: Conduct a Spatial Vulnerability Assessment and Formulate Planning Principles
Task 3: Develop Public Consultation and Communication Strategy for the Department of Environment
Task 4: Develop Sectoral Guidelines
Task 5: Develop an institutional mechanism for implementation of the EMP.
Task 6: Establish need for training and capacity enhancement.
Task-7: Develop monitoring and Evaluation Protocols.

Task 1: Establish Baseline conditions.
Sectoral baseline reports have been prepared covering 18 subsectors of 3 sectors namely Infrastructure (9), Natural Resources Management (5) and Services (4). These baseline reports have helped in identification of issues relating to ecological and environment and social aspects of each sector.

Sectors covered under Environment Master Plan for Himachal Pradesh

Infrastructure	Natural Resource Management (NRM)	Services
Roads, highways, rural roads and Transport	Agriculture	Education, and Vocational training
Hydropower (generation transmission, and distribution)	Horticulture	IT and Telecom
Tourism, Ecotourism + Art, Architecture and cultural heritage	Animal Husbandry Livestock	Livelihoods
Industry	Forests, Wildlife and Wetlands	Waste disposal.
Mining and Geology	Fisheries	
Irrigation and Public Health		
Health		
Market Infrastructure (including horticulture and agriculture)		
Rural and Urban Planning		

The objective of this task is to establish the "scenario, identify critical thrust areas, issues and corrective measures for all the sectors/activities. As per the Scope of Services, Methodology and Tasks given in the agreement, baseline reports of NRM sector have been prepared as described below.

Methodology for carrying out baseline data collection involves the following:

1. Deployment and utility of a combination of primary and secondary data was done.
2. Combination of in-house and outsourced inputs were derived and appropriately identified, expertise was drawn from the

Department of Environment, Science and Technology and other sectoral departments/ agencies. Secondary data and information were sourced from sectoral and development agencies.

3. Appropriate questionnaires for data collection were developed, administered and data collected and collated.

The data on baseline report for three sectors and subsectors have been collected from concerned line departments of Government of Himachal Pradesh, research and development agencies, academic institutions in Himachal Pradesh, Census of India 2001 and 2011 (as available and applicable for the sectors considered for preparation of Environment Master Plan), concerned sectoral development plans including Five Year Plans (including 2007- 2012), State of Environment Reports, Statistical Abstracts, Economic Surveys and reviews of concerned sector, etc. Baseline data on social and environment policies, Acts, Rules, notifications of Central Government and State Government have been drawn from authoritative texts as given in concerned Gazette notifications. Primary data have been collected through structured questionnaires for eliciting updated data from line departments and collated.

The common parameters for scoping baseline for Infrastructure sector is given below:

I	Common Parameter for Scoping Baseline
i	Resource inventory of existing assets of the sector
ii	Pattern of Planning and Development in Sector
iii	Technology/Schemes Adopted in Sector along with any Change in Technology
iv	Stakeholder Involvement In Environment Preservation and Restoration
v	Critical Environment Issues/Hotspots Associated With Sector
vi	Environmental Initiatives Taken By Sector to Address Critical Environmental Issues
vii	Environment Related Studies Carried Out In The Sector
viii	Environment Monitoring (Key Parameters Such As Air And Water Pollution) Carried Out For Activities Related To The Sector
ix	Institutional Mechanisms Within the Sector to Address Identified Environment Issues
x	Data / documentation pertaining to addressing demographic issues in the context of the sectors, such as population changes; requirements of populations and changing lifestyles, migratory populations including tourists, transhumants; transit labour population; pressures felt by communities due to degraded environment conditions.
II	Information on Human Resource Management Issues (Which May Have Relevance to Environment Management) in the Sector Such As: Manpower, Vocational Training, Awareness Levels Etc
III	Regulatory Analysis to Identify Any Regulations That Have Environment Implications (Negative Or Positive), and Compliance with the same

Baseline reports of subsectors of Infrastructure have been prepared namely Roads, highways, rural roads and Transport, Hydropower (generation transmission, and distribution), Tourism, Ecotourism + Art, Architecture and cultural heritage, Industry, Mining and Geology, Irrigation and Public Health, Market Infrastructure (including horticulture and agriculture), Rural and Urban Planning as per common parameters for scoping baseline for Infrastructure sector.

CHAPTER 1 TOURISM

1.1 Resource inventory of existing assets of the sector

Tourism is one of the fastest growing industries in the world. The number of tourists worldwide has been registering phenomenal growth and it is expected that this number would touch 1.5 billion. Tourism contributes about 11% of the world, workforce and 10.2% of the global Gross Domestic Product.

Tourism contributes nearly 8% of Himachal Pradesh State Domestic Product. The State Government's tourism policy was farmed in 2005. The business and activity-oriented tourism has entered the scene alongside the more traditional leisure tourism. There is also a tremendous opportunity for the state to act the role of a facilitator, providing an attractive and appropriate environment for new investment in the tourism industry, without being over dependent on incentives.

The State's tourism potential depends upon of the following features:

- Natural and manmade heritage are the main stay of tourism but more intangible tourism segment comprises pilgrims who visit many religious places in the State.
- Himachal has been generously endowed by nature and is one of the few places in the world that experiences five distinct seasons in the year – spring, summer, monsoon, autumn and winter.
- Himachal's forests are distinguished in having temperate, alpine & tropical forest. Wildlife sanctuaries and National Parks are spread over 7,000 sq.kms there are 33 Wildlife Sanctuaries, 2 National Parks and 3 Game Reserves Nature Park. The Sanctuaries include Simbalwara (Sirmaur), Churdhar, Chail (Solan), Maharana Pratap Sagar (Kangra) Manali (Kullu), Kanawar (Kullu), Kalatop Khajjiar (Chamba), Daranghati (Shimla). The National Parks are Pin Valley National Park, Spiti and the Great Himalayan National Park, Kullu. The Nature parks are located at Kufri (Shimla), Manali (Kullu) and Gopalpur (Kangra).
- The major rivers of the State are Yamuna, Satluj, Beas, Ravi and Chenab. There are several lakes all over the State covering 1% of the State's land area. Many of these lakes are home to a variety of aquatic and avian life, for example, the Maharana Pratap Sagar lake, formerly known as the Pong Dam Reservoir, a bird sanctuary has over 220 species belonging to 54 families. These include black-headed gulls, plovers, terns, ducks, waterfowl and egrets. The first sighting red-necked grebe in the region was made at the Sagar. The lake's location at the head of the Indian plains has made it a suitable habitat and stopover for migratory birds that enter India from Central Asia. Twenty-seven species and sub-species of fish belonging to six families have been recorded in these waters. Some of the important commercial varieties are -*Labeo dero (Gid), Labeo rohita, Labeo calbasu, Tor putitora (Mahsir), and Mystus seenghala (Singhara).*
- The State has several ancient Hindu temples and places of pilgrimage. Himachal is home to many of the 'Shaktipeeths' revered by Hindus. These are at Kangra (Vajreshwari Devi), Chintpurni (Chinmastika Devi), Jwalaji (Jawalamukhi), Naina Devi and Sarahan (Bhimakali). There are other shrines that draw thousands of pilgrims like Chamunda Devi, Deot Sidh, Baba Balak Nath and Trilokpur. Centres of Sikh pilgrimage are at Manikaran, Poanta Sahib, Baba Barbhag Singh and Rewalsar. Many of the towns have charming churches and these are at Shimla, Dagshai, Kotgarh, Kasauli, Palampur, Dharamshala, Dalhousie and

Chamba. Several villages have their own deities housed in temples that reflect local building skills and refined aesthetics.

- There are several Buddhist pilgrimage sites in Himachal Pradesh. With dozens of old and new, large and small monasteries, Buddhism has a powerful presence in the State which is also home to His Holiness the Dalai Lama attracts several visitors. Tabo monastery in Spiti dates back to 996 AD and in terms of sanctity for Trans-Himalayan Buddhism, this is considered only second to the Tholing monastery in Tibet.

- Himachal Pradesh's attractions include the unique 'hill stations' that were inhabited & developed by the British. These include the State Capital, Shimla, which was the 'summer capital' of British India. These towns hold excellent examples of colonial architecture. Other smaller towns that were developed by the British are Kasauli, Dalhousie, Palampur and Dharamshala are part of tourist circuits in Himachal Pradesh.

- Landscape and unique culture of the Trans-Himalayan districts of Kinnaur, Lahaul and Spiti attract tourists. A portion of the district Kinnaur lies south of the Greater Himalaya. However the district of Lahaul-Spiti lies wholly in the Trans-Himalaya. This is a unique part of the world where thick forests steadily give way to the almost lunar-like landscape of the cold desert.

- Himachal has two of the country's five mountain railway of India namely old Kalka Shimla Railway line which is designated as "UNESCO World Heritage Site" and in the Kangra Valley railway which is in the two tentative list of "UNESCO's World Heritage Site".

- Towns like Dharamshala, Palampur, Kullu and Manali have also developed as tourist circuits and now draw a substantial number of tourists.

- Also in the last few decades, nature and outdoor activities have grown in Himachal Pradesh and the State is rapidly becoming a focus for adventure sport. This is the only state in the country that hosts heli-skiing. The adventure sports are already thronging and are likely to grow in the coming years. Activities like trekking and camping, skiing, para-sailing and para-gliding, water-sports and white-water rafting, ballooning, ice-skating, mountain cycling, vehicle safaris, mountaineering and rock climbing, golf and angling. The State has successfully hosted international and national level events in para-sailing and white-water rafting. Many of these come under the broad head of 'eco-tourism'.

- The architectural heritage of Himachal Pradesh include age old forts and palaces, its remarkable wood and stone 'towers', the colonial towns and practically every village is a picture of pastoral perfection. There are remarkable wall and miniature paintings of the Kangra region, Buddhist *thangkas* and wealth of carving in wood. Culturally, the State is rich in its folk lore, costumes, shawls, jewellery, dance forms and the 'karali' dance-dramas.

- Health tourism is likely to grow rapidly in the coming years. The clean and invigorating environment, the substantial forest cover and the number of herbs that grow in the State, provide a natural setting to capitalize the potential of health tourism.

- In Himachal Pradesh, continue to visit the four main destinations like Shimla, Kullu-Manali, Dalhousie-Chamba and Palampur-Dharamshala. These places have the maximum number of hotels and accommodation facility in terms of bed-strength. In addition, despite limited accommodation facility available in the tribal areas of Kinnaur and Lahaul-Spiti. Number of tourists especially foreigners visiting far or remote areas have grown in the years though

road links to Kinnaur & Lahaul Spiti remains cut-off during substantial part of the year.

Tourist inflow: There are certain areas of Himachal Pradesh that attract far greater numbers of tourists than others - and there are certain areas that attract foreigners also, like Lahaul-Spiti where, in comparison to other districts, there is almost a parity of numbers between foreigners and domestic visitors. As regard the profile of visitors from within the country, this continues to follow a traditional pattern with visitors from certain areas and states continuing to dominate the market as shown in Table 1.

Table 1: Tourist Arrivals (Indian & Foreigner)

District	2010	
	Indian	Foreign
Bilaspur	695702	18157
Chamba	1035789	18092
Hamirpur	1201482	33557
Kangra	1617416	42339
Kinnaur	1424654	41420
Kullu	1636022	47735
Lahaul & S piti	887061	62492
Mandi	815169	51152
Shimla	972312	55141
Sirmaur	1172670	39840
Solan	671982	23609
Una	681727	20082
HP	12811986	453616

Source: Tourism Deptt. Himachal Pradesh, 2010

Accommodation & Other Tourism Related Infrastructure: Districwise number of registered hotels / guest house & bed capacity is given in Table 2 below.

Table 2: No. of Registered Hotels/Guest House

Year/District	No. of Hotels/Guest House Year 2010	Bed Capacity
Bilaspur	60	1288
Chamba	150	2710
Hamirpur	30	456
Kangra	357	8568
Kinnaur	71	787
Kullu	580	18682
Lahaul & Spiti	84	1307
Mandi	142	2697
Shimla	388	9981
Sirmaur	59	1580
Solan	185	7157
Una	44	810

Source: Directorate of Tourism, Himachal Pradesh, 2010

Number of Hotels, Guest Houses, Restaurants, Travel Agencies, Tourist Guides and Photographers and Bed Capacity / Number of Rooms as on 31.12.2010 is given in Table 3.

Table 3: Statistics Relating to No. of Hotels, Guest H ouses, Restaurants, Travel Agencies, Tourist Guides and Photographers and Bed Capacity/ No. of Rooms as on 31.12.2010.

Sr. No.	District	No. of Hotels/ Guest Houses	No. Of Restaurants	No. of Rooms SBR	DBR	DOR	FS	Total	Bed Capacity	Travel Agencies	Photographers	Tourist Guides
1.	Bilaspur	60	16	27	436	30	59	11	639	1288	11	3	5
2.	Chamba	150	20	57	1170	41	68	0	1336	2710	24	53	4
3.	Hamirpur	30	8	62	179	1	6	2	250	456	0	0	0
4.	Kangra	357	112	286	3725	57	131	2	4201	8568	119	27	89
5.	Kinnaur	71	7	93	287	12	9	0	401	787	19	0	8
6.	Kullu	580	54	258	7606	18	764	0	8646	18682	510	326	116
7.	Lahaul & Spiti	84	7	112	497	14	40	0	663	1307	11	0	4
8.	Mandi	142	25	120	1113	28	45	17	1323	2697	39	3	5
9.	Shimla	388	90	303	3615	99	220	211	4448	9981	367	253	281
10.	Sirmaur	59	29	57	870	17	25	18	987	1580	2	0	4
11.	Solan	185	59	77	2411	17	112	45	2662	7157	23	0	6
12.	Una	44	10	19	335	3	21	5	383	810	4	0	0
	TOTAL	**2150**	**437**	**1471**	**22244**	**337**	**1500**	**311**	**25863**	**56023**	**1129**	**665**	**522**

District wise Information on major tourist destinations, popularity, accommodation facilities, pattern of tourist stay, art & culture, fairs & festival & people life are described below:

1. District Chamba: The key destinations with the popularity of destination and duration of stay in district are given in the following Tables. The main tourist spots in Chamba district are Dalhousie, Khajjiar and Bharmour.

Popularity of Tourist Destination: Popularity among tourists as indicated by arrival of tourists pattern of stay in various destinations of Chamba is linked to the available accommodation and various infrastructure facilities as given in Table 4.

Table 4: Main Tourist Points in Chamba District

Destination	Nature of Tourism Activity	Popularity amongst Tourists Indian	Foreign
Dalhousie	Leisure	High	Moderate
Bharmour	Religion Heritage	Moderate	Moderate
Khajjiar	Lake	Low	Low
Chamba	Trekking base	Low	Moderate
Sachutaun Wildlife Sanctuary.	Wildlife sanctuary	Low	Low
Gamgul Siya Wildlife Sanctuary	Wildlife sanctuary	Low	Low
Kalatop Khajjiar Wildlife sanctuary	Wildlife sanctuary	Low	Low
Tundah Wildlife sanctuary	Wildlife sanctuary	Low	Low

Block wise accommodation facilities are given in Table 5.

Table 5: Accommodation facilities in Chamba District

Chamba	No. of [illegible]	Rest [illegible]	[illegible] of beds	[illegible]	Travel [illegible]
Banikhet	6	1	70	0	3
Bhanjraru	2	0	23	0	0
Bharmaur	4	21	110	0	3
Chamba	27	31	573	6	8
Churah	0	21	78	4	3
Khajjiar	0	0	271	0	1
Dalhousie	62	0	1798	4	0
Pangi	-	6	28	-	-
Sanghni	1	-	4	-	-
Killar	-	9	52	-	-
Total	101	74	2955	14	18

Pattern of tourist stay is given in Table 6.

Table 6: Tourist Stay Pattern in Chamba District

Destination	Average Length of Stay Domestic Tourist	Foreign Tourist
Dalhousie	Two	Two
Bharmour	Day visit	Day visit
Khajjiar	Day visit	Day visit
Chamba	Day visit	Day visit

Art & Culture
Art and culture is described under the following sub heads:

Fair and festivals (at district level) People and their lifestyle Food and dresses
Marital status

Fairs and Festivals

Fairs and festivals of Chamba district are:

1. Minjar Fair
2. Sui Fair of Chamba
3. Mani Mahesh Fair
4. Nag Fair
5. Khajjiar Jatar
6. Saluni Jatar
7. Phool Jatar
8. Bhanjraru Chhinj
9. Baar
10. Sheel
11. Chamba Dussehra
12. Summer Festival Dalhousie
13. Swami Hari Giri Fair
14. Urs

People and Life

This section describes the number of people who migrated to Chamba district and their food, dressing style.

a. Migrants: In Chamba district there are 117,467 migrants excluding unclassified migrants comprising 32,901 males and 84,566 females. The migrants of this district constitute 29.87 % of total population. Male and female migrants constitute 16.31 % and 44.15 % respectively of the total population.

b. Language: The language commonly spoken in the district is western Pahari in 5 distinct dialects. Of these, Chambeali is spoken in Chamba town and its neighbourhood over a considerable area extending to the whole of Chamba tehsil. Gaddi or Bharmauri is being spoken in the upper Ravi valley comprising of Bharmaur tehsil. Bhattiyali is the dialect of Bhattiyat tehsil and Sihunta sub-tehsil and Chaurahi is spoken in Churah tehsil and Saluni sub-tehsil and some villages of Chamba tehsil. Pangwali is spoken in the Pangi tehsil except a few villages where the inhabitants are Bhots, who speak a language which is akin to Tibetans.

c. Food: Maize and wheat are the staple food however rice is also consumed occasionally. They are also being commonly used in Chamba and Bhattiyat tehsils, where it is grown in abundance.

d. Dress: Mostly woollen garments are worn. Cotton turban, home spun and locally woven*patti pyjama* and coat is the typical dress of the Chamba people. A change in the traditional dress has been noticed both in the rural and urban areas *'Patti pyjamas'* and coats are being replaced by trousers and shirts. Women wear *'kurta'* or Panjabi *'kameez'* and *'salwar'*. They put on nylon or other synthetic cloth *'dupatta'* called *'chadru'*. In the areas of Bharmaur & Churah tehsils and Saluni sub-tehsil, people mostly wear woollen coats. Men use the *chola* and the *'dora'*. The common head dress of the Churah and Pangi women is *'joji'.* Cotton or synthetic colourful shirts and woollen *'pattu'* tied with a cotton piece around the waist are the important items of dress for Churah women. In Pangi tehsil, women put on black woollen *'churidar* pyjama *cholan', kameri* a full size shirt, *'joji'* or *'chadru'*. On festive occasions, people put on new clothes and are adorned loaded with ornaments.

2. District Mandi: Mandi district has domestic as well as foreign tourists visiting places like th Rewalsar Lake, which is of religious significance to the Sikhs, Hindus, and Buddhists alike. Other attractions in the district include boating facilities at the Rewalsar Lake, Joginder nagar and Sundernagar.

Main Tourist Spots are:

- **Mandi Town:** This town is mainly a place for transit passengers.

- **Rewalsar:** The Rewalsar Lake is a place of pilgrimage for the Buddhists, Sikhs and Hindus. The lake has boating facilities.

Table 7: Popularity of Main Tourist Destination in Mandi District

Destination	Nature of Tourism Activity	Popularity among Tourist	
		Indian	foreign
Mandi	Religious	Medium	Low

Table 8: Accommodation facilities in Mandi District

Mandi	No. of hotels	Rest houses	Number of Beds	Restaurants	Travel Agencies
Aut	1	1	12	1	-
Chakukha	0	0	-	-	-
Chindi	0	1	6	-	-
Gohar	0	1	6	-	-
Janjehli	0	2	12	-	-
Jarol	1	-	6	-	-
Jhiri	2	-	7	-	-
Jogindernagar	5	6	88	0	0
Karsog	3	6	51	0	-
Mandi	48	28	1024	5	20
Neri	0	1	2	-	-
Pandoh	0	1	-	-	-
Rewalsar	1	1	39	-	-
Sarkaghat	0	5	36	-	-
Sundernagar	7	2	200	0	1
Tattapani	4	1	34	0	0
Thunag	0	1	6	0	0
Total	72	57	1529	6	21

Table 9: Tourist Stay Pattern in Mandi District

Destination	Average Length of Stay	
	Domestic tourist	Foreign tourist
Mandi	1 day	1 day

Art & culture: This section describes fair and festivals of the district and about the people lifestyle, food and dresses.

Fairs and festivals: The people of the district celebrate various festivals almost round the year. As Hindus constitute the major population of the district, all the Hindu festivals like Dussehra, Diwali, Holi, Baisakhi and Shivratri etc. are celebrated with great pomp and show. Some of the important fairs and festivals being celebrated in the district are briefly described hereunder:-

Shivratri fair of Mandi: Shivratri fair of Mandi is one of the most colourful fairs of Himachal Pradesh. This fair is held in the month of Phalguna (February/March) on the Krishna Chaturdashi or the 14th day of waning moon and continues for eight to ten days.

Mamail Fair: The temple of Mamleshwar at Mamail is at a distance of 2 Kms. from Karsog. Vijay Dashmi fair is held there every year on the 11th day of the bright half of the lunar month in Asavina (October).

Mahunag Fair: Bakhari is a small hamlet in Mahu Panchayat circle about 13 kms. from Chura on Shimla-Karsog road where the temple of Mahunag is situated at a height of about 2,000 metres. A fair is held on a rectangular piece of land surrounded by tall pine trees, about 2 kms. away from the temple, known as Bagra Dhar on the 2nd and 3rd Jyeshth (May) every year.

Rewalsar Fair: Rewalsar fair is of great religious importance and is celebrated on the 10th day of every new year according to the Tibetan calendar. Tibetan year starts sometimes in February/March. Rewalsar fair is also known as Tsechu fair which literally means 10th of Dawa Thangpo (1st month).

Besides the above stated main fairs, a number of other fairs are also held in the district. Parashar fair is held near the lake of same name located at a distance of about 40 kms. from Mandi town in the month of June. Kau fair is held in the honour of Kamaksha devi at Kau village located at a distance of 6 kms. from Karsog in the month of June. Kuthah fair is held in honour of Tangwasi deity at Kuthah village located at a distance of 12 kms. from Thunag in the month of May. Again in the month of May, a fair is held at Bali Chowki in the honour of Markandya Rishi. In the month of July/August, a fair is held in Hurang village in Chuhar valley in the honour of deity Hurang Narain. This fair is known as Narkhan fair and

held for three days after every five years. In the month of April, a fair is held in the honour of the deities of Chuhar valley at Jogindarnagar.

Migrants: In Mandi district there are 232,761 migrants comprising 47,519 males and 185,242 females. The migrants of this district constitute 29.98 % of total population. Male and female migrants constitute 12.32 and 47.42 % respectively of the total population.

3. District Shimla: The major tourist locations in the district include Shimla town, Kufri, and Mashobra. Shimla town is the main tourist destination for domestic tourists, whereas foreigners prefer to stay away from Shimla town since they find it too crowded. Places like Kufri, Narkanda and Naldhera have showing signs of increased tourist arrivals. Majority of the tourist visiting this district prefer to stay in Shimla town since accommodation facilities in other places are limited.

Main Tourist Spot in Shima district are: Shimla, Kufri, Sarahan, Fagu, Narkanda, Naldhera, Mashobra and Rampur.

Table 10: Popularity of Main Tourist Destinations in Shimla District

Destination	Nature of Tourism Activity	Popularity amongst Tourists	
		Indian	Foreign
Shimla	Heritage & Shopping	High	Medium
Kufri	Scenic beauty & adventure (Skiing in winters)	High	Low
Fagu	Scenic beauty,	Medium	Low
Mashobra	Scenic beauty, Eco-tourism	Low	Low
Narkanda	Scenic beauty, religious & adventure (skiing)	Low	Low
Tattapani	Health, Religious	High	-
Naldhera	Scenic beauty	Medium	Low
Sarahan	Religious	High	High
Rampur	History	Low	Low

Tourist inflow and % change in the State capital: Shimla itself attract a good number of tourists. The places of tourist attraction in Shimla include The Ridge, The Mall, Jakhoo Temple, Sankat Mochan Temple and Kufri Ski slopes. About 2613301 tourists travelled to Shimla in Year 2010.

Table 11: Tourist Flow and % change in Shimla

Year	No. of Tourists		% Growth	
	Domestic	Foreign	Domestic	Foreign
2004	6345069	204344		
2005	6927742	207790	8.4	1.7
2006	7671902	281569	9.7	26.2
2007	8481988	339409	9.6	17.0
2008	9372697	376736	9.5	9.9
2009	11036572	400583	15.1	6.0
2010	12811986	453616	13.9	11.7

Source: HP Tourism Department, 2010

Table 12: Accommodation in Shimla District

Shimla	No. of Hotels	Rest	Number of Beds	Restaurants	Travel Agencies
Chail	0	1	4	-	-
Chhrabra	1	-	7	0	0
Chaupa	4	-	23	-	-
Fagu	2	-	64	-	-
Gallu	2	-	30	-	-
Hat Koti	1	1	42	-	-
Jeori	1	0	12	0	
Jhakhri	1	-	19	1	1
Jubbal	1	10	90		
Kotgarh	0	10	28	0	0
Kotkhai	2	-	18	-	-
Kufri	5	-	161	-	-
Kumarsain	0	7	74	-	-
Mashobra	3	-	156	-	-
Matiana	0	0	-	-	-
Mundaghat	1	0	92	3	
Naldhera	1	0	26	-	-
Narkanda	2	2	68	-	-
Nogli	1	0	13	-	-
Rampur	11	21	337	-	-
Rohru	6	20	170	0	2
Sarahan	4	4	24	3	2
Shillaru	1	0	10	0	-
Shillon Bag	1	0	88	-	-
Shimla Town	197	11	5858	-	-
Shoghi	1	0	8	15	134
Theog	3	12	71	-	-
Total	252	99	7493	22	139

Table 13: Tourist Stay Pattern in Shimla District

Destination	Average Length of Stay	
	Domestic tourist	Foreign tourist
Shimla Town	4 days	1 day

Destination	Average Length of Stay	
	Domestic tourist	Foreign tourist
Kufri	1 day	-
Fagu	1 day	-
Narkanda	1–2 day	-
Tattapani	1 day	1 day
Naldhera	1 day	-
Sarahan	1 day	3–4 days
Rampur	-	-

Art & culture: This section describes fair and festivals of the district and the about the people, their lifestyle, food and dresses.

A brief description of some of the important fairs and festivals held in the district is given below:

Lavi Fair Lavi fair of Rampur is the most important fair of the district and State. It is a commercial fair held on the 25th of Kartika (November). Natti dance and cultural shows are the main attractions.

Winter Sports Festivals: It is a recreational festival usually held during winter months for two days at Kufri which is about 13 kms. from Shimla. Skiing on the snow clad slopes is done. It is a recreational festival for young people. Locals, participants from other States and foreigners take part in the events.

Summer Festival at Shimla: With the onset of summer in May and June there is large influx of visitors and tourists in Shimla. For recreation and attract tourists, a festival is held on the Ridge ground in Shimla town for fine days. Selected programmes of entertainment like dramas, cultural programmes, games, etc. are organized at night.

Sarahan Fair: This fair is held in village Sarahan of tehsil Chaupa for three days in the month of Baisakha (April). The venue of the fair is the court-yard of Devta's temple. Attendance of visitors is 3 to 4000. People from the adjoining areas and even from far off areas of tehsil Pachhad and Pargana Tiyari and Balsan area of tehsil Theog come to witness and participate in the fair. Archery is the main attraction of the fair. Parties of Archers come from the various places. During the night 'Natti' dances are enjoyed with folk songs and to the beat of drums and tuning of musical instruments.

Shawani Fair, Jali: This fair is held in village Jali in honour of Nag Devta whose Ashtdhatu was established by the Pandavas. The fair is held on the day of Sharvana Purnima (July-August) when the deity gives appearance (darshan) to the people who offer their "Sukhna". Some years back there was a custom to dance on the occasion with special typical dresses. The fair lasts for two days and on the 3rd day, people perform 'Dev Dance' around the temple building.

Charyoli Fair Bodna: The fair is held in village Bodna of Tehsil Choupal on the 2nd and 3rd of Bhadra (August) in honour of Devta Shirgul also known as Vijit Raj. The deity is worshipped by the Brahmins of Majhoti.

Rampari-Ki-Jatar: This fair is held in village Rampari of Tehsil Jubbal on the first day of Ashada (June). The place is about 2 kms. from Jubbal on Theog-Hatkoti road. The fair is being celebrated since ancient times lasts for a day. Men, women and children attired in their best participate in the fair. 'Natti' dances are performed and sweetmeats and articles of general merchandise are generally sold. Young men, women and children enjoy 'hindola' ride.

Janga Shari: This fair is held in village Shari of Tehsil Jubbal and it is believed that in ancient times it was a big village inhabited by Kanaits, Kolis and Lohars. The Jagra is celebrated on the 5th day of Bhadra (September) every 5th year. It is a common festival of villages of Chamaru, Daker, Kiari Jubbal and Shari.

Sipi Fair: It is a very old fair held every year in Sihpur below Mashobra on the 1st of Jyeshtha (May) in honour of Sip Devta. Rana of Koti used to be the chief visitor. Performance of the jugglers, magicians, acrobats and cultural shows such as Karyala take place provide additional entertainment to the spectators.

Pathar-Ka-Khel-Halog: This fair is held in village Halog of Tehsil Shimla. Halog was the capital of erstwhile Dhami state. The fair is held on the second day of Diwali in the month of Kartik (November). The fair used to be held on a big scale during the princely days.

Vishu Fair-Purag: This fair is held in village Purag of Tehsil Kotkhai on the 9th day of Baisakha (April) for three days. The fair is held in honour of Mahadev Devta and devotees from places visit to pay their homage to Devta. Folk songs 'Natti' dances along with beating of drums and tune of musical instruments are performed.

Mahasu Jatar: This fair at Mahasu village is celebrated on the 3rd Tuesday in the month of Baisakha (May) for two days. The fair is a very old one and is held in front of the Durga Devi temple by a large gathering from the neighbouring areas. Archery is the main attraction of entertainment. At the end of the fair, a goat is sacrificed.

Barara Fair: This fair is held in village Barara near Kumharsain where people of all castes and creed participate. The fair is held on the 1st of Jyeshtha (May). It is celebrated from ancient times. Devta Koteshwar is brought in the fair and goats are scarified in its honour as a mark of respect. The fair is cultural and recreational and 'Natti' dances are performed. People also enjoy 'Hindola' ride.

Shancha Fair: This fair is held in village Baragaon of tehsil Kumharsain for two days on the 15th and 16th day of Sravan maas (July-August) every year.

Dudhbahali Fair: It is held near village Jaodin in tehsil Rampur on the 12th and 13th of Asadha maas (June) every year in honour of three deities i.e. Devta Jishar, Devta Dethu of Kharan and Devta Chaturmukh of Melon in Kumarsain tehsil. The fair is organised by the Gram Panchayat of Khuni-Peanoli. 'Natti' dances are performed and dramas are staged.

Rohru Fair: This fair is held in Rohru on the 9th and 10th of Baisakha maas (April) on the bank of river Pabber in honour of Devta Shikru. People of villages Thanthali, Jakhar, Dashlni, Gangtoli and Rohru are the devotees of the devta. It is a very old fair and is held to commemorate the supremacy of deity. This fair is also a commercial one and apart from the performance of 'Natti' dances and cultural activities, trading is also done. Men and women dressed in their best attire participate in the fair.

Bhoj Fair: This fair is held in village Guman in Rohru Tehsil in the month of Agrahayana maas (November) for three days in honour of Devta Bensor, Parshu Ram and Kilbaru. Devta Bansar is the presiding deity. Besides paying homage to the deities, 'Natti' dances are performed by the people. Healing prophecies made by the oracles in trance and their soothing advices and blessing of prosperity to the sufferers are the main attractions.

Rihali Fair: This fair is held in village Mandhor in Tehsil Seoni on the 1st Saravana (July) every year since ancient times. The fair is organised to pay homage to Devta Kurgan.

Chunehar Fair: This fair is held at Chunehar near Jot in Tehsil Theog every third year for two days in the month of Ashada (June-July) in honour of Devta Chitra.

Deothidhar Fair: This fair is held from 26th of Shravan maas (August) for five days till Bhadra Sakranti in village Deothidhar in Theog Tehsil. The fair is held in the honour of Devta Chikher. Initially the fair used to be celebrated for recreation after every 4 or 5 years but it has now acquired a regular feature and it is held every year. Natti dances with the beating of musical instruments and singing of folk songs are performed.

People and life: This section describes the number of people migrated, community of people, their culture, food and dressing style.

Migrants: In Shimla district there were 236,162 migrants comprising 90,499 males and 145,663 females. The migrants of this district constitute 38.25 % of total population. Male and female migrants constitute 27.77 % and 49.97 % respectively of the total population.

People: The population of the district mainly consists of Hindus followed by Sikhs, Muslims while other religions like Christians, Jains and Buddhists constitute minority. The Hindu population chiefly comprises Brahmins, Rajputs and Kanets. The other section of the people consists of Kolis, Lohars, Chamars, Badhis, Chanals, Julaha, Dumne and Rehars which are Scheduled Castes. Apart from these Gujjar community is also found in this district and they reside in high ridges/hills along with their animals like buffaloes, cows etc.

Language: Hindi and Pahari are the languages spoken here. With the spread of communication, education and increase in the literacy rate among the masses, a major portion of the people in rural and urban areas are turning to Hindi instead of Pahari. However, people of district can speak in Hindi or Pahari.

Food: The staple food of the villagers generally comprises of maize, rice and wheat. In addition, pulses like Urd, Lobia, Moong, Gram and Kolth are used. Maize which is the main cereal crop grown is favourite and is taken round the year.

Dress: Cotton as well as woollen clothes are worn by the people. In winter season mostly woollen clothes are worn by the people to keep the body warm as most of the area of the district falls in cold zone. Ordinary clothes for men consist of cotton Khadi or mill made shirt. 'pyjama', cap and jacket. The costume of the women is salwar, kameej and coloured head gear called Dhattu is commonly used.

4. District Kangra: Dharamshala & McLeod Ganj are the major tourist locations in the district. It is one of the districts most visited tourist spots by foreigners. Kangra district has been witnessing a steady growth in foreign tourist arrivals over the past years while domestic arrivals are on the decline.

Main Tourist Spot

Dharamshala, Dharamkot, McLeod Ganj, Maharana Pratap Dam, Jawalamukhi

Table 14: Popularity of main tourist destination in Kangra District

Destination	Nature of Tourism Activity	Popularity among Tourist	
		Indian	Foreign
Dharamshala	Religious	Low	High
McLeod Ganj	Religious	Low	High
Dharamkot	Picnic spot	Medium	Low
Jwalamukhi	Religious	Medium	Low
Maharana Pratap Dam	Water sports	Medium	Low

Table 15: Accommodation facilities in Kangra District

Shimla	No. of Hotels	Rest houses	Number of Beds	Restaurants	Travel Agencies
Baijnath	3	6	96	4	0
Bir	1	0	4	0	2
Chamunda	11	0	213	1	0
Dadh	0	1	10	-	-
Damtal	0	0	-	0	2
Dehra	0	14	56	1	0
Dhaliara	0	0	-	1	-
Dharamshala	52	16	988	12	14
Fatehpur	0	2	12	0	0
Gaggal	1	0	10	0	0
Ghurkari Chark	0	0	-	1	0
Gopalpur	0	0	-	1	0
Indora	0	0	-	1	-
Jassur	1	1	33	0	-
Jawali	1	3	23	0	0
Jawalamukhi	14	2	340	0	1
Kangra	21	2	333	0	2
Kehrain	0	0	4	1	-
Mcleodganj	72	0	-	20	32
Nagrota Bagwan	0	0	1587	2	1
Nurpur	2	10	4	1	0
Palampur	26	10	125	5	4
Pathankot	0	1	531	-	-
Ranital	0	1	19	3	0
Rehan	0	0	4	2	0
Sansarpur	0	1	-	-	-
Shahpur	0	1	10	-	-
Sthana	0	0	10	1	0
Trilokpur	1	0	-	2	0
Tukari	0	0	4	1	0
Total	206	71	4416	60	58

Table 16: Tourist stay pattern in Kangra District

Destination	Average Length of Stay	
	Domestic tourist	Foreign tourist
Dharamshala	Two	Ten
McLeod Ganj	Two	Ten
Dharamkot	Day visit	Day visit
Jwalamukhi	One	-
Maharana Pratap Dam	Day visit	Day visit

Art & culture: This section describes the fair and festivals of the district and about the people, their lifestyle, food and dresses.

Fairs and Festivals: Kangra district is a land of gods and goddesses. Some of the important fairs and festivals held in the district are briefly described below.

Jawalaji Fair: This fair is held at Jwalamukhi during Chaitra Navratras (March–April) and Asauj–Navratras – (September–October) for ten days. The fair is attributed to the worship of the eternal flame coming out of the earth. Offerings of karahi, lambs and other pledged things are made.

Mela Sujan Bharti: This religious fair is held at village Panapari on Jyeshtha maas 12 (May-June) in memory of Baba Sujan Bharti at the site of his Samadhi (Tomb). Offerings of wheat grains are made at the samadhi . Apart from recreational activities sweetmeats and articles of general merchandise are sold.

Chamba Fair: Chamba fair is held at village Dagoh in tehsil Palampur for three days in the month of June.

Mela Shah Abdul Rehman: This fair is held on 10th and 11th of Chaitra maas (March-April) in which people of all castes and creed participate. Wrestling bouts are the main attraction.

Baba Dayalgir Fair: This fair is held at village Daulatpur in Kangra tehsil on 22nd of Jyeshtha maas (May-June) for two days. It is a religious fair and is held in the memory of Saint Dayalgir who built Shiva temple here and gave up his mortal frame while in meditation.

Mela Pir Mahu: The religious fair is held at village Barta in tehsil Dehra Gopipur for five days in the month of June. It is held in the memory of Pir Mahu whose shrine is located here.

Dhamu Shah Fair: This fair is held in village Bari in tehsil Kangra on 27th of Chaitra maas (March-April) for two days. The fair is held in memory of Dhamu Shah.

Naoni Fair: This fair is held in the month of Shravan (July-August) for one day at village Balkhor Kular of tehsil Nurpur. The fair is religious and the devotees make offerings to goddess Nagni.

Apart from the above-mentioned fairs, a number of fairs and festivals such as Shivaratri, Holi, Baisakhi, Ramnaumi, Janamashtami, Dussehra, Diwali etc. are also celebrated in the district Una grand scale.

People and life: This section describes the no. of people migrated, community of people, their culture, food and dressing style.

Migrants: In Kangra district there are 427,477 migrants comprising 104,838 males and 322,639 females. The migrants of this district constitute 36.41 % of total population. Male and female migrants constitute 18.07 and 54.31 % respectively of the total population.

The People: Predominant population of the district comprises Hindus followed by Muslims, Buddhists, Sikhs, Christians and Jains. Jains constitute the negligible proportion of the district population. The Hindus mostly constitute Rajputs, Brahmins and Scheduled Castes. The main Rajput communities in the district are viz., Katoch, Pathania, Dogra, Jasrotia, Jaswal, Jamwal, Kanthwal, Guleria, Mian, Thakur, Rana, Rathi etc.

Dress: Mostly cotton cloth garments are worn. The dress of the men folk consists of loose shirt and pyjama with cap or safa (turban). In winter, men also wear cotton khadi/woollen coat and sweaters. The dress of the women comprises of salwar and kameej made of cotton cloth with a dupatta or chadru. Married women and widows use the dupatta/chadru as a veil whenever they have to face or talk to the elders of the house or of the village.

Food Habits: Maize and wheat are the staple food of the majority of the rural people.

Language : Majority of the people in the district speak Kangri or Pahari Kangri. According to the classification of languages, made by the Linguistic Survey of India, Kangari have been shown as one of the several dialect grouped under Western Pahari. Western Pahari has been classified as sub-group under Pahari Group, Inner sub-Branch of Indo Aryan Branch and Aryan sub-Family under the broader Indo-European Family of Languages.

5. District Bilaspur: The major tourist locations in the State include Naina Devi and Gobind Sagar Lake. This district is visited more by domestic tourists as a place of pilgrimage. The Gobind Sagar Lake is an upcoming site for water sports.

Main Tourist Spot are Naina Devi & Gobind Sagar

- Naina Devi
- Gobind Sagar

Table 17: Popularity of main tourist destinations in Bilaspur district

Destination	Nature of Tourism Activity	Popularity amongst Tourists	
		Indian	Foreign
Naina Devi	Religious	High	Low
Gobind Sagar Lake	Water sports / Bhakra Nangal Dam	High	Medium
Govind Sagar	Bird sanctuary	Low	Low
Naina Devi	Wildlife Sanctuary	Low	Low

Table 18: Accommodation facilities in Bilaspur

Bilaspur	No. of hotels	Rest houses	Number of Beds	Restaurants	Travel agencies
Bairi	1	0	12	-	-
Berthin	0	1	4	-	-
Bilaspur	16	15	324	4	4
Ghagas	2	0	37	-	-
Ghumarwin	4	2	48	-	-
Naina Deviji	0	1	-	-	-
Shantalai	4	1	50	-	-
Swarghat	0	1	18	-	-
Total	27	21	493	4	4

Table 19: Tourist stay pattern in Bilaspur district

Destination	Average Length of Stay	
	Domestic tourist	Foreign tourist
Naina Devi	Day visit	Day visit
Gobind Sagar Lake	Day visit	Day visit

Art & culture; This section describes fair and festivals of the district and about the people, their lifestyle, food and dresses. Various fairs and festivals are traditional means of amusement and recreation for the people. It is rather a cultural heritage of the people. Various types of fairs and festivals celebrated almost around the year are briefly described below.

Lohri (Makar Sakranti): It falls on 13th and 14th of January. Lohri is celebrated by igniting fires, distributing "reories, gazak and ground nuts" etc. On this day people mostly take "Khichri" with pure ghee. Hindus take holy dip in the sacred rivers.

Basant Panchami: It is festival of colours. People usually put on yellow clothes, cook yellow rice and other sweet preparations. This festival bids fare well to winter and welcomes the spring.

Shivratri: The festival is generally observed by Hindus in every household. Lord Shiva is worshipped in various temples by offering water mixed with milk on the Shivlings.

Holi: Holi is festival of colours. It usually falls in March. Men, women and childern form small

groups and throw abir, gulal and coloured water on one another. They sing and dance. This festival is celebrated by lighting fires, singing and dancing.

Baisakhi: Baisakhi falls on the 13th of April. It is celebrated all over the district by all classes of people. They put on new cloths and prepare halwa and lassi. A fair is held at many places. Women buy bangles and children prefer to buy toys, etc.

Janamashtmi: Janamashtmi the birth day of Lord Krishna is celebrated in the month of August/September every year. People worship in the temples and religious prayers are performed.

Dussehra: Dussehra is one of the great festivals of Hindus. They celebrate it with gaiety in honour of Lord Shri Ram's victory over Ravan.

Diwali: This festival is held in the month of October/November. Diwali is celebrated with great pomp and show. People whitewash their houses and shops.

People and life: This section describes no. of people migrated, community of people, culture, food and dressing style.

Migrants: In Bilaspur district there are 100,376 migrants comprising 19,218 males and 81,158 females. The migrants of this district constitute 33.98% of total population. Male and female migrants constitute 13.02% and 54.90% respectively of the total population.

People: The early inhabitants of this area were Rajputs, Brahmans and Kanets. The other sections of the people are mostly Rathis, Gujjars, Jats, Chamars and Kolis. Chamars and Kolis are the Scheduled Castes. The other castes are Badhis, Kabir Panthies, Lohars, Julaha, Doomnas and Bhanjre. Rajputs claim their origin from Chandel clan and off shoots of the ruling family. They are usually classified as Kahluriya, Mians and Chandels. The Chamars who previously carried trade in leather and the Kolis who were mostly weavers have now switched over to other occupations. Since then tremendous change have taken place and lot of change is discernible in the caste structure particularly in the observance of inter-caste relationship.

Language: The spoken dialect of the people is Kahluri which is an off shoot of Punjabi. Girerson calls it "Rude Punjabi" similar to that spoken in Hoshiarpur district of Punjab.

Food and Dress: The staple foods of the inhabitants of the district are maize, rice and occasionally wheat. Maize is their favourite food and constantly eaten from September to May.

6. District Kinnaur: This district is not visited by many tourists, especially domestic tourists. This is mainly since there are no tourist activities here and the infrastructure like roads, accommodation, wayside facilities are poorly developed. However, this district does get a few foreigners & adventure tourists during the season. The places to visit in the district include Kalpa, Sangla Valley and Reckong Peo. Medical or communication facilities are not easily accessible to a common tourist.

There is no garage or puncture repair outlet on the way. Food overall is inexpensive and tasty but one would not get real Himachali cuisine.

Main tourist Spot are Reckong peo, Kalpa & Sangla valley

Table 20: Popularity of main tourist destinations in Kinnaur district

Destination	Nature of Tourism	Popularity amongst Tourists	
	Activity	Indian	Foreign
Kalpa	Religious, Adventure & Nature	Medium	High
Sangla	Adventure & Nature / Eco-tourism	Medium	High

Table 21: Accommodation facilities in Kinnaur district

Kinnaur	No. of hotels	Rest houses	Number of beds	Restaurants	Travel agencies
Chango	1	-	18	-	-
Chholing	-	-	-	-	-
Kalpa	7	6	112	-	1
Karchham	0	1	10	1	1
Kaza	0	1	8	0	0
Moorang	0	1	4	-	-
Nako	1	0	8	-	-
Nichar	0	5	20	-	-
Ponda	0	1	4	-	-
Pooh	0	2	6	-	-
Rakchham	1	0	8	0	3
Reckong Peo	5	1	85	-	-
Sangla	5	2	88	0	1
Sarahan	0	1	4	-	-
Seraj	0	2	12	-	-
Tapri	0	1	8	-	-
Urni	0	1	4	-	-
Total	20	25	399	1	6

Table 22: Tourist stay pattern in Kinnaur district

Destination	Average Length of Stay	
	Domestic tourist	Foreign tourist
Kalpa	1 day	1 day
Sangla	2 – 3 days	-

Art & culture: This section describes fair and festivals of the district and about the people, their lifestyle, food and dresses.

Fairs and Festivals: In Kinnaur district various fairs, festivals and community dances are the traditional means of amusement and recreation for the villagers. Brief accounts of the festivals celebrated all over the district are briefly described below.

Szoa: This festival is observed in the month of January. On this day the people take their bath in the natural springs and a few even go to Satluj river for bathing if they happen to live near the river. 'Poltus', rice, pulses, vegetables, meat, 'halwa', 'chilta' and 'Pug' are the principal dishes prepared on this occasion.

Phagul or Sukar: It is celebrated in the month of February –March. In this festival the spirit of 'Kanda' (Peaks) called Kali is mainly worshipped which lasts for 15 days and is celebrated all over Kinnaur.

Baisakhi or Beesh: It is celebrated in the month of April- May. The villagers prepare food like 'Poltu', 'Halwa' and 'Koyash'id

Dakhraini: This festival is celebrated in the month of July-August. On this day a feast is organized.

Flaich or Do-khayang: This is a festival of flower celebrated on different dates in the month of September. This festival is celebrated throughout the Kinnaur district. Generally, people celebrate it on the hill near their villages.

Losar: Losar is celebrated in the month of December to welcome the new year.

Kinnaur lavi /Tribal festival: Kinnaur lavi is being celebrated since 1994 from 30th October to 2nd of November every year at district headquarter, Reckong Peo. This festival has been declared as State level festival and is being celebrated since 1987. This festival not only depicts the panorama of rich culture heritage of district but also provides an opportunity to the local people to sell/exhibit their horticulture/agriculture produce, handicrafts and artifacts.

People and life: This section describes number of people migrated, community of people, their culture, food and costume style.

Migrants: In Kinnaur district, there are 23,394 migrants, out of which 11,705 are males and 11,689 are females. 19,825 persons have their place of last residence within the state of enumeration and 2,048 persons have migrated to Kinnaur district from the other States of India. 12,822 persons have moved from one place to another but within the district of enumeration. 7,003 persons have moved from the other districts of the state to the place of enumeration. Both the categories account for 54.81% and 29.93% of the migration which have taken place within the state of enumeration.

The people: Kinnaur does not comprise a homogenous group and display significant territorial and ethnic diversity. For a better understanding of ethnic and cultural distribution the Kinnaur district according to Nag, may be classified into three territorial units. These are, namely, lower, middle and upper Kinnaur. Lower Kinnaur comprises the area between Chaura at the boundary of Kinnaur district with Rampur Bushahr and Kalpa including Nichar and Sangla valleys. The people of the lower Kinnaur are primarily of the Mediterranean physical type. It is difficult to distinguish them from the people residing in the adjoining Shimla district with whom they have some affinity. The people of the lower Kinnaur are mostly Hindus, though the ethno-historic factors have resulted in some Buddhist influence. The middle Kinnaur is the area between Kalpa and beyond Kanam, including Morang tehsil. The people of the middle Kinnaur are of mixed racial strain. Some have marked Mongoloid and others have marked Mediterranean features.

Dress: The people of the district dress mostly in woollen clothes. Their clothing is well suited to the climate and is artistic too in its own distinctive way. The head dress for men and women in a round woolen cap called *thepang* in the local dialect. It is generally of light gray or off white colour with a coloured velvet band on the outer fold. Band of green colour is most popular. However, cap with band of other colours like crimson, blue, yellow etc. are also worn.

Food habits; The staple food is wheat, ogla, phafra and barley which are local produce. Besides these kankani, cheena maize, koda, chollair and bathu are also taken. The principal pulses consumed are peas, black peas, mash and rajmash. The vegetables usually consumed are cabbage, turnips, peas, beans, pumpkin and potato.

Language: A number of dialects are spoken by the inhabitants of district Kinnaur which come under 'Kinnauri' or 'Kanauri'. The extent of spoken Tibetan is limited to the village of Nesang, Kunu and Charang adjoining Tibet. Jangiam dialect is spoken in Jangi, Lippa and Asrang villages of Morang tehsil. The Shumceho dialects is spoken in the villages of Kanam, Labrang, Spilo, Shyaso, Tailing and Rushkalang of Poo tehsil. A Kinnauri-Jangiam mixture is the language used in Rakchham and Chitkul villages of Sangla tehsil. The Scheduled Castes or Harijans speak a language which is closer to that of certain part of the adjoining districts of Kinnaur. Besides these dialects, the people of Kinnaur also speak Hindi. Both men and women, especially in Sangla and Kalpa valley, speak English in addition to their mother tongue and Hindi.

7. District Solan

Main Tourist Spots are Kasauli, Barog, Parwanoo, Chail, Arki and Nalagarh.

Table 23: Popularity among tourist destinations in Solan District

Destination	Nature of Tourism Activity	amongst Tourist
Kasauli	Site seeing	High
Barog	Orchards	High
Parwanoo	Orchards	High
Chail	Heritage	High
Arki	Heritage	Low
Nalagarh	Heritage	Low

Table 24: Accommodation in Solan District

Solan	No. of hotels	Rest houses	Number of beds	Restaurants	Travel agencies
Arki	0	1	10	-	-
Barog	6	0	215	1	-
Chail	12	1	446	-	-
Dharampur	12	0	183	1	-
Jabli	0	0	-	1	-
Kandaghat	0	1	10	-	-
Kasauli	14	3	262	-	-
Kuonihar	0	4	13	-	-
Nalagarh	9	6	261	2	0
Parwanoo	8	2	337	2	1
Sabathu	2	-	37	-	-
Shimla	0	2	7	-	-
Solan	30	8	603	4	7
Total	93	28	2384	11	8

Table 25: Tourist stay patterns in Solan District

Destination	Average Length of Stay	
	Domestic tourist	Foreign tourist
Kasauli	One	-
Barog	One	-

Destination	Average Length of Stay	
	Domestic tourist	Foreign tourist
Parwanoo	One	-
Chail	Day visit	Day visit
Arki	Day visit	-
Nalagarh	Day visit	-

Art & culture: This section describes the fair and festivals of the district and about the people, their lifestyle, food and dresses.

Fair and festivals: In the district a number of fairs are held throughout the year. A few of these are briefly described below.

Sharad Purnima Fair: This fair is held at Unchagaon (Kunihar) in a ground surrounding a tank for two days in the month of January-February. It starts from 'Puranmashi' and lasts uptil the next day. It is held in the honour of 'Sharad Purnima' and 'Devta Dano dev' whose temple is on the bank of the tank. Brahmin worship is done on 'Puranmashi' and 'Sankrant' by a Brahmin.

Dev Bara Fair: It is held at Mangal Kandar for three days from 21st March to 23rd March. This place is about 81 kms. from Shimla & the fair is held in the honour of 'Devta Baru'.

Bani Fair: Bani fair is held on the 8th May at Hardev Pura Shankli which is 3 kms. from Kunihar. Wrestling bouts is the main feature of this fair.

Sayari Fair: Sayari fair is held for a day at Baili adjoining Kunihar on 'Sankrant' in September. A cattle show is arranged and the owners of best animals are given prizes. This fair is also held at Arki for two days. Wrestling bouts are also held during the fair.

Koti Fair: Koti fair is held at Koti village in Solan tehsil in the month of May/June for a day and a night. The fair is held in the honour of 'Mira Devi' whose temple is situated here.

Solan Fair: Solan fair is held in the honour of Shoolini Devi whose temple is situated in the southern end of Solan. The fair is celebrated every year on the 2nd Sunday of June for four days. Wrestling is the prominent feature of the Solan fair.

People and life: This section describes no. of migrant people, community of people, their culture, food and dressing style.

Migrants: In Solan district there are 159,332 migrants comprising 55,080 males and 104,252 females. The migrants of this district constitute 41.68% of total population. Male and female migrants constitute 27.51% and 57.27% respectively of the total population.

The People: The people of Solan district are predominantly Hindus followed by Sikhs and Muslims. Among the Hindus are Kanets with a mixture of Rajputs and Brahmins are in majority. Scheduled Castes also share a proportion of 28.1% of the district population.

Food and Dress: Maize, wheat and rice is the staple food of the district. In rural areas, the people take generally maize chapatis and urad dal where as in the urban areas of the district wheat, pulses, vegetables are consumed as staple food.

Language: People of Solan district speak different dialects of Pahari. These dialects change slightly after some distance, a common phenomena in the hills. As a result, the Pahari dialects of the people of Nalagarh and some parts of Kasauli tehsil have an influence of Punjabi whereas the part of the district close to Shimla district speak Pahari.

8. District Sirmaur: This district attracts a lot of domestic religious tourists. There has been a steady rise in foreign tourist arrivals in the district in the past few years.

Main Tourist Destination are Paonta Sahib, Nahan, Renuka, Rajgarh.

Table 26: Popularity of Main Tourist Destination in Sirmaur District

Destination	Nature of Tourism Activity	Popularity amongst Tourists	
		Indian	Foreign
Paonta Sahib	Religious	High	Low
Renuka	Religious & Water Sports	High	Low
Nahan	Religious	High	Low

Art & Culture: This section describes the fair and festivals of the district, the people, their lifestyle, food and dresses.

Fairs and festivals: The people of the Sirmaur district celebrate various types of festivals with considerable gusto almost around the year. Bishu fair is celebrated every year in the month of March-April and Haryali in June-July. Magh festival is the greatest of all the festivals, which is celebrated by all sections of people with tremendous enthusiasm. Janamashtmi, the birthday of Lord Krishna, is also celebrated in the month of August/September every year. Diwali is celebrated in October / November month.

Two fairs namely Bawandwadshi fair and Guga Naumi fair are celebrated at Nahan which is the main attractions for the local folks. The Hola Mohalla and Baisakhi fairs in Paonta Sahib attract a large number of Sikhs from the far off villages besides local people. Since 1982, festival named 'Sharad Mahotsava' is being celebrated every year at Paonta Sahib in the memory of Yamunaji on Sharad Purnima since 1982. Baisakhi fair is also celebrated at Rajgarh where people from far and near places come in large number to witness the local folk dances. A fair is held at Trilokpur twice a year in the months of Chaitra and Ashvin. A large number of pilgrims visit this fair. Trilokpur fair is one of the famous fairs of the district.

The Renuka Lake is visited by thousands of pilgrims every year on Kartika-Ekadashi. On this occasion, the famous historic Renuka fair is celebrated, which is one of the main attraction for the people of this place. To this fair, the brass idol of Parshuram is brought from village Jamu, his permanent abode, in a silver palki accompanied by musical instruments with great pomp and show. Considering the importance of Renuka fair, it was given the status of state level fair five year ago. Renuka fair apart from its essential religious character provides a wonderful insight into cultural heritage of Sirmaur.

People & Life

Migrants: In Sirmaur district there are 126,077 migrants comprising 35,670 males and 90,407 females. The migrants of this district constitute 33.20% of total population. Male and female migrants constitute 17.82% and 50.37% respectively of the total population.

People: People in Sirmaur district are predominantly Hindus followed by Muslim, Sikh, Jain & Christian. Most of the people in the Trans-Giri region have come from the neighbouring areas of Jubbal and Chaupa. In case of the plains of Kiar-da-dun valley, some of them have migrated from plains of Punjab particularly from Ludhiana, Hoshiarpur and Patiala districts. There is considerable population of Hindus, Muslims, Gujjars in the district who are tribals.

Dress: In Cis-Giri Tract and Nahan tehsil, people have the same dressing style as is in the plains. In Trans Giri area, the traditional dress of men consisted of a white woollen unbuttoned coat called 'Lohiya', black woollen tight 'pyjama' and a woollen cap The women have now switched to 'salwar' and 'kameez' instead of 'lehenga' and 'kurti' which they used to wear in the past. Similarly, they are gradually changing over to 'dupatta' as the head gear instead of the traditional colourful triangular piece of cloth called 'dhattus'. The 'dhattu' is, however still being largely used and hold its own against 'dupatta' because of its economical and aesthetic colourful value.

Food and Drinks: Maize and wheat are the staple food of the people of Sirmaur District. They also take rice occasionally. In hot weather, they use maize sattus – maize grains parched before grinding.

Language: According to the classification of languages made by the Linguistic Survey of India, Sirmauri has been shown as one of the several dialects under Western Pahari. The Western Pahari has been classified as sub group under Pahari Group.

9. District Kullu: Majority of tourist the tourists coming Kullu district visit Kullu and Manali. These are the most popular locations in this district. The foreign tourists arrive throughout the year in major tourist locations like unlike the domestic tourist who prefer to come here in summer and during vacations. The average domestic tourist stays in Kullu or Manali for 1-2 days. Foreigners prefer to stay in Guesthouses rather than in hotels, as it is more economical. Their duration of stay is usually 5-7 days.

Main Tourist Locations areKullu, Manali, Marhi, Naggar, Rahala Falls, Solang Valley

Table 27: Popularity of main tourist destinations in Kullu district

Destination	Nature of Tourism Activity	Popularity amongst tourists	
		Indian	Foreign
Kullu	Culture, Temple & Adventure	High	Low
Manali	Nature, Culture, Shopping, Adventure & Religion	High	High
Rohtang Pass	Adventure, Sight seeing	High	High
Solang Valley	Adventure & Sight seeing	Medium	Low

Table 28: Tourist stay pattern in Kullu district

Destination	Average Length of Stay	
	Domestic touristS	Foreign tourist
Kullu3	1 day	1 day
Manali	5 – 6 days	1 – 2 months
Rohtang Pass	-	-
Solang Valley	-	-

Art & culture: This section describes fair and festivals of the district and people, their lifestyle, food and dresses.

Fairs and Festivals: The people of Kullu district celebrate a good number of fairs and festivals round the year which have, by and large, religious sanctity. Some of the important fairs and festivals held in the district are briefly described below.

Kullu Dussehra: Kullu Dussehra is different in certain ways from Dussehra celebrations in the other parts of the country. It presents cultural ethos of the people and their deep rooted religious beliefs which manifest during this festival with traditional songs, dances and colorful dress. It begins on Vijay Dashmi and lasts for a week.

Pipal Jatra/ Vasantotsava: The traditional name of Vasantotasava is Pipal Jatra or it is also called Rai-ri-Jach. It takes place at Dhalpur, Kullu on 16th of Baisakh every year.

Shamshi Virshu: This fair is held on 1st Baisakh (April 13) for one day in village Khokhan. The fair is religious and seasonal. The legend connected with the fair is that he was moved by the alluring beauties of the hill springs & used to dance at this place with his girl friends who were daughters of Rishis and Munis. The local inhabitants also regard themselves as the progeny of the daughters of those Rishis and Munis.

Mela Bhuntar: The fair is held from 1st Ashad maas (June-July) for 3 days in village Bhunter. The fair is seasonal and religious. From this day, the use of food grains from the newly harvested crops starts after cooked food offerings are made to the gods and then the meal is shared by other relatives and friends. This is known as 'Tahoolikhana'.

Sainj Fair: This fair is held in Raila on 21st of Baisakh (April-May) for one day. The significance and legend of the fair is religious and recreational. Idol of Devta Laxminarayana is brought from Raila to Sainj. Thereafter, the fair starts with folk dances and songs rhythmical with the beat of drums and trumpets.

Luhri Lavi: This fair is held on 21st and 22nd of Karthik maas (October-November) for two days and one night in village Dingidhar at Luhri. The significance of the fair is religious and commercial. The fair is held in honour of Devta Jogeshwar and Khegro Maya. The Devtas are worshipped. Nalti dances, mimicking, fold dance at night are performed.

Ani Fair: This fair is held from the 27th of Baisakh (April-May) for two days in village Franali at Anni. In the fair, deities of the adjoining villages participate. The main attractions of the fair are folk dances and other cultural programmes.

Dalash Fair: This fair is held in the month of Bhadon for three days and nights in village Soidhar at Dalash. The fair is altogether religious and is held in the honour of Devta Jogeshwar Mahadev of Dalash and Bungli Nag. The devtas are worshipped and natti dances, cultural programmes and sport tournaments are performed.

Ganter Fair: This fair is held on 3rd of Paush maas (Dec.-Jan) for one day. The fair is mainly religious and it is said that Rana and Thakurs then rulers of Kullu valley were at logger heads and used to be constantly at war with each other. To commemorate the battle, a ram used to be scarified. The practice of ram sacrifice is still in vogue.

Ghatasani Fair: This fair is held on 4th of Chaitra maas (March - April) for two days in village Dawra. The legend connected with the fair is that once mother Parvati asked Lord Shiva to forget Rama, saying that even Rama could change.

Dhoongri Fair: This fair is held on Jaishth 2nd (May-June) for three days at Dhoongri (Manali) in the memory of Devi Hadimba who meditated at Dhoogri and was married to Bhima, one of the five Pandavas.

Bhadoli Fair: This fair held once in three years, dates whereof is decided by the Brahmins. The fair is held for four days. The fair is commemorated in the memory of Lord Parshuram who is stated to have meditated here.

Buddhi Diwali: This fair is held from Maghar Amawas for three days in village Nirmand. The fair associated with the battle of Mahabharata which is said to have started on that day.

Phagli Fair: The fair is held in the month of Phalgun and hence the name Phagli. The fair is held to show the struggle of supremacy between the god and demon, in which ultimately the god emerge victorious. This fair is also held to commemorate the event of killing of demon by the god.

Birshu Fair: This fair is held in the month of Chaitra or Baisakh, throughout the district. One day before the first day of the month, delicacies are cooked in the houses and sent to all the relatives.

Sharhi Jatra: This fair is held near the temple of the Tripura Sundri, at the ground named Sharhi. This fair is held for three days. The gathering here is always large. It takes place in the month of 'Jyeshtha' (May-June).

10. District Hamirpur: The domestic tourists visiting this district mostly visit the Deothsidh temple. This district is not popular among foreign tourists.

Main Tourist Attraction are Deothsidh Temple and Sujanpur Thira.

Table 29: Popularity of Main Tourist Destinations in Hamirpur District

Destination	Nature of Tourism Activity	Popularity amongst Tourists	
		Indian	Foreign
Hamirpur	-	Low	Low
Nadaum	Scenic town	Low	Low
Deothsidh Temple	Pilgrimage	Medium	Low

Table 30: Accommodation in Hamirpur District

Hamirpur	No of hotels	Rest houses	Number of beds	Restaurants	Travel agencies
Hamirpur	10	12	273	1	0
Jahu	1	0	4	0	0
Jwalamukhi	0	1	8	0	0
Nadaun	0	1	6	0	0
Sujanpur	1	1	26	0	0
TOTAL	12	15	317	1	0

Table 31: Tourist Stay Pattern in Hamirpur District

Destination	Average Length of Stay	
	Domestic tourist	Foreign tourist
Hamirpur	One	-
Nadaun	Day visit	-
Deothsidh temple	One	-

Art & culture: This section describes fair and festivals of the district, people, their lifestyle, food and dresses.

Fairs and Festivals: The people of Hamirpur district celebrate a good number of fairs and festivals round the year which have, by and large, religious sanctity. Some of the important fairs and festivals held in the district are briefly described below.

Gasota Mahadev Fair: This fair is organized at a place which is about 10 kms. away from Hamirpur on Jahu road. It is held here every year for eight days beginning from first Monday of Jyeshtha.

Baba Deothsidh Fair: Baba Deothsidh is a religious fair held on every Sunday of Jyeshtha maas. Thousands of people from far and long distances come to join the celebration. In order to propitiate Baba Balak Nath, people offer goats to the Baba Balak Nath which are sacrificed in his honour.

Gashian Fair: This fair is held on first Tuesday of Ashar month. The fair is dedicated to Goddess Gashian. Since the time immemorial people believe that on this day fairies come to take bath in the water. Therefore, the festival has a considerable religious sanctity behind it.

Awah Devi Fair: This fair is organized at the temple of Goddess Awah Devis.

Chaniari Devi Fair: Chaniari Devitemple is situated 7 kms from Hamirpur on Hamirpur – Nadaun Road. This fair is held in Jyeshtha maas of every year in honour of Goddess Chaniari Devi. Like the other religious festivals of the district, it has also presently assumed commercial dimension where the business of considerable sum gets transacted during the festival.

11. District Una: The Chintpurni temple is a popular pilgrim destination. In Una district is visited a lot of domestic tourists however proportion of foreign tourists visit this districtis low.

Table 32: Accommodation facilities in Una District

Una	No. of hotels	Rest houses	Number of beds	Restaurants	Travel agencies
Aloh		1	30	-	-
Amb	1	1	16	-	-
Bangana	-	1	8	-	-
Bharwain	2	1	62	0	1
Chintpurni	4	0	100	0	0
Gagret	1	1	24		
Mehatpur	3	0	48	0	0
Sidhchaler	2	0	30	0	0
Una	5	7	166	4	0
Total	19	11	484	4	1

Table 33: Tourist Stay pattern in Una District

Destination	Average Length of Stay	
	Domestic tourist	Foreign tourist
Chintpurni	One	-

Art & Culture

Fairs and Festivals: There are quite a few fairs and festivals celebrated in various parts of the district. Some of the important fairs are briefly described below.

Chintpurni: At Chintpurni, three fairs are held every year, first in the month of February, second in July/August and the third in September.

Pir Nigaha: This shrine is situated in Basoli, about 8 kms. from Una.

Panjgatra: Panjgatra at Babhaur on the Satuj is held on first Baisakhi day.

Baisakhi and Holi: The fair is held at Mairi near Amb where large number of people assemble. Besides, some other fairs held in the district are namely Sidh Badhmana fair which is held on every sunday in the months of June-July. Jatoli-Haroli fair is held for the worship of Gugga Pir and Bhadar Kali fair is held in February and September.

People and lifestyle

Migrants: In Una district there are 142,652 migrants comprising 34,350 males and 108,302 females. The migrants of this district constitute 37.71% of total population. Male and female migrants constitute 18.85% and 56.80% respectively of the total population.

The People: The district is predominantly inhabited by Brahmins, Rajputs, Jats, Sainis, Bahtis and Gujjars. The Brahmins and Rajputs mainly dwell on landed property. The Brahmins who own land are mostly concentrated around Amb. The main communities among the Brahmins are Saraswat, Kangra Raina, Gaur and Bhatt.

Food: The staple food of the district is maize and wheat and gram. Sarsoan is the most common vegetable in the entire district. Meat is generally consumed by Rajputs and the Muslims.

Dress: The male dress generally comprises of the 'pyjama' or 'dhoti' covered over it with a shirt in summer. The women costume consists of a pair of 'pyjama' (Salwar) or 'ghagra' (Petticoat) and a short coat (Kurta) 'Chadar' or the Dupatta covers the body over the shoulders. This traditional dress, however, is fast vanishing with the younger generation taking to salwar, kameez and sarees.

12. District Lahaul & Spiti the main tourist destinations are Keylong, Kaza & Spiti.

Table 34: Popularity of Main Tourist Destinations in Lahaul & Spiti

Destination	Nature of Tourism Activity	Popularity amongst Tourists	
		Indian	Foreign
Kaza	Religious	Low	High
Keylong	Trekking	Low	High
Spiti valley	Trekking	Low	High

Table 35: Accommodation facilities in Lahaul & Spiti

Lahaul & Spiti	No. of hotels	Rest houses	Number of beds	Restaurants	Travel agencies
Godhla	1	0	4	-	-
Jahalwan	0	1	4	-	-
Jispa	0	1	64	-	-
Kaza	5	7	89	-	-
Keylong	6	0	99	0	1
Lossar	0	1	6	0	0
Sagnam, Spiti	0	1	4	-	-
Samdo, Spiti	0	1	6	-	-
Tabo	0	2	8	-	-
Udaipur	0	1	4	-	-
Total	11	15	288	1	1

Table 36: Tourist stay pattern in Lahaul & Spiti

Destination	Average Length of Stay	
	Domestic tourist	Foreign tourist
Kaza	-	Ten
Keylong	-	Ten
Spiti valley	-	Twelve

Art and Culture

Fair and festival: People of Lahaul & Spiti celebrate several fair and festivals on different occasions. There used to be annual fairs at various places like Ladarcha fair at Kibber and Kaza, Paurifair at Udaipur and tribal fair at Keylong. These fairs basically had trade significance in them and traders from Tibet, Ladakh, Chamba, Kullu and various parts of India used to come over with the articles from the respective regions and barter used to take place. Much of their historical significance has been lost with the closure of border with Tibet. However, the Government have been trying to encourage such fairs by introducing exhibition on

important occasions like Independence Day, Republic Day and other days of national importance as well as organising tribal fair from 14th to 16th August, at Keylong every year.

Besides these fairs, the Tsheshu religious fair is celebrated in Shashur, Gemur, Kyee, Kardang, Triloknath, Tabo, Gurughantal and Mane monasteries in the months of June or July every year.

People & Life

Migrants: In Lahaul & Spiti district there are 10,878 migrants comprising 5,100 males and 5,778 females. The migrants of this district constitute 34.76% of total population. Male and female migrants constitute 29.61% and 41.07% respectively of the total population.

People: The Lahaulis at present are amalgamation of different races. Unlike the Lahaul valley, the Spitians are purely of Tibetan stock. On the other hand even the features of Lahaulis give a combination of Mongolian and Aryan traits with their short and stout physique slightly high cheek bones and oblique almond like eyes combined with straight nose which reflects both Mongolian and Aryan blood.

Dress: Men wear coat and pyjama and women wear tight pyjama, choga like shirts tied at the waist with the waist coat. Most of the times, cloths on women are of maroon and dark brown colour. The Lahaulis have traditional straw shoes, the soles of which are made of barley straw and the upper from strong Chamba fibre. These shoes are very suitable for walking on the snow. The traditional shoes are indicative of the social status and the people belonging to high class do wear shoes which are lined with fur.

Language: Swanglas, Thakurs, Kanets and Bhots along with several Scheduled Castes communities of Chahans, Dombas, Hessis, Garas and Balras etc inhabit in the district. The people of Spiti valley speak only Tibetan language whereas there are three dialects which are spoken in Lahaul valley. Bunan is spoken in the Chandra Bhaga valley. Tinan is spoken in Chandra valley and Manchat is spoken in Chandra Bhaga valley upto Thirot. All these three dialects are said to have strong affinities with the languages of Munda speaking tribes of the Pre-Aryan times of India. It is connected with the Tibetan only in relation to vocabulary. Moreover, the researchers have found many similarities between Chanali dialect of Lahaul and Sanskrit.

1.2 Patterns of Planning and Development in the Sector

Tourism is one of the fastest growing industries in the world. The number of tourists worldwide has been registering phenomenal growth and it is expected that this number would touch 1.5 billion. Tourism contributes about 11% of the world workforce and 10.2% of the global gross domestic product. This pattern and dynamic character of the sector necessitates the policy to adapt to the changing environment. Policies are products of time and circumstances, available resources and technologies and most importantly, the needs of the stakeholders.

Table 37: Proposed Plan and target achieved in the State

Head of Development/Item	Unit	Tenth Five Plan (2002-07)		11th Five Year Plan (2007-2012)			Annual Plan 2008-09 Target
					Annual Plan (2007-08)		
		Tenth Plan Target	Actual Achievement	11th Five Year Plan (2007-12) Target	Target	Anticipated Achievement	
Tourism :							
(i) International Tourist Arrivals	Nos.	721500	1015490	901875	120000	320000	350000
(ii) Domestic Tourist Arrivals	Nos.	25028600	7875687	32537180	6500000	8592000	9500000
(iii) Accommodations Available Beds	Nos.	2250	41526	15000	3000	2200	3500

Source: Five year plan document, 2007 – 2012, Himachal Pradesh

Tourism Strategy for Himachal Pradesh: The strategy seeks to:

- To promote economically, culturally and ecologically sustainable tourism in Himachal Pradesh.
- To promote responsible tourism, that will be welcomed as both preferred employer and community industry.
- To use tourism as a means of providing new employment opportunities in rural, tribal and remote areas.
- To increase private sector participation in tourism, both as a means of generating employment and providing new infrastructure.
- To develop activity-based tourism to increase the duration of tourists visits etc.

Year	Domestic	**Foreign**	**Total** (in **lakh)**
2004	58.5	1.5	60
2005	77.5	2.5	80
2006	95.5	4.5	100
2007	113.0	7.0	120
2008	121.5	9.5	130
2009	128.0	12.0	140
2010	135.0	15.0	150

The Department of Tourism and Civil Aviation has announced a vision for tourism by the year 2020 as described below.

1. Every major tourism destination to be well linked by roads of international standards and these highways to be well serviced by both air and rail connections.
2. A substantial number of luxury and deluxe resorts to be based in Himachal Pradesh.
3. Lakes – especially the Maharana Pratap Sagar to become important destinations.
4. Apart from leisure, conference tourism, family and corporate bonding and the segment of 'wellness' tourism - with health and rejuvenation, yoga and other therapies - is expected to grow significantly.
5. Himachal Pradesh to emerge as the core of the world's 'Buddhist circuit'.
6. Himachal Pradesh by the year 2020 should be the adventure sports capital of Southeast Asia.
7. Centres of Hindu and Sikh pilgrimage that already draw a substantial number of devotees are to be provided better facilities. Marketing of these places amongst the Hindu and Sikh communities within the country as well as overseas.
8. At least 25% of the State's GDP to come from tourism and its allied industries. To raise the contribution of Tourism and allied Industries to 25% of State's GDP.

Eco-tourism: Himachal Pradesh offers a new era of nature enjoyment and learning. It also provides visitors an excellent exposure to the temperate forests. This makes it an ideal area for developing eco-tourism activities like jungle safaris, trekking, rock climbing, forest trails, nature walks, angling (esp. golden mahaseer and brown trout), camping, etc. All these activities are to be conducted in a manner that promotes awareness of the environment and helps maintain the ecological balance.

The eco tourism projects being predominantly situated in forest lands are under the Forest Deptt., which has already formulated an Eco-tourism policy in consultation with the Tourism Deptt. Under this Eco-tourism societies have been established on Community Based Eco-tourism basis to cover the Great Himalayan National Park (Kullu), Himalayan Nature Park (Shimla), Renuka Wildlife Sanctuary (Sirmaur) and Potter's Hill Van Vihar (Shimla).

Wildlife Tourism is an integral part of Eco-tourism. Himachal Pradesh has a varied topography, climate and forest cover and is endowed with a vast variety of flora and fauna. The Department of Tourism and Civil Aviation proposes to work actively with the Wildlife Wing of the Forest Deptt to further develop and improve wildlife parks/zoos, birds watching towers and other public utility services for the facility of the tourists. A reasonable fee shall be determined by the Government for use of such parks/zoos.

Development of Lakes and wetlands: It is also part of eco-tourism. The State Government will make special efforts to make natural and man made lakes as important tourist destinations. Steps will be taken to maintain and enhance their beauty by undertaking development in an integrated manner. Facilities for water sports in Maharana Pratap Sagar, Chamera reservoir and Gobind Sagar will be developed to International standard and national and international level events will also be organised to popularize these destinations. Maharana Pratap Sagar will be developed as a world class water sports destination with the financial assistance of the Central Government in order to develop activities like water sports, angling, bird watching, setting up of house boats, development of artificial beaches etc. The Government will also encourage the private sector to set up houseboats and operate shikaras in the Maharana Pratap Sagar. Improvement of the forest rest houses will also be carried out in the area and will also be made available to the tourists.

Home Stay Scheme, 2008: The scheme aims to broaden the stakeholders base for tourism and take Tourism to the rural and interior areas of the State. The incentives/exemptions under the scheme shall be available in the countryside locations of such houses.

- The Home stay scheme shall have the following objectives:
- Broaden the stakeholder's base for tourism in the State;
- Take tourism to the rural and interior areas of the State;
- Decongest the Urban areas, which cannot support any further tourism load;
- Provide employment and economic values in the interior areas;
- The activity shall be ecologically sustainable.

Tourism sub plan: There is no denying the fact that the total budget with the Department of Tourism is less in comparison to the other tourism-oriented States in the country. Tourism is one industry, which is linked with all development departments. Under their normal programmes, they are required to meet the infrastructure demands for promotion of tourism.

1.3 Technology/Schemes Adopted in the Sector along with any Changes in Technology

Guidelines for Eco-tourists have been developed which is described below.

As an eco-tourist, travel, respecting local culture and traditions and encouraging local pride---local cuisine, folk songs and dance, traditional dresses, local etiquette, local architecture. There is a science and art in everything. Be friendly, inquisitive and patient. Respect holy places.

Understand that leakage of economic benefits outside the community due to non-local ownership of tourism business is bad. Give a fair price to rural produce by buying local. Indigenously crafted or value added products provide the right livelihood to the locals and use up less natural resources.

Think eco-systems-Be conservation conscious. Support friendly resource usage-water through rain water harvesting, use of non-conventional energy; if electricity is unavailable, use energy-efficient kerosene stoves.

Be environmental sensitive & respect biodiversity. Respect carrying capacity of the physical environment and the resources, knowing that overcrowding leads to a lessening of the tranquility and simplicity of life that attracts you in the first place.

Make positive contributions to the conservation of natural and cultural heritage, maintain local harmony. Help the guides and porters to observe eco-conservation measures. Remember that erosion of cultural integrity and values due to the introduction of 'outside' influences is ruinous to indigenous cultures. Avoid over-use of community infrastructure. Keep local water sources clean and avoid using chemical detergents in streams or springs. If no toilet facilities are available, make sure you defecate atleast 30 metres away from any water source, ensuring to bury any waste. Conservation of water is vital, especially drinking water. Water from kitchen waste or rain-water through regular harvesting be used for sanitation and use, where quality of water required is not very high. Water source should not be contaminated in any way.

Keep travel-generated garbage at the minimum. Composting recycles and minimum waste generation must be practiced. Proper disposal must be at appropriate points along the route. Leave no eye-sores. 'Leave no trace' principle be followed. Camping areas should be left cleaner than what you saw when you came. Remember that another party would be using the camp site after your departure. Differentiate between non-biodegradable & biodegradable garbage. Burn or bury paper, natural refuse and litter. Keep for recycling and don't throw away any non-degradable garbage like plastic bags, foil, packets, glass bottles and metal cans.

See that no damage is done to vegetation. Taking away cuttings, seeds and roots without permission of the authorized persons is illegal, especially in nature reserves. Stop people from plucking flowers or leaves. They should be left as they are for all to enjoy. As much as possible keep to the treks/trails/hikes and avoid stepping on to vegetation—you destroy vital biodiversity. Avoid collecting souvenirs. Reduce impact, keeping to marked routes and paths.

Damage to trees/vegetation must not be done. Do not carve initials on trees or spray graffiti on monuments defacing rocks is pollution and the Apex Court too took badly to it.

Firewood is scarce and should be used sparingly, whether for heating water for bath or for bonfire or for fire-places provided. Avoid making open fires and discourage others from doing so. There should be no carelessness with reference to fire. One small careless fire can destroy an entire forest. Extinguish any fire—bonfire, fire in grill etc before leaving the place. Do not throw away cigarettes, bidis or matches.

Read up literature, brochure, be aware of the environs and surrounding. Be clear about the trek—some have a gentle slope, some have a moderate slope and others are precipitous. Match your physical fitness with the hike being taken up. Keep required medicines, water and inform the guide / networking coordinator complete details about yourself. You cannot half way ask to terminate the tour.

Take all precautions not to get lost and in the eventuality, specified instructions be followed. Avoid confusion and panic.

Check vehicle travel to reduce for polluting gases/smoke. Pooling for travel is cheaper and lesser polluting. Use bicycles/horses/ponies and wherever possible walk---healthy, non-polluting—stand and stare—there is so much to absorb—the mountain terrain is awesome, serene and educative. Avoid noise pollution—blaring horns, music systems (radios/tape-recorders), loud mobile talking. Silence in the majestic mountains has meaning and character. Take in the peace and tranquility.

Avoid offering food to animals and birds as thereby you are threatening their foraging and spoiling their hunting skills. Otherwise too, the food you give will probably make them unhealthy. Feeding monkeys too is common and should be discouraged as it spreads nuisance. A monkey bite can mean spread of rabies. If you see anyone hunting or hurting/teasing animals, report them to the authorities; if you cannot stop them yourselves. Wildlife viewing must be done, observing all security and conditions prescribed. Shouting, teasing or chasing animals is strictly prohibited.

It is illegal to carry fire-arms/nets or any explosives. Do not also carry polythenes or other prohibited plastics.

While taking photographs or shooting with your video-camera (for which there is a prescribed fee) you are encouraged not to disturb the subject you want to capture in any way. Do not use flashes, particularly close up, as this can disturb and annoy wild animals and nesting birds.

Strictly follow the guidelines for personal safety and security taking required precautions.
Wear comfortable clothes with inconspicuous colours like khaki, olive green or grey so as not to disturb environs with bright and gaudy colours. Use good quality trekking shoes—some are rain-proof too. Use hats/caps during hot days and rain gear during rains and jackets/wind-cheaters during cold. Travel light in terms of baggage. Back packers only carry essentials—food, medicines and camera.

2. Rainwater Harvesting on the top of Commercial Building: The Government of Himachal Pradesh has made, the collection of rainwater compulsory from the roof top of following buildings in the State:

- For all buildings which come up in the Urban areas of the State in future
- For all the commercial/institutional buildings, existing or proposed for construction in future and having plinth area of more than 1000 sq.m. and located anywhere in the State.

List of Hotel complexes having provision for Rain Water Harvesting Structures are enumerated below.

Chamba District

- Sagrita Resorts, Dalhousie
- Basera Guest House, Dalhousie
- Inderprastha Resorts, Dalhousie
- Snow view, Dalhousie
- Hotel Kumar, Dalhousie
- Hotel Grand View, Dalhousie
- Hotel Grace Mount, Dalhousie
- Hotel Green, Dalhousie
- Dalhousie Height, Dalhousie
- Himalayan Resorts, Dalhousie
- Hotel Ravi View
- Hotel Sangril-La, Dalhousie
- Snow View G.H., Dalhousie
- Hotel Spring, Dalhousie
- Hotel Ark, Dalhousie
- Hotel City Heart, Dalhousie

Shimla District

- Sukh Sagar Regency
- Radisson Jass
- Silverine
- Hotel Sukh Sagar
- Aachman Regency
- Apple rose, Kachi Ghati
- Hotel Aryan, Kachi Ghati
- Pineview
- Hotel Blossom, near RTO
- Brightland
- Woodville Palace
- Hotel Wingait Inn
- Hotel Gemini, Dhalli

- Kalra Regency, C/Shimla
- Le-Royale, Jakhoo
- Hotel Landmark near AG Office
- Quality Inn Himdev, Kachi Ghati
- Shimla View near TSM workshop, G/Chowki
- Willow Bank, The Mall 20 Wild Flower Hall, Chhabra
- Golf Link Resort
- Marrie Gold
- Sylvan Heights
- Ice Touch Resort
- The firhill

Kangra District

- Hotel Laj, Kangra
- The Nagri Resort
- The Height, Jachh
- Hotel Shiv Shakti, Dharamkot
- Blossom Vills Resort, Sidhpur
- Amandeep GH, D/Sala
- Rajpoot GH, Bir
- Great Himalayan Resort, Bhagsu Nag
- Saryam, GH Bhagsunag
- Aakash GH, Bhagsunag
- Sun Shine GH, Pragpur
- Yashita GH, Chamunda

Hamirpur District

- B.B.N. GH, Deothsidh
- Amar Hotel, Sujanpur
- Beas View GH, Sujanpur

Una District

- Alfa Hotel
- Maya Ji Hotel, Chintpurni
- Sun Shine Hotel, Una
- New York Plaza, Una
- Kuber Hotel Gagret

Mandi District

- Hotel Pohlo Regency, Sundernagar
- Hotel Hot Spring Internationa, Tattapani
- New Spring View Guest House, Tattapani
- Hotel Hamsafar, Sundernagar
- Hotel River Bank, Saulikhad

Bilaspur District

- Hotel Panchwati, Sunga

1.4 Stakeholder nvolvement adopted in the sector along with any changes in technology

The Government of Himachal Pradesh has undertaken the responsibility as a catalyst to give impetus to village tourism. The District Administration understand the importance of the concept in promoting rural tourism. Private sector investment ably supported by government investment in a core infrastructure would be the two key sources of funding for tourism projects in the state.

Major stakeholders within the sector are:

1. Department of Tourism & Civil Aviation
2. Department of Forest
3. Irrigation and Public Health (I&PH)
4. H.P. State Pollution Control Board (HPPCB)
5. Department of Environment, Science & Technology
6. H.P. Tourism Development Corporation (HPTDC)
7. Rural Development Department
8. Urban Development Department
9. Non Government Organization (NGOs)
10. Civil Society Organization
11. Private Sector
12. Atal Bihari Vajpayee Institute of Mountaineering and Allied Sports, Manali (ABVIMAS)

Ecotourism Society of Himachal Pradesh: The society is an autonomous and independent body. Its main aim is to preserve and protect the natural, historical and cultural heritage of Himachal Pradesh in order as a preferred destination for visitors and provides opportunities to promote Community Based Ecotourism (CBET). Particularly using latest approaches of participatory Forestery Management for sustainable development of the forests, thereby generating revenue for the State. A harmony is to be fostered between the people, environment, conservation and development. This Society would work in partnership between the civil society organization (local communities, NGOs, academic institutions and private enterprises/businesses) and the State (Forest

Chamba District

- Sagrita Resorts, Dalhousie
- Basera Guest House, Dalhousie
- Inderprastha Resorts, Dalhousie
- Snow view, Dalhousie
- Hotel Kumar, Dalhousie
- Hotel Grand View, Dalhousie
- Hotel Grace Mount, Dalhousie
- Hotel Green, Dalhousie
- Dalhousie Height, Dalhousie
- Himalayan Resorts, Dalhousie
- Hotel Ravi View
- Hotel Sangril-La, Dalhousie
- Snow View G.H., Dalhousie
- Hotel Spring, Dalhousie
- Hotel Ark, Dalhousie
- Hotel City Heart, Dalhousie

Shimla District

- Sukh Sagar Regency
- Radisson Jass
- Silverine
- Hotel Sukh Sagar
- Aachman Regency
- Apple rose, Kachi Ghati
- Hotel Aryan, Kachi Ghati
- Pineview
- Hotel Blossom, near RTO
- Brightland
- Woodville Palace
- Hotel Wingait Inn
- Hotel Gemini, Dhalli
- Kalra Regency, C/Shimla
- Le-Royale, Jakhoo
- Hotel Landmark near AG Office
- Quality Inn Himdev, Kachi Ghati
- Shimla View near TSM workshop, G/Chowki
- Willow Bank, The Mall 20 Wild Flower Hall, Chhabra
- Golf Link Resort
- Marrie Gold
- Sylvan Heights
- Ice Touch Resort
- The firhill

Kangra District

- Hotel Laj, Kangra
- The Nagri Resort
- The Height, Jachh
- Hotel Shiv Shakti, Dharamkot
- Blossom Vills Resort, Sidhpur
- Amandeep GH, D/Sala
- Rajpoot GH, Bir
- Great Himalayan Resort, Bhagsu Nag
- Saryam, GH Bhagsunag
- Aakash GH, Bhagsunag
- Sun Shine GH, Pragpur
- Yashita GH, Chamunda

Hamirpur District

- B.B.N. GH, Deothsidh
- Amar Hotel, Sujanpur
- Beas View GH, Sujanpur

Una District

- Alfa Hotel
- Maya Ji Hotel, Chintpurni
- Sun Shine Hotel, Una
- New York Plaza, Una
- Kuber Hotel Gagret

Mandi District

- Hotel Pohlo Regency, Sundernagar
- Hotel Hot Spring Internationa, Tattapani
- New Spring View Guest House, Tattapani
- Hotel Hamsafar, Sundernagar
- Hotel River Bank, Saulikhad

Bilaspur District

- Hotel Panchwati, Sunga

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8. Urban Development Department
9. Non Government Organization (NGOs)
10. Civil Society Organization
11. Private Sector
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Atal Bihari Vajpayee Institute of Mountaineering and Allied Sports, Manali (ABVIMAS): The ABVIMAS is the largest Adventure Sports training centre in the country. Spread over 20 acres of forest land on the banks of the river Beas, the Directorate has a hostel facility that can accommodate 260 people at a time, a dining hall that can cater to more than 200 people at once and an auditorium that has a seating capacity of 680 people.

1.5 Critical environment issues / hotspots associated with the sector

As per Ministry of Tourism, Government of India estimates Shimla, Kullu, Kangra and Bilaspur are expected to be top five tourist destinations accounting for more than 70% of tourist arrivals till 2021. It is expected that Kullu and Kangra districts, Bilaspur and Chamba districts will compete with each other to attract tourist arrivals Lahaul and Spiti district is expected to remain the lowest in attracting tourist arrivals.

1. Change in land use / Change in Aesthetics and Inadequate tourist infrastructure: The expected demand and supply gap in terms of bed requirement and bed available at top five tourist destinations will exceed 50,000 in 2011 and 1, 00,000 by 2021. This translates into an additional

62 ha and 127 ha of built up area and 106 ha and 201 ha of total area requirements by 2011 and 2021 in these districts. The additional requirement of built up area will lead to land use change as well as infrastructure development.

2. Non-availability of safe drinking water at tourist destinations, tourist circuit and trekking routes: The expected additional water supply demand due to tourist arrivals will exceed 1059 MLD in 2021 and 1630 MLD by respecting 2021 in the top five tourist destination. Vulnerability analysis shows that water supply infrastructure in Shimla, Kangra and Chamba district, Kullu, Ghumarwin and Bilaspur sadar tehsil is already under stress. Additional tourist load will increase pressure on existing water supply system.

3. Inadequate sanitation at tourist units/tourist destination / religious places / heritage sites /trekking routes / tourist circuits / transportation routes: The expected additional sewage generation due to tourist arrivals will exceed 847 MLD in 2011 and 1338 MLD by 2021 in the top five tourist destinations. Vulnerability analysis shows that sewage infrastructure in Shimla, Kangra & Chamba districts, Kullu, Ghumarwin & Bilaspur sadar tehsils is already under stress. Additional tourist load will increase pressure on existing sewerage infrastructure.

4. Solid waste littering and improper disposal along trekking routes, tourist circuits and tourist destination, e.g. plastic waste, PET bottles, tetra-packs, packets of snack food, food items and batteries from cameras / **audio /video equipment:** The expected additional MSW generation due to tourist arrivals will exceed 3479 tonnes per day in 2011 and 5354 tonnes per day by 2021 in the top five tourist destination. Vulnerability analysis shows that MSW infrastructure in Shimla, Kangra, Chamba districts, Kullu, Ghumarwin and Bilaspur sadar tehsil is already under stress. Additional tourist load will add pressure on existing MSW management infrastructure.

5. Increased emissions due to increased traffic at tourist destination / tourist circuits / tourist-routes / heritage sites / religious places: The expected additional transportation requirement due to tourist arrivals will exceed 10952 PCUs per day in 2011 & 15945 PCUs per day by 2021 during peak season in top five tourist destinations. Considering Bharat Stage-II norms, the expected additional average daily CO load will exceed 116 kg/day in 2011 and 146 kg/day by 2021 in these destinations. Similarly, the expected additional average daily Hydro Carbon load will exceed 27 kg/day in 2011 and 34 kg/day by 2021 in these destinations.

6. Disruption of electricity supply at tourist destination during tourist season: The expected additional electricity demand will range from 23,279 MWH to 11,03966 MWH in 2011 and 2,86,176 MWH to 15,16,565 MWH in 2021in the top five destinations.

7. Disturbance to ecology and critical habitats due to development of new tourist circuits, tourist units and tourist destination: Uncontrolled and unregulated tourism in new areas / circuits / tourism units / tourism destination / ecologically sensitive areas, forests villages, hills, mountain offer potential of disturbance to ecology / critical habitats.

8. Unregulated activities / encroachments at tourist / heritage / pilgrimage sites: Land encroachments by dhabas, vehicles at transit points are major constraints in existing congested space.

Buffer zone activities like camping rekindling of bon fire at campsites, washing of clothes and vehicles near water bodies / water sources / lakes are a major source of air and water pollution.

Illegal collection of medicinal herbs and other species of flora and fauna from in forest areas leads to biodiversity loss.

9. Lack of awareness, training and capacity building about environmental issues related to tourism: The State lacks capacity in terms of skills of human resources in the area of hospitality / tourism as well as environmental issues related to tourism. This is based on the fact that there is a huge gap in existing tourism infrastructure and the human resources needed to manage it. Further, the existing skill set of human resources of coordinating and collaborating agencies needs to be upgraded to plan and implement the selected response to address environmental issues.

10. Lack of carrying capacity studies / assessments: The growth in tourism in the State has not been matched by adequate planning to create infrastructure and facilities in tourist circuits and destinations. This has resulted in congestion of few tourist circuits / destinations. Recently, Department of Tourism and Civil Aviation has undertaken preparation of the Tourism Master Plan to address this issue.

11. Inadequate attention on preservation of local art, architecture and culture: Town and Country Planning Department has not adequately regulated the land use in the vicinity of the protected monuments. Approval of design of the new buildings infrastructure are planned, designed and constructed with out adequately considering the heritage, culture and are also not in conformity to the local hill architecture.

Pressure on account of increasing gaps and slow implementation of policy, programmes, plans and projects is leading to emergence of sector specific issues and risks/impacts. An analysis of the issues, causes and impacts has been carried out and summarized in Table 38.

Table 38: Issues/Causes and Impacts

Issues	Causes	Impacts/ Risks
Change in land use / Change in Aesthetics / Inadequate tourist infrastructure	– This land may be created by hill cutting or diversion of forest land. Lack of hotels / accommodation facility. – Unregulated construction at valley side slope	– Biodiversity loss – Soil Erosion – Increased health risks / Unhygienic and unsanitary conditions due to overcrowding waste generation beyond disposal capacity
Non-availability of safe drinking water at tourist destination, tourist circuits and trekking route.	Due to increasing tourist traffic, there is an increase in the gap in availability of safe drinking water and its demand.	– Water borne disease / Health Risks – Spread of diseases – Ground water pollution
Inadequate sanitation at tourist units/tourist destination / religious places / heritage sites /trekking routes / tourist circuits / transportation routes.	– Unregulated sewage discharge and open defecation. – Lack of infrastructure facilities like latrines at transit points (Dhabas) & soak pits. – Lack of adequate capacity of existing sanitation infrastructure. – Non existence of sanitation infrastructure at tourist destination / tourist units.	Contamination of the water source / Health Risks
Solid waste littering and improper disposal along trekking routes, tourist circuits and tourist destination, e.g. plastic waste, pet bottles, tetra-packs, wrapper of snack food, food items and batteries from cameras / audio /video equipment.	Inadequate collection, treatment and disposal facility of solid waste at tourist units/destinations/ circuits, leads to build up of solid waste at these locations.	– Air/Water/Land pollution and associated health risks due to biodegradable, non-biodegradable and hazardous waste disposal. – Aesthetics Pollution
Increased emissions due to increased traffic at tourist destination / tourist circuits / tourist-routes / heritage sites / religious places.	– Location specific traffic congestion – Lack of parking space	Outdoor air quality deterioration and associated health risks
Disruption of electricity supply at tourist destination during tourist season due to shortage of power.	Increased electricity demand from the grid leading to power shortage and power outages. Increased demand requires accelerated hydro power development	Impacts on account of new hydro power development to meet demand
Disturbance to ecology and critical habitats due to development of new tourist circuits, tourist units and tourist destinations.	Uncontrolled and unregulated tourism	– Loss of vegetation due to new trekking routes and diversion of land – Change in habitat
Unregulated activities / encroachments at tourist / heritage / pilgrimage sites	– Land encroachment e.g. space occupied for parking of buses / vehicles – Buffer zone activities / camping near water sources / Water bodies / Lake kindling of fire at campsites, washing of vehicles near water source – Illegal collection of species of flora & fauna in forest areas – Pilferage	– Air & Water pollution – Biodiversity loss / Loss of items of heritage, poor aesthetics – Congestion due to encroachment of open space

Issues	Causes	Impacts/ Risks
	Bathing in water body / lakes / rivers	
Lack of awareness, training and capacity building about environmental issues related to tourism	Limited reach and extent of awareness campaign due to topography / hilly terrain Lack of NGOs/CSOs participation Inappropriate stress on awareness generation	Unchanged consumer / tourists behavior leading to continuation of unfriendly environment practices Faster degradation of environmental and aesthetic value of Tourist destinations Loss of revenue generations
Inadequate attention on preservation of local art, architecture and culture	New buildings/infrastructure are planned, designed and constructed without adequately considering the local architecture, heritage and culture	Increase in new buildings/ infrastructure which do not conform to the laid down norms Rise in obtrusive buildings/ infrastructure which do not blend with local surroundings. Risk of such places loosing value of the destination as a tourist circuits/destination)

1.6 Environment initiatives taken by the sector to address critical environment issues

Environment is an important aspect. With the benefits of tourism reaching the people at the grassroot level these tend to create their own pressure groups. Some of the initiatives related to the sector and analysis made as an impact on environment are as follows:

The Chief Ministers of Himachal Pradesh and Uttarakhand, the Union Minister of State (Independent Charge) of Environment and Forests, Minister for Environment and Forests, Jammu & Kashmir and senior officials representing the states of Sikkim, Arunachal Pradesh and representatives of civil society, industry, media and academics met for the Himalayan Chief Ministers' Conclave in Shimla on October 30, 2009. The Conclave agreed on the following actions:-

- **Payment for ecosystem services:** The Conclave agreed to pursue the common agenda to protect, conserve and enhance forests and other natural resources of the state. It was proposed to ensure that financial incentives are provided for natural resources, which capture the cost of ecosystem services, carbon sequestration as well as land and livelihood opportunities. The need for the 13th Finance Commission to enunciate the principle of payment to Himalayan states for the protection, preservation and enhancement of forests and other natural resources was prioritized and desired that the Commission should provide adequate and ample resources for sustainable development.
- **Green transportation:** The Conclave noted that construction of roads in the fragile region could have devastating impacts, if not planned and built with care. It was agreed to support technologies, which would provide methods of building green roads and to discuss these with central and states agencies for urgent implementation. It was also agreed to explore alternative forms of mass transit, which is eco-friendly like railways and ropeways.
- **Managing growth of eco-friendly tourism and pilgrimage:** The Conclave noted that tourism and pilgrimage is an important economic and social activity for the region. However, the growth of unregulated tourism or unmanaged pilgrimage could destroy the very spiritual character and pristine ecology, which attracts visitors in the first place. It is

therefore, imperative that the region explores alternative models for this sector, which are both eco-friendly and provide economic livelihoods for local communities. It was noted that different states have been endeavouring to find such options and these examples need to be learnt from and emulated. For instance, there have been successful efforts to introduce green taxes, which have provided financial resources to manage and neutralise the impacts of tourist activity. Similarly, homestead tourism has been promoted in many states, which has led to local community interest in conservation of the environment.

Revision of Eco-tourism policy: The Eco-Tourism Policy has been revised aiming to bring the wilderness of Himachal Pradesh closer to the tourist visiting the State and at the same time attempts to put in place adequate safeguards and systems leading to the preservation of these natural resources. By involving the local communities, the policy would help improve their prosperity through increased livelihood opportunities.

Promotion and development of Eco-tourism Society: The society is an autonomous and independent body. Its main aim is to preserve and protect the natural, historical and cultural heritage of Himachal Pradesh; in order that it acts as a preferred destination for visitors and provides opportunities to promote Community Based Ecotourism (CBET) in Himachal Pradesh, particularly using latest approaches of Participatory Forestry Management, for sustainable development of the forests, thereby generating revenue for the State. The involvement of local communities in the tourism (called 'eco-tourism' herein after) would support their livelihood needs and consequently create their direct stake in conservation of local culture, ecology and environment. This concept of 'community based eco-tourism' would go a long way in providing better income generation options to the rural people. It would also mean less dependence upon the natural resources, in so far as it amounts to removal of produce from these areas. The society's main purpose includes appreciation, education and awareness of the historical and cultural heritage of Himachal Pradesh. The Society would endeavour to make the State a resource centre and a learning destination with reference to eco-tourism.

1.7 Environment related studies carried out in the sector to address critical environment issues.

ADB Safeguards: The India Infrastructure Development Investment Program for Tourism (IDSIPT) envisages an environmentally and culturally sustainable and socially inclusive tourism development, in the project states of Himachal Pradesh , Punjab, Tamil Nadu and Uttarakhand.

The Infrastructure Development Investment Program for Tourism Financing Facility will develop and improve basic urban infrastructure and services in the four participating states of Himachal Pradesh, Punjab, Uttarakhand and Tamil Nadu—to support the tourism sector as a key driver for economic growth. It will focus on: (i) strengthening connectivity to and among key tourist destinations;(ii) improving basic urban infrastructure and services, such as water supply, road and public transport, solid waste management, and environmental improvement at existing and emerging tourist destinations to ensure urban amenities and safety for the visitors, and protect nature and culture-based attractions; and (iii) capacity building programs for concerned sector agencies and local communities for better management of the tourist destinations and more active participation in tourism-related economic activities.

Tourism Master Plan: Department of Tourism & Civil Aviation has prepared Tourism Master Plan for the State.

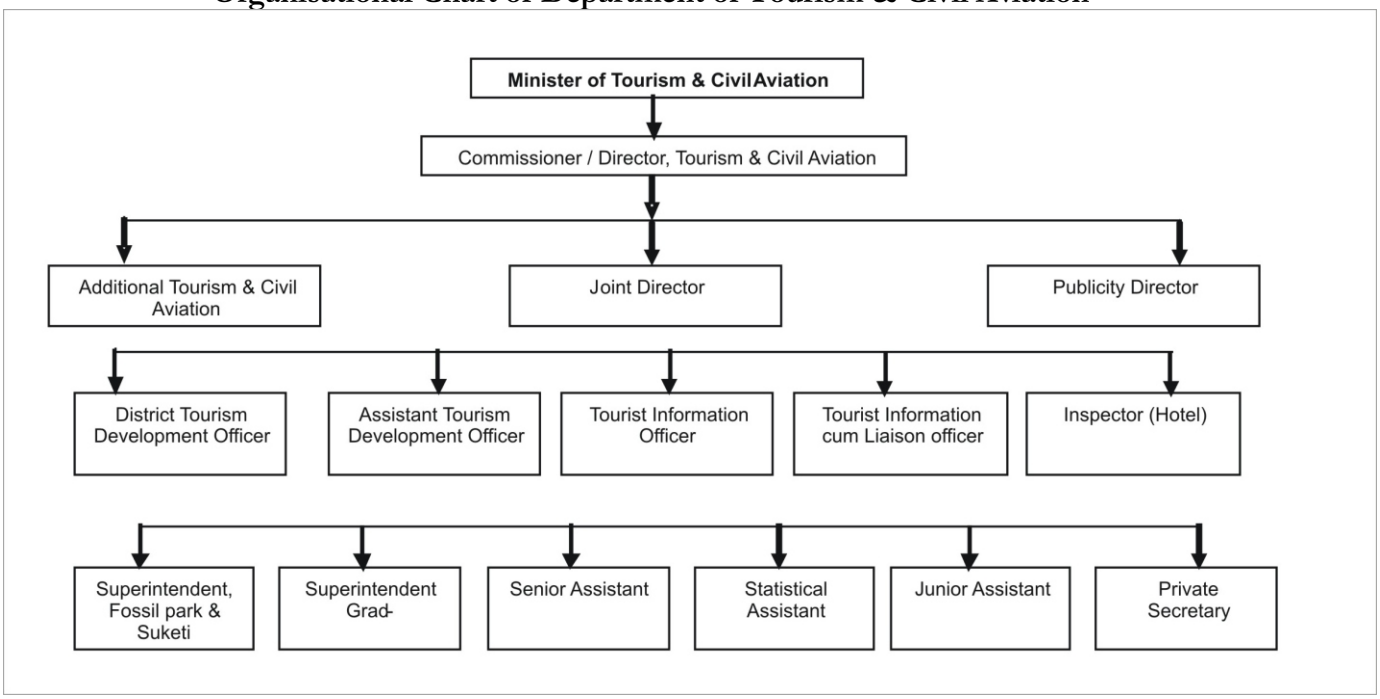
1.8 Environment monitoring (key parameters such as air and water pollution) carried out for activities related to the sector

At present environment monitoring is not carried out by Tourism department. But Environment monitoring is being carried out by HPPCB within the State at selected locations.

1.9 Institutional mechanisms within the sector to address identified environment issues

Department of Tourism & Civil Aviation: The Department of Tourism and Civil Aviation is the nodal department for the formulation of policies and programmes and for the co-ordination of activities of various Government Department and the Private Sector for the development and promotion of tourism in the State. The office of the Commissioner /Director, Tourism & civil aviation provides executive directions for the implementation of various policies and programmes.

Organisational Chart of Department of Tourism & Civil Aviation



1.10 Data / documentation pertaining to addressing demographic issues in the context of the sectors, such as population changes; requirements of population and changing lifestyle; migratory populations including tourists; transhumant; transit labour population; pressures felt by communities due to degraded environmental conditions.

In the year 2010, 1,32,65,602 tourists arrived in the State of which 4,53,616 were foreigners. Visitors from the U.K. dominate the list of foreign arrivals. The details are given below in Table 39.

Table 39: Yearwise Details of foreigners visiting Himachal Pradesh

Country	Year 2002		Year 2003		Year 2004		Year 2010	
	No. of visitors	Bed nights spent.	No. of visitors	Bed nights spent.	No. of visitors	Bed nights spent.	No. of visitors	Bed nights spent.
U.K.	17524	37877	23881	43986	28496	40966	65496	75489
France	13435	28889	15155	26910	16182	23716	29208	33723
Italy	5325	11303	5857	10574	11500	16260	13190	15667
Canada	3909	8357	4377	7660	5734	8645	13150	16023
UAE	31	63	155	283	180	280	592	760
Pakistan	0	0	241	541	155	241	202	289
USA	8159	17617	10584	19935	12001	17231	32831	38959
Germany	8069	17245	12311	21809	12955	18158	21836	26116
Malaysia	1173	2491	1884	3542	2031	3171	5811	6930
Australia	5809	12541	6463	11558	7831	11857	18452	21762
Switzerland	4050	8592	4956	7700	4239	6345	5548	7354
Bangladesh	1696	3919	1599	3012	890	1348	6917	8433
Sri Lanka	206	477	73	126	346	542	1637	2206
Japan	5009	10414	5015	9122	4457	6426	8411	10483
Saudi Arabia	5	16	119	187	315	492	577	762
Singapore	674	1407	954	1834	1136	1776	3648	4686
Iran	67	142	258	499	322	525	472	635
Others	69242	146534	74020	159583	95574	144088	225860	300455
Total	144383	307884	167902	328861	204344	302067	453616	570443

Source: Department of Tourism and Civil Aviation, Himachal Pradesh.

However, domestic tourists continue to dominate the market as is apparent from district wise data given below in Table 40.

Table 40 (a): District breakup of domestic and foreign tourists visiting in Himachal Pradesh

District	2002		2003		2004	
	Indians	Foreigners	Indians	Foreigners	Indians	Foreigners
Bilaspur	477201	166	518299	220	584706	87
Chamba	357060	1211	404609	1177	450803	1466
Hamirpur	21786	54	36190	75	41532	92
Kangra	828653	29060	891516	32146	1012567	38713
Kinnaur	9629	3439	12109	3751	14219	4609
Kullu	1072695	48352	1290438	57833	1477324	69649
Lahaul & Spiti	28175	20130	35411	23585	40897	28615
Mandi	2244554	2240	220202	3052	269479	3581
Shimla	1227710	37860	1373635	44400	1597246	55382
Sirmaur	346321	676	354128	544	393596	726
Solan	236715	1164	263499	1102	288546	1424
Una	128418	31	144378	17	174154	0
Total	4958917	144383	5544414	167902	6345069	204344

Figures include religious tourists.
Source - Department of Tourism and Civil Aviation, Himachal Pradesh.

Table 40 (b): District breakup of domestic and foreign tourists visiting in Himachal Pradesh

District	2005		2006		2007	
	Indians	Foreigner	Indians	Foreigner	Indians	Foreigner
Bilaspur	634781	128	682353	126	728666	325
Chamba	448473	1617	493567	1952	559831	2504
Hamirpur	42670	0	47454	28	124244	41
Kangra	1080520	40923	1133314	47412	1245088	60377

District	2005		2006		2007	
	Indians	Foreigner	Indians	Foreigner	Indians	Foreigner
Kinnaur	10098	2059	23128	12212	55158	24258
Kullu	1641007	67933	1867984	89751	1962424	102654
Lahaul & Spiti	44148	22997	52107	31525	85749	40080
Mandi	337105	5122	375438	5417	465137	6815
Shimla	1757307	64752	1971417	90407	2095946	98839
Sirmaur	428859	779	470926	750	514752	1048
Solan	314595	1480	346856	1947	373447	2419
Una	188179	0	207358	42	271546	49
Total	6927742	207790	7671902	281569	8481988	339409

Table 40 (c): District breakup of domestic and foreign tourists visiting in Himachal Pradesh

District	2008		2009		2010	
	Indians	Foreigner	Indians	Foreigner	Indians	Foreigner
Bilaspur	683761	190	886495	170	962061	86
Chamba	644309	3953	686136	3353	786163	3253
Hamirpur	279745	53	432433	34	554970	12
Kangra	1275155	70819	1403963	75549	1631232	91709
Kinnaur	147754	20733	271287	13811	384936	18742
Kullu	2001674	112910	2224649	119514	2395990	133707
Lahaul & Spiti	172931	41398	251415	65101	362660	59125
Mandi	603086	9154	869904	8070	1006418	10485
Shimla	2061539	112917	2175314	108981	2485564	127737
Sirmaur	575798	1785	653668	2090	748599	2712
Solan	480125	2693	586388	3811	673932	5780
Una	446820	91	594920	99	819461	268
Total	9372697	376736	11036572	400583	12811986	453616

Figures pilgrims.
Source - Department of Tourism and Civil Aviation,Himachal Pradesh.

Table 41 (a): Total Tourist Arrivals

District	1996	1997	1998	1999	2000	2001	2004
Chamba	145586	295055	323905	336212	360713	401809	452269
Bilaspur	23175	435722	459503	474407	465381	500109	
Hamirpur	18106	20372	21638	22863	27012	33498	41624
Kangra	146728	603567	664409	691889	717266	828198	1051280
Kinnaur	3806	5510	6632	4181	4411	9200	18828
Kullu	396203	732811	812895	866537	928050	1043187	1546973
Lahaul and Spiti	16869	24832	27617	24060	31633	41672	69512
Mandi	84750	150929	164792	174358	191890	240014	273060
Shimla	631282	828992	912508	962691	1063200	1167085	1652628
Sirmaur	20166	258818	285103	292780	317895	345520	394322
Solan	148903	166907	181657	189034	209608	242199	289970
Una	17286	369432	394913	405275	364261	392229	174154
H.P	165286	3892947	4255572	4444287	4681320	5244720	6549413

Table 41 (b): Total Tourist Arrivals

District	2005	2006	2007	2008	2009	2010
Chamba	450090	495519	562335	648262	314252	962147
Bilaspur	634909	682479				
Hamirpur	42670	47482	124285	279798	289309	554982
Kangra	1121443	1180726				
Kinnaur	12157	35340	79416	168527	169388	403678

District	2005	2006	2007	2008	2009	2010
Kullu	1708940	1957735	2065078	2114584	1388025	2529697
Lahaul and Spiti	67145	83632	125829	234329	161905	421785
Mandi	342227	380855	47195	612240	636774	1016903
Shimla	1822059	2061824	2194785	2174456	1408015	2613301
Sirmaur	429638	471676	515800	577583	378577	751311
Solan	316075	348803	375866	482818	323664	679712
Una	188179	207400	27159	446911	307022	819729
H. P	7135532	7953471	882139	976943	6687630	13265602

Table 42 (a): Foreign Tourist Arrivals

District	1996	1997	1998	1999	2000	2001	2004
Chamba	968	1202	1472	1562	1862	1616	1466
Bilaspur	208	321	337	584	834	815	87
Hamirpur	17	16	18	26	70	170	92
Kangra	11425	13310	17689	22019	26344	28441	38713
Kinnaur	1746	2373	2758	983	648	1830	4609
Kullu	12390	15793	17613	27597	33244	41891	69649
Lahaul and Spiti	11751	13171	15054	10185	12994	17709	28615
Mandi.	2979	3360	4088	5654	6454	6845	3581
Shimla	7899	10482	13515	19188	24225	31022	55382
Sirmaur	8	195	214	507	821	1097	726
Solan	1903	2145	2346	3001	3491	1580	1424
Una	66	159	102	138	204	12	0
Total	51360	62527	75206	91444	111191	133028	204344

Table 42 (b): Foreign Tourist Arrivals

District	2005	2006	2007	2008	2009	2010
Chamba	1617	126	2504	3953	2356	86
Bilaspur	128	1952	325	190	135	3253
Hamirpur	0	28	41	53	34	12
Kangra	40923	47412	60377	70819	43843	91709
Kinnaur	2059	12212	24258	20773	4322	18742
Kullu	67933	89751	102654	112910	52676	133707
Lahaul and Spiti	22997	31525	40080	41398	5436	59125
Mandi.	5122	5417	6815	9154	4059	10485
Shimla	64752	90407	98839	112917	53690	127737
Sirmaur	779	750	1048	1785	1265	2712
Solan	1480	1947	2419	2693	2246	5780
Una	0	42	49	91	33	268
Total	207790	281569	339409	376736	170095	453616

As per 20 year perspective plan for sustainable tourism by Government of India, Ministry of Tourism and Culture, Department of Tourism and market research division,projection for bed requirement and according bed gaps for year 2011 and 2021 is summarized below.

Demand Supply Gap – Beds: Dynamic Projection: The expected bed gaps for the short term, mid term and long term on the basis of dynamic projections is given below in Table 43.

Table 43: Demand Supply Gap - Short Term

District	2005 Beds Required (BR) (2002E)	Beds Available (BA)	GAPS BR – BA (2002E)
Chamba	6550	4914	1636
Bilaspur	6778	5834	944
Hamirpur	466	391	75
Kangra	12631	9911	2720
Kinnaur	239	125	113
Kullu	17483	12609	4874
Lahaul and Spiti	748	530	218
Mandi.	3286	2817	469
Shimla	19743	14325	5419

District	2005 Beds Required (BR) (2002E)	Beds Available (BA)	– BA (2002E)
Sirmaur	4708	4034	675
Solan	3953	2970	983
Una	4905	4489	416
Himachal Pradesh	81491	62950	18541

2002E: Indicates the estimate on beds available in the year 2002

Table 44: Demand Supply Gap - Mid Term

District	2011 Beds Required (BR) (2002E)	Beds Available (BA)	GAPS BR – BA (2002E)
Chamba	11651	4914	6737
Bilaspur	12054	5834	6220
Hamirpur	752	391	361
Kangra	22909	9911	12998
Kinnaur	852	125	727
Kullu	24072	12609	11463
Lahaul and Spiti	1002	530	472
Mandi.	4463	2817	1646
Shimla	27003	14325	12678
Sirmaur	8514	4034	4481
Solan	6986	2970	4016
Una	6574	4489	2085
Himachal Pradesh	126833	62950	63883

Table 45: Demand Supply Gap - Long Term

District	2021 Beds Required (BR)	Beds Available (BA)	GAPS BR – BA (2002E)
Chamba	11651	4914	15495
Bilaspur	12054	5834	13909
Hamirpur	752	391	716
Kangra	22909	9911	28610
Kinnaur	852	125	2406
Kullu	24072	12609	21894
Lahaul and Spiti	1002	530	2070
Mandi.	4463	2817	3484
Shimla	27003	14325	23787
Sirmaur	8514	4034	7751
Solan	6986	2970	8410
Una	6574	4489	6233
Himachal Pradesh	126833	62950	134765

1.11 Information on human resource management issues (which may have relevance to environment management) in the sector such as manpower, vocational training, awareness levels etc.

Department of Tourism & Civil Aviation

1. Commissioner/Director, Tourism & Civil Aviation: Commissioner/Director, Tourism & Civil Aviation, being Administrative and professional head of the Tourism & Civil Aviation Department in the State is responsible for working of his/her Department, shall exercise all administrative & financial powers as adjoined upon the Director/Head of the Department in the Himachal Pradesh Govt. He/She will control all Tourism & Civil Aviation Department's affairs in the State and allied activities, for which any special instructions considered necessary for administrative and professional reason, shall be issued by him/her from time to time to his/her subordinate staff.

2. Additional Director, Tourism & Civil Aviation: The Additional Director shall assist the Commissioner/Director, Tourism in the performance of his/her duties and responsibilities. He/She will be responsible for getting finalized all the establishment matters. He/She will also responsible for the matters of land references, audit, PAC/CAG, Vidhan Sabha, Civil Aviation, budget, regulation of Tourist Trade Act, Tourism Master Plan, stores and purchases and ropeways projects etc.

3. Joint Director: He/She will assist the Commissioner/Director, Tourism in the performance of his/her duties and responsibilities. He/She will be responsible in the matters of publicity, fairs & festivals, hospitality works (Centrally Sponsored Schemes and State), adventure sports activities, approval of hotels projects/joint venture projects, Tourism Development Board and Vidhan Sabha matters relating to above subjects.

Other Staff are:

- Publicity Officer
- District Tourism Development Officer
- Assistant Tourism Development Officer
- Superintendent, fossil park, Suketi
- Private secretary
- Superitendent, Grade-II
- Inspector (hotels)
- Tourist Information Officer
- Tourist information-cum-liaison Officer
- Senior Assistant
- Statistical Assistant
- Junior Assistant/Clerk
- Junior Scale Stenographer
- Steno Typist
- Driver
- Peon
- Chowkidar
- Safai Karamchari/Sweeper

1.12 Regulatory analysis to identify any regulations that have environment implications (negative or positive), and compliance with the same

Tourism, Art & Culture and cross sector policy and regulatory framework at State level shows the intent of the State government to address environmental issues related to the sector. A list of policy, plan and programmes is given below.

- State's Tourism Policy 2005 promotes environmentally sustainable tourism.
- Schemes for development of tourist infrastructure and civic amenities.
- Banning use of plastic, carry bag and plastic items in the state since October, 2009.
- Himachal Pradesh Non-Biodegradable Garbage (Control) Act, 1995.
- The Home Stay Scheme 2008
- Eco-tourism policies promote capacity building and inter department cooperation.
- Citizen's Charter, Ministry of Culture, Government of India
- The Himachal Pradesh Ancient and Historical Monuments and Archaeological Sites and Remains Act, 1976 (Act no. 32 1976
- The Ancient Monuments and Archaeological Sites and Remains Act of 1958
- The Himachal Pradesh Hindu Public Religious Institutions and Charitable Endowments Rules 1984
- The Himachal Pradesh Town and Country Planning Act, 1977.
- The Wild Life (Protection) Amendment Act, 2002 and 2006.
- The Indian Wildlife (Protection) Act, 1972, amended 1993.
- The Wildlife (Protection) Rules, 1995.
- The Indian Forest Act, 1927.
- Forest (Conservation) Act, 1980, amended 1988.
- Forest (Conservation) Rules, 1981 amended 1992 and 2003.
- The Water (Prevention and Control of Pollution) Act, 1974, amended 1988.
- The Air (Prevention and Control of Pollution) Act 1981, amended 1987.
- The Air (Prevention and Control of Pollution) Rules, 1982.
- The Environment (Protection) Act, 1986, amended 1991 and including the following Rules/Notification issued under this Act.

- The Environment (Protection) Rules, 1986, as amended from live to live.
- The Municipal Solid Wastes (Management and Handling) Rules, 2000.
- Noise Pollution (Regulation and Control) Rules, 2000.
- Wild Life (Protection) Amendment Act, 2002.
- Environmental Impact Assessment Notification, 2006.

Reference

- Department of Tourism & Civil Aviation, Himachal Pradesh
- HP Tourism Development Corporation Ltd.
- Atal Bihari Bajpayee Institute of Mountaineering and Allied Sports, Manali
- Department of Forest , Himachal Pradesh
- State Environment Report
- Department of Language, Art & Culture, Himachal Pradesh
- Department of Planning, Himachal Pradesh
- 11th Five year plan of Himachal Pradesh
- Eco-tourism Society
- Ministry of Tourism, GoI
- Districts Statistical Abstract

CHAPTER 2 POTABLE WATER SUPPLY & SEWAGE

2.1 Resource inventory of existing assets of the sector

Irrigation and Public Health (IPH) Department is responsible for planning, design, construction, operation and maintenance of surface water resources (water supply and irrigation) projects in the State. IPH is responsible for development of water related infrastructure such as drinking water supply schemes, sewerage systems, irrigation systems through source development, lifting water, digging of tube wells & providing water distribution systems, flood protection works to protect life and property in the State.

Water supply

Rural Water Supply (RWS) in H.P:H.P. has a total of 16997 inhabited villages and 45367 habitations. All villages in HP have been covered under water supply schemes. Most of the Rural Water Supply Schemes (RWSS) were commissioned in 1980, under Drinking Water Decade related programmes. All villages were covered by the year 1994. Out of the total 45367 habitations reported in April 1996, 4590 habitations were classified as not covered, 14047 habitations were partially covered and rest fully covered. Nearly two-third of the partially covered habitations are situated in the districts of Kangra, Shimla and Hamirpur with a considerable proportion of area lying in the Shivaliks. General features of these dry areas are very thin soil cover, steep slope and high runoff with little water retention at catchment level. Most of the partially covered habitations are located in Kangra followed by Hamirpur.

There are 7989 water supply schemes in Himachal Pradesh. Out of these 1496 are lift water supply schemes, 91 are tube well schemes and 6402 are gravity schemes. In addition, 14230 hand pumps are installed in the state up to May 2006.

As per census 1981, there were 16807 villages. All of them have been provided with drinking water facilities. As per a survey conducted in 2003, the slipped back habitations have also been identified and it is further bifurcated to three main categories 0-10 LPCD. Not Covered (NC), 11-40 LPCD Partially Covered (PC) and Fully Covered (FC). Status of rural water supply scheme in terms of villages covered is given in Table 1.

Table 1: Rural Water Supply Scheme

Status as on	(Not Covered) (NC)	(Partially Covered) (PC)	Total NC/PC	(Fully covered) (FC)	Total
01.04.2005	9389	22347	31736	20112	51848
01.04.2008	5055	16527	21582	30266	51848
01.04.2009	3632	12421	16053	35795	51848
01.12.2009	2842	10043	12885	38983	51868

45,367 habitations have been covered as per guidelines of Rajiv Gandhi National Drinking Water Mission (RGNDWM) up to March 2008. The Government of India, Government of Himachal Pradesh under Accelerated Rural Water Supply Programme (ARWSP) has accorded top priority to provide water supply to NC/PC (0-10 LPCD) habitations.

Urban Water Supply Scheme: Water Supply system of towns in H.P. is quite old. There are 56 towns in the State of which water supply to 6 towns namely Yol, Kasauli, Subathu, Dagshai, Dalhausie and Bakloh is being provided by Cantonment Board, Parwanoo by H.P. Housing Board, Palampur by Municipal Committee, Palampur. In Shimla and Solan, the distribution system is being maintained by the respective Urban Local Bodies.

Augmentations of water supply schemes of 43 towns have been completed. These towns are Shree Naina Devi Jee, Nadaun, Rampur, Una,

Chowari, Kangra, Jawalamukhi, Nahan, Rohru, Santokhgarh, Mehatpur, Dehra, Chamba, Rewalsar, Arki, Daulatpur, Jogindernagar, Manali, Kullu, Kotkhai, Sujanpur, Ghumarwin, Chaupa, Sunni, Palampur, Gagret, Nagrota, Hamirpur, Mandi, Nalagarh, Narkanda, Nurpur, Paonta, Theog, Dalhousie, Shah Talai, Rajgarh, Sarkaghat, Bhota, Solan, Bhunter, Jubbal and Dharamshala.

Sources of Water Supply: The State's water resources owe their existence to the good precipitation during winter and during monsoon season. These resources include glaciers, perennial streams draining into rivers, water bodies including natural lakes and manmade reservoirs, innumerable water springs and large stocks of sub-soil water. In the State, there are five river systems for water resource availability. The details of these five major rivers and its tributaries are given in Table 2.

Table 2: Major River systems and their tributaries

S.No	River System	Catchment Area (Km²)	Major Tributaries (join in the State territory)
1	Sutlej	20,398	Spiti, Ropa, Kasang, Mulgaon, Yul, Wanger and the Throng. Tirung, Gayanthing, Duling, Baspa, Solding, Manglad and Nogli streams
2	Beas	13,663	Parbati, Hurla, Sainj, Tirthan, Uhl, Sakeri, Luni, Awa, Banganga, Manuni, Guj and Chaki
3	Chenab	7,850	Chandra from the south-east and the Bhaga from the north-west join at Tandi (2286 m) to form the Chenab.
4	Yamuna	5,872	Tons, Pabbar and Giri
5	Ravi	5,528	Chirchind nala on the left-bank and Budhill, Tundah, Burjeri, Saho and Siul on the right-bank join it.

An inventory of district wise source of drinking water in the State is given in Table 3 and for urban and rural area of districts of state is given in Table 4. As the Table shows, taps, hand pumps, tube wells and wells supply drinking water.

Table 3: Different sources of water at District level

District	Ground water	Surface water	Rain water	Traditional source	Other conventional sources
Bilaspur	827	786	0	461	0
Chamba	1717	2433	3	2598	836
Hamirpur	1057	485	0	231	1
Kangra	1602	1317	11	1369	466
Kullu	0	3392	0	0	0
Lahaul & Spiti	1	290	0	57	0
Mandi	833	3924	0	1483	840
Shimla	233	3917	5	2518	9
Sirmaur	644	2249	0	535	9
Solan	344	1090	0	1215	316
Una	832	123	1	21	116
Himachal Pradesh	**8186**	**20,223**	**20**	**10,512**	**2595**

Table 4: Different sources of drinking water (Urban and Rural)

District	Type of Area	Population	Total no. of Household	Source of drinking water				No. of Households being served by safe drinking water source
				Tap	Hand Pump	Tube Well	Well	
Chamba	Total	460,887	87,699	76,952	1,120	60	512	78,644
	Rural	426,345	80,574	70,159	1,017	52	510	71,738
	Urban	34,542	7,125	6,793	103	8	2	6,906
Kangra	Total	1,339,030	272,697	220,154	16,571	1,206	19,843	257,774
	Rural	1,266,745	257,467	205,599	16,372	1,190	19,727	242,888
	Urban	72,285	15,230	14,555	199	16	116	14,886
Lahaul &	Total	33,224	9,155	7,803	533	3	25	8,364

District	Type of Area	Population	Total no. of Household	Source of drinking water				No. of Households being served by safe drinking water source
				Tap	Hand Pump	Tube Well	Well	
Spiti	Rural	33,224	9,155	7,803	533	3	25	8,364
	Urban	0	0	0	0	0	0	0
	Total	381,571	78,362	68,731	1,047	44	1,242	71,064
Kullu	Rural	351,478	70,565	61,355	843	41	1,218	63,457
	Urban	30,093	7,797	7,376	204	3	24	7,607
	Total	901,344	186,571	170,740	2,603	274	5,638	179,255
Mandi	Rural	840,362	171,299	155,962	2,437	269	5,525	164,193
	Urban	60,982	15,272	14,778	166	5	113	15,062
	Total	412,700	87,596	74,037	4,962	151	6,168	85,318
Hamirpur	Rural	382,494	81,097	68,445	4,283	135	6,043	78,906
	Urban	30,206	6,499	5,592	679	16	125	6,412
	Total	448,273	88,869	70,464	8,515	1,660	7,312	87,951
Una	Rural	408,849	80,790	63,890	7,779	1,197	7,056	79,922
	Urban	39,424	8,079	6,574	736	463	256	8,029
	Total	340,885	67,195	56,357	3,030	173	2,947	62,507
Bilaspur	Rural	318,934	61,648	50,993	2,924	170	2,908	56,995
	Urban	21,951	5,547	5,364	106	3	39	5,512
	Total	500,557	98,519	78,034	3,219	1,951	5,227	88,431
Solan	Rural	409,362	77,414	58,205	2,857	1,431	5,161	67,654
	Urban	91,195	21,105	19,829	362	520	66	20,777
	Total	458,593	82,543	60,450	5,967	435	4,243	71,095
Sirmaur	Rural	410,923	72,664	51,217	5,702	390	4,163	61,472
	Urban	47,670	9,879	9,233	265	45	80	9,623
	Total	722,502	160,646	142,661	1,539	192	5,624	150,016
Shimla	Rural	555,269	114,066	98,406	928	160	5,275	104,769
	Urban	167,233	46,580	44,255	611	32	349	45,247
	Total	78,334	20,781	17,347	166	9	240	17,762
Kinnaur	Rural	78,334	20,781	17,347	166	9	240	17,762
	Urban	0	0	0	0	0	0	0
State Total	**Total**	**6,077,900**	**1,240,633**	**1,043,730**	**49,272**	**6,158**	**59,021**	**1,158,181**
	Rural	**5,482,319**	**1,097,520**	**909,381**	**45,841**	**5,047**	**57,851**	**1,018,120**
	Urban	**595,581**	**143,113**	**134,349**	**3,431**	**1,111**	**1,170**	**140,061**

Well is the major source of drinking water accounting for 52% of source followed by 43% by tap and 5% by hand pumps. Data on taps also indicate the coverage of population by piped water supply.

Water demand and supply specifications in terms of per capita norms, total hours of water supply, water losses due to system leakages is given in Table 5.

Table 5: Water Supply Status

		Shimla circle 9				Nurpur Circle Nurpur (Kangra)
		Sunni Town	NAC Narkanda	Arki (Solan)	Theog(Shimla)	
Per Capita	100% domestic	70 LPCD	70 LPCD	120 LPCD	120 LPCD	120 LPCD
Per capacity norm for town/city		70 LPCD	70 LPCD	120 LPCD	120LPCD	120 LPCD
Total hours of supply	per day	12 hrs	12 hrs	12 hrs	1-2 hrs	2
Water losses due to system loses leakages	%	2%	2%	-	0.50 MLD	5%

		Shimla circle 9				Nurpur Circle
		Sunni Town	**NAC Narkanda**	**Arki (Solan)**	**Theog (Shimla)**	**Nurpur (Kangra)**
No. of times supplied	Daily	1	1	2	1	1
Present demand of water		0.444 MLD	-	0.59 MLD	3.50 MLD	1.894
Quantity of water produced			2007-08	2007-08	2008-09	2008-09
	Installed capacity of system(MLD)	0.653	0.45	-	-	2.07
	Quantity of water produced (MLD)	0.444	0.305	0.832	0.35	2.07
	Quantity of water supplied (MLD)	0.444	0.305	0.59	0.25	1.894
	Raw water	-	-	-	-	-
	Treated	0.444	0.305	0.59	0.35	1.894
Potential water supply sources for city	(with flow data)	0.864	0.396	Khud & spring source	Girikhad (1374.25lps)	-
Present per capita quantity of piped water supplied to users	Domestic (Total)	0.444 MLD	0.305	Domestic-0.3 MLD Commercial 0.16 MLD Institutional -0.05 MLD, Public stand Post-0.08 MLD	Domestic-0.3 MLD Commercial - 0.35 MLD Public stand Post-0.25 MLD	-
No. of reservoir	Nos.	1	1	3	3	19
Storage capacity of reservoir	L	318 KL	204 KL	811000,50000 & 800000 KLD	360 KL, 66 KL & 140 KL	2138000 Kl
Treatment plants	Sedimentation F/Bed/(ISB)	1 (Nos.) 2+1 (SB)	1 (Nos.) 2 (Nos.)	1	1	Nil

		Shimla circle 9				Nurpur Circle
		Sunni Town	**NAC Narkanda**	**Arki (Solan)**	**Theog(Shimla)**	**Nurpur (Kangra)**
Total installed capacity (MLD)	Sedimentation F/Bed(ISB)	0.08 0.4	0.05 0.255	0.10 MLD	5.29	-
Type of treatment	Chlorination using Bleaching powder			Alum & Chlorine	Alum & chlorine	Chlorination
Periodicity of monitoring water quality		Twice in a yr.	Twice in a yr.	-	-	-
Source of water	Source	Gharat Nallah	Nallah source I & II	Arki Khud Spring Sakni	Girikhad	-
	Types of source	surface	Surface	Surface	Surface	
	Present Quantity obtained (MLD)	0.444	0.45	Arki khud - 0.5 MLD Spring Sakni- 0.32 MLD	3.50 MLD	
	Distance to source (Km)	1.3 km	2.25	Arki Khud-0.5 km Spring Sakni 0.1 km	8 km	

	Chamba	Chamba Circle Dalhousie	Chowari	Bilaspur	Bilaspur Circle Nainadevi	Ghumarwin
Per Capita	125 lpcd	120 lpcd	120lpcd	70 lpcd	14 L per pilgrim	120lpcd
Per Capacity norm for town/city				135 lpcd	135 lpcd	120 lpcd
Total hours of supply	4 hrs	2 hrs	4 hrs	2 hrs	2 hrs	3-4 hrs
Water losses due to system loses & leakages	0.30 MLD	15%	12%	0.10 MLd (%)	0.05 (%)	10%
No. of times supplied	2	2	2	1	1	2
Present demand of water	3.31 MLD	4.16	0.529	5.72 MLD		-
Quantity of water produced	3.31	25.92	0.588	2.08	1 MLD	-
	3.31	4.16	0.529	2.08	1 MLD	-
	3.31	3.328	0.529	2.08	1 MLD	-
	-		-	-	-	-
	3.31	3.328	0.529	2.08	1 MLd	-
Potential water supply sources for city	-		-	Kosserian Nallah = 0.25 Changer Nallah = 0.13 Nallah Ka Noun =0.40 & Tube wells = 2.30 ; Total= 2.08	Govind sagar	Seer Khad
Present per capita Quantity of piped water supplied to users	135 lpcd	141.6 MLD	0.529	70lpcd		
No. of reservoir	6	11	3	10	7 (Storage Tank)	2
Storage capacity of reservoir	1450000	454000	109000,2600,1900 Kld (Total = 154 000 Kld)	2327 kl	1000 Kld	170
Treatment plants	1	1	Nil			1
Total installed capacity (Mld)	3.31 MLD	2.17 MLD	Nil			1.20 Mld
Type of treatment		Alum & chlorine	Alum & Chlorine	Chlorine	-	Alum & Chlorine

	Chamba	Chamba Circle Dalhousie	Chowari	Bilaspur	Bilaspur Circle Nainadevi	Ghumarwin
Periodicity of monitoring water quality						
Source of water	Chaminoo Nallah	Jandrighat Punjpulla Bathri Nallah Dain Kund Ahla Source	Banolog spring Jamwali Spring	Kosserian Nallah , Changer Nallah, Nallah Ka Noun , Tube wells	Govind Sagar	Seer Khad
	surface	Jandrighat - Ground Punjpulla- Ground Bathri Nallah - surface Dain Kund - Ground Ahla Source- Ground	Ground	Spring	Surface	Surface

	Chamba	Chamba Circle Dalhousie	Chowari	Bilaspur	Bilaspur Circle Nainadevi	Ghumarwin
	3.31	Jandrighat - 0.131 MLd Punjpulla - 0.138 Mld Bathri Nallah - 2.450 Mld Dain Kund - 0.035 Mld Ahla Source - 0.827 Mld	Banolog Spring- 0.231 Jamwali Spring- 0.36 (in Mld)	Kosserian Nallah = 0.25 Changer Nallah = 0.13 Nallah Ka Noun =0.40 Tube wells =1.30	0.7 Mld	-
	12 km	0 km	-	Kosserian Nallah = 5 km Changer Nallah = 2 km Nallah Ka Noun =1 km & Tube wells =3 km	3.5 km	1 Km

	Rampur (Shimla)	Peo(Kinnaur)
Per Capita	120 lpcd	
Per capacity norm for town/city	120 lpcd	135 lpcd
Total hours of supply	12 hrs	2-3 hrs
Water losses due to system leakages	0.013 MLD	-
No. of times supplied	2	2
Present demand of water	1.08 MLD	
Quantity of water produced	1.295	1.51 MLD
	1.295	1.51 MLD
	1.282	-
	-	-
	1.282	1.51 MLD
Potential water supply sources for city	-	
Present per capita Quantity of piped water supplied to users	Domestic Total -0.989 MLD Commercial - 0.145 MLD Institutional - 0.130 MLD Public Stand Post - 0.018 MLd	
No.of reservoir	9	8
Storage capacity of reservoir	1.288 MLd	1800+10000+18000+86000+86000+10000+2000000+29000 =2240800
Treatment plants	2	Sedimentation - 2 units F.Bed - 3 unit
Total installed capacity (MLD)	1.035+0.259= 1.295	1.51 MLd (Total)
Type of treatment	Chlorine	Chlorine
Periodicity of monitoring water quality	Raw water - weekly Treated water - daily; At distribution network - daily	
Source of water	Nogli Khad, Browni Nallah	Mabar Nallah
	Surface	Surface
	Nogli Khad - 1.036 MLd Browni Nallah - 0.259 Mld	1.51 MLD
	Nogli Khad - 11 km Browni Nallah -8 km	-

Table 6: Villages with drinking water facilities in HP

	1981			1991				2001			
District	**Tehsil**	**No. of inhabited villages**	**Villages with drinking water facility**	**Tehsil**	**CD block**	**No. of inhabited villages**	**Villages with drinking water facility**	**CD block**	**No. of inhabited villages**	**Villages with drinking water facility**	**% (drinking water facility)**
Chamba		1098	1098			1144	1144		1118	1108	99.1
Chamba	Chamba	242	242		Chamba	110	110	Chamba	111	111	
	Pangi	60	60		Pangi	61	61	Pangi	59	59	
	Chaurah	179	179		Tisa	188	188	Tisa	170	164	
	Saluni	202	202		Saluni	230	230	Saluni	225	223	
	Bhattiyat	231	231		Mehla	130	130	Mehla	129	129	
	Sihunta	80	80		Bhattiyat	326	326	Bhattiyat	323	322	
	Bharmaur	104	104		Bharmaur	99	99	Bharmaur	101	100	
Bilaspur		942	942			950	950		965	963	99.8
	Billaspur sadar	278	278	Billaspur		417	417	Bilaspur sardar	428	426	
	Ghumarwin	543	543	Ghum arwin		265	265	Ghumarwin	262	262	
				Gehrw in		268	268	Gehrwin	275	275	
Hamirpur		1621	1621			1617	1617		1635	1632	99.8
Hamirpur	Hamirpur	351	351		Hamirpur	342	342	Hamirpur	343	343	
	Barsar	341	341		Bijhri	337	337	Bijhri	339	339	
	Bhoranj	308	308		Bhoranj	308	308	Bhoranj	310	308	
	Nadaun	425	425		Nadaun	434	434	Nadaun	447	446	
	Sujanpur Tira	196	196		Sujanpur Tira	196	196	Sujanpur Tira	196	196	
Kangra		3753	3753			3620	3619		3619	3611	99.8
Kangra	Kangra	832	832		Kangra	288	288	Kangra	290	290	
	Nurpur	511	511		Nurpur	504	164	Nurpur	284	283	
	Indora	107	107		Indora	347	347	Indora	193	193	
	Fatehpur	250	250					Fatehpur	292	288	
	Lambagraon	284	284		Nagrota Surian	114	114	Nagrota	190	189	
	Dehra Gopipur	765	765		Pragpur	268	268	Pragpur	266	266	
	Palampur	761	761		Rait	270	269	Rait	273	272	
	Khundian	243	243		Nagrota Bagwan	282	282	Nagrota Bagw:	282	282	
					Bhawarna	291	95	Bhawarna	293	292	
					Dehra	507	507	Dehra	507	507	
					Panchrukhi	260	260	Panchrukhi	262	262	
					Lambagraon	272	272	Lambagraon	274	274	
					Baijnath	217	217	Baijnath	213	213	
Kinnaur		77	77						234	123	52.56
Kinnaur	Hangrang	8	8	Hangrang				Poo	80	30	
	Poo	12	12	Poo				Kalpa	66	55	
	Morang	12	12	Morang				Nichar	88	40	
	Kalpa	12	12	Kalpa							
	Nichar	22	22	Nichar							
	Sangla	11	11	Sangla							
Kullu		169	169			172	172		172	172	100
Kullu	Kullu	85	85		Kullu	50	50	Kullu	50	50	
	Naggar	-	-		Naggar	37	37	Naggar	37	37	
	Banjar	41	41		Banjar	42	42	Banjar	42	42	
	Ani	16	16		Ani	17	17	Ani	17	17	
	Nirmand	27	27		Nirmand	26	26	Nirmand	26	26	
Lahaul & Spiti		239	239			272	270		287	266	92.7
Lahaul & Spiti	Lahaul	127	127		Lahaul	191	190	Lahaul	192	190	
	Spiti	47	47		Spiti	81	80	Spiti	95	76	
	Udaipur	65	65								
Mandi		2806	2806						2833	2833	100
Mandi	Mandi	490	490		Mandi Sadar	320	320	Mandi Sadar	320	320	
	JogindarNaggar	398	398		Chauntra	269	269	Chauntra	268	268	

District	1981			1991				2001			
	Tehsil	No. of inhabited villages	Villages with drinking water facility	Tehsil	CD block	No. of inhabited villages	Villages with drinking water facility	CD block	No. of inhabited villages	Villages with drinking water facility	% (drinking water facility)
	Lad Bharol	142	142		Drang	272	272	Drang	271	271	
	Sandhol	93	93		Gopalpur	302	302	Gopalpur	301	301	
	Sarkaghat	471	471		Dharampur	258	258	Dharampur	259	259	
	SundarNaggar	243	243		SundarNaggar	243	243	SundarNaggar	244	244	
	Bali chokri	89	89		Rawalsar	172	172	Rawalsar	172	172	
	Chachyot sub Tehsil	196	196		Chachyot	225	225	Chachyot	232	232	
	Chachyot tehsil	165	165		Seraj	236	521	Seraj	248	248	
	Karsog	519	519		Karsog	521	521	Karsog	518	518	
Shimla		2225	2225			2311	2311		2520	2491	98.8
Shimla	Shimla	566	566		Rampur	212	212	Rampur	239	239	
	Rampur	119	119		Narkanda	154	154	Narkanda	166	165	
	Nankhari	60	60		Mashobra	754	754	Mashobra	490	485	
	Kumharsain	156	156		Chauhra	79	79	Basantpur	276	276	
	Seoni	202	202		Theog	394	394	Chauhra	127	126	
	Theog	392	392		Chaupal	295	295	Theog	400	394	
	Chaupal	123	123		Jubbal Kotkhai	257	257	Chaupal	353	340	
	Neerua	177	177		Rohru	166	166	Jubbal Kotkhai	303	301	
	Jubbal	89	89					Rohru	166	165	
	Kotkhai	172	172								
	Rohru	169	169								
Sirmaur		967	967			965	965		966	951	98.4
Sirmaur	Rajgarh	140	140					Rajgarh	140	140	
	Pachhad	261	261		Sangarh	121	121	Sangrah	121	119	
	Renuka	166	166		Pachhad	400	400	Pachhad	262	249	
	Nahan	149	149		Nahan	209	209	Nahan	209	209	
	Paonta Sahib	186	186		Paonta Sahib	185	185	Paonta Sahib	184	184	
	Shillai	65	65		Shillai	50	50	Shillai	50	50	
Solan		2358	2358			2348	2348		2388	2321	97.2
Solan	Arki	471	471		Solan	467	467	Solan	478	469	
	Solan	475	475		Kunihar	470	470	Kunihar	477	472	
	Ramshahr	240	240		Kandaghat	263	263	Kandaghat	269	268	
	Kandaghat	258	258		Dharampur	540	540	Dharampur	545	518	
	Kasauli	541	541		Nalagarh	608	608	Nalagarh	619	594	
	Nalagarh	373	373								
Una		552	549			552	552		758	751	99.1
Una	Una	74	74		Una	71	71	Una	104	104	
	Amb	175	173		Amb	163	163	Amb	240	237	
	Bangana	270	269		Gagret	47	47	Gagret	108	106	
	Haroli	33	33		Dhundla	271	271	Dhundla	306	304	

Table 7: Villages with availability of different sources of drinking water facilities

District	CD block	Number of villages with availability of different sources of drinking water available									
		Only tap	Only well	Tank	Only tube well	River	Fountain	Canal	Other	More than one source (only from tap, well, tube well, handpump)	No drinking water facilities
Chamba		**1,108**	**8**	**3**	**0**	**30**	**664**	**6**	**169**	**760**	**0**
Chamba	Chamba	111	0	0	0	0	79	0	16	84	0
	Pangi	59	0	0	0	3	54	0	0	56	0
	Tissa	164	3	2	0	1	60	0	18	73	0
	Salooni	223	2	0	0	0	166	0	18	177	0
	Mehla	129	0	0	0	0	76	0	9	85	0
	Bhattiyat	322	3	1	0	22	193	6	98	243	0
	Bharmaur	100	0	0	0	4	36	0	10	42	0
Bilaspur		**963**	**278**	**123**	**43**	**15**	**409**	**-**	**389**	**755**	**-**
Bilaspur	Bilaspur Sadar	426	109	62	12	6	182	-	156	331	-
	Ghumarwin	262	76	29	22	4	114	-	102	205	-
	Gehrwin	275	93	32	9	5	113	-	131	219	-
Hamirpur		**1,632**	**1,010**	**48**	**27**	**19**	**83**	**7**	**550**	**1,196**	**-**
Hamirpur	Hamirpur	343	197	26	9	5	60	7	166	279	-
	Bijhri	339	260	1	5	1	9	-	108	284	-
	Bhoranj	308	298	15	11	3	9	-	127	304	-
	Nadaun	446	215	2	2	10	1	-	109	250	-
	Sujanpur Tira	196	40	4	-	-	4	-	40	79	-
Kangra		**3,605**	**1,421**	**611**	**175**	**257**	**621**	49	**1,523**	**2,610**	
Kangra	Kangra	289	98	15	4	27	76	5	150	238	-
	Nurpur	283	192	87	33	11	25	-	109	241	-
	Indora	193	159	12	22	2	-	2	78	163	-
	Fatehpur	283	215	159	58	30	16	2	102	257	-
	Nagrota	189	124	85	30	13	35	7	104	155	-
	Pragpur	266	174	6	5	33	15	9	100	224	-
	Rait	272	71	4	1	8	52	4	133	168	-
	Nagrota Bagwan	282	44	4	2	5	27	1	103	131	-
	Bhawarna	292	43	5	2	54	78	7	123	206	-
	Dehra	507	180	193	6	50	90	5	226	383	-
	Panchrukhi	262	3	-	-	10	83	3	108	156	-
	Lambagran	274	91	39	12	13	99	4	126	203	-
	Baijnath	213	27	2	-	1	25	-	61	85	-
Kinnaur		**186**	**-**	**2**	**-**	**10**	**156**	**4**	**25**	**125**	**-**
Kinnaur	Poo	65	-	-	-	-	36	1	9	30	-
	Kalpa	57	-	2	-	7	62	3	10	55	-
	Nichar	64	-	-	-	3	58	-	6	40	-
Kullu		**172**	**17**	**2**	**-**	**45**	**109**	**9**	**64**	**137**	**-**
Kullu	Kullu	50	1	-	-	2	34	-	17	39	-
	Naggar	37	-	1	-	6	17	1	7	19	-
	Banjar	42	15	1	-	24	29	1	15	42	-
	Ani	17	1	-	-	4	12	-	17	17	-
	Nirmand	26	-	-	-	9	17	7	8	20	-
Lahaul & Spiti		266	-	-	-	28	82	3	32	89	-
Lahaul & Spiti	Lahaul	181	-	-		21	58	2	22	65	-
	Spiti	85		-	-	7	24	1	10	24	-
Mandi		**2,833**	**314**	**108**	**36**	**89**	**583**	**19**	**727**	**1,298**	**-**

District	CD block	Number of villages with availability of different sources of drinking water available									
		Only tap	Only well	Tank	Only tube well	River	Fountain	Canal	Other	More than one source (only from tap, well, tube well, handpump)	No drinking water facilities
Mandi	Mandi Sadar	320	38	1	21	9	55	7	63	123	-
	Chauntra	268	2	4	-	2	32	1	40	68	-
	Drang	271	1	1	-	6	12	5	89	99	-
	Gopalpur	259	131	20	3	26	76	2	145	225	-
	Dharampur	301	75	10	5	-	144	2	155	270	-
	SundarNaggar	244	38	6	5	5	47	-	27	92	-
	Rawalsar	172	7	10	-	6	63	-	57	106	-
	Chachyot	232	2	1	-	6	25	1	51	64	-
	Seraj	248	3	30	1	15	43	-	51	115	-
	Karsog	518	17	25	1	14	86	1	49	136	-
Shimla		**2,487**	**164**	**52**	**1**	**80**	**1,050**	**23**	**148**	**1,239**	**1**
Shimla	Rampur	239	1	-	-	4	120	2	23	138	-
	Narkanda	164	14	1	-	6	80	1	25	97	-
	Mashobra	484	14	11	-	8	254	-	32	268	-
	Basantpur	276	3	9	1	18	137	9	21	161	-
	Chauhra	126	7	-	-	11	101	7	3	108	-
	Theog	394	94	22	-	12	117	1	16	196	1
	Chaupal	338	10	5	-	10	46	2	5	49	-
	Jubbal Kotkhai	301	20	3	-	7	117	1	13	137	-
	Rohru	165	1	1	-	4	78	-	10	85	-
Sirmaur		**951**	**197**	**61**	**77**	**118**	**597**	**19**	**246**	**792**	**-**
Sirmaur	Rajgarh	140	24	9	-	19	136	-	29	138	-
	Sangrah	119	39	21	-	8	100	-	22	102	-
	Pachhad	249	5	16	-	8	220	-	53	223	-
	Nahan	209	23	9	23	38	77	2	29	132	-
	Paonta Sahib	184	76	4	54	41	37	17	105	155	-
	Shillai	50	30	2	-	4	27	-	08	42	-
Solan		**2,310**	**256**	**241**	**136**	**159**	**1,417**	**21**	**616**	**1,793**	**-**
Solan	Solan	468	35	37	1	30	350	-	129	402	-
	Kunihar	472	11	3	1	14	313	3	94	351	-
	Kandaghat	513	10	28	7	21	354	4	83	378	-
	Dharampur	513	10	28	7	21	354	4	83	378	-
	Nalagarh	589	199	154	126	90	195	13	212	432	-
Una		**750**	**661**	**147**	**228**	**8**	**31**	**2**	**402**	**698**	**-**
Una	Una	104	94	20	70	1	3	-	69	100	-
	Amb	236	223	52	86	6	17	2	158	230	-
	Gagret	106	104	43	68	1	2	-	84	106	-
	Dhundla	304	240	32	4	-	9	-	91	262	-

As per Census of India (2001) all the (100 %) villages/tehsils of Kullu district had water supply facility. Status for all the districts of Himachal Pradesh is given in the Table 8.

Table 8: Status of drinking water facility (Census 2001)

District	% of water available
Chamba	99.1
Bilaspur	99.8
Hamirpur	99.8
Kangra	99.8
Kinnaur	52.6
Kullu	100
Lahaul & Spiti	92.7
Mandi	100
Shimla	98.8
Sirmaur	98.4
Solan	97.2
Una	99.1

Groundwater: The State has a total replenishable groundwater reserve of 0.0366 hectare metres (ha m) per year and a net draft of 0.0053 ha m per year.

Table 9: Ground Water Availability

1.	Total replenishable ground water sources	0.03660 ha m yr.
2.	Provision for domestic, industrial and other areas:	0.00731 ha m yr.
3.	Available groundwater resources for irrigation in net terms	0.02929 ha m yr.
4.	Balance groundwater resources for future use in net terms	0.02399 ha m yr.
5.	Level of groundwater development	18.1%

Hand pump programme was started during 1991-92 and a total of 17651 Hand pumps have been installed in Himachal Pradesh upto March-2009. A total of 20658 hand pumps have been installed in the State.

Table 10: Year wise details of hand pumps installed in the drought prone area in Himachal Pradesh

Year	Nos. of Hand pumps installed
1991-92	323
1992-93	789
1993-94	1496
1994-95	1000
1995-96	1001
1996-97	809
1997-98	1027
1998-99	792
1999-00	1019
2000-01	1148
2001-02	1077
2002-03	1570
2003-04	1057
2004-05	639
2005-06	269
2006-07	595
2007-08	852
2008-09	2188
2009-10	3007
Total:	**20658**

District wise details of completed water supply schemes is given in Table 11.

Table 11: Completed Water Supply Schemes

District	Circle	Division	Gravity	Lift	Tubewell	Total
Chamba	Chamba	Chamba	217	0	0	217
		Dalhousie	150	2	0	152
		Salooni	256	1	0	257
		Total	**623**	**3**	**0**	**626**
Kangra	Dharamshala	Dharamshala	25	11	0	36
		Palampur	74	14	0	88
		Thural	25	16	0	41
		Shahpur	23	29	1	53
	Nurpur	Nurpur	5	31	13	49
		Indora	0	41	8	49
		Dehra	11	76	0	87
		Jawali	0	19	15	34
		Total	**163**	**237**	**37**	**437**
Una	Una	Una Div. No.I	0	0	61	61
		Una Div. No.II	65	3	31	99
		Total	**65**	**3**	**92**	**160**
Hamirpur	Hamirpur	Hamirpur	10	84	0	94
		Barsar	2	63	0	65
		Total	**12**	**147**	**0**	**159**

District	Circle	Division	Gravity	Lift	Tubewell	Total
		Ghumarwin	38	74	0	112
		Total	**109**	**138**	**0**	**247**
Mandi	Sundernagar	Mandi	235	18	0	253
		Sarkaghat	124	65	0	189
		Sundernagar	281	19	4	304
		Karsog	304	6	0	310
		Paddar	256	30	0	286
		Baggi	86	47	8	141
		Total	**1286**	**185**	**12**	**1483**
Kullu	Kullu	Anni	140	0	0	140
		Kullu Div. No I	199	0	0	199
		Kullu Div No.II	191	3	0	194
		Total	**530**	**3**	**0**	**533**
Lahaul & Spiti	Kullu	Keylong	192	0	0	192
	Reckong Peo	Kaza	121	0	0	121
		Total	**313**	**0**	**0**	**313**
Shimla	Shimla-9	Sunni	112	6	0	118
		Shimla Div. No. I	426	54	0	480
	Rohroo	Rohroo	202	7	0	209
		Jubbal	421	17	0	438
		Nerwa	252	1	0	253
	Reckong Peo	Rampur	250	4	0	254
	WS&S Shimla-3	Shimla Div. No. II	0	4	0	4
		Total	**1663**	**93**	**0**	**1756**
Solan	Shimla-9	Arki	187	78	0	265
	Nahan	Nalagarh	74	55	27	156
		Solan	200	103	0	303
		Total	461	236	27	724
Sirmaur	Nahan	Nahan	518	130	0	648
		Paonta	179	57	13	249
		Total	**697**	**187**	**13**	**897**
Kinnaur	Reckong Peo	Pooh	50	0	0	50
		Reckong Peo	121	0	0	121
		Total	**171**	**0**	**0**	**171**
		State Total	**6093**	**1232**	**181**	**7506**

Towns with a population less than 20000 (1991 census) and less rate of supply were eligible for inclusion under Accelerated Urban Water Supply Programme (AUWSP).

Sewerage: Sewerage system is as important as the water supply system and forms an integral part of environmental planning of city / town. I&PH and Municipal bodies are responsible for provision of sewerage system and related services in Planning Area. I&PH is involved in planning, construction, operation & maintenance of sewerage collection, treatment and disposal system. Municipal bodies maintains domestic and commercial connections from the door step to the main sewer lines, billing and collection and attending to citizen's grievances. District wise status of commissiond / completed sewerage schemes is given below in Table 12.

Table 12: Status of commissioned / completed sewerage schemes

Sr. No.	District	Name of Scheme	Complete Sewerage Treatment Plants		
			Nos.	Capacity (Mld)	Type of STP
1	**Chamba**	Sewerage Scheme Chamba	1	1.5	Aeration Oxidation
			2	0.898	
			3	0.2	
			4 (Septic Tank)		
		Total	3	2.55	
2	**Mandi**	Mandi	1	3.83	Extended Aeration
			2	0.47	
		Jogindernagar	1	1.735	Extended Aeration
		Total	3	6.035	
3	**Kullu**	Manali	1	1.82	Extended Aeration
4	**Bilaspur**	Bilaspur	1 (Septic Tank)		Septic Tank
		Ghumarwin	1	1.2	Extended Aeration
		Shri Nalna Devi Ji	1	1.35	Mech.Aeration System
5	**Kangra**	Jawalamukhi	1	2.83	
		Palampur	1	0.351	Sludge drying beds.
		Dharamshala	1	5.15	Extended Aeration

Sr. No.	District	Name of Scheme	Complete Sewerage Treatment Plants Nos.	Capacity (Mld)	Type of STP
6	**Shimla**	Shimla	1. Dhalli	0.75	Extended Aeration
			2. North Disposal Shimla	5.8	Extended Aeration
			3. Sanjauli-Malayana	4.44	Extended Aeration
			4. Summer hill	3.93	Extended Aeration
			5. Lal Pani	19.35	Upflow Anaerobic Sludge Blanket (UASB)
			6. Snowdown	1.35	Extended Aeration
		Rampur	1	1	Extended Aeration
			2	0.5	Extended Aeration
			3. (Septic Tank)	0.05	
		Rohru (Rural)	1	1.015	Extended Aeration
		Sarahan (Rural)	2	0.32	
		Total	1 (Septic Tank)	0.12	
			12	38.625	
7	**Solan**	Arki	1	0.7	
			2. Septic Tank	43200 Ltr	
		Total	2	0.7	
8	**Kinnaur**	Reckong Peo (Tribal)	1	1	Extended Aeration
9	**Sirmaur**	Sarahan (Rural)	1. Septic Tank	0.12	Septic Tank

Source: IPH, SE.P& I-II-EE (MP)-ENVIRONMENT /2008-1299

Circle wise status of sewerage & sewage treatment is given in Table 13.

Table 13: Status of sewerage and sewage treatment

	ParametersS	Hamirpur Circle	Bhola (Hamirpur) Circle	Bhota (Kangra) Circle	Dehra (Kangra) Circle	Sarkaghat (Mandi) Circle	Ghumarwin (Bilaspur) Circle	Una (Una) Circle
Sewerage3	Presence of sewerage system in city / town	Yes	No	Yes	No	Ongoing	Yes	Yes
	Population covered by sewer system ("000)	1340	-	6166+14500 F. P.	-	-	6.1	32.792
	Area covered with sewer system (Sq. Km.)	3	-	4	-	-	8.5	5
	Total length of sewer lines (km.)	51	-	24.5	-	-	11.95	30.79
	Population covered with onsite systems (Septic tank, Septic Pits (S.P.) & Low Cost Sanitation (LCS)	S.P.	-	-	-	-	7400 Persons	-
Sewage	Total installed capacity (MLD)	5.16	-	2.83	-	-	1.2	3.16
	Total quantity of sewage generated (MLD)	0.13	-	0.9	-	-	0.96	3.16
	Total quantity of sewage collected (MLD)	0.13	-	0.9	-	-	0.5	3.16
	Quantity of sewage (mld) treated through		-	-	-	-	-	-
	Primary Secondary Primary & Secondary Tertiary Total	0.13	-	-	-	-	0.5	-
	Sewage treatment process adopted	-	-	-	-	-	-	-
	Extended aeration (oxidation ditch, aerated lagoon etc.)	-	-	-	-	-	-	-
	Treated sewage	0.13	-	-	-	-	0.4	3.16
Sewage Treatment Plants	No. of treatment plants	3	-	1	-	-	1	2
	Total installed capacity (MLD)	5.16	-	2.83	-	-	1.2	3.16
	Total sewage treated (MLD)	0.13	-	0.9	-	-	0.5	3.16
Sewage gas & manure	Gas produce from sewage (Yes/No?)	No	-	No	-	-	No	No

3

Parameters	Mehatpur (Una) Circle	Santokhgarh (Una) Circle	Bilaspur (Bilaspur) Circle	Naina Devi Ji (Bilaspur) Circle	Chamba (Chamba) Circle	N.A.C Sunni (Shimla) Circle	N.A.C Narkanda (Shimla) Circle	Arki (Solan) Circle
Sewerage	Does the city/town have a sewerage system	Yes	No	Yes	Yes	-	Under Estimation	Under Construction
	Population covered by sewer system ("000)	16.878	18.014	13450	14280	14422 PER+18172 F.P	3798	3674
	Area covered with sewer system (sq. km.)	3.5	3.5	5	2	1	-	-
	Total length of sewer lines (km.)	15.87	13.635	23	6.54	23.6	10.035	4.905
	Population covered with onsite systems (Septic tank, S.P. & LCS)	-	-	-	-	-	-	-
	Total installed capacity (MLD)	1.76	1.65	-	1.35	2.608	0.65	0.45
	Total quantity of sewage generated (MLD)	1.76	1.65	-	1.35	2.25	-	-
	Total quantity of sewage collected (MLD)	1.76	1.65	-	1.35	2.25	-	-
Sewage	**Quantity of sewage (MLD) treated through**	-	-	-	-	-	-	-
	Primary Secondary Primary & Secondary Tertiary Total	-	-	-	-	-	-	-
	Sewage treatment process adopted	-	-	-	-	-	-	-
	Extended aeration (oxidation ditch, aerated lagoon etc.)	-	-	-	-	-	-	-
	Treated sewage	1.76	1.65	-	1.35	2.25	-	-
Sewage Treatment Plants	No. of treatment plants	3	1	-	1	3	-	1
	Total installed capacity (MLD)	1.76	1.65	-	1.35	2.6	0.65	0.45
	Total sewage treated (MLD)	1.76	1.65	-	1.35	2.25	-	-
Sewage gas & manure	Gas produced from sewage (Yes/No?)	No	No	No	No	-	-	-

	Parameters	Theog (Shimla) Circle	Nalagarh and Baddi (Solan) Circle	Paonta Sahib (Shimla) Circle	Nahan (Sirmaur) Circle	Solan (Solan) Circle
Sewerage	Does the city/town have a sewerage system	Under construction	No	-	No	-
	Population covered by sewer system ("000)	-	-	32963	-	13420
	Area covered with sewer system (sq. km.)	1.5	-	2.5	-	2
	Total length of sewer lines (km.)	12	-	16.16	-	19.19
	Population covered with onsite systems (Septic tank, S.P. & LCS)	-	-	-	-	2.9

	Parameters	Theog (Shimla) Circle	Nalagarh and Baddi (Solan) Circle	Paonta Sahib (Shimla) Circle	Nahan (Sirmaur) Circle	Solan (Solan) Circle
Sewage	Total installed capacity (mld)	-	-	1.24, 2.80, 4.82 of Zone-I, II & III	-	-
	Total quantity of sewage generated (mld)	1.6	-	-	-	-
	Total quantity of sewage collected (mld)	-	-	-	-	-
	Quantity of sewage (mld) treated through		-	-	-	-
	Primary Secondary Primary & Secondary Tertiary Total	1.6	-	-	-	-
	Sewage treatment process adopted	-	-	-	-	-
	Extended aeration (oxidation ditch, aerated lagoon etc.)	E.A	-	-	-	-
	Treated sewage	1.6	-	-	-	-
Sewage Treatment Plants	No. of treatment plants	2	-	3	-	1
	Total installed capacity (mld)	-	-	-	-	2.9
	Total sewage treated (mld)	1.6	-	-	-	-
Sewage gas & manure	Is gas produced from sewage Yes/No?	No	- -	No -		

District wise details of sewage treatment system is given in Table 14.

Table 14: Sewage Treatment System

Districts	Towns	Sewage Treatment Plants Under Operation	Sewage Treatment Under Construction
ChambaS	1. Chamba	√	
	2. Dalhousie		
	3. Chowari		
BilaspurS	1. Bilaspur		
	2. NainaDevi ji	√	
	3. Ghumarwin	√	
	4. Talai		
HamirpurS	1. Hamirpur	√	
	2 .Nadaun		
	3. Sujanpur		√
	4. Bhota		
KangraS	1. Kangra		√
	2. Dharamshala		√
	3. Palampur	√	
	4. Nurpur		
	5. Dehra		
	6.Nagrota		√
	7.Jawalamukhi		√
Kullu	1.Kullu		√
	2.Manali	√	
	3.Bhunter		√
	4.Banjar		
MandiS	1. Mandi		
	2. Sundernagar		√
	3. Sarkaghat		√
	4. Joginder Naggar		√
	5. Rewalsar		
ShimlaS	1. Shimla	√	
	2. Rampur		√
	3. Theog.		
	4. Narkanda		
	5. Sunni		
	6. Chaupa		
	7. Kotkhai		
	8. Jubbal		√
	9. Rohru	√	
Sirmaur	1. Nahan		
	2. Poanta.		√
	3. Rajgarh		
Solan	1. Solan		√
	2. Nalagarh		
	3. Parwanoo		
	4. Arki	√	
	5. Baddi		
Una	1. Una	√	
	2. Gagret		
	3. Daulatpur		
	4. Mehatpur		√
	5. Santokgarh		√

Irrigation: The Department of I& PH is also responsible for the operation and maintenance of irrigation systems through source development, lifting water, boring of tube wells & providing distribution systems. Details of total area, irrigated area and schemes is given in Table 15.

Table 15: Irrigated Area

Total geographical area of the State	55.67 lakh ha.
Total cultivable area of the State	5.83 lakh ha.
Area identified under Major/Medium Irrigation projects	0.50 lakh ha.
Area identified under Minor irrigation schemes	2.85 lakh ha.
Total identified area	3.35 lakh ha.

There are 2217 completed irrigation schemes in the State out of which Med. Are Irrg 4, are FIS 1085, are LIS 558 and Tubewell are 570. Upto the end of March, 2011, an area of 2.43 lakh ha. of land has been provided with irrigation facilities, the details of which are given in Table 17.

Table 16: Details of Irrigation facilities

Sector	Area covered upto 31.3.2011 (ha.)		Total area
	IPH	Other Department	
Minor Irrigation	115749	100657	216406
Major Irrigation	12085	0	12085
Medium Irrigation	14067	0	14067
Total	141901	100657	242558

Brief description of schemes sanctioned under RIDF-I to XIV upto 31/03/2011 is given in Table 17.

Table 17: Details of schemes sanctioned under RIDF

Item	WSS Scheme	Irrigation	Flood Protection	Total
No. of schemes approved	442	623	40	1105
No. of completed schemes	183	373	28	584
Total cost i/c State share (Rs. in lakh).	37345	50519	13156	101020
Irrigation potential created (in ha.)	0	33533	3815	37348

District wise details of completed Irrigation schemes is given in Table 18.

Table 18: Completed Irrigation Schemes

District	Circle	Medium	FIS	LIS	T well	Total
Chamba	Chamba	0	199	14	0	213
Kangra	Dharamshala	0	26	54	2	82
	Nurpur	0	2	34	119	155
Una	Una	2	0	54	333	389
Hamirpur	Hamirpur	0	75	120	5	200
Bilaspur	Bilaspur	0	17	61	0	78
Mandi	Sundernagar	1	152	55	33	241
Kullu	Kullu	0	45	18	0	63
Lahual & Spiti	Kullu	0	63	1	0	64
	Reckong Peo	0	93	2	0	95
Shimla	Shimla-9	0	58	30	0	88
	Rohroo	0	82	15	0	97
	Reckong Peo	0	22	0	0	22
	WS & S Shimla-3	0	0	0	0	0
Solan	Shimla-9	0	41	12	0	53
	Nahan	0	33	48	71	152
Sirmaur	Nahan	1	97	40	7	145
Kinnaur	Reckong Peo	0	80	0	0	80
Total		**4**	**1085**	**558**	**570**	**2217**

Source: Department of I & PH

2.2 Patterns of planning and development in the sector

In Himachal Pradesh availability of water is highly uneven in both space and time. Precipitation is confined to only about three or four months in a year and varies from about 600 mm in Lahaul & Spiti district to around 3200 mm in Dharamshala District Kangra. However, in spite of heavy rain and snow during the rainy season and winter the summer months are periods of water scarcity in many areas as the flow in the rivers and nallahs is quite low and traditional sources also dry up. This results in forced migration of humans and animals to the banks of rivers with perennial flows. On the other hand, heavy rains regularly cause havoc due to floods. Flash floods also cause damage in the higher reaches of the State.

Expansion of economic activity inevitably leads to increasing demands for water for diverse purposes namely domestic, commercial and industrial, irrigation, hydro- power generation,

recreation, etc. So far, the major consumptive use of water in the State has been for irrigation. The gross irrigation potential of the State is estimated to be 3.35 lakh ha, while the irrigation potential created has reached 2.05 lakh ha. by April, 2005. Production of food grains in H.P. has increased from around 0.7 million tonnes in the year 1966-67 to about 1.4 million tonnes in the year 2003-04. This will have to be raised to around 2.4 million tonnes by the year 2025 AD to meet the needs of the projected population of 92.25 lakh. The production of fruits and vegetables has increased from 0.05 million tonnes (1966-67) each to 0.7 and 0.9 million tonnes (2003-04) respectively. The balance area of 1.25 lakh ha by irrigation schemes need to be covered, so that the productivity of the cultivable land area of the State improves, food grain output increases and through diversion of the land to cultivation of vegetable, horticulture and cash crops the economic prosperity of the agriculturists is ensured and enhanced.

Eleventh Five Year Plan (2007-12)

Water: For augmentation of water supply, 15 towns have been proposed for the plan period. A target to cover 3000 habitations (as per 2003 survey and comprehensive Action Plan-1999) under State sector has been undertaken. Besides, there is a target of the installation of 1500 hand pumps during 11th Five Year Plan.

Sewage: Proposed outlay for Eleventh Five Year Plan is Rs. 17060.00 lakh and physical target to complete sewerage schemes of 12 towns during the Eleventh Five Year Plan has been envisaged for the five year plan period.

Tenth Five Year Plan (2002-07)

Water: There was physical target to cover 3000 habitations under State sector out of which 2421 habitations have been covered up to 31st March 2007. Under central sector, a target of covering 5000 villages /habitations was kept out of which 4825 villages /habitations were covered. During the 10th plan period, it was proposed to augment the water supply schemes of 15 towns. Against this target 17 towns have been covered up to 31st March 2007 namely Chaupa, Sunni, Palampur, Gagret, Nagrota, Nalagarh, Hamirpur, Mandi, Sarkaghat, Theog, Nurpur, Rajgarh, Narkanda, Bilaspur, Dalhousie, Poanta Sahib & Shah Talai.

Sewage: During the 10 th plan period, it was proposed to complete sewerage schemes of 12 towns out of which 7 towns namely Shimla, Manali, Ghumarwin, Jwalamukhi, Rampur, Jogindernagar and Arki have been completed. An outlay of Rs. 7936.17 lakh was approved for the Tenth Five Year Plan 2002-07, against which an expenditure of Rs. 8699.59 lakh had been incurred up to 31-03-2007.

Annual Plan (2007-08)

Water: A target of augmentation work of 4 towns namely Shimla, Solan, Jubbal and Bilaspur was kept during the Annual Plan. Physical target to cover 1600 NC/PC habitations under State sector and 2910 in Central Sector was kept which is likely to be achieved.

Sewage: The approved outlay for sewerage sector in Annual Plan 2007-08 was Rs. 2400.00 lakh which has been utilized in full. Physical target to cover 3 towns namely Poanta, Jubbal and Nagrota was fixed & completed for the year.

Annual Plan (2008-09)

Water: A physical target of covering 2000 habitations under State sector was proposed to be achieved for completion of 3 schemes of Chamba, Sundernagar and Palampur.

Sewage: An outlay of Rs. 3450.00 lakh for sewerage schemes in the Annual Plan 2008-09 was proposed & budgeted for major works in Narkanda, Bhunter and Kotkhai has been proposed.

2.3 Technology/Schemes adopted in the sector along with any changes in technology

Untreated or inadequately treated industrial effluents and sewage flowing into nallahs and rivers are affecting the surface and ground water quality. Since this can adversely affect the health of the populace. Including improvements in existing strategies, innovation of new techniques based on a strong science and technologies are needed to eliminate the pollution of surface and ground water resources. Technology and training play important roles in the development of water resources and their management.

Dual Water Technology: Dual Water Supply Policy may be adopted for rural habitations facing acute water quality problems. In these habitations even if safe water is provided upto 10 lpcd, which would be sufficient for drinking and cooking purposes. It may be considered as habitation(s) with a safe source of drinking water. For other activities like washing, etc. water available from unsafe sources could be utilized without problem. The State Government is required to formulate an Action Plan for tackling all the water quality problems. The Action Plan will comprise list of the water quality habitations with concentration of the contaminants found in excess in drinking water, apart from other details like type of scheme vis-à-vis technology adopted, tentative cost of coverage, time frame for implementation, modalities of Operation & Maintenance by PRIs/State Implementing Agency. The Action Plan should indicate the left over and total number of habitations affected with specific quality problems at the commencement of the year and the target for the year (with the names) of the habitations to be covered.

The State Government shall devise an integrated approach for technology options covering single village schemes, comprehensive piped water supply schemes, low cost treatment plants, domestic filters, roof-top rain water harvesting, in-situ water conservation, etc., for treatment of water contamination, the ratio of affected habitations to be provided with alternate safe source based drinking water supply scheme and in-situ treatment technology based drinking water supply scheme should be, as far as possible, is given in Table 19.

Table 19: Problem & alternate safe source based drinking water supply scheme

Sr. No.	Type of Problem	Alternate Safe Source Vs In-situ Treatment
	Arsenic, fluoride and salinity	90:10
	Iron affected habitations	30:70
	Nitrate affected habitations	100:00

Source: Revised Guideline on Sub- Mission on WaterQuality

Treatment Technologies: Water is treated at the source itself using rapid sand filters and chlorination before transmission by IPH. The treated water sample test indicates that the physicochemical quality of water is safe for drinking purposes. The treated water is conveyed to storage reservoirs by pumping at various stages through rising and gravity. Data from National Family Health Survey 1998-99 on households using water purification methods is given in Table 20. Noticeably 86 % of the households do not purify drinking water.

Sewage: The Sewage Treatment Plant of Extended Aeration process technology has been constructed in Shimla Town at various places which are working satisfactorily. STP based on Fluidized Aerobic Bioreactors (FAB) Technology is suitable what lead availability is constraint. However, Sewage Treatment Plant based on Extended Aeration Process Technology is suitable and can be continued.

Table 20: Water Purification Methods used at Household Level

Method of drinking water purification	Urban	Rural	Total
Strain water by cloth	1.8	2.5	2.4
Use of alum	0.5	0.5	0.5
Use of water filter	30.5	3.0	6.0
Boil water	21.7	3.6	6.0
Use of electronic purifier	1.6	0.2	0.4
Other method	1.1	2.1	2.0
Do not purify water	53.9	89.2	85.5

2.4 Stakeholder involvement in environment preservation and restoration

The State Water Policy must be implemented in a manner that promotes a participatory approach and involves local communities and stakeholders, including women, in the management of water resources, in an effective and decisive manner in various aspects of planning, design, development and management of the water related schemes.

Necessary legal and institutional changes shall be made at various levels for the purpose, duly ensuring more meaningful decision making roles for women. Water Users' Associations and the local bodies such as municipalities and gram panchayats shall particularly be involved in the operation, maintenance and the management of water related infrastructure/facilities at appropriate levels, progressively, with a view to eventually transfer the management of such facilities to the user groups/local bodies. Private sector participation may also be encouraged wherever feasible in planning, development and management of the water resources for the usage of the general public and the community.

The main stakeholders who are directly or indirectly involved with matters related to irrigation & public health are as given below**:**

- PRIs
- Mahila Mandals
- Bhakra Beas Management Board
- Tourism Department
- Fisheries Department
- Watershed
- Water Sports Complex
- State Pollution Control Board
- Department of Energy
- Himachal Pradesh Public Work Department

2.5 Critical environment issues / hotspots associated with the sector

2.5.1. Environmental issues associated with water supply

a. Reduced water availability due to increasing demand (population / resident, tourists): The demands for water, especially for drinking purposes have a significant impact and this is likely to strain available water resources. The demand for urban areas of the state up to 2021 AD is projected at 150.49 Million litres /Day. The demand for water in the rural areas is much higher, i.e. 575.97 million litres /day by 2021 AD which is 3.8 times the demand in the urban areas.

A large section of population in the State lacks access to potable water supply. The gap in demand and supply for rural potable water in the state exceeds 2,00,000 kilolitres per day (KLD) considering a benchmark of 70 litres per capita per day (LPCD). Similarly the gap in urban potable water supply in the state exceeds 50,000 kld considering a benchmark of 135 lpcd.

At district level, the gap in supply and demand of urban potable water ranges from 1383 kld in districts Bilaspur and Kullu to 27,365 KLD in Solan. Further the gap in rural potable water supply ranges from 822 klpcd in Lahaul & Spiti to 31,000 KLPCD in Kangra. These gaps indicate that population in rural areas is more affected by low access as well as shortage of potable water in the State. It also indicates that urban areas have better infrastructure to meet water supply demand in comparison to rural areas.

b. Reduced water availability due to source over exploitation, source unsustainability and neglect of traditional source: Perennial springs are not found in the Shivalik due to the low water-holding capacity of rock formations. Considerable numbers of Shivalik villages are provided water (up to 100 villages) by pumping system. Many schemes were commissioned without sufficient investigation regarding source sustainability. Available sources were used with little planning regarding the possible growth of upstream water demand. Many irrigation schemes (diversion channel) have been commissioned in H.P. which reduce the down stream flows, especially during the lean season. Many sources have not been able to supply sufficient water due to competing upstream use for agriculture and hydropower; drying up of source catchment degradation (especially in the Shivalik region).

c. Reduced water availability due to infrastructure constraints e.g. non-availability of electricity supply and increased leakage in the public distribution system: Dedicated electricity lines for distributed pumping stations does not exist. At places with high head, 2-3 stages pumping required. Failure of any of them cripples the system. There has been a general consensus that there are huge leak in the installed systems. Further, pipe leakage is common phenomena. The water supply systems in most of the towns are quite old and have outlived their utility, their sources need augmentation and the distribution systems in almost all the supply schemes need replacement and rehabilitation.

d. Reduced water availability due to lack of integrated water management strategies/plan, monitoring and funds for implementation: Lack of funds for source augmentation is a major constraint. Demand side management has not been attempted so far. There is inadequate monitoring system for the monitoring of the water intake and use in industrial, construction activity, sanitary applications, irrigation and other purposes without assessing carrying capacity/potential.

e. Reduced downstream flow due to change in natural flow/hydrology of the reservoir/dam/hydroproject: Construction of a large number of reservoirs and dams; diversion of streams and rivers and hydroelectric projects lead to reduced flow into wetlands/ water bodies/ reservoir. Further, release of impounded water by dam/reservoir depends on the management authority, small hydropower projects and other infrastructure development projects requiring water diversion also change the hydrology of the wetland/ water body/ river. The reduced down stream ecological flow leads to ecological imbalance in aquatic flora and fauna including fisheries.

f. Deterioration of surface and ground water quality due to contamination : Both surface and groundwater quality is deteriorating due to extensive and severe pollution from industrial, domestic and agricultural sources. The point sources of untreated effluents and sewerage, and diffused sources of pollutants from the use of agrochemicals, deteriorate the quality of surface and groundwater. Nearly all traditional sources are contaminated in the State due to unhygienic methods of handling water. Slaked lime is used to settle water in Khatris, but its efficiency in dealing with pathogens is limited due to continuous infiltration of contaminated water. Excess iron is reported in about 10-15% hand pumps of the State (Kangra, Hamirpur, Bilaspur and Sarkaghat area).

g. Inadequate sewage infrastructure and sanitation services in the state: At the State level, cases of admission in hospitals due to diarrhea increased from 16,263 in 1995 to 16,602 in 2002. Similarly, cases of admission in hospitals due to hepatitis increased from 379 in 1995 to 421 in 2002. At district level, Chamba, Hamirpur, Kinnaur, Kullu, Lahaul & Spiti, Mandi, Sirmaur and Una reported increase in admission in hospitals due to diarrhea during 1995 to 2002. Similarly, Bilaspur, Chamba, Kangra, Kinnaur and Una reported increase in admission in hospitals due to hepatitis during 1995 to 2002.

The gap in rural and urban sewage generation and collection in the State exceeds 1,50,000 kld and 49,000 kld respectively. At district level, the gap in rural sewage generation & collection ranges from 822 kld in Lahaul & Spiti to 31,060 kld in Kangra. Similarly, the gap in urban sewage generation, ranges from 1264 klpcd in Bilaspur & Kullu to 27,365 kld in Solan. These gaps indicates discharge of sewage both in rural and urban areas without collection and treatment.

h. Inadequate community participation in rural water supply and sanitation lead to poor water management: Since the government has the responsibility for providing water supply, community initiatives are inadequate, even in the areas of severe scarcity. People mostly try to provide for their household needs rather than rejuvenating their traditional sources. Under difficult terrain and dispersed habitation, managing a water supply can become very expensive if sufficient social development input is not provided. This is one of the main problems now facing the rural water supply scheme in the state.

i. Gaps in coordination of institutions managing water resources sector leads to gaps in operational efficiency and financial realization: Lack of private and PRIs participation water supply distribution is indicative of gaps in policy implementation. Besides PRIs, water committees are an alternative institutional mechanism being suggested though relationship between them and PRIs is not yet clearly articulated. Participation of NGOs might be limited on account of their technical limitations while large-scale private participation is unlikely until new policies are firmly in place. With current level of reliability in water supply,it may be difficult to realize the full tariffs.

There is a growing perception that water cannot be indefinitely provided as a service however, there is still no clear-cut pricing option availabl Differences over modalities of fixing the price of water arise because water is both treated as basic need or service and a commodity. Government policies and regulations on water management have so far been unable to stem the growing problems related to water quality and quantity in HP. Economic incentives and subsidies have not been beneficial in terms of promoting conservation of water resources. Government subsidies to the irrigation and domestic water supply sectors in the past several decades have allowed for greater expansion and development of both, but have also led to a complete under-valuing of the resource. Groundwater extraction by pumping is indirectly encouraged through subsidies for fuel and electricity. Rural and urban water charges are much lower than the cost of provision and suffer from poor operation and maintenance. The result in all sectors has been higher consumption and insufficient cost recovery. Table 21 heading as given in sectoral guidelines.

Table 21: Summary of identification and analysis of i ssues

Issues / Problems	Cause	Impacts/Risks
Reduced water availability due to increasing demand (population, resident/ tourists).	Unreliable water supply Increase in demand from resident/ population/tourist	Deprivation of basic necessity and quality of life Water riots Health risk
Reduced water availability due to source overexploitation, source un-sustainability and neglect of traditional water source.	Limited water resources Lack of river basin level planning Competing water usage	Drying up of source Catchment degradation Waste of investment Risk of food insecurity

Issues / Problems	Cause	Impacts/Risks
		Agriculture / Horticulture revenue loss
Reduced water availability due to infrastructure constraints e.g. non-availability of electricity supply and increased leakage in the public distribution system.	Unauthorized tapping/metering Old/worn out infrastructure leading to leakage	Unaccounted resource loss leading to strain in existing source Loss of revenue
Reduced water availability due to lack of integrated water management strategies/plan, monitoring and funds for implementation.	Hydropower projects/other water uses requires water diversion Competing water use Non-availability of adequate funds for planning and implementing	Change in hydrological regimes leads to variation in ecology of connected natural drainage system as well as downstream water uses Ecological imbalance Catchment degradation Water pollution
Deterioration of surface and ground water quality due to contamination.	Water pollution due to fertilizer, pesticides, sewage and dung ingress in water source Poor management of waste	Increased public health risk and burden of diseases
Inadequate sewage infrastructure and sanitation services in the state.	Drinking water source/transmission and distribution contamination due to inadequate sewage and solid waste treatment and disposal.	Increased public health risk/mortality and burden of water borne disease Water related disease due to unsafe drinking water on account of inadequate sanitation
Inadequate community participation in rural water supply and sanitation leads to poor water management.	Inadequate ownership of the resource Ownership of water resources & infrastructure rest with state.	Resource loss/wastage Increased government expenditure for management of resources Increases drudgery of women for fetching water in remote areas in the state.
Gaps in coordination of institutions managing water sector resources leads to gap in operational efficiency and financial realization.	Lack of implementation of reforms Lack of pricing of resource Continued subsidies on resource Resource under valuation Absence of decentralized operation and maintenance of water supply schemes	Resources loss/wastage Revenue loss to the sector

2.5.2 Environmental Issues associated with Sewerage System

a. Increasing gap in sewage collection, treatment and disposal (rural and urban) is leading to water pollution: The gap in rural and urban sewage generation and collection in the state exceeds 1,50,000 kld and 49,000 kld respectively. At district level, the gap in rural sewage generation & collection ranges from 822 kld in Lahaul & Spiti to 31,060 kld in Kangra. Similarly, the gap in urban sewage generation, ranges from 1264 klpcd in Bilaspur & Kullu to 27,365 kld in Solan. These gaps indicates discharge of sewage both in rural and urban areas without collection and treatment.

b. Increasing public health risk due to discharge and disposal of untreated sewage on land and water body: Both surface and groundwater quality is deteriorating due to extensive and severe pollution from domestic and agricultural sources. The point sources of untreated effluents and sewerage, and diffused sources of pollutants deteriorate the quality of surface and groundwater. Nearly all traditional sources are contaminated in the state due to unhygienic methods of handling water. At the state level, cases of admission in hospitals due to diarrhea increased from 16,263 in 1995 to 16,602 in 2002. Similarly, cases of admission in hospitals due to hepatitis increased from 379 in 1995 to 421 in 2002. At district level, Chamba, Hamirpur, Kinnaur, Kullu, Lahaul & Spiti, Mandi, Sirmaur and Una reported increase in admission in

hospitals due to diarrhea during 1995 to 2002. Similarly, Bilaspur, Chamba, Kangra, Kinnaur and Una reported increase in admission in hospitals due to hepatitis during 1995 to 2002.

c. Increased public health risks due to open defecation in rural/urban areas and inadequate sanitation at tourist units /tourist destination / religious places / heritage sites /trekking routes / tourist circuits / transportation routes: The expected additional sewage generation due to tourist arrivals will exceed 847 mld in 2011 and 1338 mld in 2021 in the top five tourist destinations. Vulnerability analysis shows that sewage infrastructure in Shimla, Kangra & Chamba districts, Kullu, Ghumarwin & Bilaspur sadar tehsils is already under stress. Additional tourist load will increase pressure on existing sewerage infrastructure.

d. Inadequate integrated water resource, water supply, sewage and sanitation approach/ management strategies/plan leads to higher water consumption and sewage generation: Demand side management in water sector has not been attempted so far. There is, no system for the monitoring of the water intake and use in industrial, construction activity, sanitary applications, irrigation and other purposes without assessing carrying capacity/potential. Construction of a large number of reservoirs and dams; diversion of streams and rivers and hydroelectric projects lead to reduced flow into wetlands/ water bodies/ reservoir. Further, release of impounded water by dam/reservoir depends on the management authority. Small hydropower projects and other infrastructure development projects requiring water diversion also change the hydrology of the wetland/ water body/ river. The reduced downstream ecological flow leads to ecological imbalance. Increasing water consumption / demand by the population is leading to higher sewage generation. Lack of management of demand on the upstream side and lack of optimized solution e.g. recovery, recycling, reducing leads to wastage of resource and increased pollution.

e. Inadequate finances to accelerate /upgrade/implement sewage infrastructure leads to water pollution: There is a growing perception that water cannot be indefinitely provided as a service however, there is still no clear-cut pricing option available. Differences over modalities of fixing the price of water arise because water is both treated as basic need or service and a commodity. Government policies and regulations on water management have so far been inadequate to stem the growing problems related to water quality and quantity in HP. Economic incentives and subsidies have not been beneficial in terms of promoting conservation of water resources. Government subsidies to irrigation and domestic water supply sectors in the past several decades have allowed for greater expansion and development of both, but have also led to a complete under-valuing of the resource. Groundwater extraction by pumping is indirectly encouraged through subsidies for fuel and electricity. Rural and urban water charges are much lower than the cost of provision and suffer from poor operation and maintenance. The result in all sectors has been higher consumption and insufficient cost recovery for water supply and sanitation.

f. Gaps in institutional operation mechanism related to sanitation leads to gaps in operational efficiency: A number of agencies are involved at state, district, tehsil and village level for management of sanitation. Lack of coordination and integrated planning leads to gaps in infrastructure development and operational inefficiency.

g. Tardy implementation of reform public participation in water supply and sewage sector leads to reduced coverage of sanitation services: Lack of private and PRIs participation in water supply distribution sewage collection and treatment is indicative of gaps in policy implementation. Besides PRI, water and sanitation committees are an alternative

institutional mechanism being suggested though relationship between them and PRI bodies is not yet clearly articulated. Participation of NGOs might be limited on account of their technical limitations while large-scale private participation is unlikely until new policies are firmly in place.

h. Inadequate awareness leads to lack of community/NGOs participation in rural water supply and sanitation: Since the Government has the responsibility for providing water supply and sanitation, community initiatives are minimal in the sanitation sector. Under difficult terrain and dispersed habitation, managing a water supply can become very expensive if sufficient social development input is not provided. This is one of the main problems now facing the rural water supply and sanitation scheme in the State*Mahila Mandal* is present in most of villages but they are not formed by the initiatives of the community. Instead, the DRDA and other Government Department for delivery of their scheme constitute them. There are few NGOs working especially for women issues or water supply and sanitation. Rural people in Himachal are fairly individualistic, Khatris, for instance, are almost always owned by the individual households and investments at community level are limited. A summary of issues, causes & impacts is given in Table 22.

Table 22: Summary of identification of issues, causes and analysis of impacts/risks

Issues	Causes	Impacts/Risks
1. Increasing gap in sewage collection, treatment and disposal is leading to water pollution.	• Increased sewage generation from population/tourist • Inadequate infrastructure due to incomplete connectivity, incomplete coverage and absence of sewage treatment plant.	• Increased water pollution • Increased burden of disease / health risk
2. Increased public health risk due to discharge and disposal of untreated sewage on land and water body.	• Water pollution due to sewage and dung ingress in water source • Unhygienic methods of handling waste • Poor management of waste	• Increased burden of diseases
3. Increased public health risk due to open defecation in rural/urban areas and inadequate sanitation at tourist units/tourist destination/transit points and transportation routes.	• Inadequate sanitation infrastructure (rural & urban) • Unregulated tourist transit points • Drinking water source/transmission and distribution coming in contact with sewage, municipal, industrial and bio-medical waste	• Increased burden of disease / mortality
4. Inadequate water supply/sewage/ sanitation water consumption and sewage generation.	• Competing water use • Inadequate demand side management • Inadequate monitoring of consumption of water • Independent institutional responsibility	• Change in hydrological regimes leads to ecological imbalance • Resource loss • Catchment degradation/ Sewage generation • Water pollution
5. Inadequate finances to accelerate /upgrade/implement water supply and sewage infrastructure results in water pollution.	• Inadequate pricing of resource v Continued subsidy • Resource under valuation	• Water pollution due to inadequate infrastructure
6. Gap in institutional operational mechanism related to sanitation leads to gap in operational efficiency.	• Inadequate implementation of reforms • Lack of integrated planning and	• Gaps in service delivery • Increased water pollution

Issues	Causes	Impacts/Risks
	coordination	
7. Tardy implementation of reforms / public participation in water supply and sewage sector leads to reduced coverage of sanitation services.	• Inadequate implementation of reforms • Inadequate development business model	• Reduced infrastructure development • Gaps in service delivery • Increased waste pollution
8. Inadequate awareness leads to lack of community participation in sanitation sector.	• Lack of ownership of the resource • Difficult terrain dispersed location • Inadequate of gender participation • Inadequate of NGOs participation	• Unhygienic living condition/ Burden of disease • Increased government expenditure for management of sanitation • Water pollution

2.6 Environment initiatives taken by the sector to address critical environment issues

Initiatives in view of water supply plans and schemes proposed by the sector to address the critical issues in order to maintain the balance between the availability and demand of water, water conservation, sanitation, hygiene keeping in view environment issues are discussed in the section.

Various programmes and schemes implemented to address the critical issues related to water are described below:

Rural water Scheme

Swajaldhara programme: The programme gave integrated approach to water, sanitation & hygiene, ground water conservation and rain water harvesting. Sirmaur district was covered under the pilot project under this programme. The basic features of the programme are as per the guidelines issued in June 2003.

Urban Water Supply Scheme: Augmentation of water supply schemes of 40 towns have been completed. These towns are Shree Naina Devi Jee, Nadaun, Rampur, Una, Chowari, Kangra, Jawalamukhi, Nahan, Rohru, Santokhgarh, Mehatpur, Dehra, Chamba, Rewalsar, Arki, Daulatpur, Jogindernagar, Manali, Kullu, Kotkhai, Sujanpur, Ghumarwin, Chaupa, Sunni, Palampur, Gagret, Nagrota, Hamipur, Mandi, Nalagarh, Narkanda,Nurpur, Paonta, Theog, Dalhousie, Shah Talai, Rajgarh, Sarkaghat, Bhota and Solan. The Augmentation of water supply for 6 towns is in progress namely Shimla, Sundernagar, Dharamshala, Bilaspur, Jubbal and Bhunter. It is proposed to commission water supply to Sundernagar and Dharamshala during the year 2009-10.

Accelerated Urban Water Supply Programme (AUWSP)

Under this programme, towns with a population less than 20000 (1991 census) and less rate of supply were eligible for inclusion. The Schemes were to be funded by the Centre and State in 50:50 ratio.

Prestigious Water Supply Schemes

Augmentation of Water Supply Scheme Shimla

Nauti Khad (Gumma Pumping Station): For source level augmentation, a proposal has been approved for lifting of 4.54 MLD per day from Nauti Khad down stream of Gumma. The first stage has been completed. The work of second stage is in progress. The scheme is designed for an ultimate requirement of year 2016 to deliver 20 MLD (2.00 Crore litre per day) to supplement existing scheme delivering already 30 MLD (during Summers) water through 6 different sources viz. (i) Gumma (ii) Ashwani khad (iii) Churot (iv) Jagroti (v) Seog (vi) Chair.

Water Supply Scheme, Solan from River Giri: Keeping in view the future growth and scarcity of water in important places like Barog, Dharampur and other areas, the population of 114 census villages has also been added to this project. On the basis of the above, the present water requirement comes to be 10.07 MLD against the available capacity of 6.27 MLD. To bridge the gap between demand and supply, additional water will be required and there is only one feasible source i.e. Giri river. The proposal to provide water for Solan town and 114 other villages was accordingly prepared, keeping in view the growth projections for 30 years. The estimate has been administratively approved for Rs. 51.46 crore. The work has been almost completed and Scheme is being tested for commissioning.

Rajiv Gandhi National Drinking Water Mission: Sub-Mission projects are undertaken by the States for providing safe drinking water to the rural habitations facing water quality problems like excess Fluoride, Arsenic, brackishness, Iron, Nitrate or a combination of these. Sub Mission projects are also taken up for ensuring source sustainability through rain water harvesting, artificial recharge, etc.

Hand Pumps programme: Although Hand pumps usually do not provide coverage of a habitation, (due to limitation of rigs operating along road-sides only) they are supplementing the existing piped water supply and have been installed in drought prone areas, areas of acute water scarcity and other problematic areas and the areas where tankers have been deployed in recent years.

Hand pump programme has been great success in mitigating the people's misery due to shortage of drinking water in different pockets of drought prone and acute water scarcity areas. The programme was started during 1991-92 and a total of 17651 hand pumps have been installed in the state upto March-2009.

Sewerage: Towns in the State mostly serve as health resorts, environment improvement assume special significance particularly to avoid pollution of the rivers and other water bodies of the State. To abolish carrying of night soil on head load and scavenging system in the country/states, the Government has given top priority to connect dry latrine system into water pour system. Hence, the sewerage programme has assumed immense importance. Under this programme sewerage facilities are proposed to be provided in all towns of the State. 13 sewerage schemes have been completed (Shimla, Palampur, Mandi, Jawalamukhi Shri Naina Devi Ji, Chamba, Bilaspur, Rohroo, Ghumarwin, Manali, Joginder nagar, Arki, Rampur and 2 rural schemes (Reckong-Peo and Sarahan). The work on 24 schemes is in progress (Una, Solan, Sundernagar, Paonta, Sarkaghat, Kullu, Mehatpur, Santokhgarh, Dalhousie, Chowari, Bhuntar, Dharamshala, Hamirpur, Kangra, Nagrota, Jubbal, Sujanpur, Nadaun, Kotkhai, Narkanda, Theog, Nurpur, Sunni and Dehra). Sewerage scheme for Narkanda and Bhuntar was proposed to be commissioned during the year 2008-09.

The Shimla Sewerage project was started in November, 1997. Status of sewage treatment Plants at 6 places is given below in Table 23.

Table 23: Status of STPs in Shimla

Dhalli (0.76 MLD)	Completed & commissioned
North Disposal (5.80 MLD)	-do-
Summer Hill (3.93 MLD)	-do-
Sanjauli/Malyana (4.44 MLD)	-do-
Snowdone (1.35 MLD)	Completed and tested
Lalpani (19.35 MLD)	Completed & commissioned

Out of 179 Kms. Sewer-lines, 179.352 Kms. sewer lines have been laid in different zone of the Shimla town.

Irrigation

Initiatives taken to address the issues related to irrigation and their status is summarized below:

- **Flood Protection Works:**The flood prone area in the State is 2.31 lakh ha. The Government has initiated steps to protect private properties and culturable land by providing emergent flood protection measures in the shape of embankments, spurs and wire crates etc. Upto March, 2007, an area of 13555 ha. from the fury of floods was brought under protection.

- **Channelisation of Swan River:** Swan river has a total catchment area of 1200 sq. km and has a length of 65 Kms. in Himachal Pradesh. There are 73 tributaries in the catchment area. Approximately, 10,000 ha of agriculture land is affected by floods and annually 2000 ha. of fertile land is not being cultivated due to fear of floods. During the past 10-12 years extensive damage to civil structures, properties, human life and livestock has been reported. The estimated loss to crops and property is to the extent of about Rs. 15 crores per annum.

- **Treatment of Catchment Area:** There is a provision of Rs. 75 lakh in the approved project report of Rs.106.83 crore for treatment of catchment area of tributaries falling from Jhalera bridge to Santokhgarh bridge. The Forest Deptt. has planted 58500 trees, in 50 ha., of different varieties. Besides, check dams in the tributaries and planting of grasses and bushes for bank protection has been done. Further work is in progress by the Forest Deptt.

- **Channelization of Bata river:** River Bata emerges as a Khala nearby village Kolar and passes through the fertile land from Kolar to Bata Bridge and finally joins the Yamuna River. The Bata river keeps on changing its course in rainy season and is further influenced by the tail race water of Giri Bata Hydel Project, which adds nearly 16000 cusecs of water and it causes erosion of land on both the banks of river. Over the years, Bata River has been causing damage to the life and property of the inhabitants located on the banks of Bata River. Therefore, a comprehensive detailed project report for Bata River channelization costing Rs.30.11 crore has been prepared. An embankment of 3000 metres has been constructed at site for channelisation of Bata River.

- **Command Area Development Programme:** In order to bridge gap between potential created and utilised Command Area Development activities (CAD) are also extended not only to medium schemes but also to minor irrigation schemes.

The Command Area Development Programme (CADP) was initiated in the year 1974-75 under Centrally Sponsored Scheme with the objective of utilization of created irrigation potential and optimum agriculture production from irrigable land. Initially 3 Medium Irrigation Project were included under the Centrally Sponsored Command Area Development Programme, which has since been completed. 12 more CAD projects stands completed under CAD Programme. 6 CAD Projects are in progress in the State. Upto 3/2010, 22407 ha. field channels and 21811 ha. warabandi have been completed in Himachal Pradesh.

1. Water quality

Initiatives taken to improve the quality of water are as follows:

(a) The State Pollution Control Board ensures installation of Effluent Treatment Plants by the industries before Consent to Operate is granted.

(b) To check pollution due to Sewage, the State Pollution Control Board by intervention and constant persuasion of concerned authorities, got 23 numbers of Sewage Treatment Plants (STPs) commissioned and 32 numbers of STPs are under construction as on 31/03/2008 by I&PH Department.

(c) STP or STP cum ETPs have been installed.

(d) The Sewage Treatment Plants are also installed in hotels above 25 rooms capacity outside the municipal limit.

2.7 Environment related studies carried out in the sector

Environment related studies carried out by I & PH are:

Hydrology Project–II is aimed at improving the existing system and developing an integrated and comprehensive hydrological data collection and information system in the State. The Hydrological Information System (HIS), is of immense use for all water resource sector stakeholders

World Bank has approved a credit of US$ 104.98 Million to the Government of India for the Hydrology Project Phase-II. (IBRD Ln. No 4749-IN). The total cost of the Project is US$ 135.01 Million. Phase-I of Hydrology Project was implemented in the nine peninsular States of the Country & by 6 Central agencies during 1995-2003. Phase-II of the project is being implemented in 13 States including 9 districts of HP-I & by 8 Central agencies. The Project is proposed to be implemented in the State over a period of six years starting from April 5, 2006.

Study on impact of river bed mining on water sources.

Impact of various land uses on the infiltration in Changar: Experiments were conducted to evaluate the infiltration characteristics under different land use systems in the project area. The initial and steady state infiltration rates were found as 145.18mm/hr and 14.51mm/hr respectively on degraded land & barren soil condition, 197.66 mm/hr and 31.29 mm/hr on private hay land and 160 mm/hr and 85.63 mm/hr on grazing land covered under community plantation with double ring infiltrometer.

Experiments were conducted to evaluate the infiltration characteristics under different Land use system. The initial & steady state infiltration rates were found as145.18mm/hr and 14.51mm/hr respectively on degraded land & barren soil condition, 197.66 mm/hr 197.66 mm/hr and 31.29 mm/hr on private hay land and 160 mm/hr and 85.63 mm/hr on grazing land covered under community plantation with double ring infiltrometer.

2.8 Environment monitoring (key parameters such as air and water pollution) carried out for activities related to the sector.

Monitoring of National Aquatic Resources (MINARS) is sponsoring the water quality monitoring of major rivers of the State. The monitoring is being carried out in the month of April, July, October and January every year. In all 36 points have been selected on major rivers Satluj, Beas, Ravi, Yamuna, Parvati, Sirsa, Markanda & Sukhna, Samples are analyzed for 22 parameters which includes the physico-chemical and bacteriological contents. The results are shown in Table 24. Eighteen (18) points have also been selected in major industrial towns for the monitoring of ground water of hand pumps & wells. It has been observed that quality of ground water monitored in the State conforms to the prescribed standards.

Physical and chemical qualities tested in samples taken from all the fourteen water zones in Shimla are found satisfactory conforming to prescribed standards of drinking water. Water sample taken from Public Tap located at Sanjaulli main Chowk has shown bacteriological contamination. Similarly water sample taken from Public tap at Kasumpti near B.S.N.L office has shown the presence of Coliform group of bacteria. Further, HP PCB has set in place a river water quality monitoring. Table 24- 28 shows the Monitoring results on river quality, lake water quality and other sources of water is given in the section.

Table 24: River Quality Data (Annual Avg.) Year 2003

Location	pH	DO Mg/l	BOD Mg/l	FC (MPN/100ml)	Temp (ºC)	WQI
Beas at U/S Manali, H.P.	8.1	10.0	0.3	135	6	Good
Beas at D/S Kullu, H.P.	8.0	9.1	0.7	283	10	Good
Beas at D/S Aut, H.P.	8.0	10.1	0.9	82	7	Good
Beas at U/S Pandoh Dam, H.P.	8.2	9.8	0.6	20	8	Good
Beas at Exit of Tunnel Dehal Power House, H.P.	8.0	10.8	1.3	29	8	Good
U/S Mandi, H.P	8.1	9.3	1.1	25	9	Good
Beas at D/S Mandi, H.P.	8.0	8.2	1.2	421	10	Medium
Beas at D/S Alampur, H.P.	8.1	8.1	0.8	10	17	Good
Beas at D/S Dehragopipur, H.P.	8.1	7.7	1.0	26	19	Good
Beas at D/S Pong Dam, H.P.	8.1	8.3	0.7	6	24	Good
Satluj at Nathpa Zakhri, H.P	8.3	9.5	0.3	7	14	Good
Satluj at U/S Rampur, H.P.	8.1	9.4	0.1	152	13	Good
Satluj at D/S Rampur, H.P.	8.2	9.4	0.2	226	14	Good
Satluj at U/S Tatapani, H.P.	8.2	9.2	0.2	104	15	Good
Satluj at U/S Slapper, H.P.	8.4	9.5	0.8	38	10	Good
Satluj at D/S Slapper, H.P.	8.3	10.2	0.9	41	9	Good
Satluj at D/S Bhakhra, H.P.	8.3	9.2	0.4	2	16	Excellent
Ravi at U/S Chamba, H.P.	8.2	9.2	0.7	8	12	Good
Ravi at U/S Madhopur, H.P.	7.8	8.2	0.8	7	18	Good
Ravi at U/S of Madhopur Headworks,Gurdaspur,Punjab	7.6	8.2	0.7	7	18	Good
Parvati before Conf. to River Beas, H.P.	7.8	9.8	0.7	152	9	Good
Largi at D/S, H.P.	7.8	10.4	0.6	80	6	Good
River Sirsa , U/S Sitomajri Nallahgarh, H.P	8.3	8.0	0.2	77	23	Good
River Sirsa , D/S Nalagarh Bridge, H.P	8.3	7.6	0.4	318	26	Good
Yamuna at U/S, at Ponta Shahib	8.9	8	2	46	20	Good
Yamuna at U/S, at Ponta Shahib	8.9	7.7	4.8	76	22	Medium

Table 25: Lakes Water Quality Data Year 2003

Lake / Pond / Tank / Creek	Location	Tem (c)	pH	Cond Micromho/cm	DO Mg/l	BOD Mg/l	COD Mg/l	FC MPN/100 ml	TC MPN/ 100ml
Gobind Sagar Lake	Gobindsagar Lake At Bilaspur, H.P.	10	8.4	308	9.3	0.6	53.0	58	159
Pong Dam Lake	Pongdam Lake at Pong Village,H.P.	24	8.4	236	8.1	0.9	3.0	5	27
Renuka Lake	Renuka Lake , 35 Km from Patna Sahib North , H.P	20	8.6	1207	8.1	6.0	42.0	33	85

Samples analysis in the State Pollution Control Board laboratories: The State Pollution Control Board has 5 laboratories for carrying out analysis of water, waste water, solid waste, air and bio-monitoring samples. The details of samples analyzed by the laboratories during the year 2007-08 is given in Table 26.

Table 26: Number of Samples Analyzed in State Pollution Control Board's Laboratories

S. No.	Type of Samples	Number of Samples Analyzed in State Boards Laboratories				
		Parwanoo	Paonta Sahib	Jassur	Sunder Naggar	Shimla
1	Water & Trade Effluent	764	336	181	183	-

S. No.	Type of Samples		Number of Samples Analyzed in State Boards Laboratories				
			Parwanoo	Paonta Sahib	Jassur	Sunder Naggar	Shimla
	Waste Water	RM/ Study etc. water samples	1110	83	128	346	
2	Bio-Monitoring		-	12	-	-	-

Water quality of major rivers in Himachal Pradesh monitored under MINARS and state water quality monitoring programme for year 2008 is given in Table 27.

Table 27: Water quality of major rivers in Himachal Pradesh (January 2008)

Name of the location	pH	D.O. mg/l	BOD mg/l	T.C. MPN/SPC per 100ml
Lift Nala D/S Hotel Combermere,	7.7	8.4	4	320
Lift Nala U/S M.C. Waste Processing Site	7.48	8.5	14	820
Lift Nala D/S MSW Processing Site, Shimla	6.56	8.4	12	750
Ashwani Khad U/S Lift Nala	7.09	8.9	3	60
Ashwani Khad D/S Lift Nala	6.75	8.7	30	360
Giri River D/S Yashwant Naggar,	8.14	11.6	0.6	180
Satluj River bef. conf. with Spiti at Khab 1867	7.56	-	0.1	2
Spiti River bef. conf. with Satluj at Khab	7.59	-	0.1	Nil
Satluj River after confluence of River Spiti at Khab	7.71	-	1	Nil
Satluj River bef. conf. with Tidong River	7.69	-	0.1	4
Tidong River bef. conf. to R. Satluj	7.32	-	0.1	Nil
Satluj River after conf. with Tidong River	7.64	-	0.1	6
Satluj River U/S Shorang Khad	7.26	10.1	0.1	36
Sorang River bef.conf. to R. Satluj	7.38	10.5	0.1	50
Satluj River D/S Shorang Khad	7.39	10.2	0.1	42
Baspa River U/S Reservoir	7.71	10.5	0.1	4
Baspa River D/S Reservoir at Kuppa	8.15	9.8	0.2	8
Baspa River Baspa Project Reservoir	7.7	10.2	0.2	6
Satluj River U/S TRT Baspa Hydel Project Reservoir	7.52	9.6	0.1	60
Satluj River bef. conf. to Baspa River	7.74	9.8	0.1	50
Satluj River After Conf. To Baspa	7.47	10.1	0.1	66
Satluj River at Wangtu Bridge, 1389-R- Sat-A	7.28	9.8	0.1	19
Satluj River D/S Nathpa,	8.42	10.7	0.1	20
Satluj River bef. conf to Ganvi Khad	7.92	9.8	0.1	18
Ganvi Khad	7.51	9.4	0.1	40
Satluj River D/S Ganvi Khad	7.01	9.5	0.1	22
Satluj River U/S TRT Jhakri	7.83	10.1	0.2	40
Satluj River D/S TRT Jhakri	7.95	10.4	0.1	20
Satluj River U/S Landfill site, Rampur	7.27	10.5	0.1	26
Satluj River D/S Landfill site, Rampur	7.92	11.2	0.2	34
Satluj River U/S Rampur, 1086-R-Sat-A	8.02	11.4	0.1	56
Satluj River D/S Rampur,1087-R-Sat-A	8.14	9.6	0.2	130
Satluj River D/S Dattnagar, Rhep, Rampur	8.58	10.5	0.2	70
Satluj River U/S Tatapani,1013-R-Sat-A,	7.61	9.4	0.3	80
Satluj River U/S Slapper, 1014-R-Sat-A	8.07	12.4	0.2	240

Name of the location	pH	D.O. mg/l	BOD mg/l	T.C. MPN/SPC per 100ml
Satluj River Dehar Power House, 1005-R- Bea-A	7.92	12.5	0.5	920
Satluj River D/S Slapper, 1015-R-Sat-A	8.01	12.3	0.4	540
Satluj River D/S Acc Barmana. Satluj River	7.99	12	0.7	920
Satluj River D/S Bhakhra 1016-R-Sat-A	7.79	10.8	0.1	20
Satluj River U/S Bhakra	7	11	0.4	24
Satluj River D/S Bilaspur, 1291-L-Gol-A	7.9	12	0.8	540
Swan River D/S Santokgarh 1869-R- Swan	8.01	9.4	2.2	160
Swan River U/S Landfill Site, Santokhgarh	7	8.6	1.4	120
Swan River D/S Landfill Site, Santokhgarh	7.6	7.7	1.8	160
Beas River U/S Manali, 1001-R-Bea-A	7.91	9	0.2	26
Beas River D/S Manali	7.03	10.9	5.9	≥2400
Beas River U/S Waste Processing Facility Manali	7.54	11.7	1.1	≥2400
Beas River D/S Waste Processing Facility Manali	7.38	11.6	1.3	≥2400
R. Beas D/S of Conf. With Allaign Nalla	7.15	11.5	1.4	≥2400
Allaign Nalla bef. conf. with Beas	8.06	11.4	0.9	≥2400
R. Beas D/S conf. with Duhangan Nalla	7.13	11.7	0.4	≥2400
Duhangan Nalla bef. conf with R. Beas	7.31	11.6	0.7	350
Beas River U/S Kullu	7.56	10.3	2.2	≥2400
Beas River D/S Kullu 1002-R-Bea-A	7.08	10.4	2.4	≥2400
Beas River U/S Waste Processing Facility Kullu	7.58	11.7	1.7	≥2400
Beas River D/S Waste Processing Facility Kullu	7.59	11.6	1.9	≥2400
Beas River U/S of Conf. Of R. Parvati	7.47	11.7	1.2	_2400
Parvati River U/S Manikaran	7.45	12.3	1	79
Parvati River D/S Manikaran	7.65	11.7	1.3	≥2400
Parvati River River at Bhunter 1290-R- Par_A	7.26	9	1.2	≥2400
Beas River D/S of conf. of R. Parvati	7.52	10.2	1.6	≥2400
Sainj River U/S Envisaged Power House site of Parvati-II	7.59	11.9	1.1	46
Sainj River D/S Envisaged Power House site of Parvati-II	7.56	11.8	1.5	130
Sainj River U/S Envisaged Power House Site of Parvati-III	7.5	11.8	1	130
Sainj River D/S Envisaged Power House Site Of Parvati-Iii	7.74	11.8	1.6	130
Beas River U/S Fermenta Biodil	7.73	11.7	0.6	280
Beas River D/S Fermenta Biodil	7.97	11.7	0.5	1600
Beas River D/S Aut , 1003-R-Bea-A	7.82	11.5	1	920
Largi River D/S Largi ,1090-R-Lar-A	8.05	12	0.6	180
Beas River D/S of Conf. of trt of Largi Hep Power House	7.77	11.5	1.3	23
Beas River U/S Pandoh Dam , 1004-R- Bea-A	7.78	11.6	0.4	23
Beas River D/S Pandoh Dam	7.52	11.4	0.7	70
Suketi River U/S of conf. of Dregger Outfall of SNR Balancing Reservoir	8.13	10.8	0.6	≥2400
Suketi River at Dadour Bridge	7.63	9.7	1.3	≥2400
Shuketi Khad U/S Mandi,	7.99	10.1	0.6	≥2400
Beas River D/S Mandi , 1006-R-Bea-A	7.56	11.5	0.4	920

Name of the location	pH	D.O. mg/l	BOD mg/l	T.C. MPN/SPC per 100ml
Beas River U/S Salt Mine Drang	7.15	10.7	7.6	≥ 2400
Beas River D/S Salt Mine Drang	8.37	9.3	0.3	17
Beas River D/S Mandi , 1006-R-Bea-A	8.37	8.7	0.5	21
Beas River U/S of conf. of Envisaged TRT of UHL-III	7.99	11	0.7	240
Beas River D/S of conf. of Envisaged Trt	8.42	11	1	350

TRT – Tail Race Tunnel

Sewage water quality of different STPs in Shimla in November 2009 is given in Table 28.

Table 28: Sewage Water Quality of different STPs

Name/ Location of STP	November 2009									
	pH		TSS		COD		BOD		TDS	
	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
Lalpani	7.22	7.00	1240.00	120.00	290.00	80.00	94.00	18.00	740.00	640.00
Sanjauli (Malyana)	7.90	7.25	140.00	100.00	310.00	80.00	102.00	24.00	820.00	760.00
Snowdone	8.10	7.46	298.00	60.00	350.00	46.00	275.00	15.00	1230.00	256.00
Dhalli	8.02	7.45	270.00	68.00	410.00	80.00	316.00	22.00	1640.00	412.00
Summerhill	7.98	7.26	234.00	48.00	370.00	58.00	234.00	14.00	1260.00	278.00
North disposal Shimla	8.05	7.45	395.00	58.00	400.00	68.00	280.00	24.00	2200.00	400.00

Name/ Location of STP	December 2009									
	pH		TSS		COD		BOD		TDS	
	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
Lalpani	7.30	7.02	1180	100.00	310.00	80.00	108.00	22.00	720.00	640.00
Sanjauli (malyana)	8.32	7.55	1220	120.00	310.00	88.00	104.00	28.20	900.00	700.00
Snowdone	Data Not Available									
Dhalli	8.12	7.4	425.00	76.00	394.00	80.00	310.00	19.00	1880.00	405.00
Summerhill	8.30	7.14	405.00	56.00	390.00	60.00	265.00	18.00	2100.00	400.00
North disposal Shimla	Data Not Available									

2.9 Institutional mechanisms within the sector to address identified environment issues

The organizational setup of IPH department is given in Figure 1.

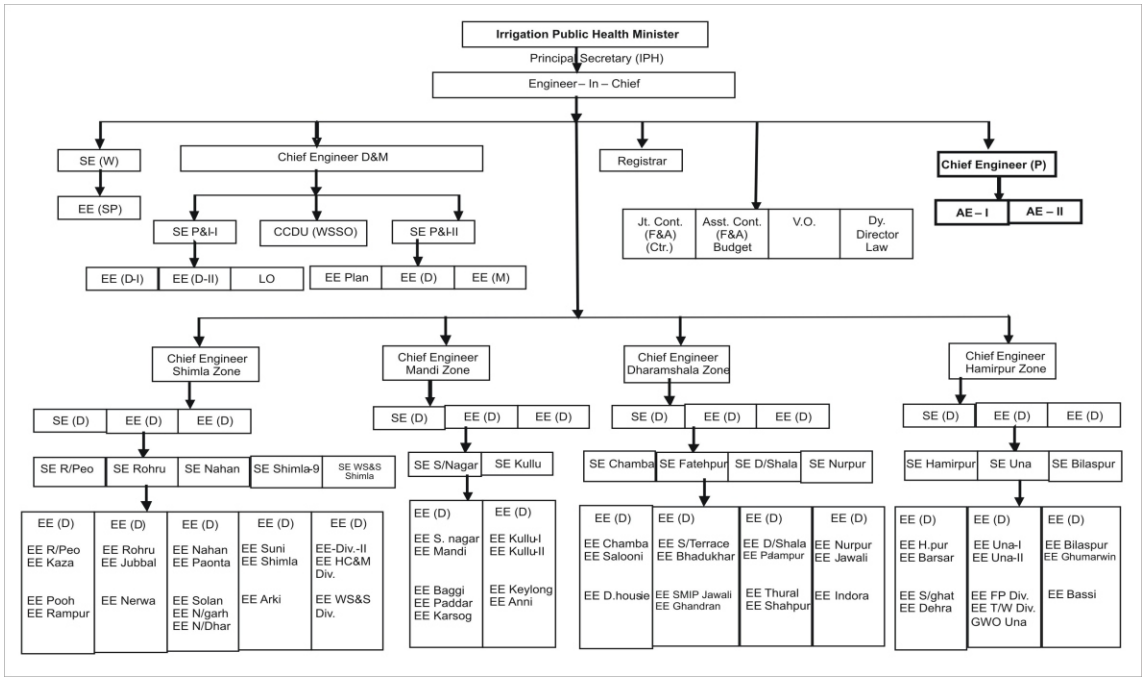


Figure 1: Organizational Setup of IPH Department

2.10 Data / documentation pertaining to addressing demographic issues in the context of the sectors, such as population changes; requirements of populations and changing lifestyles; migratory populations including tourists; transhumants; transit labour population; pressures felt by communities due to degraded environment conditions.

Water demand in rural & urban areas is given in Table 29 & water required is given in Table 30.

Table 29: Water Demand/requirement

District	Water Demand (Kld)	
	Category	2008
Chamba	Urban	5059.657
	Rural	32381.65
	Total	37441.31
Lahaul & Spiti	Urban	0
	Rural	2523.43
	Total	2523.43
Kinnaur	Urban	0
	Rural	5949.605
	Total	5949.605
Shimla	Urban	24496.02
	Rural	42173.66
	Total	66669.68
Sirmaur	Urban	6982.625
	Rural	31210.33
	Total	38192.95
Solan	Urban	13358.1
	Rural	31091.77
	Total	44449.86
Bilaspur	Urban	3215.347
	Rural	24223.6
	Total	27438.95
Una	Urban	5774.764
	Rural	31052.8
	Total	36827.57

District	Water Demand (Kld) Category	2008
Kangra	Urban	10580.87
	Rural	96238.1
	Total	106819
Kullu	Urban	4407.974
	Rural	26695.37
	Total	31103.35
Mandi	Urban	8932.546
	Rural	63826.97
	Total	72759.52
Hamirpur	Urban	4424.526
	Rural	29051.09
	Total	33475.62

Table 30: Water Required

District	Total Absolute Water Demand(KL/day) 2008
Chamba	37441.31
Bilaspur	27438.95
Hamirpur	33475.62
Kangra (Dharamshala)	10580.87
Kullu	31103.35
Mandi	72759.52
Shimla	66669.68
Sirmaur(Paonta Sahib)	6982.625
Solan	44449.86
Una	36827.57
Shimla	66669.68
Lahaul & Spiti	2523.43

Details of sewage generated in rural & urban areas in Himachal Pradesh is given in Table 31.

Table 31: Sewage Generation in Himachal Pradesh

District	Sewage (Kld) Category	2008
Chamba	Urban	4300.71
	Rural	27524.4
	Total	31825.1
Lahaul & Spiti	Urban	0
	Rural	2144.92
	Total	2144.92
Kinnaur	Urban	0
	Rural	5057.16
	Total	5057.16
Shimla	Urban	20821.6
	Rural	35847.6
	Total	56669.2
Sirmaur	Urban	5935.23
	Rural	26528.8
	Total	32464
Solan	Urban	11354.4
	Rural	26428
	Total	37782.4
Bilaspur	Urban	2733.05
	Rural	20590.1
	Total	23323.1
Una	Urban	4908.55
	Rural	26394.9
	Total	31303.4
Kangra	Urban	8993.74
	Rural	81802.4
	Total	90796.1
Kullu	Urban	3746.78
	Rural	22691.1
	Total	26437.8
Mandi	Urban	7592.66
	Rural	54252.9
	Total	61845.6
Hamirpur	Urban	3760.85
	Rural	24693.4
	Total	28454.3

Sewerage facility and status of sewerage treatment plant of some of the towns of Himachal is summarized in the following section.

Shimla: Shimla Municipal Area has an underground sewerage system and is maintained by IPH. The details of sources of water for Shimla city is given in Table 32.

Table 32: Details of Sources of Water for Shimla City

S.N.	Source Name / River Name	Transmission Type	Year of Start	Installed capacity (MLD)	Quantity of water produced (MLD)	Supply to SMC (MLD) Non Lean Period	Lean Period
1	Dhalli Catchment Area	Gravity	1875	4.54	1.80	0.23	0.20
2	Cherot / Jagroti Nallah	Pumping	1914	4.80	3.86	3.86	2.65
3	Chair Nallah	Pumping	1914	2.50	3.00	2.50	1.42

S.N.	Source Name / River	Transmission	Year of	Installed	Quantity of	Supply to SMC (MLD)	
4	Nauti Khad (Gumma)	Pumping	1924& 1982	24.06	19.75	24.06	16.80
5	Ashwani Khad	Pumping	1992	10.06	10.80	10.80	6.30
	Sub Total			36.62	33.55	37.36	24.52
6	Tube Wells (10 no.)						2.63
	Total						30.00

The combined design capacity of the water sources is 45.96 MLD, although the present yield is limited to 39.21 MLD (from the five sources) due to technical problems. Presently, 27.37 MLD of treated water from main sources is supplied to SMC and 2.63 MLD from tube wells during the lean period. The total water supplied to the city is 33.00 MLD.

Bilaspur: In Bilaspur town sewerage lines were laid in the year 1956-57. As per 1991, Census, there were 2499 residential houses in the town, out of which 1000 households i.e. 40 % sewerage connections. The length of present sewer lines is 23,880 metres having 1235 manholes. Presently, the sewage is being disposed in open Nallah and Khuds. In order to improve the sanitary conditions in the planning area, H.P. IPH Department has proposed to construct four treatment plants at Luhnu ground, at Diara below the house of Late Sh. Hari Chand Advocate, near water sports building at Roura and Police Lines, Lakhanpur in Sector I, Naggar Parishad. The estimated cost of these plants is Rs. 351 Lakhs the type of sewerage treatment and place of disposal of sewerage is given in Table 33.

Table 33: Type of sewerage treatment and place of disposal

Sr. No.	Location	Type of treatment	Place of disposal
1	Nihal Kharian Road	Sedimentation	Nallah
2	Near Girl School	Sedimentation	Nallah
3	Near Durga temple, Roura	Sedimentation	Nallah
4	Near meat market, Roura	Sedimentation	Nallah
5	Near Luxmi Narayan temple, Diara	Sedimentation	Nallah
6	Near house of Late Sh. Harish Chander,Advocate, Diara	Sedimentation	Nallah
7	Near Nalla Ka Naun	Sedimentation	Nallah
8	Near Lower Dholra	Sedimentation	Nallah
9	Near Lower Lakhanpur	Sedimentation	Nallah

Source: Executive Engineer, H.P. Irrigation and Public Health Department, Bilaspur.

Dalhousie: There is no sewerage system existing in the town. 48.27% houses have dry latrines and 51.73% have flush latrines. At present, night soil from dry latrines is being disposed off in the depressions and open Nallahs. There is no sewerage system existing in the town. 48.27% houses have dry latrines and 51.73% have flush latrines. At present, night soil from dry latrines is being disposed off in the depressions and open Nallahs.

Hamirpur: Majority of the houses have their own septic tanks and very few houses have the sewerage connection that too in the Govt. sector buildings like Housing Board Colony, NIT, Polytechnic etc. The sewerage scheme of Hamirpur town is under construction. Besides laying the sewerage network in town, the Govt. has provided subsidies for converting the dry latrines into water borne latrines under the low cost sanitation scheme, under the rural sanitation.

Kullu: The town does not have comprehensive sewerage system and is dependent on septic tanks and soak pits. The IPH department is implementing a sewerage scheme for the right bank of river Beas which shall cater to Naggar Panchayat area and area from Dhungri to Suinsa.

Sewerage Connections: The 95.62% houses does not have sewerage connection as given in Table 34.

Table 34: Sewerage Connection

Sewerage	No	%
Yes	20	4.38
No	437	95.62
Total	**457**	**100.00**

Mandi: As per 2001 Census, there were 6714 households in the town, out of which 2191 have sewerage connections. Rests have private sanitary system of septic tanks and soak pits. IPH Department has provided 100 sewerage connections to other people. Sewerage Treatment Plants have been designed for 40,000 persons. Type of sewerage treatment plants and place of disposal in Mandi is given in Table 35.

Table 35: Type of sewerage treatment and place of disposal in Mandi

Sr. No.	Location	Type of Treatment	Capacity of Treatment Plant	Place of Disposal
1	Raghunath - ka - Padhar	Biological Treatment	3.83 Million Litres per Day (MLD)	River Beas
2	Khaliar	Biological Treatment	0.47 Million Litres per Day (MLD)	River Beas

Source: Executive Engineer, H.P. Irrigation & cPHHealth Department, Mandi

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Besides laying the sewerage network in the town, Government of H.P. is also providing subsidies for converting the dry latrines into water borne latrines under Low Cost Sanitation schemes outside the Naggar Parishad areas. Presently, two Sewerage Treatment Plants at Raghunath -Ka – Paddar in Sector – XI and Khaliyar in Sector- X are existing. Two more sites have been identified at Bheuli in Sector-VIII and Shilla Kipper in Sector-VII. The length of existing sewer lines is 51,552 meter with 2,917 manholes. The diameters of sewer pipe line vary from150 mm to 600 mm. This system was designed for a population of 41,600 persons. However, to cater for the future requirement, a sewerage scheme worth Rs. 1079.32 Lakhs for laying of 150 mm to 600 mm diametre sewer pipe lines is under active consideration of IPH department.

Nahan: The town has no sewerage system. Drainage is generally through covered drains. Nahan town is famous on account of its covered drains. Town and Country Planning Department, Himachal Pradesh has implemented a number of schemes for channelisation and covering of existing Nallahs.

Solan: Out of total households, 22% households are having sewerage system, 53% households have septic tanks, 3% households flush it into open drain, 2% households have dry system of manual carriage, 3% of the households have pit latrine and 17% households are without latrine facilities and defecate in open. The details of sewerage system in Splan district is given in Table 36.

Table 36: Sewerage system in Solan district

Sr. No.	Description	No. of households	%
1.	Connected with sewerage system	2151	22
2.	Connected with own septic tank	5295	53
3.	Flush flowing into open drain	320	3
4.	Dry system of manual carriage	223	2
5.	Pit latrine	281	3
6.	No latrine available	1700	17
Total		**9970**	**100**

Status of on-going sewerage schemes (STP) in Himachal Pradesh is given in Table 37.

Table 37: Status of ongoing sewerage schemes (STP)

Sr. No.	District	Name of Scheme	Sewerage Treatment Plants Nos.	Capacity (Mld)	Remarks(Status)
1	**Hamirpur**	Hamirpur	3	3.13	Commissioned
				1.35	Commissioned
				0.68	98 % work completed
		Sujanpur	2	1.5	40% completed
				1.75	Work awarded
				1.31	Tender to be recalled
		Nadaun	3	0.2	do
				0.27	do
		Total	**8**	**10.19**	
2	**Kullu**	Kullu	3	2.5	Commissioned
				2.57	95 % completed.
				0.38	Commissioned
		Bhunter	3	0.99	70 % completed
				0.46	100 % completed.
				0.87	47 % completed
		Total	6	7.77	
3	**Sirmaur**	Paonta	3	**0.44**	Completed but to be commissioned
				1	95 % completed.
				1.72	Estimate under process.
		Total	3	3.16	
4	**Solan**	Solan	3	2.81	New proposal for zone A C D & E
				2.9	Submitted for approval
				2.98	Zone B, 2.9 MLD commissioned.
		Total	3	8.69	
5	**Mandi**	Sundernagar	1	3.55	Completed
		Sarkaghat	2	1.35	Yet to be started
				1.67	40 % completed
			3 Septic tank		Commissioned
		Total	**4**	**6.57**	
6	**Una**	Una	2	0.63	98 % completed
				2.53	90 % completed
		Mehatpur	3	0.94	Work yet to be started.
				0.73	-
				0.09	Work yet to be started
		Santokhgarh	1	1.6	
		Total	6	6.52	
7	**Chamba**	Chowari	1		Treatment was divided into 3 zones. Now as per instruction of CE (NZ), the scheme will be based on single T/unit, for which capacity of T/plan is to be finalized. Treatments were divided into 4 zones. Now as per instruction of CE, the scheme will be based on single T/unit, for which capacity of T/plant is to be finalized.
		Dalhousie	1		
		Total	2		
8	**Shimla**	Jubbal	1	0.65	Tender for STP awarded
		Kotkhai	1	0.57	Working estimate under process
		Narkanda	1	0.44	Material arranged.
		Sunni	1	0.51	-
		Theog	2	0.93	-
				0.66	-
		Total	**6**	3.76	
9	**Kangra**	Kangra		1.68	Tender under progress

Sr. No.	District	Name of Scheme	Sewerage Treatment Plants Nos.	Capacity (Mld)	Remarks(Status)
				1.46	do
			3	0.54	DNIT got approved
			1 (Septic Tank)	0.12	-
		Dehra	1	1.38	Technical approval under process
		Nagrota	1	1.34	85% work completed
		Nurpur	1	3.05	Tender received & under process.
		Total	**7**	**9.57**	
		Grand Total		**56.23**	

Source: IPH, Himachal Pradesh

Table 38: District wise Status of Habitation Coveredand is Yet to be Covered by IPH

Description		Chamba	Bilaspur	Hamirpur	Kangra	Kinnaur	Kullu	Lahaul & Spiti	Mandi	Shimla	Sirmaur	Solan	Una
Water Supply	Habitation yet to be covered as on 01.04.09 (Total)	7732	2416	2683	6613	379	3840	346	10239	7703	4338	3613	1946
	Achievement during 2009-10 up to 11/09 (Total)	5580	1220	2388	6652	379	2727	342	6515	5990	3423	2418	1349
Hand pumps	Status of Hand Pump up to 3/09	1012	1417	2023	4535	141	569	340	1946	1220	1422	1732	1240
	Achievement during 2009-10 up to 11/09	36	113	104	289	0	4	13	181	121	96	201	100
Irrigation	Area covered under Irrigation upto 3/09	9455 ha	7693 ha	7019 ha	65054 ha	7908 ha	7501 ha	6156 ha	31491 ha	11653 ha	2787 5 ha	1583 ha	1675 7 ha
	Achievement during 2009-10 up to 11/09	49 ha	25 ha	104 ha	257 ha	149 ha	40 ha	134 ha	130 ha	207 ha	267 ha	170 ha	702 ha
Command Area Development (CAD)	Area covered under CAD upto 3/09	No CAD Work	No CAD Work	No CAD Work	FC 3268 ha WB 2842 ha	No CAD Work	No CAD Work	No CAD Work	FC 7015 ha WB 6938 ha	No CAD Work	FC 6761 hac WB 6761 ha	No CAD Work	FC 5286 ha WB 5193 ha
	Achievement during 2009-10 up to 11/09				FC 0 ha WB 0 ha				FC 60 ha WB 60 ha		FC 0 ha WB 0 ha		FC 0hac WB 0hac
Flood Protection	Area Protected under Flood Protection upto 3/09	676.15 ha	426 ha	165 ha	2338.7 8 ha	1013 .39 ha	920. 82 ha	1157. 23 ha	703 ha	131 ha	1487. 36 ha	240 ha	5973. 14 ha
	Achievement during 2009-10 up to 11/09	1 hac	4 ha	0	92 ha	25 ha	0 ha	44 ha	0 ha	20 ha	70 ha	0 ha	350 ha

Blockwise cases of waterborne diseases in Mandi district given in Table 39.

Table 39: Reported Cases of waterborne diseases in Mandi district

Name of the Block: Medical	Popu-lation	Number of cases registered in last one year (April 2005 to March 2006)													
		Diarrhoea			Gastroenteritis			Typhoid			Hepatitis			TOTAL	Incidence
		OPD	IPD	Total	OPD	IPD	Total	OPD	IPD	Total	OPD	IPD	Total		
Ratti	160024	5973	524	6497	1679	519	2198	331	346	677	98	36	134	9506	5.94%
Riwalsar	78584	3738	180	3918	176	52	228	367	78	445	18	14	32	4623	5.88%
Drang (Paddhar)	87831	5099	525	5624	1012	500	1512	357	177	534	72	6	78	7748	8.82%
Chauntra	72742	2476	33	2509	41	30	71	140	31	171	1	0	1	2752	3.78%
Chakhiot (Bagsaid)	65836	2194	224	2418	160	104	264	31	1	32	0	0	0	2714	4.12%
Seraj	82125	4806	265	5071	541	103	644	6	0	6	0	0	0	5721	6.97%
Dharampur	95816	3419	199	3618	514	73	587	597	2	599	0	0	0	4804	5.01%
Gopalpur	98845	4809	416	5225	558	118	676	1323	454	1777	49	3	52	7730	7.82%
Rohand (Sundernagar)	126081	4158	179	4337	704	204	908	962	185	1147	0	0	0	6392	5.07%
Karsog	102686	5241	301	5542	728	125	853	897	136	1033	93	0	93	7521	7.32%
TOTAL	**970570**			**44759**			**7941**			**6421**			**390**	**59511**	**6.13%**

Source: Environment related studies & Study on opportunity cost of unclean water with regard to health in Himachal Pradesh by IPH Dept. HP, WASH, GTZ.

Habitations covered by IPH for water supply in terms of partially covered, fully covered and not covered have been summarized in the Table 40 (a) and Table 40 (b).

Table 40(a): Habitations covered by IPH

Sr. No.	Name of District	Habitations as per survey 2003 as on 1.4.2008					Target for 2008-09 (GOI)		
		NC (0-10)	PC (11-40)	Total (NC+PC)	FC	G.Total	MNP	ARWSP	Total
1	Chamba	471	2994	3465	4267	7732	324	516	840
2	Kangra	106	797	903	5710	6613	85	136	221
3	Una	198	813	1011	935	1946	95	150	245
4	Hamirpur	0	704	704	1979	2683	65	102	167
5	Bilaspur	0	1433	1433	983	2416	130	210	340
6	Mandi	1563	4162	5730	4509	10239	530	845	1375
7	Kullu	701	1010	1711	2129	3840	158	250	408
8	Lahaul & Spiti	2	3	5	341	346	0	1	1
9	Shimla	523	2312	2835	4868	7703	260	416	676
10	Solan	591	1259	1850	1763	3613	171	272	443
11	Sirmaur	891	1020	1911	2427	4338	180	282	462
12	Kinnaur	4	20	24	355	379	2	4	6
Grand Total		**5050**	**16527**	**21582**	**30266**	**51848**	**2000**	**3184**	**5184**

Table 40(b): District wise habitations covered by I PH

Sr. No.	Name of District	Coverage up to 12/08 Under ARWSP NC (0-10)	PC (11-40)	Total (NC+PC)	Under MNP NC (0-10)	PC (11-40)	Total (NC+PC)	Status of survey 2003 (as on 1.01.09) NC (0-10)	PC (11-40)	Total (NC+PC)	FC	G. Total
1	Chamba	47	117	164	20	288	308	404	2589	2993	4739	7732
2	Kangra	102	251	353	4	27	31	0	519	519	6094	6613
3	Una	17	120	137	9	44	53	172	649	821	1125	1946
4	Hamirpur	0	204	204	0	0	0	0	500	500	2183	2683
5	Bilaspur	0	112	112	0	19	19	0	1302	1302	1114	2416
6	Mandi	237	402	639	34	118	152	1297	3642	4939	5300	10239
7	Kullu	10	10	20	16	21	37	675	979	1654	2186	3840
8	Lahaul & Spiti	0	1	1	0	0	0	2	2	4	342	346
9	Shimla	70	350	420	0	53	53	453	1909	2362	5341	7703
10	Solan	34	82	116	9	90	99	548	1087	1635	1978	3613
11	Sirmaur	105	86	191	107	185	292	679	749	1428	2910	4338
12	Kinnaur	4	9	13	0	4	4	0	7	7	372	379
Grand Total		**626**	**1744**	**2370**	**199**	**849**	**1048**	**4230**	**13934**	**18164**	**33684**	**51848**

District/Circle wise status of installed and non functional Hand-pump upto 01.02.2010 is given in Table 41.

Table 41: District/Circle wise status of installed and non functional Hand-pump upto 01.02.2010

Sr. No.	Distt.	Circle	Total Hand pump installed upto 31.03.09	Total Handpump installed upto 31.01.2010	No. of Non Functional Handpumps & reason: Repairable	Non Repairable	Water level down	Total (6+7+8)	Quality Problem/ Excess iron
1	2	3	4	5	6	7	8	9	10
1	Shimla	R/Peo	123	133	1	0	5	**6**	0
		Rohru	538	642	23	12	14	**49**	0
		Shimla	515	577	19	10	0	**29**	0
		Shimla-U/Area	44	44	0	0	0	**0**	0
		Total:-	**1220**	**1396**	**43**	**22**	**19**	**84**	**0**
2	Solan	Shimla	610	645	12	5	4	**21**	0
		Nahan	1122	1288	21	5	0	**26**	0
		Total:-	**1732**	**1933**	**33**	**10**	**4**	**47**	**0**
3	Sirmaur	Nahan	**1422**	**1518**	**21**	**75**	**0**	**96**	**0**
4	Kinnaur	R/Peo	**141**	**160**	**6**	**8**	**0**	**14**	**0**
5	L&S	Kullu	99	112	3	0	0	**3**	0
		R/Peo	241	246	0	1	0	**1**	0
		Total:-	**340**	**358**	**3**	**1**	**0**	**4**	**0**
6	Hamirpur	Hamirpur	**2023**	**2246**	**50**	**4**	**5**	**59**	**61**
7	Bilaspur	Bilaspur	**1471**	**1605**	**17**	**21**	**26**	**64**	**50**
8	Una	Una	**1240**	**1360**	**12**	**71**	**51**	**134**	**2**
9	Mandi	Hamirpur S/Ghat)	566	675	0	0	16	**16**	20
		Sundernagar	1380	1541	68	30	28	**126**	17
		Total:-	**1946**	**2216**	**68**	**30**	**44**	**142**	**37**
10	Kullu	Kullu	**569**	**598**	**16**	**18**	**18**	**52**	**8**
11	Chamba	Chamba	937	986	24	7	4	**35**	5
		Chamba-	75	78	0	0	0	**0**	0

Sr. No.	Distt.	Circle	Total Hand pump installed upto 31.03.09	Total Handpump installed upto 31.01.2010	No. of Non Functional Handpumps & reason				Quality Problem/ Excess iron
					Repairable	Non Repairable	Water level down	Total (6+7+8)	
		Tribal							
		Total:-	**1012**	**1064**	**24**	**7**	**4**	**35**	**5**
12	Kangra	Nurpur	1218	1218	23	35	0	**58**	0
		Dharamshala	2499	2733	19	64	0	**83**	0
		Hamirpur (Dehra)	818	909	18	33	0	**51**	19
		Total:-	**4535**	**4860**	**60**	**132**	**0**	**192**	**19**
		G.Total:	**17651**	**19314**	**353**	**399**	**171**	**923**	**182**

District /Tehsil wise Status of Irrigation in HP

Bilaspur: The net irrigated area in the district during 1998-99 was 3,164 ha. The kuhls constitute the major source of irrigation in the district which accounted for 72.41% of the net irrigated area during the 1998-99. These small water channels called kuhls are made by making notches on the river and other water sources and water is thus led to the fields for irrigation. The irrigation by wells and tube wells was available to 194 hectares and 679 ha of irrigated land was irrigated by other sources of irrigation in the district during 1998-99. The breakup of net irrigated area and percentage net irrigated area to total net cropped area at tehsil/sub-tehsil level is given in Table 42.

Table 42: Net Irrigated Area (in ha)

Agricultural Year	Kuhls/Canals	Tank	Well and Tube well	Other sources	Total	Percentage of net irrigated area sown to total net area
1990-91	1,854	-	264	771	2,889	8.9
1991-92	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1992-93	2,393	31	485	1	2,910	9.1
1993-94	2,323	22	564	-	2,909	9.1
1994-95	2,323	22	564	-	2,909	9.0
1995-96	2,291	-	194	679	3,164	10.2
1996-97	2,291	-	194	679	3,164	10.2
1997-98	2,291	-	194	679	3,164	10.2
1998-99	2,291	-	194	679	3,164	10.4

Source: - District Statistical Abstract-2000

At C.D. block level, data shows that Ghumarwin block with 262 villages have a total area of 20,281 hectares. Of this 51.1% of land is cultivable and 11.2% is an irrigated land. Geharwin block, all the 275 village have a total area 33,919 hectares. 31.2% land is cultivable and of this 2.7% land is under irrigated. The C.D. block, Bilaspur Sadar has a total 49,920 hectares area of 428 villages. The percentage of cultivable area accounts for 22.1%. Of this 17.9% area is under irrigation.

Source of irrigation are: Government Canal, Private Canal, Well (without electricity), Well (with electricity), Tubewell (without electricity), Tubewell (with electricity), Tank, River, Lake, Water fall,

Chamba: The hilly terrain of the district present difficulties in providing adequate irrigation facilities. The only source of irrigation available in the district is Kuhls. Out of total cropped area of the district, only 6,580 hectares were having irrigation facilities of one type or the other, which shows that large part of

cultivated land depends upon the vagaries of weather. The proportion of irrigated area is only 9.92% out of total net cultivated area in the district.

Irrigation facilities are being provided by the Soil Conservation Wing of Agriculture Department. A watershed irrigation tank of 9 Cum capacity is provided at subsidy by the Department while community irrigation schemes are being provided at 100% subsidy. Table 43 given details of the total area in hectare at the percentage of irrigated area to total cultivable area.

Table 43: Percentage of irrigated area to cultivable area

Sr. No.	Name of C. D. block	Number of inhabited villages	Total area in Ha	Percentage of cultivable area to total area	Percentage of irrigated area to total cultivable area
1	Pangi	59	41,034	5.3	45.2
2	Tisa	170	49,599	12.8	0.1
3	Saluni	225	40,191	19.1	1.3
4	Chamba	111	29,918	22.4	4
5	Bhattiyat	323	57,738	17.8	24.3
6	Mehla	129	58,321	14.3	3.2
7	Bharmaur	101	45,892	17.4	0
	District Total:	**1,118**	**322,693**	**15.3**	**8.3**

Note : - Cultivable area = irrigated area + unirrigated area

Table 43 also shows C.D blockwise distribution of villages according to land use. It gives details of total area and cultivable area available of inhabited villages in the district. Cultivated area includes irrigated as well as unirrigated area. It further elaborates the extent of cultivable area under irrigation. There are total 1,118 inhabited villages in the district having a total area of 322,693 hectares. Of this, 15.3% is cultivable and 8.3% of total cultivable area has irrigation facility.

Kangra: Kangra district is drained by several perennial rivers and khads which provide vast potential for development of irrigation facility to the cultivated area. Cultivated area is mainly irrigated by means of kuhls by diverting water of streams through the kuhls. The net cultivated area in the district was 118,521 hectares out of which 32,194 hectares were irrigated during 1998-99. The proportion of net irrigated area was only 27.16% of the total net cultivated area during 198-99. It shows that more than 70% of area depends on rainfall. The irrigated area (source wise) during 1999-2000 is given in Table 44.

Table 44: Irrigated area (source-wise) in 1999-2000

Year	Source wise irrigated area (in hectares)				
	Canal/Kuhl	Tank	Well and Tube Well	Others	Total
1999-2000	30,128	-	2,056	-	32,194

Source: District Statistical Abstract Kangra, 2000

The only major irrigation project in the State is Shahnehar project in Kangra district and is under execution. On completion of this project, an irrigation potential of 15,287 hectares shall be created.The main source of irrigation in the district are lift canals, government canals, private canals, tube-wells, and wells etc.

Kinnaur: The major source of irrigation in the district is kuhls. The other sources of irrigation are not in use due to hilly terrain. Table 45 shows the area irrigated by the different sources of irrigation from 1991-92 to 1999-2000 in the district as well as tehsil/sub-tehsil.

Table 45: Source wise Irrigated Area (In Hectares)

year	Irrigation by kuhls	Other sources of irrigation viz. Canal, Well, Lake, Tube well etc.	Tehsil wise irrigated area for the year 1999-2000	Irrigated area
1991-92	4,841	-	Nichar	184
1992-93	4,258	-	Sangla	994
1993-94	4,307	-	Kalpa	1,442
1994-95	5,622	-	Morang	1,062

1995-96	5,523	-	Pooh	605
1996-97	5,523	-	Hangrang	403
1997-98	5,528	-	Total	4,690
1998-99	5,534	-		
1999-2000	4,690	-		

Source: District Statistical Abstract, Kinnaur-2000

Kullu: During 1999, the total net cultivated area in the district was 35,524 hectares. Out of this area only, 2,267 ha was under irrigation.

The major source of irrigation in the district is Kuhls, lift irrigation where water is lifted from the streams/rivers by electric motor and tanks wherein rainwater is stored. The other sources of irrigation are not in use due to the hilly terrain. More than half of the total irrigated area falls in Kullu and Manali Tehsils which constitutes the main Kullu valley. Details of area irrigated by different sources is given in the Table 46.

Table 46: Irrigated Area Source-wise from 1995-96 to 1998-99

Agriculture year	Source wise irrigated Area (Ha.)					
	Canal	Tank	Well	Tube well	Others including Kuhls & lift irrigation	Total
1995-96	-	-	-	-	2,596	2,596
1996-97	-	-	-	-	N.A.	N.A.
1997-98	-	-	-	-	2,665	2,665
1998-99	-	-	-	-	2,267	2,267
Tehsil wise irrigated Area for the year 1998-99						
Kullu	-	-	-	-	1,063	1,063
Manali		-	-	-	446	446
Sainj	-	-	-	-	42	42
Banjar	-	-	-	-	2	2
Ani	-	-	-	-	148	148
Nirmand	-	-	-	-	566	566
Total	**-**	**-**	**-**	**-**	**2,267**	**2,267**

Source: Statistical Abstract, Kullu-2000.

Lahaul & Spiti: The rain in the district is very scanty and occasional. The people, therefore are constrained to depend upon perennial irrigation facilities which are sourced from springs, nallahs and rivers through the local kuhls. Most of the cultivated area in the district is irrigated while in Lahaul it is almost 100%, in Spiti it is about 85%. District Land Record shows that 3,264 ha land is under irrigation in the district during 1999-2000. Of these, 1,361 ha of irrigated land pertains to Lahaul, 763 ha to Udaipur and 1,140 ha to Spiti tehsil. 971 ha of irrigated land of district was under cereals. 818 ha under potato cultivation, 18 ha under oil seeds and 1,457 ha under the various pulses and peas. Irrigation sources in Lahaul & Spiti district during 1999-2000 is given in Table 47.

Table 47: Irrigation sources in Lahaul & Spiti district during 1999-2000

District/Tehsil/ Sub-tehsil	Source wise irrigated area (in hectares)			
			Other Sources (Kuhl/ spring Govt.& Private)	Total
Lahaul (T)	-	-	1,361	1,361
Udaipur (S.T)	-	-	763	763
Spiti (T)	-	-	1,140	1,140
Lahaul & Spiti	-	-	3,264	3,264

Source: District Land Record Officer, Keylong

Mandi: Irrigation is entirely from Kuhls or small water courses emanating from the minor streams and hill torrents. There is no irrigation from Beas and very little from Suketi while the beds of their main tributaries are usually too deep in their lower courses to permit large areas being watered. 1997-98, only 13,139 ha constituting 14.34% of the net cropped area of 91,612 hectares in the district was irrigated. The lift irrigation has been introduced and shallow wells have been dug by employing German rigs supplied under the Indo-German Agriculture Projects in the valley areas. The gravity irrigation schemes are also being executed making productive use of the stream flow. Sprinkle irrigation was introduced in Balh valley and the system has become popular and extends to lower areas. The tube-wells have been introduced in Balh valley. A more efficient system of irrigation with under ground air-conditioned pressure pipes connected directly with the centrifugal pump and (which lift out for irrigation) protected with alfa-alfa valves has

been introduced. The additional benefit of this arrangement is that it saves the valuable agricultural land, and protection from wastage and the land thus saved meets the cost of construction in about eight years. Area irrigated by various sources is given in Table 48.

Table 48: Area irrigated by various sources

Year	Irrigated by well (in Ha)	Other sources (in Ha.)	Total irrigated Area (in Ha.)
1997-98	202	12,937	13,139

Source: District Statistical Abstract, Mandi, 2000

District/ tehsil/Sub-tehsil	Govt. Canal	Govt.Tube-well	Private Tube-well	Tank	Govt. Kuhl	PrivateKuhl	Govt. Irrigatio-n Scheme	Private Lift Irrigation Scheme	Total Area Irrigated
Sirmaur	3,337	1,635	865	-	662	7,772	133	1	14,405
Rajgarh	-	-	-	-	3	1,510	-	-	1,513
Nahan	55	697	2	-	112	369	129	1	1,365
Pachhad	-	-	-	-	218	948	-	-	1,166
Renuka	-	-	-	-	149	848	4	-	1,001
Shillai	-	-	-	-	5	873	-	-	878
Paonta Sahib	3,282	895	803	-	77	973	-	-	6,030
Kamrau	-	43	60	-	98	555	-	-	756
Dadahu	-	-	-	-	-	549	-	-	549
Nohra Dhar	-	-	-	-	-	837	-	-	837
Ronhat	-	-	-	-	-	310	-	-	310

Source: District Statistical Abstract, Sirmaur- 2001

Solan: Due to terrain extensive irrigation is difficult in the district. However, cultivated area exists in patches in villages along the hill slopes which is basically suited for minor irrigation. The district has a number of perennial streams with immense scope for exploitation of surface water potential. Tehsil wise irrigated area by various sources in Solan district is given in Table 49.

Table 49: Net irrigated area by various sources (in ha) in Solan district

Tehsil/Sub-tehsil	Canal/Kuhl	Pond	Well and Tap	Other sources	Total Irrigated Area
Arki	2,117	-	-	143	2,260
Kandaghat	732	5	-	32	769
Kasauli	1,354	-	320	-	1,674
Krishangarh	640	-	-	5	645
Nalagarh	2202	-	1,726	184	4,122
Ramshehar	865	-	4	5	874
Solan	1,281	-	-	2	1,283
District Total	**9,191**	**5**	**2050**	**371**	**11,627**

Source:-Statistical Abstract, Solan district,2000

Table 50 shows that 11,627 ha of land in Solan district is irrigated by various sources. As many as 9,191 hectares of land was irrigated by canal or local Kuhls, while irrigation source of well/taps was available to another 2,050 ha of irrigated land in the district, 371 ha was irrigated by other sources and only 5 ha was irrigated by ponds. 4122 ha of land in Nalagarh tehsil was covered under irrigation facilities whereas it was available to only 645 ha of land in Krishangarh sub-tehsil. Crop wise 12,013 ha of irrigated area was covered by wheat, 9,891 ha by maize, 7,992 ha by paddy, 915 ha by pulses and 132 and 116 ha by barley and potato respectively. Existence of excess irrigated area while calculating it covered under various crops is due to counting of sowing and irrigation occasions at various times.

Una: The main river of district is Swan which does not provide the perennial source of water. However, the water level in plain area and adjoining to Swan river is shallow which can be used for irrigation by digging tube wells. Besides this, water of river Satluj has been lifted at village Bhabour Sahib of Punjab to provide irrigation facility to the some of villages of Una tehsil. The main sources of irrigation in the district are Canals, Tube- wells and Wells.

2.11 Information on human resource management issues (which may have relevance to environment management) in the sector such as: manpower, vocational training, awareness levels etc.

Principal Secretary (IPH) to the Government of Himachal Pradesh: Himachal Pradesh Irrigation & Public Health Department is under the overall administrative control of Principal Secretary (IPH) to the Government of Himachal Pradesh.

Engineer-in-Chief: The Department is headed by Engineer-in-Chief whose office is at Shimla and s/he is assisted by four Zonal Chief Engineers & a Chief Engineer-Design and Monitoring for effective management and implementation of Government programme in this sector.

Dharamshala Zone: District Kangra and Chamba comes under the jurisdiction of this zone. 3 IPH circles namely Nurpur, Dharamshala, Shahnehar at Fatehpur and Chamba comprise this zone.

Mandi Zone: District Kullu, Mandi and Lahaul area of District Lahaul & Spiti comes under the jurisdiction of this zone. 2 IPH circles namely Kullu and Sundernagar comprise this zone.

Shimla Zone: District Shimla, Solan, Sirmaur, Kinnaur and Spiti area of District Lahaul & Spiti come under the jurisdiction of this zone. 5 IPH circles namely Reckong Peo, Rohru, Shimla-9, WS&S Circle Shimla-3 and Nahan comprise this zone.

Hamirpur Zone: District Hamirpur, Bilaspur and Una come under the jurisdiction of this zone. 3 IPH circles namely Hamirpur, Bilaspur and Una comprise this zone. Details of other employees in IPH Department is given in Table 50.

Table 50: Status of other employees in IPH Department

Sr. No.	No. of Employees	Designation	Status As on
1	593	Junior Engineer (Civil)	31-12-2005
2	26	Junior Engineer (Mechanical)	31-12-2005
3	1	Junior Engineer (Electrical)	31-12-2005
4	3	Legal Assistant	31-12-2004
5	5	Personal Assistant	31-12-2005
6	31	Sr. Scale Stenographer	31-12-2005
7	30	Circle Head Draughtsman	31-12-2006
8	107	Divisional Head Draughtsman	31-12-2006
9	201	Draughtsman	31-12-2006
10	146	Junior Draughtsman	31-12-2006
11	3	Jamadar	31-12-2006
12	1	Restorer	31-12-2006
13	1	Sweeper	31-12-2006
14	3	Daftri	31-12-2006
15	12	Peon	31-12-2006

2.12 Regulatory Analysis to identify any regulations that have environment implications (negative or positive) and compliance with the same.

- State Water Policy Draft
- HP Tourism Policy
- HP Municipal Act
- HP Ground Water Pollution Act
- HP Town & Country planning Act
- Panchayati Raj Act
- State Sector Reforms
- NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNNURM
- Rural Tourism Infrastructure Development Scheme
- Total Sanitation Campaign
- Health Vision, 2008
- HP Non-Biodegradable Garbage (Control) Act
- River/Stream Bed Mining Policy Guidelines
- HP Municipal Act/ HP Municipal Bye-Law
- New Hydropower Policy
- HP Forest Sector Policy
- Notification No. IPH-B (C) 10-1/2004
- Notification No. IPH-B (C) 10-3/2004
- Notification No. IPH-B (F) 2-2/2004
- Notification No. IPH-B (F) 5-4/2004

CHAPTER 3 HEALTH

3.1 Resource Inventory of existing assets of the sector

The attempt of the Himachal Pradesh Government in providing health care to the people of the State has been to follow the determining principle of the World Health Organisation meet held at Geneva in 1979. It was "with the objective of continually improving the state of health of the total population, every individual should have access to primary health care and through it, to all levels of comprehensive health system." The Government of Himachal Pradesh aware that the primary health care has to be the hub of the health system. It has to be comprehensive in addressing the main health problems in the community providing promotive, preventive, curative and rehabilitative care. These services include:

- Health education and its promotion
- Promotion of nutrition
- Adequate supply of safe water
- Basic sanitation
- Maternal and child care and family welfare services
- Immunization against the major infectious diseases
- Prevention and control of the locally endemic diseases
- Appropriate treatment for common diseases and injuries

Health Vision 2008: The Government of Himachal Pradesh has drawn a Health Vision 2008. The purpose is to have a directional movement towards better health of the people of the State which does not signify merely the absence of disease. WHO defines health as a "complete state of physical, mental, and social well being." The state of health of the individual, or the community, is a function of the socio-economic environment and the Health Vision aim to promote:

- a stake in a change of the system;
- a hope in a more concerted effort to tackle problems and
- a vision for more people responsive to health care.

The Health Vision gives the vital rates to be achieved by 2008 as given in Table 1.

Table 1: Vital Health Rates for Himachal Pradesh

Health Indicators	Existing SRS-2002	Vision 2008
Birth Rate	20.7	19.00
Death Rate	7.5	7,0
Infant Mortality Rate	52	45
Neonatal Mortality Rate	31	20
Child Mortality Rate	13	10
Total Fertility Rate	2.3	2.0

SRS: Sample Registration System. Source: Health Vision 2008

State has 1640 Health Centres – 1135 with the Department of ISMH and 505 Primary Health Centres, 439 (PHCs) and 66 Community Health Centres (CHCs) with the HFWD- functioning at the Primary Health Care level. Details of various Government Health Institutions is given in Table 2.

Table 2: District-wise position of buildings in respect of various Government health institutions as on 31-3-2008

District	Type of Institutions	Total Number (31-3-08)	Govt. Building	Panchayat Building	Donated Building	Rented Building	Under Construction if any
1.Bilaspur	Regional Hospital	1	1				
	Other Hospital	1	1				
	CHC	6	6				6

District	Type of Institutions	Total Number (31-3-08)	Govt. Building	Panchayat Building	Donated Building	Rented Building	Under Construction if any
	PHC	27	24	1	0	2	9
	CD	2	2				
	Sub-Centres	116	91	0	25	0	0
2.Chamba	Regional Hospital	1	1				
	Other Hospital	3	3				2
	CHC	7	7				
	PHC	42	30	6	0	6	3
	CD	0	0				
	Sub-Centres	170	125	45	0	0	0
3.Hamirpur	Regional Hospital	1	1				
	Other Hospital	1	1				
	CHC	5	5				1
	PHC	25	20	3	0	2	5
	CD	0	0				
	Sub-Centres	151	73	7	71	0	0
4.Kangra	Dr.R.P. Zonal Hospital	1	1				
	Other Hospital	8	8				2
	CHC	14	12	1	1		4
	PHC	77	61	16	0		24
	CD	2	2				
	Sub-Centres	434	127	0	307	0	4
5.Kinnaur	Regional Hospital	1	1				
	Other Hospital	1	1				1
	CHC	3	3				1
	PHC	21	15	6	0		9
	CD	0	0				
	Sub-Centres	33	21	11	0	1	8
6. Kullu	Regional Hospital	1	1				1
	Other Hospital	1	1				
	CHC	5	5				1
	PHC	17	16	0	0	1	3
	CD	0	0				
	Sub-Centres	101	87	0	10	4	0
7.Lahaul & Spiti	Regional Hospital	1	1				
	Other Hospital	0	0				
	CHC	3	3				
	PHC	16	15	0	0	1	
	CD	0	0				
	Sub-Centres	36	23	0	13	0	6
8.Mandi	NSCB Zonal Hospital	1	1				
	Other Hospital	5	5				3
	CHC	11	10		1		3
	PHC	61	44	7	6	4	4
	CD	0	0				
	SUB-Centres	312	235	0	76	1	2
9.Shimla	DDU Zonal Hospital	1	1				
	Other Hospital	11	11				1
	CHC	7	5		2		
	PHC	76	68	0	1	7	19
	CD	9	9				
	Sub-Centres	261	169	35	49	8	0

District	Type of Institutions	Total Number (31-3-08)	Govt. Building	Panchayat Building	Donated Building	Rented Building	Under Construction if any
10.Sirmaur	Regional Hospital	1	1				
	Other Hospital	4	4				
	CHC	3	3				
	PHC	36	17	9	0	10	6
	CD	3	3				
	Sub-Centres	148	72	0	76	0	1
11.Solan	Regional Hospital	1	1				
	Other Hospital	4	4				1
	CHC	4	3		1		
	PHC	32	19	6	0	7	8
	CD	5	5				
	Sub-Centres	178	130	8	40	0	2
12.Una	Regional Hospital	1	1				
	Other Hospital	1	1				
	CHC	5	4		1		1
	PHC	19	18	0	0	1	7
	CD	1	1				
	Sub-Centres	131	108	23	0	0	0
HP	Regional Hospital	12	12	0	0	0	1
	Other Hospital	40	40	0	0	0	10
	CHC	73	66	1	6	0	17
	PHC	449	347	54	7	41	97
	CD	22	22	0	0	0	0
	Sub-Centres	2071	1261	129	667	14	23
H.P.	Zonal Hospital	3	3	0	0		
	Regional Hospital	9	9	0	0		1
	Other Hospital	39	39	0	0		11
	CHC	73	66	1	6		17
	PHC	449	347	54	7	41	97
	CD	22	22	0	0		0
	Sub-Centres	2071	1261	129	667	14	23

District wise details of hospitals in Himachal Pradesh is given in Table 3.

Table 3: District Wise Number of hospitals in Himachal Pradesh as on 31-03-2008

District	HOSPITALS					
	Zonal Hospital	District Hospital	Civil Hospital	Ref. Hospital	Teaching Hospital	Total Hospital
1.Bilaspur	1	0	1	0	0	2
2.Chamba	1	0		1	0	4
3.Hamirpur	1	0	1	0	0	2
4.Kangra	1	0	7	0	1	9
5.Kinnaur	0	1	1	0	0	2
6.Kullu	1	0	1	0	0	2
7. Lahaul & Spiti	0	1	0	0	0	1
8.Mandi	1	0	4	1	0	6
9.Shimla	1	0	8	1	2	12
10.Sirmaur	1	0	3	1	0	5
11.Solan	1	0	4	0	0	5
12.Una	1	0	1	0	0	2
H. P.	**10**	**2**	**33**	**4**	**3**	**52**

Details of dental hospital are given in Table 4.

Table 4: Dental hospital at Himachal Pradesh

Sr. No.	Name of dental hospital	Location
1.	Bhojia Dental College & Hospital	Chandigarh - Nalagarh Road, Budh, (Baddi) Teh. Nalagarh (H.P.)
2.	H.P. Govt. Dental College & Hospital	Shimla – 171 001 (Himachal Pradesh)
3.	Himachal Dental College	Sunder Naggar, Distt. Mandi, (HimachalPradesh
4.	Himachal Institute of Dental Sciences	Paonta Sahib, Distt. Sirmaur (H.P.)
5.	MNDAV Dental College & Hospital	Tatul, P.O. Oachghat-173223 (H.P.)

Details of district wise no. of medical institutions, hospitals (CHC, PHC and dispensaries) etc. as on 31.03.2008 is given in Table 5.

Table 5: District wise number of medical Institutions, beds and Community Development Block in Himachal Pradesh As On 31-03-2008

Sr. No.	District	Hospitals	Community Health Centres	Primary Health Centres	Civil Dispensaries	Sub Centres	Beds (Sanctioned)	Beds (In-Position)
	1	2	3	4	5	6	7	8
1	Bilaspur	2	6	27	2	116	385	355
2	Chamba	4	7	42	0	170	611	560
3	Hamirpur	2	5	25	0	151	434	366
4	Kangra	9	14	77	2	434	1962	1704
5	Kinnaur	2	3	21	0	33	226	197
6	Kullu	2	5	17	0	101	392	345
7	Lahaul & Spiti	1	3	16	0	36	136	94
8	Mandi	6	11	61	0	312	1110	909
9	Shimla	12	7	76	9	261	2224	1803
10	Sirmaur	5	3	36	3	148	604	391
11	Solan	5	4	32	5	178	721	554
12	Una	2	5	19	1	131	369	347
13	H.P.	52	73	449	22	2071	9174	7625

Table 6: Bilaspur

Sr. No.	Number of Medical Institutions	2005	2006	30-6-2007	31-3-2008
1	General Hospitals	2	2	2	2
2	Community Health Centres (Total)	5	5	6	5
3	Primary Health Centres (Total)	27	27	27	25
4	Civil Dispensaries	2	2	2	0
5	Sub- Centres	117	117	116	151
6	Number of Beds (Sanctioned)	385	385	385	385
7	Number of Beds (in position)	-		355	355

Table 7: Hamirpur

Sr. No.	Number of Medical Institutions	30-6-2005	30-6-2006	30-6-2007	31-3-2008
1	General Hospitals	2	2	2	2
2	Community Health Centres Total	5	5	5	5
3	Primary Health Centres Total	24	27	25	25
4	Civil Dispensaries	0	2	0	0
5	Sub- Centres	152	117	151	151
6	Number of Beds (Sanctioned)	434	385	434	434
7	Number of Beds (in position)			366	366

Table 8: Chamba

Sr. No.	Number of Medical Institutions	30-6-2005	30-6-2006	30-6-2007	31-3-2008
1	General Hospitals	4	4	4	4

Sr. No.	Number of Medical Institutions	30-6-2005	30-6-2006	30-6-2007	31-3-2008
2	Community Health Centres (Total)	7	7	7	7
3	Primary Health Centres (Total)	40	40	41	42
4	Civil Dispensaries	0	0	0	0
5	Sub- Centres	169	169	170	170
6	Number of Beds (Sanctioned)	611	611	611	611
7	Number of Beds (in position)	0	0	560	560

Table 9: Kangra

Sr. No.	Number of Medical Institutions	30-6-2005	30-6-2006	30-6-2007	31-3-2008
1	General Hospitals	8	8	8	9
2	Community Health Centres (Total)	13	13	13	14
3	Primary Health Centres (Total)	78	78	78	77
4	Civil Dispensaries	2	2	2	2
5	Sub-Centres	434	434	434	434
6	Number of Beds (Sanctioned)	1462	1462	1462	1962
7	Number of Beds (in position)			1204	1704

Table 10: Kinnaur

Sr. No.	Number of Medical Institutions	30-6-2005	30-6-2006	30-6-2007	31-3-2008
1	General Hospitals	2	2	2	2
2	Community Health Centres (Total)	3	3	3	3
3	Primary Health Centres (Total)	17	17	21	21
4	Civil Dispensaries	0	0	0	0
5	Sub- Centres	33	33	33	33
6	Number of Beds (Sanctioned)	226	226	226	226
7	Number of Beds (in position)			197	197

Table 11: Kullu

Sr. No.	Number of Medical Institutions	30-6-2005	30-6-2006	30-6-2007	31-3-2008
1	General Hospitals	2	2	2	2
2	Community Health Centres (Total)	5	5	5	5
3	Primary Health Centres (Total)	17	17	17	17
4	Civil Dispensaries	0	0	0	0
5	Sub- Centres	100	100	101	101
6	Number of Beds (Sanctioned)	392	392	392	392
7	Number of Beds (in position)			345	345

Table 12: Lahaul & Spiti

Sr. No.	Number of Medical Institutions	30-6-2005	30-6-2006	30-6-2007	31-3-2008
1	General Hospitals	1	1	1	1
2	Community Health Centres (Total)	3	3	3	3
3	Primary Health Centres (Total)	14	14	14	16
4	Civil Dispensaries	0	0	0	0
5	Sub- Centres	35	35	36	36
6	Number of Beds (Sanctioned)	136	136	136	136
7	Number of Beds (in position)			94	94

Table 13: Mandi

Sr. No.	Number of Medical Institutions	30-6-2005	30-6-2006	30-6-2007	31-3-2008
1	General Hospitals	6	6	6	6
2	Community Health Centres (Total)	9	9	10	11
3	Primary Health Centres (Total)	59	59	60	61
4	Civil Dispensaries	0	0	0	0
5	Sub- Centres	311	311	311	312
6	Number of Beds (Sanctioned)	1110	1110	1110	1110
7	Number of Beds (in position)			909	909

Table 14: Shimla

Sr. No.	Number of Medical Institutions	30-6-2005	30-6-2006	30-6-2007	31-3-2008
1	General Hospitals	11	12	12	12
2	Community Health Centres (Total)	6	5	7	7
3	Primary Health Centres (Total)	77	77	76	76
4	Civil Dispensaries	9	9	9	9
5	Sub- Centres	260	261	261	261
6	Number of Beds (Sanctioned)	2182	2174	2224	2224
7	Number of Beds (In-Position)			1803	1803

Table 15: Sirmaur

Sr. No.	Number of Medical Institutions	30-6-2005	30-6-2006	30-6-2007	31-3-2008
1	General Hospitals	5	5	5	5
2	Community Health Centres (Total)	3	3	3	3
3	Primary Health Centres (Total)	34	34	35	36
4	Civil Dispensaries	3	3	3	3
5	Sub- Centres	148	148	148	148
6	Number of Beds (Sanctioned)	604	604	604	604
7	Number of Beds (in position)			391	391

Table 16: Solan

Sr. No.	Number of Medical Institutions	30-6-2005	30-6-2006	30-6-2007	31-3-2008
1	General Hospitals	5	5	5	5
2	Community Health Centres (Total)	3	3	4	4
3	Primary Health Centres (Total)	32	32	32	32
4	Civil Dispensaries	5	5	5	5
5	Sub- Centres	178	178	178	178
6	Number of Beds (Sanctioned)	921	921	721	721
7	Number of Beds (In-Position)			554	554

Table 17: Una

Sr. No.	Number of Medical Institutions	30-6-2005	30-6-2006	30-6-2007	31-3-2008
1	General Hospitals	2	2	2	2
2	Community Health Centres (Total)	4	4	5	5
3	Primary Health Centres (Total)	20	20	19	19
4	Civil Dispensaries	1	1	1	1
5	Sub- Centres	131	131	131	131
6	Number of Beds (Sanctioned)	369	369	369	369
7	Number of Beds (in position)			347	347

Details of medical institutions in Kangra district is given in Table 18.

Table 18: List of Medical Institutions in Kangra district

Sr. No.	Name of Medical Institutions	Name of Tehsil
1	Dr. R.P. Hospital Dharmsala	Kangra
2	Civil Hospital, Palampur	Palampur
3	Civil Hospital, Nurpur	Nurpur
4	Civil Hospital, Dehra Gopipur	Dehra Gopipur
5	Civil Hospital, Kangra	Kangra
6	Civil Hospital, Baijnath	Baijnath
7	Civil Hospital, Garli	Dehra Gopipur
8	Civil Hospital, Thural	Lambagaon
9	General Hospital, Yol	Kangra
10	Maternity Hospital, Kangra	Kangra
11	Community Health Centre, Jawalamukhi	Dehra Gopipur
12	Community Health Centre, Indora	Indora
13	Community Health Centre, Nagrota (Bagwan)	Kangra
14	Community Health Centre, Gangath	Nurpur
15	Community Health Centre, Jawali	Jawali
16	Community Health Centre, Shahpur	Kangra
17	Community Health Centre, Fatehpur	Fatehpur
18	Community Health Centre, Rehan	Nurpur
19	Community Health Centre, Chadhiar	Palampur
20	Community Health Centre, Dadasiba	Dehra Gopipur
21	Community Health Centre, Jai Singhpur	Jai Singhpur
22	Community Health Centre, Nagrota Surian	Dehra Gopipur
23	Primary Health Centre, Lanj	Kangra
24	Primary Health Centre, Tyara	Kangra
25	Primary Health Centre, Takipur	Kangra
26	Primary Health Centre, Ichhi	Kangra
27	Primary Health Centre, Laynna	Kangra
28	Primary Health Centre, Dharini	Kangra
29	Primary Health Centre, Chari	Kangra
30	Primary Health Centre, Baroh	Baroh
31	Primary Health Centre, Kandi	Baroh
32	Primary Health Centre, Chamunda Devi	Palampur
33	Primary Health Centre, Kotla	Nurpur
34	Primary Health Centre, Sadwan	Nurpur
35	Primary Health Centre, Jassur	Nurpur
36	Primary Health Centre, Kherian	Nurpur
37	Primary Health Centre, Jalag Draman	Jai Singhpur
38	Primary Health Centre, Lambagaon	Jaisinghpur
39	Primary Health Centre, Majheen	Jaisinghpur
40	Primary Health Centre,Gopalpur	Palampur
41	Primary Health Centre, Panchrukhi	Palampur
42	Primary Health Centre, Tumbar	Palampur
43	Primary Health Centre, Bhawarana	Palampur
44	Primary Health Centre,Garh	Palampur
45	Primary Health Centre, Khaira	Palampur
46	Primary Health Centre, Dhira	Dhira
47	Primary Health Centre, Jaind	Palampur
48	Primary Health Centre, Sulah	Palampur
49	Primary Health Centre, Beer	Baijnath
50	Primary Health Centre, Kandwari	Baijnath
51	Primary Health Centre, Mahakal	Baijnath
52	Primary Health Centre, Tarmehar	Baijnath
53	Primary Health Centre, Dalip Naggar	Baijnath
54	Primary Health Centre, Kothi-Kohar	Baijnath
55	Primary Health Centre, Sansai	Baijnath
56	Primary Health Centre, Kasba-Kotla	Dehra Gopipur

Sr. No.	Name of Medical Institutions	Name of Tehsil
57	Primary Health Centre, Pragpur	Dehra Gopipur
58	Primary Health Centre, Pir Saloohi	Dehra Gopipur
59	Primary Health Centre, Haripur	Dehra Gopipur
60	Primary Health Centre,Darkata	Dehra Gopipur
61	Primary Health Centre, Khundian	Khundian
62	Primary Health Centre, Dola - Karyana	Dehra Gopipur
63	Primary Health Centre, Tihri	Dehra Gopipur
64	Primary Health Centre, Masroor	Dehra Gopipur
65	Primary Health Centre, Ray	Indora
66	Primary Health Centre, Gharjarot	Fatehpur
67	Primary Health Centre, Dhametta	Jawali
68	Primary Health Centre, Baranda	Indora
69	Primary Health Centre, Kuther	Jawali
70	Civil Dispensary, Bandian Khopa	Palampur
71	Civil Dispensary, Paprola	Palampur
72	Civil Dispensary, Rajoon	Palampur
73	Civil Dispensary, Manan	Palampur
74	Civil Dispensary, pharer	Palampur
75	Civil Dispensary, Naura	Palampur
76	Civil Dispensary, Bachhwain	Palampur
77	Civil Dispensary, Bhatoli Fakorian	Dehra Gopipur
78	Civil Dispensary, Dari	Kangra
79	Civil Dispensary, Khaniyara	Kangra
80	Civil Dispensary, Janiyanker	Kangra
81	Civil Dispensary, Molag	Lambagaon
82	Civil Dispensary, Badhukhar	Nurpur
83	Civil Dispensary, Bharmar	Nurpur
84	Civil Dispensary, Dhameta	Nurpur
85	Civil Dispensary, Chalwara	Nurpur
86	Civil Dispensary, Paral	Nurpur
87	Civil Dispensary, Damtala(ESI)	Indora
88	Civil Dispensary, Sunhai	Kangra
89	Civil Dispensary, Hatli-Jambawalan	Nurpur
90	Civil Dispensary, Baswa Bajiran	Nurpur
91	Civil Dispensary, Nurpur	Nurpur
92	Civil Dispensary, Dharun	Nurpur
93	Civil Dispensary, Dhurana (Dol)	Nurpur
94	Civil Dispensary, Ladauri	Nurpur
95	Civil Dispensary, Tikka-Nagrota	Nurpur
96	Civil Dispensary, Banoori	Palampur
97	Civil Dispensary, Rakkar	Palampur
98	Civil Dispensary, Sansarpur-Terrace	Dehra Gopipur
99	Civil Dispensary, Sunhet	Dehra Gopipur
100	Civil Dispensary, Rakkar	Dehra Gopipur
101	Civil Dispensary, Bagli	Kangra
102	Civil Dispensary, Mecleodganj	Dharmsala
103	Civil Dispensary, Seon	Kangra
104	MCW Centre, Dharmsala	Dharmsala
105	MCW Centre, Bir	Baijnath
106	MCW Centre, Nurpur	Nurpur
107	MCW Centre, Pragpur	Dehra Gopipur
108	Ayurvedic Hospital, Paprola	Palampur
109	Ayurvedic Hospital, Dharmsala	Dharmsala
110	Ayurvedic Hospital, Dehra	Dehra Gopipur
111	Ayurvedic Hospital, Ispur	Kangra

Source: Department of Health & Family Welfare Himachal Pradesh.

Type & location of medical institutions in Kinnaur district is given in Table 19.

Table 19: List of medical institutions in Kinnaur District

Sr. No.	Name of medical Institutions	Name of Village
1	Primary Health Centre	Katgaon
2	Primary Health Centre	Tapri
3	Primary Health Centre	Sapni
4	Primary Health Centre	Rupi
5	Primary Health Centre	Urani
6	Primary Health Centre	Miru
7	Primary Health Centre	Bara-khambha
8	Primary Health Centre	Spillow
9	Primary Health Centre	Morang
10	Primary Health Centre	Giabong

Sr. No.	Name of medical Institutions	Name of Village
11	Primary Health Centre	Hango
12	Primary Health Centre	Ribba
13	Primary Health Centre	Lippa
14	Primary Health Centre	Kanam
15	Primary Health Centre	Kalpa
16	Primary Health Centre	Tangling
17	Primary Health Centre	Kilba
18	MCW Centre	Reckong Peo
19	Community Health Centre	Nichar
20	Community Health Centre	Poo
21	Community Health Centre	Sangla
22	Distt. Hospital	Reckong Peo
23	Civil Hospital	Chango
	State Special Hospital	
24	I.T.B.P. Hospital	Reckong Peo
25	Project Hospital	Bhawa-Naggar
26	Distt. Ayurvedic Hospital	Reckong Peo

Source: Department of Medical & Health, Himachal Padesh

Type and location of medical institutions at Bilaspur district is given Table 20.

Table 20: List of medical Institutions in Bilaspur district

Sr. No.	Name of Medical Institutions	Name of Centre
1	Primary Health Centre	Kalol
2	Primary Health Centre	Bapiara
3	Primary Health Centre	Barthin
4	Primary Health Centre	Talai
5	Primary Health Centre	Gehrwin
6	Primary Health Centre	Bheri
7	Primary Health Centre	Namhol
8	Primary Health Centre	Panjgain
9	Primary Health Centre	Badhetar
10	Primary Health Centre	Swarghat
11	Primary Health Centre	Bhajun
12	Primary Health Centre	Malokhar
13	Primary Health Centre	Behal
14	Primary Health Centre	Bagi
15	Primary Health Centre	Rajpura
16	Primary Health Centre	Bhakhara
17	Civil Dispensary	Dadhol
18	Civil Dispensary	Hatwar
19	Civil Dispensary	Talyana
20	Civil Dispensary	Diara
21	Civil Dispensary	Saloa
22	Civil Dispensary	Swahan
23	Civil Dispensary	Tarsooh
24	Civil Dispensary	Chharol
25	Civil Dispensary	Manwa
26	Civil Dispensary	Kuh-manjwar
27	Civil Dispensary	Roura
28	MCW Centre	Bilaspur
29	MCW Centre	Bharari
30	MCW Centre	Barthin
31	MCW Centre	Ghumarwin
32	MCW Centre	Panjgain
33	Community Health Centre	Markand
34	Community Health Centre	Ghawandal
35	Community Health Centre	Bharari
36	Community Health Centre	Harlog
37	Community Health Centre	Jhandutta
38	Distt. Hospital	Bilaspur
39	Civil Hospital	Ghumarwin
40	Distt. Ayurvedic Hospital	Bilaspur
41	Distt. Ayurvedic Hospital	Kandraur

Source: Department of Medical & Health Himachal Padesh.

Type and location of medical institutions in Chamba is given in Table 21.

Table 21: List of Medical Institutions in Chamba district

Sr. No.	Name of Medical Institutions	Name of Centre
1	Community Health Centre	Sahoo
2	Community Health Centre	Choori
3	Community Health Centre	Kilar
4	Community Health Centre	Bharmaur
5	Community Health Centre	Holi
6	Community Health Centre	Kihar
7	Community Health Centre	Saluni
8	District Hospital	Chamba
9	Civil Hospital	Dalhousie
10	Referral Hospital	Chuari Khas
11	Zonal Hospital	Tissa
12	Project Hospital (Special)	Surgani
13	Project Hospital (Special)	Tissa
14	General Hospital (Cantonment Board)	Dalhousie
15	General Hospital (Cantonment Board)	Bakloh
16	Distt. Ayurvedic Hospital	Chamba
17	Ayurvedic Hospital	Bharmaur

Type and location of medical institutions in Kullu district is given below in Table 22.

Table 22: List of Medical Institutions in Kullu district

Sr. No.	Name of Medical Institution	Name of village
1	Primary Health Centre	Naggar
2	Primary Health Centre	Raison
3	Primary Health Centre	Bran
4	Primary Health Centre	Bhutti
5	Primary Health Centre	Garsa
6	Primary Health Centre	Bhuntar
7	Primary Health Centre	Sainj
8	Primary Health Centre	Goshaini
9	Primary Health Centre	Neither
10	Primary Health Centre	Arsu
11	Primary Health Centre	Dugher
12	Primary Health Centre	Thatibir
13	Civil Dispensary	Kothi
14	Civil Dispensary	Manikaran
15	Civil Dispensary	Jagatsukh
16	Civil Dispensary	Neol
17	Civil Dispensary	Jaon
18	M.C.W. Centre	Kullu
19	Community Health Centre	Manali
20	Community Health Centre	Ani
21	Community Health Centre	Dalash
22	Community Health Centre	Nirmand
23	Community Health Centre	Jari
24	Distt. Hospital	Kullu
25	Civil Hospital	Banjar
26	Distt. Ayurvedic Hospital	Katrain
27	Lady Wellington Hospital	Manali

Source: Department of Health & Family Welfare, Himachal Pradesh

Type and location of medical institutions in Lahaul & Spiti district is given in Table 23.

Table 23: List of Medical Institutions in Lahaul & Spiti district

Sr. No.	Name of Medical Institutions	Name of Villages
1	Primary Health Centre	Sissu
2	Primary Health Centre	Gondhla
3	Primary Health Centre	Tholang
4	Primary Health Centre	Tingret
5	Primary Health Centre	Gemur
6	Primary Health Centre	Thirot
7	Primary Health Centre	Jahalman
8	Primary Health Centre	Tabo
9	Primary Health Centre	Sagnam
10	Civil Dispensary	Phurra
11	Civil Dispensary	Samdo-Darcha
12	Civil Dispensary	Hansa
13	Civil Dispensary	Kibbar
14	Civil Dispensary	Losar
15	MCW Centre	Udaipur
16	Community Health Centre	Udaipur
17	Community Health Centre	Shansha
18	Community Health Centre	Kaza
19	Distt. Hospital	Keylong
20	Distt. Ayurvedic Hospital	Keylong

Type and location of medical institutions in Mandi district is given in Table 24.

Table 24: List of medical Institutions in Mandi district

Sr. No.	Name of medical Institutions	Name of Villages
1	Primary Health Centre	Rawalsar
2	Primary Health Centre	Baggi
3	Primary Health Centre	Gokhara
4	Primary Health Centre	Kataula
5	Primary Health Centre	Nagwain
6	Primary Health Centre	Shiva Badar
7	Primary Health Centre	Smaila
8	Primary Health Centre	Dharwar
9	Primary Health Centre	Gopalpur
10	Primary Health Centre	Jamni
11	Primary Health Centre	Bhamla
12	Primary Health Centre	Dhalwan
13	Primary Health Centre	Thona
14	Primary Health Centre	Fatehpur
15	Primary Health Centre	Bhadarwar
16	Primary Health Centre	Marhi
17	Primary Health Centre	Scoh
18	Primary Health Centre	Cholthala
19	Primary Health Centre	Madap
20	Primary Health Centre	Tihra
21	Primary Health Centre	Nihari
22	Primary Health Centre	Sainj
23	Primary Health Centre	Pangana
24	Primary Health Centre	Chauntra
25	Primary Health Centre	Makreri
26	Primary Health Centre	Pandhol
27	Primary Health Centre	Barot
28	Primary Health Centre	Nohali-Draman

Sr. No.	Name of medical Institutions	Name of Villages
29	Primary Health Centre	Badi-Dhar
30	Primary Health Centre	Sudhar
31	Primary Health Centre	Pali
32	Primary Health Centre	Balh-Tikkar
33	Primary Health Centre	Jachh
34	Primary Health Centre	Jhungi
35	Primary Health Centre	Balio Chowki
36	Primary Health Centre	Gada-Gusain
37	Primary Health Centre	Thuang
38	Primary Health Centre	Rohanda
39	Primary Health Centre	Dehar
40	Primary Health Centre	Hara-Boi
41	Primary Health Centre	Chowk
42	Primary Health Centre	Jarol
43	Primary Health Centre	Khural
44	Primary Health Centre	Taleli
45	Civil Dispensary	Lagna
46	Civil Dispensary	Dev-dhar
47	Civil Dispensary	Parwara
48	Civil Dispensary	Batheri
49	Civil Dispensary	Chukhu
50	Civil Dispensary	Ashla
51	Civil Dispensary	Chamiyar
52	Civil Dispensary	Kothi-Gheri
53	Civil Dispensary	Nanwan
54	Civil Dispensary	Sidhyani
55	Civil Dispensary	Khuhan
56	Civil Dispensary	Kanaid
57	Civil Dispensary	Maloh
58	MCW Centre	Mandi
59	MCW Centre	Sundarnaggar
60	MCW Centre	Sarkaghat
61	MCW Centre	Jogindarnagar
62	MCW Centre	Karsog
63	MCW Centre	Ahju
64	MCW Centre	Gohar
65	MCW Centre	Paunta
66	Community Health Centre	Padhar
67	Community Health Centre	Kotli
68	Community Health Centre	Gohar
69	Community Health Centre	Baldwara
70	Community Health Centre	Ratti
71	Community Health Centre	Ladbharol
72	Community Health Centre	Bagsaid
73	Community Health Centre	Dharampur
74	Community Health Centre	Janjehli
75	Zonal Hospital	Mandi

Sr. No.	Name of medical Institutions	
76	Civil Hospital	Sundarnaggar
77	Referral Hospital	Sarkaghat
78	Civil Hospital	Jogindarnagar
79	Civil Hospital	Karsog
80	Civil Hospital	Sandhol
81	Sanjeevani Hospital (Pvt.)	Mandi
82	Distt. Ayurvedic Hospital	Jogindarnagar
83	Distt. Ayurvedic Hospital	Mandi
84	Colony Hospital	Sundarnaggar
85	BSL Hospital	Pandoh
86	BSL Hospital	Salapar

Type and location of medical institution in Shimla district is given in Table 25.

Table 25: List of Medical Institutions in Shimla District

Sr. No.	Name of Medical Institutions	Name of Villages
1	Primary Health Centre	Kholighat
2	Primary Health Centre	Ghanvi
3	Primary Health Centre	Deothi
4	Primary Health Centre	Bahali
5	Primary Health Centre	Lalsa
6	Primary Health Centre	Kungal Balti
7	Primary Health Centre	Gopalpur
8	Primary Health Centre	Taklech
9	Primary Health Centre	Naraingarh
10	Primary Health Centre	Jeori
11	Primary Health Centre	Samaij
12	Primary Health Centre	Belupul
13	Primary Health Centre	Kutara
14	Primary Health Centre	Lower Koti
15	Primary Health Centre	Summer-Kot
16	Primary Health Centre	Pujarli-IV
17	Primary Health Centre	Pujarli-III
18	Primary Health Centre	Tikar
19	Primary Health Centre	Katlah
20	Primary Health Centre	Narkanda
21	Primary Health Centre	Kotighat
22	Primary Health Centre	Smathla
23	Primary Health Centre	Baragaon
24	Primary Health Centre	Malandi
25	Primary Health Centre	Jalog
26	Primary Health Centre	Thanedhar
27	Primary Health Centre	Virgarh
28	Primary Health Centre	Dharampur
29	Primary Health Centre	Chhaila
30	Primary Health Centre	Matiana
31	Primary Health Centre	Balag
32	Primary Health Centre	Bani
33	Primary Health Centre	Tharoach

Sr. No.	Name of Medical Institutions	Name of Villages
34	Primary Health Centre	Kupvi
35	Primary Health Centre	Marog
36	Primary Health Centre	Tikkari
37	Primary Health Centre	Jhinna
38	Primary Health Centre	Laani
39	Primary Health Centre	Kiari
40	Primary Health Centre	Kalbog
41	Primary Health Centre	Saraswati-Naggar
42	Primary Health Centre	Giltari
43	Primary Health Centre	Devgarh
44	Primary Health Centre	Gumma
45	Primary Health Centre	Badiara
46	Primary Health Centre	Ghoshali
47	Primary Health Centre	Kwar
48	Primary Health Centre	Deudi
49	Primary Health Centre	Jangla
50	Primary Health Centre	Mashobra
51	Primary Health Centre	Dhami
52	Primary Health Centre	Shogi
53	Primary Health Centre	Kufri
54	Primary Health Centre	Koti
55	Primary Health Centre	Annadel
56	Civil Dispensary	Rewalpur
57	Civil Dispensary	Sarain
58	Civil Dispensary	Barthata
59	Civil Dispensary	Garaug
60	Civil Dispensary	Himari
61	Civil Dispensary	Mandal
62	Civil Dispensary	Mandhol
63	Civil Dispensary	Chabba
64	Civil Dispensary	Ghaini
65	Civil Dispensary	Pandoa
66	Civil Dispensary	Naldehra
67	Civil Dispensary	Ghanahatti
68	Civil Dispensary	Gumma
69	Civil Dispensary	Jatol
70	Civil Dispensary	Kasumpti
71	Civil Dispensary	Chhota Shimla
72	Civil Dispensary	Dhar Phagli
73	Civil Dispensary	Sanjauli
74	Civil Dispensary	HP Sectt. Shimla
75	Civil Dispensary	Jakhoo
76	Civil Dispensary	HP Vidhan Sabha
77	Civil Dispensary	HP High Court Shimla
78	Civil Dispensary	Shogi Ripon (ESI)
79	Civil Dispensary	Bhutti
80	Civil Dispensary	Kharan
81	Civil Dispensary	Dhar-Gaura
82	Civil Dispensary	Dharara
83	Civil Dispensary	Balsan
84	Civil Dispensary	Dharech
85	Civil Dispensary	Ghund
86	Civil Dispensary	Mohari
87	Community Health Centre	Kotkhai
88	Community Health Centre	Chirgaon
89	Community Health Centre	Kumharsain
90	Community Health Centre	Nankhari
91	Community Health Centre	Kotgarh
92	Community Health Centre	Seoni
93	M & CW Centre	DDU Hospital, Shimla
94	M & CW Centre	Chhota Shimla
95	M & CW Centre	Tilak Naggar
96	M & CW Centre	Sanjauli
97	M & CW Centre	Ghannahatti
98	M & CW Centre	Chaupal
99	M & CW Centre	Rohru
100	M & CW Centre	Theog
101	M & CW Centre	Rampur
102	M & CW Centre	Jubbal
103	M & CW Centre	Kotkhai
104	M & CW Centre	Sangri
105	General Hospital	DDU Hospital, Shimla
106	General Hospital	Indira Gandhi Medical College & Hospital
107	General Hospital	Kamla Nehru Hospital, Shimla
108	Civil Hospital	Rampur
109	Civil Hospital	Junga
110	Civil Hospital	Sarahan
111	Civil Hospital	Theog
112	Civil Hospital	Jubbal
113	Civil Hospital	Chaupal
114	Civil Hospital	Rohru
115	Civil Hospital	Nerua
116	Cancer Institution	Radiotherapy Unit, IGMC Shimla
117	Cancer Institution	Isolation Hospital,Shimla
118	Private/Mission/Trust Hospital, Shimla	Sanitarium Hospital, Shimla
119	Private/Mission/Trust Hospital, Shimla	Indus Hospital, Shimla
120	Private/Mission/Trust Hospital, Shimla	Tara Hospital, Shimla
	Distt. Ayurvedic Hospital	Chhota Shimla, Shimla
	Ayurvedic Hospital	Rohru

Source: Department of Health & Family Welfare, Himachal Pradesh.

Type and location of medical institutions at Sirmaur district is given in Table 26.

Table 26: List of Medical Institutions in Sirmaur

Sr. No.	Name of medical Institutions	Name of Villages
1	Primary Health Centre	Kaulla-Wala-Bhoond
2	Primary Health Centre	Dhagera
3	Primary Health Centre	Parara
4	Primary Health Centre	Badag
5	Primary Health Centre	Jamta
6	Primary Health Centre	Narag
7	Primary Health Centre	Bagthan
8	Primary Health Centre	Mangarh
9	Primary Health Centre	Dhamla
10	Primary Health Centre	Koti-Padhog
11	Primary Health Centre	Ronhat
12	Primary Health Centre	Kafota
13	Primary Health Centre	Kanti-Mashwa
14	Primary Health Centre	Lana-Cheta
15	Primary Health Centre	Haripurdhar
16	Primary Health Centre	Koti-Dhiman
17	Primary Health Centre	Bogdhar
18	Primary Health Centre	Gatadhar
19	Primary Health Centre	Naura-Dhar
20	Primary Health Centre	Jakhna
21	Primary Health Centre	Majra
22	Primary Health Centre	Khundian
23	Primary Health Centre	Kamrau
24	Primary Health Centre	Sataun
25	Civil Dispensary	Banethi
26	Civil Dispensary	Chilog
27	Civil Dispensary	Ghinni
28	Civil Dispensary	Dimber
29	Civil Dispensary	Phagu
30	Civil Dispensary	Rampur-Bharapur
31	Civil Dispensary	Badripur (ESI)
32	Civil Dispensary	Malwa Cotton Mills, Paonta Sahib (ESI)
33	Civil Dispensary	Sahabu-Khera (ESI)
34	Civil Dispensary	Charna
35	Civil Dispensary	Chjokar
36	Civil Dispensary	Tikkari Dasakna
37	Civil Dispensary	Kayari-Gunda
38	Civil Dispensary	Kala Amb (ESI)
39	M & C.W. Centre	Nahan
40	M & C.W. Centre	Dadahu
41	M & C.W. Centre	Rajgarh
General Hospital		
42	Zonal Hospital	Nahan
43	Civil Hospital	Rajgarh
44	Civil Hospital	Paonta Sahib
45	Referal Hospital	Dadahu
46	Civil Hospital	Sarahan
47	District Ayurvedic Hospital	Nahan

Type and location of medical institutions at Solan district is given below in Table 27.

Table 27: List of Medical Institutions in Solan

Sr. No.	Name of Medical Institutions	Name of Place
1	Community Health Centre, Nalagarh	Nalagarh
2	Community Health Centre, Syri	Kandaghat
3	Community Health Centre, Dharampur	Dharampur, Kasauli
4	District Hospital, Solan	Solan
5	Civil Hospital, Chail	Kandaghat
6	Civil Hospital, Kandaghat	Kandaghat
7	Civil Hospital, Parwanoo	Dharampur, Kasauli
8	Civil Hospital, Arki	Kunihar, Arki
	Hospitals run by Cantonment Board	
9	General Hospital, Kasauli	Dharampur, Kasauli
10	General Hospital, Subathu	Dharampur, Kasauli

Type and location of medical institutions in Una district is given in Table 28.

Table 28: List of Medical Institutions at Una

Sr. No.	Name of Medical Institutions	Name of Place
1	2	3
1	Primary Health Centre	Amlehar
2	Primary Health Centre	Amb
3	Primary Health Centre	Churudu
4	Primary Health Centre	Badehra

Sr. No.	Name of Medical Institutions	Name of Place
		Rajputana
5	Primary Health Centre	Marwari
6	Primary Health Centre	Thanakalan
7	Primary Health Centre	Sohari-Takoli
8	Primary Health Centre	Kungrath
9	Primary Health Centre	Dulehar
10	Primary Health Centre	Basdehra
11	Primary Health Centre	Badsali
12	Primary Health Centre	Bathree
13	Civil Dispensary	Akrot
14	Civil Dispensary	Dharamshala-Mahanta
15	Civil Dispensary	Dhusara
16	Civil Dispensary	Lathiyani
17	Civil Dispensary	Badehra
18	Civil Dispensary	Santokhgarh
19	Civil Dispensary	Chalola
20	Civil Dispensary	Dehlan
21	Civil Dispensary	Mehatpur-(Esi)
22	MCW Centre	Santokhgarh
23	Community Health Centre	Haroli
24	Community Health Centre	Gagret
25	Community Health Centre	Gagret
26	Community Health Centre	Dhundla
27	Distt. Hospital	Una
28	Civil Hospital,Chintpurni	Amb
29	Sarswati Mehta Charitable Hospital	Kotla (Amb)
30	Mehta Charitable Hospital	Oel (Gagret)
31	Lala Lachman Dass Hospital	Panjwar (Gagret)

Details of Sub centre, PHC, CHC & various health professionals are given below in Table 29.

Table 29: Health Infrastructure of Himachal Pradesh

Particulars	Required	In position	Shortfall
Sub-centre	1128	2071	-
Primary Health Centre	186	449	-
Community Health Centre	46	73	-
Multipurpose worker (Female)/ANM at Sub Centres & PHCs	2520	2496	24
Health Worker (Male) MPW(M) at Sub Centres	2071	1270	801
Health Assistant (Female)/LHV at PHCs	449	114	335
Health Assistant (Male) at PHCs	449	62	387
Doctor at PHCs	449	407	42
Obstetricians & Gynaecologists at CHC	73	3	70
Physicians at CHCs	73	6	67
Paediatricians at CHCs	73	1	72
Total specialists at CHCs	292	10	282
Radiographers	73	47	26
Pharmacist	522	341	181
Laboratory Technicians	522	208	314
Nurse/Midwife	960	1062	-

(Source: RHS Bulletin, March 2008, M/O Health & F.W GOI)

A consolidated list of health institutions in the State is given in Table 30.

Table 30: Other Health Institutions in Himachal Pradesh

Health Institution	Number
Medical College	2
District Hospitals	12
Referral Hospitals	
City Family Welfare Centre	
Rural Dispensaries	
Ayurvedic Hospitals	25
Ayurvedic Dispensaries	1109
Unani Hospitals	-
Unani Dispensaries	3
Homeopathic Hospitals	1
Homeopathic Dispensary	14

The State has 1640 Health Centres – 1135 with the Department of ISMH and 505 (439 PHCs and 66 CHCs) with the HFWD- functioning at the Primary Health Care level. The coverage of rural population by the Primary Health Care Institutions is given in Table 31.

Table 31: Average rural population covered by health institutions (as on 31 March 2005)

Institutions	GOI norms for plains	Government of India norms for hills	Rural population covered
Sub-Centre	5000	3000	2651
PHC	30000	20000	12488
CHC	1.20 lakh	80,000	83066

The second factor that helps in assessing the impact of PHC is the median distance of the Health Institutions from the villages. According to NFHS -1 (1992), median distance of a sub-centre and PHC was 3.5 and 6.9 km. respectively in the State. A remarkable achievement for the State was that at the time of NFHS-2 (1998-99), the median distance of Sub Centres (SC) was reduced to 1.5 Km. The distance of PHC reduced from 6.9 km to 6.4 km. However, with the conversion of some of the Civil Dispensaries (CD) into Primary Health Centres during 2000-2001, the median distance for a PHC would be further reduced. Median distance from nearest health facility is given in Table 32.

Table 32: Distance from the nearest health facility

Distance	Health Facility (Percentage)					
	S/C	PHC	PHC or S/C	Hospital	Disp./ Clinic	Other Health
Within village	46.3	13.1	47.7	7.1	40.7	60.2
Less than five km.	37.1	25.2	39.1	17.4	34.7	32.2
5-9 km.	9.8	29.5	11.2	25.8	13.2	7.5
10 km.	6.8	32.2	2	49.7	11.4	0
Median distance (km)	1.5	6.4	1.3	9.9	2.3	0

Source: NFHS - 1998-99

Modern System of Medicine

A survey has shown that the Indian System of Medicine draws larger percentage of people in Himachal Pradesh than in the neighboring States of Punjab and Haryana. About 93% prefer the modern system of medicine. The State has a fairly extensive network of a public health institutions (allopathic) whose details (as on 31st March 2005) is given in Table 33.

Table 33: District wise allopathic public health institutions

Sr.No.	District	C.Hs	CHCs	PHCs	CDs	S/Cs
1	Bilaspur	2	5	27	2	117
2	Chamba	4	7	40	0	169
3	Hamirpur	2	5	24	0	152
4	Kangra	8	13	78	2	434
5	Kinnaur	2	3	17	0	33
6	Kullu	2	5	17	0	100
7	Lahaul & Spiti	1	3	14	0	35
8	Mandi	6	9	59	0	311
9	Shimla	11	6	77	9	260
10	Sirmaur	5	3	34	3	148
11	Solan	5	3	32	5	178
12	Una	2	4	20	1	131
	Total	50	66	439	22	2068

CH: Civil Hospital; CHC: Community Health Centre; PHC: Primary Health Centre; CD: Civil Dispensary; S/C: Sub-Centre (Source: Health at a Glance, 2005)

District wise total bed capacity in public health institutions is given in Table 34.

Table 34: District-wise Public Health Institutions

Sr. No.	District	Hospitals	AHC	HHC	UHC	AC	NCC	Total
1	Bilaspur	2	65	2	-	-	-	69
2	Chamba	2	100	2	-	-	-	104
3	Hamirpur	3	69	1	-	-	-	73
4	Kangra	5	228	1	1	-	-	235
5	Kinnaur	1	40	1	-	2	-	44
6	Kullu	1	65	1	-	-	-	67
7	Lahaul & Spiti	1	20	1	-	2	-	24
8	Mandi	2	163	1	-	-	-	166
9	Shimla	3	144	1	1	-	-	149
10	Sirmaur	1	78	1	-	-	-	80
11	Solan	1	77	1	1	-	-	80
12	Una	3	69	1	-	-	1	74
	Total	**25**	**1118**	**14**	**3**	**4**	**1**	**1165**

AHC: Ayurvedic Health Centre; HHC: Homeopathy Health Centre; UHC: Unani Health Centre; AC: Amchi Clinic; NCC: Nature Cure Centre Source: Department of ISMH

Besides one each, there are one Ayurvedic College at Paprola (Kangra) and two Panchkarma Units at Bilaspur and Paprola.

Indian System of Medicine

A survey on the utilization of health care services across various systems of medicine in Himachal Pradesh vis-à-vis the neighboring States and India reveals that the percentage of treatments in allopathic system in rural Himachal Pradesh (93%) is slightly lower than that in the neighboring States of Punjab (97.8%) and Haryana (97%) where as the Indian average is (95.91%). It means that more people than those in the neighboring States have faith in the Indian System of Medicine and Homeopathy. It is because the State Government had been playing a pro-active role in promoting the Indian System of Medicine. A comparative detail of utilization of health care services across various system of medicine is given in Table 35.

Table 35: Utilization of Health Care Services by various systems of Medicine

	Allopathic	Homeopathic	Ayurvedic	Unani	Any combination
RURAL					
Himachal	93	1.93	4.3	0.09	0.39
Punjab	97.8	0.21	1,12	0.39	0.06
Haryana	97	1.91	0.35	0.04	0.04
India	95.91	1.78	1.53	0.27	0.07
URBAN					
Himachal	97.39	0.41	0.45	1.41	0
Punjab	97.8	0.92	0.64	0.44	0
Haryana	98.24	0.74	0.61	0.15	0.26
India	96.31	2.09	1.03	0.27	0.05

In compliance to Biomedical Waste (Management and Handling) Rules, Municipal Corporation of Shimla established a centralized treatment facility for incineration of infectious hospital waste during the month of August 2002. Biomedical waste (yellow bag) collected from different health care establishments is being incinerated in a Centralized Treatment Facility (CTF) established by Municipal Corporation of Shimla since August 2002. Details CBWTF in Himachal Pradesh is given Table 36.

Table 36: Availability of Biomedical Waste Treatment Facilities (CBWTF) in Himachal Pradesh

Sr. No.	Name of CBWTF	Cities/towns Covered	Treatment Facility installed at CBWTF
1.	Municipal Corporation, The Mall, Shimla	Shimla Town & Solan, Nalagarh & Baddi Town	Incinerator - 100 Kg/hr &70 Kg/hr
2.	Municipal Council, Akhara Bazar, Kullu	Kullu, Manali and Bhunter Town	Incinerator - 70 Kg/hr
3.	BMWT Plant Pvt. Ltd., Pangoli, Pathankote, Punjab.	Distt. Kangara, Chamba, Hamirpur& Una	Incinerator - 200 Kg/hr, Autoclave, Shredder,

(As per the information provided by the SPCBs/PCCs for the Year 2008)

Further, details of CBWTF is given in Table 37.

Table 37: Common incarnation facility of Himachal Pradesh

Sr. No.	Common Biomedical Waste Treatment Facility	Equipment installed & their capacity	No of medical Establishment	No. of Beds covered	Total quantity of waste treated	APCS at Incinerator
1	Regional Hospital Dist. Sirmaur	Incinerator 25 Kg/hr	01	100	30-35 kg/day	No
2	Civil Hospital, Paonta SahIb	Incinerator 10 Kg/hr	10	30	20-25 kg/day	No

3.2 Patterns of Planning and Development in the Sector

Himachal Pradesh has set up health and family welfare advisory committees known as Parivar Kalyan Salahkar Samiti level (PARIKAS) at the panchayat, block and district levels for the involvement of the PRIs. The functions of the panchayat PARIKAS include supervision and monitoring; implementation of national health programmes; ensuring cleanliness of the

villages; checking pollution of water, air and noise; making people aware of dog and snake bites and their first aid treatment; cleaning and using bleaching powder, etc., for traditional water sources; disseminating information about Reproductive and Child Health (RCH) care; checking regular opening of Sub-Centres and ensuring that immunisation and other necessary facilities are being provided to the newborn by the health functionaries; helping in updating the records of births, deaths and marriages; and preparing health micro plans every year.

The functions of the block and district level PARIKAS are to provide effective leadership and able guidance; hold periodic inspection of health institutions through sub-committees (with each sub- committee having an elected representative and a medical officer nominated by PARIKAS); appropriate counseling, whenever required; and disseminating Information, Education and Communication (IEC). It is also envisaged that the PARIKAS at the three levels will be broad based and shall function as interdepartmental co-ordination committees.

National Vector Borne Disease Control Program (NVDCP): This program mainly controls malaria in the State. Laboratory technicians and surveillance worker are deployed in malaria endemic districts under this program though instances of malaria are less.

Revised National TB Control Program (RNTCP); The state run TB control initiatives which incorporates the principles of Directly Observed Treatment Short course (DOTS) for control and eradication of TB. The programme provides free of cost, quality anti-tubercular drugs through the numerous PHC and the growing number of DOTS providers in private sector.

Sewerage development plan is being administered by the Urban Development Department instead of Irrigation & Public Health (IPH) department w.e.f. 1.4.2008. Hence the previous programme under this head and activities prepared for the annual plan 2008-09 are for 56 towns in Himachal Pradesh, out of which 49 towns are under IPH Department. 6 towns (Yol, Bakloh, Kasauli, Sabhatu, Dagshai and Dalhousie Cantonment) are under Cantonment Boards and Parwanoo is under Housing Board.

Sewerage schemes for 13 towns namely, Sh. Naina Deviji, Chamba, Mandi, Bilaspur, Palampur, Rohroo, Shimla, Manali, Ghumarwin, Jawalamukhi, Arki, Jogindernagar & Palampur, 2 rural / tribal schemes Sarahan & Reckong Peo respectively have been completed up to 31st March, 2007.

In addition, other plans/schemes like integrated low sanitation scheme, state sanitation strategies consisting of schemes for urban poor and city sanitation task force and total sanitation campaign, Environmental Improvement of Urban Slums (EIUS) are being implemented at state level.

Rural and urban water supply plans under Eleventh Five Year Plan (2007-12), Accelerated Rural Water Supply Program (ARWSP) Rajiv Gandhi National Drinking Water Mission (RGNDWM) and Prime Minister Gramodaya Yojana – Rural Drinking Water, desilting of water bodies and water conservation works under Mahatma Gandhi National Rural Employment Guarantee Scheme are major plans / programs to provide access to potable drinking water in the state.

Mahila Gram Panchayat Swasthya Sahayika Scheme (MGPSS) 2009: The main objective of this scheme is to promote the role of Gram Panchayat in providing basic health care to their resident. These includes preventive, promotive and curative health services including antenatal/natal care, RCH, sanitation and nutrition.

Nutritional Program for Adolescent Girls (NPAG): This programme is implemented on pilot basis in urban slums. Under this scheme, anganwadi workers weigh all adolescent girls (11-19 years) in the community four times in a year and BPL food grain is distributed to them having body weight less than 35 kg.

In order to achieve these rates in a short span of five years, the Health Department geared itself by undergoing a reform process. A brief description of the reforms undertaken is given below:

National Rural Health Mission (NRHM) – The Vision

The National Rural Health Mission (2005-12) seeks to provide effective healthcare to rural population throughout the country with special focus on 18 states, which have weak public health indicators and/or weak infrastructure. These 18 States are Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand, Jammu & Kashmir, Manipur, Mizoram, Meghalaya, Madhya Pradesh, Nagaland, Orissa, Rajasthan, Sikkim, Tripura, Uttaranchal and Uttar Pradesh. The Mission is an articulation of the commitment of the Government to raise public spending on Health from 0.9% of GDP to 2-3% of GDP **.**

Goals set in NRHM

- Reduction in Infant Mortality Rate (IMR) and Maternal Mortality Ratio (MMR)
- Universal access to public health services such as women's health, child health, water, sanitation & hygiene, immunization, and nutritions
- Prevention and control of communicable and non-communicable diseases, including locally endemic diseases
- Access to integrated comprehensive primary healthcare
- Population stabilization, gender and demographic balance
- Revitalize local health traditions and mainstream AYUSH
- Promotion of healthy life styles

Upgradation of CHCs to Indian Public Health Standards (IPHS) is a major strategic intervention under the National Rural Health Mission (NRHM). The purpose is to provide sustainable quality care with accountability and people's participation along with total transparency. This requires the development of a proper management structure which may be called as Rogi Kalyan Samiti (RKS) (Patient Welfare Committee) / Hospital Management Society (HMS).

Rogi Kalyan Samiti (RKS): Rogi Kalyan Samiti (Patient Welfare Committee) / Hospital Management Society is a simple yet effective management structure. This committee, which would be a registered society, acts as a group of trustees for the hospitals to manage the affairs of the hospital. It consists of members from local Panchayati Raj Institutions (PRIs), NGOs, local elected representatives and officials from Government sector who are responsible for proper functioning and management of the hospital / Community Health Centre / FRUs. RKS / HMS is free to prescribe, generate and use the funds with it as per its best judgment for smooth functioning and maintaining the quality of services.

Structural Reforms

- There were 139 Civil Dispensaries functioning in the rural areas of the State that were doing the job of dispensing medicines. These were mainstreamed to provide preventive, promotive and curative health care.
- To increase the number of institutional deliveries, 24 hour service in selected institutions has been started. These institutions are working since 2002 and the results have been encouraging. 13210 deliveries were conducted in these institutions during the year 2004. Maximum

number of 6283 was in Hamirpur District and the lowest 134 was at Sirmaur District. Table 38 gives the district-wise details of such institutions:

Table 38: Institutional Deliveries – 24 hour Service in Selected Institutions

District	Hospital	CHC	PHC	Total
Bilaspur	-	5	5	10
Hamirpur	-	6	2	8
Kangra	1	11	6	18
Shimla	-	6	9	15
Sirmaur	1	3	1	5
Solan	1	3	8	12
Una	1	3	2	6
Total	**4**	**37**	**33**	**74**

Source: Health and Family Welfare Department

Functional Reforms for Health sector

A. Efficiency related

- Functional Integration of Department of Indian System of Medicines and the Department of Health and Family Welfare to follow standard protocol in National Health Programmes. The ISMH earmarked 661 Institutions in the State for the purpose. The training of ISMH Medical Officers was initiated in 2005.
- Decentralization of Administrative and Financial Powers right up to the PHC level.
- Merging of all Health and Family Welfare Societies into one at the State and the District levels.
- Interconnectivity of MIS for collecting data for NHP/Disease Surveillance and Manpower Planning. To begin with, the field data is being collected in the revised and consolidated Forms 6, 7, and 8. This has considerably reduced the paper work in the field. More attention is being given to health related problems.
- Privatization of support services in Health Institutions: Three support services; viz., scavenging, laundry, and diet are being transferred to Private Sector, wherever possible.
- Rationalization of Drug Use: Essential Drug List, Drug Formulary and Standard Treatment Guidelines have been prepared after the formulation of Essential Drug Policy. Capacity building of Medical Officers in the use of generic drugs is a continuing process and is on before generalizing their use.

B. Resources related

- Establishment of Society under the Registration of Societies Act called Rogi Kalyan Samiti at all Hospitals up to the CHC Level. These Samitis would improve:System efficiency; Service quality; Patient satisfaction; Local decisions and initiative of the Officers; Accountability at Hospital level; Resource utilization; The Hospital itself; Resource generation through Community Financing and User's Charges.
- Provision of Seed Money to improve such facilities that add to resource generation in the Hospitals.

C. Governance related

- Policy Formulation: A Health Vision for 2020 has been developed for the State.

In order to establish a better co-ordination between the public and private sector, Health Vision 2008 prescribes the following steps:

i) Enact legislation to regulate the private sector (private clinics, nursing homes etc.) and put a check on quackery.

ii) To establish norms and standards for space, equipment and human resource for private medical care institutions.

iii) Involvement of genuine private sector in the preventive and promotive health care activities like immunization, special campaigns, IEC activities, control of epidemics etc.

iv) To establish a fool proof mechanism for coordinating the activities of two sectors at the State, District and Block levels.

Health Vision –2008, Health and Family Welfare Department follows following aspects of training:

I) In-service training will also focus on management issues in health sector.
ii) Induction training for Medical Officers, with a focus on management, shall be started on priority basis.
iii) It shall be ensured that high quality training is provided.
iv) Private training institutions shall be encouraged.
v) A basic pre requisite for development of training system will be creation of separate cadre of trainers.

3.3 Technology adopted in the Sector along with any changes in technology

Health sector is a growing field where new technologies have been adopted so that work done in health sector being completed quickly and more effectively. The technology being adopted in health sector is mainly in laboratory where diagnosis and analysis of samples is being done.

Treatment Technology used for bio-medical waste treatment: The environmental regulations actually mandate the treatment of infectious medical waste on a daily basis if it is stored at room temperature. A number of treatment methods are available. The final choice of suitable treatment method is made carefully on the basis of various factors, many of which depend on local conditions including the amount and composition of waste generated, available space, regulatory approval, public acceptance, cost, etc. The current technology used in Himachal Pradesh for biomedical waste management is given in Table 39.

Table 39: Status of Bio-medical waste treatment technology-2009

No. of Common Bio-medical Waste Treatment Facility/Private Agencies		No. of Healthcare facility which are utilizing CBWTF/private Agencies	No. of HCF having treatment and	Total no. of treatment equipment (excluding CBWTF)					
				Incinerator					
Operational	Under Construction			APCD	APCD			Hydro-clave	Shredder
3	0	265	273	1	7	5	0	0	4

3.4 Stakeholder involvement in environment preservation and restoration

1. Private Sector: A large number of private clinics, nursing homes and hospitals have come up mainly at Shimla and other district towns. A few private hospitals have been set-up at sub-divisional level too. Total bed capacity of private sector in the State is about 500.

2. NGO and Voluntary sector: It is not certain if the curative care services are proneded by their sector. A large number of NGOs are, however, coming forward to mitigate the sufferings of humanity in collaboration or under the guidance of the Department of Health and Family Welfare. A charitable hospital at Bhota in Hamirpur District is being run by religious organization. Chinmaya Tapovan Trust, Kangra conducts training programmes for 11 village health guides, 20 traditional birth attendants, 20 bal sevikas, 18 mahila mandal workers, 9 multipurpose health workers and 3 adolescent field workers. There are few NGOs extending support in the Health Care namely as Himachal Pradesh Voluntary Health Association (HPVHA) at Shimla, Society for Social Uplift through Rural Action (SUTRA) at Jagjitnagar, Solan, People's Action for People in Need (PAPN) at Sirmaur, Society

for Environmental and Rural Awakening (ERA) at Kangra.

3. Human Resource Development: The biggest challenge to the health-care education institution is not just technical, managerial or financial development but quality human resource development that includes following:

- Development of young health professionals and supportive staff who are responsible to social, technical, scientific and management abilities to work effectively in a comprehensive health system;
- development of a faculty consisting of not only good teachers but good role models with social vision, commitment to ethical norms and values that inspires the community; and
- Development of a team of supportive staff that complements with skill and dedication the faculty in the educational institutions.

There are quite a few basic and in-service training institutions in the State as follows:

4. Health and Family Welfare Training Centres at Shimla and Kangra: These training institutions are meant to impart in-service training to Medical Officers and para-medical staff of the Health Department regularly according to the needs of the Department. A Principal who is assisted by an Epidemiologist, Medical Professor and other faculty heads each training centre. Guest faculty is also invited from H&FW Directorate, other institutions and departments.

5. Para-medical Training Schools: There are facilities for pre-service and in-service trainings for all categories of staff in the Department. Details of training facilities are given below:

a) General Nursing Training Schools = 5 (Total capacity 230 per batch)
b) Female Health Workers Training Schools = 7 (Total capacity 420 per batch)
c) Male Health Workers Training Schools = 6 (Total capacity 360 per batch)

Indira Gandhi Medical College Shimla and Zonal Hospital Dharamshala also train Operation Theatre Assistants (20), Lab. Technicians (75) Radiographers (20) and Para Medical Ophthalmic Assistants (20). Trainings are given only when there is a need to fill the departmental vacancies.

6. Medical and Dental Colleges: There are two Medical Colleges and one Dental College in Government sector besides four more Dental Colleges at Sundernagar, Paonta, Solan and Baddi, in private sector. Medical College at Shimla has an intake capacity of 65 and Tanda has an intake of 50. Dental College at Shimla has 30 seats. Medical College, Shimla also has facilities for 16 post- graduate degrees and 8 diploma specialties. The Departmental Head of Medical Education is also the Secretary in the Health Department, but it is a separate Directorate as is the Directorate of Dental Services.

7. Training facilities in ISM&H Department: The two institutions which impart training are namely:

a) Ayurvedic College at Paprola (Kangra). It has an yearly intake of 50, for five and half years course of BAMS and
b) Pharmacy Training School at Jogindernagar. It has capacity to train Ayurvedic Pharmacists in two years course and trainings are conducted as per the needs of the Department.

8. Vanaspati Van (Herbal Gardens): The Western Himalayas have about 1350 herbal and aromatic plants. Half the number is available in the hills of Himachal Pradesh. The State has

also been considered as ideal for growing the following seven plants: Shatavari, Daru Haldi, Vatsnabh, Atees, Chirayata, Kuth and Kutki. An Herbal-Medicine Board is functioning in the State with the Chief Minister as its President and the Director of ISMH as its Secretary. A number of medicinal herbs are being grown here for demonstration purpose. The annual production of herbs here is worth Rs.1.00 lakh. A Herbarium has also been established here.

3.5 Critical Environment Issues / Hotspots associated with the Sector

1. Water related diseases due to non access to safe drinking water:

At the state level, cases of admission in hospitals due to diarrhoea increased from 16,263 in 1995 to 16,602 in 2002. Similarly, cases of admission in hospitals due to hepatitis increased from 379 in 1995 to 421 in 2002. At district level, Chamba, Hamirpur, Kinnaur, Kullu, Lahaul & Spiti, Mandi, Sirmaur and Una reported increase in admission in hospitals due to diarrhea during 1995 to 2002. Similarly, Bilaspur, Chamba, Kangra, Kinnaur and Una reported increase in admission in hospitals due to hepatitis during 1995 to 2002.

A large section of population in the state lacks access to potable water supply. Water distribution in monitored by the MC Shimla, Solan and Palampur whereas in Parwanoo it is being distributed by HIMUDA. In other areas, it is with the IPH department. However, the gap in demand and supply for rural potable water in the state exceeds 2,00,000 kilolitres per day (kld) considering a benchmark of 70 litres per capita per day (lpcd). Similarly the gap in urban potable water supply in the State exceeds 50,000 kld considering a benchmark of 135 LPCD.

At district level, the gap in supply and demand of urban potable water ranges from 1383 kld in districts Bilaspur and Kullu to 27,365 kld in Solan. Further, the gap in rural potable water supply ranges from 822 klpcd in Lahaul & Spiti to 31,000 klpcd in Kangra. These gaps indicate that population in rural areas is more affected by low access as well as shortage of potable water in the state. It also indicates that urban areas have better infrastructure to meet water supply demand in comparison to rural areas.

2. Health issues due to inadequate sanitation: The gap in rural and urban sewage generation and collection in the state exceeds 1,50,000 kld and 49,000 kld respectively. At district level, the gap in rural sewage generation & collection ranges from 822 kld in Lahaul & Spiti to 31,060 kld in Kangra. Similarly, the gap in urban sewage generation, ranges from 1264 klpcd in Bilaspur & Kullu to 27,365 kld in Solan. These gaps indicate discharge of sewage both in rural and urban areas without collection and treatment.

3. Health issues due to inadequate solid waste collection and treatment:

- The gap in rural and urban municipal solid waste generation, collection and treatment at state level is about 758 Tonnes per Day (TPD) and 185 TPD respectively. At district level, it ranges from 4.2 TPD in Lahaul & Spiti to 157.7 TPD in Kangra in rural areas. Similarly, it ranges from 4.8 tpd in Bilaspur & Kullu to 104.5 TPD in Solan in urban areas.
- The gap in rural and urban biomedical waste generation and collection and treatment at state level exceeds 3 TPD and 1TPD respectively. In rural areas, this gap ranges from 60 kg per day in Lahaul & Spiti to 709 kg per day in Kangra. Similarly, it ranges from 55 kg per day in Bilaspur and Una to 305 kg per day in Shimla.
- The gaps in MSW and BMW management indicate untreated waste disposal in both rural and urban areas.
- Lack of sewage, MSW & BMW collection, and treatment and disposal

facilities results in vulnerability of water supply sources to both microbiological and chemical contamination. Further, the population behavior with respect to personal hygiene and sanitation gets adapted to existing situation. It is reflected in practices like open defecation, less usage of latrines, reduced washing of hands and bathing and poor kitchen cleanliness.

4. Inadequate health infrastructure: Number of beds available per 1000 population is 1.2 in the State, which is much less than 3.96 per 1000 population in the world. NRHM 2007-08 report highlights lack of health infrastructure in the State due to inadequate mechanism of drugs distribution, inadequate capacity of existing infrastructure including buildings and equipment, shortage of trained medical/paramedical staff at PHC/CHC level and lack of participation of NGOs/CSOs and the private sector in health care system.

5. Health deterioration due to air pollution:

- At State level, the percentage of population dependent on biomass/fuel wood for cooking in rural and urban areas exceeds 80% and 20 % respectively. This indicates exposure of population especially women to smoke / indoor air population.
- Increase in registered vehicles and expansion of road network in urban areas has resulted in deterioration of urban air quality. Industrial areas like Baddi, Kala Amb and Parwanoo have been classified as severely polluted areas based on Comprehensive Environment Pollution Index (CEPI), developed by CPCB. Air pollution from industries is one of the major factors in the determination of this index.

6. Health deterioration due to malnutrition: Low birth weight, mothers malnutrition, low birth weight of new borne, delayed feeding of new borne, underfeeding of the mother, inadequate breastfeeding of the baby, delayed weaning practices, social taboos about food, religious hurdles & sentiments, worm-infestation, water-borne diseases, acute respiratory infections, non availability of nutritional food locally cause burden of diseases in Himachal Pradesh. These indicate malnutrition amongst children and pregnant women.

7. Occupational health of workers in industries: Data from Labour Bureau, Government of Himachal Pradesh indicate negligible occurrence of "occupational disease" as per Factory Act 1948 and Employees State Insurance Act, 1948. This has been attributed to low level of reporting both by employers and employees to the respective agencies. However, the CEPI data from CPCB and hospital admission statistics for upper & lower respiratory diseases in districts having major industries in Himachal Pradesh indirectly indicate occupational health issues of industrial workers.

8. Communicable disease due to tourism: HIV positive cases are concentrated in the five districts of Shimla, Bilaspur, Hamirpur, Mandi and Kangra. Four districts except for Hamirpur, are major tourist destination. A number of HIV/AIDS infections have also been reported along the national highways i.e. from Shimla to Kangra and from Anandpur Sahib to Manali.

9. Lack of awareness: State Project Implementation Plan NRHM-2007-08 highlights lack of awareness about health issues due to limited reach and extent of public awareness campaign on account of hilly terrain/topography and inadequate of NGOs and CSOs participation in the health sector in the state.

10. Inadequate health infrastructure for management of hazardous waste, biomedical waste and radioactive waste: With advancement of medical science most of the hospitals/nursing homes are now equipped with latest instruments for diagnosis and treatment of various diseases. One of the most important aspect associated with hospitals is the safe management of the wastes generated from these establishments, which contains human anatomical wastes, blood, body fluid, disposable syringe, used bandages, surgical gloves, blood bags, intravenous tubes, etc. Besides, BMW, the generation of mercury waste (thermometer, fluorescent lights and CFLs etc), inadequate/improper collection and disposal thereof is not adequate. This poses health risks and increased environment management costs. The main concern lies with the hospital waste generated from hospitals/nursing homes as it may pose deleterious effects due to its hazardous nature. Bio-medical wastes, if not handled in a proper way, is a potent source of diseases like AIDS, Tuberculosis, Hepatitis and other bacterial diseases causing serious threats to human health. The related issue with the inadequate health infrastructure is improper siting of facilities (to treat and dispose biomedical/hazardous/ solid waste) which have been set up in the state. The improper siting, inadequate treatment and disposal of waste (resulting out of mixing of waste from different streams) pose grave threats to human well being and natural environment.

11. Inadequate Monitoring and Evaluation: The participation of Health and Family Welfare Department in health monitoring and inspection *vis a vis* environment risks is inadequate. Inadequate monitoring of banned chemicals and other substances, poor reporting of the incidences results in delaying raising of alarm/early warning of health epidemics, disease outbreaks and infestations to the citizens.

12. Inadequate Research and Development (R&D) and medical professional course/ training in emerging health issues: Diseases like cancer, heart disease, hypertension, diabetes, etc and various microbial threats like viral flue cholera, plague have not been given adequate attention in the State. The current standards/accreditation of medical professional courses/ training including paramedical training need to be upgraded and matches with the best in the industry and duly accredited.

Pressure on account of increasing gaps and slow implementation of policy, programmes, plans and projects is leading to emergence of sector specific issues and risks/impacts. An analysis of the issues, causes and impacts has been carried out and summarized in Table 40.

Table 40: Issues, Causes and Impacts

Issues / Problems	Causes	Impacts/Risks
1. Water related disease due to non access to safe drinking water	Untreated water supply source Microbiological contamination from human/animal excreta, etc. Chemical contamination from agriculture / pesticides Lack of dependable source of water Lack of storage infrastructure	Health Risks / Epidemics / Diarrhoea / Water related diseases Health Risk / Unhygienic living conditions
2. Health issues due to inadequate sanitation	Lack of infrastructure: Latrines Sewage collection, treatment & disposal Personal hygiene awareness	Health Risk / Unhygienic living conditions / Water borne disease

Issues / Problems	Causes	Impacts/Risks
3. Health issues due to inadequate solid waste collection & treatment	Inadequate infrastructure Municipal solid waste collection, treatment & disposal Biomedical waste collection, treatment & disposal	Health Risk / Unhygienic living conditions / Water borne disease
4. Personal hygiene & sanitation	Population behavior with respect to: Open defecation Washing of hands Kitchen cleanliness Bathing Use of latrines	Health Risk / Unhygienic living conditions / Water borne disease
5. Health deterioration due to air pollution	- Exposure to smoke due to burning of domestic fuel Air pollution due to increased vehicular traffic Air pollution due to emissions from industries	Health Risks / Increase in respiratory disease
6. Lack of awareness about health issues practices	Limited reach & extent of public awareness campaign due to topography / hilly terrain Lack of NGOs / CSOs /CBOs participation	Health Risks / Increased burden of disease / mortality
7. Inadequate health infrastructure	Inadequate mechanism for drugs availability and distribution Inadequate utilization of the heath infrastructure due to various legal constraints Inadequate capacity of health infrastructure / facilities including buildings & equipment Shortage of trained medical / paramedical staff at PHC / CHC level Lack of participation of NGOs / CSOs and private sector in health care system	Health Risks / mortality
8. Health deterioration due to malnutrition	Poor nutrition to vulnerable groups e.g. BPL families infant and pregnant women	Health Risks / Morbidity & Mortality
9. Occupational health of workers in industries	Inadequate ventilation cleanliness, sanitation and safe working practices.	Health Risks / Increased burden disease
10. Communicable disease due to tourism (HIV/AIDS)	Proliferation of HIV/AIDS due to unsafe practices Lack of awareness	Health Risks / Increased burden of disease
11. Inadequate health infrastructure for management of hazardous waste, biomedical waste, radioactive waste	Improper siting Inadequate treatment and disposal Mixing of wastes from different streams	Health Risks / Increased burden of disease
12. Inadequate Monitoring and Evaluation:	-Inadequate awareness -Inadequate staff -Inadequate capacity and skills	Early warning of health epidemics/disease outbreak not functional

Issues / Problems	Causes	Impacts/Risks
13. Inadequate Research and Development (R&D) and medical professional course & training in emerging health issues	-Lack of specialized and super specialty health institutions in the state - Lack of trained health professionals/paramedical staff - Maintaining quality health education as per MCI standards	Health Risks / Increased burden of disease Projected growth in Health Tourism may not be realised

3.6 Environment Initiatives taken by the sector to address Critical Environment Issues

Common Bio-Medical Waste Treatment Facility (CBWTF): Expression of interest (EOI) has been invited from interested parties to shortlist competent parties who could subsequently bid for setting up, running and managing the Common Bio-Medical Waste Treatment Facility (CBWTF) at any one or more among the following locations in the state strictly as per the CPCB, HPPCB and other regulating bodies guidelines for following details:

Shimla (covering Shimla and Kinnaur districts)
Kangra (covering Kangra and Chamba districts)
Solan (covering Solan and Sirmaur districts)
Mandi (covering Mandi and Kullu districts)
Hamirpur (covering Hamirpur, Una and Bilaspur districts)

The Health and Family Welfare Department has issued detailed instructions in the Manual for managing the Hospital Waste.

1. The waste shall be segregated at the point of generation and stored in coloured containers as per the colour code prescribed in the Bio-medical Waste (Management and Handling) Rules 1998. The prescribed colour code is:
   - **Black :** General waste, peels, paper, and wrappers;
   - **Yellow:** Human anatomical tissue, blood, body fluids, waste contaminated with blood, dressing and soiled cotton and all other to be incinerated waste;
   - **Red:** Same as yellow but needs deep burial;
   - **Blue / Grey:** Sharps and plastic waste for shredding / autoclaving / to be micro waved.
2. The Manual also mentions of the disinfectants to be used for disinfecting sharp waste, disposable infectious plastics, infectious glassware, blood and body fluids. It says that the most economical and effective disinfectant is hypochlorite. The other disinfectants mentioned in the Manual are, Methylated Spirit (70%), Alcoholic hand wash (70% methyl alcohol to which 1% glycerin is added), Gluteraldehyde (2%) and Savlon (1%).
3. The duties of MS have been defined in the Manual as the officer who would apply to the H.P. Pollution Control Board for authorization for the handling of bio-medical waste and see that the new waste bags and containers are ordered on a regular basis to maintain continuous supply.
4. The H.P. State Pollution Control Board gives this report on bio-medical waste. Till March 2005 in all 580 Govt. and 194 private health institutions have been identified. Out of these 774 health institutions 346 have been exempted from seeking authorization under Rule-8, of the Bio-Medical Waste (Management and Handling) Rules, 1998. 401 health institutions have applied for authorization

and 129 have been granted authorization. 108 defaulting institutions have been served with show cause notice under the Bio-medical Waste (Management and Handling) Rules, 1998. These health institutions have installed twelve incinerators. Municipal Corporation, Shimla and Municipal Committee, Kullu have Common Waste Treatment Facility Incinerators.

5. Disease Surveillance Laboratories carry out testing for infectious and contagious diseases, such as malaria, typhoid, cholera and hepatitis, tuberculosis and HIV/AIDS. These laboratories, therefore, generate waste which includes infected human tissues and blood samples, microbes, discarded chemicals, sharps, etc. Such waste, if not managed properly, carries the risk of infection for waste handlers and to the larger community and is also a potential environmental hazard, through pollution of land, water and ground water. Although the amounts of waste generated from such laboratories is small, its varied and hazardous composition requires comprehensive management of the waste lifecycle, from source to disposal, to prevent adverse impacts on the environment and public health. Adequate waste management in laboratories will not only improve overall environmental performance but also facilitate in providing a safe workplace for the laboratory personnel. In addition, laboratories have to comply with the environmental regulations of the Government of India, specifically the Bio-Medical Rules (prepared in 1998 and amended in 2000 &2003).

3.7 Environment related studies carried out in the sector

Himachal Pradesh has entered an era in which, as a result of spread of education and enhanced awareness, the public is expressing increasing concern about protecting human health and preserving the quality of our environment. Hospital waste generated during the patient care is its a cause of concern. It is a potential health hazard to the health care workers, public and flora and fauna of the area. Emission of gases by Incinerator such as Furan, Dioxin, Hydrochloric acid etc have promoted the Department of Health and Family Welfare to think seriously about the matter and the diseases transmitted through improper disposal of hospital waste. The Central Government has already passed an Act in 1996 and Bio-Medical Waste (Handling and Management) Rules were introduced in 1998.

Department of Health and Family Welfare has brought out a Hospital Manual and its Chapter XIII is on Prevention of Hospital Acquired Infection and Hospital Waste Management. During hospitalization or after the discharge of the patient from the hospital, he or she may develop an infection called Nosocomial Infection. This occurs as a result of:

- Improper asepsis of the environment due to accumulation of untreated hospital waste and the unscientific way in which this waste is disposed off
- Improper asepsis of equipment, instruments;
- Poor sterilization/ disinfection techniques;
- Invasive monitoring and therapeutic procedures;
- Transmission of infection by staff carriers;
- Consumption of infected food, milk and water;
- An epidemic arising in the community and spreading to the hospital.

The Manual prescribes adequate surveillance programme for constant reporting and investigation of infections, the first being the formation of Hospital Infection Control Committee (HIFCOM). Other steps that are to be taken to check the menace are:

- Adequate sanitation and disinfection of environment;
- Adhere strictly to aseptic techniques while performing surgical and instrumentation procedures;
- Segregate contaminated instruments;
- Provision of source isolation;
- Discourage indiscriminate use of antibiotics.

Bio-medical Waste Management: A Common Biomedical Waste Treatment Facility (CBWTF) is a setup where biomedical waste, generated from a number of healthcare units, is imparted necessary treatment to reduce adverse effects that this waste may pose. Biomedical waste generation data at major health care facilities of Shimla town on daily basis under present study have been collected for two consecutive years. There are around 100 clinics and health care facilities in the limits of Municipal Corporation of Shimla. In the present study only five major health care facilities are considered.

Lack of awareness amongst the hospital staff including doctors towards the segregation of infectious waste is one of the main reasons for mismanagement of Bio-medical waste in the hospital.

Table 41: Waste Generation in Major Hospitals of Shimla Town

No.	Name of the Hospital	Quantity of waste /bed in kg.	Total quantity in kg.
1	Indira Gandhi Medical College	0.858	450.0
2	Kamala Nehru Hospital	1.95	295.02
3	Deen Dayal Hospital	0.644	128.80
4	Indus Hospital	1.3	130.0
5	Army Hospital at Tutu	0.386	38.56
	Total	**-**	**1062.48**

Source: Report on Solid Waste Management in Shimla Town

NRHM is a landmark for providing accessible and affordable health care to all citizens living in rural areas particularly to the poorer and weaker sections. It lays stress on reducing maternal and infant morality, universal access to public health services, prevention and control of communicable and non-communicable disease, ensuring population stabilization, maintaining gender balance, revitalization of local health traditions and promotion of healthy life styles. Under the overall umbrella of NRHM a number of programmes especially the Reproductive and Child Health Programme (RCH-II), Immunization Programme, Janani Suraksha Yojana (JSY) and Disease Control Programme have been included. The mission focuses on decentralized implementation of the activities and funneling of funds, it sets the stage for Distt. Management of Health and active community participation in the implementation of health programmes. The Himachal Pradesh Govt. has already constituted the State and Distt. Health Mission and grass-root activities have been started with zeal and zest. All the CHCs would be converted into First Referral Units under the programme in a phased manner. Similarly, 50% of the PHCs in the State would be providing 24 hours services by the end of the programme. The programme also focuses on convergence with IPH, Rural Development and Panchayati Raj, Ayurveda and Social Justice and Empowerment Departments.

3.8 Environment monitoring (key parameters such as air and water pollution) should be carried out for activities related to the sector

At present, there is no mechanism for environmental monitoring within the sector related to environment issues. However, HP State Pollution Control Board monitoring, air, water, noise, effluent including trade effluent from industries as described in potable water sector.

Monitoring of Indian National Aquatic Resources (MINARS) is sponsoring the water quality monitoring of major rivers of the State. The monitoring is being carried out in the month of April, July, October and January every year. In all 36 points have been selected on major rivers Satluj, Beas, Ravi, Yamuna, Parvati, Sirsa, Markanda & Sukhna, Samples are analyzed for 22 parameters which includes the physico-chemical and bacteriological contents. The results are shown in Table 24. Eighteen (18) points have also been selected in major industrial towns for the monitoring of ground water of hand pumps & wells. It has been observed that quality of ground water monitored in the State conforms to the prescribed standards.

Physical and chemical qualities tested in samples taken from all the fourteen water zones in Shimla are found satisfactory conforming to prescribed standards of drinking water. Water sample taken from Public Tap located at Sanjaulli main Chowk has shown bacteriological contamination. Similarly water sample taken from Public tap at Kasumpti near B.S.N.L office has shown the presence of Coliform group of bacteria. Further, HP PCB has set in place a river water quality monitoring. Table 42-45 shows the Monitoring results on river quality, lake water quality and other sources of water is given in the section.

Table 42: River Quality Data (Annual Avg.)Year 2003

Location	pH	DO Mg/1	BOD Mg/1	FC (MPN/100ml)	Temp (°C)	WQI
Beas at U/S Manali, H.P.	8.1	10.0	0.3	135	6	Good
Beas at D/S Kullu, H.P.	8.0	9.1	0.7	283	10	Good
Beas at D/S Aut, H.P.	8.0	10.1	0.9	82	7	Good
Beas at U/S Pandoh Dam, H.P.	8.2	9.8	0.6	20	8	Good
Beas at Exit Of Tunnel Dehal Power House, H.P.	8.0	10.8	1.3	29	8	Good
U/S Mandi, H.P	8.1	9.3	1.1	25	9	Good
Beas at D/S Mandi, H.P.	8.0	8.2	1.2	421	10	Medium
Beas at D/S Alampur, H.P.	8.1	8.1	0.8	10	17	Good
Beas at D/S Dehra gopipur, H.P.	8.1	7.7	1.0	26	19	Good
Beas at D/S Pong Dam, H.P.	8.1	8.3	0.7	6	24	Good
Satluj at Nathpa Zakhri, H.P	8.3	9.5	0.3	7	14	Good
Satluj at U/S Rampur, H.P.	8.1	9.4	0.1	152	13	Good
Satluj at D/S Rampur, H.P.	8.2	9.4	0.2	226	14	Good
Satluj at U/S Tatapani, H.P.	8.2	9.2	0.2	104	15	Good
Satluj at U/S Slapper, H.P.	8.4	9.5	0.8	38	10	Good
Satluj at D/S Slapper, H.P.	8.3	10.2	0.9	41	9	Good
Satluj at D/S Bhakhra, H.P.	8.3	9.2	0.4	2	16	Excellent
Ravi at U/S Chamba, H.P.	8.2	9.2	0.7	8	12	Good
Ravi at U/S Madhopur, H.P.	7.8	8.2	0.8	7	18	Good
Ravi at U/S Of Madhopur Headworks,Gurdaspur,Punjab	7.6	8.2	0.7	7	18	Good
Parvati before Conf. to River Beas, H.P.	7.8	9.8	0.7	152	9	Good
Largi at D/S, H.P.	7.8	10.4	0.6	80	6	Good
River Sirsa , U/S Sitomajri Nallahgarh, H.P	8.3	8.0	0.2	77	23	Good
River Sirsa , D/S Nalagarh Bridge, H.P	8.3	7.6	0.4	318	26	Good
Yamuna at U/S, at Paonta Sahib	8.9	8	2	46	20	Good

Location	pH	DO Mg/l	BOD Mg/l	FC (MPN/100ml)	Temp (°C)	WQI
Yamuna at U/S, at Paonta Sahib	8.9	7.7	4.8	76	22	Medium

Table 43: Lakes Water Quality Data Year 2003

Lake / Pond / Tank / Creek	Location	Tem (c)	pH	Cond Micromaho/cm	DO Mg/l	BOD Mg/l	COD Mg/l	FC MPN/100ml	TC MPN / 100ml
Gobind Sagar Lake	Gobindsagar Lake At Bilaspur, H.P.	10	8.4	308	9.3	0.6	53.0	58	159
Pong Dam Lake	Pongdam Lake at Pong Village,H.P.	24	8.4	236	8.1	0.9	3.0	5	27
Renuka Lake	Renuka Lake , 35 Km from Patna Sahib North , H.P	20	8.6	1207	8.1	6.0	42.0	33	85

Samples analysis in the state board laboratories: The State Pollution Control Board has 5 laboratories for carrying out analysis of water, waste water, solid waste, air and bio-monitoring samples. The details of samples analyzed by the laboratories during the year 2007-08 are given in Table 44.

Table 44: Number of Samples Analyzed in State Pollution Control Board's Laboratories

Sr. No.	Type of Samples		Number of Samples Analyzed in StatePollution Control Boards Laboratories				
			Parwanoo	Paonta Sahib	Jassur	Sunder Naggar	Shimla
1	Water & Waste Water	Trade Effluent	764	336	181	183	-
		RM/ Study etc. water samples	1110	83	128	346	
2	Bio-Monitoring		-	12	-	-	-

Water quality of major rivers in Himachal Pradesh monitored under MINARS and state water quality monitoring programme for year 2008.

Table 45: Water quality of major rivers in Himachal Pradesh (January 2008)

Name of the location	pH	D.O. mg/l	BOD mg/l	T.C. MPN/SPC per 100ml
Lift Nala D/S Hotel Combermere,	7.7	8.4	4	320
Lift Nala U/S M.C. Waste Processing Site	7.48	8.5	14	820
Lift Nala D/S MSW Processing Site, Shimla	6.56	8.4	12	750
Ashwani Khad U/S Lift Nala	7.09	8.9	3	60
Ashwani Khad D/S Lift Nala	6.75	8.7	30	360
Giri River D/S Yashwant Naggar,	8.14	11.6	0.6	180
Satluj River bef. conf. with Spiti at Khab	7.56	-	0.1	2

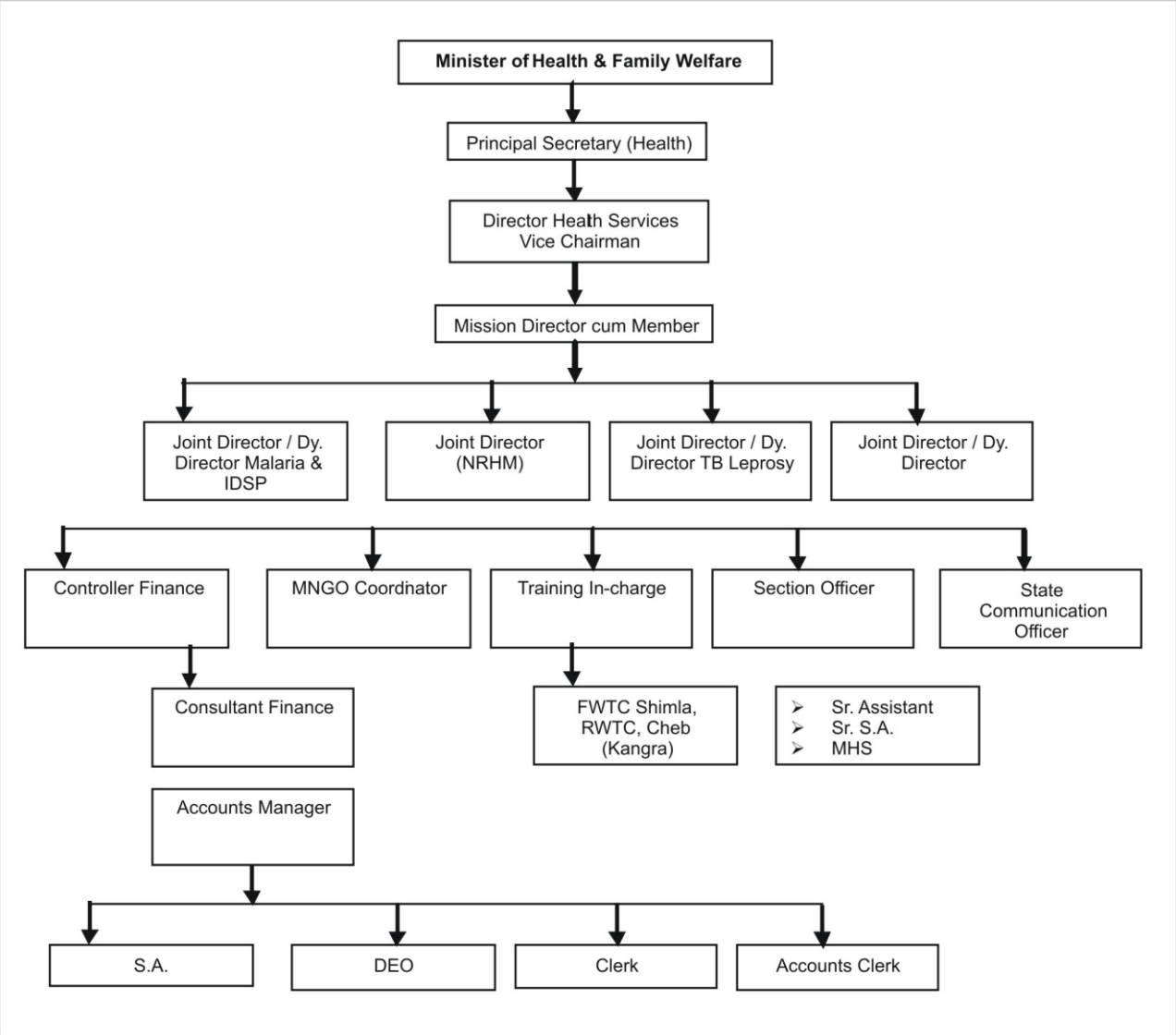
Name of the location	pH	D.O. mg/1	BOD mg/1	T.C. MPN/SPC per 100ml
Spiti River bef. conf. with Satluj at Khab	7.59	-	0.1	Nil
Satluj River after confluence of River Spiti at Khab	7.71	-	1	Nil
Satluj River bef. conf. with Tidong River	7.69	-	0.1	4
Tidong River bef. conf. to R. Satluj	7.32	-	0.1	Nil
Satluj River after conf. with Tidong River	7.64	-	0.1	6
Satluj River U/S Shorang Khad	7.26	10.1	0.1	36
Sorang River bef.conf. to R. Satluj	7.38	10.5	0.1	50
Satluj River D/S Shorang Khad	7.39	10.2	0.1	42
Baspa River U/S Reservoir	7.71	10.5	0.1	4
Baspa River D/S Reservoir at Kuppa	8.15	9.8	0.2	8
Baspa River Baspa Project Reservoir	7.7	10.2	0.2	6
Satluj River U/S trt Baspa Hydel Project Reservoir	7.52	9.6	0.1	60
Satluj River bef. conf. to Baspa River	7.74	9.8	0.1	50
Satluj River After Conf. To Baspa	7.47	10.1	0.1	66
Satluj River at Wangtu Bridge, 1389-R-Sat-A	7.28	9.8	0.1	19
Satluj River D/S Nathpa,	8.42	10.7	0.1	20
Satluj River bef. conf to Ganvi Khad	7.92	9.8	0.1	18
Ganvi Khad	7.51	9.4	0.1	40
Satluj River D/S Ganvi Khad	7.01	9.5	0.1	22
Satluj River U/S trt Jhakri	7.83	10.1	0.2	40
Satluj River D/S trt Jhakri	7.95	10.4	0.1	20
Satluj River U/S Landfill site, Rampur	17.27	10.5 26	0.	
Satluj River D/S Landfill site, Rampur	7.92	11.2	0.2	34
Satluj River U/S Rampur, 1086-R-Sat-A	8.02	11.4 56	0.1	
Satluj River D/S Rampur,1087-R-Sat-A	8.14	9.6	0.2	130
Satluj River D/S Dattnagar, Rhep, Rampur	8.58	10.5	0.2	70
Satluj River U/S Tatapani,1013-R-Sat-A,	7.61	9.4	0.3	80
Satluj River U/S Slapper, 1014-R-Sat-A	8207	12.4 240	0.	
Satluj River Dehar Power House, 1005-R-Bea-A	7.92	12.5	0.5	920
Satluj River D/S Slapper, 1015-R-Sat-A	8401	12.3 540	0.	
Satluj River D/S Acc Barmana. Satluj River	7.99	12	0.7	920
Satluj River D/S Bhakhra 1016-R-Sat-A	7.79	10.8 20	0.1	
Satluj River U/S Bhakra	7	11	0.4	24
Satluj River D/S Bilaspur, 1291-L-Gol-A	7.9	12	0.8	540
Swan River D/S Santokgarh 1869-R-Swan	8.01	9.4	2.2	160
Swan River U/S Landfill Site, Santokhgarh	7	8.6 120	1.4	
Swan River D/S Landfill Site, Santokhgarh	7.6	7.7	1.8	160
Beas River U/S Manali, 1001-R-Bea-A	7.91	9	0.2	26
Beas River D/S Manali	7.03	10.9	5.9	>2400
Beas River U/S Waste Processing Facility Manali	7.54	11.7	1.1	> 2400

Name of the location	pH	D.O. mg/1	BOD mg/1	T.C. MPN/SPC per 100ml
Beas River D/S Waste Processing Facility Manali	7.38	11.6	1.3	≥ 2400
R. Beas D/S Of Conf. With Allaign Nalla	7.14	11.5 >	1	≥ 2400
Allaign Nalla bef. conf. with Beas	8.06	11.4	0.9	≥ 2400
R. Beas D/S conf. with Duhangan Nalla	7.13	11.7 >	0.4	≥ 2400
Duhangan Nalla bef. conf with R. Beas	7.31	11.6	0.7	350
Beas River U/S Kullu	7.56	10.3	2.2	≥ 2400
Beas River D/S Kullu 1002-R-Bea-A	7.08	10.4	2.4	≥ 2400
Beas River U/S Waste Processing Facility Kullu	7.58	11.7	1.7	≥ 2400
Beas River D/S Waste Processing Facility Kullu	7.59	11.6	1.9	≥ 2400
Beas River U/S of Conf. Of R. Parvati	7.47	11.7 >	1.2	≥ 2400
Parvati River U/S Manikaran	7.45	12.3	1	79
Parvati River D/S Manikaran	7.65	11.7	1.3	≥ 2400
Parvati River River at Bhunter 1290-R-Par_A	7.26	9	1.2	≥2400
Beas River D/S of conf. of R. Parvati	7.52	10.2 >	1.6	≥ 2400
Sainj River U/S Envisaged Power House site of Parvati-II	7.59	11.9	1.1	46
Sainj River D/S Envisaged Power House site of Parvati-II	7.56	11.8	1.5	130
Sainj River U/S Envisaged Power House Site Of Parvati-III	7.5	11.8	1	130
Sainj River D/S Envisaged Power House Site Of Parvati-Iii	7.74	11.8	1.6	130
Beas River U/S Fermenta Biodil	7.73	11.7	0.6	280
Beas River D/S Fermenta Biodil	7.97	11.7	0.5	1600
Beas River D/S Aut , 1003-R-Bea-A	7.82	11.5	1	920
Largi River D/S Largi ,1090-R-Lar-A	8.05	12	0.6	180
Beas River D/S of Conf. of trt of Largi Hep Power House	7.77	11.5	1.3	23
Beas River U/S Pandoh Dam , 1004-R-Bea-A	7.78	11.6	0.4	23
Beas River D/S Pandoh Dam	7.52	11.4	0.7	70
Suketi River U/S of conf. of Dregger Outfall of snr Balancing Reservoir	8.13	10.8	0.6	> 2400
Suketi River at Dadour Bridge	7.63	9.7	1.3	> 2400
Shuketi Khad U/S Mandi,	7.99	10.1	0.6	> 2400
Beas River D/S Mandi , 1006-R-Bea-A	7.56	11.5	0.4	920
Beas River U/S Salt Mine Drang	7.15	10.7	7.6	> 2400
Beas River D/S Salt Mine Drang	8.37	9.3	0.3	17
Beas River D/S Mandi , 1006-R-Bea-A	8.37	8.7	0.5	21
Beas River U/S of conf. of Envisaged trt Of Uhl-Iii	7.99	11	0.7	240
Beas River D/S of conf. of Envisaged Trt	8.42	11	1	350

TRT – Tail Race Tunnel

3.9 Institutional Mechanisms within the Sector to address identified Environment Issues

The Directorate of Health and Family Welfare functions under the administrative control of Secretary (Health) Govt. of HP and is located at Block No. 6, SDA Complex, Kasumpati, Shimla-9. The Directorate is headed by the Director of Health Services. Roles and Responsibilities have been given to Panchayati Raj Institutions: Health and Family Advisory Committees have been formed at the three levels of the Panchayati Raj Institutions. These have been named as PARIKAS (Parivar Kalyan Salahkar Samiti). Their composition and works have been defined.



3.10 Data / documentation pertaining to addressing demographic issues in the context of the sectors, such as population changes; requirements of populations

and changing lifestyles; migratory populations including tourists; transhumants; transit labour population; pressures felt by communities due to degraded environment conditions

The Department of Health and Family Welfare, Government of Himachal Pradesh and is engaged in providing primitive, preventive and curative health to the people of the State through a net-work of 2071 Health Sub Centers, 443 PHCs, 22 Civil Dispensaries, 72 Community Health Centres, 36 Civil Hospitals, 9 Regional Hospitals, 3 Zonal Hospitals, 1 TB Sanatorium, 3 Leprosy Hospitals, 1 Himachal Pradesh State Hospital of Mental Health & Rehabilitation Centre, Mental Health Hospital, 1 Hospital for the Mother & Child, 1 ESI Hospital and 8 ESI Dispensaries, 2 Medical Colleges and 1 Govt. Dental College in the State as on 31.03.2007.

In Himachal Pradesh, presently one Health Sub Centre is serving 2838 people against the National Average of 5401. Similarly, a PHC is providing health care facilities to about 13,367 people against the National Average of 32,469 whereas a CHC is serving 88,911 people against the National Average of 2, 43,427.

Top Ten Causes of Diseases Burden : The top ten causes of diseases burden in different age group for females and males are shown in Table 46 and 47. Among children of 0-4 years diarrhoeal diseases, low birth weight and lower respiratory infection are leading causes of diseases burden. Among the reproductive age group, road accidents and other unintentional injuries, iron deficiency anemia, tuberculosis, chronic obstructive pulmonary diseases and upper respiratory infections are leading cause of diseases burden. DALY has two components namely Years Life Lost due to premature mortality **(**YLL**)** and Year Life Lost Due to Disability (YLD). The local data essential for the mortality (YLL) component of Disability-Adjusted Life Years (DALY) are the number of deaths by age, sex and average age at death within respective age groups.

Table 46: Top ten causes of Burden of Diseases (DALYs) among females in Himachal Pradesh

Rank	0-4 yrs	5-14 yrs	15-44 yrs	45-59 yrs	60 +yrs
1	Diarrhoeal diseases	Iron-deficiency anaemia (IDA)	Other unintentional injuries (OUI)	Chronic Obstructive Diseases	Chronic Obstructive Pulmonary Disease
2.	Low birth weight	OUI	Road accident	OUI	OUI
3.	Lower Respiratory Infectious	Asthma	Iron –deficiency anaemia	Ischaemic heart disease	OUI
4.	Other infectious diseases	Other infectious diseases	Chronic Obstructive Pulmonary Diseases	Tuberculosis	Ischaemic heart disease
5.	IDA	Diarrhoeal diseases	Self-inflicted injury	Road accident	Tuberculosis
6.	Dental caries	Otitis Media	Tuberculosis	Other infectious diseases	Road accident
7	Upper Respiratory Infections	Dental caries	Asthma	Peptic ulcer	IDA
8.	Asthma	Upper Respiratory Infections	Other infectious diseases	IDA	Cataracts

Rank	0-4 yrs	5-14 yrs	15-44 yrs	45-59 yrs	60 +yrs
9.	Otitis Media	Lower Respiratory Infections	Upper Respiratory Infections	Asthma	Asthma
10	OUI	Vitamin A Deficiency	Dental carrier	Dental carrier	Dental carrier

Table 47: Top ten causes of Burden of Diseases (DALY) among Males in Himachal Pradesh

Rank	0-4 yrs	5-14 yrs	15-44 yrs	45-59 yrs	60 +yrs
1.	Diarrhoeal diseases	Iron-deficiency anaemia	Iron-deficiency anaemia	Chronic Obstructive Pulmonary Disease (COPD)	Chronic Obstructive Pulmonary Disease
2.	Low birth weight	Diarrhoeal diseases	Other unintentional injuries(OUI)	Iron-deficiency anaemia	Other infectious diseases
3.	Other infectious diseases	OID	COPD	OUI	OUI
4.	Lower Respiratory Infectious diseases	Other unintentional injuries	Self-inflicted injury	Other infectious diseases	Rheumatic heart disease
5.	Iron deficiency anaemia	Otitis Media	Tuberculosi s	Tuberculosis	Ischaemic heart disease
6.	Dental caries	Asthma	Road accidents	Ischaemic heart disease	Iron-deficiency anaemia
7	Upper Respiratory Infections	Dental caries	Peptic Ulcer	Dental caries	Dental car
8.	Otitis Media	Road accident	Dental caries	Asthma	Diarrhoeal diseases
9.	Other unintentional injuries	Upper Respiratory Infections	Lower Respiratory Infections	Road accident	Tuberculosis
10	Other digestive injuries	Lower Respiratory Infections	Other infectious diseases	Cataracts	Asthma

The overall top ten causes of burden of diseases among males and females shown in Table 46 & 47 indicates that respiratory infections, diarrhoeal diseases, iron deficiency anaemia, tuberculosis, chronic obstructive pulmonary diseases and road accidents are six major causes of disease burden in both sexes. The disease burden on account of iron deficiency anaemia and tuberculosis in both the sex is mostly in the age group 15-44 years. This calls for early diagnosis and treatment for both the conditions. Leading causes of disability (YLD) in males and females is given in Table 48.

Table 48: Leading causes of disability (YLD) in males and females in Himachal Pradesh

Male	%	Female	%
Chronic Obstructive Pulmonary Diseases	26.09	Iron deficiency anaemia	20.13
Iron deficiency anaemia	14.19	Chronic Obstructive Pulmonary Diseases other unintentional injuries	17.15
Other unintentional injuries	12.24	Diarrhoeal diseases	13.04
Dental caries	7.08	Other unintentional injuries	12.68

Male	%	Female	%
Diarrhoeal diseases	6.15	Other infectious diseases	11.64
Asthma	5.92	Dental caries	7.31
Other unintentional injuries	5.23	Asthma	5.87
Upper Respiratory Infection	4.80	Tuberculosis	5.61
Lower Respiratory Infection	3.24	Road accident	5.38
Otitis media	2.28	Upper Respiratory Infection	4.78

The gap in the information collection system is that disease-wise information is not collected. 42 different types of illness are identified under seven main heads – 1.Nervous System; 2. Digestive System; 3. Blood Flow System; 4. Respiratory System; 5. Skin System: 6. Fevers; and 7. Eye Diseases. District-wise number of patients attending the ISMH institutions for treatment during 2003-04 is given in Table 49.

Table 49: Number of patients treated by ISMH

		2003			2004		
Sr. No	District	Outdoor	Indoor	Total	Outdoor	Indoor	Total
1	Bilaspur	407650	12743	420393	408266	10728	418994
2	Chamba	200463	3535	203998	313604	3156	316760
3	Hamirpur	395386	2684	398070	391543	4376	395919
4	Kangra	1221428	6384	1227812	1048070	11868	1059938
5	Kinnaur	62610	2801	65411	63444	1706	65150
6	Kullu	283815	194	284009	281569	83	281652
7	Lahaul &Spiti	29790	-	29790	59883	-	59883
8	Mandi	699385	2324	701709	684149	1999	686148
9	Shimla	471234	314	471548	447271	17060	464331
10	Sirmaur	271284	1736	273020	279305	1695	281000
11	Solan	301467	3009	304476	310777	3801	314578
12	Una	406200	9716	415916	398603	4782	403385
13	RAH Paprola	47189	2375	49564	47340	2773	50113
14	RAH Shimla	30551	4702	35253	30903	409	31312
	TOTAL	4828452	52517	4880969	4764727	64436	4829163

RAH: Rajkiya Ayurveda Hospital
Source: ISMH Department

Number of patients – outdoor as well as indoor - that went to the Institutions run by HFW during 1999 -2004 is given in Table 50.

Table 50: Patients treated during 1999 to 2004 in HFW institutions

Year	Outdoor			Indoor			Total		
	New	Old	Total	New	Old	Total	New	Old	Total
1999	7181755	2339358	9521113	256368	1142745	1399113	7438123	3482103	10920226
2000	6935854	2144187	9080041	256652	1145051	1401703	7192506	3289238	10481744
2001	7175041	2163166	9338207	273573	136106	1409679	7448614	3299272	10747886
2002	7262338	2088000	9350338	284734	1114900	1399634	7547072	3202900	10749972
2003	7494032	2091433	9585465	294096	1111253	1405349	7788128	3202686	10990814
2004	7674236	2193077	9867313	314878	1152414	1467292	7989114	3345491	11334605

District-wise number of cases reported in Hospitals as Indoor admission is given in Table 51.

Table 51: District-wise number of cases reported in Hospitals as indoor Admission

Selected Diseases	Bilaspur						Chamba						Hamirpur						Kangra						Kinnaur					
	1995		2000		2002		1995		2000		2002		1995		2000		2002		1995		2000		2002		1995		2000		2002	
	Case	D.	Case	Dt.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.
Stomach Cancer	1	0	0	0	1	0	3	0	2	0	2	0	0	0	1	0	0	0	0	0	6	0	4	0	0	0	1	0	5	0
Liver Cancer	3	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	0	0
Prostate Cancer	0	0	4	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Lymphoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parkinson's diseases	16	0	0	0	0	0	45	0	37	0	23	0	42	0	11	0	15	0	155	0	40	0	155	0	35	0	35	0	27	0
Cirrhosis of the liver	43	4	3	2	1	0	3	0	8	0	2	0	1	0	0	0	5	1	15	0	20	17	34	0	0	0	3	0	9	2
Nephritis & Nephrosis	6	0	145	0	90	0	149	0	296	4	249	2	16	0	59	2	143	2	174	0	604	1	423	0	4	0	61	0	97	0
Congenital abnormalities	0	0	0	0	1	0	0	0	0	0	6	0	12	1	5	0	0	0	4	0	5	0	6	0	4	0	0	0	1	1
Unintentional poisonings	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diarrhoeal Diseases	1313	5	1073	1	1072	0	906	15			1190	3	1195	5	1091	1	1618	0	3033	2	2433	0	2651	0	167	6	146	3	224	1
Polio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	5	0	12	0	63	0	13	0	23	0	31	0	40	1	10	1	16	0	66	0	52	0	143	0	4	0	1	1	5	0
Malaria	13	0	8	0	0	0	15	0	0	0	0	0	12	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
Filariasis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trachoma	3	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0
Intestinal Helminths	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	216	0	0	0	0	0	0	0
Protein energy malnutrition	1	0	0	0	0	0	0	0	4	0	115	0	0	0	0	0	0	0	15	0	10	0	0	0	15	0	0	0	2	0
H. Pylori (peptic ulcers)	33	1	41	1	3	0	21	2	178	1	176	1	35	0	35	0	61	0	1661	0	12	8	103	0	10	0	5	0	5	0
Other Digestive disorders	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acute respiratory infections	661	0	502	0	130	0	174	24			32	0	1047	3	203	8	296	0	5701	7	532	8	115	0	100	0	11	0	19	0
Chronic respiratory diseases	100	4	180	16	70	0	204	21	60	0	275	10	327	0	16	0	14	0	3281	0	107	0	124	0	110	5	3	0	0	0
Lung & related cancers	0	0	1	0	3	0	2	0	2	0	2	0	0	0	1	0	0	0	0	0	3	2	4	0	0	0	0	0	0	0

Selected Diseases	Kullu						Lahaul &Spiti						Mandi						Shimla						Sirmaur					
	1995		2000		2002		1995		2000		2002		1995		2000		2002		1995		2000		2002		1995		2000		2002	
	Case	D.	Case	Dt.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D
Stomach Cancer	0	0	3	0	0	0	0	0	0	0	0	0	10	1	0	0	0	0	40	8	60	12	71	16	0	0	8	1	8	0
Liver Cancer	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	8	2	14	3	23	4	0	0	34	8	0	0
Prostate Cancer	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	2	49	3	47	3	0	0	6	0	5	0
Lymphoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parkinson's diseases	3	0	21	0	149	0	0	0	2	0	1	0	511	0	387	0	842	0	238	0	413	0	219	0	52	0	612	0	561	0
Cirrhosis of the liver	0	0	4	0	5	0	0	0	0	0	1	0	0	0	445	1	20	0	43	4	80	3	85	2	4	0	75	2	65	0
Nephritis & Nephrosis	7	0	60	0	347	14	6	0	3	0	1	0	178	0	1986	1	1555	0	125	2	315	0	433	0	13	0	276	4	304	1
Congenital abnormalities	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	168	0	3	0	0	0	0	0	0	0	2	0
Unintentional poisonings	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diarrhoeal Diseases	843	0	2387	0	1108	0	50	0	115	4	87	1	3102			3	3188	0	2941	26				4	1362			1	1615	1
Polio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	47	0	13	0	17	0	4	0	2	0	2	0	103	6	44	0	85	0	85	3	44	0	40	1	1	0	0	0	0	0
Malaria	0	0	0	0	0	0	0	0	3	0	0	0	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Filariasis		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trachoma	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0	136	0	0	0	0	0	0	0	0	0	0
Intestinal Halminths	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61	0	11	0	0	0	16	0	0	0	14	0	19	5
Protein energy malnutrition	0	0	0	0	0	0	0	0	5	0	4	0	290	1	0	0	18	0	53	11	76	0	92	0	0	0	10	2	22	0
H. Pylori (peptic ulcers)	60	0	76	0	31	3	0	0	28	0	7	0	938	2	602	0	915	0	723	8	492	7	660	5	4	0	108	0	123	0
Other Digestive disorders	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acute respiratory infections	324	0	117	0	111	0	0	0	0	0	83	0	2273	0	1695	0	446	0	340	17	142	7	198	8	535	1	261	0	276	2
Chronic respiratory diseases	311	0	59	3	145	50	0	0	0	0	0	0	548	5	1028	0	361	0	1159	22	74	4	86	5	361	2	86	0	165	1
Lung & related cancers	0	0	1	0	0	0	0	0	0	0	0	0	4	2	0	0	0	0	83	6	107	16	130	21	0	0	10	1	2	0
Cardiovascular disease	0	0	21	0	16	0	0	0	0	0	0	0	333	0	682	14	88	0	80	0	27	0	50	2	32	0	66	3	82	1

Selected Diseases	Solan						Una						HIMACHAL PRADESH					
	1995		2000		2002		1995		2000		2002		1995		2000		2002	
	Case	D.	Case	Dt.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.	Case	D.
Stomach Cancer	0	0	0	1 0	16	0	0	0	2	0	0	0	54	9	83	13	9	
Liver Cancer	0	0	0	0	0	0	0	0	1	0	0	0	15	2	53	13	25	4
Prostate Cancer	0	0	0	4 0	3 0	0	0	0	0	0	0	0	33	2	61	3	5	
Lymphoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parkinson's diseases	0	0	0	97 0	0 0	1576 0	0 0	4390 0	0 18	0	2398	0	10					
Cirrhosis of the liver	0	0	4	0	3	0	0	0	12	0	0	0	109	8	654	25	230	5
Nephritis & Nephrosis	0	0	104	0	30	0	0	0	58	2	0	0	678	2	3967	14	3672	19
Congenital abnormalities	0	0	3	0	1	0	0	0	4	0	0	0	189	1	20	0	17	1
Unintentional poisonings	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diarrhoeal Diseases	1189	0	1992	0	1107	0	162	0	462	1	591	1	16263	83	17242	35	16602	11
Polio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis	7	0	5	0	2	0	4	0	4	0	17	0	379	10	210	2	421	1
Malaria	3	0	0	0	0	0	0	0	0	0	0	0	120	0	16	0	0	0
Filariasis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trachoma	0	0	0	0	0	0	0	0	0	0	0	0	208	1	0	0	0	0
Intestinal Healminths	0	0	0	0	0	0	0	0	0	0	0	0	11	0	14	0	316	5
Protein energy malnutrition	0	0	0	0	0	0	0	0	0	0	0	0	374	12	105	2	253	0
H. Pylori (peptic ulcers)	17	0	84	0	78	0	8	0	139	0	0	0	3510	13	1800	17	2162	9
Other Digestive disorders	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acute respiratory infections	129	0	200	0	181	0	94	0	199	2	0	0	11378	52	4018	25	1887	10
Chronic respiratory diseases	95	0	126	0	115	0	1665	066	141	1	0	0	6662	59	1880	24	13	
Lung & related cancers	0	0	0	0	0	0	0	0	3	2	0	0	89	8	128	21	141	21
Cardiovascular disease	0	0	27	94 0	0 20	1069 0	240	669 0	135	0	0	0	4					

Trends of malaria in Himachal Pradesh from 1960-2005 is given in Table 52.

Table 52: National Vector Borne Disease Control Programme (Malaria) in Himachal Pradesh

Year	Blood Slides Collected	Blood Slides Examined	Number Found Positive	PV Cases	PF Cases	SPR	2.1	API
1960	7877	7877	1	1	0	-	-	-
1961	30677	30677	16	11	5	-	-	-
1962	59400	59400	7	4	3	-	-	-
1963	85928	85928	45	25	20	-	-	-
1964	84808	82742	38	30	8	0.04	9.5	0.04
1965	131577	126305	122	114	8	0.1	13.9	0.1
1966	114830	112450	63	61	2	0.05	12	0.07
1967	208058	208382	50	49	1	0.02	10	0.02
1968	265716	244924	116	111	5	0.05	9.9	0.05
1969	266631	237928	71	69	2	0.02	9.2	0.03
1970	219410	199126	87	87	0	0.04	7.7	0.03

Year	Blood Slides Collected	Blood Slides Examined	Number Found Positive	PV Cases	PF Cases	SPR	2.1	API
1971	224195	217551	111	109	2	0.05	7.9	0.04
1972	311781	266093	236	234	2	0.08	9.3	0.08
1973	421840	305208	2075	2073	2	0.6	10.6	0.7
1974	319512	321803	8078	8076	2	2.5	10.9	2.7
1975	302626	295757	16481	16478	3	5.5	9.6	5.3
1976	272652	256826	22110	22104	6	2.6	8.5	7.3
1977	563825	463754	42154	42147	7	9.0	14.8	13.5
1978	631256	588649	49947	49931	16	8.6	18.7	16.1
1979	524978	514792	39870	39859	11	7.7	15.7	12.0
1980	676385	646449	49044	48979	65	7.5	19.2	14.6
1981	842600	807589	85534	85136	398	10.5	23.6	25.0
1982	721960	681064	48708	48562	146	7.1	19.4	13.8
1983	719694	685598	38947	38754	193	5.7	19.4	11.0
1984	726479	680516	27966	27173	793	4.1	19.0	7.8
1985	745825	695373	36478	35819	659	5.2	19.0	10.0
1986	717344	684886	42136	41812	324	6.1	18.4	11.3
1987	711635	693320	22460	22395	65	3.2	18.2	5.9
1988	717691	701053	10209	10168	41	1.4	18.3	2.7
1989	716994	702247	8589	8575	14	1.2	17.9	2.2
1990	695304	681787	14379	14349	30	2.1	16.9	3.6
1991	732494	724531	20115	20110	5	2.8	17.7	4.9
1992	708111	703301	7251	7242	9	1.0	17.1	1.7
1993	668808	665928	4062	4060	2	0.6	15.9	1.0
1994	600159	597549	3091	3085	6	0.5	14.1	0.7
1995	596556	593844	6695	6682	13	1.1	14.0	1.5
1996	587277	582537	8349	8336	13	1.4	13.3	1.9
1997	594425	591289	5320	5316	4	0.9	13.3	1.2
1998	633175	627661	1433	1432	1	0.2	13.9	0.3
1999	627970	626847	700	694	6	0.1	13.7	0.1
2000	582890	581296	491	491	0	0.08	12.5	0.1
2001	567815	566859	349	349	0	0.06	12.0	0.07
2002	521896	520834	176	176	0	0.03	11.0	0.04
2003	503935	503935	133	126	7	0.03	10.4	0.028
2004	502202	500901	126	119	7	0.03	10.4	0.026
2005	483371	479358	129	129	0	0.03	9.7	0.03

Trend of AIDS control programme in Himachal Pradesh are given in Table 53.

Table 53: Trend of AIDS Control Programme as on 31-03-2008

	2000	2001	2002	2003	2004	2005	2006	2007
Number of persons screened	23870	26939	30949	35773	43859	49918	50610	63151
Number of HIV positive cases	201	278	350	531	817	1212	1640	2170
Number of AIDS cases	72	87	92	143	186	263	344	434
Sero-Positivity rate per 1000			11.0	14.8	18.8	24.3	28.73	34.36

District- wise HIV/AIDS cases since 1987 is given in Table 54.

Table 54: District wise HIV/AIDS cases

District/Others	Up To 30-06-2006 since 1987				Up To 31-03-2006 since 1987			
	HIV/AIDS Cases	Percentage	AIDS Cases	Percentage	HIV/AIDS Cases	Percentage	AIDS Cases	Percentage
	(HIV +ve)				(HIV +ve)			
1. Bilaspur	254	14.28	59	16.39	242	14.76	58	16.86
2. Chamba	32	1.80	2	0.56	31	1.89	2	0.58
3. Hamirpur	441	24.79	92	25.56	411	25.06	89	25.87
4. Kangra	422	23.72	54	15.00	377	22.99	54	15.70
5. Kinnaur	9	0.51	1	0.28	9	0.55	1	0.29
6. Kullu	25	1.41	6	1.67	23	1.40	6	1.74
7. Lahaul-Spiti	0	0.00	0	0.00	0	0.00	0	0.00
8. Mandi	186	10.46	74	20.56	180	10.98	71	20.64
9. Shimla	127	7.14	39	10.83	105	6.40	30	8.72
10. Sirmaur	28	1.57	6	1.67	28	1.71	6	1.74
11. Solan	64	3.60	17	4.72	61	3.72	17	4.94
12. Una	152	8.54	4	1.11	134	8.17	4	1.16
13. Others (Non-Himachalis)	39	2.19	6	1.67	39	2.38	6	1.74
Total	**1779**	**100.00**	**360**	**100.00**	**1640**	**100.00**	**344**	**100.00**

Temporal details of HIV/AIDS in Himachal Pradesh is given in Table 55.

Table 55: Temporal details of HIV/AIDS in Himachal Pradesh

Year	New Cases Detected			Cases Deleted		% Ach.
	Target	Ach.	% Ach.	Target	Ach.	
1982-83	3000	401	13.37	-	-	-
1983-84	500	319	63.80	200	307	153.50
1984-85	500	291	58.20		250	125.00
1985-86	500	308	61.60	300	208	69.33
1986-87	300	279	93.00	300	357	119.00
1987-88	300	239	79.67	300	378	126.00
1988-89	200	220	110.00	200	362	181.00
1989-90	200	196	98.00	200	384	192.00
1990-91	200	186	93.00	200	517	258.50
1991-92	250	151	60.40	250	221	88.40
1992-93	250	210	84.00	250	388	155.20
1993-94	200	227	113.50	200	792	396.00
1994-95	200	163	81.50	300	278	92.67
1995-96	200	167	83.50	300	578	192.67
1996-97	200	361	180.50	300	911	303.67
1997-98	300	335	111.67	600	1104	184.00
1998-99	400	371	92.75	1000	625	62.50
1999-00	200	409	204.50	1000	857	85.70
2000-01	50	335	670.00	500	279	55.80
2001-02	50	263	526.00	340	368	108.24
2002-03	100	280	280.00	400	258	64.50
2003-04	-	308	-	-	289	-
2004-05	-	250	-	-	285	-
2005-06	275	231	84.00	300.00	272	90.67

Year	New Cases Detected			Cases Deleted		% Ach.
	Target	Ach.	% Ach.	Target	Ach.	
2006-07	-	198	-	-	217	-
2007-08	-	246	-	-	236	-

Detail of cases of Leprosy in Himachal Pradesh during 2007-08 is given in Table 56.

Table 56: Cases of Leprosy in Himachal Pradesh during 2007-08 (upto 31-03-2008)

District	New Cases Detected			Ancdr/	Cases Detected		Cases Under Treatment	Cases Under Treatment						
	MB	PB	TTL	10000	MB	PB	TOTAL	MB	PB	TOTAL	PR/10000	OPA	IPA	TOTAL
1. Bilaspur	9	1	10	2.62	8	2	10	9	-	9	0.24	5	4	9
2. Chamba	17	1	18	3.49	16	1	17	19	-	19	0.37	2	17	19
3. Hamirpur	3	-	3	0.65	3	1	4	3	-	3	0.06	-	3	3
4. Kangra	22	8	30	2	17	7	24	23	3	26	0.17	9	17	26
5. Kinnaur	4	1	5	5.32	5	1	6	3	-	3	0.32	3	-	3
6. Kullu	12	3	15	3.53	12	1	13	12	3	15	0.35	5	10	15
7. Lahaul & Spiti	2	-	2	5.38	-	-	0	2	-	2	0.54	2	-	2
8. Mandi	15	2	17	1.68	14	-	14	16	2	18	0.18	2	16	18
9. Shimla	28	3	31	3.84	36	3	39	26	2	28	0.34	20	8	28
10. Sirmaur	16	11	27	5.26	17	7	24	15	5	20	0.39	6	14	20
11. Solan	49	27	76	13.6	46	30	76	43	12	55	0.98	49	6	55
12. Una	8	4	12	2.39	5	4	9	7	-	7	0.14	7	-	7
H.P.	**185**	**61**	**246**	**3.62**	**179**	**57**	**236**	**178**	**27**	**205**	**0.3**	**110**	**95**	**205**

District wise prevalence rate of leprosy per 10000 population during 1998 – 2008 is given in Table 57.

Table 57: District wise prevalence rate per 10000 population during 1998 – 2008 under NLEP

District	1998-99	1999-00 PR/10,000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
	PR/10,000		PR/10,000	PR/10,000	PR/10,000	PR/10,000	PR/10,000	PR/10,000	PR/10,000	PR/10,000
1. Bilaspur	0.3	0.14	0.23	0.29	0.17	0.28	0.08	0.24	0.21	0.24
2. Chamba	1.3	0.59	0.41	0.48	0.48	0.39	0.48	0.48	0.35	0.37
3. Hamirpur	0.7	0.5	0.26	0.22	0.14	0.16	0.18	0.13	0.09	0.06
4. Kangra	0.7	0.25	0.23	0.21	0.23	0.13	0.17	0.23	0.13	0.17
5. Kinnaur	4.6	0.6	0.6	0.48	0.63	0.86	1.00	0.55	0.43	0.32
6. Kullu	1.7	0.65	0.72	0.76	0.92	0.51	0.27	0.27	0.31	0.35
7. Lahaul-Spiti	0.3	0.32	0	0.3	0.00	0.00	0.00	0.28	0.00	0.54
8. Mandi	0.7	0.16	0.27	0.24	0.29	0.31	0.12	0.13	0.15	0.18
9. Shimla	1.2	0.41	0.51	0.54	0.58	0.54	0.67	0.39	0.41	0.34
10. Sirmaur	4.5	0.79	1.7	0.74	0.75	1.07	0.41	0.32	0.32	0.39
11. Solan	0.4	0.56	0.47	0.6	0.54	0.96	1.33	0.94	1.00	0.98
12. Una	1.8	0.52	0.2	0.13	0.24	0.34	0.12	0.10	0.08	0.14
H.P.	**1.3**	**0.47**	**0.55**	**0.39**	**0.41**	**0.43**	**0.37**	**0.31**	**0.28**	**0.30**

Details of case of leprosy in HP during 2006-07
in given in Table 58.

Table 58: Cases of Leprosy in Himachal Pradesh during 2006-07

District	New Cases Detected					Cases Deleted				
	Target	Mb	Pb	Total	%Age Ach	Target	Mb	Pb	Total	%Age Ach.
1. Bilaspur	10	7	2	9	90.00	10	7	3	10	100.00
2. Chamba	30	15	0	15	50.00	35	21	1	22	62.86
3. Hamirpur	10	3	2	5	50.00	10	4	3	7	70.00
4. Kangra	35	16	5	21	60.00	40	29	8	37	92.50
5. Kinnaur	15	3	0	3	20.00	15	4	0	4	26.67
6. Kullu	20	12	1	13	65.00	25	10	1	11	44.00
7. Lahaul-Spiti	5	0	0	0	0.00	3	1	0	1	33.33
8. Mandi	20	13	2	15	75.00	25	10	3	13	52.00
9. Shimla	45	32	7	39	86.00	50	26	11	37	74.00
10. Sirmaur	25	13	4	17	68.00	30	14	3	17	56.67
11. Solan	45	35	17	52	115.56	45	25	23	48	106.67
12. Una	15	4	5	9	60.00	12	5	5	10	83.33
IGMC				0					0	
H.P.	**275**	**153**	**45**	**198**	**72.00**	**300**	**156**	**61**	**217**	**72.33**

3.11 Information on Human Resource Management Issues (which may have relevance to environment management) in the sector such as: manpower, vocational training, and awareness levels, etc.

The Directorate is headed by the Director of Health Services. There is also a Mission Director specifically for the NRHM. Director-Health services is assisted by one Additional Director, 4 Joint Directors, 6 Deputy Directors/ Programme Officers, one Deputy Director, CRS, Assistant Director Nursing, Communication Officer and other supervisory staff including one Administrative Officer, one Deputy Controller (F &A), one Assistant Controller (F&A), 6 Superintendents and one Assistant Drug Controller. The Directorate is divided into six main branches viz. Medical-1 (Establishment of Medical Officers, Pharmacists, Staff Nurses, Lab Technicians etc.) Medical-2 (Establishment of Male and Female Health Workers, Drivers, Class-IV staff etc.) Medical -3 (Procurement, Cash, Audit and Accounts), Medical-4 (Planning Budget, expenditure and major civil works), Medical-5 (NRHM and other National Programmes), Medical -6 General and Miscellaneous branch. The legal cell assists in the defence of court cases. A separate State Level Aids Control Society under the State Programme Officer implements the Aids Control Programme exclusively. There are two Health and Family Welfare Training institutes under Principals at Parimahal (SHFWTC) Shimla and RHFWTC Chheb, Kangra. There are also 6 GNM Training Schools and MPW training Schools under the Department. A Composite Testing Lab at Kandaghat also functions under the control of DHS.

At the District level the Health Department functions through the office of Chief Medical Officers who are assisted by Medical Officer (Health) and other District Health Programme Officers like DTO, DLO, DAPO, DSO, etc.
At the Block Level, Block Medical Officers (BMO's) look after the Primary Health Care establishments within the blocks. The Civil and Regional Hospitals function under the control of the Senior Medical Officers while the Zonal and other Secondary Care Hospitals function under the control of Medical Suprintendents.
Capacity building of Medical Officers for proper utilization of the powers is being done along with the RCH Refresher Courses held in the two Training Centres of the State at Shimla and Kangra.

3.12 Regulatory analysis to identify any regulations that have environment implications (negative or positive), and compliance with the same

Health sector and cross sector policy and regulatory framework at state level shows the intent of the state government to address inadequate service delivery in order to reduce the disease burden in the state. A list of policy and programme is described below.

Policy Plan Programme

- National Rural Health Mission (2005-12)
- Atal Swasthya Sewa
- PARIKAS
- Rajiv Gandhi National Drinking Water Mission
- Mahila Gram Panchayat Swasthya Sahayika Scheme
- National Health Policy/programmes interfacing with policies & programmes of the environment related sectors.
- National Rural Health Mission promotes village/district health plans to achieve sanitation up to Indian Public Health Standards.
- National Urban Sanitation Policy, State level urban sanitation strategies and city sanitation plans.
- State's Health Vision 2008 promotes initiation and strengthening existing system for liquid, solid and excreta disposal.
- Sewerage development plans/schemes are being implemented under IPH & Urban Development Department.
- Sanitation schemes, state sanitation strategies city sanitation task force and total sanitation campaign implemented in the state.
- Integrated low sanitation scheme and total sanitation campaign
- Biomedical Waste Rule, 1998
- Municipal Solid Wastes (Management and Handling) Rules 2000
- Solar thermal programmes
- Special nutrition programme for adolescent girls
- State Employment Insurance Scheme is applicable for occupational disease as defined in ESI Act 1948.
- IEC component of major health/water supply/sanitation plans / programmes & scheme.
- Guidelines on Mercury-Contaminated Wastes, CPCB Hazardous Material Rules
- Hazardous Waste (Management, Handling and Transboundary Movement) Rules 2008

Reference

- Department of Health and Family Welfare, HP
- Department of Dental Health
- Department of Ayurved, HP
- Medical Council of HP
- Ministry of Health & Family Welfare, Government of India
- RHS Bulletin, Ministry of Health & Family Welfare, Government of India
- NFHS-1998-99
- NRHM
- Solid Waste Management Report of Shimla Town
- State Pollution Control Board
- Central Pollution Control Board
- Department of Planning

CHAPTER 4 ROAD & TRANSPORT

4.1 Resource inventory of existing assets of the sector

Roads are a very vital infrastructure for rapid economic growth of the State/country. In fact, the development of important sectors of economy such as Agriculture, Horticulture, Industry, Mining and Forestry depends upon efficient road network. Sector such as education, health, family planning and promotion of tourism also depend upon efficient road network. So the primary objective is to provide connectivity by way of all weather roads to all the habitations (villages) in the state.

There are four agencies managing roads. The National Highways are looked after by the Government of India, the State Highways by the Himachal Pradesh Public Works Department (HPPWD), the town roads by the municipal bodies and the rural roads partly by HPPWD and partly by the Rural Development Department. There is no agency to coordinate between these which often work in a compartmentalized manner. Details of development of road network in the State since its formation is given in Table 1.

Table 1: Category of roads in Himachal Pradesh

S. No.	Category of Road	Single Lane	Double Lane	Total
1	National Highways	486	749	1235
2.	Border Roads	422	269	691
3.	State highways	901	617	1518
4.	Rural Roads	19291	701	19992
	Total	**21100**	**2336**	**23436**

Source: Planning Department (2003): 1994-95

Himachal Pradesh is connected with a wide network of roads connecting its cities, important towns, villages, industrial centres, places of tourist importance and other remote areas. The primary road network consists of 1235.53 kms of eight National Highways, namely NH1A, NH20, NH21, NH21A, NH22, NH70,NH 72, and NH88; 691 kms of Border Roads; 1518.50 kms of State Highways; 2318 kms of Major Roads and about 20541 kms of Rural Roads. Barring a very few majority of these roads are in poor condition and not conforming to the standards required for safe and efficient movement of traffic. As of 31st March 2005, the length of the motorable roads was only 24922. About 90 percent of these motorable road lengths i.e. 22567 are made of single lane roads and only 2355 are double lane only roads. 14219 kms length is metalled and/or tarred, and balance 10703 kms is unmetalled.

On an average about 2500 kilometers of road is added every five years. The growth rate of road network was higher in the initial years of development, which slowed down in the subsequent years as after the basic connectivity at the district and subdivision level was provided. Moreover, demand for funds for other sectors of the economy like health, education and social services increased.

I Existing Status of Road network and Pathways as on (31.03.2009)

1. National Highways: There are eleven National Highways with a total length of 1470.606 kms. The highest length was found in NH-22 followed by NH-21 and NH-70, which was more than 200 kms. Smallest highway was NH-73A which was only 7.420 kms. Details of National Highway are given in Table 2. Upto the end of December, 2009, 57 kms long portion had been provided with metalling and tarring.

Table 2: National Highways in Himachal Pradesh

Sr. No.	Name of National Highways	NH No.	Name Of Circle	Name of Division	Length in division (in kms)
1	Jalandhar Panthankot Jammu Srinagar road	1-A	Shahpur	Jogindernagar	10.000
2	Pathankot Chakki Mandi road	20	Shahpur	Jogindernagar	196.800
3	Pinjore Nalagarh Swarghat road	21-A	Shimla	Solan	48.875
4	Chandigarh Mandi Manali road	21	Shahpur	Pandoh	240.835
5	Ambala Kalka Shimla Wangtoo Kaurik road	22	Shimla	Solan =122.916 Rampur =172.00	294.916
6	Jalandhar Hoshiarpur Gagret Mubarikpur Amb Nadaun Hamirpur Taunidevi Awahdevi Tihra Dharampur Kotli Mandi road	70	Shahpur	Hamirpur	206.560
7	Ambala Naraingarh Kala Amb Paonta Dehradun Rishikesh Haridwar road	72	Shimla	Solan	57.00
8	Shimla Brahampukhar Ghagus Hamirpur Nadaun Ranital Kangra (Mataur) road	88	Shimla Shahpur	Solan = 60.600 Hamirpur = 137.100	197.700
9	Laldhank Bata Chowk road	73-A	Shimla	Solan	7.420
10	Paonta Rajban Shillai Menus Hatkoti road, Km 0/0 to108/0 & 149 to 160/500 (41.0Km in Uttaranchal)	72-B	Shimla	Solan	119.500
11	Nagrota Ranital Dehra Mubarikpur road, Km. 0/0 to 91/0	20A	Shahpur	Jogindernagar	91.000
				Total	**1470.606**

Road Transport: Road Transport is the mainstay of economic activity in the Himachal Pradesh as other means of transport namely Railways, Airways, Auto Rickshaw etc. are negligible. Therefore, such Himachal Road Transport Corporation (HRTC) assumes paramount importance. The passenger transport services to the people of Himachal Pradesh within and outside the State are being provided by HRTC, with a fleet strength of 1,997 buses (as on September, 2009).

According to National Policy, all villages are ultimately to be connected with all weather motorable road in tribal area. District wise requirement of motorable roads to connect all villages (except isolated) have been worked out and achievements by March, 2005 are given in Table 3.

Table 3: Road Density in Himachal Pradesh

Sr. No.	Name of Distt./ Area	Area in Kms	Population as per 2001 Census	Road density required to connect all except isolated villages			Position of motorable road on 3/2005		
				Required length in Kms	Density Per 100 Sq.Kms.	Density Per 1000 population	Length in Kms	Density in Kms. Per 100 Sq.Kms	Density in Kms. Per 1000 population
1	Kinnaur	6401	78334	891	13.91	11.37	637	9.95	8.13
2	Lahaul & Spiti	13835	33224	1421	10.27	42.77	1053	7.61	31.69
3	Chamba (Pangi Bharmaour area)	3419	54844	964	28.19	17.58	325	9.50	5.93
	Total	23655	166402	3276	13.85	19.69	2015	8.52	12.11

Apart from National Highway and Border Roads, work on 190 State Highways and Rural Roads initiated in tribal area by the end of March 2005 having total length of 2000 kms. Out of this length, 1468 (including central roads) has been made motorable upto March, 2005 having spill over of 583 kms. length.

On the formation of present HRTC on 02.10.1974, the total routes operated by HRTC were 379 which have grown to 1733 routes in 2000-2001 and the fleet strength have grown from 733 to 1728 in 2000-2001. As the road length increased, basic infrastructure for development also kept pace with it, this had direct relation on the growth of the HRTC.

HRTC operates three types of buses, ordinary buses, high-tech buses and deluxe buses. HRTC regular Deluxe / Semi Deluxe / Ordinary Bus services from Shimla to the other major cities in the state apart from important stations of North India such as Jaipur, Delhi, Chandigarh, Jalandhar, Gurgaon, Amritsar, Dehradun, Haridwar, Pathankot, and Ambala. Himachal Pradesh Tourism Development Development Corporation (HPTDC) has a large fleet of well-maintained luxury coaches operating within and outside the State. HPTDC also provides buses, tata sumo, and jeeps on hire basis and organises sightseeing tours, special tours and packages to meet the exclusive travel requirements of the tourists.

2. **State Highway:**The total length of state Highway in the State is 1625.70 kms. The highest length of State highways is found in SH-13 followed by SH-33, SH-32 and SH-16, which was more than 100 kms. Smallest highway (SH-1) is only 26 kms. Details of State Highwayis given in Table 4.

Table 4: State Highways in Himachal Pradesh

Sr. No.	Name of Road	District	Length in Kms	SH. No.
1	Lal Dhank Paonta Rajban Hatkoti (except NH portion and RD 133/0 to 171/0 in Uttarakhand)	Shimla	26.00	1
2	Kumarhatti-Sarahan-Nahan (Dosarka)	Sirmaur/ Solan	78.00	2
3	Chhaila Neripul Yashwant Naggar Oachghat Kumarhatti	Shimla/ Sirmaur/ Solan	86.30	6
4	Sainj Chaupa Nerwa Shallu	Shimla	90.00	8
5	Shalaghat Arki Kunjhar Barotiwala	Solan	80.40	9
6	Theog Kotkhai Hatkoti Rohru	Shimla	80.00	10
7	Sainj Ani Banjar Aut	Kullu/ Mandi	96.00	11
8	Samla Tatapani Mandi	Shimla/ Mandi	185.60	13
9	Shimla Kunihar Ramshehar Nalagarh Ghanoli	Shimla/ Solan	112.30	16
10	Dharamshala Dadh Palampur Holta Chadhiar Sandhol (Except NH portion)	Kangra/ Mandi	90.00	17
11	Jogindarnagar Sarkaghat Ghumarwin (except NH portion)	Mandi/ Bilaspur	83.00	19
12	Jawalamukhi Dehra Jawali Raja-ka-Talab	Kangra	79.60	22
13	Mehatpur Una Mubarikpur Daulatpur H.P. Boundary (except NH portion)	Una	67.00	25
14	Pong Dam Fatehpur Jassur	Kangra	53.00	27
15	Nurpur Lahru Tunuhatti	Kangra/ Chamba	42.20	28
16	Una-Aghar Barsar Jahu Bhambla Nerchowk	Una/ Hamirpur/ Mandi	126.30	32
17	Pathankot Banikhet Chamba Tissa	Chamba	139.00	33
18	Hamirpur Sujanpur Thural Maranda	Hamirpur /Kangra	59.00	39
19	Shahpur Sihunta Chowari	Chamba	52.00	43
		Total	**1625.70**	

3. Roads: The density of road is about 44.76 kms per 100 sq. km. of the area which is less

against 76.80 kms per 100 sq. km for all India. The total paved length constitutes about 57.05 %. Practically, the entire road network falls under rural roads. Only 14473 kms length has Cross-Drainage works. As on 31st March 2009, the total road length in Himachal Pradesh was 32450 km. of this length 30302 km are motorable and 345 km jeepable and 1803 km are less than jeepable tracks. Between the years 1996 & 2009, the length of motorable roads has been increased but jeepable and less than jeepable (track) roads has decreased significantly during the same period as given in Table 5.

Table 5: Roads including National Highway (Kms)

Year	Motor able		Jeepable	Less than jeepable (Track)	Total
	Double Lane	Single Lane			
1996	2200	17110	910	4445	24665
1997	2250	17510	921	4475	25156
1998	2290	17980	961	4542	25773
1999	2309	18491	1001	4572	26373
2000	2329	19145	950	4310	26734
2001	2332	19874	906	4105	27217
2002	2336	20427	781	3959	27503
2003	2336	21100	598	3771	27805
2004	2344	21648	481	3611	28084
2005	2355	22567	442	3103	28467
2006	2369	23599	390	2653	29011
2007	2374	25210	381	2299	30264
2008	2377	26434	365	2195	31371
2009	2377	27925	345	1803	32450

Source: Public works Department & Deptt. Of Economic& statistics, Himachal Pradesh

4. Other metalled roads: Total length of major district road was 1753.05 kms in of Himachal Pradesh. Details of major district road is given in Table 6.

Table 6: There Major District Roads (MDR) in the State

Sr. No.	Name of Road	District	Length Kms	MDR No.
1	Nahan Dadahul Haripurdhar	Sirmaur	87.00	1
2	Solan Meenus (except State Highway-6 portion)	Sirmaur/Solan	98.00	2
3	Banethi Rajgarh Chandol	Sirmaur	127.00	3
4	Markanda bridge Suketi Park Kala Amb Trilokpur	Sirmaur	21.50	4
5	Kolar Bilaspur	Sirmaur	13.00	5
6	Parwanoo Kasauli Dharampur Subathu Solan	Solan	65.32	6
7	Barotiwala Baddi Sai Ramshar	Solan	44.95	7
8	Kufri Chail Kandaghat	Solan/Shimla	57.00	8
9	Solan Barog Kumarhatti	Solan	13.00	9
	Dharampur Kasauli	Solan	10.50	10
11	Arki Dhundan Bhararighat	Solan	18.70	11
12	Nalagarh Dhabota Bharatgarh	Solan	9.40	12
13	Shogi Mehli Junga Sadhupul	Shimla	49.40	13
14	Mashobra Bhekhalti	Shimla	18.00	14
15	Narkanda Thanadbar Kotgarh Bithal	Shimla	44.00	15
16	Rampur Mashnoo Sarahan Jeori	Shimla	62.00	19
17	Bakrot Karsog(Sanarli) Sainj	Mandi	41.80	21
18	Salapper Tattapani Sunni Luhri	Mandi/Shimla	120.80	22
19	Mandi Kataula Bajaura	Mandi	51.00	23
20	Mandi Gagal Chailchowk Janjehli	Mandi	45.80	24
21	Chailchowk Gohar Pandoh	Mandi	29.60	25
22	Mandi Rewalsar Kalkhar	Mandi	28.00	26
23	Nore Wazir Bowli	Kullu	37.00	28
24	Kullu Naggar Manali (left Bank)	Kullu	39.40	29
25	Jia Manikarn	Kullu	33.50	30
26	Swarghat	Bilaspur/Una	55.70	31

Sr. No.	Name of Road	District	Length Kms	MDR No.
	Nainadevi Bhakhra			
27	Naina Devi Kaula Da Toba	Bilaspur	12.20	32
28	Bamta Kandrour	Bilaspur	6.70	33
29	Nagaon Beri	Bilaspur /Solan	37.00	34
30	Hamirpur Bhoranj Jahu	Hamirpur	30.00	35
31	Nadaun Sujanpur	Hamirpur	21.00	36
32	Barsar Deothsidh	Hamirpur	11.30	37
33	Sujanpur Sandhol Marhi	Hamirpur /Mandi	45.00	38
34	Nangal Santokhgarh Tahliwal Polian Jaijon (HP Boundary)	Una	17.50	39
35	Una Hoshiarpur Bankhandi Hoshairpur	Una	15.00	40
36	Tahliwal Garhshankar (H.P Boundary)	Una	8.00	41
37	Bharwain Chintpurni Kandrori Damtal	Una /Kangra	95.56	42
38	Baijnath Ladbharol Kandapattan	Kangra/Mandi	33.00	43
39	Gaggal Chetru Dharamshala Mcleodganj	Kangra	24.00	44
40	Rait Charhi Dharamshala	Kangra	20.00	45
41	Kaloha Pragpur Dhaliara Dadasiba Sansarpur	Kangra	60.92	46
42	Kandwal Damtal	Kangra	16.50	47
43	Dadh Malan	Kangra	4.00	48
44	Banikhet Dalhouse Khajiar	Chamba	29.00	49
45	Chamba Bharmour	Chamba	45.00	52
		Total	**1753.05**	

5. Village connectivity in State: According to Census 2001, the State has a total number of 17495 inhabited and 2623 uninhabited villages out of which only 6410 villages have been connected by pucca roads which is only 36.6% of the villages. It has been estimated that the state requires a total of 39045 kms of road length to provide connectivity to all the villages. The road length is 25191 kms thereby requiring construction of another about 13854 km of roads in the state. Details of village connectivity is given in Table 7.

Table 7: Village connectivity in the State

Total village (No.)	Inhabitated Village	Uninhabited village		Villages connected by pucca road No.
20118	17,495	2,623	36.6	6410

6. Bridges: The State has 1604 bridges as on 31st March, 2009. Average construction of new bridges has increased from 25, 29, 34 & 57 between the year 1970-71 & 1979-80, 1980-81 & 1989-90, 1990-91 & 1999-2000 and 2000-01 & 2008-09 respectively. Highest number of bridges was found in Kangra district followed by Mandi, Chamba, Kullu and Shimla and lowest in Kinnaur, Lahaul & Spiti and Bilaspur district. District wise details of bridges completed during 1966 – 2009 is given in Table 8.

Table 8: Detail of Bridges Completed in Himachal Pradesh (as on 31/03/2009)

Sr. No.	Year	Bilaspur	Chamba	Hamirpur	Kangra	Kinnaur	Kullu	Lahaul & Spiti	Mandi	Shimla	Sirmaur	Solan	Una	Total During the Year	Completed upto end of the year
1	Upto 3/66	8	3	10	66	-	47	8	2	9	6	4	5	168	168
2	1966-67	-	-	-	-	-	-	1	-	-	-	-	-	1	169
3	1967-68	-	2	-	1	-	-	3	-	-	2	-	-	8	177
4	1968-69	-	4	2	-	-	1	1	-	1	1	-	-	10	187

Sr. No.	Year	Bilaspur	Chamba	Hamirpur	Kangra	Kinnaur	Kullu	Lahaul & Spiti	Mandi	Shimla	Sirmaur	Solan	Una	Total During the Year	Completed upto end of the year
5	1969-70	-	6	2	2	-	-	-	3	2	7	1	1	24	211
6	1970-71	4	2	3	-	-	8	-	1	1	-	2	-	21	232
7	1971-72	1	3	1	-	-	2	1	3	-	1	1	1	14	246
8	1972-73	-	1	-	6	-	1	1	2	5	2	1	7	26	272
9	1973-74	2	3	-	7	-	-	1	2	-	-	-	3	18	290
10	1974-75	-	13	1	3	-	-	4	1	3	6	2	2	35	325
11	1975-76	-	5	-	6	-	3	-	3	2	-	1	3	23	348
12	1976-77	-	2	1	8	1	-	-	6	2	2	1	1	24	372
13	1977-78	2	-	3	6	-	1	-	2	-	1	3	1	19	391
14	1978-79	1	2	5	3	-	3	2	4	2	-	3	1	26	417
15	1979-80	1	1	1	15	1	6	-	5	2	-	4	4	40	457
16	1980-81	1	5	1	6	1	4	2	8	-	2	-	-	30	487
17	1981-82	-	1	3	7	-	3	-	9	-	-	2	-	25	512
18	1982-83	1	1	4	8	-	-	-	4	1	3	3	4	29	541
19	1983-84	-	4	3	6	-	6	-	5	-	2	3	5	34	575
20	1984-85	4	-	4	9	-	4	-	4	-	-	2	5	32	607
21	1985-86	1	3	1	2	-	1	1	2	8	8	3	1	31	638
22	1986-87	3	6	3	4	-	-	3	3	2	5	3	3	35	673
23	1987-88	1	3	4	4	-	2	2	4	3	6	-	1	30	703
24	1988-89	1	3	1	1	2	3	2	2	4	-	1	5	25	728
25	1989-90	1	4	-	1	-	2	-	-	7	2	7	-	24	752
26	1990-91	2	3	-	6	-	1	-	-	7	6	5	-	30	782
27	1991-92	2	11	3	8	-	3	-	-	4	1	2	1	35	817
28	1992-93	1	3	5	4	2	5	2	3	3	1	-	1	30	847
29	1993-94	2	5	2	10	2	3	1	-	1	-	1	3	30	877
30	1994-95	-	3	2	10	-	3	-	-	3	1	1	2	25	902
31	1995-96	2	3	2	14	-	5	1	-	-	4	5	2	38	940
32	1996-97	2	3	2	10	2	1	2	-	4	-	4	-	30	970
33	1997-98	3	2	7	6	4	1	-	-	3	1	1	-	28	998
34	1998-99	1	6	4	6	1	1	2	5	10	4	2	-	42	1040
35	1999-2000	3	3	1	10	1	4	1	7	4	10	7	4	55	1095
36	2000-01	2	6	3	10	1	1	3	14	3	5	3	2	53	1148
37	2001-02	1	3	10	9	2	2	5	13	7	2	2	2	58	1206
38	2002-03	4	-	7	11	1	1	-	6	5	1	1	3	40	1246
39	2003-04	2	7	7	11	6	1	2	6	5	6	6	5	64	1310
40	2004-05	1	2	4	13	3	3	3	6	7	3	3	7	55	1365
41	2005-06	1	4	4	21	3	-	1	7	3	3	1	3	51	1416
42	2006-07	4	7	4	15	0	5	2	14	9	2	2	3	67	1483
43	2007-08	1	5	4	17	8	3	2	7	2	3	1	1	54	1537
44	2008-09	2	7	4	21	5	1	1	14	2	1	1	8	67	1604
Total upto 3/2009		**68**	**160**	**128**	**383**	**46**	**141**	**60**	**177**	**136**	**110**	**95**	**100**	**1604**	

7.**District Wise Road Network:**Highest road length (single and double lane) is found in Kangra and Shimla districts which were 33% of the total length of roads in the State. Lowest length of double lane road was observed in Hamirpur (52 kms) and Chamba (92 kms) districts. The Hamirpur and Una have no jeepable and less than jeepable track. The lowest road network was observed in Kinnaur, Una and Hamirpur as given in (Table 9).

Table 9: District wise types of road with length

District	Total (km)	Motorable double lane (km)	Motorable single lane (km)	Jeepable (km)	Less than jeepable Track (km)
Bilaspur	1486	125	1348	0	13
Chamba	3071	92	1993	280	706
Hamirpur	1714	52	1662	0	0
Kangra	5281	468	4800	3	10
Kinnaur	989	177	549	20	243
Kullu	1578	128	1384	6	60
Lahaul-Spiti	1191	260	909	2	20
Mandi	5145	191	4415	27	512
Shimla	4860	339	4481	3	37
Sirmaur	2861	216	2548	2	95
Solan	2616	173	2334	2	107
Una	1658	156	1502	0	0
Total State	**32450**	**2377**	**27925**	**345**	**1803**

(* Status as on 31 March 2009)

Source: Deptt. of Economics & Statistics, Himachal Pradesh

Details of districtwise metalled, non-mettalled road constructed during 1998 – 2009 is given in Table 10.

Airports: There are three Airports in Himachal Pradesh. These airports are Gaggal near Kangra, Jubbal near Shimla and Bhuntar near Kullu. All these airports are accessible only by regional level flights. They can handle only 15 seater aircrafts. All the 3 airports together can handle 38 aircrafts.

Railways: There are only two narrow gauge railway lines connecting Shimla with Kalka (96 km) and Jogindernagar with Pathankot (113 km) and one 33 Km. broad gauge railway line from Nangal Dam to Charuru (District Una).

Table 10: Metalled and un-metalled road during 1998 - 2009

District	1998-99	1998-99	1998-99	1999-2000	1999-2000	1999-2000	2000-01	2000-01	2000-01	2001-02	2001-02	2001-02	2002-03	2002-03	2003-04
	Metalled	Unmetalled	Total	Metalled	Unmetalled	Total	Metalled	Un-metalled	Total	Metalled	Un-metalled	Total	Un metalled	Total	Metalled
Chamba	545	710	1255	636	673	1309	720	647	1367	788	635	1423	617	1473	926
Bilaspur	567	525	1092	604	514	1118	652	499	1151	680	492	1172	467	1211	783
Hamirpur	567	583	1150	642	568	1210	758	532	1290	884	496	1380	485	1465	1066
Kangra	1940	2029	3969	2128	1957	4085	2305	1905	4210	2440	1871	4311	1789	4430	2931
Kinnaur	302	256	558	331	245	576	337	249	586	366	234	600	235	614	400
Kullu	417	496	913	439	506	945	466	505	971	478	519	997	503	1029	582
Lahaul & Spiti	280	634	914	304	637	941	322	646	968	350	643	993	640	1015	401
Mandi	1032	1892	2924	1151	1894	3045	1324	1886	3210	1442	1845	3287	1832	3377	1691
Shimla	1065	2032	3097	1172	2048	3220	1287	2036	3323	1398	1989	3387	1961	3482	1624
Sirmaur	698	1110	1808	744	1098	1842	817	1068	1885	859	1058	1917	1054	1957	980
Solan	723	1069	1792	760	1077	1837	806	1074	1880	845	1073	1918	1074	1977	995
Una	771	557	1328	831	515	1346	870	495	1365	911	467	1378	425	1406	1074
H.P.	**8907**	**11893**	**20800**	**9742**	**11732**	**21474**	**10664**	**11542**	**22206**	**11441**	**11322**	**22763**	**11082**	**23436**	**13453**

District	2003-04	2003-04	2004-05	2004-05	2004-05	2005-06	2005-06	2005-06	2006-07	2006-07	2006-07	2007-08	2007-08	2007-08	2008-09	2008-09	2008-09
	Un-metalled	Total	Metalled	Un-metalled	Total	Metalled	Un-metalled	Total	Metalled	Un-metalled	Total	Metalled	Un-metalled	Total	Metalled	Un-metalled	Total
Chamba	580	1506	974	578	1552	1008	621	1629	1039	710	1749	1074	914	1988	1098	987	2085
Bilaspur	454	1237	816	474	1290	890	416	1306	948	421	1369	993	423	1416	1036	437	1473
Hamirpur	443	1509	1140	405	1545	1189	390	1579	1247	373	1620	1277	388	1665	1352	362	1714
Kangra	1586	4517	3093	1555	4648	3349	1415	4764	3611	1350	4961	3856	1267	5123	4080	1188	5268
Kinnaur	227	627	412	225	637	413	231	644	424	251	675	432	271	703	439	287	726
Kullu	478	1060	637	462	1099	658	503	1161	696	612	1308	734	705	1439	765	747	1512
Lahaul & Spiti	632	1033	433	620	1053	450	622	1072	468	639	1107	479	666	1145	512	657	1169
Mandi	1777	3468	1818	1843	3661	1902	1941	3843	1978	2131	4109	2069	2290	4359	2166	2440	4606
Shimla	1972	3596	1693	2092	3785	1756	2254	4010	1863	2444	4307	1942	2668	4610	2000	2820	4820
Sirmaur	1016	1996	1024	1047	2071	1041	1218	2259	1071	1465	2536	1094	1603	2697	1123	1641	2764
Solan	1027	2022	1046	1082	2128	1098	1121	2219	1143	1172	2315	1205	1197	2402	1263	1244	2507
Una	347	1421	1133	320	1453	1220	259	1479	1265	263	1528	1359	251	1610	1456	202	1658
H.P.	**10539**	**23992**	**14219**	**10703**	**24922**	**14974**	**10994**	**25968**	**15753**	**11831**	**27584**	**16514**	**12643**	**29157**	**17290**	**13012**	**30302**

District	2003-04 Un-metalled	2003-04 Total	2004-05 Metalled	2004-05 Un-metalled	2004-05 Total	2005-06 Metalled	2005-06 Un-metalled	2005-06 Total	2006-07 Metalled	2006-07 Un-metalled	2006-07 Total	2007-08 Metalled	2007-08 Un-metalled	2007-08 Total	2008-09 Metalled	2008-09 Un-metalled	2008-09 Total
Bilaspur	454	1237	816	474	1290	890	416	1306	948	421	1369	993	423	1416	1036	437	1473
Hamirpur	443	1509	1140	405	1545	1189	390	1579	1247	373	1620	1277	388	1665	1352	362	1714
Kangra	1586	4517	3093	1555	4648	3349	1415	4764	3611	1350	4961	3856	1267	5123	4080	1188	5268
Kinnaur	227	627	412	225	637	413	231	644	424	251	675	432	271	703	439	287	726
Kullu	478	1060	637	462	1099	658	503	1161	696	612	1308	734	705	1439	765	747	1512
Lahaul & Spiti	632	1033	433	620	1053	450	622	1072	468	639	1107	479	666	1145	512	657	1169
Mandi	1777	3468	1818	1843	3661	1902	1941	3843	1978	2131	4109	2069	2290	4359	2166	2440	4606
Shimla	1972	3596	1693	2092	3785	1756	2254	4010	1863	2444	4307	1942	2668	4610	2000	2820	4820
Sirmaur	1016	1996	1024	1047	2071	1041	1218	2259	1071	1465	2536	1094	1603	2697	1123	1641	2764
Solan	1027	2022	1046	1082	2128	1098	1121	2219	1143	1172	2315	1205	1197	2402	1263	1244	2507
Una	347	1421	1133	320	1453	1220	259	1479	1265	263	1528	1359	251	1610	1456	202	1658
H.P.	**10539**	**23992**	**14219**	**10703**	**24922**	**14974**	**10994**	**25968**	**15753**	**11831**	**27584**	**16514**	**12643**	**29157**	**17290**	**13012**	**30302**

District wise metalled & un-metalled road density (as on 31-03-2009) is given in Table 11.

Table 11: Metalled and un-metalled Road density

S. No.	Name of District.	Area of Distt. (Sq. Kms.)	Status as on 31.3.2009					
			Metalled roads (Kms.)	Road density per 100 Sq.Kms of Area.	Un-Metalled roads (Kms.)	Road density per 100 Sq.Kms of Area.	Total roads (Kms)	Road density per Sq.Kms.of Area.
1	Bilaspur	1167	1036	88.77	437	37.45	1473	126.22
2	Chamba	6528	1098	16.82	987	15.12	2085	31.94
3	Hamirpur	1118	1352	120.93	362	32.38	1714	153.31
4	Kangra	5739	4080	71.09	1188	20.70	5268	91.79
5	Kinnaur	6401	439	6.86	287	4.48	726	11.34
6	Kullu	5503	765	13.90	747	13.57	1512	27.48
7	Lahaul & Spiti	13835	512	3.70	657	4.75	1169	8.45
8	Mandi	3950	2166	54.84	2440	61.77	4606	116.61
9	Shimla	5131	2000	38.98	2820	54.96	4820	93.94
10	Sirmaur	2825	1123	39.75	1641	58.09	2764	97.84
11	Solan	1936	1263	65.24	1244	64.26	2507	129.49
12	Una	1540	1456	94.55	202	13.12	1658	107.66
Total		**55673**	**17290**	**31.06**	**13012**	**23.37**	**30302**	**54.43**

District wise village connectivity with motorable roads as on 31-03-2009 is given in Table 12.

Table 12: Village Connectivity with Motorable road (as on 31.3.2009)

Sr. No.	Name of District	Total nos of villages	No. of villages connected with road	No. of Villages un-connected with road	% of connected villages
1	Bilaspur	962	651	311	67.67
2	Chamba	1113	488	625	43.85
3	Hamirpur	1634	1069	565	65.42
4	Kangra	3614	2194	1420	60.71
5	Kinnaur	233	58	175	24.89
6	Kullu	172	109	63	63.37

Sr. No.	Name of District	Total nos of villages	No. of villages connected with road	No. of Villages un-connected with road	% of connected villages
7	Lahaul & Spiti	284	118	166	41.55
8	Mandi	2823	11529	1294	54.16
9	Shimla	2515	926	1589	36.82
10	Sirmaur	966	616	350	63.77
11	Solan	2378	1049	1329	44.11
12	Una	755	437	318	57.88
	Total	**17449**	**9244**	**8205**	**52.98**

District & tehsil wise villages connected during 1981 – 2001 is given in Table 13.

Table 13: Villages connected by pucca road for year 1981, 1991 & 2001

District	1981			1991			2001			
	Tehsil	villages connected by pucca road (%)	villages connected by pucca road Nos.	C.D. Block	villages connected by pucca road (%)	villages connected by pucca road Nos.	Tehsil	CD block	Villages connected by pucca road (%)	Villages connected by pucca road Nos.
Chamba		50.73	557		14.07	161			29.8	333
Chamba	Chamba	59.09	143	Chamba	27.27	70	Chamba	Chamba	32.9	
	Pangi	-	-	Pangi	-	-	Pangi	Pangi	5.1	3
	Chaurah	36.87	66	Tisa	-	-	Chaurah	Chaurah	11.9	23
	Saluni	59.41	120	Saluni	9.13	21	Saluni	Saluni	25.8	32
				Mehla	15.38	20	Bhalai		37.7	29
							Dalhousie		44.6	54
	Bhattiyat	72.29	167	Bhattiyat 3.8	26.38	53 86	Bhattiyat		4	
	Sihunta	38.75	31				Sihunta		43.2	35
							Holi		23.4	11
	Bharmaur	28.85	30	Bharmaur	4.04	4	Bharmaur		25.9	14
Bilaspur		19.32	182						53.2	513
Bilaspur	Nainadevi	36.36	44				Nainadevi		52	78
	Billaspur sardar	24.46	68				Billaspur sardar		55.4	154
	Ghumarwin	12.89	70				Ghumarwin		62.6	194
							Jhanduta		38.3	87
Hamirpur		11.29	183		26.65	431			44.8	733
Hamirpur	Hamirpur	11.68	41	Hamirpur	24.85	85		Hamirpur	42.3	145
	Barsar	12.61	43	Bijhri	26.71	90		Bijhri	46.3	157
	Bhoranj	11.36	35	Bhoranj	25.65	79		Bhoranj	51.6	160
	Nadaun	12	51	Nadaun	35.25	153		Nadaun	48.8	218
	Sujanpur Tira	6.63	13	Sujanpur Tira	12.24	24		Sujanpur Tira	27	53
Kangra		24.33	913		31.57	1143			49.9	1809
Kangra	Kangra	24.88	207	Kangra	41.32	119	Kangra		54.7	170
	Nurpur	25.05	128	Nurpur	32.54	164	Nurpur		51.2	198
	Indora	48.6	52	Indora	29.39	102	Indora		59.9	67
	Fatehpur	17.6	44	Nagrota Surian	36.84	42	Fatehpur		31.7	72
	Dehra Gopipur	28.89	221	Pragpur	42.54	114	Jawali		55.6	101
	Kundian	7	17	Rait	40.74	110	Harchakiran		39.7	23.026
	Lambagraon	3.52	10	Lambagraon	19.49	53	Shahpur		61.3	110

District	Tehsil	1981 villages connected by pucca road (%)	1981 villages connected by pucca road Nos.	C.D. Block	1991 villages connected by pucca road (%)	1991 villages connected by pucca road Nos.	Tehsil	CD block	2001 Villages connected by pucca road (%)	2001 Villages connected by pucca road Nos.
	Palampur	24.97	190	Bhawara	33.68	98	Dharamshala		72.5	111
	Fatehpur	17.6	44	Panchruki	36.15	94	Baroh		26.9	43
				Dehra	23.87	121	Dehra Gopipur		50.9	206
				Nagrota Bagwan	33.68	70	Jaswan		51.2	44
							Rakkar		90.1	91
							Kundian		15.7	34
							Thural		32.5	27
							Dhira		38.9	44
							Jaisinghpur		52.3	114
							Palampur		55.3	218
				Baijnath	25.81	56	Baijnath		65.3	130
							Multhan		20	7
Kinnaur		33.77	26						33.3	78
Kinnaur	Hangrang	50	4				Hangrang		40	6
	Pooh	58.33	7	Poo			Poo		30	8
	Morang	16.67	2				Morang		23.7	9
	Kalpa	33.33	4	Kalpa			Kalpa		58	22
	Nichar	40.91	9	Nichar			Nichar		29.5	26
	Sangla	-	-				Sangla		25	7
Kullu		28.99	49		34.88	60			47.7	82
Kullu	Kullu	54.12	46	Kullu	48	24		Kullu	60	30
				Naggar	75.68	28		Naggar	73	27
	Banjar	7.32	3	Banjar	16.67	7		Banjar	28.6	12
	Ani	-	-	Ani	5.88	1		Ani	35.3	6
	Nirmand	-	-	Nirmand	-			Nirmand	26.9	7
Lahaul & Spiti		13.39	32		19.49	53			30.3	97
	Lahaul	25.2	32	Lahaul	26.7	51		Lahaul	30.2	58
	Spiti	-	-	Spiti	2.47	2		Spiti	30.5	29
	Udaipur	-	-							
Mandi		12.4	348		15.19	428			25.9	748
Mandi	Mandi	16.94	83	Mandi sadar	26.25	84	Mandi		34.6	128
				chauntra	11.9	32	Padhar		18.5	35
	Jogindarnagar	17.34	69	Drang	18.01	49	Jogindarnagar		40.5	83
	Bharol(Lad)	-	-	Gopalpur	20.2	61	Bharol		9	13
	Sandhol	-	-	Rawalsar	15.7	27	Sandhol		1.6	1
				Dharampur	5.81	15	Dharampur		37.1	33
				Seraj		10	Kotli		73	46
	Sarkaghat	13.59	64				Sarkaghat		25.7	70
							Baldwara		37	50
	Sundarna	16.05	39	Sundarnagar	19.34	47	Sundarnagar		46.6	75

District	Tehsil	1981 villages connected by pucca road (%)	1981 villages connected by pucca road Nos.	C.D. Block	1991 villages connected by pucca road (%)	1991 villages connected by pucca Nos.	Tehsil	CD block	2001 Villages connect road (%)	2001 connect Nos.
							Aut		33.9	20
	Bali chokri	4.49	4				Bali chokri		9.3	9
							Thunag		17.8	30
	Chachyot	25	49	Chachyot	17.33	39	Chachyot		28.2	42
							Nihri		13.7	28
	Karsog	7.71	40	Karsog	12.28	64	Karsog		18.4	85
Shimla		15.6	347		14.11	326			18.9	477
	Shimla	18.2	103				shimla (rural)		24.6	124
							Shimla(urban)		-	-
	Rampur	24.37	29	Rampur	13.21	28	Rampur		25.5	39
	Nankhari	5	3	Narkhanda	44.81	69	Nankhari		8.1	7
	Kumharsain	35.9	56	Mashobra	14.99	113	Kumharsain		34.3	57
	Seoni	19.8	40	Chauhara	1.27	1	Seoni		27.7	56
	Junga						Junga		23.7	14
	Theog	10.97	43	Theog	13.96	55	Theog		20.8	83
Shimla	Chaupal	1.63	2	Chaupal	0.34	1	Chaupal		10.7	13
	Cheta						Cheta		2.4	1
	Nerua	-	-				Neerua		7.9	15
	Jubbal	22.47	20	Jubbal Kotkhai	14.4	37	Jubbal		13	17
	Kotkhai	20.93	36				Kotkhai		14.5	25
	Tikar						Tikar		14.6	6
	Rohru	8.88	15	Rohru	13.25	22	Rohru		12	15
	Chirgaon						Chirgaon		4.3	5
	Dodra Kawar						Dodra Kawar		-	-
Sirmaur		16.44	159		21.45	207			32.8	317
	Rajgarh	13.57	19	Sangrah	7.44	9	Rajgarh		35	49
							Nohra		21.3	10
	Pachhad	12.26	32	Pachhad	16	64	Pachhad		24	63
	Renuka	2.41	4				Renuka		21.6	16
							Dadahu		9.6	7
Sirmaur	Nahan	22.82	34	Nahan	22.97	48	Nahan		47.8	65
	Paonta Sahib	37.63	70	Paonta Sahib	45.95	85	Paonta Sahib		61.9	86
							Kamrau		33.3	15
	Shaillai			Shillai	2	1	Shillai		14.3	4
	Ronhat						Ronhat		9.1	2
Solan		27.19	73590		21.51	505			32.8	783
	Solan	31.35	13057	Solan	25.91	121		Solan	40.2	192
	Kunihar			Kunihar	14.26	67	Arki	Kunihar	28.9	138
Solan	Arki	15.62	8970	Dharampur	26.67	144		Kandaghat	27.5	74
	Kandaghat	36.45	9242	Kandaghat	21.29	56		Dharampur	30.3	165
	Nalagarh	33.2	23303	Nalagarh	19.24	117		Nalagarh	34.6	214

District	Tehsil	1981 villages connected by pucca road (%)	1981 villages connected by pucca road Nos.	C.D. Block	1991 villages connected by pucca road (%)	1991 villages connected by pucca road Nos.	Tehsil	CD block	2001 Villages connected by pucca road (%)	2001 Villages connected by pucca road Nos.
	Ramshahr	8.31	1909							
	Kasauli	32.24	17109							
Una		40.04	221		83.03	287271			59.3	450
Una	Una	51.35	38	Una	97.91	115328	Una		89.2	124
	Amb	43.43	76	Amb	70.96	66145	Amb		50.2	122
	Bangana	29.63	80	Gagret	52.01	76217	Bangana		49.7	1
				Dhundal	53.2	29581	Bharwain		60	27
	Haroli	81.82	27				Haroli		100	25

Village data given in Table 13, indicate that in last 3 decades.

- For the year 1981, % of maximum number of village are connected by pucca road in Chamba (50.73%), followed by Una (40.04%).
- In the year 1991, Una has the maximum number of village connected by pucca road with 83.03 % followed by Bilaspur of 31.89 %.
- In the year 2001, percentage of village connected by pucca road was maximum in Una with 59.3% followed by Bilaspur of 53.2 %.

District wise Transport facilities in Himachal Pradesh

Bilaspur: The district is connected by all weather roads as well fair weather roads with all important cities and towns of the State and the country. National Highway No.21 passes through the district. There is no rail link in the district. The nearest railway station is at Kirtpur Sahib in Ropar district of Punjab which is about 84 kms. from Bilaspur. The district is has transport depot at Bilaspur and buses ply on 90 routes in the state and inter-state routes. Out of these routes, 18 are inter-state routes while remaining operates with in the state. This depot has fleet of 84 buses which covers distance of 38.37 Lakhs kms. during 1999-2000. During the decade, there has been sharp increase registration of vehicles in this district. The various type of vehicles registered during 1991 were 579 & 1244 vehicles during 1999-2000. Year wise number of vehicles registered in Bilaspur district is given in Table 14.

Table 14: Motor Vehicles Registered

Sr. No.	Category of vehicles	Registered during the year 1991	1996	1997	1998	1999-2000
1	Buses	14	19	21	24	9
2	Trucks	76	193	325	121	161
3	Motor Cycles	32	12	17	10	54
4	Scooters	371	373	479	649	590
5	Jeeps	8	11	5	-	105
6	Private Cars	29	70	132	57	186
7	Pickup Vans	4	-	-	-	-
8	Tractors	34	56	63	64	66
9	Petrol Tankers	-	5	3	2	4
10	Delivery Vans	-	-	-	-	45
11	Deptt. Cars	-	6	-	-	-
12	Others	11	30	65	68	24
Total		**579**	**775**	**1,110**	**995**	**1,244**

Source: District Statistical Abstract-2000.

Chamba: In the absence of railways and navigable rivers, the district is entirely dependent upon the road transport system. At the end of year 1997-98, HRTC had a fleet of 79 buses plying on 98 routes. In addition, the buses of Punjab Roadways, Jammu & Kashmir Road Transport Corporation and private buses are also plying in the district. The goods are mainly being transported & operated by the private truck operators. The total road length in the district was 1,255 kms. including state

highways during 1998 out of this about 83 kms. length of roads, is double lane and length of 1,172 kms. is single lane. The length of jeepable roads is 410 kms, while less than jeepable roads in the district is 1,008 kms. Where other means of transport are not possible, the sheep, goats, mules and ponies are used to carry essential commodities. The main HRTC routes falling in the districts are given in Table 15.

Table 15: Routes & Total mileage of HRTC buses in Chamba

Sr. No.	Name of Routes	Total mileage in kms.
1	Chamba-Shimla	844
2	Chamba-Haridwar	1,340
3	Chamba-Mandi	668
4	Chamba-Amritsar	464
5	Chamba-Katra	590
6	Chamba-Panchrukhi	500
7	Chamba-Delhi	1,280
8	Holi-Palampur	564

In the districts Chamba, there is gradual increase in the length of single and double lane motorable roads in the district. The length of 12 kms. has been added in the category of double lane motorable roads during 1990-1998 while length of single lane motorable increased from 889 kms. to 1,172 kms. between 1990 and 1998.Length of roads in Chamba during 1990 to 1998 is given in Table 16.

Table 16: Roads including National Highways (in kms.)in Chamba

Type of Roads	1990	1991	1992	1993	1994	1995	1996	1997	1998
Motorable Double lane	71	71	71	73	76	76	79	N.A.	83
Motorable Single lane	889	912	946	953	982	1039	1077	N.A.	1,172
Jeepable	325	330	390	402	414	370	380	N.A.	410
Less than Jeepable	917	936	920	939	939	955	975	N.A.	1,008
Total	**2,202**	**2,249**	**2,227**	**2,367**	**2,411**	**2,440**	**2,511**	**N.A.**	**2,673**

Source: District Statistical Abstract, 2000

Hamirpur: The district is neither linked with air nor with railway line. Therefore, the entire goods transportation is done by road in the district. The district has a good number of roads and it is connected by roads to the outside areas. The goods are transported by private truck operators while in case of passenger transport, the buses of various regions are mainly plied by HRTC. HRTC Hamirpur is plying a fleet of 95 buses. Punjab Roadways are also plying buses on various routes in the district. The district headquarters Hamirpur is linked with the state capital by a bus route. The main bus routes linking up the district with other states are Hamirpur-Haridwar, Awahadevi-Delhi, Hamirpur-Amritsar, Sujanpur Tira-Delhi, Hamirpur-Chandigarh and Hamirpur-Manali-Ladakh.

By the end of March 1999, the total length of roads was 1,184 kms. out of which 1,183 kms was motorable road. The length of double lane road was 71 kms, 1,112 kms. of single lane road and one kilometre jeepable road. All the tehsils and C.D. blocks headquarters are well connected by roads. The State Highways Nos. 32 & 39 and National Highway nos. 70 & 88 pass through the district. During the period 1.1.1999 to 31.12.1999, 1,741 vehicles were registered in the district. Number and type of motor vehicles registered during, 1999 in Hamirpur is given in Table 17.

Table 17: Registered Vehicles in Hamirpur during Year 1999

Sr. No.	Type of Vehicles	Total Number
1	Bus	63
2	Truck	199
3	Private car	190

4	Scooter/Motor Cycle	914
5	Jeep	67
6	Tractor	121
7	Pickup Van	18
8	Petrol Tanker	3
9	Others	166
	Total	**1,741**

Source: District Statistical Abstract, Hamirpur - 2001

Kangra: Kangra is the only district which has the largest network of railway. District is connected by 163 kms. long narrow gauge line between Pathankot and Jogindarnagar. Apart from carrying passengers the railways facilitate the movement of essential commodities and construction material.

With the construction of airport at Gagal, district has also been linked with air service. The district has been extensively linked with roads where regular buses ply. There is a vast network of roads and all the important places like district/tehsil/sub-tehsil headquarters have been linked with motorable roads on which regular government and private buses ply. Most of the villages have also been connected by vast network of motorable roads. Out of total road length of 4,226 kms, the motorable road length was 3,969 kms by the end of March, 1999 in the district. State Highway No.5, 21, 23, 27 and National Highway No. 1-A happen to pass through district.

There are 4 depots of HRTC in the district, namely Baijnath depot having a fleet of 74 buses, Dharmsala depot 94 buses, Dehra Gopipur depot 62 buses and Palampur depot have 66 buses during the period 1996-97. The Transport Departments of the neighbouring states such as Jammu & Kashmir, Punjab, Haryana, etc. are also plying their buses on reciprocal basis. Length of metalled and un-metalled roads during 1995 to1999 is given in Table 18.

Table 18: Metalled and un-metalled roads in kms. During 1955 - 1999

Sr. No.	Year	Metalled	Unmetalled	Total
1	1995	3,665	224	3,889
2	1996	3,746	242	3,988
3	1997	3,808	249	4,057
4	1998	3,877	257	4,134
5	1999	3,969	257	4,226

Source - District Statistical Abstract, Kangra, 2000

In addition to these motorable roads, the district has 37 kms. jeepable and 220 kms. non-jeepable roads. In 1999, vehicles were registered in the district. Number and type of motor vehicles registered in 1999 is given in Table 19.

Table 19: Registered vehicles in 1999

Sr. No.	Type of Vehicle	Total Number
1	Bus	118
2	Truck	237
3	Motor Cycles & Scooter	2,981
4	Private Car	883
5	Jeep	154
6	Pick up Van	59
7	Tractor	403
8	Petrol Tanker	4
9	Tempo	8
10	Govt. Vehicles	21
11	Ambulance	1
12	Mini Truck	106
13	Other	16
	Total	**4,985**

Source: District Statistical Abstract, Kangra, 2000

Kinnaur: The district is neither linked with air nor with railway. Therefore, the entire goods transportation is done by road in the district. The goods are transported by private truck operators. Before the formation of state, there were no motorable or even jeepable roads in the district. Now all the tehsil headquarters are connected with the district headquarters by motorable roads. In order to provide maximum transport facilities to the people, the Government is constructing additional link road with view to connect each panchayat with their respective tehsil/ block headquarters. A number of kutcha roads linking the villages are maintained by the H.P. PWD. The district has about 997 kms. road length (as of March, 1999)

only 558 kms. of motorable roads, 80 kms. jeepable roads and 359 kms. of less than jeepable roads. Reckong Peo bus depot of HRTC is operating a fleet of 46 buses daily on different routes. Some buses are also plying on inter-district and inter-state routes. Length and growth of metalled and unmetalled roads during 1994-95 to 1998-99 in the district is given in Table 20.

Table 20: Metalled and unmetalled roads

(in kms.)

Year	Metalled	Unmetalled	Jeepable	Total
1994-95	485	346	65	896
1995-96	490	346	76	903
1996-97	500	348	70	918
1997-98	525	356	75	956
1998-99	558	359	80	997

In 1999, 266 vehicles were registered in the district. Number and type of motor vehicles registered in 1999 is given in Table 21.

Table 21: Registered vehicles in 1999

Sr. No.	Type of Vehicles	Total number
1	Bus	9
2	Truck	31
3	Motorcycle	29
4	Scooter	23
5	Jeep	59
6	Private car	82
7	Pick up Van	1
8	Tractor	3
9	Govt. Vehicle	5
10	Mini Truck	32
11	Private Bus	1
	Total	**266**

Source: District Statistical Abstract, Kinnaur-2000

Kullu: The district headquarters is situated on National Highway No. 21. It is also served better by State Highway No. 11 & 14 and other metalled & unmetalled roads. Total road length in the district was 1,235 kms. in 1999. Motorable road length was 913 kms. Kullu is well connected with the different places of the state and other places outside the state. HRTC Kullu started its operation during the year 1976-77. In 1997, the depot has a fleet of 90 buses to provide services long route services on the Manali–Amritsar, Manali-Delhi, Kullu-Nirmand, Manali-Jawalaji, Manali-Dehradun, Manali-Chamba, Kullu-shimla, Kullu-Trilokinath, Manali-Jammu, Kullu-Leh, Kullu-Keylong routes etc.

The district is not connected with railway line. However, Kullu has network of roads where regular buses ply. Length and growth of metalled and un-metalled roads from 1995 to 1999, is given in Table 22.

Table 22: Metalled and un-metalled roads

(in kms.) in Kullu

Year	Metalled	Un-metalled	Total
1995-96	377	475	852
1996-97	392	481	873
1997-98	402	493	895
1998-99	417	496	913

Source: Statistical Abstract Kullu-2000.

In addition to these motorable roads, Kullu has 29 kms. Jeepable and 291 kms. less than Jeepable roads. In 1999, 1,207 vehicles were registered in the district. Sub-division wise number and type of motor vehicles registered in 1999, is given in Table 23.

Table 23: Motor Vehicles registered in 1999

Sr. No.	Category of Vehicles	Sub-division wise number of vehicles registered				
		Kullu	Manali	Banjar	Ani	Total
1	Buses	12	-	-	-	12
2	Trucks	27	10	1	7	45
3	Motor Cycle	55	41	2	3	101
4	Scooter	141	118	5	6	270
5	Jeeps	28	25	12	2	67
6	Pvt. Cars	93	233	30	34	390
7	Tractors	32	22	3	5	62
8	Petrol Tankers	4	-	-	-	4
	Total	562	521	63	61	1,207

Source: Statistical Abstract, Kullu-2000.

Lahaul & Spiti: The Government is trying to link every village of the district by roads and provide regular bus service to the people. HRTC has strengthened its activities considerably in the district during the last twenty years. Two regional offices at Keylong and Kaza are functioning in the district, which

provide bus facilities to other parts of the state and local areas of the district with respective sub-divisional headquarters. The HRTC operates a fleet of 15 buses on 14 routes. The places which have a regular bus services are Delhi-Keylong, Keylong-Shimla, Keylong-Dharamshala, Keylong-Chintpurni, Kaza-Shimla and Kaza-Kullu, etc. These buses cover a distance of 5,740 kms. on annual basis as given in Table 24. The transport facility for connecting the district with other places is available for five months in Keylong region and for nine months in Spiti region of the district. Within these two regions, local buses used to ply in the fair weather during the winter season. Details of transport facilities in Lahaul & Spiti during 1999 – 2000, is given in Table 24.

Table 24: Transportation facilities in Lahaul & Spiti District

Year	No. of buses	No. of routes	Distance covered during the year
1999-2000	15	14	5,740 kms.

Source: R.T.O. Keylong, Udaipur and Kaza, Superintendent of Police Keylong (Ps. 50-51 of District Statistical Abstract, Lahaul & Spiti District 2000)

Mandi: The district has been connected with National Highway-21 and narrow gauge Pathankot-Jogindarnagar railway line. It is well connected with all weather roads with many prominent places and cities. Most of the villages and all the towns are linked with the district and tehsil headquarters by a network of motorable roads. Even the remote villages, where it is not possible to construct motorable roads, footpaths and bridle roads have been constructed. The total length of metalled and unmetalled roads in the district during the year 1997-98 was 977 and 1865 kms. respectively as compared to 698 and 1609 kms. in 1990-91.

A fleet of 219 ordinary buses of H.R.T.C. from Mandi, Sundarnaggar and Sarkaghat depots are plying on the road every day. Moreover, numerous private buses are also operating within the district. 2,795 vehicles were registered and operating in the district in 1999. H.R.T.C. buses of Mandi depot covered 62.46 Lakhs kilometers distance during 1998-99 while the distance covered by the buses of Sundarnaggar and Sarkaghat Depots during the same period was 47.90 and 44.83 Lakhs kms respectively. Details of road & transport status in Mandi in during 1998 – 99 are given in Table 25.

Table 25: Roads and transport status in Mandi district during 1998-99

Year	Roads (in kms.)		Registered Vehicles	Nationalised Transport			Distance Covered (M000 Kms.)	Depot
	Metalled	Unmetalled		Bus	Trucks	Other		
1	2	3	4	5	6	7	8	9
1998-99	977	1,865	2,795	207	1	4	149.04	3

Source: District Statistical Abstract, Mandi-2000 Page 90-95

Shimla: Shimla district has mountainous terrain throughout and rail transportation is difficult, roads are the only means of transportation. By the end of the year 1998-99, the total roads length in the district was 3641 kms., of which 311 kms. were double lanes, 2,786 kms. single lane, 69 kms. jeepable and 475 kms. less than jeepable. In order to promote transportation facility, the state government has allotted route permits for plying mini buses. There are five depots of HRTC operating in Shimla during the year 1998-99. These were namely Dhalli Depot, Tara Devi Depot, Rohru Depot, Shimla Depot and Rampur Depot. HRTC is also operating local bus services in Shimla town and its periphery areas. There are number of taxis at various places which provide transportation facility to the needy persons. The State Tourism Corporation has a fleet of deluxe buses for sight seeing purposes. The buses from Punjab, Haryana, Chandigarh, Delhi, Rajasthan, Uttar

Pradesh, Uttaranchal and Jammu & Kashmir are also plying in the district. Besides, there were 4.4 kms. of pucca metalled roads 383.3 kms. of Kutcha un-metalled road and 1450.6 kms. bridle path developed by the Forest Department during 1999-2000 in the district. Road length during 1998 – 99 is given in Table 26

Table 26: Road length in Shimla during 1998-99

Year	Total road length in the district in kms.					
	Motorable double lane	Motorable single lane	Jeepable road	Less than jeepable road	Total road length	Motorable road per 100 sq. kms. of area
1	2	3	4	5	6	7
1998-99	311	2,786	69	475	3,641	60.36

Source: Statistical Abstract Shimla , 2000.

Sirmaur: The district is not connected with any railway line and the nearest railway station are Dehradun and Ambala from Nahan and Poanta Sahib. The district is extensively linked with the roads where the regular buses ply. The goods are transported by private operators while the passenger transport is controlled by the HRTC. Buses of the other State Transport Corporations and to some extent, the private owners also ply on various routes in the district. The State Transport Corporation operates its buses to link the district with Delhi, other states and district headquarters as well as the interior parts of the district and tehsil/sub-tehsil headquarters. As many as 1,682 vehicles of various kinds in the district were registered during, 2000. A fleet of 80 H.R.T.C. buses were plying on the road covering a distance of 6,432 thousand kilometres during the year 1999-2000 as given in Table 27.

Table 27: Registration of vehicles, no. of buses and distance covered during the year 1999-2000

Year	No. of registered vehicles	No. of buses plied on the road	Distance covered by the buses during the year (in M000 kms.)
1999-2000	1,682	80	6,432.391

Source: District Statistical Abstract, Sirmaur-2001 Page 62-63

Solan: There is a network of 2264 Kms. length of roads in Solan. Beside roads in the district. Total length of a railway line upto 72 Kms also exists. National Highway No. 22 and railway line passes through the district. All the block headquarters in the district are well connected with the major commercial centres, district headquarters and Shimla. There are three transport depots viz. Solan, Parwanoo and Nalagarh which are functioning in the district. In Solan district during 1995-96 these depots were having a fleet strength of 138 buses and 3 other vehicles and operational mileage covered by the fleet was about 110 thousand Kms. During 1999-2000 Solan district depots were having 142 vehicles and the mileage covered was 1,21,000 kms as given in Table Table 28.

In the district, out of a total road length of 2264 Kms, 171 Kms. is double motorable road. About 1621 Kms. is single motorable road, 50 Kms. is jeepable road and 422 Kms. is non jeepable road as given in Table 28. All the tehsil headquarters are now connected with the district headquarters by motorable roads. Most of the villages are also connected with the tehsil/sub-tehsil headquarters by a vast net work of motorable roads.

Table 28: No. of vehicles, motorable roads and distance covered in Kms. in Solan district

Particulars	1995-96	1996-97	1997-98	1998-99	1999-2000
1 Motor Vehicles	138	141	140	140	138

(A)Buses	-	-	-	-	-
(B) Truck	3	3	4	4	4
(C)Other Vehicles					
Total	**141**	**144**	**144**	**144**	**142**
2 Operational Motorable road	155	159	162	163	167
3 Distance covered in Kms.('000)	110.5	118.63	125.36	124.49	121.82

Souirce: District Statistical Abstract Solan-2000 (Page-93)

Table 29: Roads and distance in Kms. (including National Highway) in Solan district

Item	1994-95	1995-96	1996-97	1997-98	1998-99
1 Double lane motorable roads	153	161	165	169	171
2 Single lane motorable roads	1,502	1,525	1,560	1,506	1,621
3 Jeepable roads	47	47	47	50	50
4 Other non Jeepable roads	415	417	418	422	
Total	**2,117**	**2,150**	**2,190**	**2,227**	**2,264**

Source: District Statistical Abstract Solan (Page-94)

Una: The district is connected by the roads from Chandigarh, Delhi, Punjab and Himachal Pradesh. The district headquarters is also connected by broad guage railway line. The goods are transported by private truck operators while in case of passenger transport the buses of various regions are mainly plied by H.R.T.C. A fleet of 94 buses of HRTC is plying on different routes. Punjab Roadways is also plying buses on various routes in the district. The total length of metalled and unmetalled roads is 1,515 kms. including National and State Highways during 1999-2000. Out of this, 90 kms of road length is double lane while remaining length of road is single lane.

All the tehsils and block headquarters are well connected by roads and State Highway 32 passes through the district. During 2000-2001, 2,836 vehicles were registered in the district, detail as given in Table 30.

Table 30: No. of registered vehicles in Una during 2000-2001

Sr. No.	Name of Vehicle	Total Number
1	HRTC Bus	21
2	Truck	46
3	Motor cycle/ Scooter	1,883
4	Moped	40
5	Jeep/Tata Sumo	87
6	Private Car/Van	507
7	Pick-up Van	30
8	Tractor	148
9	Petrol Tanker	2
10	Department's Car	2
11	Crain	1
12	Ambulance	2
13	Mini Truck	38
14	Three-wheeler	4
15	Private Bus	21
16	Mini Bus	4
	Total	**2,836**

Source: District Statistical Abstract, Una-2001

4.2 Patterns of planning and development in the sector

Hilly regions, generally, have extremes of climatic conditions, difficult and hazardous terrain, topography and high altitude areas. The region is sparsely populated and basic infrastructural facilities available in more developed plains of hinterland are mostly absent. The areas and, therefore, the roads are affected by floods consequent to torrential rainfall, land-slide, snow-fall, avalanche, etc. compelling certain roads to be kept closed in part of the year, especially in winter months. A recommendation about the alignment survey and geometric design of Hill Roads was first published in 1973 and revised in 1982.

Planning of Roads in Hill Areas: Planning of road in hill areas is much different from the plains. Significantly, large number of villages are sparsely populated and located in isolation at

different altitude unlike in plain areas. It is usually not possible topographically as well as economically to directly link them with motorable roads. Alignment of roads has, thus, to be circuitous and is primarily governed by topography. In hilly areas, road links should be provided on the basis of cluster or group of villages as far as feasible because the populations of each village may be very low. Villages located within a radius 1.6 km and having altitude difference of not more than 200 m can be considered as one cluster or groups of villages. Isolated villages, having population of more than 500 should be provided with an all-weather link road. For a cluster of villages of population less than 500, a selective approach of an all-weather road may be worked out keeping in view the local conditions. For new roads, connecting new areas an estimation of traffic likely to generate can be done by studies on population and consumer needs, development plans for the area and traffic on adjacent roads.

Basic Principles of Geometric Design: A uniform application of design standards is most desirable for the road safety and smooth flow of traffic. The use of optimum design standards will reduce the possibility of early obsolescence of the facilities brought about the inadequacy of the original standards.

As a general rule, geometric features of highway except cross-sectional elements do not lend themselves suitable for stage construction. Particularly in the case of hill roads, improvement of features, like, grade and curvature at a later date can be very expensive and may sometimes be impossible. It is, therefore, necessary that ultimate geometric requirements of hill roads should be kept in view right in the beginning.

Camber/Cross Fall: Generally, the pavement on straight reaches should be provided with a crown in the middle and surface on either side sloping towards the edge. However, this may not be possible in every situation, particularly in reaches with winding alignment where straight sections are few and far between. In such cases, discretion may be exercised and instead of normal camber, the carriageway may be given a uni-directional cross fall towards the hill side having regard to factors, such as, the direction of super elevation at the flanking horizontal curves, ease of drainage, problem of erosion of the down-hill face, etc.

For a given surface type, the steeper values of camber should be adopted in areas having high intensity of rainfall and the lower values where the intensity of rainfall is low. The camber of cross fall on straight sections of roads should be as given below.

a) Earth roads -3 to 4 % (1 in 33 to 1 in 25)
b) Gravel or WBM Surface - 2.5 to 3 % (1 in 40 to 1 in 33)
c) Bituminous surfacing -2.0 to 2.5 % (1 in 50 to 1 in 40)
d) Concrete pavement - 2.0 %

The cross falls for earth shoulders should be at least 0.5 % more than the pavement camber subject to a minimum of 3 %. On super-elevated sections, the shoulders should normally have the same cross fall as the pavement. In order to minimize the damage to edges of pavement due to over flooding of drains and from surface water as well as wheels of vehicles coming on the road edge, it is recommended that hard shoulders may be provided between edge of the pavement and drain with stone edging upto the depth of road crust parallel to the road edge. Top of these edge stones may be kept about 2 cm below the roadway level at the edge. In case the roads are in grade, the stone edging shall also be in the same grade and run parallel to the road edge.
Source: Hill roads IRC:52-2001

Capacity Values: The computation of capacity of study sections is based on the capacity values as given in Table 31. These values correspond to the World Bank appraisal guidelines for similar road projects in India.

Table 31: Capacity Values

Carriageway	Capacity (PCUs/Day)
Single Lane	4,000
Intermediate Lane	12,000
Double Lane	20,000

The above capacity values are for bituminous surface roads in plain terrain with low curvature and having standard pavement width of 3.75 m for single lane, 5.5 m for intermediate lane and 7.0 m for double lane, and good quality shoulders. For other conditions of terrain and curvature, substandard pavement widths, unsuitable shoulders, the above capacity values will have to be suitably modified.

Recommended design service volumes for roads is given in Table 32.

Table 32: Recommended design service volumes for Roads

Carriageway	Paved width (m)	Curvature (Degrees per km)	Terrain	Capacity (PCUs/Day)
Single Lane	3.75	Low (0-100)	Rolling	1800
		High (>101)		1700
		Low (0-200)	Hilly	1600
		High (>201)		1400
		Low (0-100)	Rolling	5700
Intermediate Lane	5.50	High (>101)		5600
		Low (0-200)	Hilly	5200
		High (>201)		4500
Double Lane		Low (0-100)		
	7.00	High (>101)	Rolling	11000
		Low (0-200)		10000
		High (>201)	Hilly	7000
				5000

Capacity Considerations in Hill Roads: IRC: 64-1990 'Guidelines for Capacity of Roads in Rural Area' contains recommended design service volumes for hill roads as given in Table 33. The capacity of two-lane roads can be increased by providing paved and surfaced shoulders at least 1.5 m width on either side. Provision of hard paved shoulders results in slow moving traffic being able to travel on the shoulder which reduces the interference to fast traffic being able to travel on the shoulder which reduces the interference to fast traffic on the main carriageway.

Table 33: Recommended Design Service Volumes for Hill Roads

Sr. No.	Types of Road	Design Service Volume in PCU/day		
		Carriageway width	For low curvature (0-200 degrees per km)	For high curvature (above 200 degrees per km)
1.	Single-lane	3.75 m	1,600	1,400
2.	Intermediate-lane	5.5 m	5,200	4,500
3.	Two-lane	7.0	7,000	5,000

Design Speed: Normally, 'ruling design speed' should be the guiding criterion for correlating the various geometric features. "Minimum Design Speed" may, however, be adopted in sections where site conditions including costs do not permit that. The design speeds for various categories of hill roads is given in Table 34.

Table 34: Design Speeds (km/h)

Sr. No.	Road Classification	Mountainous terrain		Steep terrain	
		Ruling	Minimum	Ruling	Minimum
1.	National & State Highways	50	40	40	30
2.	Major District Roads	40	30	30	20
3.	Other District Roads	30	25	25	20
4.	Village Roads	25	20	25	20

Planning issues in development of hill area

- Development pattern of hilly area is governed by its topographical constraints like steep slopes, elongated hilly spurs, forest areas, and zones of perpetual sunshades. Due to extremely limited vehicular accessibility and dependence on pedestrian movement, development of Shimla is concentrated in a limited area
- The Ridge and southern slopes are more amenable for development due to gradual slopes and sunny side. Thus all major land uses are located on southern slopes of Shimla.
- Shimla is facing the problems typically faced by any hilly region like soil erosion, flooding of foothills, scarcity of buildable land, emergence of linear urban corridors, inaccessibility of certain areas, uneven development of urban system etc.
- The high growth of population coupled with the floating population is exerting heavy pressure on existing infrastructure and also leading to encroachments, unauthorized constructions, construction activities not incompatible with traditional culture and heritage of the city, etc.
- Poor enforcement of zoning regulations.

Road Infrastructure development and growth: There are four agencies handling roads. The National Highways are looked after by the Government of India, the State Highways by the State PWD, the town roads by the Municipal bodies and the rural roads partly by the PWD and partly by the Rural Development Department. The development of roads in the State since its formation is given in Table 35.

Table 35: Road Infrastructure in Himachal Pradesh

Plan period	Road length (in Km)
1951-56	504
1956-61	1300
1961-66	2114
1966-69	6196
1969-74	9042
1974-79	10394
1980-85	13637
1985-90	15560
1992-97	18376
1997-2002	20837
2002-03	23436

Source: Planning Department (2003):1994-95

On an average, about 2500 kilometers of road length is added every five years in the state. The growth rate of road network was higher in the initial years of development, which slowed down in the subsequent years as after the basic connectivity at the district and subdivision level was provided, the demand for funds for other sectors of the economy like health, education and social services increased. Over 90% of the road network consists of single lane roads as given in Table 36. With the high growth rate of vehicle population and use, the problems of congestion arise.

Table 36: Category of roads in Himachal Pradesh

Sr. No.	Category of Road	Single Lane	Double Lane	Total
1	National Highways	486	749	1235
2.	Border Roads	422	269	691
3.	State highways	901	617	1518
4.	Rural Roads	19291	701	19992
	Total	21100	2336	23436

Source: Planning Department (2003): 1994-95

Roads and Bridges (Central Sector) Roads play a vital role in boosting the economy of the hilly state like Himachal Pradesh. Starting almost from a scratch the State Government has constructed 32,926 Kms. of motorable roads inclusive of jeepable track till December, 2009. Government has been assigning a very high priority to road sector. Achievements made upto December, 2009 are given in Table 37 and Table 38.

Table 37: Population wise villages connected with road

Villages Connected with road (Population)	As on 31st March				As on Dec. 2009
	2006	2007	2008	2009	
more than 1500	198	199	200	202	205
1000-1500	235	239	248	262	266
500-1000	931	977	1050	1151	1175
200-500	2726	2848	2970	3092	3141
Below 200	4254	4268	4371	4536	4595
Total	**8344**	**8531**	**8839**	**9243**	**9382**

Source: Economic Survey Report, 2009-10

Table 38: Target and achievements in transport sector

Item	Unit	Target for 2009-10	Achievement upto Dec., 2009	2009-10 Anticipated
1. Motorable	Kms	1010	611	1010
2. Cross drainage	Kms	2294	1003	2294
3. Metalling & tarring	Kms	1214	811	1214
4. Jeepable	Kms	19	5	19
5. Bridges	No.	72	32	72
6. Villages connectivity	No.	335	139	335

Source: Economic Survey Report, 2009-10

Concerns and Options The Road Policy Himachal Pradesh should focus on the following concerns (as per the Road Policy).

(1) Road maintenance organization and finance;
(2) Traffic management to improve traffic system capacity, quality, or safety;
(3) Demand management to secure maximum social value for network use;
(4) Infrastructure expansion planning and appraisal.

(a) Road maintenance: It is estimated by the Ministry of Road Transport & Highways (MORTH), 2005 that out of the total road length of 65569 Km in India, about 25000 Km is under severe strain due to heavy traffic. The allocation of budget on account of maintenance of roads in the central sector is only 40% of the requirement. Among the main issues in the maintenance of roads in the context of Himachal Pradesh are: preparation of road inventories, analysis of defects, determination of requirements and type of interventions, arranging financial resources and preparation of maintenance plans. The condition of roads gets bad especially in segments of high use like the national highways leading to tourist destinations like Kullu-Manali, Shimla, Dharamshala and Dalhousie. However, the Himachal Pradesh Budget Manual provides for creation of a Road and Infrastructure fund, no such fund has been created.

(b) Traffic Management: The traffic management measures that may be useful in the context of Himachal Pradesh are roadside parking management, traffic circulation measures, bus service priority and regulatory measures under the Motor Vehicles Act. To prevent roadside parking of vehicles, it is essential that special parking areas are developed. The basic reason forf lack of parking facilities it is perception that parking has to be provided at a social cost without any additional charge to the users. However, the biggest limitation with this assumption is that often funds are not available from the public resources to provide this facility since no bank loan would be available for a venture with no returns. To facilitate parking areas to come up, it may be appropriate to treat parking space as a normal commodity such as gas or electricity, and to follow the implications of a commercial

or market approach for prices and investment policy.

However, traffic management cannot be seen as a one-shot measure. It needs to be seen as a continuous process. Otherwise, the benefits of congestion reduction achieved by any such intervention will be overtaken by the increasing population of vehicles. Emphasis therefore has to be on creating a favorable institutional environment that encourages effective operation and development of technical skills to implement new techniques.

Demand Management: The economic rationale of demand management is that if price directly incurred by travelers in making journeys is lower than the full cost of the journey, then some trips will impose a net cost to the community. The full cost of a trip includes personal cost borne by the traveller and the social costs imposed by the traveller on the community in the form of contribution to congestion, the increase in accident potential, and the polluting effects on the environment. The objective of the demand management is to secure the total level of traffic, and its distribution by modes, locations, and times of day that would exist if traffic by each travel mode were to be charged prices equal to its full marginal social cost.

Infrastructure Provision: Early planning and reservation of space is necessary. Cities with only 10 to 15 percent of their area devoted to the transport infrastructure cannot support unlimited motorization. Besides, once the township is established it becomes rather difficult to super impose additional transport infrastructure. Moreover, where congestion is suppressing demand, as is the case with most towns in Himachal Pradesh, additional roads normally mean additional traffic and hence more congestion. Thus, a strategy that combines necessary road capacity adjustment to support city expansion with clear policies on the allocation and use of the road space is likely to reconcile city expansion with livability (World Bank 2002).

Vehicle Population and Growth Rates: The growth rates of vehicle population in the state have been phenomenal. From an average growth rate of 2.7 % during 1980-85, growth rate of vehicle population increased to 7.8 % in 1995-2000. After 1998, the annual growth rates of vehicle population increased substantially to 12 percent due to the availability of easy finance and new vehicle models being launched in the market. The number of vehicles (as on end of December 2003), is given in Table 39.

Table 39: Motor Vehicle Populations in Himachal Pradesh

Sr. No.	Category of vehicle	Population	As percentage to total
1	Two wheelers	149,286	58
2	Cars and jeeps	63,249	24
3	Trucks	37,805	14
4	Buses	4,417	2
5	Three wheelers	2,611	1
6	Others	3,656	1
	Total	**261,024**	**100**

Source: DOT (2003)

Two wheelers and cars comprised 82% of the total vehicle population. The commercial vehicles were only 25% of the total vehicle population. The motor vehicle population in Himachal Pradesh is thus rising with higher share of personal vehicles. Within the personal vehicles as well, the share of two wheelers is very high (about 60%). This composition of vehicle population coupled with high growth rates of personal vehicles has caused serious problems of congestion, accidents and pollution.

Promoting Safe Transport: Another important externality resulting out of transport use is impact of users on accident risks via their level of care reflected in the shape of their driving style and speed and their activity level reflected in the form of number of kilometers traveled. It is argued that reducing accident externalities rely on the use of liability and

compensation rules. The Indian Motor Vehicles Act makes third party insurance necessary for all vehicles. With risk aversion, insurance comes into play. The premium that one has to pay is not related to the number of kilometers traveled by the insured and the driving style of the individual. In addition, the road users also cause damage to the roads, which in turn becomes a cause of accident for the other users. Therefore, a tax on the damage caused could also be useful in controlling road accidents while at the same time providing a resource base to repair the damage. In this case, the road damage is a function of the vehicle weight. The latter depends on the weight per axle. Introduction of a kilometer charge that is a function of the number of axle loads of a heavy vehicle could be an efficient alternative to tackle such a situation.

Integration of Transport in Town and Country Planning: An effective transport planning has to begin at the time of planning of a town or a facility. The sustainability of the urban transport system must be considered a critical part of the sustainability of the total urban system. Very often towns, market complexes, and industrial areas are planned without taking into consideration the transport requirements. As a result not enough provisions are made for parking. It is observed that traffic may eventually expand to fill the road space available. Moreover, new developments around the new roads would cause an increase in the vehicle fleet and in the level of car use. Another way of tackling the problem is by spatially locating trips destinations in a way that optimizes road use. The historical configuration of many urban areas limits the scope of this solution. Moreover, land use and transport are linked by very complex relationships. In general, these constitute long-term solutions and are characterized by high level of inflexibility. The modification of the natural landscape could be irreversible and the cost of environmental degradation should be taken into account. To protect the built and natural environments, the plan should help reduce car traffic by making public transport an attractive option. Achieving such integration will require coordinated planning of services and facilities; pricing and investment regimes that reflect the full costs and benefits of the various transport modes and close linkage of transport with economic, environmental and social policy initiatives.

The HRTC has introduced some new schemes for the benefit of people of the state like:

(i) **Smart Card Scheme:** Smart card is obtainable on payment of Rs. 50 and is valid upto one year. Passenger get a discount of 10 % and senior citizens get discount of 20 %.

(ii) **Group Discount Scheme:** A group of 4 to 10 persons travelling more than 100 kms. will get a discount of 10 % and a group of more than 10 persons will get a discount of 15 %.

(iii) **Courier Service:** HRTC has introduced courier service through its buses from booking office to booking office w.e.f. 1.11.2000.

Pradhan Mantri Gram Sadak Yojana (PMGSY): The Government of India launched the Pradhan Mantri Gram SadakYojana (PMGSY) on 25th December 2000. PMGSY is a 100 percent Centrally Sponsored Scheme and 50 percent of the cess levied on High Speed Diesel (HSD) has been earmarked to fund the scheme. The primary objective of the PMGSY is to provide connectivity by way of an all weather road to the eligible un-connected habitations in the rural area, in such a way that all un-connected habitations with a population of 500 persons and above are to be covered in plain area. In respect of Hill State (North-East, states, Himachal Pradesh, Jammu & Kashmir, Uttaranchal) and the desert areas (as identified in the Desert Development Programme) as well as the Tribal (Schedule-V) area, the objective would be to connect habitations with a population of 250 persons and above.

The PMGSY will permit up-gradation (to the prescribed standards) of the existing roads in those districts where all the eligible habitations of the designated population size have been provided all weather road connectivity. However, it must be noted that up-gradation is not central to the programme and can not exceed 20% of the state's allocation as long as eligible unconnected habitations in the state still exist.

Phase-wise length of roads constructed, expenditure incurred and habitations connected under PMGSY and World Bank are given in Table 40.

Table 40: Phase-wise length of roads constructed, expenditure incurred and habitations

(UPTO 31.5.2009)

S. No.	Phase	No. of roads sanctioned	No. of completed roads	Length of proposed road (Kms.)	Length of roads constructed (Kms.)	No. of Habitations to be benefited	No. of Habitations benefited	Remarks
1	Phase-1 (2000-01)	127	127	534.600	534.600	302	302	
2	Phase-II (2001-02)	245	242	932.706	925.206	445	440	
3	Phase-III (2003-04	370	325	1881.935	1701.755	796	786	
4	Phase-IV (2004-05)	105	58	620.213	424.300	284	223	
5	Phase-V (2005-06)	105	75	614.496	494.406	295	236	
6	Phase-VI (2006-07)	391	164	2088.756	1348.440	831	391	
7	Phase-VII (2007-08)	74	2	517.315	58.175	154	2	Clearance of proposals received on 31.12.2007
8	Phase-Vlll (2008-09)	13	0	96.296	0.000	28	0	Sanctioned Received
9	World Bank Phase-I (2004-05)	115	92	587.640	521.795	264	234	
10	World Bank Phase-II (2005-06)	66	30	424.725	282.078	164	117	
11	World Bank Phase -III (2007-08)	13	0	65.095	6.750	19	0	Clearance of proposals has been received on 31.12.2007
	Total :-	**1624**	**1115**	**8363.777**	**6297.505**	**3582**	**2731**	
1	Phase-VI(2006-07) Additional proposals	178	79	2042.160	1005.630	-	-	
2	Phase-VII (2007-08)	47	0	619.735	73.365	-	-	Clearance of proposals received on 31.12.2007.
3	World Bank Phase-III (2007-08)	31	0	362.82	28.00	-	-	Clearance of proposals received on 31.12.2007.
4	Phase-VIII (2008-09)	6	0	48.855	0	0	0	
	Total :-	**262**	**79**	**3073.57**	**1106.995**	**0**	**0**	
	Grand Total	**1886**	**1194**	**11437.347**	**7404.5**	**3582**	**2731**	

Central Roads Fund (CRF): All State roads including State Highways, Major District Roads and other roads of importance can be taken up under this programme. The State Govt. can also consider Urban Roads for inclusion in the programme. It may, however, be noted that roads which are classified as rural roads are not to be included in this programme.

Types of works to be considered in this programme shall consist of construction of missing bridges; cross drainage works; rehabilitation of bridges; widening to two lanes; strengthening of weak pavement sections; improvement of riding quality/periodic renewal of selected stretches of SH/MDR; engineering aspects of road safety works covering improvement of traffic junctions, road marking, signaling, construction of subways and over bridges, construction of parking lay-byes, bus sheds, highway patrolling scheme etc.; research and development; development of data base; training of highway engineers; contribution of professional organizations like Indian Roads Congress, Indian National Group of International Association for Bridge & Structural Engineers (IABSE) and National Institute for Training of Highway Engineers (NITHE) etc.; construction of bye-passes, parallel service roads along National Highways/ State Highways in built up areas may be considered in exceptional cases. Status of sanctioned projects under CRF is given in Table 41.

Table 41(a): Status of Sanctioned Projects under CRF

Year of Sanction	No. of Projects Sanctioned (In Nos)			Length for roads (In kms) & Bridges (In mtrs)	
	Roads	Bridges	Total	Roads	Bridge
2001-02	7	-	7	116.840	-
2002-03	1	3	4	13.350	469.57
2003-04	8	3	11	116.135	239.00
2004-05	3	-	3	14.585	-
2005-06	8	-	8	104.112	-
2006-07	2	-	2	14.450	-
2007-08	4	-	4	30.065	-
2008-09	6	1	7	56.165	75.00
2009-10 Up to 31/05/09	-	-	-	-	-
Total:	39	7	46	465.702	783.57

46 road and bridges has been sanctioned out of which 29 roads and bridges have been completed as on 31st March 2009. The progress of completed projects was higher in bridges (86%) than the roads (57%). Table 42 gives the details of sanctioned and completed projects in Himachal Pradesh.

Table 41(b): Progress of Roads and Bridges in the State of Himachal Pradesh

S.No.	Sanctioned (in nos.)			Completed as on 31/05/2009 (In Nos)			In Progress (in nos.)		
	Roads	Bridges	Total	Roads	Bridges	Total	Roads	Bridges	Total
1	39	7	46	23	6	29	16	1	17

Note: Projects completed include 5 projects on TKH road & 1 Bridge also considered as closed

4.3 Technology/schemes adopted in the sector along with any changes in technology

Bio-engineering: Bio-engineering is the use of vegetation, either alone or in conjunction with civil engineering structures, to reduce instability and erosion on slopes. It should be a fundamental part of the design and construction of all roads in rural (and urban) hill areas, mainly because it provides one of the best ways to armour slopes against erosion. Because of the steep and dynamic slopes found in the Himalayas, most hill roads are engineered near to the margin of safety. Bio-engineering is an effective way of enhancing civil engineering structures to increase stability as far as possible It is relatively low in costs uses local materials and skill, and provides livelihoods benefits through economically useful products.

Both bio-engineering and civil engineering systems perform*engineering functions* Table 42 shows the main functions of common structures of each category. Obviously plants cannot emulate all of the functions of civil engineering systems, particularly those having effects deeper than about 0.5 meter. Also, plant types vary in their ability to serve the various engineering functions. During the initial assessment of bio-engineering possibilities in Himachal Pradesh, certain technical areas were identified as requiring skill development among the majority of professional level staff. These sub-disciplines are poorly covered in almost all civil engineering courses, because slope stability in the Himalayas is a relatively small niche.

Table 42: Comparison of the main engineering functions performed by civil and bio-engineering structures

Civil Engineering Techniques		Bio-engineering Techniques	
Technique	**Function**	**Technique**	**Function**
Stone Pitching	Armour	Horizontal Grass	Armour, Catch, Reinforce
Rivetment	Armour	Diagonal Grass	Armour, Drain, Reinforce
Dentition Work	Armour	Palisades	Catch, Reinforce, (Support)
Check Dam	Catch & Support	Brush Layering	Catch, Reinforce, (Support)
Retaining Wall	Support & Catch	Shrub Planting	Catch, Reinforce, Anchor, Support
Drainage Systems	Drain & Some Support	Tree Planting	Reinforce, Anchor, Support
Bolster	Support, Armour & Catch	Bamboo Planting	Catch, Armour, Reinforce, Support

Despite these potential difficulties, the use of bio-engineering is fully compatible with the approach outlined for the State Roads Project, which is currently in preparation by the Government of Himachal Pradesh and the World Bank. Its use would promote both the pro-environmental and improved asset management objectives of the project. It also supports the aims of institutional development and the move towards a sector-wide approach, through the broadening of capacity in Himachal Pradesh to manage its infrastructure assets better by using cost-effective solutions for slope stabilisation. The planned widening of roads will involve massive hill cutting, resulting in yet more unstable slopes, and with the disposal of surplus debris, the stability of slopes will be a key environmental issue to be mitigated under the HP State Roads Project. In the light of this, the introduction of these techniques is a good practical example of the Bank's stated aim of helping the Government of Himachal Pradesh to gain access to global knowledge for mitigating the adverse effects of unscientific road construction and the stabilisation of unstable slopes.

Under most circumstances, bio-engineering can be effectively combined with appropriate and low cost geotechnical applications to provide the most cost-effective, integrated solution to slope stability problems. This is important for places like Himachal Pradesh because, with the steep and dynamic slopes found in the Himalayas, most hill roads are engineered near

to the margin of safety. Bio-engineering is the most affordable and effective way of enhancing civil engineering structures to increase stability as far as possible. The vegetative structures are also flexible, being capable of absorbing movement and recovering from damage. In this respect, bio-engineering is simply part sustainable asset management since it helps to ensure the life of physical structures, and reduces overall maintenance costs. On roadsides, plants reduce the falling of debris from degrading slopes, which is one of the greatest contributors to road maintenance costs through blocked drains and damaged pavements. In this context, vegetation is very important in the control of erosion and shallow forms of instability (1 to 3 meters in depth at most). Some typical applications of bio-engineering are described in Table 43. However, it must also be appreciated that the beneficial effects may be insignificant under extreme conditions, particularly in tropical and monsoonal climates, and that it plays no significant role in the stabilization of deeper failures of soils or rock.

Table 43: Description of the main systems of Bio-engineering

System Type	Design and Function
Grass Planting	Grass seed is spread on the slope, armouring the surface. Alternatively, grass is hand-planted in lines across the slope. The lines armour the slope and catch debris. Angled lines planted by hand may also help to drain the surface, but catch little debris
Shrub and Tree Planting	Shrubs or trees are planted at regular intervals on the slope. As they grow, they create a dense network of roots in the soil. The main engineering functions are to reinforce and, later, to anchor. In the long term, large trees can also be used for slope support.
Brush Layering, Palisades and Fascines, etc	Woody cuttings are laid in lines across the slope, usually following the contour, in particular configurations. These form a strong barrier, preventing the development of rill, and trap material moving down the slope. In the long term, a small terrace will develop. The main engineering functions are to catch debris, and to armour and reinforce the slope. If they are angled, these structures can provide a drainage function.
Composite Systems	A range of composite systems are commonly used examples are: Live check dams, which armour and reinforce gully beds and catch debris; vegetated stone pitching, which provides strong armouring for ephemeral water courses; planted geotextiles, where the geotextile provides armouring, later supplemented by the vegetation, which also reinforces the soil.

Vegetation as a key component in off-road engineering is also environmentally sound and effectively forms a practical application of several environmental mitigation measures. In the hills, roads are an inseparable part of the slopes that they cross and they must be fully integrated into this landscape if they are to be sustainable. Bio-engineering techniques offer the best way of blending roads into the landscape and limiting damage to surrounding agricultural, horticultural and forest land. They allow the restoration of something of the original vegetation and ecosystems, and particularly of tipping sites and spoil disposal areas. Through both implementation and later productivity, they offer social and economic benefits for poor rural farmers. These benefits assume even greater significance due to the very small land holding size in the hills.

The practical options for bio-engineering in environments such as those found in Himachal Pradesh can be summarized.

- Grass planting: large clump grasses can be planted in various configurations, such as contour, diagonal or even down slope lines, depending on the characteristics of the materials, and perhaps combined with a jute or synthetic geo-textile. This provides erosion control and shallow reinforcement.
- Vegetative structures using hardwood cuttings: brush layers, fascines and palisades, with the angle of the lines determined by the type of material and slope on which they are applied. These also control erosion, catch

debris and provide strong, fibrous root reinforcement.

- Tree planting, as part of a plant community with under storey of shrubs and grasses: a wide range of possibilities are available, to suit all environmental conditions. Tree roots offer greater reinforcement and anchorage. Many of the bio-engineering techniques most appropriate to the roadside slopes of Himachal Pradesh require the intensive use of grass planting, using slips produced through vegetative propagation. This is technically straightforward and suitable species are available locally, but current nursery capacity of the HPPWD will need to be expanded to provide an adequate volume of soil beds to allow the bulking-up of grass clumps. Current capacity is adequate for the provision of other bio-engineering materials (containerized seedlings and rooted hardwood cuttings), though a range of different species will need to be introduced. These will all be either local or derived from ecologically similar sources in nearby states.

MS project 2003: Highlights of the technology used for the project can be summarized as:

Road construction development Plan had been made by NIIT Ltd. using MS project 2003 for Himachal Pradesh Public Works Department.

To start with, a simple project for training purpose on construction of road from Anandpur to Geha was considered.

Project is as per the Detailed Project Report of road under PMGSY (Pradhan Mantri Gram Sadak Yojana)

Tools used: Microsoft Office (project professional 2003) enterprise-wide project planning and management using Microsoft's Enterprise Project Management Solution, based on Microsoft office Project 2003 and its supporting technologies, Windows 2003 server, including Windows Share Point, SQL Server 2000,and office system 2003.

Project baseline involves following steps :

Taking a snapshot of the project

Does not stop the addition of tasks, changing of resources etc.

Allows for a comparison between actual data and planned (baseline) recommend best practice.

Modernisation of Maintenance Management

(i) **Introduction of Pavement Management System (PMS):** The PMS based on the rationale method of assessment of distress and decision support system for taking up the maintenance activities is to be introduced for productive use of meagre resources. NHAI has developed Road Information System (RIS), which will include the inventory of the National Highways with NHAI and also be used for the PMS purpose. Similarly, the Ministry has started developing a programme for inventorisation and Pavement Management System with the assistance of Central Road Research Institute.

(ii) Introduction of mechanisation in maintenance: Several machines for repair of distresses in pavement have been introduced. Their use would need to be encouraged to improve the maintenance culture. Similarly, Mobile Bridge inspection units are also to be procured for proper inspection / distresses in bridges.

(iii) Maintenance by contract: Traditionally, road maintenance works are executed departmentally by the Public Works Department. In order to raise efficiency these maintenance works may be outsourced to private sector. NHAI has introduced operation, maintenance and tolling contract for the National Highways entrusted with NHAI. Similar concepts are also to be started for the National Highways with the State PWDs.

(iv) Corridor Management: It is being increasingly appreciated that the

maintenance of only roads and bridges section of National Highways are not sufficient for safe movement of vehicles. Corridor Management; which comprises comprehensive management of the road section including engineering and non-engineering aspects are to be introduced for proper management and maintenance of National Highway sections. This Corridor Management should include. Maintenance of roads and bridges to the desired standard, tackling safety hazards and traffic bottlenecks; traffic management; collection of user fee; incidence management & land management.

For this purpose Highway Police Patrol, crane and tow truck service, medical aid posts, communication system, advance information system, setting up of control stations, etc. are to be considered. NHAI has initiated this corridor management aspect. All these sections of National Highways are to be covered in phases.

(v) Legislative Matter: The Control of National Highways (Land & Traffic) Act, 2002 has come into force from January, 2005. These acts give power for control of encroachment within right-of-way, control of access to National Highways, control of traffic plying on National Highways, control of construction activities by the side of the National Highways. The Highway Administration for enforcing the various provisions of this Act has already been established. Necessary steps are to be taken for enforcement of the various provisions of this Act for safe and speedy movement of traffic on National Highways.

Computerization: Department of Transport is one of the department in Himachal Pradesh where not only the computerization has been introduced to a larger extent but has been accepted by the department officials as well as people in the State. The computerization has been taken up with following objectives:

- Improvement in the quality of services by re-engineering the administrative processes in order to extend convenience to users, minimization of expenditure/ manual work and sharing of information.
- To ensure greater transparency, efficiency, objectivity, accountability and speed that can help overcome unbridled discretion and corruption by providing improved services in a time bound manner.
- To bring Government departments closer to the masses by offering efficacious and speedy services under a single window.
- Reduction in response time in the delivery of services i.e. better citizen services.
- Direct participation of the masses in governance.
- Ensuring revenue so as to be self-sustainable.
- Greater control over the processes & quick implementation of government policies from time to time.
- Instant access to information if needed by any other government department.

The department has taken up computerization in following areas of its activities as given in Table 44.

Table 44: Area of computerization

Sr. No.	Area of Computerization	Software
	Areas Already Computerised	
1.	Registration of Vehicles, Permit Issuance and other related activities	**Vahan**
2.	Issuance of Various Types of Driving/Learner/Conductor Licenses and related activities	**Sarthi**
3.	Computerization of all transport barriers for the collection of various fees and taxes	**eNaka**
4.	Composite Fees drafts management	**CFMIS**
	Projects Under Pipeline	
5.	Route Permit, Time Table and SRT Collection MIS	**Pathkar**
6.	Reports and Returns Management Information System	**eRRMIS**

Fulfillment of Objectives: The fulfillment of these objectives has been observed to be in the following ways:

- The Post-computerization process has removed several hurdles for the citizens in obtaining Licenses, Registration of vehicles and paying of taxes.
- The public is getting the desired document same day in the evening or latest by the next day.
- The passing/inspection fee, registration fee, token tax, HPA entry/cancellation fee etc. is being calculated by the system itself and there will be no scope for any error or discretion. It will also help in the better monitoring of Govt. revenue.
- Up keep and maintenance of voluminous record is not a problem.
- The MIS reports required from time to time by the Govt. for monitoring and policy making purposes can be obtained without much efforts and loss of time. Similarly, query can be raised with any field.
- The license is generated in Form-7 in the form of a laminated card which has a good get up and is easy to carry and contains more information.
- The driving license database is very helpful for the persons who are in need of blood of particular group. Citizens can check the blood group owner with particular group especially rare blood groups from the touch screen kiosk and can contact the person and request him/her blood.
- There is an overwhelming response from the common people who were extremely willing to pay the service charges in lieu of quick and high quality delivery of services.
- The biggest advantage of this initiative would be that once the all the subdivisions are inter-linked; the owner of a motor vehicle will have a lot of flexibility in depositing the tax anywhere in the State.

Alternative Technologies: With ever depleting supplies of crude oil and rising prices, it is being increasingly felt that alternate modes of transport and alternative sources of fuel for transport related usage needs to be found out. In addition, energy efficient modes of transport like electric trolley; buses and battery-operated vehicles would present a radically different direction in the years to come. A shift from personalized transport to the public transport would also ease the problems of energy consumption, emissions, congestion, and road safety.

It has been advocated that the development of new communication technologies, such as telecommuting, tele-shopping and videoconferencing may allow limiting vehicle use. Concerns include the fact that the available time made possible by such technologies can be used for other (non-business) trips and that activities such as videoconferencing may generate additional travel as a complementary activity. The experience of the telephone as a substitute to the mail system constitutes a precedent.

Introduction of mixed traffic modes is yet another factor that could play a major role in reducing emission and improving public safety. The transport planning should invariably include walking and cycling. This integration can be achieved by providing extensive cycle tracks, bicycle parking at important places like market areas, railway stations and educational institutions

4.4 Stakeholder involvement in environment preservation and restoration

Stakeholders in road network & Pathway transport sector are:

- Direct transport users traveling public, distributive industry
- Indirect transport users households, consumers, agricultural producers, health-care providers, education providers.
- Transport facilitator's regulators, roads administrators, enforcement agencies.
- Transport provider's freight and public transport operators, road construction companies.
- Transport servicer's equipment suppliers, maintenance industry.
- Urban community consumers, users of rural facilities.
- National community defence and geo-political interests.
- External community importers of rural produce, multi-national manufacturers and trading companies, tourists.

Nature of each stakeholder's involvement in the transport sector

- Transport related activities (qualified and quantified)
- Administrative activities (planning, funding, regulating)
- Users demands
- Resources used (quantified and qualified)
- Funding (scale and sources)
- Performance measures (quantity and quality)

Stake holder & their involvement in the sector are given in Table 45.

Table 45: Stakeholder & their involvement

Stakeholders Name	Involvement	
	Direct	Indirect
Public		U
Line deptt.(PWD)	U	
Municipality	U	
Gram Panchayat	U	
Zila Panchayat	U	
Border Road Organisation (BRO)	U	

4.5 Critical environment issues / hotspots associated with the sector

Environmental issues associated with road and highway sector involves issues related to bio-physical and social environment are described below. These include generic as well as specific issues related to the sector.

Inadequate access due to poor road connectivity: Lack of access to roads and difficulty in transportation of agricultural products due to difficult terrain and sparse population in interior areas, high cost of surface transport produce to the consuming markets; and poor communication network due to hostile terrain lead to spoilage and wastage of products.

Poor road conditions leads to delayed access to warehousing as well as markets: Hundreds of apple farmers are facing trouble in Himachal Pradesh, as their produce is not able to reach markets on time due to bad road conditions e.g. in Kotkhai subdivision of Shimla, the cultivators inform that due to poor road conditions and landslips the apple-loaded trucks get stuck in long traffic jams. They further said that sometimes the trucks, instead of reaching in a day, take almost three days to reach the markets in Delhi and other cities, which damage the fruit.

Development of new roads infrastructure leads to associated environmental problems: New road infrastructure development in hilly terrain leads to a number of environmental impacts. Some of these impacts are on account of project activities like hill cutting, filling, blasting and disposal of muck. Road development may lead to fragmentation of habitat, loss of flora and fauna, loss of habitat, triggering landslides and soil erosion. Further, hydropower development requires movement of heavy equipment and material in interior areas for which existing road infrastructure needs

upgradation resulting in increased intensity of impacts.

Development of road infrastructure leads to unplanned / unauthorized urbanization both in rural and urban areas : Improved access to road infrastructure leads to unplanned development and urbanization both in rural and urban areas. e.g. urbanization beyond the boundaries of master plan in urban areas as well as mushrooming of dhabas along major roads/ highways in the rural areas lead to congestion, traffic jams, air and water pollution.

Inadequate parking infrastructure in urban areas leads to congestion and air pollution: Due to increase in urban traffic especially during tourist season, the existing infrastructure runs out of capacity. This leads to traffic jams, air pollution and loss of fuel. Shimla, Kullu and Manali etc.

Traffic congestion at tourist spot in rural areas leads to problems of air pollution and waste generation: Due to increase in traffic at tourist locations e.g. Rohtang pass, especially during tourist season, traffic jams occur very frequently, which result in air and water pollution as well as solid waste disposal problems in ecologically fragile areas.

Inadequate traffic management in urban areas leads to air and noise pollution: Due to lack of integration of traffic and transportation plan with master plan, existing infrastructure runs out of capacity leading to air and noise pollution.

Inadequate public transportation in urban areas leads to traffic congestion: Poor public transportation and its non integration with other modes of transport leads to traffic congestion in urban areas resulting in air and noise pollution.

Inadequate safety and public health risks due to road infrastructure: Increased number of accidents due to congested infrastructure and occurrence of disease like HIV/ AIDS due to migrant labor and truckers leads to public health risk.

Inadequate funds for road / highway upgradation and infrastructure development: Lack of funds for highway upgradation and infrastructure development leads to increased gap in demand and availability of infrastructure. Further, lack of private sector participation and absence of PPP model leads to greater requirement of resources.

Pressure on account of increasing gaps and slow implementation of policy, programs, plans and projects is leading to emergence of sector specific issues and risks/impacts. An analysis of the issues, causes and impacts has been carried out and summarized in Table 46.

Table 46: Issues, Causes and Impacts

Issues	Causes	Impacts/Risks
Inadequate access due to poor road connectivity	Inadequate availability of infrastructure facilities & collection facilities Expensive transportation	Loss/ Wastage of produce and increased pollution Deterioration in quality of produce Input resource loss e.g. fertlizers, soil nutrients, water etc.
Poor road conditions leads to delayed access to warehousing as well as markets	Inadequate maintenance of road infrastructure Poor traffic management Input resource loss	Loss/ Wastage of produce and increased pollution Deterioration in quality of produce Input resource loss e.g. fertlizers, soil nutrients, water

Issues	Causes	Impacts/Risks
Development of new roads infrastructure leads to associated environmental problems	Change in land use	Habitat degradation Air pollution Water pollution Soil pollution Land use change
Development of road infrastructure leads to unplanned / unauthorized urbanization both in rural and urban areas	Fragmentation of habitat Loss of flora and fauna Unauthorized shops and encroachment adjacent to right of way both in rural and urban areas	Soil erosion Restricted movement leads to safety hazardous Waste generation (MSW & sewage) Congestion on the road
Inadequate parking infrastructure in both urban and rural areas leads to congestion and air pollution	Lack of space at markets / commercial establishment, tourist places, religious places Vehicle numbers exceeding planned development	Traffic congestion Air pollution Safety / public health hazardous
Traffic congestion at tourist spot in rural areas leads to problems in air pollution and waste generation	Adhoc development in the absence of planned development	Air pollution Waste generation Safety / public health risks
Inadequate traffic management in urban areas leads to air and noise pollution	Lack of traffic management during peak season tourist	Air pollution Noise pollution
Inadequate public transportation in urban areas leads to traffic congestion	Lack of alternate transportation system and inefficient operation of existing system e.g. ropeways, combination of existing public transportation with other modes	Air pollution Noise pollution Safety / public health risks
Inadequate safety and public health risks due to road infrastructure	Migration of labour for new construction and upgradation of road infrastructure Difficult operation of health infrastructure Difficult access to health infrastructure	Safety / public health risks Stress on environmental carrying capacity
Inadequate funds for road / highway upgradation and infrastructure development and upgradation	Lack of private participation in road infrastructure development Lack of funds result in decreased environmental management	Non implementation / mainstreaming of environmental and safety safeguards Degraded quality of life

4.6 Environment initiatives taken by the sector to address critical environment issues

As per 11th Five Year Plan (Report of World Group on Roads) improvement of National Highways under various phases of NHDP has

already been decided and implementations programme have been furnished. As per the present programme, a length of 21,090 Km of National Highways will still remain with State PWDs and BRO.

During 10th Five Year Plan, priority was given to Improvement of Riding Quality (IRQP) of existing network as against widening of NHs to two lanes. Now, all the National Highways should be having a minimum of 2-lane standards and it is felt that under the 11th Five Year Plan the priority may be given for the construction of missing links to two lane roads and constructions of missing Bridges, widening of NHs to two lane standards wherever there are single or intermediate lane widths. Similarly rehabilitation/repair/reconstruction of existing weak bridges, culverts and construction of new bridges /culverts at these location, need to be taken up on priority. Because of limitation of funds, other types of improvement may be taken up on selective basis.

Forwarding Path as per the Working group 11th Five Year Plan (2007-2012): Several actions have been suggested for effectively tackling of environmental and social impacts resulting from up gradation of roads. Following actions can go a long way in effectively tackling of the environment and social impacts resulting from up-gradation of road projects.

1. Creation of special cells in the MORT&H/NHAI/PWDs of States / UTs to coordinate all activities related to environmental impacts of highway projects.
2. Social dimensions of resettlement and rehabilitation of affected people must be incorporated in all highway projects involving displacement of people at the project preparation stage itself and proper R&R plan implemented before execution of works.
3. Removal of encroachments on NH/SH & MDR land and to prevent future encroachments.
4. A Corridor Management Plan should be drawn up for major state highways so that the problems of ribbon development, encroachments, uncontrolled access and poor safety can be tackled.
5. Control on roadside advertisements to preserve the visual aesthetics.
6. Consideration may be given to recycling of existing pavements to reduce the need for more road building aggregates.
7. Promotion of use of waste materials such as fly-ash and copper slag, etc.
8. Use of bio-engineering techniques for protection of slopes in hill areas and reducing risk of landslides.
9. Implementation of the Control of National Highway (Land and Traffic Act), 2002 for improved traffic management and control of access on National Highways.
10. Up gradation of vehicle technology to meet the future emission standards laid down by the Government.
11. An effective Inspection and Maintenance programme of in-use vehicle.

Quality Assurance system: The HPPWD is moving towards accreditation for quality assurance systems under ISO 90013. It has also been agreed to aim for accreditation for ISO 14001, which covers environmental issues of corporate activities, including an environment policy and overall environment strategy and management systems. Both are important for the introduction of a well organized system of slope stabilization and protection works. The Department would develop specific environmental measures, such as how to cope with spoil during maintenance (as distinct from during construction and widening). Hence, part of the environmental strategy must be the assigning of designated dumping sites in safe areas and the acceptance that additional haulage costs will be balanced against reduced maintenance costs. Other related topics that will be covered under this strategy include general construction management, labour and equipment camps, waste disposal, worker safety, traffic management, preservation and

plantation of trees, and water use in construction. All of these have some level of bearing on the good practice use of bio-engineering techniques. The Department has some in-house capacity, but will eventually need to reform, so that it becomes more streamlined and efficient.

The implementation of the State Roads Project through Himachal Pradesh Road and Other Infrastructure Development Corporation Limited or (HPRIDC) is a welcome step in this direction. It is important that the introduction of bio-engineering works follows a strategy that promotes this modernization of governance, rather than adding to the organization that needs to be reformed. Operations through the HPRIDC are subject to separate accounting and a more open financial management system, and this will be advantageous in the use of new techniques. Yet there will still be close collaboration with government, and hence considerable capacity development spin-offs. In essence the project is to be implemented by the HP government through the HPRIDC, using the PWD for execution. Upgrading works will be executed by contractors to be supervised by an independent engineer (Supervision Consultant) under this project. A Technical Examiner (also independent consultant) will assess the Periodic Maintenance Works. On a pilot basis, bio-engineering works using local plant species will be given trials to rehabilitate some vulnerable locations and identified dumping sites along road stretches subject to periodic maintenance.

Improvement & Resettlement Plan: The Government of India has requested the assistance of the World Bank for the improvement and rehabilitation of State Highways, Major District Roads and Other District Roads in the State of Himachal Pradesh. The improvement works will consist mainly in raising the formation level, upgrading/improvement of road geometrics, widening to two-lane/intermediate-lane from the existing, intermediate-lane or single-lane width, and pavement strengthening, improving the cross drainage. Road stretches crossing urban areas may also require upgrading to a two-lane cross section, and/or provision for drains, sidewalks and parking where required. In some cases, new alignments (by-passes) and/or realignments may also be required. The Government of Himachal Pradesh (GOHP) through the Himachal Pradesh Road Infrastructure Development Corporation (HPRIDC) is the executing agency for the project and establishment and infrastructure of Himachal Pradesh Public Works Department (HPPWD) shall be utilized by the HPRIDC for implementation. The Government of Himachal Pradesh has pre-selected approximately 413 km of roads for Phase-I. The project preparation is being undertaken in two Phases:

Phase 1 (Project Preparation) is to provide the information and assessments necessary for World Bank appraisal of the proposed Project, including feasibility study and screening of the 1675 km of prioritized roads to finalize about 800km for inclusion in the project, preliminary design and environmental and social assessment and then final design of about 50 percent of identified project roads (413 km for upgrading/improvement), economic analysis and development of proposals for selected institutional measures to be undertaken under the Project.

Phase II (Project Implementation) will cover final design of the remaining roads to be included in the Project, and assistance with project implementation, co-ordination, and strengthening of engineering skills.

Minimization of Impacts: Due importance has been given to environmental and social issues while designing the road. The coordination between social and design team helped in reducing the number of PAPs. In the design, various mitigation measures incorporated include: delineation of CoI; concentric widening; provisions of covered drainage; provision of toe wall/retaining wall;

specific protection to save structures on uphill; provision of bypasses; reduction of speed; alternatives considered; community consultation & highway health risk.

4.7 Environment related studies carried out in the sector

Strategic Option Studies (SOS): As a first step in May 2005, the State PWD has successfully completed a Strategic Option Study (SOS) and identified about 1675 km of State Highways (SH) and Major District Roads (MDR) the prioritized up-gradation and improvement. In June 2006, 171.965 km length of roads has been found to be without proper ground alignment. Although no physical verification was possible, all to the extent possible environmental screening analysis has been carried out for these roads.

Feasibility Study: The feasibility study has been carried out for the road network of 1675 km (43 road links) identified by the SOS study. The feasibility study has come out with a list of high priority roads based on the engineering and economic aspects prepared using the HDM model. The Economic Internal Rate Return (EIRR) has been calculated using the model for each of the project roads. The roads, which have a rate of return of 12% and above have been qualified for the up-gradation. The EIRR does not include a comprehensive environmental and social screening and scoping analysis. Therefore, environmental and social screening and scoping studies have carried out prioritization based on these issues.

Environmental Screening and Scoping Studies: The environmental and social screening report (ESR) has been prepared to establish the environmental sensitivity of the project roads under consideration. The study has established the boundaries of the further studies required (scoping) based on the proximity to legally defined ecological resources. Other project roads have to obtain state level clearance from the State Pollution Control Board (SPCB) and State Level Environmental Impact Assessment Authority (SEIAA) set up by the Government of India at State level. Because of the World Bank's categorization as Category A projects, an EIA is also required for all roads considered for up-gradation.

The feasibility study (that includes environmental screening also) has identified approximately 800 km of high priority roads, which will be subjected to detailed design and associated studies in two or more phases. The first set of 413 kms of road constituting phase 1 (both batch 1 and 2) has been identified by the State Government to include in the project. This 413 km of roads is part of the final 800 km of roads that have been identified as a part of the feasibility study.

State Road Improvement project for the 250 km road: To reduce traveling time and to ensure faster movement of perishable farm produce (fruits and vegetables), better roads are the only feasible alternative, as the mountainous topography of the state makes railways and civil aviation unviable. Upgradation of the road network in the state will increase the connectivity of places, safe mobility of goods and people, resulting in greater utilisation of resources and socio-economic development of the people. The State Government has undertaken widening and improving / upgrading the road network in the state to meet the demands of growing economy. It has completed Strategic Option Study and identified 1675 km road length covering some of the state highways and district roads. Out of this, planning and designing work in respect of following five high priority roads is being taken up in Phase I package II of the project, of which detail designs and alignments have been completed for the following five road stretches:

- Nahan-Sarahan-Kumarhatti
- Draman-Sihunta

- Bharwana-Lambagaon-Jaisinghpur
- Ranital-Lenj-Kotla
- Sarkaghat-Jahu-Ghumarvein

Source: Govt, HP (Himachal Pradesh State Road Project, HPSRP)

EIA summary for Theog-Rohru Project road: The Government of Himachal Pradesh has initiated an ambitious plan for improving/upgrading the road network of the state to meet the requirements of a growing state economic and match up with infrastructure development taking place elsewhere in the country. The Government of Himachal Pradesh through the HPRIDC would be the executing agency for the project. The establishment and infrastructure of the HPPWD would be utilized by the HPRIDC for project implementation. An environmental screening and scoping exercise was carried out and a report has been prepared to establish the environmental sensitivity of the project roads under consideration, using which appropriate decisions can be made. The study also establishes the context and need for further studies required (scoping) with regard to ecologically sensitive and environmentally important areas. The feasibility study (that includes environmental screening also) will finally help in identifying approximately 800 kms of high priority roads, for which detailed design and associated studies will be taken up in two or more phases.

Proposed Improvements of the Project Road: Less than 10% of the state roads are double-laned, only 50% of the road length has drainage and valley side safety measures. Depending on the present condition of the selected roads, different levels of improvement/up-gradation measures will be required for different road stretches. The improvement works will mainly consist of: cutting of hill ward side for widening; raising the formation level where ever required; upgrading/improving road geometrics; widening to two-lane/intermediate lane from existing intermediate-lane/single-lane widths; pavement strengthening, and improving cross drainage; stabilization of the hill slope as far as possible by breast walls, retaining walls and or bio engineering techniques; road Stretches crossing urban areas may also require alternative new alignments or realignments, or provision for drains, sidewalks and parking along existing road; construction of bridges and their approach roads; river training works; pedestrian guard rails and safety barriers; replacement of culverts and construction of new culverts; replacement/rehabilitating of culverts will accommodate two full lanes for the full formation width; realignments & construction of viaducts.

A total of 1.31 kms of realignments have been considered in the project to improve safety. Including this 1.31 kms of realignment there are 129 locations where in the project road widening has shifted slightly to either right hand side or Left hand side leaving oxbow land (left over land portions) in all these locations. Several environmental enhancement proposals have been recommended at these locations as given below.

Road safety measures, rain shelters (bus waiting shed) and parking area wherever there is a space available away from junctions and pedestrian crossings. Wherever possible, the provisions of bus lay-byes have been included in the design.

Implementation of a Resettlement Action Plan (RAP). The RAP has elaborate implementation arrangements including the services of NGOs.

Environmental Impacts: Environmental impacts are debris and waste disposal; impact to forest reserves (land requirement as well as the forest tree cutting; water construction; soil erosion; loss of agricultural areas/horticultural areas; social impacts including land acquisition and resettlement; impact to wildlife-traffic/wildlife conflict; impact to drinking

water sources such as, HP's and springs; provision for parking areas; impact to religious properties; longitudinal and cross drainage; stabilization of slopes; impact to religious properties; monkey menace-traffic/monkey conflict & longitudinal and cross drainage.

Major findings of study are:

1. The field surveys coupled with institutional and local community consultations revealed several biodiversity concerns along the project road. To resolve this concern, a Biodiversity impact assessment study needs to be conducted with the help of a wildlife/forestry expert. During various engineering, environmental and social surveys considerable faunal presence along the project roads was observed.
2. Wildlife presence is found in all forest regions/categories in the state and therefore becomes an important consideration. This presence is noted even beyond the designated protected areas such as Sanctuaries and National Parks.
3. Project influence areas of all roads are rich in floral and faunal diversity.

EIA for 3 roads starting from Una Town: This project relates to the Una link roads constituting Mehatpur-Una (12 Km), Una-Amb (33 km) and Una-Nerchowk (126.7 kms) project roads. From where the second road starts and ends at Amb at 50.50 kms as given in Table 47. The 3rd road starts from Una traversing through Bilaspur, Hamirpur and Mandi districts of Himachal Pradesh.

Table 47: Physical location of project

Road Name	Length (km)	Districts	Start Location	Chainage (km)	End Location	Chainage (km)
Mehatpur-Una	12.000	Una	Mehatpur	5.000	Una	18.000
Una-Amb	33.000	Una	Una	18.000	Amb	50.000
Una-Nerchowk	126.700	Una,Hamirpur and Bilaspur	Una	0.000	Nerchowk	126.700
		Total: 184 kms				

The roads, which have a rate of return of 12% and above have been, qualified for the up-gradation. The EIRR does not include a comprehensive environmental and social screening and scoping analysis. Therefore prioritization based on these issues has been carried out by the environmental and social screening and scoping studies as a part of the feasibility studies.

A total of 4.09 kms of realignments for Mehatpur-Una-Amb and 10.57 kms for the Una-Nerchowk has been considered to improve safety. Several environment enhancement proposals have been recommended at Road safety measures, Rain shelters (bus waiting shed) and parking area and implementation of a resettlement Action Plan (RAP). The Economic Internal Rate of Return (EIRR) as given in Table 48.

Table 48: Economic Return Details of the Project Road

Road Section	EIRR (%)	NPV (INR. Million)
Una-Jalera-Mehatpur-Una (4 Laning)	22%	802
Una-Amb	27%	1532
Una-NerChowk	47%	10079

Environment Management Plan for widening and strengthening of Theog Kotkhai –Hatkoti -Rohru road: The project road starts from Theog town with 0.000 chainage and ends at 80.684 km just at the beginning of Rohru town. This road traverses through Shimla district only. This State

Highway (SH-28) is the only link and access to apple orchard farms of the area, most of the economic activity and income of the local residents depends on this State Highway. The road passes through hilly terrain with steep grade and acute, blind and sharp turns at most of the places. Part of this road is a predominant snowfall area. During winters, this road becomes inaccessible. Most of the settlements/villages/towns are connected through link road to the project road. This is the only connectivity to the Dodra-Kwar, difficult and tribal areas of Himachal Pradesh. The road traverses through four important townships viz. Theog, Kotkhai, Jubbal and Rohru. The archaeologically significant structures at Hatkoti Mata temple and few other temples were also located in the nearby areas towards Rohru. This section passes through eco-sensitive areas such as reserved forests (RF). The land requirement for widening is minimal due to the implementation of a State funded project under Central Road Fund (CRF) scheme.

Level of Service of identification of sections warranting capacity augmentation: The Level of Service (LOS) at which a road operates can be judged by its Volume Capacity Ratio (V/C). In order to rank the roads as per their existing Level of Service (LOS), the study links have been arranged in the descending order of their V/C ratios and grouped together on the basis of their present LOS.

Out of 90 links measuring a total length of 1614.527 km, 64 links measuring a length of 1200.91 km are operating below LOS B, with V/C > 0.5; 55 links measuring a length of 1025.90 km are operating below LOS C with V/C > 0.7 and 34 links measuring a length of 665.15 km are operating below LOS D with V/C > 1.0. This section wise breakup of level of service is given in Table 49.

Table 49: Section wise breakup of Service LoS

LOS Below	V/C Greater than	No of Sections	Length (kms)
B	0.50	64	1200.91
C	0.70	55	1025.90
D	1.00	34	665.15

For State Highway or other important Roads in rural areas, the design service volume of traffic is normally taken as 50 percent of their maximum capacity. In other words, these roads should be designed for a volume-capacity ratio (V/C) of 0.50. This V/C corresponds to a Level of Service (LOS) B. The inadequacy of the capacity of state roads can, therefore, be gauged by the extent by which its V/C exceeds 0.50.

As indicated above, 64 sections measuring a length of 1200.91 km have V/C > 0.50. These links are, therefore, carrying traffic beyond their design service volume and area operating below LOS B. The situation is expected to only worsen with the rapid growth of traffic in future. All these sections, therefore, warrant capacity augmentation to bring them to the desired Level of Service B.

Principal Findings of the study Earlier the Ministry of Roads Transport & Highways (MORT & H) (erstwhile MOST). GOl has also issued guidelines to different State Governments for framing proposals of road improvement programmes for World Bank Loans. According to those guidelines, road improvement schemes were required to be divided into following categories.

i) Expressways on corridors where traffic volume is very high, say greater than 40,000 PCUs/day
ii) Four-laning of existing 2-lane roads where traffic volume is high, say, between 18,000 and 40,000 PCUs/day
iii) Improving poor two-lane roads to good two-lane roads

iv) By passes around congested towns
v) Widening to regular two-lane roads of sections, which are either single-lane or intermediate lane.

4.8 Environment monitoring (key parameters such as air and water pollution) carried out for activities related to the sector

Monitoring of Ambient Air Quality was started in Himachal Pradesh. Over these 25 years there have been significant change in pattern of industrialization and other activities that have an impact on air pollution. The road network in the State today is reaching far into the interior and the dams are being constructed in remote areas. The air quality is thus likely to deteriorate.

Air Pollution from Vehicles: The large number of tourist's inflow leads to very high vehicular influx as the State being hilly the rail and air connections are limited. Owing to its geo-physical features (mountainous area and location on the Himalayas), the ecosystems here are more sensitive to environmental damage. The State Pollution Control Board has set up monitoring stations at major industrial and tourist towns in the state. The ambient air quality in major tourist and industrial towns is deteriorating with SPM, NOx and PM10 reaching threshold levels.

A comparison of data of 1996 and 2004 as per Air Quality Criteria laid down by CPCB shows that air quality remains unchanged except for SPM levels in Shimla that show improvement in Air Quality Category. Location wise air quality status in Himachal Pradesh is given in Table 50.

Table 50: Air Quality Status in Himachal Pradesh

Location	Category	1996				2004			
		SO_2	NO_2	SPM	RPM	SO_2	NO_2	SPM	RPM
Shimla, Takka Bench on Ridge	Sensitive	L	M	H	NOT MONITORED	L	M	L	L
Shimla Bus Stand	Residential	L	L	M		L	L	L	L
Parwanoo Sector-IV	Residential	L	L	H		L	L	C	-
Parwanoo Sector-1	Industrial	L	L	L		L	L	L	M
Jassur Near PCB Office Damtal	Residential	L	L	M		L	L	M	-
Jassur Old Road Damtal	Residential	L	L	H		L	L	H	-
Paonta Sahib Industrial Area	Industrial	L	L	M		L	L	M	-
Paonta Sahib Industrial Area Gondhpur	Industrial	L	L	M		L	L	M	-

[Source: NAAQMS/10/1998-99 and Website HPSEP and PCB]

The HPSPCB and PCB checked a total number of 2001 vehicles in Vehicular Monitoring and Mass Awareness Camps in the State during the year 2002-2003. Out of these vehicles 1254 were Diesel driven and 747 Petrol driven. Vehicles checked for smoke density and CO-HC concentration respectively, only 51.75% of diesel driven and 72.29% of petrol driven vehicles were found meeting the prescribed standards. About 48.25% (649) of diesel driven vehicles and 27.71% (207) of petrol driven vehicles did not meet the laid down standards. [Source: Annual Report 2003-04, HPSPCB and PCB.

There is a dire need to increase the number of ambient air quality monitoring stations so that the network is more representative. It is also important to start monitoring of RPM and CO.

Air quality monitoring data covering SO_2, NO_2 & RSPM during April 2008 – March 2009 is given in Table 51, 52 & 53.

Table 51: Air Quality of SO_2

Location	SO_2 in µg/m^3	Month											
		April, 2008	May, 2008	June, 2008	July, 2008	Aug., 2008	Sept.,2008	Oct., 2008	Nov., 2008	Dec., 2008	Jan., 2009	Feb., 2009	Mar., 2009
DIC Baddi	Monthly Average	2	3.2	2.4	2.7	2.1	2.2	2.8	2.7	2	2	2	2
	Peak	5.6	7.9	5.1	5.7	4.5	5.1	7.9	5.7	6.8	6.2	7.4	7.4
Housing Board, Baddi	Monthly Average	1	1	2.6	2.8	2.1	2	3	2.2	2	2	2	2
	Peak	1	1	6.2	5.7	4.5	2	10.2	4.5	5.1	4.5	5.1	5.1
A.H.C. Barotiwala	Monthly Average	1	1	2.8	2.2	2.1	2	2.5	2	2	2	2	2
	Peak	1	1	7.6	5.1	4.5	2	6.8	2	4.5	5.1	5.7	4.5
Regional Office, Damtal	Monthly Average	2	2	2	2	2	2	2.1	2	2	2	2	2
	Peak	2	2	2	2	2	2	6.7	2	2	2	2	2
Old Road, Damtal	Monthly Average	2	2	2	2	2	2	2	2	2	2	2	2
	Peak	2	2	2	2	2	2	2	2	2	2	2	2
Kala Amb	Monthly Average	2	2	2	2	2	2.9	2	2	2	2	2	3.9
	Peak	3.9	3.9	2.9	3.9	3.9	6.1	4	3.6	5.1	6.1	6.1	6.6
Kala Amb, Trilokpur	Monthly Average	2	2	2	2	2	1.6	2	2	2	2	2	2
	Peak	2.4	2.4	3.9	2	2	3.3	3.1	2.5	3.1	3.1	2.5	3.1
Paonta Sahib	Monthly Average	2	2	2	2	2	2.2	2	2	2	2	2	2
	Peak	2.9	2.4	2.4	2	2.4	7.1	4.1	2.5	3.1	3.1	3.1	3.6
Paonta Sahib, Gondpur	Monthly Average	2	2	2	2	1.8	3.4	2	2	2	2	2	2.9
	Peak	3.4	3.9	2.9	2.9	2.4	9.7	4.1	4.1	4.6	6.1	5.1	5.1
Parwanoo, Sec-4	Monthly Average	2	2.4	2	2	2.1	2.1	3	2.3	2	2	2	2
	Peak	2	6	4.5	4.5	4.5	4.5	10.2	5.1	4.5	6.4	4.5	5.1
Parwanoo, Sec-1	Monthly Average	2	2.7	2.4	2.2	2.2	2.2	2.4	3.1	2	2	2	2
	Peak	2	6.8	5.1	4.5	4.5	4.5	4.5	5.7	5.1	5.7	6.8	6.8
Tekka Bench, Shimla	Monthly Average	2.7	3.1	3.1	2.6	2.8	2.9	2.4	2.2	2.5	2.5	2.9	2.8
	Peak	6.3	12.6	10.7	6.8	7.1	6.8	5.3	5.8	8.7	7.3	7.8	6.8
Bus Stand Shimla	Monthly Average	5	3	2.9	3.3	2.8	2.9	2.8	3.6	2.5	2.9	3.6	3.1
	Peak	12.9	10.4	7.3	11.3	7.1	6.8	9.2	11.7	8.7	7.8	9.2	10.2

Source: State Pollution Control Board, Himachal Pradesh

Table 52: Air Quality of NO_x

Location	NOX in µg/m^3	Month											
		April, 2008	May, 2008	June, 2008	July, 2008	Aug., 2008	Sept.,2008	Oct., 2008	Nov., 2008	Dec., 2008	Jan., 2009	Feb., 2009	Mar., 2009
DIC Baddi	Monthly Average	14.1	13.2	10.6	11.4	7.1	7.5	9.8	10.1	10.4	10.4	11.8	11.1
	Peak	18.8	24.4	16.6	17.6	15.6	13.7	15.6	15.6	17.1	15.6	15.6	16.1
Housing Board, Baddi	Monthly Average	1	1	11.8	12.1	7.1	6.4	9.3	8.8	9	7.7	8.4	8.2
	Peak	1	1	17.6	18.5	14.6	10.7	19.5	13.6	13.7	13.2	12.7	14.1
A.H.C. Barotiwala	Monthly Average	1	1	12.5	11.4	7.6	6.5	9.5	7.8	7.7	8.4	8.5	7.9
	Peak	1	1	16.6	15.6	12.7	10.7	15.6	10.7	11.7	13.7	13.7	12.7
Regional Office, Damtal	Monthly Average	18.7	18.3	14.7	15.1	14.7	16.2	15.5	15.6	12.4	12.8	14.5	16.7
	Peak	55	24.8	20.9	22.1	22	22	24.7	22.9	17.5	21.5	23	23.9
Old Road, Damtal	Monthly Average	19.9	21.1	17	17.8	18.8	18.6	21.6	19	18.3	16.4	20	21.1
	Peak	30.1	29.3	23.8	28	25.6	27.5	30.1	28.5	29.9	24.2	26.5	27.5
Kala Amb	Monthly Average	13.3	14.6	13.9	13.9	13	14.3	13.8	16.1	18.2	19.7	19.9	20.9
	Peak	17.9	17.5	16.7	16.3	15.9	18.6	15.4	19.1	23.6	27.6	23.6	24.5
Kala Amb, Trilokpur	Monthly Average	11.8	11.6	11.8	11.2	10.7	11.6	12.3	13.5	13.3	14.7	13.4	15.5
	Peak	14.6	14.2	18.7	13.4	13	13.9	15.4	16.3	17.3	17.7	17.2	19.5
Paonta Sahib	Monthly Average	11.7	12	11.5	11	11.2	10.1	12.6	13.7	14.2	14.8	13.8	15.5
	Peak	16.3	14.6	16.3	13.4	15	14.5	16.8	18.1	17.7	19	17.7	19
Paonta Sahib, Gondpur	Monthly Average	13.1	14.6	13.6	13.3	13.2	13	13.6	15.5	17.1	18.8	19.4	18.4
	Peak	17.5	17.5	17.1	15.4	17.5	18.1	16.8	19	21.3	22.7	23.2	22.7
Parwanoo, Sec-4	Monthly Average	10.5	10.2	8.5	7.5	7.1	6.9	10.5	8.9	8	7.4	7.6	7.8
	Peak	12.5	22.1	17.8	21.5	15.6	13.7	27.3	18	13.2	14.3	12.7	13
Parwanoo, Sec-1	Monthly Average	11	11.1	9.2	8.8	6.8	8.3	9.7	11.6	10.3	9.8	10.8	10.3
	Peak	14.4	18	16.6	12.7	12.7	14.1	14.1	20	14.6	14.6	15.2	19.5
Tekka Bench, Shimla	Monthly Average	4.7	5.1	6	6.4	8.7	9.6	7.3	6.8	6.4	5.2	6.5	6.2
	Peak	11	14	12.8	22.8	24	23.3	23.8	22.4	18.3	11.9	16.5	14.6
Bus Stand Shimla	Monthly Average	8.9	8.7	11.7	12.5	8.7	9.6	12.4	9	6.4	9.5	10.7	7.9
	Peak	20.1	21	21.9	30.2	24	23.3	26.5	21.9	18.3	43.4	21.5	18.3

Source: State Pollution Control Board, Himachal Pradesh

Table 53: Air Quality of RSPM

Location	RSPM in µg/ m^3	Month											
		April, 2008	May, 2008	June, 2008	July, 2008	Aug., 2008	Sept.,2008	Oct., 2008	Nov., 2008	Dec., 2008	Jan., 2009	Feb., 2009	Mar., 2009
DIC Baddi	Monthly Average	142	186	134	85.9	46.3	53.7	81	90.3	94.8	102.6	46.4	55.3
	Peak	247	613.5	261.5	172.8	145.7	142.4	171.4	176.6	449.3	559.2	102	125.5
Housing Board, Baddi	Monthly Average	1	1	101.1	64	28.2	51.7	61.3	86.8	98.8	127.8	49.4	49.3
	Peak	1	1	184.6	195.1	61.6	120.7	145.3	159.1	200.6	274.9	101.4	129.1
A.H.C. Barotiwala	Monthly Average	1	1	89.8	50.4	39.7	36.6	63.3	43.2	68.6	54.2	96.9	60.2
	Peak	1	1	134.7	131.1	101.8	68.6	106.5	71.8	154.8	87.5	174.6	184.3
Regional Office, Damtal	Monthly Average	56	70	53	51.3	48	55	66.6	55.7	56.9	53.1	62	67.3
	Peak	06	114	97	88	73	164	194	90	171	157	173	189.5
Old Road, Damtal	Monthly Average	65	88	68	62.4	66	75	83.6	73.2	88	75.4	71.3	84.7
	Peak	95	159	106	125	101	142	132	124	155	123	129	151
Kala Amb	Monthly Average	234	236	248	223	225	277	243.6	235.7	312.2	228.5	260.3	284.9
	Peak	486	595	472	422	440	465	361	288	766	356	364	472
Kala Amb, Trilokpur	Monthly Average	112	107	110	90	69	60	84	68.2	103.7	110.9	70.1	117
	Peak	165	158	177	145	219	151	223	143	185	166	141	258
Paonta Sahib	Monthly Average	99	96	105	33	82	68	83.1	90	114	104	86	102.6
	Peak	163	187	276	165	166	143	411	165	326	135	142	224
Paonta Sahib, Gondpur	Monthly Average	134	191	134	167	178	216	154.1	183	201.6	205.9	179.1	157.3
	Peak	306	385	214	387	351	435	483	273	335	348	271	300
Parwanoo, Sec-4	Monthly Average	56	75	64	39	31	50	64.5	84.7	86.1	87.3	73.5	71.3
	Peak	101	147	220	158	89	102	168.6	161.3	152	202.1	151.8	136.9
Parwanoo, Sec-1	Monthly Average	130	113	98	80	43	61	63	99	126.7	109.3	129.4	110.3
	Peak	217	297	185	207	98	114	117	190.4	282.7	293.3	258.7	185.3
Tekka Bench, Shimla	Monthly Average	62	73	45	40	57	51.5	47	36.7	41.8	51.4	56	83
	Peak	142	161	85	130	137	116	161	102	125	108	107	142
Bus Stand Shimla	Monthly Average	62	73	65	60	57	51.5	62	46.6	51.3	53	60.3	87.3
	Peak	120	247	124	124	137	116	119	103	91	104	92	221

Source: State Pollution Control Board, Himachal Pradesh

4.9 Institutional mechanisms within the sector to address identified environment issues

The HPPWD is moving towards accreditation for quality assurance systems under ISO 90013. It has also been agreed to aim for accreditation for ISO 14001, which covers environmental issues of corporate activities, including an environment policy and overall environment strategy and management systems. Both are important for the introduction of a well organised system of slope stabilisation and protection works. The Department would develop specific environmental measures, such as how to cope with spoil during maintenance (as distinct from during construction and widening). The implementation of the State Roads Project through a Corporation (the

Himachal Pradesh Road and Other Infrastructure Development Corporation Limited or (HPRIDC). It is important that the introduction of bio-engineering works follows a strategy that promotes this modernisation of governance, rather than adding to the organisation that needs to be reformed. Upgrading works will be executed by contractors to be supervised by an independent engineer (Supervision Consultant) under this project. A Technical Examiner (also independent consultant) will assess the Periodic Maintenance Works. On a pilot basis, bio-engineering works using local plant species will be given trials to rehabilitate some vulnerable locations and identified dumping sites along road stretches subject to periodic maintenance.

The organizational-cum-function chart of the Public Works Department, Himachal Pradesh indicating its organizational set up and functions at different levels of hierarchy, is shown in Figure 1.

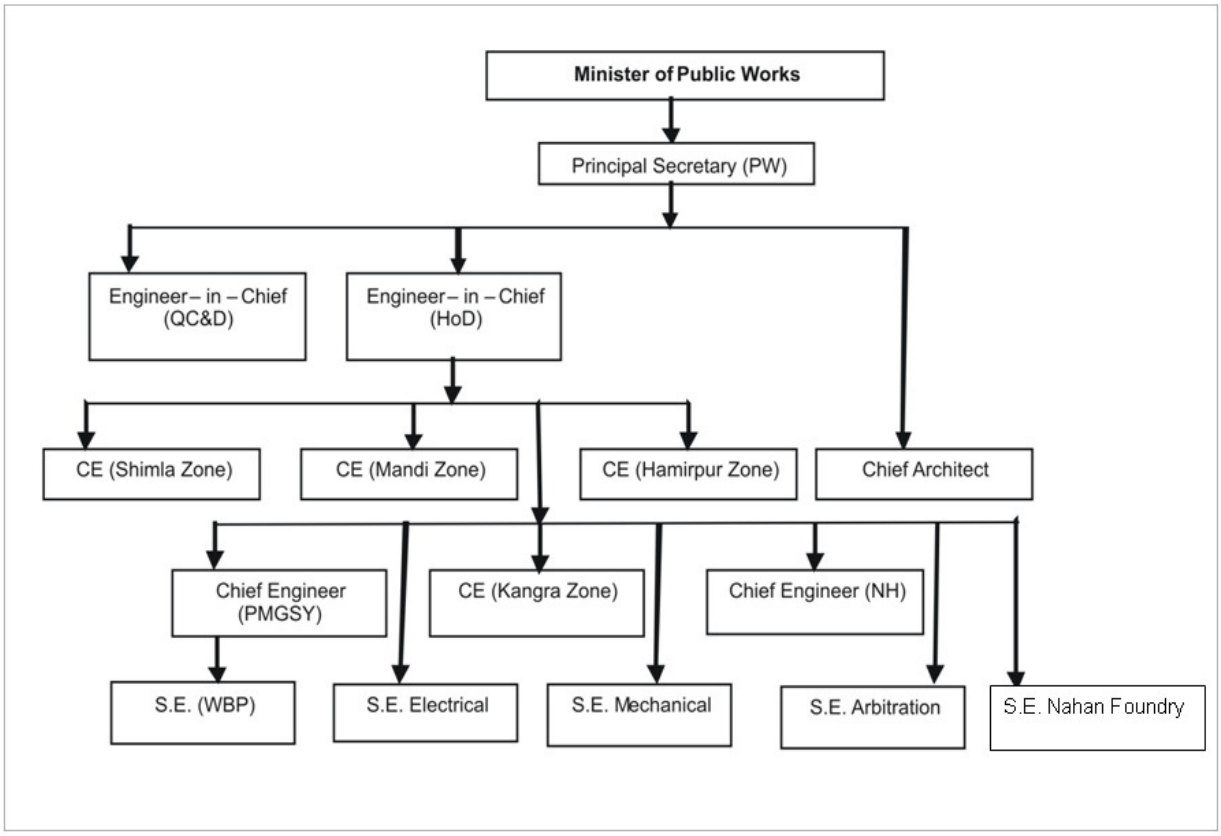


Figure 1: Organizational-cum-function chart of the Public Works Department, Himachal Pradesh

The Organizational Structure of the Transport Department is given in Figure 2. The sector is affected by outdated management and implementation practices.

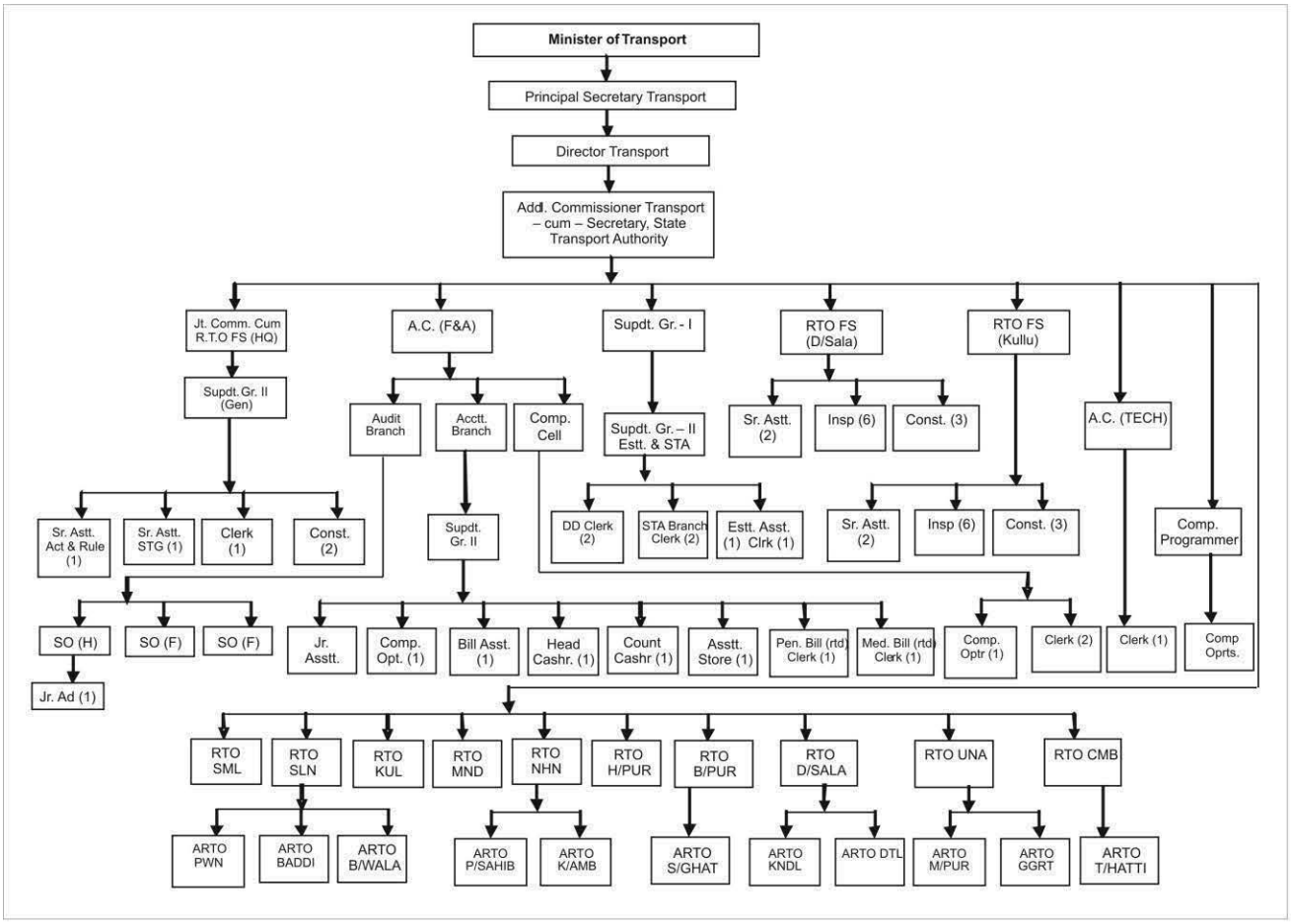


Figure 2: The Organizational Structure of the Transport Department

4.10 Data / documentation pertaining to addressing demographic issues in the context of the sectors, such as population changes; requirements of populations and changing lifestyles; migratory populations including tourists; transhumants; transit labour population; pressures felt by communities due to degraded environment conditions.

Himachal Pradesh is the leader in road development among the hill States, it has yet to implement its own targets and meet its requirements. Only half of the roads are all-weather roads, large stretches are unmetalled and of inferior quality with poor compacting and drainage. The road system is totally inadequate to meet the needs of the greatly expanded tourist industry which has to become a dynamic component of the economic development of Himachal Pradesh. There is a need for construction of roads all over the inhabited area. As of March 2009, status of connectivity of villages with motorable road is given in Table 54. In this context, it is necessary to emphasize the importance of taking adequate care to preserve the environment of this beautiful hill State when constructing roads.

Table 54: Village Connectivity with Motorable road as on31.3.2009

Sr. No.	Name of District	Total Nos of Villages	No. of Villages Connected with Road	No. of Villages Un-connected with Road	%age of Connected Villages
1	Bilaspur	962	651	311	67.67
2	Chamba	1113	488	625	43.85
3	Hamirpur	1634	1069	565	65.42
4	Kangra	3614	2194	1420	60.71
5	Kinnaur	233	58	175	24.89
6	Kullu	172	109	63	63.37
7	Lahaul & Spiti	284	118	166	41.55
8	Mandi	2823	11529	1294	54.16
9	Shimla	2515	926	1589	36.82
10	Sirmaur	966	616	350	63.77
11	Solan	2378	1049	1329	44.11
12	Una	755	437	318	57.88
	Total:-	**17449**	**9244**	**8205**	**52.98**

Tehsil wise Connectivity of Pucca Roads: As per Census 2001, the number and percentage of villages connected by pucca road. Districts/ tehsil wise connectivity of roads is given in Table 55.

Table 55: Village Connected by pucca road

District	Tehsil	CD block	villages connected by pucca road	
			(%)	Nos
Chamba			29.8	333
	Chamba		32.9	79
	Pangi		5.1	3
	Chaurah		11.9	23
	Salooni		25.8	32
Chamba	Bhalai		37.7	29
	Dalhousie		44.6	54
	Bhattiyat		43.8	53
	Sihunta		43.2	35
	Holi		23.4	11
	Bharmaur		25.9	14
Bilaspur			53.2	513
	Nainadevi		52	78
Bilaspur	Billaspur Sadar		55.4	154
	Ghumarwin		62.6	194
	Jhanduta		38.3	87
Hamirpur			44.8	733
		Hamirpur	42.3	145
		Bijhri	46.3	157
Hamirpur		Bhoranj	51.6	160
		Nadaun	48.8	218
		Sujanpur Tira	27	53
Kangra			49.9	1809
Kangra	Kangra		54.7	170

District	Tehsil	CD block	villages connected by pucca road	
			(%)	Nos
	Nurpur		51.2	198
	Indora		59.9	67
	Fatehpur		31.7	72
	Jawali		55.6	110
	Harchakiran		39.7	23
	Shahpur		61.3	100
	Dharamshala		72.5	111
	Baroh		26.9	43
	Dehra Gopipur		50.9	206
	Jaswan		51.2	44
	Rakkar		90.1	91
	Kundian		15.7	34
	Thural		32.5	27
	Dhira		38.9	44
	Jaisinghpur		52.3	114
	Palampur		55.3	218
	Baijnath		65.3	130
	Multhan		20	7
Kinnaur			33.3	78
	Hangrang		40	6
	Poo		30	8
Kinnaur	Morang		23.7	9
	Kalpa		58	22
	Nichar		29.5	26
	Sangla		25	7
Kullu			47.7	82
		Kullu	60	30
		Naggar	73	27
Kullu		Banjar	28.6	12
		Ani	35.3	6
		Nirmand	26.9	7
Lahaul & Spiti			30.3	87
Lahaul & Spiti		Lahaul	30.2	58
		Spiti	30.5	29
Mandi			25.9	748
	Mandi		34.6	128
	Padhar		18.5	35
	Jogindarnagar		40.5	83
Mandi	Bharol		9	13
	Sandhol		1.6	1
	Dharampur		37.1	33
	Kotli		73	46
	Sarkaghat		25.7	70

District	Tehsil	CD block	villages connected by pucca road	
			(%)	Nos
	Baldwara		37	50
	Sundarnaggar		46.6	75
	Aut		33.9	20
	Bali chokri		9.3	9
	Thunag		17.8	30
	Chachyot		28.2	42
	Nihri		13.7	28
	Karsog		18.4	85
Shimla			18.9	477
	Shimla (rural)		24.6	124
	Shimla urban)		-	-
	Rampur		25.5	39
	Nankhari		8.1	7
	Kumharsain		34.3	57
	Seoni		27.7	56
	Junga		23.7	14
	Theog		20.8	83
Shimla	Chaupal		10.7	13
	Cheta		2.4	1
	Nerua		7.9	15
	Jubbal		13	17
	Kotkhai		14.5	25
	Tikar		14.6	6
	Rohru		12	15
	Chirgaon		4.3	5
	Dodra Kawar		-	-
Sirmaur			32.8	317
	Rajgarh		35	49
	Nohra		21.3	10
	Pachhad		24	63
	Renuka		21.6	16
Sirmaur	Dadahu		9.6	7
	Nahan		47.8	65
	Paonta Sahib		61.9	86
	Kamrau		33.3	15
	Shillai		14.3	4
	Ronhat		9.1	2
Solan			32.8	783
		Solan	40.2	192
	Arki	Kunihar	28.9	138
Solan		Kandaghat	27.5	74
		Dharampur	30.3	165
		Nalagarh	34.6	214
Una			59.3	450

District	Tehsil	CD block	villages connected by pucca road	
			(%)	Nos
Una	Una		89.2	124
	Amb		50.2	122
	Bangana		49.7	152
	Bharwain		60	27
	Haroli		100	25

District wise status of roads with respect to no. of households, transport, parking facilities villages connected with amenities in Himachal Pradesh is described below.

Bilaspur: Road passing through Bilaspur Planning Area are; i) Chandigarh-Manali National Highway 21 connecting Bilaspur with Chandigarh on one side and Mandi-Kullu-Manali on other side; ii) Shimla-Dharamshala National Highway 88 connecting Bilaspur with Shimla on one side and Hamirpur-Kangra-Dharamshala on other side.

The roads emanating from Bilaspur Town are; i) State Arterial road A-IV Bilaspur to Kandrour via Chandpur connecting National Highway 88 at Kandrour; ii) Link road from Bilaspur to Shira- Bandla- Brahmpukhar; iii) Link road from Badhyat to Sungal via Nog. Beside above, numbers of internal roads are existing in the town. The lengths of these roads are 23.40 Km. Status of road in Bilaspur with respect to households is given in Table 56.

Table 56: Status of Road in Bilaspur District

Sr. No	Approach road	House hold	Percentage
1.	Motorable	2031	50.10 %
2.	Jeepable road	699	17.24 %
3.	Foot path	1044	25.75 %
4.	No path	280	6.91 %
Total		**4054**	**100.00 %**

Source: - Survey by H.P. Town and Country Planning Department 2002

Existing Road Network in Chamba District: The major roads including State Highway emanating form the town, local roads as well as by lanes interlinking various mohallas in main town and localities in newly developing area, bus stand, work shop, parking lot have an area of 23.29 hectare which is 16.45% of the total urban area and 2.47% of planning area.

Mandi: There a good network of inter and intra district roads which provide accessibility to town from its hinter land. Four roads are passes through Mandi Planning Area. These roads are; i) Chandigarh-Manali National Highway-21 connecting Chandigarh on one side and Manali on other side; ii) Pathankot-Mandi National Highway-20; iii) Hoshiarpur-Dharampur-Mandi Highway-70; and iv) Hoshiarpur- Mandi State Highway-32.

Five roads has been emanating from Mandi Planning Area. These roads are i) A single lane By-Pass connecting Talyar with National Highway-21 at Mangwain; ii) Mandi-Majhwar road via Mohal Nela; iii) Mandi-Skore road via Mohal Purani Mandi; iv) Kataula road through Mohal Khaliar and Mohal Chippnu; and v) Link road through connecting Bir-Tungal. Besides above, a number of internal roads exist in town.

The length of these roads is 3.73 kilometer.

Solan: The National Highway No. 22 is a prominent road passing through Solan town. It is an important road from many points of view. Firstly it is a defence road connecting Delhi, Dehradun, Ambala and Chandigarh to the China Border. Next it is the life line of State as well as all raw products, building materials, passengers, goods etc. come through this route only. It is on account of its significance that there are two by-passes within Solan Planning Area. These are: i) Solan by- pass linking Saproon and Chambaghat; and ii) Barog by-pass linking Saproon and Kumarhatti via Anji & Raboun.

Besides N.H.-22, The Solan has many other important roads connecting Solan to its nearby areas, towns or settlements. These are: i) Solan - Rajgarh road; ii) Solan - Subathu - Arki Road; iii) Solan - Kandaghat road via Basal and Salumana; iv) Solan - Jaunaji – Road; v) Solan - Damrog - Jatoli road; and vi) Solan - Ashwani Khad road. It will ultimately connect Solan to Herth as well as Chail.

Kullu: The area under consideration depends almost entirely upon the road system for its transportation requirements, except a small air-strip. The NH-21 passes through all the major settlements i.e. Bajaura, Bhuntar, Kullu, Katrain, Patlikuhal Manali etc. of the valley and connects them with each other. From Aut to Manali this road runs parallel to river Beas on its western bank after Manali, where it crosses the river. This road carries total intra-regional as well as inter-regional traffic to and from the valley. Hence, this road is the backbone of transportation network of the Kullu region.

Another most significant traffic artery of the area is Kullu-Manali road via Naggar and Jagatsukh. It runs parallel to the Beas on its eastern bank from just opposite to Kullu town to Manali where it joins with NH-21. This road links the eastern and western banks of the Beas. It connects the important settlements on the eastern bank of the river such as Jagatsukh, Sarsai, Haripur and Naggar etc. Eastern bank of the valley is well known for apple and other fruit crops. Total length of this road from Kullu to Manali is 39 km.

Besides, the above mentioned roads which serve the entire valley there are other link roads such as Babeli-Jindore mule road, Chhaten Seri-Benchi, Dobhi-Phojal up to Neri, Dobhi school to Gharakar, Shirar – Bysor to village Shirar, Katrain-Channi up to Jandi, Katrian to Ghuntu Bag, Patlikuhal Naggar, Patlikuhal, Baragran-Hallan, NH-21 to Bran, Bhang to Burua, Shanag to Goshal and Palchan - Burua to Cajhech on right bank of river Beas and Seobagh to left bank, Kais-Soi-Sor-Jana, Nagger to Pulgan, Naggar-Patlikuhal, Naggar-Jana, Chakki-Hallan, Sarsai-15 mile, Jagatsukh, Hamta pass, link to village Kothi and Palchan to Naggar on left bank etc. Most of the rural settlements are far off from traffic routes, hence have poor accessibility. In spite of the fact that roads are the only means of transportation in the valley, the road network is not efficient to meet the existing transportation needs of the valley, particularly in rural areas.

Shimla: The transportation network is predominantly road based. The role of railway in meeting the requirements of commuters in Shimla is insignificant. The internal circulation pattern of the city is linear and the natural geographical hill spurs have governed the network pattern. Following are the main roads, which serve the Shimla Planning Area.

National Highways

- **Chandigarh-Kaurik National Highway -22:** Chandigarh -Kaurick National Highway-22 connects Shimla with Solan, Kalka, Parwanoo and Chandigarh, on one hand and Narkanda and Rampur, on the other. Its width ranges from 10 metres to 12 metres.

- **Shimla-Mataur (Kangra) Road National Highway -88:** Shimla -Mataur National Highway-88 connects Shimla city with Ghagas, Hamirpur, Jawala Ji, Kangra and Mataur on Pathankot-Mandi National Highway-20. Its width ranges from 6 metres to 9 metres. Its length within Shimla Planning Area is about 13 kilometres. i.e. from Shimla town to Ghanahatti. It acts as lifeline for populous belt of the state.

- **Tutikandi-Dhalli By- Pass:** This Bypass connects barrier with Khalini, New Shimla, Kasumpti and further Dhalli. It is acting as an alternate route and easing the heavy traffic load of the Cart road. Its length within Shimla Planning Area is about 25 kilometers and its width ranges from 9 metres to 12 metres.

State Highways

- **Cart road/Circular Road**
  The Cart Road is the main arterial road of the city, which runs parallel to the Mall in the city area, serving the various parts of the Shimla city. The width of Cart road ranges from 5 meter to 8 meter.
- **Regional Roads**
  Major arterial roads which emanate from the city are Tara Devi-Jubbarhatti-Kunihar road, Dhalli-Tattapani road, Kufri-Chail road and Kasumpti-Junga road.
- **The Mall**
  The Mall is a "pedestrian artery". The main town has grown up in the form of a crescent around it. The commercial central area along the Mall is the hub of social life.

Una: Nangal – Una – Amb road which passes through the town is acting as its lifeline. This highway divides the Una town into two halves i.e. North – Old town and South newly developed areas. Other major roads connect it with Hamirpur, Mandi, Nangal town ship, Amb, Hoshiarpur, Pathankot, Chintpurni, Gagret, Santokhgarh and Mehatpur. It has an excellent model location and known as Gateway of North Himachal. A pedestrian path has been proposed on Una-Ki-Khud joining 84 pouries with the D.A.V. school to ease the pedestrian rush of the students on the State Highway especially on the bridge site.

Bilaspur: The area existing under major roads including National Highway- 21, other link roads passing through the Planning Area and parking places is 81.74 Hectare, which is 7.28% of the Planning Area. The National Highway-21 passes through Bilaspur Planning Area. Traffic volume on this Highway has increased due to the Associated Cement Companies (ACC)'s Cement Factory, at a distance of 23 Kilometre at Barmana, which generates about 400 trucks per day out of which majority of trucks passes through Bilaspur town enroute to nearest broad-gauge railhead at Kiratpur Sahib.

Parking Facility: Parking is a major problem in all urban areas of the State. According to the survey conducted by H. P. Town and Country Planning Department, 36% households do not have any parking facility, out of which 98% are parking the vehicles on roadside resulting traffic jams and causing accidents as given in Table 57. Therefore parking facilities have to be created in new areas. The over all parking problems can be solved by creating private parking spaces as a commercial venture and by making mandatory provisions in the Zoning Regulations in this regard.

Table 57: Availability of Parking Facilities

Sr. No	Availability	House hold	Percentage
1.	Yes	850	64 %
2.	No	480	36 %
	Total	**1330**	**100 %**

Source: Survey by H.P. Town and Country Planning Department 2002.

The 64% households have parking facilities. Majorities of the households' i.e. 97.92 % who do not have any parking facility are parking their vehicles on road as given in Table 58.

Table 58: Non -Availability of Parking Facilities

Sr. No.	Non-availability/ alternative used	House hold	Percentage
1.	On road side	470	97.92 %
2.	Paid parking	10	2.08 %
3.	Free parking	-	-
	Total	**480**	**100 %**

Source: Survey by H.P. Town and Country Planning Department 2002

Mandi: The area existing under circulation network is 50.86 ha which includes National Highway 20, 21 and 78 with 23.59 ha area, State Highway-32 with 5.90 ha area and other internal roads with 29.37 ha area. The existing area under Terminal Facilities i.e. Bus Terminal is 0.41 ha. Under Parking Facilities 0.42 ha area is existing this way total existing area under traffic and transportation use works out to 51.69 ha which is 2.25% of the Planning Area.

Una: A by-pass road connectivity is required for the traffic of state Highways Nangal – Una – Amb road and other major roads with four lanes and internal roads with two lanes are also required to be provided. For increasing vehicular traffic, parking, repair and terminal facilities will have to be provided on the outskirts of the town. Bus stand has quite inadequate area to cater the present and future increasing vehicular traffic and passing facilities. It is proposed that present HRTC workshop situated in the heart of the town on proposed to be utilized to construct a modern Bus stand with modern amenities for passengers. The scattered mechanical repair shops/workshops and service stations on State Highway and other roads creating traffic hazards is proposed to be shifted on old Hoshiarpur road in sector-I and space between Basoli road and Basoli-Ki-Khud i.e. on Una-Nangal road in Sector-IV. The Una-Ki-Khud is proposed to be channelised to use the waste land and to utilize this land for the purpose or urbanization. It will also solve the problem of floods which due to this adjoining residential areas.

Chamba: The major roads including State Highway emanating form the town, local roads as well as by lanes interlinking various mohallas in main town and localities in newly developing area, bus stand, workshop, parking lot have an area of 23.29 ha which is 16.45% of the total urban area and 2.47% of Planning Area. As per survey conducted, there are 7.2% taxies and 27.74% buses as means of transport per day. However during the peak season of tourists and Manimahesh Yatra the number of cars/taxis and buses increased 5 times to ten times respectively.

Parking of vehicles particularly of the private ones, trucks and taxis is as over problem. The vehicles are parked anywhere on the roadside in the town in a haphazard manner, particularly in central commercial area i.e. Chaugan Bazar of the town and near the public places in the morning and evening peak hours. Much unauthorized and haphazard parking reduces the effective width of road, thereby hindering the smooth flow of traffic. Location wise status of parking in Chamba Planning Area is given in Table 59.

Table 59: Parking Status in Chamba Planning Area

Sr. No.	Location	Two Wheeler	Four Wheeler (LV)	r (HV)
1.	Nearby Shitla Bridge on Chamba Pathankot road	48	50	15
2.	Nearby Sultanpur Chowk	25	63	24
3.	Baloo Chowk area	20	25	13
4.	Zero Chowk (organized parking)	4	10	14
5.	Zero Chowk on Chamba – Bharmaur road	3	12	6
6.	Hardaspura Chowk	2	1	1
7.	Nearby main post office	35	15	-
8.	On Museum Road	15	11	-
9.	On Chaugan Road near Hospital	35	13	-
10	Parking near the District Court	28	4	-

Kullu: Three rope ways at places like Raison, Rampur and Baner, are of great significance to the adjoining areas since they join the two parts of the valley. Approximately 32% of tourists plus local passenger traffic is catered by public transport constituting of private and public buses, whereas remaining 68% of tourist / passenger traffic depend upon private light motor vehicles.

The National Highway-21 passes through the Kullu Valley Planning Area and occupies 45.45 ha of area in the left out Kullu Valley Planning Area. The other roads occupies 60.74 ha including circulation network, bus stops, parking spaces occupy 2.81 ha area. The total area under traffic and transportation including circulation network, bus stops and parking spaces is 109 ha, which is 1.84% of the left out Kullu Valley Planning area.

Parking of vehicles, particularly that of the privately owned taxies and auto is a critical problem. These vehicles are parked any where

on the sides of roads at Duara, Patlikuhal, Naggar, Jagatsukh and Palchan etc. in a haphazard manner. The problem of parking is worst in Alu ground, Patlikuhal, Bandrol and Naggar bazaar area. The maximum private hotels do not have sufficient space for parking within their premises. The survey conducted by the Department in the commercial areas at the nodal locations as given in the Table 60, vehicles are parked on road side and there are no other developed parking spaces available in these areas.

District wise transport facility is given in Table 61.

Table 60: Location of parking spaces

Sr. No.	Location of Site	Capacity
1.	Village Bandrol	12 taxies, 40 trucks and 12 tractors.
2.	Village Duara	10 taxies and 30 trucks.
3.	Village Patlikuhal	35 taxies and 40 trucks.
4.	Village Barod	15 taxies, 100 trucks and 15 Buses.
5.	Village Naggar	25 taxies and 5 trucks.
6.	Village Jagatsukh	8 taxies and 5 trucks.
7.	Village Palchan	30 taxies, 35 trucks, 12 tractors and 15 buses.
	Total	**135 taxies, 228 trucks, 12 tractors and 15 buses**

Table 61: Transport Facility in Himachal Pradesh

District	CD Block	Bus Service	Railway Station	Navigable Waterway
Chamba		**402**	**-**	**4**
Chamba	Pangi	3	-	2
	Tissa	37	-	-
	Saluni	101	-	-
	Chamba	60	-	-
	Bhattiyat	141	-	2
	Mehla	33	-	-
	Bharmaur	27	-	-
Bilaspur		**574**	**-**	**185**
Bilaspur	Ghumarwin	144	-	2
	Geharwin	184	-	111
	Bilaspur Sadar	246	-	72
Hamirpur		891	-	-
Hamirpur	Sujanpur Tira	91	-	-
	Nadaun	266	-	-
	Hamirpur	155	-	-
	Bijhri	194	-	-
	Bhoranj	185	-	-
Kangra		**2127**	**57**	**43**
Kangra	Nurpur	180	1	-
	Indora	107	1	1
	Fatehpur	122	1	16
	Nagrota Surian	97	18	10

District	CD Block	Bus Service	Railway Station	Navigable Waterway
	Pragpur	185	1	1
	Dehra	263	3	10
	Kangra	166	8	-
	Rait	141	-	1
	Nagrota Bagwan	180	8	-
	Bhawarna	216	5	-
		172	-	2
	Baijnath	129	5	-
	Panchrukhi	169	6	2
Kinnaur		**90**	**-**	-
	Pooh	38	-	-
Kinnaur	Kalpa	28	-	-
	Nichar	24	-	-
Kullu		**111**	**-**	**-**
	Naggar	29	-	-
	Kullu	33	-	-
Kullu	Banjar	24	-	-
	Ani	13	-	-
	Nirmand	12	-	-
Lahaul & Spiti		**167**	-	-
Lahaul & Spiti	Lahaul	118	-	-
	Spiti	49	-	-
Mandi		**1,207**	**9**	**14**
	Chauntra	117	8	1
	Drang	115	-	-
	Dharampur	129	1	12
	Gopalpur	174	-	-
Mandi	Sundarnaggar	101	-	1
	Rawalsar	110	-	-
	Mandi Sadar	173	-	-
	Chachyot	92	-	-
	Seraj	55	-	-
	Karsog	141	-	-
Shimla		**54**	**55**	**56**
	Rampur	98	-	-
	Narkanda	94	-	-
	Theog	127	-	-
	Mashobra	198	9	4
Shimla	Basantpur	113	-	-
	Chaupal	91	-	-
	Jubbal Kotkhai	134	-	-
	Rohru	68	1	-
	Chauhra	15	-	-
Sirmaur		**523**	**-**	-
	Rajgarh	83	-	-
	Pachhad	113	-	-
Sirmaur	Nahan	112	-	-
	Paonta Sahib	125	-	-
	Sangrah	58	-	-
	Shillai	32	-	-
Solan		**1210**	**22**	-
	Kunihar	272	-	-
Solan	Nalagarh	323	1	-
	Dharampur	223	10	-
	Solan	249	5	-

District	CD Block	Bus Service	Railway Station	Navigable Waterway
Una	Kandaghat	143	6	-
		489	**3**	**-**
Una	Amb	110	-	-
	Gagret	75	-	-
	Dhundla	211	-	-
	Una	93	3	-
Himachal Pradesh (Total)		**6787**	**146**	**302**

Details of district wise connectivity of road & road density is given in Table 62

Table 62: District Level Connectivity of Roads

District	Position as on 31.03.09			
	2008-09 Metalled	2008-09 Unmetalled	2008-09 Total	Road density per 100 Sq.Kms.of Area
Chamba	1098	987	2085	31.94
Bilaspur	1036	437	1473	126.22
Hamirpur	1352	362	1714	153.31
Kangra	4080	1188	5268	91.79
Kinnaur	439	287	726	11.34
Kullu	765	747	1512	27.48
Lahaul-Spiti	512	657	1169	8.45
Mandi	2166	2440	4606	116.61
Shimla	2000	2820	4820	93.94
Sirmaur	1123	1641	2764	97.84
Solan	1263	1244	2507	129.49
Una	1456	202	1658	107.66
H.P.	**17290**	**13012**	**30302**	**54.43**

District wise details of registered of motor vehicles is given in Table 63.

Table 63: District wise Number of Registered Motor Vehicles (2008)

Types of Vehicles	Chamba	Bilaspur	Hamirpur	Kangra	Kinnaur	Kullu	L&S	Mandi	Shimla	Sirmaur	Solan	Una
Buses	21	73	75	98	14	55	3	90	20	17	138	41
Trucks	160	238	219	348	79	194	4	258	328	240	3088	20
Motor cycle/scooter	951	1105	2218	7807	43	840	79	2646	893	2324	3879	3686
Private cars	472	592	756	2314	214	999	28	1318	2260	546	1760	543
Jeeps	45	20	27	140	34	137	2	111	96	58	71	38
Tractors	25	59	131	156	9	36	24	118	17	113	131	-
Water tankers	-	4	2	-	7	-	-	3	2	-	-	-
Departmental cars	1	4	-	1	1	-	-	1	1	-	-	-

Types of Vehicles	Chamba	Bilaspur	Hamirpur	Kangra	Kinnaur	Kullu	L&S	Mandi	Shimla	Sirmaur	Solan	Una
others	167	233	181	250	83	563	36	394	270	166	386	77
Total	**1842**	**2328**	**3609**	**11113**	**484**	**2824**	**176**	**4939**	**3887**	**3465**	**9453**	**4405**

Source: Registration & Licensing Authorities of H.P

Details of registered vehicles during 2006 – 2008 are given in Table 64.

Table 64: State Level (Registered Vehicles)

Year	Buses	Trucks	Motor cycle/scooter	Private cars	Jeeps	Tractors	Water tankers	Departmental cars	others	Total
2006	1071	2956	29175	14506	1549	1189	74	49	2969	53640
2007	576	5397	32953	13175	2079	1132	64	194	6635	62205
2008	645	5176	26471	11802	779	819	18	9	2806	48525

Note: *Data collect from Statistical Outline of Himachal Pradesh 2007-08*

Details of registered vehicles during 2005 – 2007 are given in Table 65.

Table 65: Number of Registered Motor Vehicles

Sr. No.	Category of Vehicles	Registered during the year		
		2005	2006	2007
1	Buses	356	634	576
2	Trucks	2176	2436	5397
3	Motor cycles/Scooters	20170	29175	32953
4	Pvt. Cars	5682	14506	131755
5	Jeeps	1053	1549	2079
6	Pick up vans	1336	833	1132
7	Tractors	815	1189	2267
8	Statio Wagons	14	2	127
9	Petrol/water tankers	141	74	64
10	Delivery vans	27	95	26
11	Cabs (Taxies etc.)	421	102	293
12	Omni Buses	-	298	457
13	Others (Tempo, Crane, Ambulance etc)	1120	2728	3464
14	Deptt. Cars	95	18	194
15	Maxi Cabs	-	1	1
	Total	**33409**	**53640**	**62205**

Source: Concerned Registration and Licensing Authority, H.P

4.11 Information on human resource management issues (which may have relevance to environment management) in the sector such as: manpower, vocational training, awareness levels etc.

Himachal Pradesh Public Works Department is headed by the Engineer-in-Chief with Headquarters at Shimla. Works and matters regarding codes, Specifications, Planning & Monitoring, Inter-State Connectivity for the entire State and also the entire establishments of PWD are controlled by the Engineer-in-Chief. On administrative and functional considerations, the department has been divided into three zones namely North, Central and South Zones. All the three zones are headed by Chief Engineers. Headquarters of South Zone is at Shimla; those of North and Central Zones are at Dharamshala and Mandi respectively.

Chief Engineer (National Highways) with headquarters at Shimla controls the Planning and Execution of works of National Highways traversing through the State.

Engineer-in-Chief (Quality & Design) acts as State Level Quality Co-Ordinator for achieving quality parameters of works in the State. Material Testing Laboratories at State level and Zonal Laboratories are under his control. He conducts quality control checks throughout the State. He is the in-charge for Standardization of Designs and Drawings for Buildings, Bridges and Assurance of common Technical Instructions, Manual of Order, Codes & Specifications, Schedule of Rates, Training Programs, Workshops and allied fields, etc.

Chief Engineer (PMGSY) is monitoring, planning and having day to day interaction with Govt. of India (MORD) for the works of PMGSY and PMGSY (World Bank) funded projects through National Rural Road Development Agency (NRRDA).

Chief Engineer (Electrical) controls the works related to electrical installation, central heating air conditioning, lifts, fire-fighting, fire alarm system, L.T. Sub-Station, Public Address system and CCTV systems in all Govt. residential & non-residential buildings.

Chief Architect is heading Architectural Wing at Shimla. This wing deals with all Architectural planning for buildings undertaken by PWD under North, South and Central Zones. In addition, this wing also undertakes consultancy jobs for corporate bodies and institutions, such as Regional Engineering College Hamirpur and Railways, etc.

Superintending Engineer Arbitration Circle Solan deals with the entire arbitration cases of the Department.

Duties and responsibilities of officers in the Department of Transport, Himachal Pradesh are described below.

1. Director Transport, Himachal Pradesh

i) Director Transport being administrative head of the Transport Department in the State is responsible for the efficient working of Transport Department exercise all administrative and financial powers as adjoined upon the heads of the department in Himachal Pradesh.

ii) S/He is also the Chairman of Regional Transport Authorities constituted by the Govt. of HP.

iii) S/He shall submit to the Govt. budget and appropriation proposals in consolidated form for the department as a whole for consideration/approval.

iv) S/he shall ensure the implementation of Central Motor Vehicle Act/Rules, HP Motor Vehicle Rules, HP Motor Vehicle Taxation Act/Rules in letter and spirit.

v) S/He approves all kinds of models of vehicles to be allowed to be registered in the State.

vi) S/he shall submit proposals regarding policy matters pertaining to the department to the Additional Chief Secretary (Transport) for finalization.

vii) S/He shall ensure the achievements of financial targets set by the Govt.

viii) S/He also recommends the cases to the Govt. for allotment of Registration series to all the RTOs/RLAs in Himachal Pradesh.

ix) S/he has over all control over all the RTOs in the Himachal Pradesh and also exercise in direct control over R&Ls for realization of taxes due the State under the Motor Vehicle Act/Rules and HP Motor Vehicle Taxation Act and as well as settlement of audit paragraphs pertaining to them and issue directions thereof.

x) S/he is also Chairman-cum-Chief Executive Officer of E-Governance Society of Transport Department, HP.

xi) S/He shall exercise all the powers delegated to him/her by the State Govt.

from time to time and is directly answerable to the Govt.

2. Additional Commissioner Transport-Cum-Secretary, State Transport Authority, HP

i) The Additional Commissioner Transport-cum- Secretary, STA, HP shall assist the Director Transport in the performance of his/her duties and responsibilities and all proposal shall have to be initiated through him/her to the Head of Department.

ii) S/he has been delegated with the powers of Head of Offices in Directorate & S/he will be responsible for administrative matters of the Department.

iii) S/he also acts as controlling officers of RTOs in Transport Department and issues necessary directions/clarifications to them.

iv) S/he shall be required to inspect the working of all the RTO offices and after inspecting, the field offices will record inspection notes.

v) S/he will also exercise financial power attached to his/her post in the capacity of being controlling officer.

vi) S/he will act as Nodal Officer in respect of Transport Department for issues related to the preparation of Long Term Master Plan for HP.

vii) S/he will act as Ex-officio-Vigilance Officer in respect of Transport Department.

viii) S/he shall have to finalize the reciprocal agreements on behalf of HP Govt. with the adjoining states.

ix) Public Information Officer under RTI Act, 2005 in Directorate of Transport, HP.

x) Being a Secretary, STA, S/he is also looking after the following jobs:

- Registering authority for commercial vehicles such as Taxi/Maxi/ Contract carriage buses and also for non-transport vehicles under the HP 62 & HP 62 A series.
- Grant of Taxi/Maxi Permits
- Grant of National Permits of Trucks.
- Grant of All India Permits for Contract Carriage Buses/within state permits.
- Compounding challan powers to streamline the traffic.
- Appellate Authority under section 15(1) of Himachal Pradesh Motor Vehicle Taxation Act, 1972.
- To co-ordinate and regulate the activities and policies of RTA.
- To settle all disputes and decide all the matters on which differences of opinion arise between RTAs.
- Licensing Authority including International Driving License.
- Member Secretary of E-Governance Society of Transport Department.

xi) Any other job assigned by the Head of Department.

3. Joint Commissioner Transport-Cum-Regional Transport Officer (Flying Squad)

i) Clarification / directions regarding Stage Carriage Permits / Time Tables / Inter state agreements with Regional Transport Offices in the State through Additional Commissioner Transport.

ii) To check the illegal plying of vehicles in all over he State and vested with compounding / challan powers to streamline the traffic in accordance with provisions of Motor Vehicle Act/Rules, HP Motor Vehicle Rules, HP Motor Vehicle Taxation Act/ Rules and also realize the taxes on the spot, due towards State of HP.

iii) Power to renew / NOC of driving licenses issued earlier. iv) Any other job assigned by the Head of Department.

4. Regional Transport Officers (Shimla/Solan/ Sirmaur/ Una/ Bilaspur / Hamirpur/Dharamshala/ Mandi/ Kullu & Chamba)

i) He is the Head of office and assigned the powers of DDOs being a Controlling officer.

ii) To check the illegal plying of vehicles in his/her jurisdiction and compounding / challan powers to streamline the traffic as RTO.

iii) Powers to issue (basic & National permits for goods vehicles, three wheeler/stage

Carriage/Taxi/Maxis as sanctioned by the STA/RTA.

iv) Power to registration of vehicles (taxi/maxi/personalized & commercial vehicles).

v) Power to issue temporary permit for carrying out repair of vehicle.

vi) Power to issue special permit under section 88(8) of Motor Vehicle Act, 1988.

vii) Power to convene the meeting of stage carriage/HRTC for joint time Table and issuance of time Tables.

viii) To act as Public Information Officer.

ix) Licensing authority in respect of Driving/Conductor licenses.

x) S/he is the Secretary of Regional Transport Authority of the region concerned for preparation of agenda for the meeting of RTA.

xi) Any other job assigned by the Head of Department.

5. Regional Transport Officer (Flying Squad), Dharamshala & Kullu

i) S/he is the Head of office and assigned the powers of DDOs being a Controlling officer.

ii) To check the illegal plying of vehicles in his/her jurisdiction and compounding challan powers to streamline the traffic as RTO Flying Squad.

iii) Any other job assigned by the Head of Department.

6. Assistant Commissioner Transport (Technical)

i) He is the head of Technical Section in Headquarter.

ii) He submits proposal for approval of models of different kind of vehicles to the Director Transport, HP through Additional Commissioner Transport, HP.

iii) The work relating to Road Safety programme, Pollution Check Centers and Opening / inspection of Driving Training School have been done under his supervision.

iv) Clarification to all the Motor Vehicle Inspectors in Technical matters.

v) To check the illegal plying of vehicles in all over the State and Compounding challan powers to streamline the traffic as Asstt. Commissioner Transport (Tech.).

vi) To maintain data regarding vehicle inspection/driving test taken by the Motor Vehicle Inspector in the Pradesh.

vii) Any other job assigned by the Head of Department.

Besides, following positions are above place namely; Assistant Controller (F&A) ; Budget Branch; DDO; Accounts Branch; Cash Section- Cash Counter for general public; Pension Branch; Composite Fee; Construction of bus stand; Assurances of Assembly Questions- Budget Assurances; Head of Audit

Branch; Review meeting; Section Officer (SAS); Assistant Regional Transport Officers (Parwanoo / Baddi / Barotiwala / Kala Amb / Paonta Sahib /Mehatpur/ Gagret/ Swarghat / Damtal / Kandwal & Tunuhatti); Superintendent Grade-II (Establishment); Superintendent Gr-II (General); Superintendent Gr-II (Enforcement); Senior Assistants; Senior Assistant (Establishment); Senior Assistant-1 (Enforcement); Senior Assistant-2 (Enforcement); Senior Assistant (Stage Carriage); Senior Assistant (Bill); Senior Assistant (Cashier); Senior Assistant (Store); Senior Assistant (Two in each RTO offices); Motor Vehicle Inspector; Personal Assistant; Junior Auditor; Junior Assistant/Clerk Clerk (HQ); Clerk (field offices); Traffic Inspector; Programmer; Computer Operator; Drivers; ConsTables; Home Guard

4.12 Regulatory Analysis to identify any regulations that have environment implications (negative or positive) and compliance with the same

Road infrastructure and transportation sector and cross sector policy and regulatory framework at state level shows the intent of the state government to address inadequate service delivery in order to reduce the disease burden in the state. A list of policy and program is given below:

- National Road Transport Policy
- National Urban Transport Policy
- Policy on Development on New Township
- Right of Way Policy
- National Policy on Resettlement & Rehabilitation
- The Control of National Highways (Land and Traffic) Act
- The Carriage by Road Act
- Land Acquisition Act
- The Central Road Funds (State Roads) Rules
- Motor Vehicles Act
- Environment (Protection) Act, 1986
- Environment Protection Rules
- The Himachal Pradesh Road Infrastructure Protection Act
- The Himachal Pradesh Municipal Act, 1994
- The Himachal Pradesh Business Bye-Laws
- The Himachal Pradesh Town and Country Planning Act
- The Himachal Pradesh Panchayati Raj Act
- Policy on Development on New Township
- The Himachal Pradesh Road Infrastructure Protection Act
- The Himachal Pradesh Panchayati Raj Act
- The Forest (Conservation) Act
- Wildlife Protection Act
- Municipal Solid Waste (Management and Handling) Rules, 2000
- Biological Diversity Act, 2002
- The Air (Preservation and Control of Pollution) Act, 1981
- The Water (Prevention and Control of Pollution) Act, 1994
- Noise Pollution (Regulation and Control) Rules, 2000
- Tourism Policy, 2005
- The Control of National Highways (Land and Traffic) Act

Reference

- HP Public Works Department
- Department of Transport
- State Environment Report (Year not mentioned)
- State Pollution Control Board
- Department of Planning
- Department of Economics & Statistics, HP
- Districts Statistical Abstract
- Ministry of Road Transport & Highways
- Department of Rural Development

CHAPTER 5 MINING & GEOLOGY

5.1 Resource Inventory of existing assets of sector

Minerals constitute a fundamental component of material and economic base of Himachal Pradesh. It is now on the threshold of becoming the "Cement State" of India as good quality limestone, which is one of the most important ingredients in the manufacture of cement, is available in plenty. At present there are three cement plants in the large and medium sector. Besides, 3 mini cement plants are functioning in the State. 4 large scale cement plants have been approved to be set up in the state based on limestone deposits at Sunder Naggar, Alsindi (Mandi district), Boroh-Shind (Chamba) Bagga-Bhalag (Solan District) and based on the reject of the NMDC mine of Arki, District, Solan. One cement plant based on the Gumma limestone deposit (District Shimla) is under consideration.

The various mineral found in the various districts of Himachal and their form of occurrence is given below.

- **Antimony** is a associated base metal sulphides confined to granitic rocks of Vaikrata group of Rohtang Gneissic complex (central xtalline zone) exposed near the snout of the Bara Shigri glacier found in Kullu, Lahaul & Spiti district.

- **Barytes** occurs as fracture filling epigenic veins in sandstone of Ordovician Thango formation. It is also recorded in Krol group, Infra krol-Blaini sequence found in Arsomang and Gekod Thach in Kinnaur District Kanti, Tatyana, Batowri, Kheel and Banaur area along right flan of the Tons river in Sirmaur District.

- **Bauxite** appears to be a palaeosol formed over Proterozoic sediments of the lesser Himalayan tectogen 215 mineralize at the base of the Palaeozoic-eocene rocks forming a crust over the pre Tertiary rocks found in Deharu & Chapla in Shimla. Bench & Nahan in Sirmaur, Deothal in the Solan.

- **Beryl** found near Wangtu bridge site and at Shapki in Kinnaur district and also in Chaur mountain area.

- **Clay** found inalong coarse of Satluj at Shiasu, Ganfa, Chango, Shalkar, Sumdo, Hurling, Atargoo, Kioto in Kinnaur and Lahaul & Spiti district. Fluvial clay occurs at Sirmuri Tal and Nimba Ka Khala in Sirmaour District. Clay associated with granite occur at Kinnaur, Mandi and Sirmaur district. Small pockets at Karsog, Chuch, Batala bel, Garain, Negi Nal, Bashaich and Phaish, Tarai, Dopha and Nid and Chaur granitic complex in Sirmaur. Clays associated with Shiwalik rocks are recorded from Kangra District.

- **Coal** is a Carbonised weed having no economic significance occurs in the Subathu formation and Shiwalik group found in Bilaspur, Kangra District, Manasai and Dehar in Mandi District.

- **Copper** is a Precambrian-Cambrian sequences, Naraul formation, Rampur group found in Rangbar in Kinnaur District, Garsha valley of Kullu, Uchich area of Parvati Valley, Manikaran , Larji Rampur Window Zone, Chander tal area of Lahaul in Kunzom la formation.

- **Garnet** found in small xtals occur in Sarakani and Rorung Dhar area of Kullu district. Large xtals associated with Pegmatoids and Schists occur in the southern part of Chaur mountain area.

- **Gold** is a Primary gold-associated with late Archean palaeoproterozoic volcano 216 mineralized sequences (Rampur group) B. Gold as paleoplacer in Shiwalik rocks in the Middle and Upper Shiwaliks Subgroups. C. Neoplacer gold is well distributed in the present day sediments of most the rivers and rivulets draining the middle and upper Shiwalik terrains and also in lower and higher Himalaya found in Primary Gold- with uranium at Manikaran in Kullu. With Quartzite of Khaspat area, Nogli, Powari in Shimla District Morang in Kinnaur District.

- **Iron Ore** is a Magnetite and Haematite in low grade Schists of Salkhala group, Haimanta group, 216 mineralize Thango formation. Found in Charayandhar, Thang, Sangalwara and Jhungie area of Mandi District. Dharamshala in Kangra district. Gargi & Garsa in Kullu District. Pujarli in Shimla district. Mangsu la area in Kinnaur district (Magnetite).Haematite quartzite in Thango & Shitikar in Spiti valley.

- **Kyanite** found in Xyals of Kyanite often a beautiful blue color are available in profusion in Kinnaur and Bhabeh areas and also in eastern parts of Kullu district.

- **Lead & Zinc Ore** is anIndividual mineralized zone is lenticular and confined to shear zone in Deoban carbonates close to contact with overlying clastic Shimla group. Sphalerite is the dominant sulphide followed by galena and chalcopyrite found in Kinnaur, Kullu and Lahaul & Spiti district. At Panuh, Shangri, Mangana in Solan District. Amba Khola in Sirmaur District. (No Economic Importance). Lead–Zinc Mineralization in the Tons valley (Chamri & Ambota) is important. (galena, sphalerite-chalcopyrite-pyrite are identified).

- **Limestone and dolomite** is a lower Himalaya - The Shali, Deoban, Larji are the main Mesoproterozoic carbonate belts of great potential. The other belts with carbonate lithounits are Meso to Neo Proterozoic Mandhali, Basantpur-Kunihar, Krol and Jutogh. Higher Himalaya- Early Carboniferous, lipak formation and the Triassic-Early Jurrasic Lilang group are important belts. The early carboniferrous Kalhel limestone in Chamba. Palaeocene-Eocene Kakra and Subathu formations also have carbonate rocks. Found in Bilaspur, Kangra, Mandi, Shimla, Solan, Lahaul & Spiti, Chamba, Bilaspur etc.

- **Magnesite** is an often associated and is restricted to the basal part of the Batal and Manjir formation found in Chamba district.

- **Pyrite** is aLenses of Pyrite occurs at many places in rocks of Jutogh group. Found in Tara devi in Shimla district Haipurdhar in Sirmaur district.

- **Quartz, Silica, Pebble-Glass Sand is** quartzites of Manikaran, Nagthat, Muth and Subathu formations also have glass sand potential. Found in White quartz pebbles in bed of Jaijon and Kum khad in Una district similarly quartzite pebbles are reported from Aruali, Banda, Sieha and Solag in Bilaspur district, Barhwaini and Bhadroa in Kangra district.

- **Radioactive mineral** is a Uranium mineralization in the form of visible yellow brown encrustations on weathered surfaces of the Manikaran Quartzite of the Rampur Group and also in paragneisses of Jeori-Wangtu Granitoid Complex close to a tectonic dislocation. Uranium in Shiwaliks-Shiwalik sediments in certain lithostratigraphic units contains high concentration of Uranium. Found in Kasha area, Nogli valley in Shimla

district Rampur rocks in Parbati and Garshal valleys of Kullu district.

- **Rock phosphate** is phosphatic nodules occur in terminal Proterozoic Batal-Katargali-Formation, Permian Gungri Formation and Salooni Formation, Jurrasic Spiti Formation, and Palaeocene-Eocene Kakra and Subathu Formations, Khatpul and Taltapani formation. Found in Rajgarh and Deoria area of Sirmaur, Nigali-Shyan la area (Lower tal area).

- **Gypsum** is an early carboniferous Lipak formation contains large reserve of good quality gypsum of evaporite origin. Gypsum occuring as thin bands associated with the red shale dolomite sequence of Krol B of Vendian age. Found in Liwa Thach in Lipak gad to Hurling and also near Losar and Dhuma, Shalkar and in Gyundi river in Kinnaur and Lahaul & Spiti district Korga and Bharli in Sirmaur district.

- **Silver** is a Argentiferous Galena is known from Uchich in the Parbati valley where old workings exist in Manikaran Quartzite. Found in Parbati valley in Kullu (Saugthan). Chargaon in Kinnaur district.

- **Slate is a** confined to Kullu, Salkhala group and Batal formation, Khokan formation. Found in Mandi, Chamba and Kangra district.

- **Rock Sali** is a Ropri formation of Shali group found in Guma Drang in Mandi district, Mandbari in Kangra district.

- **Natural gas** is a Lower Shiwaliks, Subathu group as it contains organic matter and degree of metamorphism is higher. Found in Jawalamukhi & Nurpur of Kangra district.

District wise various minerals exploited in Himachal Pradesh is given below.

A. Limestone

Limestone is a calcareous sedimentary rock composed of mineral calcite ($CaCO_3$) which upon calcination yields lime (CaO) for commercial use. Cement and Iron & Steel industries are the major consumers of limestone. It is also utilized in chemical industries like calcium carbide, bleaching powder, soda-ash, precipitated calcium carbonate, etc. Besides, it is used as fluxing material in ferro-alloys, pelletization plants, foundaries and in the production of sponge from iron, as refining materials in the production of sugar; as an additive in glass industry; as a coating material in fertilizers industry, etc.

Total Deposits of Limestone in Himachal Pradesh

Himachal Pradesh has vast reserves of the limestone, spread over various locations. The State is ranked 4th in all India as far as reserve under proven category is concerned and 7th as far as total reserves are concerned. The district wise details of the limestone deposits of all grades (including cement grade) in Himachal Pradesh are as given below in **Table 1.**

Table 1: District wise details of Limestone Reserve

(In Million tonnes)

District	Proved	Probable	Possible	Total
Bilaspur	370	150	500	1020
Chamba	400	850	100	1350
Kangra	10	20	10	40
Kullu			120	120
Mandi	500	20	600	1120
Sirmaur	150	200	1200	1550
Shimla		50	1600	1650
Solan	550	100	1000	1650
Lahaul & Spiti			1000	1000
Kinnaur			100	100
Total	**1980**	**1390**	**6230**	**9600**

The distribution of important limestone bearing Formations are as shown in Figure 1.

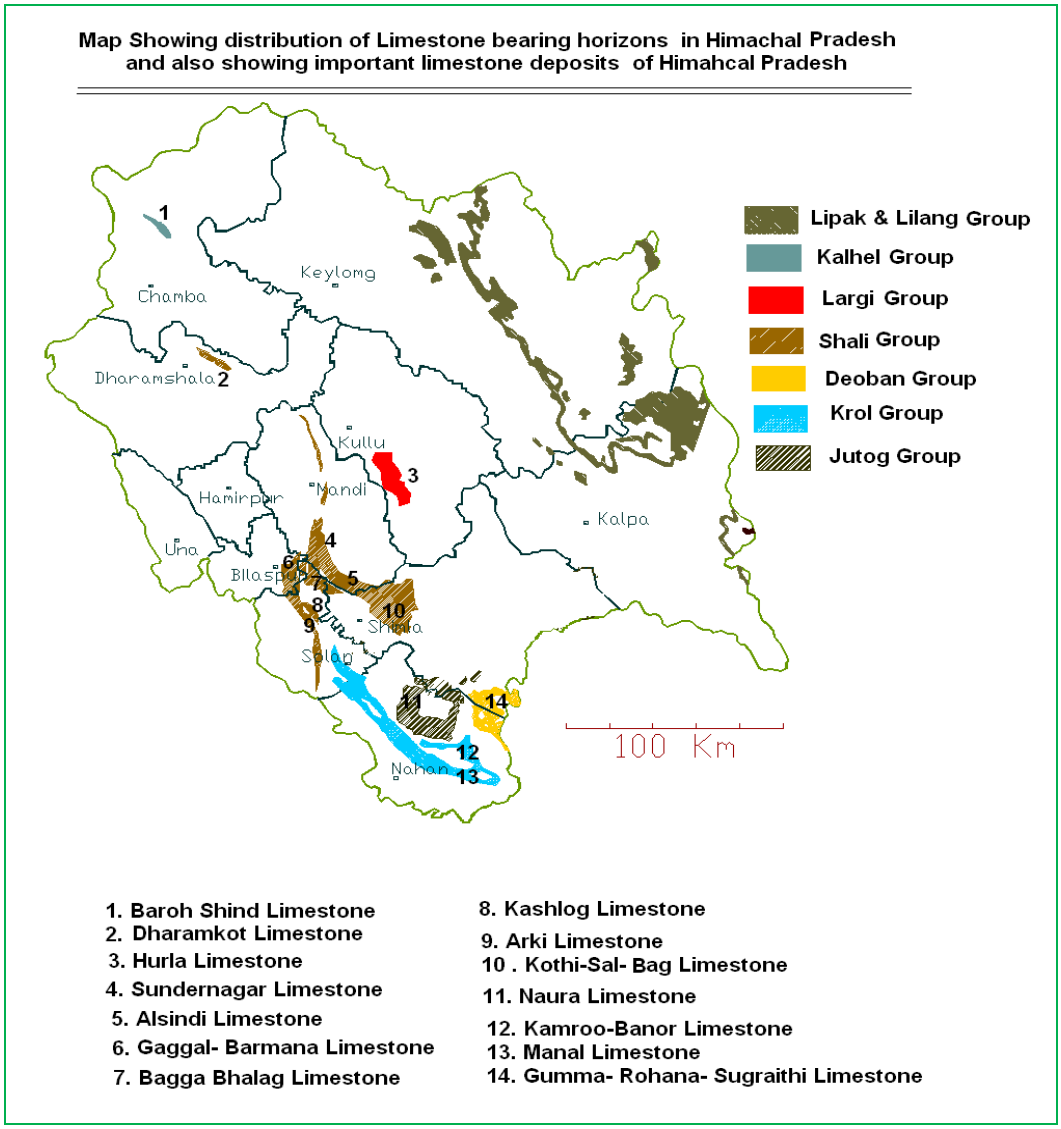


Figure 1: Reserves of limestone district wise

Reserves of limestone district wise is described below

i) Bilaspur district

Gagal- Barmana Limestone: Large reserves of limestone (both dolomitic and non-dolomitic) occur amongst the Pre Tertiary rocks near Jamthal (31°24': 76°52'), Aur or Gagal-Hill (31°06'; 31°20':76°51'), Chhabiawae (31°23':76°51') and Darobn (31°21':76°51'). The limestone is suitable for cement manufacture. In Gagal-Burmana area, the reserves of cement grade limestone have been estimated as 117.1 million tonnes. The Gagal limestone deposit contains CaO 45.20% to 47.80% and MgO 0.91%. The Burmana limestone deposit contains CaO 47.62% and MgO 1.47%.

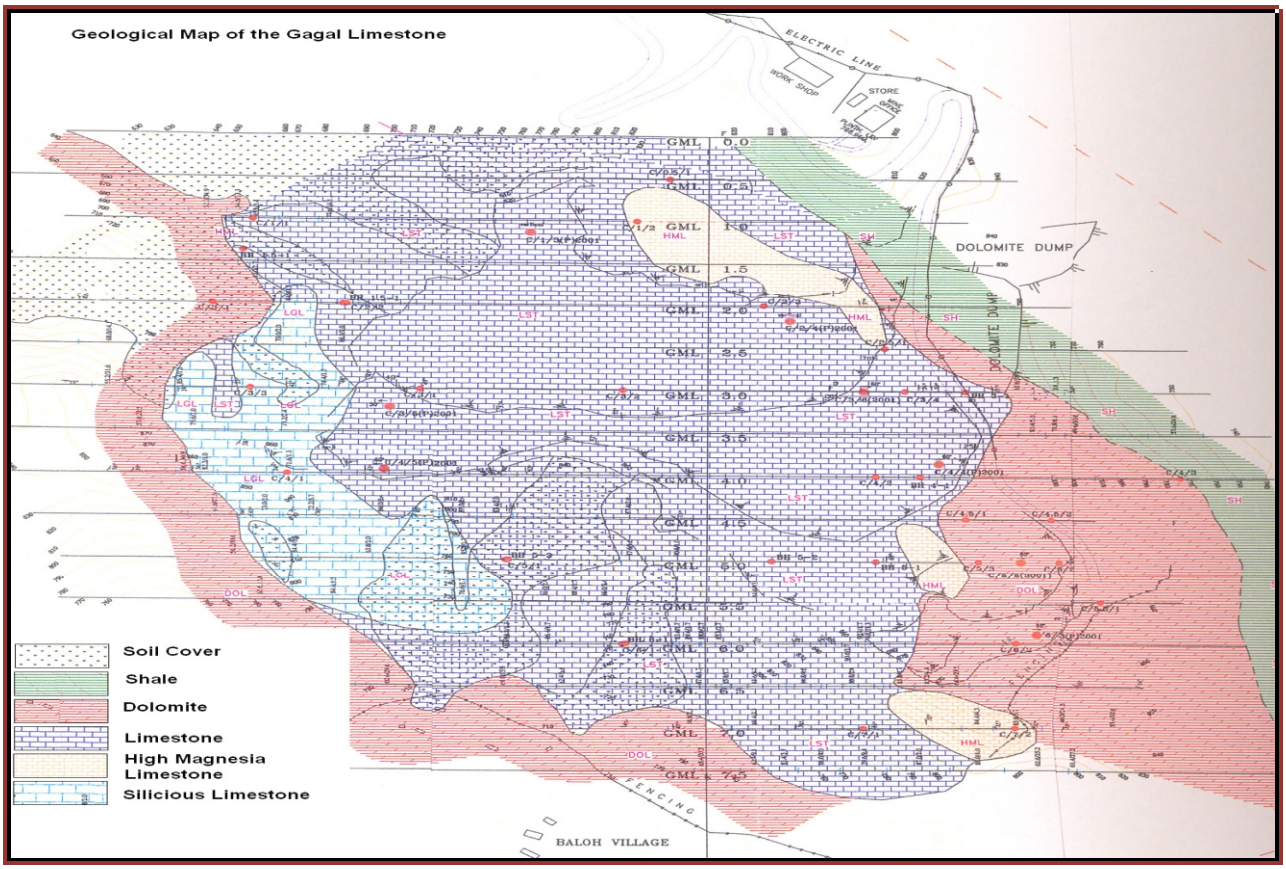


Figure 2: Geological map of the Gagal Limestone

Occurrence of dolomite has been reported from a locality 1.5 kilometre west of Lohrda (31°15':76°00') and 800 metre east of Bhajun (31°14':76°49'). The analyses show that the dolomite may find use as flux. Occurrences of calcareous tufa have been recorded at Lathwin (31°31':76°41') and near Thakurdwars (31°26': 76°31').

ii) Chamba district: *Broh Sind belt* ((31°30':76°55') of limestone in Chamba district is located 40 km away from Chamba, on Chamba –Tissa Road. Topographically the area belongs to lesser Himalaya. It forms a rugged hilly terrain with a range of elevation from 990 Metre to 2244 Metre and it lies to the east of river Siul and limestone belt gradually rise upto the height of 3000 metre in Southeast direction. The general physiography of the area is as given in **figure 3.**

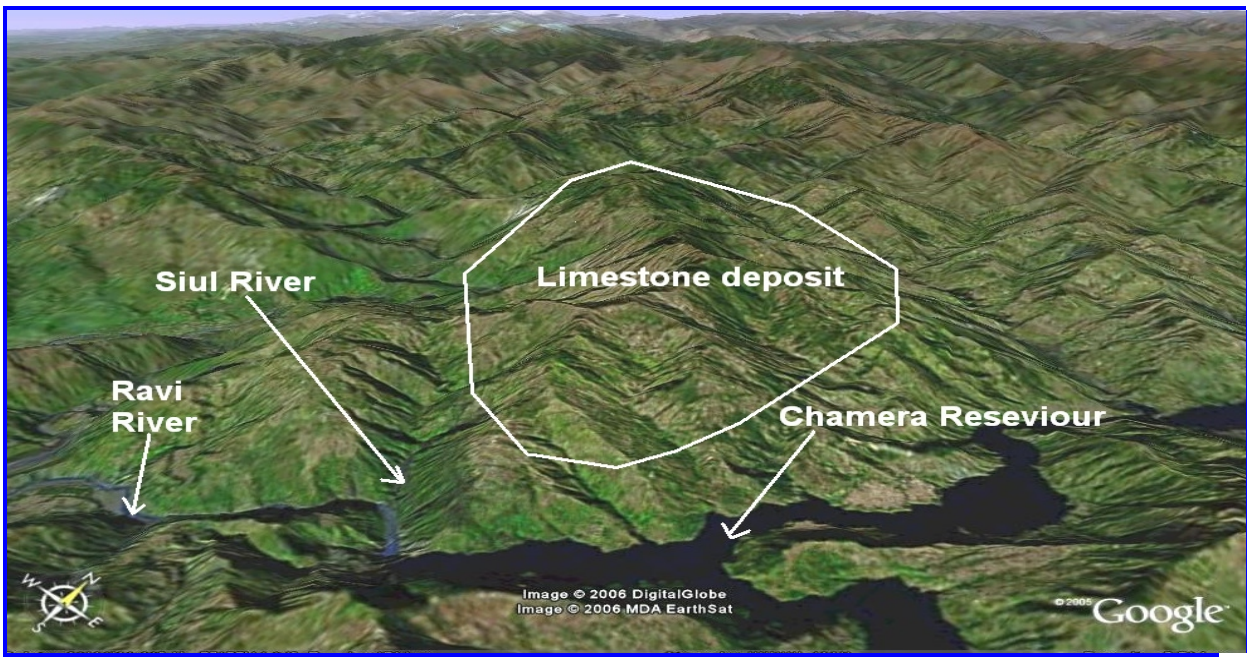


Figure 3: Google earth 3 D image of Broh Sind Pallilimestone belts showing general physiography of the area

The rocks of the Chamba region are grouped into (1) the lower and (2) the upper sequence. The lower sequence rests on the Middle Proterozoic Bhalai Formation. The Bhalai Formation is conformably overlain by the Chamba Formation, which consists of grey, buff, olive stained slates, phyllite and psammites. The Chamba formation is followed in succession upwards by the Pukhri Formation, which consists of dark grey, carbonaceous, thinly bedded slates and phyllite along with subordinate quartzite and is overlain by Manjir formation, which constitutes the uppermost part of the lower sequence in the Chamba region. The Manjir Formation consists of grey and purple thinly bedded slate which at places contains pebbly horizon. The upper sequence is represented by the lower Salooni Formation, also known as the Katarigali Formation (unfossiliferous,) and is overlain by the Saho Volcanics and the upper Salooni Formation (containing lower Permian plant fossils). The Upper Salooni Formation is overlain by the (Early to Middle Permian) Kalhel limestone that forms the youngest formation in the area. It is mainly crystalline limestone of variegated colours, interbedded with grey coloured quartzites in the upper part. The general geology of the area is given in Table 2.

Table 2: Showing general stratigraphy of the area

Symbolic Representation of Formation	Formation	Age	Thickness	Lithology
	KALHEL LIMESTONE	Lr. Triassic	400 m	Grey and yellow dolomitic limestones with interbedded white and grey orthoquartzites in the upper part and numerous stems and osccles of crinoids in the lower part
	UPPER SALOONI	M. Permian to U. Permian	400 m	Limestones interbedded with grey calcareous states / calcareous phyllites / quartzites
	SAHO VOLCANICS	M. Permian	10-50 m	Metavolcanics of basaltic and andesitic composition
	KATARIGALI (Lr. Salooni)	UP. Carbo To M. Permian	800 m	Dark grey and carbonaceous pyritous slates, containing black phosphatic nodules / siliceous crystalline limestone / carbonaceous phyllite / phyllitic quartzites
	MANJIR CONG	L. Cambrian	1000 m	Grey and purple metamorphosed pebbly mudstones paraconglomerates with inter calated bands of grey states, consisting conglomeretic flysch
	PUKHRI SLATE	M. Proterozoic	2000 m	A rapid alteration of slates or phyllites and metasiltstone-metagreywaoke, constituting shaly flysch
	CHAMBA FORMATION	M. Proterozoic	3500 m	Monotonous aleration of metagrey – waoke and slate, forming sandy flysch
	BHALAI FORMATION (Dalhousie Granite)	M. Proterozoic	3500 m	Greyish green, talcose phyllites and schists, garnet – biotite schist, micaceous quartzites and interbedded with bands of dark grey crystalline limestone with associated Dalhousie Granite

The limestone belong to the upper most part of the Kalhel Formation. In the area the limestone bed is 600 metre thick and is underlain by quartzite, dolomite and slate. Limestone has a low dip toward north at 90 to 300. The reserves so far proved by drilling are estimated to be 400 million tonnes and inferred reserve are about 850 million tonnes. The core recovery in most

of the bore holes is about 60% and at places it is 100%. The average chemical composition of limestone is as given in Table 3.

Table 3: Chemical composition of limestone

Constituent	%age
CaO	52.64
MgO	1.35
R_2O_3	0.7
Insolubles	2.85
LIO	42.61

Dolomitic limestone is associated with Mangnesite in Salooni and Durlai Formations in the district. Dolomitic Limestone bands ranging in thickness from one to three metres have been found at Sidh Ka Dehra (33°02'15":76°26'00"). Tundru (35°05'15":76°27'30"), Chinar Got (33°06'15":76°29'30"), Kuldhan Got (33°45' 05":76°24'30") and Chabi Got 33°08' 45":76°08'45"). The dolomite bands occur in Sidh Dehra Formation. Thin bands of marble associated with tremolite occur in Kilar Formation around Batwas (33°05' 15": 76°27'45"), Pindru (38°01'30":76°26'15") and Sarkund (33°01'15": 76°24'00"). Bands of dolomite ranging in thickness from one metre to two metres with strike extension ranging from 50 to 100 metres have been found within Sidh Dehra Formation at about one kilometre west of Tiaso Adwar (33°09'15':76°30'30")

iii) Kangra District: Cement grade limestone deposit is reported at Dharamkot (32°13':76°19'), about 3 kilometres north of Dharamshala (32°13':76°19'). The deposit comprises dark grey and pink limestone. The gross reserves of easily quarriable limestone (cement grade) are of the order of 17.6 million tonnes. The pink limestone contain on an average CaO 47. 52% and MgO 2.01% while the grey limestone contains on an average CaO 41.92%. A deposit of calcareous tufa occurs on the south western flank of the Ramgarh ridge, east of Samlarah (31°41':76°19').Calcareous tufa has also been recorded near Nagni (32°18':75°17').

iv) Kinnaur district: Carbonate rocks are present in the Manchap and Lipak Formations and in the Lilang Group as persistent bands.

v) Kullu district: Several thick bands of pink, cream and purple limestone interbedded with dolomite occur in the Aut Formation of Larji Group near Hurla (31°50': 77° 11') Tharas 31° 50':'77°11'), Dalasni (31°47':77°12') and Larji (31°43':77°13'). Several thick bands of grey dolomite interbedded with limestone of Larji Group occur as tectonic window in the southern parts of the Kullu valley. A dolomite band is well exposed on the ridge east of the river Beas between Hurla (31°50':77°11'15") and south of Larji (31°46';77°14') and also in the Hurla - Garsah and Larji-Behali sections in the Garsha and Sainj Valleys respectively.

vi) Mandi district

a) Alsindi Limestone Deposit: Cement grade limestone belonging to the Sorgharwari Formation of Shali Group occurs between Alsindi (31°17' 45': 77° 07'45") in Mandi district in the west and Jaunrog (31°18'00": 77°20'30") in Shimla District in the east. The limestone was investigated along a strike length of 15 km by the Geological Survey of India. The estimated reserves are of the order of 550 million tonnes. The limestone has been investigated by the Geological Wing, Department of Industries. About 200 million tonnes of limestone is approximately in 1.5 sq km of area. It is pink to grey in colour and contains thin shale partings. The limestone contains CaO varying from 44.40 to 52.00% and MgO trace to 9.80%.

It is situated at a distance of about 70 Km from Shimla on Shimla- Basantpur Tattapani-Karsog State Highway No 13. The area forms part of the Lesser Himalaya and shows typical mountainous topography. Physiographically, the area is bounded in the east and south-east

by Badeog Dhar and in the south by Rista-Ki-Dhar. The terrain ranges in height between 1200 metres to 1992 metres above mean sea level. The drainage pattern is mostly dendritic.

The limestone deposits of the area belongs to Sorgharwari Formation of Shali Group which is fine grained, dense, homogeneous and exhibit concoide to subconcoidel fractures. The colour varies from pink to grey. The pink limestone at places contains purple to green shale partings.

The general geology of the Shali Group is as given below in **Table 4.**

Table 4: Litho-stratigraphy of the Shali Group

Group	Formation	Lithology	Thickness (In Metres)
Shali	Bandla	Green and purple coloured shale, slate, siltstone, sporadic earthy limestone , thin bedded orthoquartzite and a fairly persistent band of white quartzarenite at the base.	250
	Parnali	Cherty dolomite, grey limestone and white quartzarenite.	700
	Makri	Grey, green, black and purple shales and slates, thin bedded limestone, thin bedded quartzarenite with or without dolomite.	180
	Tattapani	Cherty dolomite, grey and pink in colour with grey phyllitesed shales.	610
	Sorgharwari	Pink and grey cream textured limestone with shale partings.	460
	Khatpul	Massive dolomite with sporadic quartzarenite, and a thin red shale band at the base.	300
	Khaira	Mainly pink and purple, also white quartzarenite.	380
	Ropri	Brick red shale and siltstone with grey dolomite in the lower horizon; local development of salt, salt grit and the marly lithocomplex "Lokhan"	400

The Sorgharwari Formation comprise of pink, grey and cream coloured limestone with thin shale partings, and stretches from Koti in South East to Alsindi and further to Gagal- Barmana and Sundernagar in the North – West. In the Alsindi area, the Shali belt is only 2.80 Km broad and this structurally narrow part of the Shali belt is called as "Alsindi Corridore".

The Sorgharwari member achieves its maximum thickness of 300 metres in the area. The limestone bed has two distinct sequences namely; the lower, pink to purple limestone; the upper, grey limestone

The pink to purple limestone is very fine textured, creamy, well laminated, banded and bedded. It is also fine grained, dense homogeneous and exhibit concoidal or subconcoidal fractures. Pink limestone at places contains purple and green shale parting.

The grey limestone generally succeeds the pink limestone. At places it has banded appearance. Creamish grey limestone of Sorgharwari Member interbeds with pink limestone before grading into Tattapani Formation. Along the road section, in the basal part, the limestone is very thinly bedded and the shale partings constitute about 20 percent of the rocks. In this section, it is highly puckered and jointed. The limestone breccia which appears to have been formed as a result of solution action is exposed along the slopes of Aliad Nala about 200 metres from the main road along Uday-Aliad footpath.

The general strike of the rock is NW-SE dipping NE 23^0 to 72^0. The rocks in the vicinity of Aliad village have been folded into anticlines and synclines thereby increasing the thickness of the deposits. The maximum width of limestone is about 650 metres and is exposed in

the vicinity of Aliad Village and the maximum strike length is about 600 metres near Village Aliad.

The limestone deposits can be classified as complex deposits because it is moderately to steeply dipping; frequent intercalations, with variable thickness; uniform quality but with irregular boundaries.

Based on drilling data about 200 million tonnes of limestone have been proved by the geological Wing, Department of Industries, H.P. in approx. 1.5 sq. km. area and about 400 million tonnes have been inferred in rest of the unexplored area.

b) Sundernagar Limestone Deposit: Cement grade limestone belonging to the Sorgharwari Formation of Shali Group also occurs in Ropa - Banaik– Kiran-Bhojpur area (31°31':76°54' to 31°32':76°56') of Sundernagar Subdivision. The deposit starts from Ropa Quarry near village Banaik (old Sundernagar) in the N-W end and extends in the SE direction towards Kiran and Dovaida then towards other side of hill slope upto right bank of Lindi Khad and runs upto Bhojpur and Badairn etc. The limestone of the area belongs to the Shali Formation. The general succession of the rocks in the area is as given in Table 5.

Table 5: Succession of Rocks

Recent Material	Consisting of fine grained argillaceous soil with rounded to sub rounded boulders of dolomitic limestone
Purple pink Limestone	Well bedded pink limestone with purple and green shale parting
Flesh Dolomitic Limestone	Hard flesh coloured to light pink coloured dolomitic limestone with grey colored dolomitic band
Grey Dolomitic Limestone	Grey hard dolomite with shale parting and with algal stromatolites

Grey dolomitic limestone belongs to the Khatpul Formation of Shali Group and flesh coloured dolomitic limestone is a transition stage between dolomitic and purple limestone. The Purple – Pink limestone belongs to the Sargharwari Formation of the Shali Group.

The limestone has been investigated by the Geological Wing, Department of Industries and has proved 225 million tonnes of limestone. The average chemical analysis of the limestone are as given in the **Table 6.**

Table 6: Average chemical analysis of the Sundernagar area limestone

	CaO%	MgO %	LiO%	R_2O_3%	Fe_2O_3%
Kiran Block	47.95	1.66	39.57	0.32	8.94
Ropa Area	48.87	1.35	39.69	0.38	8.22
Bhojnagar Area	48.72	1.63	40.00	0.42	8.11

Shimla District

Limestone deposits of Deoban, Shali Group, Shimla and Mandhali Formation occur in different parts of this district.

a) Guma- Rohana- Sugraithi Limestone, Tehsil Chaupa, District Shimla: The deposit lies in between 30°46'00"N:77°42'00"E- 0°54'45"N:77°42'45"E) along Minas-Guma -Chaupal link road and falls in Survey of India Toposheet Nos 53 F/9 and F/13. The area is located in the South Eastern part of Tehsil Chaupal of District Shimla. The Eastern part is bounded by the Tons, river forming the boundary between Uttaranchal and Himachal Pradesh. In the Southern part, the Sainj Khad marks the boundary between Shimla and Sirmaur Districts of Himachal Pradesh. Guma area can be approached from Shimla via-Chaupa and Tiuni. It is about 153 Kms. SE of Shimla via Shimla-Chaupa-Nerwa-Shillai road. Guma is also connected with Shimla by a 175 Kms. long metalled road via-Hatkoti-Tiuni. The area is also connected with Paonta Sahib by 102 km long Paonta-Chaupa metalled road and from Dehradun via Vikasnagar-Koti – Minas-Nerwa link road. Dehradun is the nearest broad gauge Rail Head and is about 125 Kms. from Guma. Based on the large scale mapping of Deoban and associated formations by the Geological Survey of India, the Geological sequence of the area can be divide into three blocks namely;

Rohana- Bigrauli – Bohar Block; Guma-Bhatkar-Sobal-Paban-Bandar Block; Sugraithi-Chaur- Badera Block.

b) Kothi-Sal-Bagh limestone Deposit District. Shimla: The cement grade limestone deposit belonging to Sorghawari Formation of Shali Group have been reported in the Kothi-Sal-Bagh Area (31°14' 00"- 31°15' 30"- : 77°14'30"-77°15'30"). The deposit is linked with an all weather road and lies at a distance of 72 Km from Shimla. The Shimla- Basantpur-Kingal road passes through the deposit and Sunni- Luhri road runs roughly along the bottom of the deposit (District Shimla side deposit). The limestone belongs to the Shali Group. The Shali Group in this area forms a Window Structure where older rocks are exposed, surrounded by the younger rocks. The rocks also show formation of an anticline structure and its one limb is exposed on the left bank of river Satluj in district. Shimla and other limb passes towards the other side of river Satluj in Mandi district. This Window structure is again interrupted by a fault running in almost North-South to SSW direction. The total Geological reserves computed by Geological Survey of India are to the tune of 700 million tonnes.

Sirmaur district The chemical, cement and dolomitic grade of limestone deposits occurs in different parts of this district. The limestone bearing horizon in Sirmaur can be classified into 18 sectors as Naura Area, Sangrah area, Bhootmari area, Pamta area, Baldawa area, Bagan Dhar area, Malani Shilla area Milla area, Tatiyan area, Kamroo area, Chowki Marigwal – Korga area, Banor Bharli area, Bohar Khatwar area, Poka- Bhadrog area, Manal area, Koti Dhiman area, Biala area and dolomitic magnesia limestone horizon of the Parara area. The total limestone reserve of Sirmaur districts are as per Geological Survey of India is about 1200 million tonnes.

Mineral resources potential, location in district is described in Table 7.

Table 7: Mineral Resources of Himachal Pradesh

Mineral	District	Locality	Potential
Limestone	Bilaspur	Gagal – Barmana	117.1 million tons
	Kangra	Dharamkot	17.6 million tons – 42.52
	Mandi	Alsinid and Junrog	550 million tonnes CaO – 34.4 to 52% MgO – 9.8% Shimla Drawal
		Kariali Block	80.43 million tonnes CaO – 4.50%
		Jalog-Thench Block	3.185 million tonnes
		Chamga Nala	224 million tonnes CaO – 44.8%
		Shali	146 million tones CaO – 45.25%
	Sirmaur	Datwardi	101.36 million tonnes CaO – 53.93%
		Hathana	29.87 million tones CaO – 53.9%
		Dida	34.65 million tonnes CaO – 53.22%
		Nohra	6.26 million tonnes (Upto 60 m depth) CaO – 53.95%
		Bulain Dhar	1.94 million tonnes (Upto 60 m depth) CaO – 53.60%
Magnesite	Chamba	Muchetar Nala	55,620 tonnes MgO – 39%
Rock Salt	Mandi	Guma	7.55 million tonnes Grade NaCl – 70.40%, KCl – 3% Impurities – 21%
		Drang	7.55 million tonnes Grade NaCl – 70.40%, KCl – 3% Impurities – 21%
Slate	Chamba	Rupaina	518400 tonnes
		Bhora	1360800 tonnes
		Chaunda Devi	6480 tonnes

Mineral	District	Locality	Potential
		Renda	172800 tonnes
		Between Kalam Nadi and Sapri	115500 tones
	Kangra	Dharamkot	992250 tonnes
		Got	21600 tonnes
		Bhatti	Impurities – 21%, 162000 tonnes
Stibnite	Lahaul & Spiti	Bara Singri	105682 tones, 1.65%
Barytes	Kinnaur	Arsomang	3 veins 20 to 60 m long and 15 to 40 cm width. Another vein as 30 m long 97.70% $BaSO_4$
Clay	Kangra	Kothar	15000 tonnes
		Hatli	5076 tonnes
	Sirmaur	Kalidhang	Reserve of clay around Kalidhang, 2.63 million tonnes upto a depth of 20 Silica Sand
	Una	Jaijoan Dil Khad	Total reserve for Grade A 50309 tonnes, 97.44% SiO_2
		Bathri	Total reserve for, Grade A, B & C upto a depth of 2 m 842570 tonnes
Gypsum	Kinnaur	Shalkar	1.25 million tonnes upto a depth 25 m. Grade not given. Total *in situ* reserve in this belt may be 100 million tonnes
Kyanite	Lahaul & Spiti		Kyanite 40 m in thickness and traceable for 1 km

Source: State of the Environment Report- H.P.-State Council for Science, Technology and Environment, March, 2000

The district wise commercially exploitable minerals are given in Table 8.

Table 8: Commercially exploitable minerals in Himachal Pradesh

Bilaspur	Limestone. Dolomitic Limestone, Shale, brick earth, minor minerals like sandstone and bajri.
Kangra	Roofing slate, Brick earth and minor minerals, like sandstone and bajri.
Chamba	Limestone, Roofing slate, magnesite and minor minerals like sandstone and bajri.
Kinnaur	Gypsum and minor minerals like sandstone and bajri
Kullu	Roofing slate, quartzite crystal, mineral water, semi-precious stone and minor minerals like sandstone and bajri.
Lahaul & Spiti	Antimony-ore, gypsum and minor minerals like sandstone and bajri
Solan	Lime stone, diplomatic limestone, shale, building Stone and minor minerals like sandstone and bajri
Una	Silica boulders and minor minerals like sandstone and bajri
Mandi	Limestone, rock salt, and minor minerals likesandstone and bajri
Hamirpur	Silica-sand boulders and minor minerals like sandstone and bajri
Shimla	Limestone, quartzite, slabs slate and minor minerals like sandstone and bajri
Sirmaur	Limestone, Barytes, Gypsum, Shale, quartzite and minor minerals like sandstone and bajri

The same can be represented in figure 4.

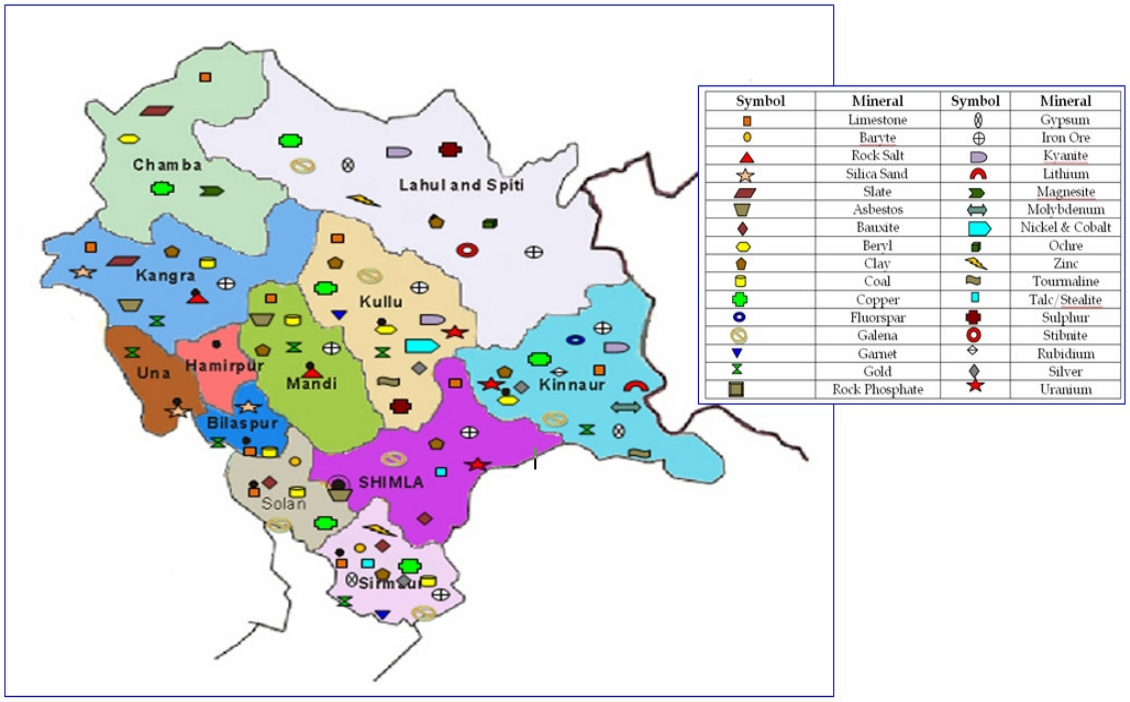


Figure 4: Location of minerals in Himachal Pradesh

Table 9: Mineral Production / Value

Sr. No.	Mineral	Production (tons)	Value (Lakh)
Major Minerals			
1.y	Limestone cement grade	5901346	3914.27
2.y	Limestone fine grade	78656	1022.00
3.y	Shale	347302	42.26
4.y	Baryte	929	1.58
5.y	Rock Salt	1056	10.56
6.y	Silica Sand used in glass industries/ Sand stone used as raw mix in cement	12643	5.04
Minor Minerals			
1.y	Bajri	1406552	617.40
2.y	Sand	1326263	528.16
3.y	Building stone	627136	146.38
4.y	Boulder	824086	316.04
5.y	Quartzite	31484	9.44
6.y	Slate	7137	104.29
7.y	Limestone Kiln grade	4496	5.45
8.y	Aggregate	525170	74.20

Source: State Geologist, Industry Department, Himachal Pradesh.

Table 10: Mineral based Industries in Himachal Pradesh:

Major Cement Plants	3 Nos.
Mini Cement Plants	3 (in operation)
Hydrated Lime and Calcium Carbonate	20 Nos.
Limestone Powder/chips	25 Nos.
Stone cutting units	5 Nos.
Hollow Blocks	14
Stone crushers	About 250

5.2 Patterns of planning and development in the sector

The Geological Wing was set up in the Department of Industries, H.P. in the Year 1964 -65 with only one Geologist, who was heading the Organisation on deputation from Geological Survey of India. On the reorganisation of erstwhile State of Punjab, in November 1966, majority of Geologist and staff were allotted to Himachal Pradesh. Thus, a well equipped Geological Wing started

functioning in the Himachal Pradesh from Nov, 1966 with following functions:

1. Exploration of mineral wealth of the State for their scientific and economical exploitation and setting up of mineral based industries like large cement plants etc.
2. Development and regulation of minerals by granting various mineral concessions through leases, auctions, short term permits etc. Implementation of River/Stream Bed Mining Policy, 2004, Policy guidelines for Registration, Location, Installation and Working of Stone Crushers in Himachal Pradesh, Court Cases, redressal of complaints etc.
3. Preparation of survey document of each district;
4. Scrutiny of Mining- cum – Environment Management Plans;
5. Carrying out geo-technical studies/investigations of bridges, buildings, landslides, road alignments, hydro-electric projects, I&PH schemes, Geological, stability / feasibility report of various roads constructed under PMGSY as per the user agencies demands (approximately 60 assignments per year) etc.
6. Geo-environmental studies of lakes, geothermal studies etc.

The Geological Wing of Industries Department is engaged in exploration of mineral wealth of the state, their scientific and economic exploitation and setting up of mineral based industries like large cement plants, development and regulation of minerals by granting various mineral concessions through leases, auctions short term permit. preparation of survey documents of each District, scrutiny of Mining-cum-Environment Management Plans, carrying out geo-technical studies / investigations of bridges, buildings, etc. and Geoenvironment studies of lakes, geothermal studies. Apart from this, Department is implementing the River/Stream Bed Mining Policy, the Crusher Policy, preparing survey documents of each district, carrying out geo-technical survey of roads, bridges, landslides, parking sites and checking of various mining plans.

Source: FYP-07-12

Table 11: Detail of leases granted in Himachal Pradesh

District	Major Mineral				Minor Mineral						Total
	Limestone	Baryte	Silica Sand	Limestone	crusher	Cutstone	Sand	Hollow Block	Screening	Slate	
Bilaspur	1										1
Chamba	1				5					8	14
Hamirpur					7						7
Kangra					48			14	9		71
Kinnaur					1						1
Kullu					21					3	24
Lahaul & Spiti					1						1
Mandi	2				31				1	1	35
Shimla					12	3	4				19
Sirmaur	49	2		20	8						79
Solan	2				34	5	17				58
Una			4		10						14
Total	**55**	**2**	**4**	**20**	**178**	**8**	**21**	**14**	**10**	**12**	**324**

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:
The Industries based on minerals provides direct employment to about 12,500 persons and indirectly to more than 40,000.

While granting the lease, the environmental clearance and clearance under Forest Conservation Act, 1980 etc. are required as provided in the rules. As per present policy of the State, at least 50% of clinker or any other %age as prescribed by the Government has to be converted into cement through grinding units located in Himachal Pradesh. The cement plant will be eligible for incentives as per the Industrial Policy of the State and Central Government prevalent at the time of coming into production. Further, the applicant shall be required to meet the conditions of the employment of at least 70% of Himachalis as prescribed in the Industrial Policy Guidelines 2004 and as amended from time to time.

Integrated Infrastructure Development Scheme

The Integrated Infrastructure Development Centre (IIDC) Scheme Goalthai was approved for Rs 432 lakh by the Govt. of India, Ministry of SSI financed by the State Govt. and the Central Govt. in the ratio of 3:2.

The I.I.D. Centre is situated 6 kms away from Nangal on Nangal- Bhakhra Dam Road. Total area of this IID Centre is 492.48 bighas and has been developed in two phases. 148 plots have been developed and 144 plots have been allotted to entrepreneurs.

Existing status of cement industry:- Himachal Pradesh has vast limestone deposits which are capable of sustaining large numbers of limestone based industries which include cement plants and other industries engaged in the manufacture of calcium carbonate, poultry grit, lime, limestone powder etc. These industries are generally located near limestone deposits. There are three cement plants (M/s Associated Cements Co. Ltd. Gagal, District, Bilaspur, M/s Ambuja Cements Ltd. Darlaghat, District, Solan and M/s Cement Corporation of India, Rajban, District, Sirmaur) in large and medium sectors. Besides about 3 mini cement plants, 9 hydrated lime and quick lime calcium carbonate units, 88 numbers of limestone powder/poultry feed have been set up.

1. Central Transport Subsidy: The new industrial units are allowed 75% transport subsidy for a period of five years from the date of commencement of commercial production. This scheme which was operational on disbursement from the State budget and reimbursement from the Government of India basis but now this system has been changed and the Central Government has placed funds with HPSIDC Ltd. as a Nodal Agency for disbursement on behalf of GOI to the Industrial Units.

2. Central Capital Investment Subsidy: The Central Capital Investment Subsidy for the industrial units coming up in the State is admissible @ 15% under the Special Package of Incentives notified for Himachal Pradesh. Under this Scheme, Rs 64.07 crores has been provided by the Govt. of India, Department of Industrial Policy & Promotion (DIP&P) for disbursement to units as per norms of the Scheme.

3. Collection of Statistics of SSI Units: A Central Plan Scheme "Collection of Statistics of SSI units" is being implemented in Himachal Pradesh. Under the Scheme, a Nucleus Cell has been created at the Directorate Level. The main objective of the Cell is to update data on SME sector, maintain the frame list of SME units functioning in the State, conduct surveys etc.

5.3 Technology adopted in the sector alongwith any changes in the technology

Geo-technical/Geo-environmental investigations:

(A) **Geological Exploration**

1. Cement grade limestone of Gumma-Rohana area (Tehsil Chaupa) Shimla District.

Shimla.
Drilling work for exploration of cement grade limestone was carried out payment basis on the request of M/s India Cements Ltd. Drilling upto 478.15 mtrs. in Gumma-Rohana block of Tehsil Chaupa, District. Shimla.

2. **Karaili-Kothi-Sal-Bagh area of Tehsil Sunni, Shimla District.**
Sub-surface exploration of cement grade limestone was carried out up to 68.65 mtrs in Karail-Kothi- Sal-Bagh area after grant of prospecting licence in favour of M/s Dalmia Cements Ltd.,

3. **Drilling for foundation testing**
Drilling for geo technical investigations were carried out in different parts of the state.

4. Drilling done during the year 2008-2009 was - 611.60 mtrs.

5. Location of mining leases, stone crushers, auction sites and applied for areas in district Una district were marked on Survey of India Topo-Sheets on 1: 50,000 scale. The detail was subsequently transferred to 1:250,000 scale map for office use.

6. Reconnaissance Survey to confirm the continuity of Sorgharwari limestone extension on the western side of Alsindi was carried out. 8 samples were collected at different locations to know the chemical composition of different radicals. In addition, systematic mapping of 4 sq km area was carried out to delineate different rock horizons and structural analysis.

(B) **Geotechnical Investigations:**

During the financial year 2008-2009, following Geo-Technical studies were undertaken as per the request made by different Govt. Departments & District Administration etc.:-

Geotechnical Report of the site proposed for Govt. Degree College Building at Killar, District, Chamba; Section Store at Darka Phati Balh Kothi Tarapur, Tehsil & District. Kullu; Indoor Stadium site at Rohroo, District, Shimla; Shopping Complex Cum - Waiting Hall near ice-skating ground at Lakkar Bazar Bus Stand in Shimla Town; Dogri to Samana Tiun link road in Tehsil & District. Kullu; border road from Sugar point along Indo-China border in Lahaul & Spiti District; road from Tara Devi to Malog Julgi (Jeepable road) in Tehsil and District. Shimla; link road from Dhella Kofardhar Mankhi Dhank in Tehsil Rampur, District, Shimla; Bhojnagar to Neri Kalan via Tikkri road, Tehsil Kasauli, District, Solan; Malaghat to Ghaighat road in Tehsil Kasauli, District, Solan, Garaunghati to Kamlog road, Tehsil Kasauli, District, Solan; Berli Manlog link road in District, Solan; Bridge over Sumra Khad near village Sumra in District, Kinnaur; Foot Bridge on Satluj river at Behna in District, Shimla; Founding Level on left side abutment of Shantha Bridge Nerwa, Tehsil Chaupa, District, Shimla; Bridge over Masshrain Khad near village Timvi, Tehsil Chaupa, district, Shimla; Bridge on the Sainj Khad on Simloh Mandholghat Dargi via Naggar road in Shimla District; Augmentation of flow irrigation scheme from Kanan Nallah to Village Kibbar in Lahaul-Spiti District; Improvement of flow irrigation scheme from Shilla park/nallah source to Lanja in Tehsil Spiti, District. Lahaul & Spiti; Flow irrigation scheme (kuhl) from Ulla Nallah to Keuling Village under Kaza Sub-Division, District. Lahaul & Spiti; Flow irrigation scheme (kulh) from Ulla Nallah to Lara Village under Kaza Sub-Division, Lahaul & Spiti district.

5.4 Stakeholder involvement in environment preservation and restoration

Two days workshop with the stakeholders on the new draft MMDR Act under the Chairmanship of Hon'ble Minister of Mines & DoNER and under the Chairpersonship of Secretary (Mines) was held in 2009 Himachal Pradesh.

The main stakeholders who are directly or indirectly involve in environment preservation and restoration are as given below**:**

1. Forest Department-
2. Department of Environment, Science & Technology
3. State Pollution Control Board
4. HPPWD
5. IPH Department
6. Mining Department
7. Industries Department
8. Rural and Panchayati Raj Institutions

5.5 Critical Environment Issues / Hot spots associated with the sector

Environment and Social issues related to Mining sector are improper siting of mining areas, impact on air quality, impact on water quality and quantity, noise pollution,, inadequate hazardous waste treatment and disposal, land degradation, impact on flora and fauna, and impact on aesthetics.

1. Improper siting of mining areas: Mineral deposits are site specific and have to be developed and mined/operated only where they exists. Hence, it is all the more important to select proper mining sites which cause least damage to environment. Some of the impacts include disturbance to environment, forest land, fertile land problems due to land acquisition and rehabilitation of land and persons displaced; disturbance to vegetation growth and fauna of the area; air, water and noise pollution; land degradation and waste disposal. Loss of aesthetic beauty etc. Department of Industries/mining wing has created land banks (both private and government land) in Solan, Una, Kangra, Sirmaur, Hamirpur, Bilaspur, Shimla and Mandi Districts for attracting entrepreneurs and investors. These areas are close to source of raw material extracted from natural resources.

2. Poor ambient air quality: Ambient Air quality/Air Pollution is due to dust generated during various processes of mining. Dust generated due to various mining activities causing air pollution are drilling; blasting; loading and unloading of mined material; on haulage roads transportation of material through trucks; fixed sources like crushers, screen, conveyors etc., Consequences of air pollution due to dust generated during mining operations may cause, visible plumes and haze; staining and soiling of surfaces; poor aesthetic or chemical contamination of vegetation, water bodies; effect on personal comfort; amenities health and occupational health hazard. Dusts containing toxic metals are Lead, Mercury, Zinc, Cobalt etc. Air Quality trends in Himachal Pradesh indicate higher concentration of Suspended Particulate Matter (SPM) in Paonta Sahib.

Removal of vegetation from the area designated for mining and other purposes produces dust which when air-borne, increases the concentration of SPM in the surrounding areas. Removal, handling, transportation and storage of soils also increases the concentration of SPM in the atmosphere. The use of diesel run equipments in these activities causes increases in level of NOx. Drilling and blasting of overburden and mineral contributes to SPM and explosive fumes into the atmosphere.

3. Water quality / water pollution / depletion of water sources: Water pollution may be caused by direct discharge of mine waste to water streams. Due to erosion and wash off from mined out areas and waste dumps, the water drained may be charged with suspended solid particulates dissolved chemicals and toxic substances, or may be acidic, alkaline, or polluted by acid mine drainage not fit the survival of fish and benthic invertebrates. Impact of mine drainage on water regime is due to degradation of surface and sub-surface water quality & alteration of surface run off and stream flow, water pollution could cause rise in turbidity and suspended matter, rise in temperature by a few degree ºC, poor aesthetic condition due to change in colours due to toxic elements, foam and froth due to mineral beneficiation, radio-activity, etc.

In the industrial area of Baddi, Barotiwala, Nalagarh, Kala Amb & Parwanoo, the water quality of the River Sirsa, Markanda and Sukhna Nallah is categorized as 'D' because of low levels of oxygen due to organic pollution. River Sirsa is categorized as A to D because industrial and domestic effluent pollutes river in Baddi, Barotiwala and Nalagarh region.

4. Noise pollution due to mining activities: The noise generated due to mining and allied equipments arises from working of machinery like loaders, dozers, locomotives, fixed plant installations like crushers, conveyors, pump, ventilation fans, mobile plants like compressed air rock drills, large portable compressors, diesel, trucks, front end loaders. Due to blasting activities, exposure to noise beyond certain level is harmful to human health and efficiency. Noise pollution has become a part of industrial and urban life. Urban people are at constant exposure to such pollution contributed by movement of vehicles and blowing of horns.

5. Waste management: Waste is generated due to removal of overburden and inter burden. Refuse from ore processing plants including slimes, mud and tailings; waste from lubricants; oil and grease from mining machinery and disposal of sub-grade mineral. External dumps are permanent sources of land pollution through wash off with rains and air borne dust through wind action. They present ugly and repulsive look. In hilly areas, the waste flowing through natural surface destroys vegetation, chokes natural drainage and run off during rainy season, spoils the surrounding landscape in terms of stability and natural land form.

6. Change in land use: Mining is a temporary land use and is not an everlasting process. The land use pattern undergoes a change due to use of land for mining, excavation, dumping and other associated activities. Where communities exist at a potential mine site, mining impacts on environment can significantly influence community attitude to the operation. Mining leads to change in topography, change in local drainage patterns etc. Topography and land use change is due to digging of open pits and dumping of over burden rock mass in the form of the heaps. The land use pattern undergoes a change due to the use of the land for mining, dumping and other associated activities. The land use in the surrounding areas is also affected due to the impact of mining on water regime. Polluted water from pits affects the characteristics of the top soil, affecting the end use. The damage pattern on the surface undergoes a change due to the alterations in the surface topography due to mining and associated activities.

7. Loss of Flora and Fauna: The mining operation causes change in flora and also have effect on the plantation in the core as well as buffer zone. Impact on fauna due to noise, land degradation and deforestation also results from change in the land use, loss of natural vegetation cover, removal of vegetation (flora) and fauna from the area is required for mining and other purposes. Pollution of water in the surrounding water bodies, due to flow of debris on the slope, affect the aquatic ecology of water bodies. Dust in the atmosphere is contributed by

the mining and associated activities. Dust when deposited on the leaves of the plants in the surrounding areas, retard their growth.

8. Poor Aesthetics / visual Impacts: Mining activities remove vegetation cover, modify the land forms, create colour contrasts and impose man made objects into natural vistas, looks sore to the eyes. The removal of vegetation from the mining area and the flow of debris on the slope give an ugly look. Summary of identification and analysis of issues is given in Table 12.

Table 12: Summary of Identification and Analysis of Issues

Issues	Causes	Impacts/Risks
1. Siting of mining areas	Mining deposits are site specific and is developed and mined / operated only where they exists.	Disturbance to environment, forest land, fertile land, etc. Problems due to land acquisition and rehabilitation of land and persons displaced. Disturbance to vegetation growth and fauna of the area. Air, water and noise pollution. Land degradation and waste disposal etc. Loss of aesthetic beauty etc.
2. Ambient Air quality/Air Pollution due to dust generated during various processes of mining.	Dust generated due to various mining activities causing air pollution. Drilling, Blasting Loading and unloading of mined material On haulage roads transportation of material through trucks. Fixed sources like crushers, screen, conveyors etc. Dust blows.	The consequences of air pollution due to dust generated during mining operations may impact. Visible plumes and haze. Staining and soiling of surfaces. Aesthetic or chemical contamination of vegetation or water bodies. Effect on personal comfort, amenity and health. Occupational health hazard like. 'Silicosis' a serious life threatening lung disease caused due to mining and quarrying of silicate minerals. 'Mesothelioma; a type of cancer caused due to exposure of asbestos mining – also termed as – "asbestosis". Dusts containing toxic metals namely Lead, Mercury, Zinc, Cobalt etc.
3. Water quality / water pollution / depletion of water sources.	- Direct discharge of mine waste to water streams erosion and wash off from mined out areas and waste dumps. The water drained may be charged with suspended solid particulates dissolved chemicals and toxic substances, or may be acidic, alkanine, or polluted by acid mine drainage not fit the survival of fish and benthic	Impact of mine drainage on water regime due to degradation of surface and sub-surface water quality. Alteration of surface run off and stream flow. Water pollution could cause following harmful effects. Rise in turbidity and suspended matter.

Issues	Causes	Impacts/Risks
	invertebrates. - Drilling and Plasting	Rise in temperature by a few degree ºC. Aesthetic pollution due to change in colour due to toxic elements. Foam and froth due to mineral beneficiation. Radio-active pollution Lowering of watertable and depletion of water resources.
4. Noise pollution	The noise generated due to mining and allied equipments arises from: Working of machinery like loaders, dozers, locomotives etc. Fixed plant installations like crushers, conveyors, pump, ventilation fans. Mobile plants like compressed air rock drills, large portable compressors, diesel, trucks, front end loaders etc. Due to blasting and drilling activities.	Exposures to noise beyond certain level is harmful to human health and efficiency. The generation of unreasonable noise within the environment affects people adversely. Interference with sleep. Effect on hearing Effect on communication. Effect on mental and physical health. Effect on working efficiency. Continuous exposure of workers to high level of noise may result into Annoyance Fatigue Hypertension Loss of hearing Temporary shift in threshold limit of hearing. Other anatomical disturbance like change in breathing amplitude, gastric secretion etc.
5. Waste management	Removal of overburden and inter burden. Refuse from ore processing plants including slimes, mud and tailings. Waste from lubricants, oil and grease from mining machinery. Disposal of sub-grade mineral.	External dumps are permanent sources of land pollution through wash off with rains and air borne dust through wind action. They present ugly and repulsive look. In hilly areas, the waste flowing through natural surface destroys vegetation, chokes natural drainage and the run off during rainy season, spoils the surrounding landscape in terms of stability and natural land form.

Issues	Causes	Impacts/Risks
6. Change in land use.	Mining is a temporary land use and is not an everlasting process. The land use pattern undergoes a change due to the use of land for mining, excavation, dumping and other associated activities.	Where communities exist at a potential mine site, mining impacts on the environment can significantly influence community attitude to the operation. Change in topography. Change in local drainage patterns etc.
7. Loss of Flora and Fauna	Development of Mining areas, Drilling, Blasting and Excavation	Loss of natural vegetation cover. Displacement / dispersion of fauna Degradation of land
8. Poor Aesthetics / visual impacts	Mining activities remove vegetation cover, modify the land forms, create colour contrasts and impose man made objects into natural vistas.	Looks sore to the eyes

5.6 Environment initiatives taken by sector to address critical environment issues

i. Zoning Atlas & Associated Activities: Apart from its regulatory role, the State Pollution Control Board is undertaking a pro-active visionary approach by making use of scientific tools such as GIS application for environment management etc. To undertake the Spatial Environmental Planning Program, the State Board has a state of the art facility in terms of infrastructure and technical manpower. It has so far covered all the districts under Zoning Atlas for Siting of Industries. In addition, the State Board has also taken lead towards revising all these zoning atlases as per the modified criteria devised by the Central Pollution Control Board and the Ministry of Environment and Forests, Govt. of India and consequently more sites are available now for sustainable industrialization. The summary of the activities undertaken/being undertaken by the State Board in order to achieve the objectives of sustainable industrialization are as follows:

1. Zoning Atlas for Siting of Industries for all districts of the State.
2. Industrial Estate Planning for Baddi, Barotiwala-Nalagarh in Solan and Paonta Sahib in Sirmaur.
3. State Environmental Atlas of Himachal Pradesh.
5. District-wise Environmental Atlases for Solan, Sirmaur, Kangra, Mandi & Hamirpur and remaining districts are also being covered.

ii. Policy Guidelines for Registration, Location, Installation and working of stone crushers in Himachal Pradesh. (notified on 11/8/2004): On the directions from the Hon'ble High Court of H.P. in CWP No. 228/02 titled as Sh. Desh Raj Vs State of H.P. and titled as others, the State Government has notified the Policy Guidelines for Registration, Location, Installation and Working of stone crushers in Himachal Pradesh. It defines procedure for registration and installation of stone crushers as per siting parameters notified by the Department of Science and Technology on 29/4/03 and 10/9/04.

iii. Noise monitoring: The State Pollution Control Board monitors noise in Shimla, Solan, Baddi-Barotiwala, Nalagarh and Una/Mehatpur areas. Solan and Baddi-Barotiwala recorded high noise pollution than Shimla. Noise and vibrations due to blasting and operation of the machines drive away wild animals and birds from the nearby forest.

5.7 Environment related studies carried out in the sector

Studies/reports done by Geological wing

1. Geological Report on the Saline Water Spring Located Around Village-Hiran, Near Jwalaji In District Kangra of Himachal Pradesh.
2. Ageological report on the site proposed for improvement of flow irrigation scheme Langja in Gram Panchayat Langja Tehsil-Spiti, District Lahaul & Spiti.
3. Geological note on the Construction of Bridge over Lingti Nala near Village Rama in District Lahaul and Spiti.
4. Geotechnical Report in respect of Soil Erosion, Sinking of Land and Landsliding at Ridge,"The Mall" on Shimla District, Shimla, Himachal Pradesh.
5. Geological Report on the Stability of Hill Slope for the protection of
6. Radha Swami Satsang Beas building complex, Shimla
7. Geotechnical report in respect of Soil Erosion, Sinking of Land and Landsliding at Barog, District Solan, Himachal Pradesh.
8. Feasibility report: District Una, HP

5.8 Environment monitoring/ impacts for the activities related to the sector

There is no environment monitoring mechanism within the sector. Environment monitoring is carried out by State Pollution Control Board.

5.9 Institutional mechanisms within the sector to address identified environment issues

Geological Wing: The Geological Wing was set up in the Department of Industries, H.P. in the Year 1964 -65 with only one Geologist, who was heading the Organisation on deputation from Geological Survey of India. On the reorganisation of erstwhile State of Punjab, in November 1966, majority of Geologist and staff were allotted to Himachal Pradesh. Thus a well equipped Geological Wing started functioning in the Himachal Pradesh from Nov, 1966 with following functions:

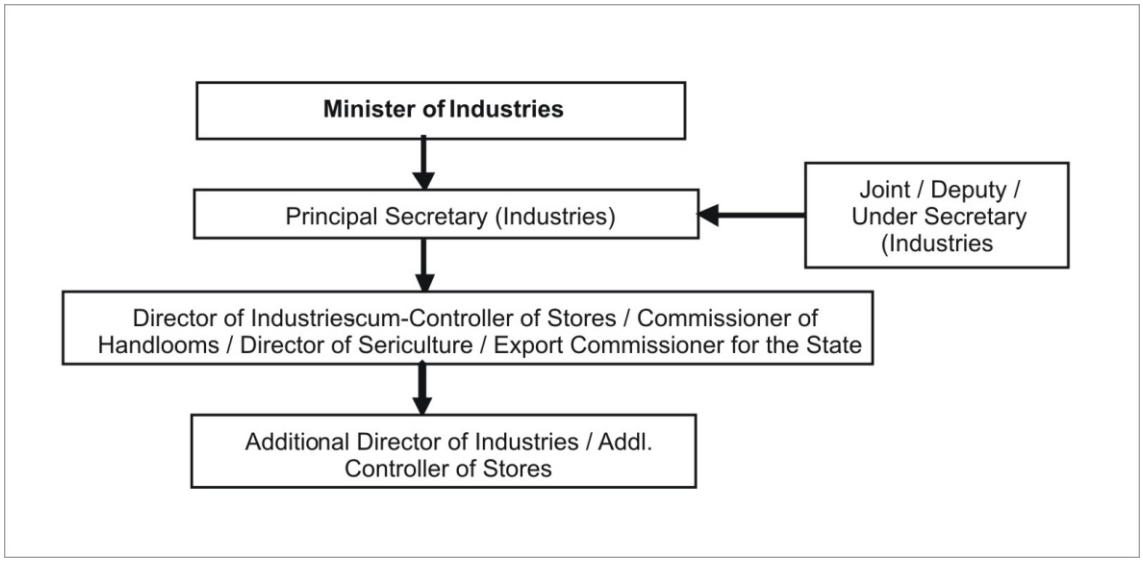
- Exploration of mineral wealth of the State for their scientific and economical exploitation and setting up of mineral based industries like large cement plants etc.
- Development and regulation of minerals by granting various mineral concessions through leases, auctions, short term permits etc. Implementation of River/Stream Bed Mining Policy, 2004, Policy guidelines for Registration, Location, Installation and Working of Stone Crushers in Himachal Pradesh, Court Cases, redressal of complaints etc.
- Preparation of Survey Document of each District;

- Scrutiny of Mining- cum – Environment Management Plans;
- Carrying out geo-technical studies/investigations of bridges, buildings, landslides, road alignments, hydro-electric projects, I&PH schemes, Geological, stability / feasibility report of various roads constructed under PMGSY. As per the user agencies demands (approximately 60 assignments per year) etc.
- Geo-environmental studies of lakes, geothermal studies etc.

The Director of Industries is the overall in-charge of the Directorate including the Geological Wing. Geological Wing is headed by the State Geologist who works under the control and supervision of Director of Industries. The State Geologist is further assisted by Geologists and Assistant Geologist and by the Mining Officers in the field, apart from the supporting staff from drilling, surveying, draughtsman and ministerial staff.

Organizational chart

The organisational chart of the Industries Department is as indicated below:



Store Purchase Organisation	Administration	Industrial Development
Additional. Controller of Stores Joint Director of Industries Tehsildar Naib Tehsildar Store Inspection Officers Superintendent Gr.-I S.O. (Audit)	Addl. Director of Industries (Admn.) Assistant Controller (F&A) Superintendent Gr.-I	Industrial Advisor Joint Director of Industries Project Co-ordinator Deputy Directors of Industries Manager
Geological & Mining	**Sericulture**	**Handloom**
State Geologist Geologists Assistant Geologists Driller Superintendent Gr.-I S.O (Audit) Assistant Driller Lab Assistant	Project Co-ordinator	Dy. Director of Industries

Field Offices

District Industries Centre	Mining
General Managers Managers/ Member Secretaries, SWCAs, Parwanoo, Baddi, Nalagarh,Paonta Sahib, Kala Amb,Sansarpur Terrace, Gwalthai,& Damtal Industrial Promotion Officers Economic Investigators Extension Officer (Industries) (Block Level)	Mining Officers Mining Inspectors Assistant Mining Inspectors Mining Guards

5.10 Data / documentation pertaining to addressing demographic issues in the context of the sectors, such as population changes; requirements of populations and changing lifestyles; migratory populations including tourists; transhumants; transit labour population; pressures felt by communities due to degraded environment conditions.

The location limestone bearing belts of the Sirmaur District are as given below in the **figure 5.**

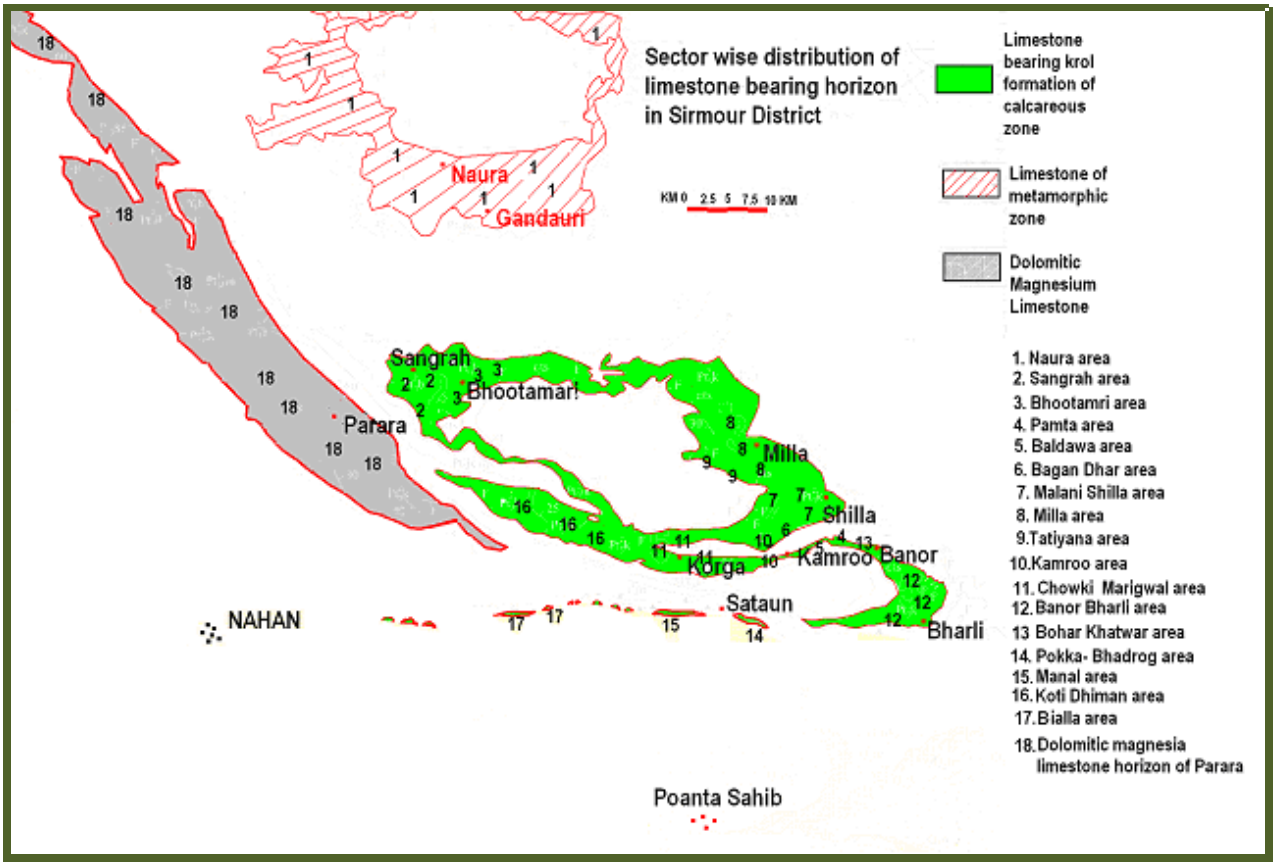


Figure 5: Location Limestone bearing belts of the Sirmaur District

Solan District

a) Arki Limestone deposit: Low silica (L.D. grade) limestone deposit of Basantpur Formation have been investigated by the

Geological Wing, Department of Industries, H.P. The deposit is situated 2 Km NNW of Arki on Shalaghat- Kunihar Road and lies between longitudes 76^0 58' 02"- 76^0 58' 24" and latitudes $31^0$11'05"- $31^0$11'36".A total of 87 million tonnes of reserve had been proved in this area. The average chemical analysis is given below in Table 13.

Table 13: Chemical analysis Arki limestone deposit

Constituent	%age
CaO	53.78
MgO	1.10
SiO_2	0.50
R_2O_3	0.35
Fe_2O_3	0.11
Al_2O_3	0.25

The area has been leased out to National Mineral Development Corporation.

b) Kashlog- Mangu Limestone deposit: Limestone deposit having a strike length of about 1.2 Kms with an average width of upto 0.5 km, suitable for cement manufacture had been investigated by the Geological Wing, Department of Industries. The Geological reserve in the Kaslog Mangu area, Tehsil Arki, District Solan is given below in Table 13.

Table 14: Kaslog & Mangu limestone deposit

Block	Reserve in Million Tonnes			
	Proved	Probable	Possible	Total
Western (Kaslog)	40.53	6.54	3.88	50.96
Eastern Mangu	85.41	21.20	24.13	130.74
Total	125.94	27.76	28.01	181.7

c) Bagga - Bhalag limestone Deposit: The deposit is located between latitude $31^0$19'04"N -$31^0$20'58"N and longitude $76^0$52'45"E - $76^0$55'04"E in Mangal, area of Solan. The deposit had been investigated by the Geological Wing, Department of Industries. The average chemical analysis of the Bagga- Bhalag Limestone deposit, is given in Table 15.

Table 15: Chemical analysis of the Bhalag & Bagga limestone deposit

Constituent	%age	
	Bhalag Block	Bagga Block
CaO	46.81	40.00
MgO	2.44	1.75
SiO_2 (Insoluble)	10.94	20
Fe_2O_3	0.69	1.2
Al_2O_3	1.17	2.30
LIO	38.02	33

B. Baryte

a) Sirmaur District: The barytes deposits in Sirmaur district is usually associated with Krol limestone and appear to have formed by the process of replacement. The mineral occur in either pure form of admixed with dolomite of the Krol Formation. In the Jogar- ka- Khala however it is associated with Balaini Boulder beds.

i) Kanti (30^0 37' N – $77^0$38' E): The deposit is situated about 1 km SSE of Kanti on the northern slope of the hill. The mineral occurs associated with Krol limestone in the form of a vein which has an average width of 7 metres and is traceable for about 50 metres. Further to east, three or four other small outcrops of barytes are met with the same strike but these are comparatively small and the mineral is also greatly admixed with dolomite. In some cases, the specks of galena mineral were also found associated with barytes. The deposit was first prospected by the Sirmaur Mineral Development Corporation when five or six trenches were put in the main vein across the deposit.

ii) Tatyana (30^0 38' 30"N – $77^0$38' E): The deposit is situated about one km south east of Tatiyana Village on the northern slope of limestone hillock near a spring. This occurrence is similar to nature to that at Kanti with the difference that here the mineral is very much admixed with dolomite. The zone of baryte covers an area of 350 X 120 metre on the slope of the hill. This area was also first investigated by the Sirmaur Mineral Development Corporation.

C. Rock Salt

a) Mandi District: The rock salt occurs in Guma (31° 58':76°51') and Drang (31° 46': 76° 56') areas. The total reserves of rock salt are about 75 million tonnes. Chemical analysis indicates on an average insoluble impurities 21%, KCL 3 % and NaCl about 70.40% and the rest consisting of CaO, $CaSO_4$and MgO. Detailed geological work and drilling has been carried out to assess the grade and reserves. Drilling data shows that except for minor intercalation of non productive beds (clay, quartzite, etc.) the cores are composed of salt throughout the area investigated. Chemical analysis show that the average salt content is over 70% and with depth no regular change in the salt content is indicated. Besides Drang, saline grits occur intermittently in discontinuous patches over a linear distance of 18 kms northwest of Mandi The important occurrences of this salt grit are: Megal (31°45': 76°57'), Drang, 931^0 48^0 20"; 76^0 57^0 00") Herkalan (31° 56': 76° 52'),Guma (31° 56': 76° 51'), Dewalkhas (32° 05': 76° 40') and Kandbad (32° 071: 75° 35').

i) Drang -Gumma Rock Salt deposit: Rock Salt has been extracted since long in Mandi hills at two locations namely Drang and Gumma. These mines were transferred to M/s Hindustan Salts Ltd. in 1963, after acquiring these from erstwhile Mandi State by Govt. of India. Mandi Salt belt extends from Mandi to Jogindernagar and even further, but three places viz. Megal, Drang and Gumma where Salt is known to occur, lie along N.H.-20. Drang is at a distance of about 40 Kms. from Jogindernagar and about 17 kms. ahead of Mandi.

b) Kangra district: Thin, white, saline encrustation forms on the surface of pebbles and rocks near Behna (31°22':77°23') are observed.

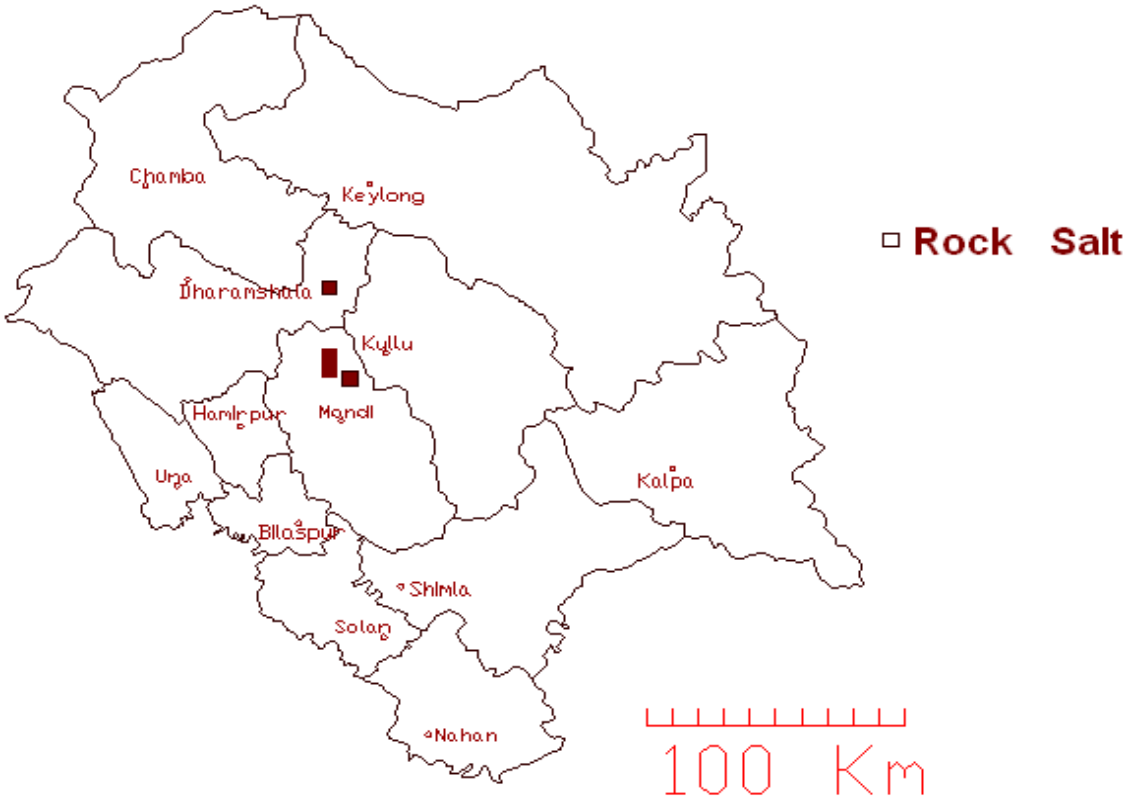


Figure 6: Occurrence of rock salt in Himachal Pradesh

D. Silica Sand

a) Una District: Deposits to the tune of 2.5 million tonnes have been envisaged up to a depth of one metre, by the Geological Wing Department of Industries, Himachal Pradesh in the Bathri, Gardhala & Padhauri Khads of the Una District. The reserve in long run may prove to be much more because of the replenishment of boulders by seasonal high water Khads. Stream beds form the boulder deposits, the source for which is boulder conglomerate of the Upper Shiwalik. All the khads are situated 18 to 33 km in the south west of Una and they lie within a distance of 15 km. The area covered includes both regular and abandoned courses. Regular course is that part of stream which gets water during rainy season and abandoned courses are the dead course. Regular courses cover 3,097,725 sq. metres in the various khads. Thickness of the deposit varies from one to three metres. One metre of depth was taken into consideration while calculating the reserves and to fix the easily quarriable depth. All the deposits comprise quartzite, sand and fraction of granite, limestone and breccia-fragments. Quartzites are white, spotted white, greenish white, blackish grey, pink, purple to greyish green. The entire material of the stream beds has been classified as white, spotted white, greenish white, quartzite fragments, gravel and sand. Quartzite fragments are rounded, sub-rounded and discoidal in shape having smooth surface. Their size varies from gravel to boulder. Gravel has not been taken into consideration because its hand picking would be uneconomical. During the monsoons, these beds are replenished to a very large extent from the Shiwalik rocks due to erosion by heavy flows. The result of chemical analysis of silica boulders of the Una District is given below in Table 16**.**

Table 16: Chemical analysis of silica boulders of the Una District

Constituent	Pure white boulders	Spotted white boulders	Greenish boulders
SiO_2	98.035 %	98.053 %	97.678 %
Al_2O_3	1.386 %	1.274 %	1.50 %
Fe_2O_3	0.110%	0.133 %	0.21 %
TiO_2	Nil	Nil	Nil
CaO	0.1 %	0.135 %	0.17 %
MgO	0.056 %	0.056%	0.109 %
Loss of Ignition	0.0286 %	0.319%	0.306 %

b) Bilaspur District: Soft white quartzite, found near Sirha (51°21': 76° 47'), Aruali (31° 18' : 76° 47'), Banda (31^0 19' : 76° 47') and Solag (31° 21' : 76° 50'), may be suitable for glass industry.

c) Kangra District: Soft quartzite boulders which yield good glass sands on crushing occur near Barhwain (31° 48': 76° 08') and on the Bastram ridge. Smaller deposits also occur in the Khads near Bhadroa (32^0 15' : 75° 41').

E. Building Stones: The principal rock types used as building stone are limestones (including marbles), sandstones, slates and granites. Building stone is also commonly referred to as 'Dimension Stone' in many countries. Building stones are naturally occurring rocks of igneous, sedimentary or metamorphic origin which are sufficiently consolidated to enable them to be cut or shaped into blocks or slabs for use as wall, paving or roofing materials in the construction of buildings and other structures.

Important building stones which area mined in Himachal Pradesh is slate, sandstone and quartzite and river borne material e.g. boulders, cobbles etc)

1. Slate: Slate is a fine grained, hard, compact, cleavable rock derived from microcrystalline metamorphic rocks of clays and shale and possesses a cleavage that permits it to split readily into thin smooth sheets. The thin layers split along the cleavage planes may cut across bedding planes. The metamorphism of shale by

:

pressure produce slates which are characterized by the presence of close-set planes of cleavage along which they can be split easily into thin sheets. The cleavage plane is related to the direction of pressure to which the material was subjected and not to the bedding plane. Slate has emerged as an alternative to granite and marble which are comparatively costly. Slate has the aesthetic value like other dimension stones i.e. granite and marble. Slate is cut and fabricated into dimensional form. Slate is categorized into minor and major minerals in the country depending on its end use. The slate industry has received a boost in recent years due to increased interest in architecture. The export of slate has increased, over the years. The major use of slate in foreign markets is in roofing tile, but other uses as flooring tile and cladding are also picking up.

Occurrences: Himachal Pradesh is known in the country for its good quality of slate, which find place in foreign market also because of its pleasing colour, durability and uniformity in thickness. The art of extraction of slates is known to the local people of the area since generations. The good quality thick bands of slates occur in Chamba, Kangra, Mandi, Kullu district and to some extent in Shimla, Sirmaur and Kinnaur, & Solan district. Slates are confined to Kullu Group, Shimla Formation, Chamba Formation, Jaunsaur Formation & Katargali Formation.

As per rough estimate there are about 81 million tonnes of the inferred reserves of slate in the State. District wise slate reserves in the State are given below in Table 17.

Table 17: Reserves of the slate

District	Reserves in tonnes
Chamba	32000000
Kangra	7000000
Kullu	19000000
Mandi	11000000
Shimla	9000000
Kinnaur	2000000
Solan	1000000
Total	**81000000**

District wise important slate occurrence is described below.

a) Chamba district: Good deposits of slate, suitable for roofing, paving and fencing purposes occur in Kullu, Chamba and Katarigali Formations in different parts of Chamba district.

In Kullu Formation, the slates are confined to its middle part. Good deposits of slate suitable for roofing, paving and fencing purposes occur in a zone nearly seven kms in length extending from near Talai (32^0 21' 55" : 76^0 04' 30") to northwest of Makotsu (32^0 24' 50" :76^0 01' 10"). The slate belt attains its maximum thickness of 884 metres in Chakki nala and minimum thickness of 200 metres near Makotsu.

The following are the important slate occurrences in the formation:

(I) Rupaina (31^0 22'00": $76^0$03' 35") -Nargal (32^0 22' 15": 76^0 02' 25") area: The slate belt in this area is 240 m thick and extends over a strike length of above 800m. The probable reserves estimated are of the order of 5, 18, 400 tonnes.

(ii) Bhora (32^0 23' 05": $76^0$02' 50")-Bela ($32^0$22"40": $76^0$02' 15") area: The slate horizon in this area is about 560 m thick extending over a strike length of about 900m. The probable reserves are of the order of 1,360.800 tonnes.

(iii) Chaunda Devi (l32° 24' 40": 760 01' 50") area: The slate deposit is 320 m thick and extends over a strike length of about 700 m. The probable reserves are of the order of 6,04,800 tonnes.

(iv) Renda (32^0 24' 40" : $76^0$01'15") area: The slate horizon in this area is 160 m thick and extends over a strike length of 400 metres. The probable reserves are of the order of 1,72,800 tonnes.

(v) In Chuari (32^0 25'50" : 76^0 01' 00")-Dalhousie (32^0 34': 75^0 58') area, five horizons of slate have been recorded in

Kullu Formation. Out of these, the two top most horizons contain good quality slate.

The slate bearing localities in this area are:

Khotri {32°25'55":76^{0}02' 10"), Chamari (32°26'00":76^{0}01'15"), Debrera (32°27'10":76°00'10"), Dabriara (32°28' 55":76° 00'25"), Kophru (32° 59' 00": 76°00'10"), Base (32°29'10":76° 59' 45"), Dramman (32°29'50":75°59'25"), Sugalu (32°31'00":75°59'10"), Sappar (32°30'50":75°58'35"), Kunna (32°31'10":75°58'35"), Basti (32°31'15":75°58'35"), Kathu-Ka-Khol (32°29' 55" : 75°58' 45"), Thanoli (32°00'15" : 75°58'30"), Grarana (32°29'30" :75°58'00").

The total reserves of cleavable slates occurring in the area, between Kalm Nadi in the southeast and near Sapri (32^0 33' 25" : 75^0 58' 35")in the north west have been estimated to be of the order of 11,505,000 cu m. The reserves have been calculated upto a depth of 15ml.

(vi) In the Chamba Formation, fairly good deposits of slate occur in its middle and upper parts in the area north and north east of Rakh. This formation, in fact, is the main source of slates being produced in the Chamba and Bharmour tehsils of this district. The important slate bearing localities are Dulara (32°29'05":76°14'35"), Dhanara (32°26'25":76°14'45"), Se (32°29'40":76°14'30") and Panthal (32°28'55":76°14'30"). The investigation carried out in the slate belt in the area between Sajhot (32°30'05:76°13'55") to near Dudiana (32°28'50":76° 15'20") have revealed the probable reserves of the order of 18.4 million tonnes. In the Katarigali Formation a zone of dark grey black shale/slate has been traced from near Kandail in the northwest to near Gharola (32°26'10":76°27'10") in the south west.

b) Kangra district: A more or less continuous slate belt of variable width and thickness occur over a strike extension of about seven kilometres from a little west of Bhagsunath (32^0 14' 40": 76^{0}20'00") in the south west to near Chamba Pass (32°17'04":76°15'10") in the northwest. The belt comprise two slaty horizons of variable widths occurring at different stratigraphic levels within the Kullu Formation. One of the horizons occurs at the base of streaky and gneissose quartzite. is about 75 metres wide and has an average width of about 120 metres. The important slate occurrences are as under:

(I) Dharamkot (32°15'05":76°19'15") area: The slate horizon in this area is 210 m thick extending over a strike length of 1750 m. The probable estimated reserves are of the order of 9,92,250 tonnes.

(II) Ab Got (32°16'50":76°17'35") area: The slate horizon in this area is 40 m thick and extends over a strike length of 200 m. The probable estimated reserves are of the order of 21,600 tonnes.

(III) Area north of Bhatti (32°16'45":76°15'15"): The 60 m thick slate belt extends over a strike length of 100 m. The probable reserves are of the order of 1,62,000 tonnes.

The above area is known for important Khaniyara Slate mining. Mining in this area started along Manjhi and Manuni Khad in 1850. In 1867, Mr. R. W. Shaw established "Kangra Valley Slate Quarry" and worked till independence in 366 Acre (146 hectare area), 204 Acre in Manuni Khad and 162 Acre in Manjhi Khad. Then, it were worked by the Khaniyara Gabli Dhar Slate Quarry Board.

2. **Sandstone and Quartzites:** Sandstone and quartzite suitable for building occur throughout the geological column and have a State wide distribution. The general description of the Formations bearing building stone of quartzite, sandstones, quartzarenite, suitable for

the construction purpose is given in Table 18.

Table 18: State wide Distribution of Mineral

Formation	Approximate reserve in Million tonnes
Shiwalik	18000
Sirmaur	13000
Ladungsari	3000
Lilang	1500
Kuling	6000
Lipak	1300
Sanugba	300
Tal	1200
Krol	1000
Infrakrol	80
Jaunsaur	1800
Shimla	2400
Kullu	10000
Shali	2000
Largi	300
Rampur	7600
Dharagad	200
Sundernagar	400
Jutog	4700
Total	**74780**

3 River borne material: The cobbles, pebbles and boulders of the Newer Formation are the important source of raw material for the stone crushers in Himachal Pradesh.

F. Other Minerals

1. Asbestos

a) **Kangra district:** Small occurrence of asbestos of uneconomic nature occur in a nala south east of Kami village (32°12': 78°35').

b) **Mandi District:** The highly weathered basaltic rocks of Darla volcanics exposed along the right bank of a small nala flowing between Ardhi and Badsar contain very thin fibres of asbestos.

c) **Shimla district:** Chrysotile asbestos was observed by Captain Palmer in association with a dolerite dyke on the Shali ridge north of Shimla. The occurrence of Asbestos in Himachal Pradesh is given in figure 7:

Figure 7: Location of occurrence of Asbestos in Himachal Pradesh

2. Bauxite

a) Shimla District

(i) Occurrence of bauxite has been reported about one kilometre northeast of village Deharu (30°49':77°39'). The bauxite forms basal part of the Subathu Formation (Eocene). It occurs at a number of places as localized pockets which range in thickness from one to three metres but generally do not extend laterally beyond 10 metres. The bauxite is earthy pale-grey and brownish in colour and is characterised by well developed pisolitic texture. Sample of bauxite on chemical analysis indicated the presence of Al_20_3 55.10% $Si0_2$ 24.97%, Fe_2O_3 1.20% TiO_2 5%

(ii) In Chapla area (31°03':77°11'), the bauxite deposit occurs mostly as lateritised rocks at the base of the Palaeocene Kakra rocks. Thickness and length of the zones vary from one to five metres and one to five kilometres respectively. The deposit is low in alumina and high in silica content.

b) **Sirmaur district:** In Benchi area (30°47':77°37'), bauxite occurs in isolated patches at the base of Eocene/Palaeocenc rocks i.e. Kakra and Subathu Formations. The deposit contains low alumina and high silica. Bauxite is also reported near Nahan (30° 33':77°16') and its outcrop is buried under a landslide.

c) **Solan district:** In Deothal area (30°51":77°10"), bauxite occurs as pisolitic ore having a thickness of one to five metres traceable for about 1.5 km.

The occurrence of bauxite in Himachal Pradesh are as given below in the **Figure 8.**

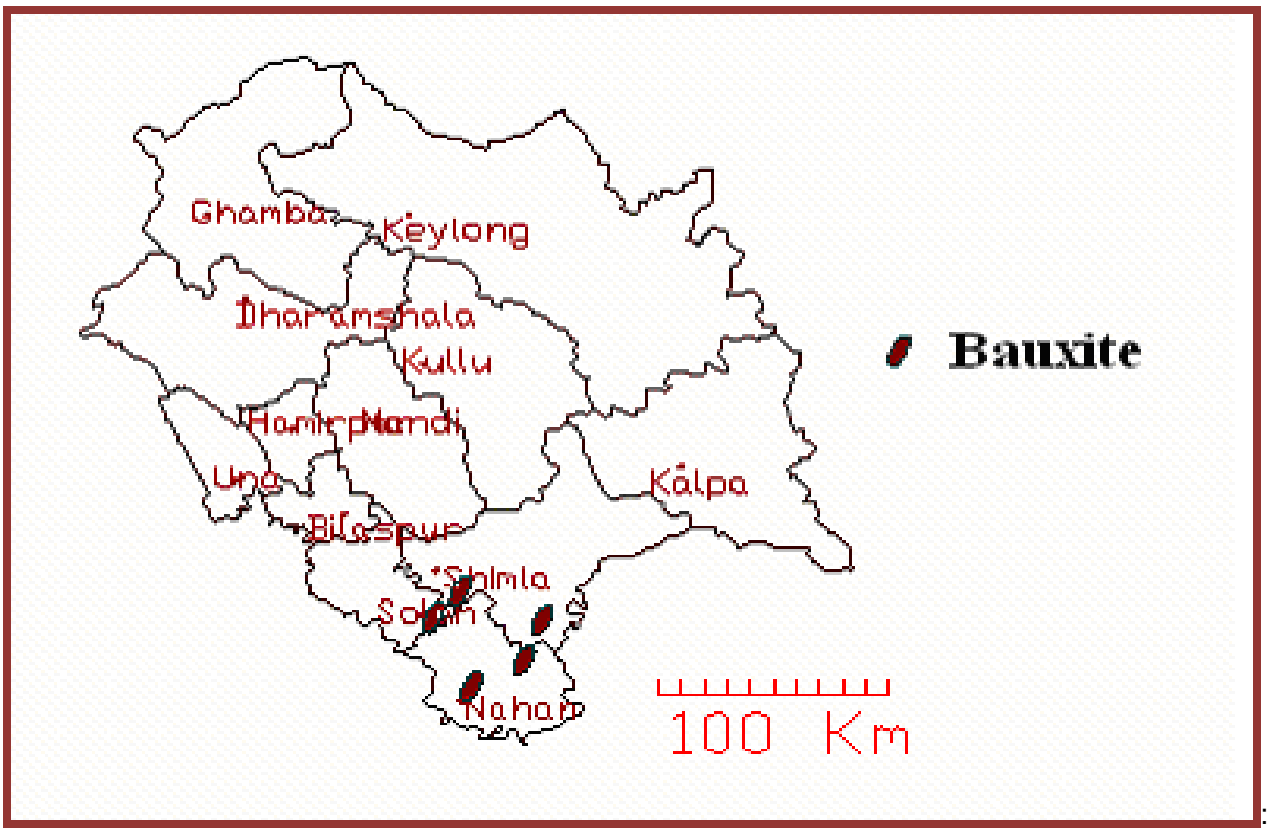


Figure 8: Location of occurrence of Bauxite in Himachal Pradesh

3. Beryl

a) Chamba district

(i) Beryl bearing pegmatites have been located in Kilar gneiss around Haksu bridge (33°05':76°23'0.

(ii) Pegmatite bodies with beryl have been found within gneisses of Kilar Formation. The pale yellow to light bluish-green beryl occurs at about one kilometres east of Dehda nala bridge (33°05'10":76°22'30") and about 1.5 km south of Jules (33°05'35":76° 23'15". The visual estimate of beryl in pegmatite is less than 0.5%.

b) Kinnaur district

(i) Pale blue beryl has been reported from the Wangtu bridge (31° 32': 78° 15') and for some distance up the Satluj and Shipki La (31°49':78°45') Pass.

(ii) Beryl associated with pegmatite has been reported from near Riuni village (78°04'20":31°04'16") and Nalgan Ghatti (31°19'20": 78°12'15").

(iii) Sporadic bluish coloured transluscent hexagonal crystals of beryl are noticed in the pegmatites intrusive into the schistose rocks of the Vaikrita Group in Morang (31°36'00':78°26'30') Tirung (31°34'30': 78°27'00') area.

(iv) Greenish blue beryl is found in the pegmatite along its contact with the country rocks near Ribba (31°35'15':78°22'00") and near the confluence of Kashanj Khad and Satluj river.

(v) Small crystals of beryl within pegmatite veins traversing the Rakcham granite have been reported from the area between Pangi (31°36': 78°21') and Akpa (31° 35'00": 78° 22' 45").

c) Kullu district

(i) Beryl bearing pegmatites intrusive into gneissoses schist and granites have been reported from Sara Umga Thach (32°10':77°29') and north east of Pando Seo Thach (31°56' 30":77°40'30").

(ii) Sporadically beryl is found associated with pegmatites in Mantalai (31°51'45":77°47' 15") area and in Tanang Khol (31°57':70°33').

(iii) Crystals of beryl measuring upto eight cms in length are found associated with the pegmatites at Munni Thach (31°59'45":77°39'45") and Piangniru Thach (32°14'30": 77°18'30"). The occurrence of Beryl in Himachal Pradesh is as given in figure 9.

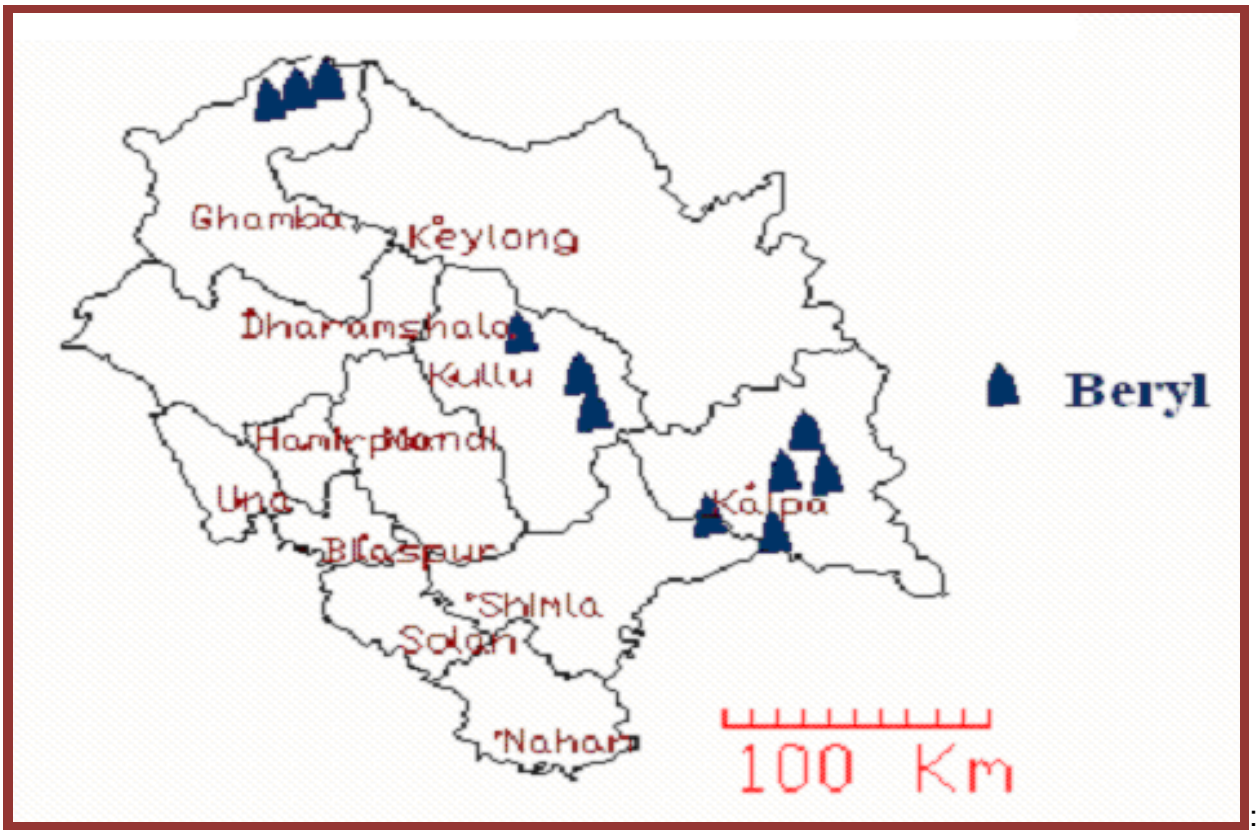


Figure 9: Locations of occurrence of Beryl in Himachal Pradesh

4. Clays: Clay occurrences in Himachal Pradesh can be broadly classified into (i) lacustrine and fluvial, (ii) residual associated with granite and (iii) associated with the Middle and Upper Shiwaliks.

a) **Sirmaur district:** Brick -clay of fluvial origin occurs at and around Sirmur Tal (30°32' 30": 77°39' 20"), 16 kms north of Paonta Sahib. Similar clays also occurs along the Nimba -ka - Khala, The occurrence extends for 500 metres with an average width of 80 m. The average thickness is 3.38 m with 1.2 m thick overburden. Other occurrences of this type of day are at Rati Kharak (30°31'00":77°32' 10") and Kalidhang (30°36'30":77°39'30"). At Rati Kharak the clay occurs in an area, 480 m in length and 120 m in width. The thickness of the clay is two metres. In Kalidhang area, the clay occurs on both sides of Khasuda Ka Khala. The deposit is 540 m in length and 180 m in width. Thickness varies from 20 m to 30 m. The deposit contains clay bands of varying colours. The clay bands are inter layered with bands of gravel, pebbles and sandy loamy soil. The varved nature of the clay deposit indicates that the clay is of lacustrine origin. The reserves of the clay around Kalindhang are about 2.93 million tonnes upto a depth of 20 m. The location of the clay deposit in Sirmaur district are as given in **Figure 10**

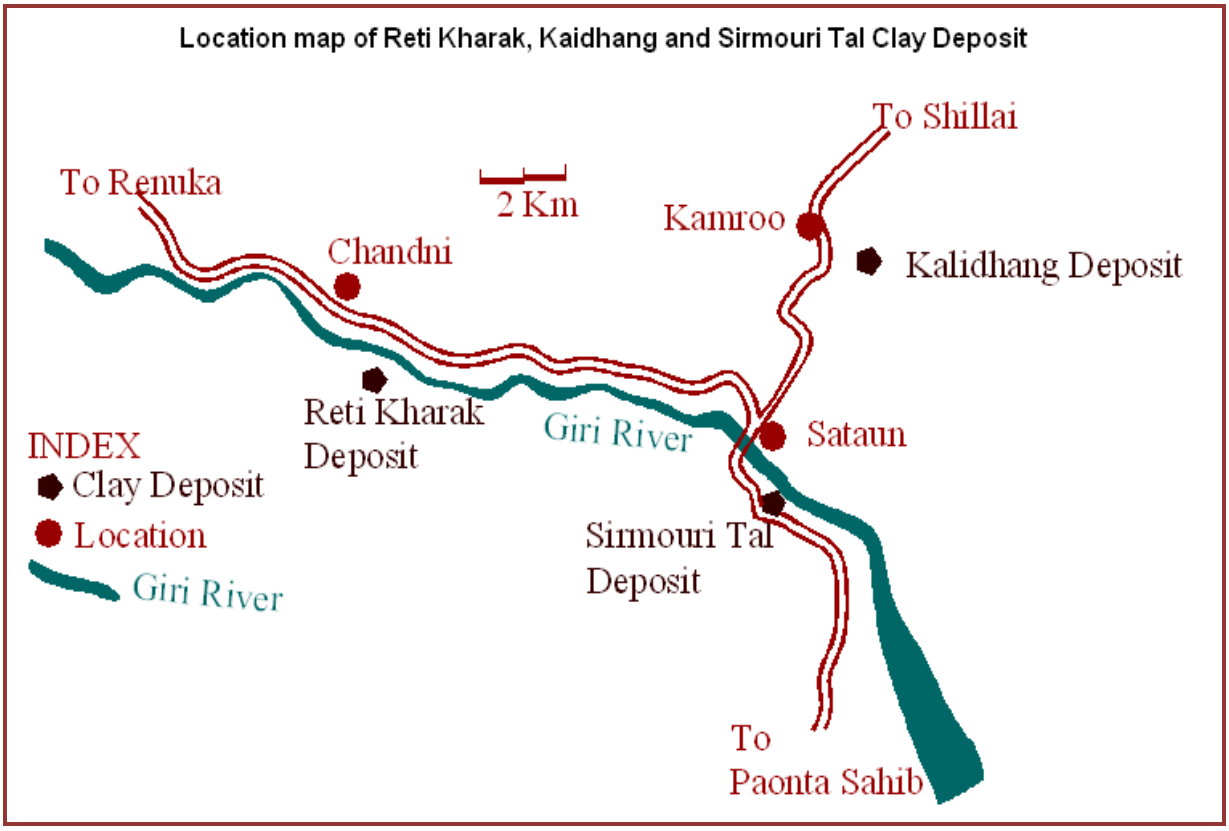


Figure 10: Locations of the clay deposit in Sirmaur district

b) **Kangra district**

(i) Yellow coloured clay has been reported from three kilometres west of Shahpur (32°13':76°12").

(ii) Light grey to whitish grey clay bands varying in thickness from half to three metres and having 90% clay contents has been reported from Middle and Upper Shiwaliks, at Khajan (32°19'30":75°54'05"), Indpur (32°091 30":75°44' 00"), Paliana(32°09'00") 75°54'30") Kothar (32°04'34":75°52'10") and Hatli (32°05'05":75°50'50") in Nurpur Tehsil. Reserves of white clay of Kothar area are of the order of 15,000 tonnes. The clay is composed of montmorillonite, kaolin, quartz, carbonate and Fe-oxide. Reserves of clay of Hatli area are around 5070 tonnes. The clay contains montmorillonite, illite, kaolinite, quartz, muscovite and albite.

c) **Kinnaur district**

China clay occurs as alteration product of granite, gneiss and pegmatite near Lipa (31°39':78°24'). Lacustrine clays occur at Shalkar, Chango and Ganfa along the Spiti river.

d) **Kullu district**

China clay occurrence has been reported from near Bathua (31°28':77°32') which is locally used for white washing.

e) **Lahaul & Spiti district:** Two lacustrine clay pockets have been reported at Kioto (32°56':77°55') and Atargoo (32°78°10'). The first one is about 500 metres in length with a maximum width of 80 metres while the latter one is 250 metres in length with a maximum thickness of 15 metres.

f) **Mandi district** : Small irregular pockets and lenses of clay are found within the weathered muscovite granite, tourmaline -muscovite granite, porphyritic granite and pegmatite of Mandi -Karsog granite complex at Mohi

(31° 35':76° 55'), Seri Chak (31° 06' 54": 76° 55' 45"), Seul (31°40'36":76°55' 36"), Saul Khad (31° 40'28':76°53J'27"), Dhalar (31°35'24":76°55'30"), Batala Beh (31°15'50":77°13'20"), Karsog (31°23'00":77°12'00"), Chichot (31°33'00": 77°01'00"), Garaich (31°24'30":77°14'45"), Negi Nal (31°26' 00':77°11'00"), Bashaich (31°26'15":77°13'30"), Phaish (31°27'00":77°05'15"), Tarai (31°35'09":76°59'56"), Dopha (31°31'33":77°01'22"), Nid (31°32'20";77°01'00"), Oangthar (31°32'37":77°06'15'). Seri,(30° 36'55":77°00'06"), Raipri (31°37'34":77°00'30'), Burahata (31°36'09":77°01'59"), Balhari (31°39' 03":77°00'45", Pingla (31°35'16";77°01' 23"), Rakbnun (31°47' 30":77°17'30"), Tarapur (31°38' 00":76°59'37"), Kohlu, Dalikar (31°37'38" 77°01'00"), and Rackchui (31°39'05': 76°59' 43").

The clay pockets in the above areas range in length from 10 metres to 220 metres and only the clay pocket at Phaish extends for about one kilometres. The width of the clay pockets varies from one metre to 1040 metres

g) **Shimla district:** Pottery clays resulting from the decomposition of limestone associated with carbonaceous slates are described as occurring on the spurs of the hills running north from Shimla (31°08';77°10'). They have been used for the manufacture of bricks, tiles and coarse pottery. The location of the clay deposit in Himachal Pradesh is given in **figure 11.**

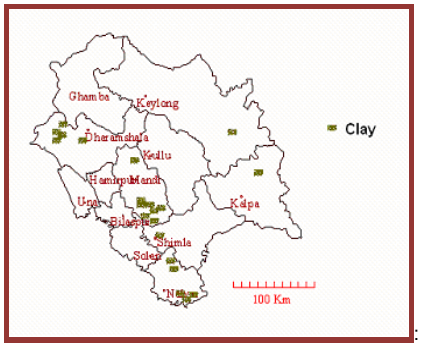


Figure 11: Locationg of clay deposits of Himachal Pradesh

4. Coal

a) **Kangra district:** Coal occurs near Dehra Gopipur (31° 531:76°83') in the Pinjor sand rock of the Upper Shiwalik Formation and in the Nahan sandstone. The report of coal occurrence from this locality was based on two very small lenticular pockets and a few stringers of lignite in the north eastern cliff of Beas river. The first pocket contains a few lenticular remains of carbonised wood. The thickness of second occurrence varies from one centimetre to seven centimetres with maximum length of about 30 cm.

b) **Mandi district:** A carbonaceous horizon is traceable for about 90 metres near Mansai (31°34:76°51'). There is another 91 centimetres thick seam traceable for 45 m, 750 m to the south of the earlier one. A coal seam near Dehar (31°251:76°491) crops out in and near the steep right bank of Sutlej river about 280 m upstream of the suspension bridge. The carbonaceous horizon is interbedded with limestone with almost vertical dips. Two carbonaceous seams, 180 cm and 90cm thick could be traced for a distance of about 90m.

c) **Sirmaur District:** At Deothal (31°51':77°10') in the tributary of Kewal Khala there is occurrence of coal in the Subathu Formation, but due to folding in the rock it has been greatly crushed and it occurs in soft powder form.

d) **Solan District**: The coal of uneconomic value is also reported in the Taksal area of the Solan District

e) **Bilaspur District:** A lenticular carbonaceous matter occurs in the Subathu Shale near Dela (31° 24': 76° 46'), Maliwarkhad and Bandla (31°20':76°46'). The coal deposits of Himachal Pradesh are as shown in the **figure 12.**

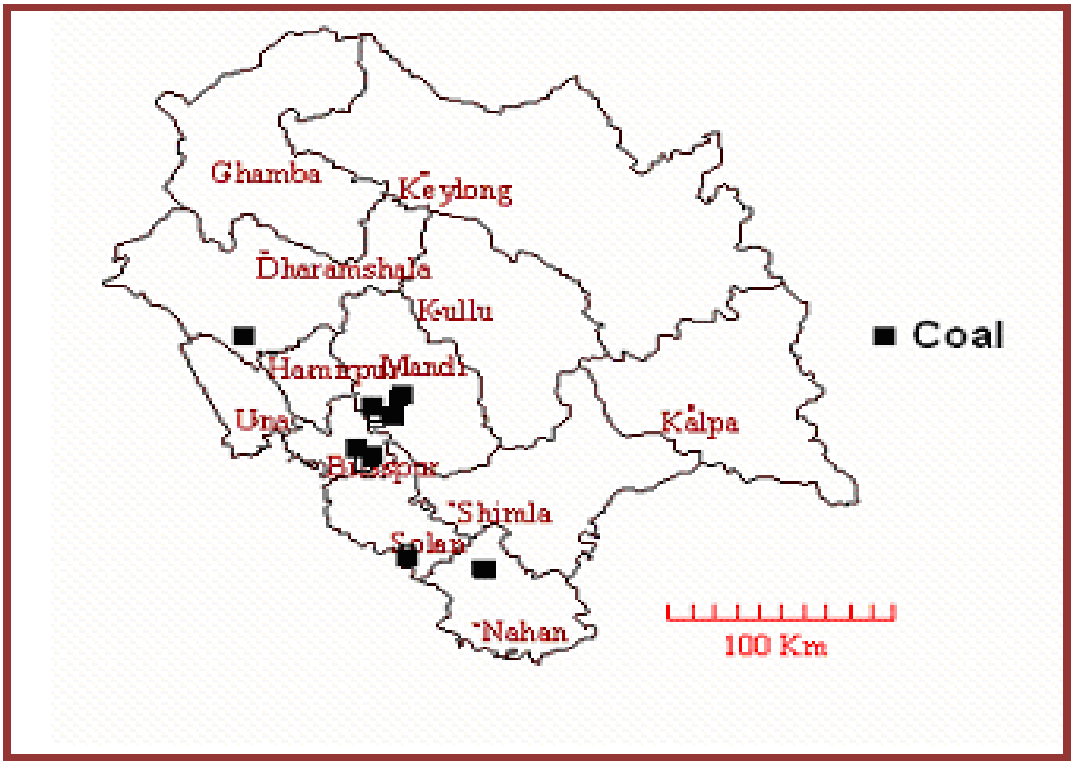


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Figure 12: Showing occurrence of coal in Himachal Pradesh

6. Copper

a) Lahaul & Spiti district

Malachite staining is occasionally noticed in association with quartz veins in Chandra Tal (32°39':77°37') and Sarchhu (32°42'30":77°32') areas. Copper mineralisation in the form of chalcopyrite, malachite and azurite are seen along brecciated zones and within quartz veins associated with limestone of the Kunzam-La Formation in between Chander Tal & Bara Lacha pass (32°44':77°26'). In this area, two types of veins have been encountered:

- The veins which shows the mineralization of chalcopyrite are ferruginous and is restricted to the peripheries.
- The veins which do not show any mineralization are white in colour.

Copper mineralization is also reported in the Shitikar area (32°25': 77°40'). Here the quartz veins are the mineralized body and varies in length from 5 cm to 30 metres. The breath also varies from 1 cm to 2 metres. About 6 veins show chalcopyrite mineralization occurring as stringers. Out of 126 samples analyzed by the Geological Survey of India, only four sample shows 150 ppm copper otherwise most of the sample shows 50 or less than 50 ppm of copper.

b) Kullu District

(i) Malachite stains and sparse disseminations of chalcopyrite have been reported in the massive quartzites belonging to Bhallan Formation of the Rampur Group at Seond (31°541:77°13/). The copper values vary from 0.1 % to 0.22%. The mineralisation is restricted to very limited area of about 60m along a road cutting.

(ii) Stains of malachite are observed in quartz veins traversing chloritized schist near Shatnala bridge. Sample from Shatgar (31°58':77°12') gave copper value as 1.21 %. The mineralisation comprises stains of malachite with sparse dissemination of chalcopyrite and pyrite.

(iii) In Maol (Mahul) (31°551:77°07') area, the sulphide mineralization occurs over

a strike- length of one kilometres and is in the form of grains of Chalcopyrite and pyrite and patches, incrustations and stains of malachite and azurite. The mineralization is impersistent and sporadic in nature.

(iv) In Garsa Valley, i.e., the area lying between Kurla Nal in the north and the Sainj Khad in the south, and to the east of Beas river, the copper mineralisation is manifested by numerous surface shows in the form of stains and encrustations of malachite and azurite, covering an area of about 9 km x 6 km.

c) Chamba District: It is believed by the inhabitants of Chamba District that a large quantity of copper ore had been mined from the Silagharat in the old times. Historically the mining in the area is said to have been carried out in 1559 A. D. It is said that in the times of Raja Partap Singh Verman, the ruler was in need of source of revenue for repair of Laxmi Narayan Temple. A farmer from the Hul area presented to the Raja a piece of copper and informed him of the existence of a large deposit. Thus, a rich deposit of copper is said to have been found and worked.

d) **Kinnaur District**

(i) Malachite encrustations are reported in the Manchhap nala (31°25'30":78°33'30") section.

(ii) Few specks of pyrite and chalcopyrite with malachite stains have been noticed in quartz veins near Mangsula (31°22'30":78° 30' 30"). These veins are more frequent near the Granite Batal Formation contact.

(iii) A few malachite stains have been noticed in the phyllites of the Batal Formation near Lippa (31°39':78°38").

(iv) Two small old workings for copper are observed near Rangbar (31°49':78°24') in the Ropa valley. It consists mainly of malachite and azurite coatings along the joint planes and fissures of quartzite bands in the Kunzam La Formation. An old working of copper is reported near Sangnam (31°47':78°28'). Cu values of 550 ppm have been obtained from here.

(v) Sparsely disseminated pyrite occurs in quartzites and phyllites north east of Sangnam. In a nala north of Giabong, malachite and azurite stains are seen in phyllites.

e) **Sirmaur District:** At Sataun (30°33';77°38'), copper mineralization occurs in the carbonaceous shales and quartzites of the Blaini Formation. The mineralisation zone is 25m wide along a road section and consists of stringers and disseminations of pyrite and chalcopyrite. Copper values range from 0.13% to 4.40%. One zone has analysed and showed 2.27% Cu along 1.30 m width.

f) **Solan district:** An old Copper mine exists near Solan (30°55': 77° 07') in the Simla Group of rocks.

The location of the copper ore deposits in Himachal Pradesh are shown in **Figure 13.**

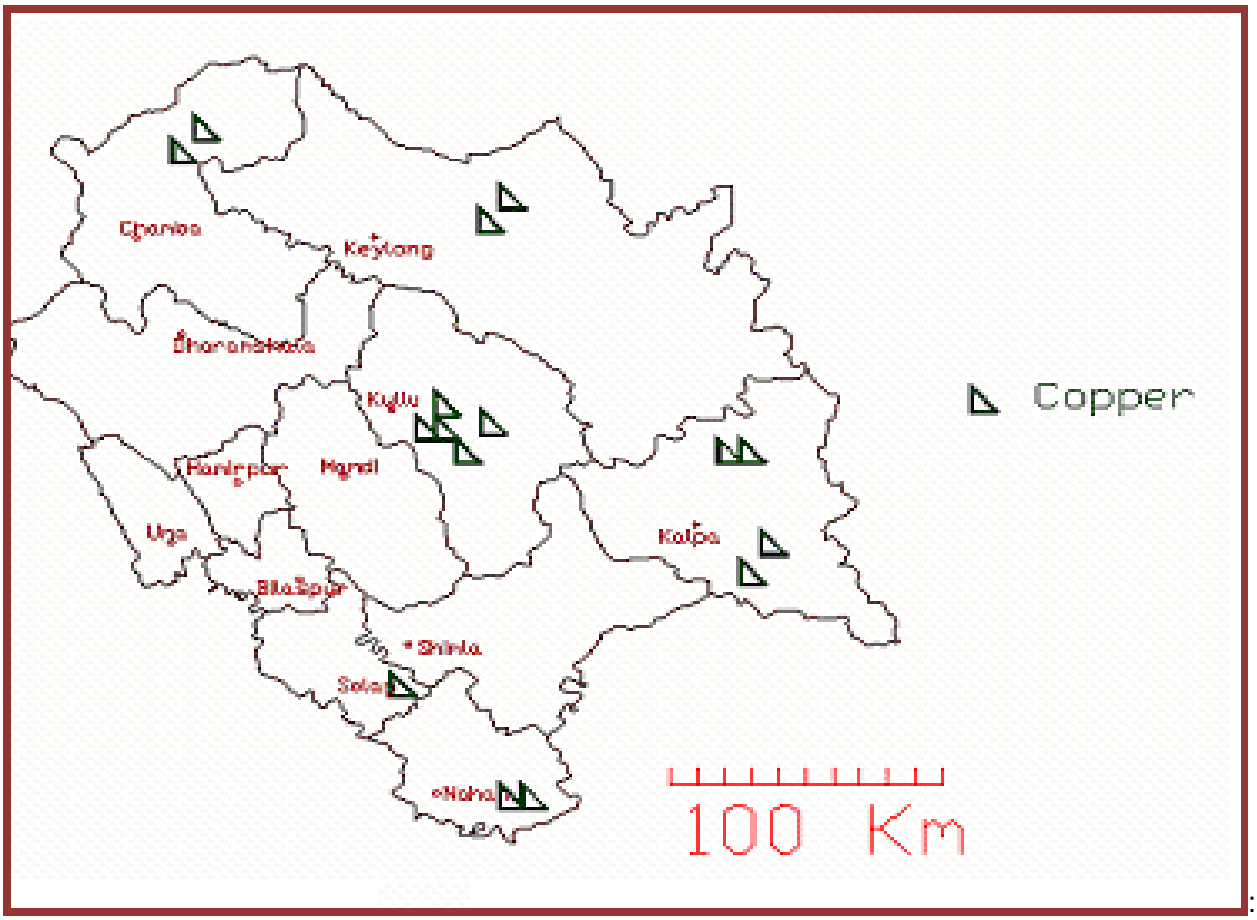

Figure 13: Showing location of Copper ore in Himachal Pradesh

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7. Flourspar

a) ***Kinnaur district:*** Rare occurrence of light green crystals of flourspar has been reported in the pegmatite veins at Wangtu (31°32':78°04') bridge.

8. Galena

a) **Sirmaur district:** (i) Massive lode of a minor deposit comprising galena and sphalerite have been reported at Anyar (30°44':77°44'). The samples from old working have been analysed indicating lead 0.75% and zinc 0.21% Another sample gave 10% zinc/content.

i Three old working (adits) exist at Anyar in the Infra Krol phyllites, slates and limestones. The middle adit shows mineralisation and is 2.80 m long extending in N 600 W direction after which it becomes narrow and is caved. This audit is located in yellowish – brown friable phyllite trending N 70º W- S70º E and dipping 65º to NE. The ore body consist of massive load comprising pyrite, minor specks of galena and sphalerite. The load is 0.70 m thick and strikes in N 50º W –S50º E direction and dips 35º to 65º to the NE. The load appears to be localized along the anticline trending N70º W- S70º E. Another small lode about 0.30 m thick occurs to the hangwall side. The northern old mine occurs at the contact of phyllite and grey limestone. This audit is 3.70 m long and inclined at an angle of 30º in a N50º E direction.

ii. Synsedimentary, polymetallic sulphide mineralisation occurs within an interbedded slate-limestone sequence near the Deoban-Shimla Group contact in Dathyari- (30°41' 77°45') – Chamri (30°43':77°44') – Auri (30°42':77°44')

area. Three mineralised lodes 20cm to 150cm thick ranging in length from 75m to 80m have been delineated over a strike length of nearly 340 metres.

iii. Small lenses and veins of quartz with galena are observed in slate and phyllite exposed in the Amba area (30°38:77°27'). Large pebbles with rich galena mineralisation are a common sight all along the Amba*Nala*. Small gossanised band measuring 4m x 1m occurs in sandstone and shale of Subathu Formation, one kilometre east of Chapla (30°58' :77 °27') in Dabur God. Lead value varies from 0.9 to 0.38%.

b) **Shimla district**

Lead in the form of vein occurs in schist and gneiss of Jutogh Group at Darkoti (31° 07*'*: 77° 36'). At Darkoti the lead mineralization occurs in garnetiferous mica schist, granitic gneiss and quatz- mica schist.

c) **Solan district**: Lead ore is found in the form of some galena pebbles of varying size at Tal (31°10': 76°53') in the Arki Tehsil. A ferruginous limestone band, north of Tal has indicated 1.2% Zn and 0.29% Pb over an average width of 7.5 m.

A small gossanized band 4 m X 1 m occurs in the sandstone and shales of Subathu Formation about one km east of Chapla (31°58':77°00') in Dabur Gad.

d) **Kullu district**

(i) A few specks of galena have been observed in the quartz veins and chlorite-schist at Sangthan (31°58':77°15'). Lead values range from 100 to 240 ppm and Zinc values varying from 200 to 470 ppm.

(ii) Minor disseminated specks of sulphide are observed in quartzose phyllite east of Komand (Kot Kandi) (31° 53':77°14'). Chemical analysis has shown 400 ppm lead.

(iii) In Khanor Khad area near Manikaran (32°02':77°27') the ore and gossan together yielded lead, gold and copper. At Uchich (32°01':77°23') the lode is over 60 centimetres in width and contains lead, gold and silver.

(iv) At Chong ($31^0$77':77°11) the ore contains lead, and silver. A small stringer of galena associated with quartz vein has also been reported from near Garona (31°50':77°14'). Occurrences of lead ore have also been reported from north east of Behali.

e) ***Lahaul & Spiti district:*** The occurrence of galena in small quartz vein infiltrated along a fault plane in upper Triassic limestone between Po (32° 03' :78° 23') and Dankhar (32° 05' 78° 16') in the Spiti valley has been noted by Haden. Galena associated with vein quartz occurs in the quartzite of the Polen Formation near Tabo.

f) ***Kinnaur district***

(i) Specks of galena have also been noticed along thin quartz veins in the gneisses near Nalgan ghati (31^0 19' 20": 78^0 12' 50").

(ii) A few specks of galena are observed in a minor shear zone exposed east of Alingdar (31^0 26' 30'; 78^0 38'30").

Locations of the Galena deposits in Himachal Pradesh are as shown in **Figure 14.**

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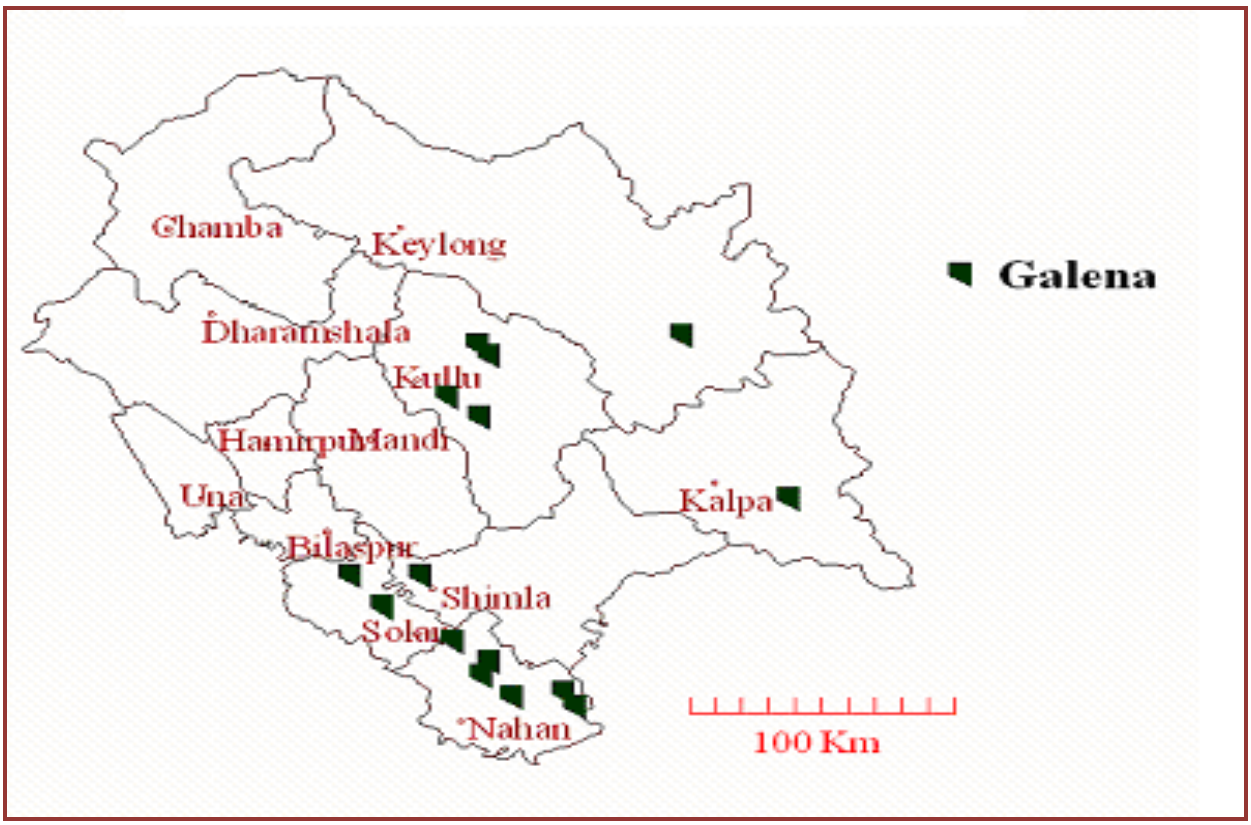

Figure 14: Location of Galena occurrence in Himachal Pradesh

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9. Garnet

a) **Kullu district**

(i) Small garnet crystals have been reported to occur in the Sarkani (31°43':77°16') – Rorung Dhar (31°34':77°26') area.

(ii) Garnet crystals in the gneiss and schist have been reported around Sara Umga Glacier (32°10':77°31').

b) **Sirmaur district:** Garnet occurs in abundance in the mica schists and is conspicuously developed all along the base of Chor mountain. It is commonly seen on the top hills comprising mica schist and in the beds of nalas that flow through the mica schist. For the most part garnets are small in size but in a few places e.g. Kehdi ka Dhar it attain the size of 4 cm in diameter. The garnets met within the nalas are usually rounded through rolling action.

10. Gold

Gold in Himachal Pradesh occurs in three distinct settings:

1 Primary Gold is associated with Late Archean Paleoproterozoic Volcano-Sedimentary sequence (mainly Rampur Group). It occurs in association with Uranium in Manikaran Quartzite of Kashapat area.

2 Paleoplacer Gold – In the Shiwalik Formation known from many localities in Himachal Pradesh namely found Bilaspur, Kangra, Sirmaur & Una Districts and occurs as small flakes, known as "colours" in the coarse sand and pebbly beds of the Middle and Upper Shiwalik Formations. The concentration seldom goes above 0.2 gm/tonne.

3. Neoplacer Gold is well distributed in the present day sediments of most of the rivers and rivulets draining the Middle and Upper Shiwalik Formation. It is located in the foot hill zone of Newer Formation in the Shiwalik belt and even at places in the Lower and Higher Himalaya. The Gold occurs in the point bars and meander channels largely associated with coarse to pebble beds.

a) **Mandi district:** Small Quantity of Gold has been reported in the bed of Satluj river at Jauri (31°19' N -77°02' E). The detailed analysis of the area between Dharampur & Sarkaghat (lying between 31°41' N & 31°52' N -76°39' & 76°47' E) shows poor concentration of gold value ranging less than 20 ppb to 100 ppb. Flakes of Gold are frequently seen in the sediments of the Sun and Alian Khads, particularly between Hukal and Kandewale and average concentration is < 6 ppb to 20 ppb.

b) **Kangra district:** Gold washing in the Beas River at Rai (32°10'N -75°55'E) and downstream was reported, with an yield of about 73 grains/cubic yard. The analysis of bed rock and stream sediments have shown gold values less than 0.1 ppb.

c) **Kullu district:** Gold panning was reported at Shamshi (31°53' N -77°12' E) in the river sands of Beas River.

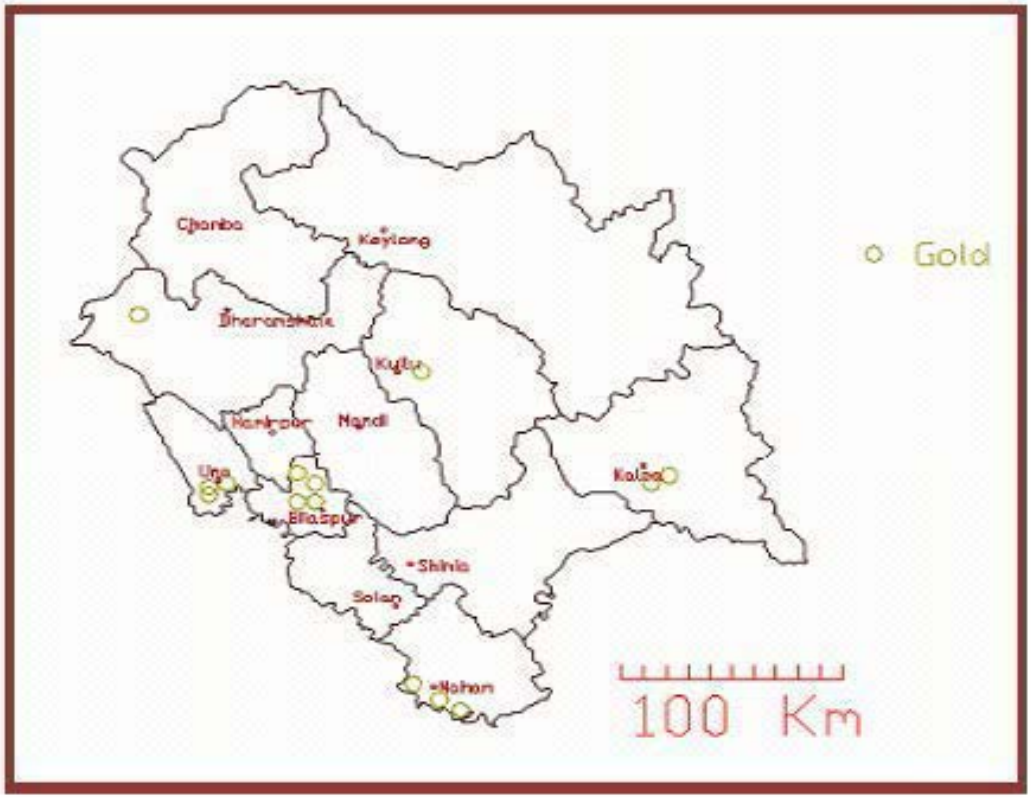
d) **Kinnaur district:** Small Quantity of Gold are obtained from sand bars along the Satluj River between Morang (31°36'N -78°28' E) and Wangtu (31°32'N -78°04'E).

e) **Bilaspur District**: Placer gold is recorded from the nala sands towards the northeast of Ghumarwin (31°27'N-76°42'E), the source being the boulder beds of Shiwaliks. The detailed investigation was done by Geological Survey of India along the Sir Khad, Sukar Khad, Drug Nala, Kariali Nala and Lindi Nala between 31°23'N & 31°29'N -76°35' & 76°43' E. The stream sediments of the Sir Khad along the south east of Tira shows megascopic gold and yield 2 to 15 grain of gold on panning of 5 kg material, similarly Drug nala sediments yield about 8-20 megascopic grains of gold on panning of 5 Kg material.

(e) **Una District**: Occurrence of gold flakes in the river sediments of Basoli river nere Basoli was reported by the Geological Survey of India in 1985-86. The Geological Survey of India investigated area of Soan River, Ambwali Khad, Panjoa ki Khad, Garni Khad, Una di Khad, Borewali Khad, Fatehal di Khad, Kajni ki Khad, Sunkewali Khad, and Borewali Khad. The sediments of all these streams shows incidents of gold.

(f) **Sirmaur District:** Placer gold has been reported from the Shiwaliks and is reported in different part of the district. The Geological Survey of India had done detailed investigation in the Ujjal Ki Nadi, Gumti Nala, Trilokpur Nadi, Khiari Ka Khala, Bharion Khala, Matar ka Khala, Jamni Nala, Somb River , Salauni ki Nadi etc. The investigation shows that all these river sediments are auriferous.

Location of gold in Himachal Pradesh is given in figure 15.



: **Figure 15: Location of Gold deposit in Himachal Pradesh**

11. Gypsum

a) **District Sirmaur:** Gypsum occurs at several places in massive form in the Krol Limestone and as selenite crystals associated with the carbonaceous shales in the Nahan Sandstone. The deposits of the former type are comparatively large whereas those of the later are usually very small.

Gypsum deposit in District Sirmaur are found in Korga, Bharli, Shilorna, Kulthiana, Ridana, Bhaunrari, Nahan

b) ***Kinnaur:*** Large deposits of gypsum occur associated with the Lipak Formation between Liwa Thach (31°55':78°30') and Kapusa (32°04:78°34') especially in the Yulang Valley, north of Chango, and in the Yangthang (31°53':78°:37') area. A small area around Shalkar (32°00':78°34') was covered by detailed mapping and reserves of 1.25 million tonnes were inferred upto 25m down depth extension. The total in- situ reserves in this belt, however, may be over 100 million tonnes. Small occurrences of gypsum are known from similar beds exposed near Tari Khango Pass. The gypsum is mostly of alabaster type, soft, white, granular, with common large pockets of anhydrite and small selenite zones.

c) **Lahaul & Spiti district:** Gypsum associated with the Lipak Formation occurs on the right bank of Spiti river, east of Losar (32°25':77°45'), along the right bank between Hurling (32°04':78°31') and Sumdo (32°04':78°36'), in Gyundi Valley (32°16':77°50') and at Dhuma Dangse (32°25':77°40'). The occurrence between Hurling and Sumdo is quite extensive. Anhydrite and selenite are locally associated with gypsum in this stretch. Elongated crystals of transluscent gypsum are present in the Spiti Formation, east of Lamayuru.

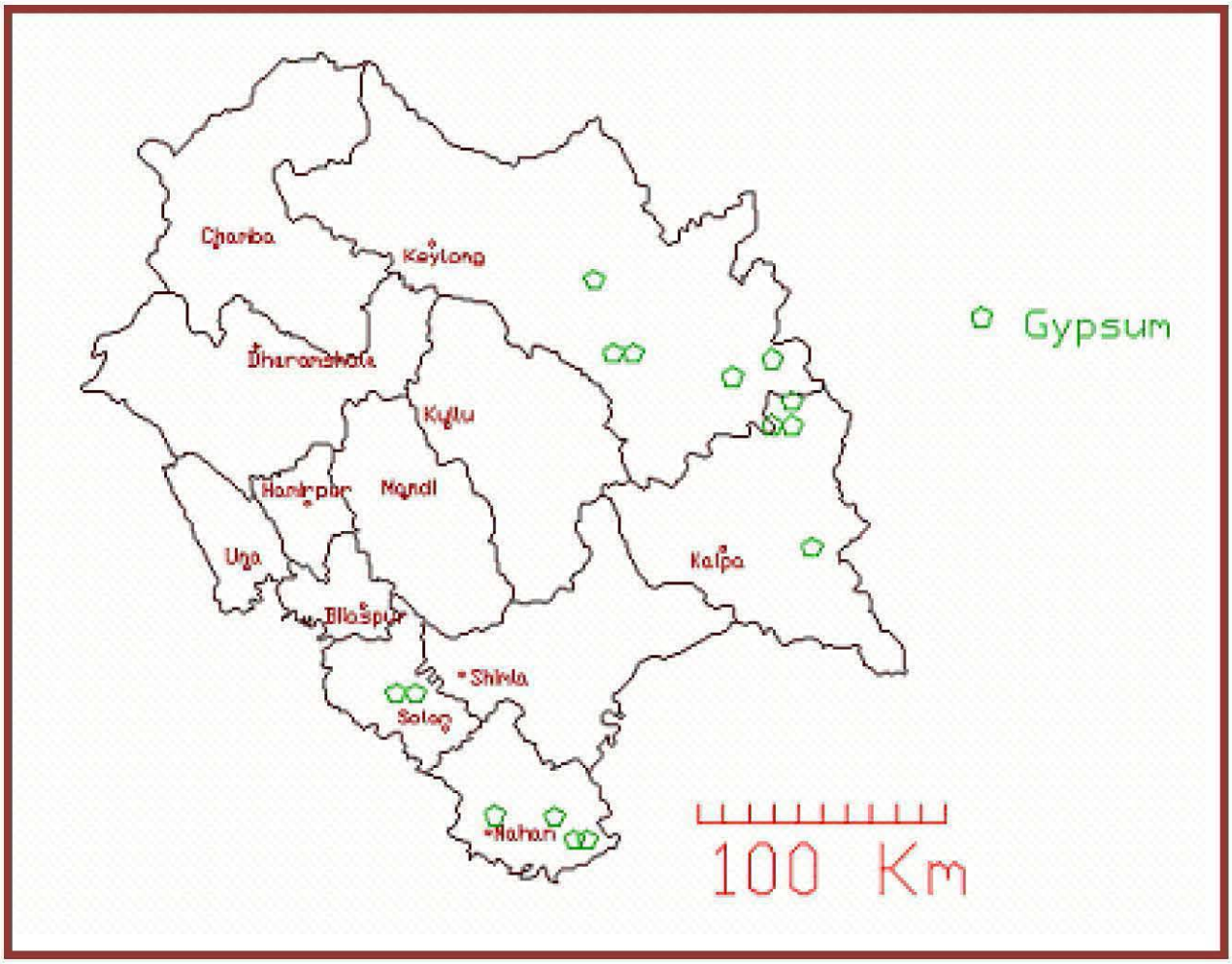


Figure 16: Location of Gypsum deposits in Himachal Pradesh

12. Iron Ore

a) **Sirmaur district:** Magnetite occurs as lenticles in quartzite of Jutogh Group at Lana Cheta (30°47':77°22') – Kanhari (30°47':77°21') area, known as Lana Cheta Iron ore.

Lana Cheta Iron ore deposit: Lana Cheta area is situated on the borderline of the Renuka and Rajgarh Sub-division of District Sirmaur. The area is situated at an altitude of about 1300 metre above mean sea level, along either bank of Nait Khala, with two parallel ridges on either side. The Nait Khala flows in south western direction and cuts across the strike of the Formation. It is a perennial stream and is fed by seasonal transverse tributaries which run mostly parallel to the strike formations.

The Iron ore deposit of Lana Cheta had been known since long and was possibly worked by the local blacksmiths for the manufacture of their tool etc. The iron ore occurrences south and south-east of Kanhari village are popularly known as Lana-Cheta iron ore deposits. They are exposed along the banks of Nait Khala. The mineralization is restricted at the base of quartzites of Jutog Group. No mineralization is seen in the carbonaceous slate and schist.

Lower horizon: There are two main localities namely Kanhari old workings and Fumaria old workings. Kanhari old workings are situated along the northern scarp of the Nait Khala, about 800 metres south of Kanhari village. There are two old workings; one being just along the foot-path and the other is about 20 metres South West of the first one. The mineralization is restricted to the old workings only and there is hardly any lateral extension.

Upper horizon: The upper horizon is exposed 640 metres in north eastern direction from the lower horizon and has greater extensions but poor concentrations. Starting from almost top of the ridge south of Kanhari village, it is exposed along the banks of Mait Khala which passes through the Reoli ridge and, with a few exposures in the fields North East of Chandrona village, is again exposed along the Southern slopes of Chandrona ridge and gradually pinches out in South East direction. Detail of iron ore reserves in Lana Cheta are given in Table 19.

Table 19: Detail of reserve of iron ore in Lana Che ta area

Block	Iron ore reserve in metric tonnes	
Left bank block	4500	Average 30 percent of magnetite
Right bank block	6000	Average 30 percent of magnetite
Neoli block	3000	Average 30 percent of magnetite
Chandrona block	2000	Average 30 percent of magnetite
Upper Khaneri old working	70	Average 80 percent of magnetite
Lower Khaneri old working	10	Average 50 percent of magnetite
Main Fumaria old working	370	Average 65 percent of magnetite

b) **Kangra district**: Iron ore occurs as magnetite particles disseminated in the Talcose Schist in the neighborhood of the Dharamshala (32°14':76°13'). Iron ore is also reported to occur near Bir (32°03':76°47') and Kohad (32°05':76°52').

c) **Kinnaur district**: Magnetite tuff are reported from Mangru La (31°22':78°30') in which small scale smelting had also been carried out. The magnetite occurs as profuse disseminations as octahedral crystals in the volcanogenic sediments which shows very low grade metamorphic and are grouped with Kunzam La Formation.

d) **Kullu district** : Bands of hematite – quartzite about 3 to 6 centimetre thick and about 2 metre long have been reported from north of Roshal Village (32°02':77°18'). Old working of Iron ore are reported from Gargi (32°02':77°20') and south of Garahan (31°58':77°20').

e) **Lahaul & Spiti district**: About five km South east of village Muth the occurrence of red hematite in the Thango Formation is reported (31°57':77°00'). Lenticular hematite quartzite occurs in the Tango Formation at Tango (32°02':77°57') and Shitekar (32°26':77°40'). The main band of Tango is 1.5 to 2.5 metre thick and extends for 130 metre along the strike.

f) **Mandi district**: Magnetite associated with hematite occurs in schist and phyllite in a belt extending intermittently from Rama Bhet (31°3'1:77°06') upto the vicinity of Sangalwaro (31°30':77°13'). Sparsely disseminated magnetite and hematite occur around Jhungi (31°25':77°06') in the phyllites. Magnetite occurs as disseminated grains in quartzite and as concentration in thin bands near Kohar Khas (32°06':76°48'). The iron bearing quartzites have been traced from about one and a half kilometres north of Baragoran (32°05':76°00') to Multhan (31°031:76°05).

Shimla district: Hematite is found as bands and lenses in the Rohru area. Alternating bands of iron ore with biotite-schist were encountered at Shil (31°09:77°40'). The bands are frequent though at the most only 2.5 cm thick. More important occurrences are distributed in the Banoti Valley around Narain (31°12':77°39') and Shekal (31°11':77°39'). Two old workings of

hematite are located at Soom south of Pujarli (31°11':77°40'). The old workings are within the hematite quartzite band (Jutogh Group) measuring about 50m x 10m. Location of iron ore deposits is given in figure 17.

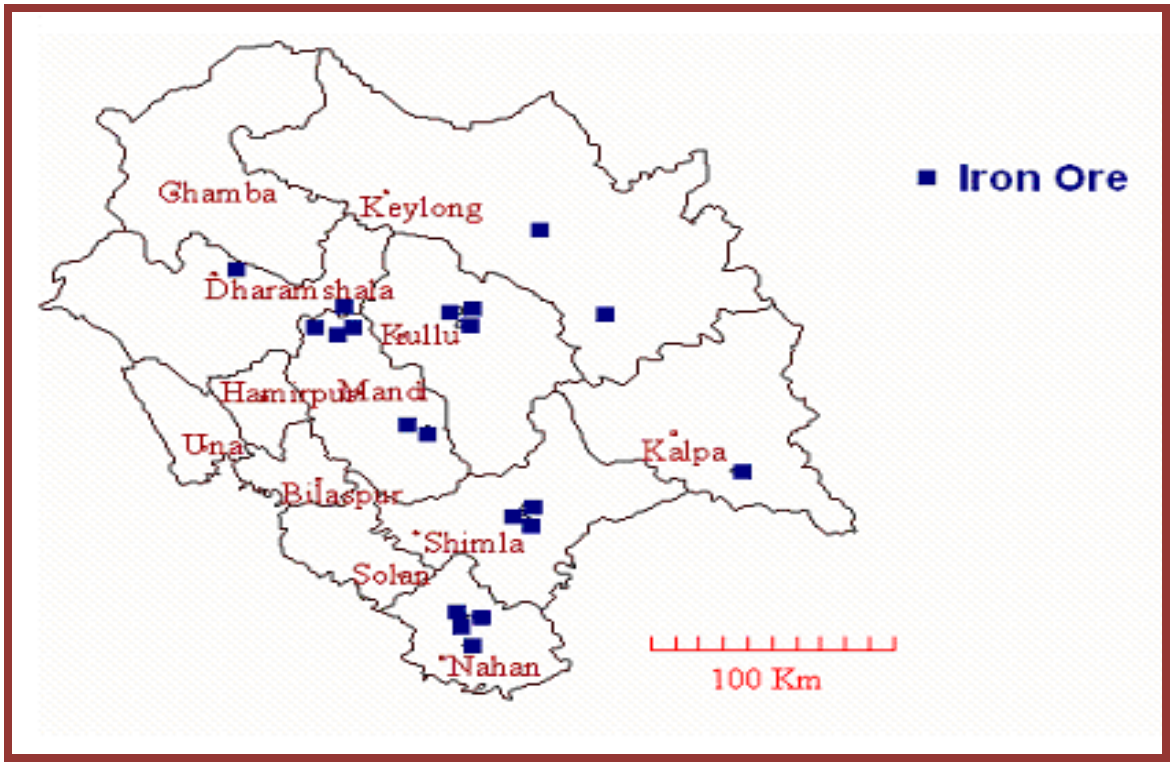


Figure 17: Location of Iron ore deposits of Himachal Pradesh

13. Kyanite

a) **Kinnaur district:** Kyanite blades measuring eight to 15 cm in length in kyanite staurolite schist have been reported from Morang (31°36'00": 78°26'30")-Tirung (31°34'30":78°27'00") area.

b) **Kullu district**

(i) Kyanite has been reported in the rocks of Central Gneiss and Schist Formation around Bershani (31°06':77°26"), Khir Ganga Thach (32°00':77°31") and Tanti Thach (31°57':77°30').

(ii) Fairly long blades of kyanite are found in schist and gneisses south of Tapru Thach (31°58'00":77°32'30") two kilometres upstream of Ori Age Thach (31°57'15":77°33'00") in the Tang Khol (31°57'00":77° 33'00"), Chini Gohru Thach (31°58'00":77°34' 30") and in Bakar Kiara Khol (31°58'00":77°32'00"). The blades have crystals upto 20 cm. The occurrences are of sporadic nature.

(iii) Bluish translucent blades of kyanite associated with gneiss are noticed in Bakerbihal Khol (31°46'00":77°41'00") Bhagon Thach (31°58'00":77°36'30"), Ratiruni Thach (32°00'30":77°40'30") and several other places. The individual blades at times exceed 10 cms. in length.

(iv) Kyanite blades occur in quartz-mica schist of the Central Gneiss Formation east of Khirganga Thach (31°59'40":77°30'30"), east of Kalga Thach (31°59'45":77°27'30") Bhalingach Thach (31°59'00":77°29'00") and Tunda Bhuj Thach (31°58'00":77°35'00"). Schistote xenoliths occurring in granite occurrences have no economic significance.

c) **Lahaul & Spiti district:** Significant kyanite mineralisation associated with meta sediments of the Batal Formation (Precambrian) has been reported from the Thanpattan (32°56'00":76°54'30") area of Miyar Valley. The main zone rich in mineralization is 40 m in thickness and traceable for over one kilometer. Location of Kyanite in Himachal Pradesh is given in figure 18.

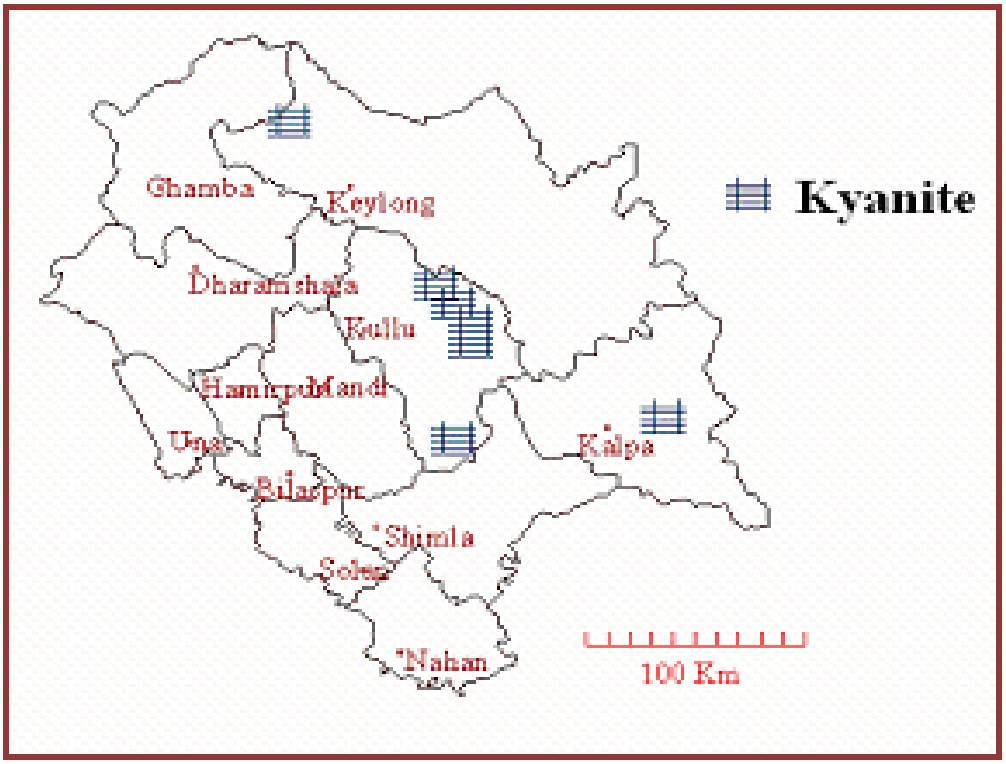


Figure 18: Location of Kyanite in Himachal Pradesh

14. Lithium

a) **Kinnaur district:** The granite pegmatite veins intrusive into the rocks of Vaikrita Lipak Formations in the Yangthang (31°53':78°37') area show Lithium values of 300-1000 ppm.

15. Magnesite: Magnesite is reported only in Chamba district, Magnesite occurs in grey phyllite of Salooni Formation in lense like irregular shape and a few deposits are large in size. Invariably the dolomite limestone is found associated with magnesite. At places carbonaceous phyllite are seen coming in contact with magnesite deposit. Magnesite is medium to very coarse grained and crystalline in nature. Granular and bladed texture is commonly developed.

(I) Lenses of magnesite occur in the Katarigali Formation near the confluence of Muchetar nala and the Ravi river (32°23'00":76°39'100"). The main magnesite band is exposed in a vertical cliff face on the left side of Muchetar nala and extends towards WNW to the ridge top. It is a lensoid band varying in size between 30 x 3 m and 350 x 10 m. On an average, its thickness varies between four and nine metres. The estimated reserves, calculated up to five metres depth are of the order of 55,620 tonnes. About 500 m downstream of the confluence of contain kyanite blades upto five centimetres in length north of Ratiruni Thach and east of Mantalai. All the

:

Muchetar nala and Ravi River, occur several small lenses of magnesite varying in size between 2 m x .5 m and 10 m x 2 m.

ii) In Duner (32°02':76°19) magnesite is associated with dolomite, inter- bedded with slate and carbonaceous shale of upper part of Katarigali Formation. Chemical analysis has revealed MgO 38.19% and CaO 1.40%.

(iii) A lensoid band of magnesite body 3 metres thick and 700 metres in strike length is recorded in Katarigali Formation at Tundah (32°30'16":76°28/14"). Chemical analysis of a single sample revealed MgO 37.15% and CaO 6.02%.

Some irregular patches and small pockets of varying size of magnesite occur in the dolomite bands southwest of Kao (32°28'09":76°35'24'). The chemical analysis of a single specimen revealed MgO 36.50% and CaO 3.13%.

Small pockets of magnesite associated with a limestone band of Katarigali Formation occur near Pasan Got area (32°43'50":76°21'30'). The chemical analysis of single specimen indicated MgO 41.72% and CaO 2%.

iv) In the area north of Bhajund (52°45'15":76°26'25") pockets and lenses of magnesite (2 m x 0.7 m) have been noticed in a 3 metres thick dolomitic limestone band which marks the contact between the Katarigali and Manjir Formations. The magnesite grades into dolomitic limestone.

(vi) Magnesite lenses along with limestone varying in thickness from 7 metres over a strike length of about 75 m are seen in Suni area.

(vii) In Kala (32°23'45':76°38' 30") area, magnesite bands with thickness from a few metres to 20m have been located.

(viii) Magnesite bands ranging in thickness from 1 to 10 m have been reported from Panglod nala (32°48'30':76°21'30").

(ix) Lenticular magnesite bands ranging in thickness from a few metres to 20 m have been reported at a number of places south of Manimahesh (32°23'45':76°38 '130').

(x) Lenticular bands of magnesite associated with dolomite/limestone in Katarigali Formation occur in Chanota (32°22':76°29') and Gharola (32°26':76°27') areas. The size of the magnesite bands at Chanota varies between 30 m x 3 m and 350 m x 10 m with thickness varying between four and nine metres. Chemical analysis of a few samples has revealed MgO 45.15%. In Gharola area the size of the magnesite lenses varies between 10 m x 2 m and 1 m x 30 cm.

xi) Magnesite bodies ranging in thickness from one metre to five metres with strike extension for 50m have been found in the lower horizon of Dunai Formation, about half a kilometre north of Keh Got (32°58' 30":76°22'30') and about one kilometre north of Riali Got. Location of magnesite deposit in Himachal Pradesh is given in figure 19.

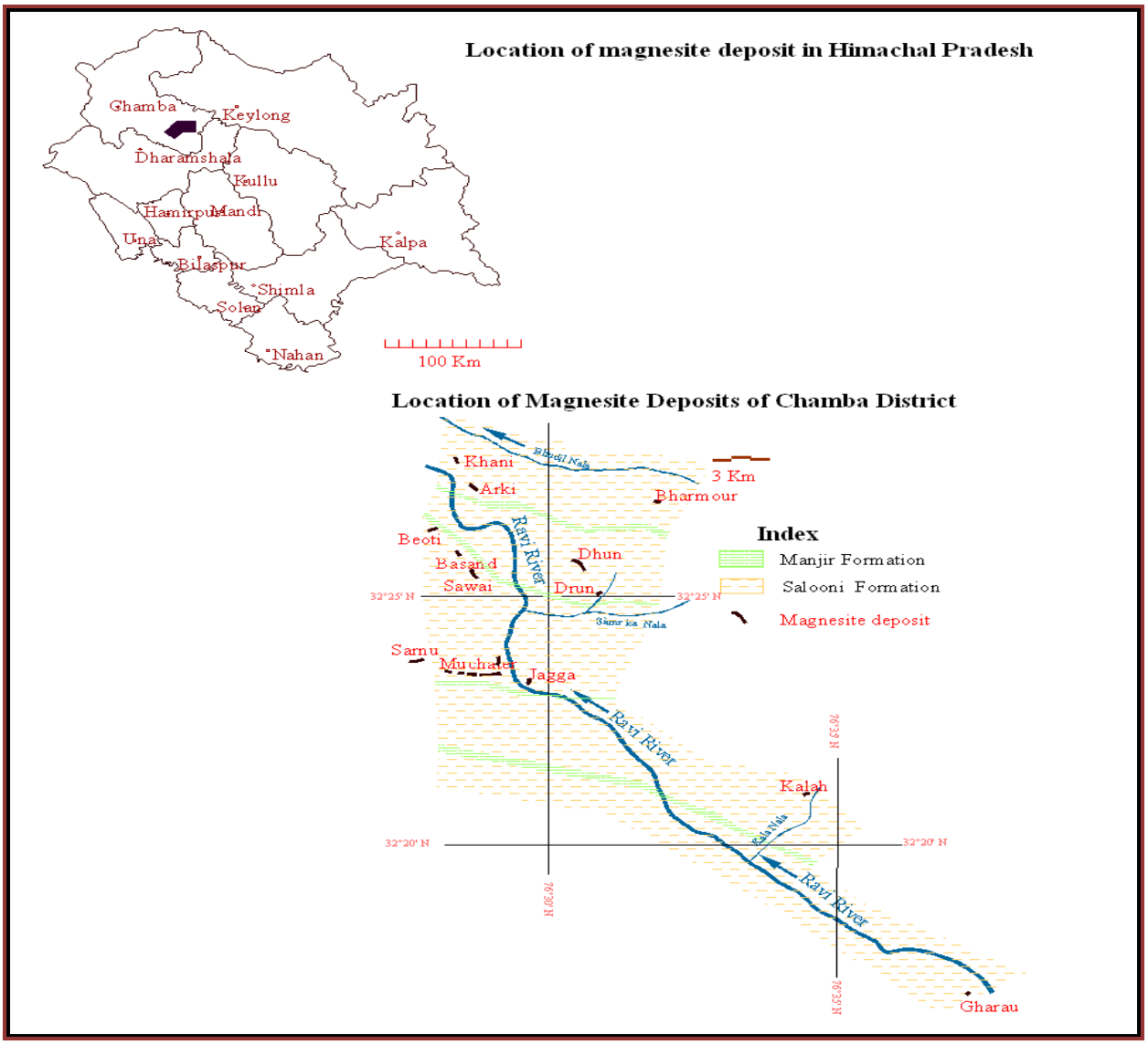


Figure 19: Location of magnesite deposit in Himachal Pradesh

16. Mineral water :

a) **Bilaspur district:** At Bhasra (31°14':77°47') the water is strongly saline, and it is said to be efficacious in cases of scrofula, dropsy and rheumatism.

b) **Kangra district**

(i) At Jawalamukhi (31°52':76°23') water is saline and is being used as a cure for goitre.

ii) At Lausa (32°23':76°05'), water is sulphurous at a temperature of 22°c. It contains in 1,000 parts, Na_2SO_4 -0.159, NaCl- 0.74, Na_2CO_3 2.600 and $CaCO_3$ 0.0040. It is used to cure goitre.

(iii) At Tatwani (32°07':76°46') there is a spring in the bed of the Lum, a tributary of the Birmi river. The temperature of water is 49°C. Water is limpid with a saline taste and slightly alkaline.

Residues contain 92.33% of sodium chloride with small quantities of chloride, sulphate and carbonate of lime, also 0.012 parts of sodium bromide in 1,000 parts.

(iv) At Tira (32°08':76°14') a saline spring occurs with 42.2°0 C temperature of water. Water is limpid with a saline taste and is slightly alkaline. Residue contains 93.23% of sodium chloride with small quantities of sulphate and carbonate of lime.

c) **Kinnaur district:** At Changrizang (32°03':78°40') water issues at 46.5°C from seven or eight small vents within a space of 20 m. It is strongly charged with H_2S and leaves saline encrustations. Hot spring is also reported from Skiba, Thopan, Karcham, Tapti, and Roura Thach.

d) ***Kullu district***

(i) There are three springs at Vashishtha (32°16':77°15') one of which gives a copious discharge. The temperature of water is 59° C. Water emits H_2S and is much resorted to for medicinal purposes.

(ii) At Manikaran (32°02':77°25') there are as many as fourteen springs. Temperature of water varies from 71.4°C to 94.4°C (boiling point at this elevation). Discharge of water is exceedingly copious. Sulphuretted hydrogen is emitted, but the water is clear and palatable containing 3.2 parts of saline matter in 10,000. It deposits large quantities of ferruginous travertine.

e) ***Solan district*** There are altogether five springs at Jaoni (31°32':77°50'). The temperature of water is 55° C. Water is clear with a disagreeable saline taste and deposits of ferruginous matter.

f) **Mandi district:** Ten springs occur on the right bank of the Satluj river near Tattapani (31°14:77°50'). The temperature of water is 57° C. The water is strongly sulphurous with a disagreeable saline taste. It contains chloride and sulphate of soda. Location of mineral water in Himachal Pradesh is given in figure 20.

Figure 20: Locations of mineral water in Himachal Pradesh

17. Molybdenum

Kinnaur district*:* Single, steel grey grain of molybdenite has been recorded in rocks near the snout of Jabgya glacier.

18. Nickel & Cobalt

Kullu district: Traces of nickel and cobalt have been reported from the copper ore occurring in quartzite in the Naraul (31°49':77°13'), & - Danala (31°47':77°15') area of Garsah valley. The mineralisation comprises chalcopyrite, covellite, pyrite and cobalt-nickel bloom.

19. Ochre

Lahaul & Spiti district: Yellow ochre in recent deposits near Dauksa along Ratang river (32°13:78°05) is known to occur.

20. Pyrite

a) **Shimla district:** In the old Patiala and Keonthal States, pyrite deposit has been recorded the deposit is commonly known as Taradevi pyrite deposit though these exist at different localities. Pyrite occurrences restrict themselves to the lower horizon of Jutogh Group, i.e. Boileauganj quartzites. Nowhere mineralisation has been observed in the overlying carbonaceous schists and mica schists.

i) **Rampur area:** About 1.5 Km South-West of Badhari (31°05'40":77°06'30") in the Nala section on the left bank, yellow to turmeric brown and red stains recorded. Yellow exposures smell like sulphur. The number of these stains increases as the main vein is approached. Water of the nala flowing through the vein has reddish brown to yellowish colour. Occurrence of pyrite can be subdivided into three types namely:

a) Vein
b) Pockets
c) Spordiac and disseminations

Veins: Just southwest of Rampur, a pyrite vein is exposed on the steep escarpment of the left bank of the nala. The country rocks are quartzite. The vein runs in N 10° W - S10°E to N20°W – S20°E direction. It follows the schistosity planes. The strike length of the vein is 23 metre and thickness varies from 10 cms to 30 cms. There are some minute vein separated from the main vein by quartzites and quartz schists. These veins are discontinuous Leaching of sulphur, due to the oxidization of pyrite, is very prominent. In the steep escarpment sulphurous encrustations are observed over a considerable distance, away from the vein in the strike direction.

Pockets: Mineralisation in small pockets and cavities has been observed at number of places. These are associated with quartz veins. Pockets are parallel to the schistosity planes of chlorite schists.

Sporadic and disseminations: Mineralisation in the form of minute disseminations has been recorded the main vein sporadically scattered in the country rocks.

ii) Rahana Area in this area 21 old workings have been reported (31°04'10":77°09'50"). All except one are in collapsed condition. The vein is discontinuous and the exposed strike length is 21 metre and apparent thickness varies from 5 cm to 10 cm. the trend of this vein is the same as that of lower one. The ore occurs in the powdery form and the veins follows the planes of schistosity. Small exposures of pyrite in the shapes of small lenses have been observed at the confluence of Shimri and Ghosh nalas (31°04'45":77°06'10"). These lenses are associated with quartz veins.

iii) Taradevi Area (31°00':77°10') in this area pyrite occurs in the following two localities

a) Badhai Ghat Nala - In Badhai Ghat Nala, there is an old mine in collapsed condition and appears to have been sunk from roof. No mineralisation has been observed on and around the face of the adit.

b) Kyari Nala. - In this Nala, on both the banks, there are, one dozen of old adits, most of them in abandoned condition and also blocked at the entrance because of roof

collapse. The pyrite vein is approximately 40 cm thick at the entrance of audit, which thins out with depth to 6 cms.

A zone of pyrite dissemination associated with chalcopyrite and arsenopyrite is recorded in the phyllite and schist of the Jaunsar Group near Matiana (31°13':77°24'). The mineralisation is associated with impersistent veins of white quartz. The longest vein is about two metres long and eight centimetres wide. Small veinlets are about 40 to 50 cm long and 1 to 2 centimetres wide. The mineralisation zone is exposed in the road cutting. It runs for about 2 kilometres of which the second kilometre is a zone of sparsely disseminated pyrite. The chemical analysis shows that the pyrite contains 0-5 to 5.8% sulphur.

Pyrite occurrences have also been reported from near Bhuin (31°07':77°27') on the Theog (31°07':77°32') Kotkhai road.

Small cubes of pyrite are disseminated in the carbonaceous schist of Jutogh Group over an area of about 3 square metres along the road cutting, east of Rohru (31°12':76°45').

The occurrence of 70 centimetres wide zone of pyrite disseminations in a band of carbonaceous phyllite has been recorded north of the Sungri Rest House (31°23':77°42'). The band is traceable for a distance of about three kilometres along the strike with an average width of about 240 cm.

Pyrite occurrence is also recorded at Chirgaon (31°32':78°06') and Purbani (31°36':78°18').

Chamba district: Sporadic cubes of pyrite occur in Kamli Got area along joint planes in slates and phyllites in 2 to 5 metres thick zone traceable for a length of 150 cm, about 800 m southwest of Mawa (32°46':76°18'). Such mineralisation is also recorded 2 kilometres east of Kamli Got (32°461:78°20) in the debris of quartzitic slates on the right bank of Lanj nala. The pyrite associated with pyrrhotite is of no economic significance.

Pyrite has been recorded in highly crushed carbonaceous slates of Katarigali Formation near the Chakoli bridge (32°45'30":76°00'), Bharaura (32°46':75° 58'), Kanthili (32°47':75°57') and Sumu Kuthi (32°48':75°56') as disseminated cubes, veins, stringers and fine grained impregnation. Near Chakoli Bridge, pyrite veins vary in thickness from mm to 4.5 cm.

Sirmaur district: An occurrence of pyrite in the form of lenses and veins in limestone and slate was recorded at Sayasu (30°4':77°4') and Diyandon (30°43':77°43'). The steeply dipping vein at Sayasu is exposed in the bed of the Tons River, for a distance of 150 metres with a thickness varying between 50 cms and 1.2 metres. An analysis the sample showed 30% sulphur with arsenic in traces.

Lahaul & Spiti district: Dissemination and stringers of pyrite were observed in the Shatul Gneiss near Dulgi Ghati (31°26':78°05') and in the rocks of Jutogh Group west of Brandy Khagau (31°26':78°06').

Bilaspur district: At Belag (31°24':76°46') and other places in the district, pyritiferous material occur as lumps in coal. The occurrences are of no economic significance.

21. Radioactive Minerals: Uranium mineralisation in the form of visible yellow brown encrustations on weathered surfaces of the Manikaran Quartzite of the Rampur Group and also in paragneisses of Jeori-Wangtu Granitoid Complex close to a tectonic dislocation is reported from Kasha area, Shimla district, in Parbati and Garshal valleys of Kullu district. It is also reported in Batal Formation in Kinnaur District and in Shiwalik Belt of Hamirpur, Bilaspur, Solan and Sirmaur district.

Kullu District

Chhinjra - Shakirandhar Sector (31°51': 76°16') : Uranium-mineralised quartzites, of the Manikaran Formation in Kullu district, extend from Chhinjra in the north to Shakirandhar in the south over a strike length of 45 km. Major vein densities have been observed only at Chhinjra and Shakirandhar. The Kullu-Banjar area has a number of uranium occurrences with varying percentage of U_3O_8. Occurrences of Uranium in Kullu district is given in Table 20.

Table 20: Uranium occurrences in Kullu district (Narayan Das et al. 1979)

Locality	Type	Extent	Sample Assay Data
Chhinjra area (Parbati Valley)	Vein type associated with occasional pods and disseminations	121.4 hectares	Ore from selective blocks assays 0.32% U_3O_8
Dhara-Khanora Nal (Parbati Valley	Vein type mainly	1sq. km	Spot sample assays up to 0.1% Up
Sajwar-Shakirandhar Range (Banjar Valley)	Vein type with occasional disseminations	Distributed between 400 and 2700 m altitude	Ore grade from selective block assays up to 0.74% U_3O_8
Hirub-Shakirandhar Range (Banjar Valley)	Vein type	171 sq. m	Selective ore grade assays about 0.58% U_3O_8
Giagi - Khalandi - Shakirandhar (Banjar Valley)	Vein type	120 sq. m 447 sq. m	Spot samples assay from 0.093 % up to 3.65% U_3O_8 and in some 8.2% U_3O_8,
Dharagad-Bandal (Tirthan Valley)	Vein type only	120 sq. m	Spot samples assay between 0.16% and 10.7% U_3O_8
Nadahra (Tirthan Valley)	Vein type with occasional pods and disseminations	Scattered in patches over 900 sq m	Spot samples assay between 0.175 to 3.0 % U_3O_8
Kundi- Panihar (Tirthan Valley)	Disseminations and vein type	90 sq. m	Spot values upto 3.38% U_3O_8 from the vein
Bhatrang- Pingrang Valley	Disseminations and vein type	3 sq. m	Samples assay upto 0.19 % U_3O_8

Shimla District

Kasha (31°24'30":77°50'15")- Pat (31°24'00":77°50'00") area: Uranium mineralisation is seen at Kasha, in the south eastern part of the Rampur Window of the Nogli valley. Host rock is highly sheared gneiss with bands of schists and phyllite, ericite, ilmenite, rutile, sphene, apatite, zircon and tourmaline occur as accessories. U-minerals like pitchblende/uraninite and atunite and sulphides namely pyrite, chalcopyrite, pyrrhotite constitute the ore mineral. Pitchblende / uraninite, occurring in a high state of alteration (UO_3:UO_2 = 10), is the primary uranium mineral. Carnotite, uranophane, schoepite, fourmarierite, kasolite, wolsendorifite and gastunite are the secondary uranium minerals present. The main mineralised band is confined to parallel shear zones near the thrust plane and mineralization is controlled by schistocity superimposed on bedding and subsequently folded. Veins, fracture fillings and dispersions developed during subsequent deformation contain secondary uranium minerals. Mineralisation indicates wide range of remobilisation from the surrounding gritty quartzite and metabasic rocks known for higher concentration of uranium (an average of 70 ppm U in gritty quartzite and up to 140 ppm U in metabasic rocks).

Kinnaur district: Anamolous radioactivity value is observed near Ropa village (31°48:78°26) where the black slates of the Batal Formation are exposed. The yellowish encrustations along fracture planes in the Wangtu Granite are reported to be carnotite. Location of Uranium in Himachal Pradesh is given in figure 21.

Figure 21: Locations of Uranium in Himachal Pradesh

Uranium in the Shiwalik Belt: Shiwalik sediments in certain lithostratigraphic units contain high concentration of uranium. The maximum incidence of radioactivity is found in the Lower and Middle Shiwalik sandstones. A few U-anomalies have been located in the Upper horizons of the Middle Shiwalik. Individual radioactive anomaly zones in Shiwalik Belt range from a few sq.m to 6000 sq. m., and the thickness of the zones range from a fraction of a metre to as much as 10m. The radiometric assay values of samples in the anomalous zones range from 0.001 to as high as 0.6% U_3O_8 with low thorium. Mineralisation is strata-bound and mostly tabular, although local disturbance has been noted. Leaching of parent uranium from the beds has taken place. Intense oxidation implying migration of uranium has been observed. Uraninite, along with coffinite is the primary mineral and walfenite. Uranophane, B-uranophane, autonite, tyuyamunite and meta-tyuyamunite are the secondary minerals occurring in the oxidation zones. In the Upper Shiwalik subgroup, vertebrate fossils, those which are phosphatic, contain 0.05% to 0.34% Upx with no thorium. Sandstone hosting the fossils is poor in uranium. Uranium has leached into groundwater. In the Nalagarh-Pathankot area, the hydrogeochemical sampling has indicated about 30 zones of anomalous concentrations of uranium in the waters to the extent of 4 to 40 ppb U.

22. Rock Phosphate: Rock phosphate in Himachal Pradesh occurs in formations ranging in age from Precambrian to Eocene, however no extensive deposit is known from the State. Some formations, such as the Shali, Salooni, Krol and Subathu hold good potential for phosphate potentiality.

Shall Group: Pockets of shale and chert of the Khatpul member and the dolomites of the Tattapani member were found to be mildly phosphatic (0.6 to 0.8 % P_2O_5) near Pata in district Solan and Kandi (31°19':76°44') in Mandi district.

Shimla Group: Shale and limestone of the Basantpur Formation have been sampled and tested for phosphate in parts of Solan and Mandi districts. The carbonaceous shales have been sampled northwest of Khad, northeast of Barech, near Ropar and Suin and Doha and Neri. In all these localities. However, the phosphate content of the samples analysed was less than 0.5 % P_2O_5.

Infra Krol: Lenses and thin discontinuous bands of phosphorite or phosphatic chert interbedded with the Infra Krol shales were reported from parts of Sirmaur and Solan districts. These being streaky in nature, are only of academic interest.

Salooni Formation; Phosphatic nodules varying from 1.5 cm to 7 cm, in diameter and analysing 20 to 30 % P2O5, were recovered from the black slates. A few sporadically distributed nodules were also seen in the grey slate and phyllites. The phosphatic nodules have been recorded from a number of localities in district Chamba such as Tarota (32° 42' : 76° 05'), Dhaneli nala (32° 45':76°00'), Chikoli bridge, Dhamot (32°43':76°05') and from Tiloga, Thamiru (32°48':76°57'), Deutal (32°45':76°00'), Bhatinund (32°43':76°04') of Chamba District.

Krol Formation: The Krol sandstone so far has been one of the best prospects for phosphorite in Himachal Pradesh. A promising horizon of bedded phosphorite occurs in the Krol-Deoria area near Solan. Fragments of phosphatic chart interbedded in the Krol sandstone were reported from Ochhghat area in Solan district. Phosphorite in the Kalor-Deoria area (32° 52':76°44') Shimla district occurs interbedded with the Krol sandstone and with the overlying Krol A shales.

Tal Group: Presence of similar nodules from the Tal Formation was reported from Paonta tehsil of Sirmaur district. The Tal Formation in Sirmaur district occurs in two synelines namely the Nigali Dhar (30°34':70°43') and the Korgai synclines. Rock phosphate in the area is generally found in the Lower Tal only. However, some pockets of phosphatic chert have also been reported to occur in the Krol dolomite near Shamyala and Nigali. Cherty pebbles occuring in the conglomerates of the Upper Tal are also mildly phosphatic. These conglomerates are conspicuously developed near Charag Dhar in the Nigali Dhar Syncline. Three types of phosphorite have been differentiated in the Lower Tal (i) The commonest variety resembles black crushed chert. (ii) The rusty yellowish brown, granular phosphorite occuring as bands, whose thickness ranges from one centimetre to more than 1 metre. This variety is well developed between Banana and Kheunal and at Shamyala. (iii) Phosphatic nodules occurs mostly in the black carbonaceous shales of the Lower Tal. The nodules vary in size from less than 1 centimetre to as much as 10 cms and analyse 20 to 25 % P_2O_5. After detailed work on the Tal Formation in both the Nigali Dhar and the Korgai synclines, it was concluded that there is no band showing appreciable thickness and phosphate content to be of economic value. Bands analysing more than 2% P_2O_5. Over a thickness of one metre or more, are rare in occurrence and have a very limited lateral extent. The area and the rocks have therefore been found to be having no economically workable phosphate deposit.

Kuling Formation: In Kinnaur district black cherty nodules have been reported in the shale of Kuling Formation contain 21% P_2O_5. The phosphatic horizon is about 21 m thick but percentage of nodule is very low.

Spiti Shale: In Lahaul & Spiti Phosphatic nodules ranging from 4 to 10 cm from the Spiti Shales are reported to have analysed 5-15 % P_2O_5. Location of Rock phosphates in Himachal Pradesh is given in figure 22.

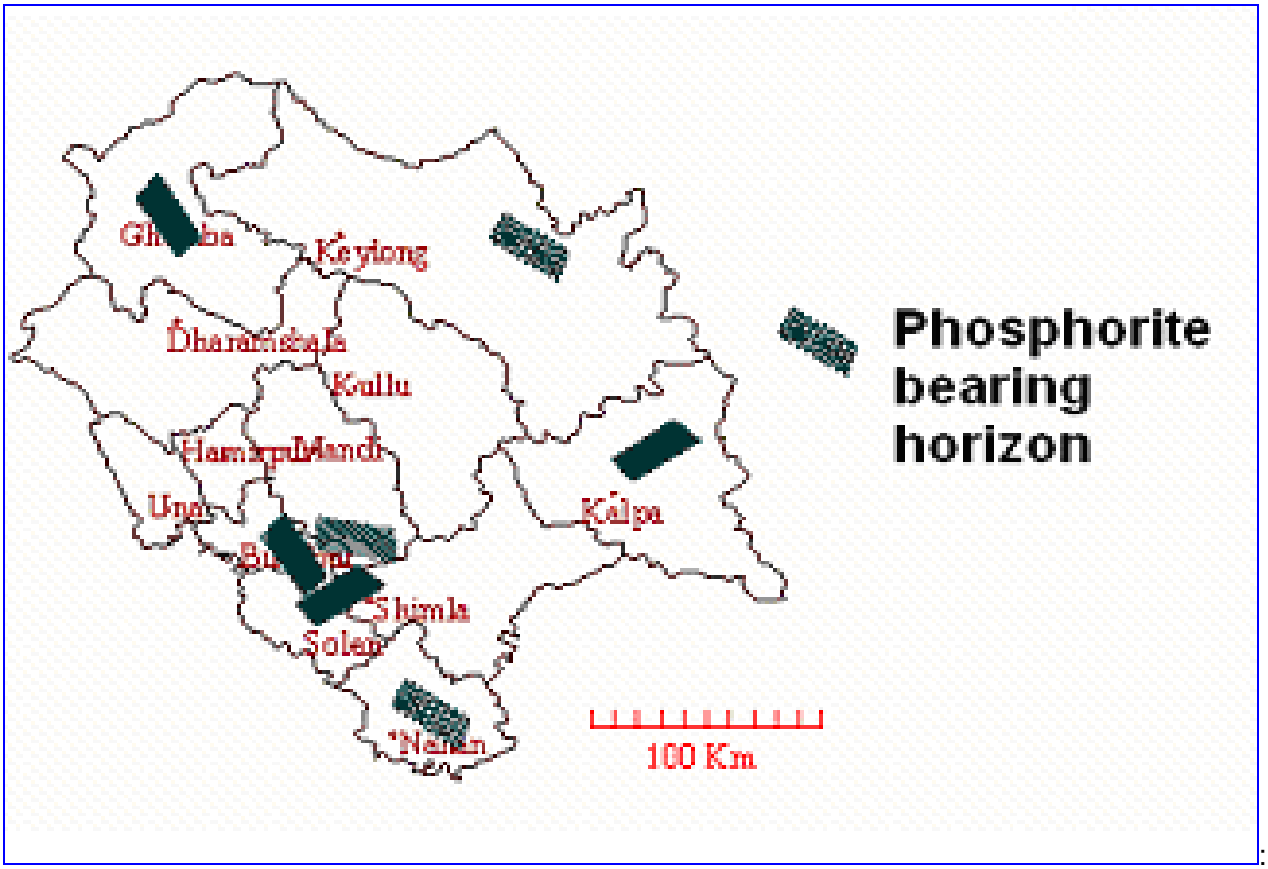


Figure 22: Rock phosphate bearing horizon of H.P.

23. Silver

Kullu district: Several lodes of argentiferous galena in the neighbourhood of Manikaran which are as under:-

(i) **Uchich** have been reported about 69 cm wide lode had been reported from (32°01':77°23'). The ore samples show gold and silver mineralisation.

(ii) **Khenor Khad:** Three mineralised zones have been reported from this place. First zone has yielded silver, second zone lead, gold, silver and copper, and the third zone, several centimetres thick, has yielded lead, gold and silver.

Sirmaur district: Silver has been reported three kilometres east of Chiargaon. The samples, however, gave a value of only 10 ppm of Ag.

Kinnaur district: The galena boulders in Amba (30°38':77°27') area contain up to 250 ppm silver.

24. Rubidium

Kinnaur district The pegmatite veins intrusive into the Carboniferous rocks in the Yangthang (31°53':78°37') area contain upto 350 ppm of rubidium.

25. Stibnite

(Bara Sigri area (31°17'N -77°36' E)**, Lahaul & Spiti District):** The history of discovery of Stibnite goes back to 1854. Antimony deposit near Bara Sigri Glacier have been reported the main bed of 10-15 feet thickness consist of Iron ore, with antimony and other metals on the sides. Location of Pyrite in Himachal Pradesh is given in figure 23.

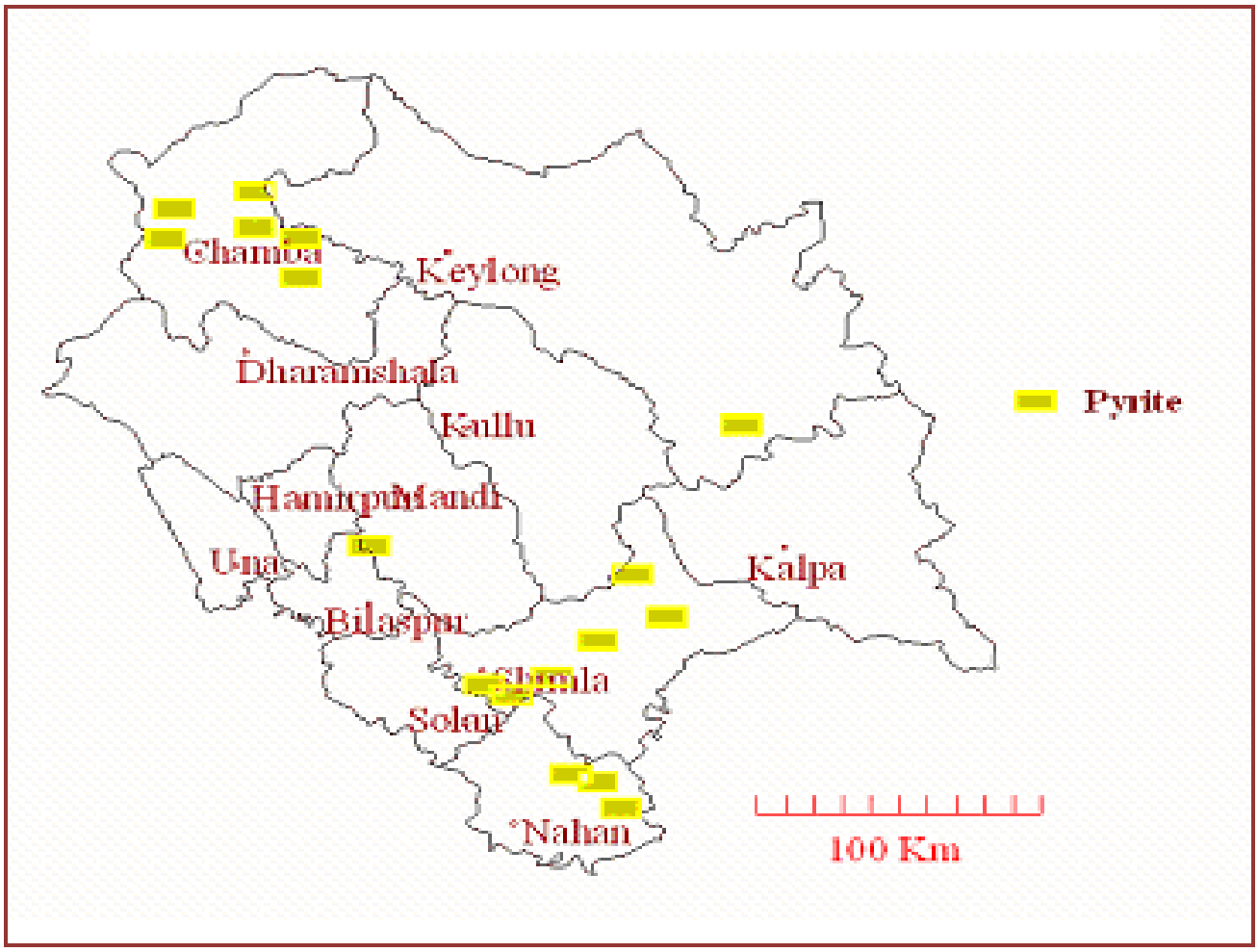


Figure 23: Location of Pyrite occurrences of Himach al Pradesh

Details of stibnite in Bara Sigri area is given in Table 21.

Table 21: Description of stibnite and associated sulphide ore veins in Bara Sigri area

Sr. No	Host Rock	Length	Width	Strike	Dip
1	Pegmatite	30.5 Cm	7.5 Cm	NNE-SSW	Vertical
2	Pegmatite	Ore occur as splash and disseminated products		N35^{0}E-S35^{0}W	Vertical
3	Pegmatite	Ore occur as splash along joints and fractures			
4	Pegmatite	6.7 metres	5 Cm	N50^{0}E-S50 ^{0}W	60 ^{0}SE
5	Quartzo- fedspathic granites	Ore occur as splash and disseminated products		N60^{0}W-S60 ^{0}E	63 ^{0}SW
6	Pegmatite	2.7 metres	7.5 Cm	N10^{0}W-S10 ^{0}E	87 ^{0}SW
7	Quartzo- fedspathic granites	Ore occur as splash and disseminated products		N30^{0}E-S30 ^{0}W	Vertical

There are 9 old working pits reported in the area. The other ore bodies are also located in the area which varies in width form 0.5 cm to 1.5 cm. The rough estimate of the anticipated reserves are about 10,000 tonnes with 1.65% of Sb. Location of stibnite in Himachal Pradesh is given in figure 24.

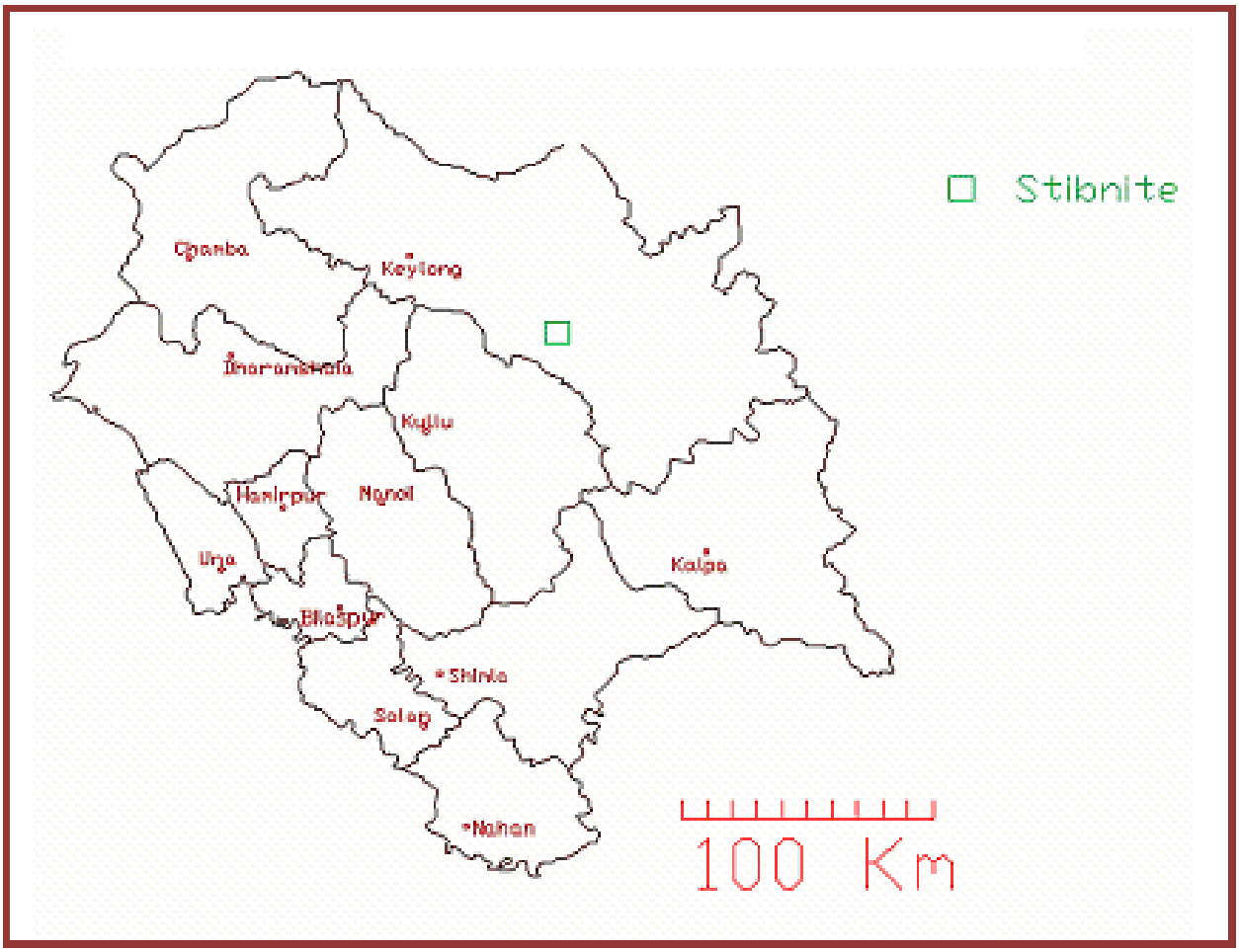


Figure 24: Showing location of Stibnite Ore

26. Sulphur

Lahaul & Spiti district: Small quantity of Sulphur is associated with Gypsum near Losar (32°25' N-77°45' E) and also small quantity of sulphur is associated with other gypsum deposit of Lahaul & Spiti district. The deposition of the sulphur can be grouped into three categories namely; Associated with hot springs; Associated with gypsite and Associated with river terrace.

Sulphur associated with hot springs: Various sulphur springs are situated along the Parechu and on the thrust in the vicinity of Giu Nala. Sulphur, Borax and Gypsum are associated and are deposited at the orifice of the spring. The Sulphur occurs as precipitate. However, the quantity associated is too insignificant for economic use.

Sulphur associated with Gypsite: This type of deposit occurs associated with gypsite and limestone. This sulphur is powdery or at places oolitic. It occurs in various shades of yellow and red. The sulphur, thus found is small in quantity and occurs irregularly. At most of the places, they do not continue beyond a depth of more than 0.9 metres.

Sulphur deposits associated with river terrace: The river Parechu has a course roughly parallel to the thrust and hence the river terraces with sulphurous soil also have same trend. It occupy an area of 0.03 sq km. The deposit occurs within thick beds of river terrace. With subsequent deepening of the valley the terrace are now much above the present river level.

The hot springs exists, parallel to thrust and along the banks of the river and sulphur precipitated got diffused in the loose matrix in between the pebble and cobble of the river terraces now found at higher level, thus leaving sulphurous soil all along the slope of the valley. The quantity is too insignificant for economic use.

District Kullu: Sulphur deposit is associated with spring deposits in Parbati valley and hot water springs in Beas River.

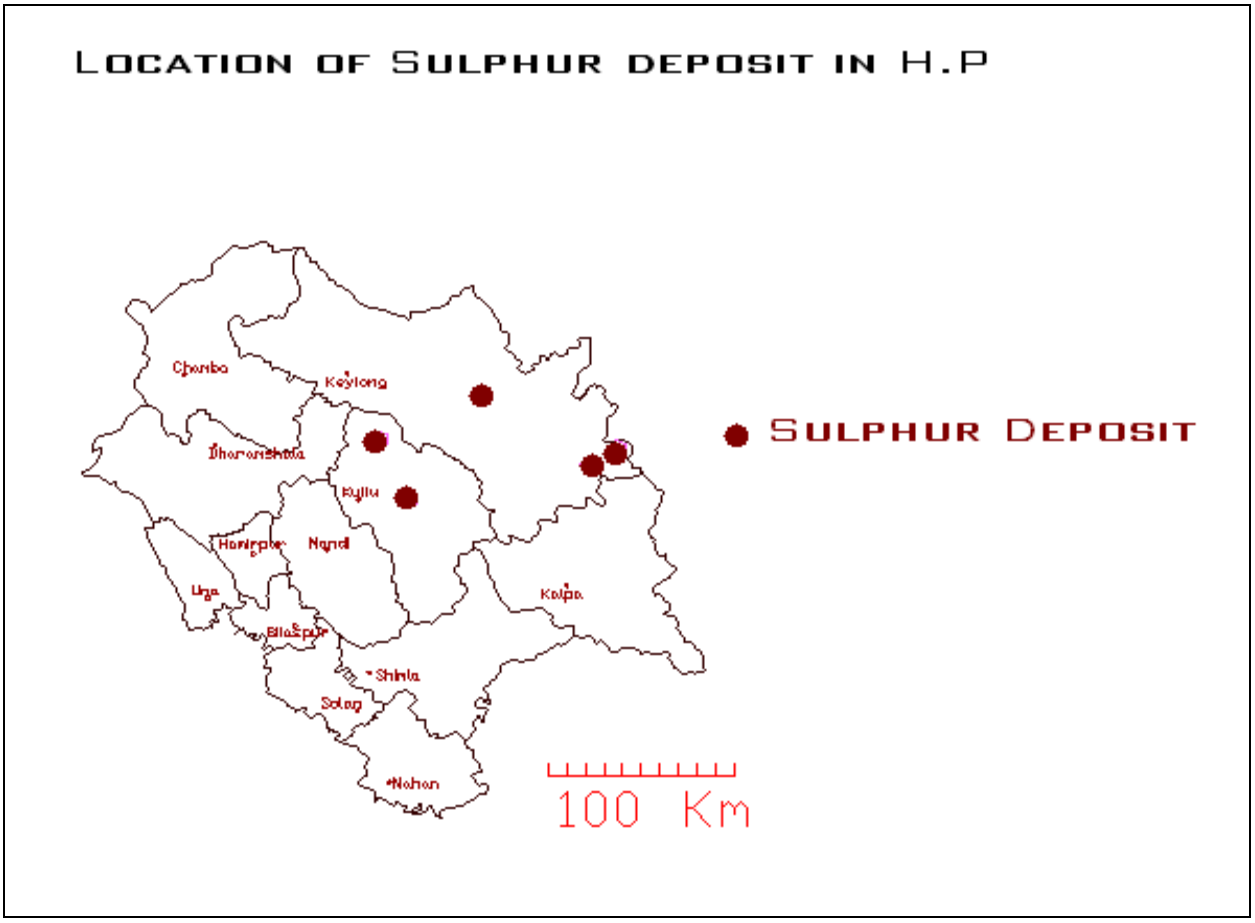


Figure 25: Location of Sulphur deposit in Himachal Pradesh

27. Talc/ Steatite

Shimla district: An occurrence of talc has been reported from near Asrau (31°29': 78°20') and Idpa (31°29':78°24'). The rocks consist of talc schists.

Sirmaur district Steatite of good quality occurs at Nahan (30°33':77°17')

28. Tourmaline

Kinnaur district

(i) Tourmaline has been reported in the pegmatites traversing the gneisses and granites around Rakchhan (31°23':78°26') and Chhitul (31°21':78°26').

(ii) In Khokpea nala, a small lens of tourmaline rich graphite schist is exposed within the Vaikrita Group. Similar concentration is noticed in quartzites about a kilometre south east of Shangi (31°33':78°29').

Kullu district

(I) Tourmaline bearing pegmatites intrusive into gneisses and granites have been reported around Umga Thach (32°10':77°27') and Samsi Thach (32°07'77°29').

(ii) Black crystals of tourmaline, five centimetres in length and over one centimetre in width, are present in pegmatites around Sara Unga Thach (32°10:77°29) and Pando-Seo Thach (31°56': 77°40').

29. Zinc

Lahaul & Spiti district: Zinc blende is sparingly disseminated through the gangue of the antimony ore at Bukkanbudi (31°42':75°49').

Sirmaur district: Zinc is found associated with galena and pyrite at Anyar (30°44':77°45') and Chamri (30°43':77°45'). At Anyar, the samples analysis of from old working shows 1.5% Zn and 0.21 %Pb. Another sample gave 10% Zn. At Chamri the zone contains 3.01% Zn and 3.01 % Pb.

5.11 Information on human resource management issues (which may have relevance to environment management) in the sector such as: manpower, vocational training, awareness levels etc.

The Director of Industries is the overall incharge of the Directorate including the Geological Wing. The State Geologist who works under the control heads geological Wing and supervision of Director of Industries. The State Geologist is further assisted by Geologists and Assistant Geologist and by the Mining Officers in the field, apart from the supporting staff from drilling, surveying, draughtsman and ministerial staff.

The Industries Minister (Hon'ble Chief Minister) heads the Industries Department. At the Secretariat level, there is a two tier structure with the Principal Secretary (Industries) and the Joint/Deputy/Under Secretary (Industries).

The Geological and Mining Wing is headed by the State Geologist. He reports to the Director of Industries for mineral exploration/regulation works. He is further assisted by Geologists, Assistant Geologists, Superintendent Gr.- I & II, ministerial and other staff.

The organisational set up in the field offices of the Department of Industries is as under:

(i) **District Industries Centres:** The District Industries Centre are headed by General Managers. They are further assisted by Managers, Industrial Promotion Officers, Economic Investigators, Extension Officers (Industries) at Block level, ministerial and other staff.

In order to provide facilities to entrepreneurs close to their places of work, Single Window Clearance Agencies were functioning at

Parwanoo, Baddi, Nalagarh in Solan District, Paonta Sahib, Kala Amb in Sirmaur District, Gwalthai in Bilaspur District and Sansarpur Terrace, Damtal in Kangra District.

(ii) **Mining Offices:** The Mining Office is headed by a Mining Officer. S/he is assisted by Mining Inspectors, Asstt. Mining Inspectors, Mining Guards and ministerial and other staff. Further, more the Drilling operation is headed by Drillers who are assisted by Asstt. driller and Laboratory Assistant.

The total sanctioned strength of officers & employees in the Department of Industries is given in Table 22.

Table 22: Staff position in respect of Industries Department

Sr. No.	Category	Sanctioned posts	Vacant
1	Class-I	47	10
2.	Class-II	121	25
3.	Class-III	615	241
4.	Class-IV	430	63
Total		**1213**	**339**

The following six Board/Corporations are functioning under the administrative control of the Industries Department: -

I. H.P. State Industrial Development Corporation Ltd. (HPSIDC).
II. H.P. Financial Corporation Ltd. (HPFC).
III. H.P. State Handicrafts & Handloom Corporation Ltd. (HPSH&HC)
IV. H.P. State Small Scale Industries and Export Corporation Ltd. (HPSSI&EC)
V. H.P. General Industries Corporation Ltd.(HPGIC)
VI. H.P. Khadi and Village Industries Board.(HPKVIB)

The State Development Report 2002 suggested following Marketing Strategies of Major and Minor Minerals which have ramifications for manpower especially the marketing of minerals.

- Limestone extracted from the mines of major cement plant is used by them in their own plants.
- Other major minerals mainly limestone and very rare silica sand and Baryte are marketed by the lessee themselves in the open market.
- Minor minerals are also marketed by the lessees/contractors in the open market.y

5.12 Regulatory Analysis to identify regulations that have environment implications and compliance with the same.

Mining sector and cross sector policy and regulatory framework at state level shows the intent of the state government to address the issues relating to improper siting poor ambient air quality, deteriorating water quality and quantity, noise pollution, waste treatment and disposal, land degradation, loss of flora and fauna, and poor aesthetics. A list of policy and programme is given below.

- Environment (Siting for Industrial Projects) Rules, 1999
- Environment (Protection) Act, 1986
- EIA Notification, 2006 and amendments
- Zoning Atlas
- Central Pollution Control Board
- Comprehensive Environment Pollution Index (CEPI)
- The Air (Prevention and Control of Pollution) Act, 1981
- National Ambient Air Quality Standard (NAAQS)
- National Water Policy, 2002
- State Water Policy
- The Water (Prevention and Control of Pollution) Act, 1974
- HP Ground Water (Regulation and Control of Development and Management) Rules, 2007

- The Noise Pollution (Regulation and Control) Rules, 2000
- Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008
- The Land Acquisition Act, 1894
- The Forest Conservation Act, 1927
- Mining Policy
- Industrial Policy
- Forest Sector Policy

Reference

- Department of Industries
- State of Environment Report (Year not mentioned)
- Districts Statistical Abstract
- HP State Pollution Control Board

CHAPTER 6 INDUSTRY

6.1 Resource inventory of the existing assets of the sector

Himachal Pradesh has made significant progress in the field of industrialization in the past few years. The Industrial Sector has achieved the take off stage with well diversified base of industries ranging from rural and traditional handloom and handicrafts, cottage, tiny and SSI units to high-tech precision industries. The liberalized economy, delicensing and incentives provided by the Central Government for promotion of industries by notification of Govt. of India's Special Package, of Incentives for the State have proved to be a "Pull factor" to attract various industries to the State. After the announcement of these incentives and the package the flow of investment to the State has increased manifold. Between 07-01-2003 and 31-03-2011, there are 14313 New Small, Medium & Large scale Units, of which 1019 are in Medium & Large Scale & registered with the Department of Industries with an investment of Rs. 31177.57 crore and employment to about 1.7 lakh persons.

The share of industries in the State GDP has increased from 1.1% in 1950-51 to over 17% during 2006-07. Presently the Industrial sector has been contributing about Rs. 200 crores in the State exchequer in the form of state taxes, duties and levies. Apart from this accruals of direct and indirect taxes in the form of CST/GST, road taxes, duties on industrial products and exports. On an average the Industries department has been generating/earning annual revenue of Rs. 54 crores by way of royalties from mines, sale of industrial plots/sheds, service charges and other sources.

During the year 2010-11, 963 small scale industrial units have been registered with an investment of Rs. 96539.36 lakh which provides employment opportunities to 10,002 persons. In medium & large sector, 27 industrial units with an investment of Rs. 211833.6 lakhs provide employment opportunities to about 3740 persons. With the announcement of New Industrial Package by Government of India with effect from 7th January, 2003 and subsequent revision of the State Industrial Policy in 2004, there has been a spurt in the industrial investment coming to the State. The huge investment has increased the demand for industrial land and power and has put more pressure on the existing infrastructure. This has necessitated commensurate increase in developmental activities especially strengthening of infrastructure and augmentation of existing infrastructure throughout the State. Significant requirement of funds has, therefore, arisen for building of roads, development of plots, acquisition of land, strengthening of T&D network for power, creation of common facilities, social and commercial related infrastructure.

As per data collected from Director of Industries, Himachal Pradesh, during 1979-80 to 2001-02, Large & Medium industries (L&M) have increased 8.7 times. The investment in this sector has gone up 11.5 times between 1990-91 and 2001-02 and employment has doubled. In the Small Scale Industries (SSI) sector, between 1980 and 2002, the number of units has multiplied 4.2 times. The investment increased 4.5 times during 1990-91 to 2001-02 and employment 1.5 times. By March 2002, the total production was worth Rs. 5000 crore, providing direct employment to 1.56 lakh persons, with an investment of Rs. 3048 crore in the SSI and L&M sectors.

The investment in the L&M scale sector accounts for 78% while employment only 19%. On the other hand, in the SSI and tiny sectors investment is only 22% and employment 81%. In the Eighth Plan (1992-97) the number of industrial units increased from 21,630 to 25,777 (19.3%), employment from 1,05,277 to 1,30,560

persons (24%) and investment from Rs. 446.38 crore to Rs. 2081.01 crore (466.6%). On the other hand, in the Ninth Plan (1997-02) industrial units increased 13.1%, employment 16.2% and investment 46.5% as given in Table Table 1.

Table 1: Growth of Industry in Himachal Pradesh

Year	Units (No.)			Employment (No.)			Investment (in crore) Current Prices		
	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total
1979-80	6969	22	6991						
1990-91	20545	110	20655	86227	15125	101352	150.54	200.84	351.38
1991-92	21518	112	21630	89997	15280	105277	222.38	224	446.38
1992-93	22440	114	22554	93577	15747	109324	289.28	265	554.28
1993-94	23265	121	23386	96779	17824	114603	350.2	404.33	754.53
1994-95	24121	129	24250	100119	19693	119812	412.4	761.27	1173.67
1995-96	24845	147	24992	103269	22467	125736	465.1	1447.4	1912.5
1996-97	25617	160	25777	106665	23895	130560	485.34	1595.66	2081.01
1997-98	26378	173	26551	110112	25988	136100	518.78	2031.14	2549.92
1998-99	27253	174	27427	114491	26103	140594	564.43	2085.41	2649.84
1999-00	28045	182	28227	119618	28930	148548	613.56	2288.49	2902.05
2000-01	28731	188	28919	122745	29047	151792	643.5	2310.52	2954.03
2001-02	29479	191	29670	126594	29382	155976	685.48	2363.34	3048.82

Source: Director of Industries Himachal Pradesh.

The industries exist only in eight districts. More than 95% of these industries are in the periphery districts of Solan, Sirmaur, Kangra and Una districts. In the remaining districts L&M industries are mainly based on local raw material, like the two cement plants in Bilaspur, while the electronics industries have been located in Shimla mainly due to the availability of better infrastructure and manpower. The major industries are food products, textile/spinning, chemical and chemical products, electronics, steel and steel products, paper and paper products and precision and mechanical engineering. They constitute 80% of the total L&M industries.

In the SSI and Tiny sectors of Himachal Pradesh, 65% of the industrial units relate to food and allied products, hosiery, wood and wood products and mechanical items. These, along with chemical and allied products, are major sources of employment. Details of the number of industrial units and the employment provided by different types of industrial groups are given in Table 2 and Table 3.

Table 2: District wise number of Industrial Units, Investment and Employment (as on 31 March 2002)

District	Units (No.)			Employment (No.)			Investment (in crore) Current Prices		
	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total
Bilaspur	1879	3	1882	6876	1221	8097	28.65	384.66	413.32
Chamba	1879	3	1882	6876	1221	8097	28.65	384.66	413.32
Hamirpur	2286	—	2286	8322	—	8322	35.61	—	35.61
Kangra	7844	6	7850	34096	791	34887	143.69	21.35	165.04
Kullu	2000	1	2001	9784	52	9836	33.81	6.25	40.07
Kinnaur	506	—	506	1533	—	1533	2.97	—	2.97
Lahaul & Spiti	542	—	542	1452	—	1452	2.31	—	2.31
Mandi	2904	1	2905	11620	186	11806	63.14	2.7	65.84
Shimla	2723	4	2727	10080	541	10621	43.6	33.29	76.89
Sirmaur	2291	30	2321	10057	4343	14400	85.78	256.14	341.93
Solan	2639	138	2777	17436	21345	38781	161.32	1640.04	1801.36
Una	2386	8	2394	10091	903	10994	63.92	18.9	82.82

District	Units (No.)			Employment (No.)			Investment (in crore) Current Prices		
	SSI	L&M	Total	SSI	L&M	Total	SSI	L&M	Total
HP	**29479**	**191**	**29670**	**126594**	**29382**	**155976**	**685.42**	**2363.33**	**3048.78**

Source: Directorate of Industries Himachal Pradesh

Table 3: Industrial Group wise, number of Units and Employment in Small-Scale Industries in the State (as on 31 March, 2001)

Sr. No.	Industrial Groups	Units		Employment	
		Number	Percentage	Number	Percentage
1	Food & Allied	7982	27.7	27937	18.9
2	Hosiery	3916	13.6	11748	8
3	Wood & Wood Products	3562	12.4	16029	10.9
4	Paper & Paper Products	462	1.6	2541	1.7
5	Leather & Leather Products	1336	4.6	4676	3.2
6	Glass & Ceramic	577	2	6058	4.1
7	Chemical & Allied	1621	5.6	19452	13.2
8	Mechanical Items	4136	14.3	31020	21.1
9	Electric & Electronics	931	3.2	8379	5.7
10	Misc. & Other	4319	15	19435	13.2
Total		**28842**	**100**	**147275**	**100**

Source: State Industrial Profile of Himachal Pradesh (2001-02), by Small Industries Service Institute(SISI), Government of India, Solan, Himachal Pradesh.

District wise details of Industries in Himachal Pradesh are given in Table 4.

Table 4: Types of Industries in Himachal Pradesh

Sr. No.	Districts	No. of Industries	Major Types of Industries
1	Bilaspur	1037	Flour Mills , Cattle Feed, Engineering, Ply Industries, Poultry Feed, Steel Works, Allied Industries, Food Products, Furniture Industry, Grinding Industries, Handicraft Industry, Hosiery, Information & Technology, Knitting Works, Printing Press, Packaging Industries, Beauty Parlour, Pharmaceuticals, Welfare Society, Saw Mill etc.
2	Chamba	735	Flour Mills, Automobile Service, Bakery, Boutique, Color Lab, Cream Factory, Furniture Industries, Handloom Industry, Metal Industry, Oil Mills, Printing Press, Weaving Works, Wool Carding, Hosiery, Welding Works etc.
3	Hamirpur	1186	Agro Industry, Flour Mills, Bakery, Batisa Udyog, Beauty Parlor, Engineering Service, Food Processing Industry, Furniture Industries, Handicraft Industry, Information & Technology, Metal Industry, Mushroom, Oil Mills, Printing Press, Steel Industry, Stone Crusher, Timber Industry, Trader & Manufacturer, Weaving Works, Hosiery, Welding Works
4	Kangra	3050	Agro Industry, Flour Mills, Bakery, Beauty Parlour, Boutique, Chemical Udyog, Computers Technology, Crushing Company, Engineering Service, Electronics Works, Fabrication, Furniture Industries, Handicraft Industry, Handloom Weaving Industry, Masala Grinding Unit, Metal Industry, Printing Press, Processing Unit, Poultry Feed Mills, Rice Mill, Steel Industry, Wool Industry, Weaving Works, Welding Works etc.
5	Kinnaur	509	Flour Mills, Bakery, Furniture Industries, Handloom Industry, Metal Industry, Weaving Works etc.

Sr. No.	Districts	No. of Industries	Major Types of Industries
6	Kullu	890	Allied Industry, Beverage Industry, Flour Mills, Bakery, Carding Industry, Chemical Udhyog, Crushing Company, Fabrication, Furniture Industries, Hosiery Udhyog, Handicraft Industry, Handloom Industry, Masala Grinding Unit, Metal Industry, Printing Press, Processing Industry, Grinding Mill, Saw Mill, Steel Industry, Tea Industry, Wool Industry, Weaving Works, Welding Works etc.
7	Lahaul & Spiti	66	Cooperative Industrial Society, Crafts Women Weaver Company, Industries, Processing Society, Steel Fabrication etc.
8	Mandi	1768	Milk Foods, Information Technology, Rolling Shutter, Weaving Industry, Stone Crusher, Printing Press, Oils Mills, Namkeen Industry, Furniture Industries, Food Processing, Engineering, Carpentry Works, Fabrication, Handicrafts, Steel Industry, Core Product, Agro Industry, Automobiles Works, Carding Industry, Bakery Unit etc.
9	Shimla	2094	Rice Mill, Art Dyers & Dry Cleaners, Confectioners, Flour Mills, Fabricators, Paper Products, Crusher, Furniture Industries, Healing Products, Handlooms, Processing Software Centre, Parlour etc.
10	Sirmaur	1089	Allied Industries, General Mills, Packaging, Chemical Industries, Composite Unit, Bakery, Crushers, Weaving Unit weaving Unit, Wooden Furniture Work, Engineering Works, Mineral & Chemical, Fabricators, Rice Mill, Grinding Works etc.
11	Solan	1494	Industries, Garments, Packaging, Pharmaceuticals Works, Crusher, Fabricators, Agro Mills, Allied Industries, Bricks Industry, Flour Mills, Electronic Equipment, Rolling Mills, Handloom Enterprises, Feed Industry etc.
12	Una	1014	Agarbatti Works, Agro Engineering Works, Crusher, Chemical Udhyog, Furniture Works, Packaging Works, Painting Works, Food Processing Industries Welding Works, Cattle Feed, Flour Mills, Agro Industries, Timber Store etc.

Source: Industrial Census 2008, Himachal Pradesh

Status of Industry in Himachal Pradesh: During the last few years, the industrialization in the State of H.P. has made significant progress. In 31st March 2011, State of HP have about 37835 (37364 Small Scale and 471 Medium & Large Scale) Industrial Units with an investment of about Rs. 13492.14 Crores and employment of about 2.554 lakh persons registered with the Department of Industries. The details of registered industrial units are given in Table 5, Table 6 and Table 7.

Table 5: District wise details of industrial units registered in the Small, Medium & Large scale Sector ***(status: as on 31-03-2011)***

Sr. No.	District	No of units	Investment (Rs. in lakh)	Employment
1	Bilaspur	2280	53827.71	9904
2	Chamba	1763	3303.43	6102
3	Hamirpur	2768	6264.33	9966
4	Kangra	8873	35226.71	40160
5	Kullu	2489	7303.15	13235
6	Kinnaur	571	514.62	1789
7	Lahaul & Spiti	576	321.79	1589
8	Mandi	3824	10427.32	15813
9	Shimla	3392	24029.91	13028
10	Solan	4871	937064.98	96909
11	Sirmaur	3170	164142.95	27533
12	Una	3258	106787.37	19377
	Total	**37835**	**1349214.27**	**255405**

Table 6: Year wise details of units registered in the Small Scale Sector ***(status: as on 31-03-2011)***

Sr. No.	Year	No of units set up	Investment (Rs. in lakh)	Employment generated
1	up to 02-03	30176	70977.48	129871
2	2003-04	663	3708.48	3769
3	2004-05	913	8891.44	6412
4	2005-06	914	12217.3	6611
5	2006-07	952	45272.78	10665
6	2007-08	842	70637.33	11302
7	2008-09	909	73795.48	10939
8	2009-10	1032	75320.01	10011
10	2010-11	963	96539.36	10002
	Total	**37364**	**457359.66**	**199582**

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Table 7: Year wise details of units registered in Medium & Large Scale Sector ***(Status: upto 31-03-2011)***

Sr. No.	Year	No of units set up	Investment (Rs. in lakh)	Employment generated
1	up to 02-03	196	237806	29823
2	2003-04	15	3494	762
3	2004-05	35	30287	3473
4	2005-06	64	50159.24	4606
5.	2006-07	46	61525.9	4568
6.	2007-08	19	48263.61	1923
7.	2008-09	46	114103.26	4225
8.	2009-10	23	134382.42	2703
10	2010-11	27	211833.6	3740
	Total	**471**	**891855.03**	**55823**

District Industries Centres (DICs) have been functioning in all the districts of the state. The objective of DIC programme is to provide all facilities, services and support required by village and small entrepreneurs under single roof. The industrial areas and estates have been set up to provide infrastructure facilities to the entrepreneurs. Three industrial estates have been set up to provide infrastructure facilities to the entrepreneurs at Kangra, Jawali and Dera Gopipur-Gopipur in the district. Besides these, seven industrial areas namely Nagoya Bagwan, Nagri, Dhaliyara, Sansarpur Terrace, Baib Attariyan, Nagrala and Raja-Ka-Bagh have been set up to attract the entrepreneurs from the different parts of the country.

An economic census was conducted by the Department of Economics and Statistics, Himachal Pradesh in 1998. The information on location of enterprises, description of activities of enterprises, nature of operation, type of ownership, social group of owner, power and fuel used for the activity and the number of persons engaged in the enterprise under agricultural and non-agricultural sectors, were collected.

While analyzing the distribution of non-agricultural enterprises by major activity group, it is revealed that both in rural and urban areas retail trade, community, social and personal services and manufacturing were three most important activity groups followed by hotel and restaurants. The share of establishments in total non-agricultural enterprises was the highest in electricity, gas and water supply followed by communication, finance and real estate and mining and quarrying community social and personal services and transport.

Handicrafts**:** Art of weaving occupies a place of pride in the crafts of the district. This household industry is certainly of the very ancient origin in the district. The district is rich in producing wool. The wool spinning and weaving is important household industry of many households in this district. Woollen caps, shawls, pattoos and tweed cloth (Patti) are woven from home-spun yarn for self use and local marketing. 'Patti' is used for making coats, long coats and caps etc.

District wise Status of Industries in Himachal Pradesh

Bilaspur: Presently, the economy of the district is confined mainly to agriculture. There is only one large scale industry at Barmana engaged in production of cement.

Due to availability of raw material, M/s Associated Cement Company limited has set up a cement factory on a large scale in private

sector at Barmana. At Barmana, M/s Associated Cement Companies Limited, has two cement units with a capacity of 30 Lakhs tonnes. These units have provided employment to 1065 persons. Another medium scale industrial unit with investment of Rs.128 Lakhs producing flexible packaging material is located in industrial area of Bilaspur. It provided employment to 167 persons. During 1999, 90 industrial units on small scale were registered in the district. These are such as match splint unit, hosiery, ayurvedic drug manufacturing units, tyre retreading, paint and varnish making unit, stone crushers etc. Besides these, there are few artisan units like handloom, leather shoe making, pottery, black smithy, wooden ware, etc. A resin and turpentine factory is also functioning in the public sector near Bilaspur Town. Furniture factory established by Himachal Pradesh General Industries Corporation Ltd. is also functioning in the district.

The cottage industries like weaving, basketry, rope making, mat making, earthen-ware, black smithy, carpentry, rice mills, oil mills, seed crushing, leather work, gold and silver smithy which are essential for the self sufficiency of rural area are scattered all over the district. The Khadi and village Industries Board is also helping the people in the establishment of village industries. The Board distributed loans worth Rs 37,57,000 as well as grant worth Rs 16,00,000 to village industries numbering 11 during the period 1999-2000. During the year 1999-2000 a sum of Rs. 7.08 lakh was sanctioned by the Banks as loans to 20 small scale industrial units.

To inculcate the spirit of industrialization Government of Himachal Pradesh has established two Industrial Training Institute in Bilaspur district which provide training in 13 trades like Tailoring and cutting, Electrician, Fitter, motor mechanic, Draughtsman (civil), Carpentry, Bleaching and Dying, Steno (Hindi), Hand weaving, Motor Driving & Computer etc.

The Department of Industry is trying to create requisite infrastructural facilities for the industrial sector. To encourage the entrepreneurs to establish industries, the Department is providing various incentives such as allotment of land in industrial area, power charges concessions, capital investment subsidy on fixed assets, interest subsidy, freight subsidy, sales tax incentives, subsidy on feasibility report, etc. Besides, KVIC/KVIB also provides margin money subsidy for establishing small industrial units. The pace of industrial growth is slow in the district. In 1991, there were 86 registered factories which have increased to 90 in 1999.

Himachal Pradesh Khadi & Village Industries Board is engaged in setting up of village industries by providing loans, subsidy and other incentives. The Board provides loan/ margin money as per prescribed rate of interest of Khadi Commission.

Chamba: Chamba district is most backward as no large or medium scale industry exists in the district. Chamba produces shawls and other woollen goods and cotton fabrics. Chamba 'chappals' are very famous and there demand very high. Government of Himachal Pradesh runs a leather training centre which trains local workers who are associated with this sector.

The important village industries are weaving, carpentry and black smithy which are practiced since the old times to cater to the local needs. The rich traditional skills of its inhabitants and opportunities for local resources based industries, offer a vast potential for growth of small scale and cottage based industries in the district. The cottage industries like weaving, basketry, rope making, mat making, earthen ware, black smithy, carpentry, rice mills, leather works, gold and silver smithy are essential for the self sufficiency of rural areas which are scattered all over the district. There is one training institute relating to technical education at Chamba. The industrial sector consists of the units mostly under tiny and cottage industries.

Among the other industries, Handloom is the most common for the development of handicrafts industries in the district the Handloom and Handicrafts Corporation runs textile production centres at Chamba and Tisa, footwear factory and Chamba 'Rumal' production centre at Chamba.

District Industries Centre (D.I.C.) is the nodal agency of development of industrial activities in the district. District Industries Centre has developed 12 industrial plots and constructed 15 sheds at Sultanpur and all the sheds are occupied by the entrepreneurs. Another industrial area is at Parel. The District Industries Centre has constructed nine sheds and developed 10 plots. At Hatli, 5 sheds are ready and 22 plots have been developed. At Holi, 10 sheds are under construction. A few more industrial areas acquired for the construction of sheds in the district are Industrial Area Garnota (109 bighas acquired), Industrial Area Judera (6.14 bighas acquired) and Industrial Area Bhanota (16.15 bighas acquired).

The availability of land, water and power is satisfactory in the district. Natural resources and availability of other raw materials the types of industrial units have good potential in the district, as given in Table 8.

Table 8: Type of Industry in Chamba District

Sr. No.	Types of Industry	Availability of Natural Resources and Raw Material
1	Wool based Industry	Wool is available in sufficient quantity in the district.
2	Resin based Industry	This industry can also be set up as there are plenty of Devdar/Chil trees.
3	Herbal based Industry	'Dhoop' and Cedar wood oil can be promoted.
4	Cement Factory	A cement plant is expected to be installed by Larson and Turbo company in the district.
5	Mine based Industry	Sand, slate mines are available in plenty from which flooring chips, flower pots and bricks can be manufactured.
6	Honey based Industry	A honey processing plant can be set up in the district as the bee keepers are producing plenty of honey.
7	Fruit based Industry	Fruit canning, pickles, jam, jellies and juice can be produced in the district.
8	Forest based Industry	Furniture manufacturing units, wood carving activities can be promoted.

Inspite of various incentives, the pace of industrialization is slow because of problems like marketing, lack of entrepreneurship and remote location of the district.

Hamirpur: There are no large scale industrial units in the district due to lack of infrastructural facilities, resources and demand. An industrial estate has been set up at the distance of 2 km. from Hamirpur. Units have been established. M/s Verma Steel Fabricators & M/s Dev Raj Sewing Machine Assembling, M/s Jagdamba Association has set up resin and turpentine factory at Kahdru assisted by Village and Khadi Board and P.V.C. shoes at Hamirpur.

The district has Engineering College, Polytechnic and ITI. A good number of skilled ex-servicemen are also available in the district. Under various programmes, incentives and subsidies are being provided to entrepreneurs to promote the industrial growth in the district. Financial assistance is being given to educated & unemployed youths in this regard. Whatever industrial units have been set up in the past are either servicing units such as atta chakki, cotton carding, oilseed crushing, automobile workshops and other mechanical workshops etc. Some small scale establishments such as cottage type units undertaking production of gate, grills, agricultural implements, water tanks, furniture both steel and wooden, soap units, polythene sheet, dhoop making etc. have come up on the basis of demand. There are also some cottage type hosiery, knit wear, bakery and candles manufacturing units functioning in the district.

The State Handicraft Board runs a training and production centre and also procurement units in the district. The Board has shawl producing centres at Hamirpur and Dugna. A bamboo basket making centre is functioning at Bhalet and a carpet weaving centre at Ranghr in Tira Sujanpur tehsil. All the aforesaid units are quite small.

While analysing the distribution of non-agricultural enterprises by major activity groups, it is revealed that both in rural and urban areas retail trade, community, social, personal services and manufacturing were the most important activity groups followed by hotels and restaurants.

Kangra: The District has many resources of water, hydropower, minerals, forests, cool and dust free climate. All these factors provide favourable condition for setting up agriculture based food processing and electronic industries in the district. However, there is much scope for the small and medium size industries. Kangra district has tea processing factory at Baijnath, Bir, Palampur and Sidhwari. Suraj industries at Sansarpur Terrace is engaged in the manufacturing of vanaspati ghee while another industrial unit at Kandori known as Him Ispat Ltd. is manufacturing cold rolled steel strips, in the district.

Five industrial training institutes at Shahpur, Nurpur Neharan Pukhar, Dhameta and Saliyana have been established to provide training in different trades. In addition to these, three more institutes for women are also functioning at Dharmshala, Palampur and Jwali. One Government Polytechnic has been set up at Kangra.

Prime Minister 'Rojgar Yogna' for providing assistance to educated unemployed youths for self employment has been launched all over the state. There is a potentiality for setting up of herbal, mineral, horticultural and agricultural based industries in the district. The state Government is giving special emphasis for electronic units. Tea is grown in Kangra district especially in Dharmshala, Palampur and Baijnath at an altitude of 1,000 metres to 1,500 metres above mean sea level. A good number of people are engaged in 'dhoop' making, lac industry, Katha making, slate industry, wool spinning and weaving, bamboo work and pottery. The industrial growth in the district has been hampered by certain constraints as transportation of raw material and finished goods which entails high cost resulting in high cost of finished goods.

Some other important small and cottage industries, which are exist in the districts are Dhoop Making (Jwalamukhi and Kangra), Lac Industry (Nurpur and Dehra Gopipur), Katha Making and Slate Industry.

Apart from this, handloom and handicrafts are also an important cottage industry of the district. Handloom work, such as Floral Shawls, Carpet Weaving, Gudmas and Namdas, Bed Sheets, Woollen Sweaters and Mufflers are produced in various parts of the district, employing good number of local people. Wooden Work, Bamboo Work and Pottery is also provide gainful employment to the people.

Kinnaur: As regards industries, Kinnaur is however undeveloped district in the State. Because of climate & topography conditions of the district. The chances of setting up large scale industries are rare. Because lack of means of transportation and communication as well as other economic and infrastructural facilities. However, traditional village and rural household industries like spinning, weaving, black smithy, silver smithy, gold smithy, carpentry, wood and metal carving, basketry, flour milling, oil milling, fruit processing and distilling exist in almost all parts of the district.

Two centres manufacturing shawls, gudmas and namdas are functioning in the district at Spillo and Nichar. There is one Industrial Training Institute located at Reckong Peo which imparts

training in various trades such as wireman, weaving, stenography (Hindi) and electrician. Besides, there is an Industrial Technical Institute for the girls in Reckong Peo which imparts training in tailoring, weaving, knitting, carpet weaving and carpentry, etc

Industries found in Kinnaur District are based on Wool, Silk and Fibre textiles (276), Food products (128) and Wood Products Industries. Details of type of Industries is given in Table 9.

Table 9: Types of Industries in Kinnaur District

Sr. No.	Industry group of description	NIC code Two digit level	Cumulative Number of Units as on 31.03.2008	Number of SIDO units de-registered during quarter	Cumulative No. of units (as on 30.06.2008)
1.	Food Products	20	128	--	128
2.	Other Food Products	21	--	-	--
3.	Beverages, Tobacco & Tobacco Products	22	---	---	--
4.	Cotton Textiles	23	--	---	--
5.	Wool, Silk & Fibre Textiles	24	276	-	276
6.	Jute, Hemp & Mesta Textiles	25	-	-	--
7.	Hosiery & Garments	26	10	--	10
8.	Wood Products	27	51	--	51
9.	Paper Products & Printing	28	6		6
10.	Leather Products	29	--	--	--
11.	Rubber & Plastic Products	30	--	--	--
12.	Chemical & Chemical Products	31	--	--	---
13.	Non Metallic Mineral Products	32	--	---	---
14.	Basic Metal Industry	33	--	-	---
15.	Metal Products	34	25	-	25
16.	Machinery & Parts Except Electric	35	--	--	--
17.	Electrical Machinery & Apparatus	36	--	--	--
18.	Transport Equipments & Parts	36	--	-	--
19.	Misc. Manufacturing Industries	37	6	--	6
20.	Water Works & Supply	42	--	--	--
21.	Construction	50	--	--	--
22.	Activities Allied to Construction	51	--	--	--
23.	Restaurant & Hotels	69	--	--	--
24.	Storage & Water Housing Services	74	--	---	--
25.	Real Estate & Business	82	--	--	--
26.	Education, Scientific & Research	92	--	--	--
27.	Medical & Health Services	93	--	--	--
28.	Recreational & Culture Services	95	--	--	-
29.	Personal Services	96	--	--	--
30.	Repair Services	97	14	--	14
31.	Services Not Elsewhere Classified	99	--	--	--
32.	Other Services & Groups	100	17	1	18
	Total		**533**	**1**	**534**

Source: Endst.No. Ind. Kin. PMT/4/2006-District Industries Centre, Reckong Peo, Kinnaur

Kullu: The district is centrally located and it is locked from almost all directions by lofty mountains. Besides, the district does not have any basic raw materials and minerals except lime stone for setting of large and medium scale industrial unit. The district has bright potential for establishing industrial units for processing of fruit product as Kullu district is one a major producer of apple and other fresh fruits in the state. However, the district is known for some of its beautiful traditional handicrafts in

weaving. M/s D.S. Foods Ltd. Raison is medium scale industrial unit of the district.

Handicrafts**:** Art of weaving occupies a place of pride in the crafts of the district. This household industry is certainly of the very ancient origin in the state. In the series of weaving, Kullu shawls are famous among the handicrafts of district. Kullu caps and mufflers are considered popular gifts of this district and are much in demand in the state and in others parts of the country. Plain shawls of Pashmina locally known as 'Loi' are woven by all households. Shawls are of two kinds, one is plain and other is of different designs. The shawls are woven from home- spun yarn as well as from the imported yarn called *Ruffle*". The designed shawls known as *Phulwali"* are of recent origin and their prices depend on the quality of material used and design pattern woven on them by the craftsman.

Another allied craft is the weaving of Pattoos and tweed cloth (Patti). '*Patti'* is used for making coats, long coats (*Cholas*) and caps etc. Kullu caps are made of coloured woollen cloth with a velvety circular band of shaneel around it. '*Pullans*' foot wear (like bed room slippers) are made of fibres and wool are other products of handicrafts of upper reaches of inner and outer Seraj, '*Pattoos'* are also made of local wool. These are thicker and heavier than shawls. Ordinary thick and soft one is called '*Dohru*" are mostly used as bed blankets. The '*Pattoos*" woven of fine wool with coloured strips are used by women folk as a dress in the rural areas.

The weavers of Kullu district have also formed Co-operative Society to encourage the export of handicraft goods. Bhutti Weavers Co-operative Society is one of the oldest co-operative society which provides technical and financial assistance to its members and has opened sale outlets in different parts of the state.

Lahaul and Spiti: Lahaul & Spiti district does not have any significant industry worth. This is partly because of non availability of raw material, no local expertise exists and no local market exists for the produce. Only household industries like carpet making, carding of wool and weaving of woolen and pashmina shawls and other clothes exist. The Government of Himachal Pradesh has opened carpet weaving training centre at Keylong, wool spinning and weaving centre at Keylong and sub centre at Junda, Government Pashmina Spinning and weaving centre at Chhiljam in Spiti with sub-centre at Hikam.

There are many Lamas who are adept painters. Their paintings, wood carvings and clay models are real master pieces and the finish indeed immaculate. Their art can flourish considerably if they are provided infrastructural facilities and marketing of their finished goods are arranged by government agencies. At the end of 1999-2000, there were 17 registered industries functioning in the district.

Mandi: The district is predominantly an agricultural tract and devoid of medium and small scale industries. It is endowed with bountiful resources of hydropower, minerals, forests and cool and dust free climate. All these factors provide favourable conditions for agro-based, forest based, food processing, beverages and electronics industries in the district. The setting up of these industries will also improve avenues of employment to the large number of agriculturists raising their income and standard of living. A start was given to this programme during the five year plans with the object of utilizing the available raw materials and providing employment and improving the economic condition of people. The training and production centres in various trades have been started in the district as a part of the plan programme. Liberal loans were given at concessional rates of interest for setting up of new industries and augmentation of the existing units. As a result of this, a number of small-scale industries have sprung up in the district.

The Industries Department is also providing margin money to the extent of 50% to the educated & unemployed people. The industrialists are also getting subsidy of freight under writing of share capitals, concessional rates for industrial plots, building construction materials, relief in electricity tariff, installation of diesel generating sets, central sale tax and preference in purchases by the Government of Himachal Pradesh. At the end of 1999, as many as 102 industries with the capacity of 2,473 personnel were functioning in the district. About 15 industrial units were granted loans to the tune of 345.3 thousands and another 117 units were granted subsidy to the tune of Rs. 2,065.9 thousands during the same period. During 1998-99, the district had 18 mechanical based industries, 12 forest based, 34 cloth industry, 4 food processing, 2 paper based, 7 processing and repairing, 34 flour mills, 5 chemical based and 9 other types of industries functioning in the district, besides a large number of small scale industrial units registered with the Industry Department. The department runs Polytechnic College at Sundernagar, which provides full time diploma courses in Civil, Mechanical, Electrical, Automobile Engineering etc. Besides, the Industrial Training Institute at Mandi provides the training of turner, fitter, electrician, draughtsman, surveyor, carpenter, motor mechanic, tailoring, stenography and mechanical refrigeration etc. Besides, the Industries Department, the Khadi and Village Industry Board has provided grants of Rs.179,610 and loan of Rs. 194,653 to 23 industrial units during the end of 1998-99 for purchasing of raw materials and augmentation of units etc. Only one large and medium industrial unit i.e. M/s Fermenta Biotech Limited, Takoli was established in 1989 with the investment of Rs. 574.52 lakh. It produces 87 tonnes of penicillin G. Amidose Biocatalyst and 6-n-Amylmetacresol every year by providing employment to 93 people.

Shimla: The economy of the district is confined to agriculture and horticulture. In order to provide infrastructural facilities to the entrepreneurs, industrial areas were established at Shoghi. Four large and medium scale units viz. M/s Bhillai Wires Pvt. Ltd., established in 1995 with the total investment of Rs.2,990 lakhs with 160 personnel and installed capacity of 400,00 kms. Fibre, M/s Durha Machine Pvt. Ltd., established in 1989 with the total investment of Rs.250 lakh with 28 manpower and installed capacity of 60 million leadtabs, M/s Indian Magnetics Ltd., established in 1989 with the total investment of Rs. 874 Lakhs with 103 manpower and installed capacity of 327,572,17 squares of video tape/video cassettes and M/s Ramson Communication Ltd. established in 1992 with the total investment of Rs. 200 lakh with 110 manpower and installed capacity of 15,000 lines of subscriber carrier and long line equipment are functioning at Shoghi in Shimla district. The State Government Agencies are sanctioned and distributed a sum of Rs.30.51 lakh to 11 industrial units during the year 1998-99 as loan and advances.

There were so many cottage and small scale registered units in the district. Among the agro-based industries, the units functioning in the district are atta chakki, cotton carding, thresher, oil expeller, bakery, fruit canning and preservation, etc. Forest based industries in the district are engaged in the manufacturing of wooden packing cases, wooden furnitures, toys, sticks, joinery, beehives and other wooden novelties. Mineral based industrial units in the district mainly consist of stone crusher and earthen pottery while textile based industrial units are manufacturing of hosiery products, woollen shawls, patties, chaddars, thread balls, fancy handicrafts etc. Engineering and allied industrial units are engaged in manufacturing of barbed wire, wire nails, tin smithy products, steel fabrication & furniture, auto repairs and sewing machine assembling. The chemical based industrial units are engaged in the production of laundry soap, detergent, ink, tyre retreading and polythene bags etc. Electronic based industries are engaged in manufacturing of video cassettes, television, voltage stabilizer,

TV/Radio repair and intercom system, etc. The different industrial training institutes are functioning in the district. The District Industries Centre in collaboration with small industries service institute organises entrepreneur development programme courses. The Himachal Pradesh Khadi and village Industries Board is also playing an important role to train the persons in industries. The main marketing centres in the district are Shimla, Theog, Rampur, Kotkhai, Jubbal, Rohru, Chaupal and Narkanda, etc. The district is rich in raw material for the establishment of cottage and small scale industries. However, the raw material like cement, sheet and wax etc. is being allotted from raw material depot at Parwanoo. The district has no quality marking centre in existence. For quality marking of the products, manufactures have to go outside the district which not only takes time but also increase the cost of production. There were total 28,836 industries in the district during 1998 out of which 1339 based on agriculture and another 27,497 on non-agricultural industries. About 96,377 persons were engaged in these industries i.e. 2,458 persons in agriculture and 93,919 persons in non-agriculture based industries. The district has 147 factories with the manpower of 3,750 persons and 85 regular based small scale industrial units functioning during the year 1998-99.

Sirmaur: Few industries were introduced during the time of Raja Shamsher Singh, one of them is the Nahan Foundry Ltd. which was set up for the first time in 1875 A.D. which was taken over by the Himachal Pradesh Government in 1964. The main items of the production of this factory are cane, crusher, cast iron and black sheets panes, flour mills, centrifugal mono blocks pump sets and other agricultural implements and accessories. The State Government decided to convert it into H.P.P.W.D. & I.P.H. state workshop and transferred all operational assets within factory premises to the said workshop in 1988. Resin and turpentine factory in Nahan is another oldest factory, which has its raw material from the extraction of chil trees, which are in abundance in the district. This factory was opened in 1945 and came into operation from 1949 onwards. The control and administration of the factory has been completely taken over by the State Government in 1957.

The cement corporation of India has set up cement factory at Rajban with an installed capacity of 600 metric tonnes per day that has generated an employment to about 750 persons. Other important factories being Himachal Mineral and Chemical, Paonta Sahib, Himachal Mill Ltd., Paonta Sahib, Nahan Ceramics, Paonta Sahib, Farm Fresh Fruit Pvt. Ltd., Bata Mandi, Paonta Sahib, Himachal Pradesh Surgical, Paonta Sahib, Govt. Ayurvedic Pharmacy, Majra, Himachal Turpentine Products Ltd., Kala Amb, Himachal Mine Quartts, Bata Mandi, etc. There are numerous units in the district registered with the Industries Department which includes industries like saw mills, leather units, utensil repairs and making, weaving and atta chakkies etc.

There were 24 large scale industrial units registered with the Industries Department with the capital investment of Rs.45,285.97 Lakhs and 4,608 industrial workers in these units as on 31.3.2001. Apart from these, 87 Small Scale Serviceable units were also functioning in the district with capital investment capacity of Rs. 64.56 Lakhs and 178 skilled workers. During the year 2000-2001, a total 1,199 small scale units were registered with capital investment of Rs. 9,026.65 Lakhs to provide employment about 6,449 workers. In order to accelerate the pace of the industrialization, three growth centres/industrial areas namely Kala Amb, Dhaula Kuan and Paonta Sahib have been set up in the district during the early nineties.

To provide technical skill in industrialization amongst the youth, the Government has started training institutions at various places so that the pace of industrialization can be accelerated in the district. There are industrial tailoring

institutes for girls at Nahan and other centers at Trilokpur, Paonta Sahib, Rajgarh, Badaur in Renuka and Bajon in Shalai and Baragat at Sangrah. There is an Industrial Training Institute at Nahan which imparts training in various fields like fitter, turner, electrician, radio, T.V., Mechanic, draughtsman etc. The rural industrial training institutes at Paonta Sahib and other places have been transferred to Himachal Pradesh Village and Khadi Board. The Government has set up sericulture centres farms at Dhaula Kuan, Devinagar, Katesan Devi, Parduni, Karonda Wali Ghatti, Sainwala and Puruwala. The Government with the intention to popularize silk farming provides subsidy and loan to the individuals for rearing cocoon. The traditional cottage industries indeed play their vital role in the rural economy which is ban making handloom weaving, basket making, etc.

Solan: In view of the limited availability of agricultural land and ever growing unemployment, the industries have been accorded a prominent place in the development of the district. The district is quite rich in mineral resources. Out of the main minerals viz. building stones, brick clay, limestone, sand and boulders, the latter is being used as raw material for crushers. Large deposits of limestone have been found in Arki tahsil which are being used by large capacity cement plant in Darlaghat.

Solan is the most industrially advanced district in the state. There are about 126 medium and large scale industries located in the district having fixed capital investment of Rs.1950.02 crores generating employment to 38,281 persons. The main manufacturing items being produced by medium and large scale sectors are cement, telecom equipment, fruits, dial watches, telephone parts, textiles, cotton/synthetic yarn, forging, ayurvedic medicines IMFL, PCP, medicines, flour, steel ingots, magnetic head, computers software/hardware, etc. except Mohan Meakins Breweries Ltd. all these units have come up very recently. A large number of ancillary units are also functioning in the district. Most of these units are located in the foothills due to locational advantage and proximity to market in neighbouring states.

There are about 2,644 registered small scale industries units functioning in the district generating employment to about 17,191 persons. 70% of these units are located in rural area. The important items manufactured include parts of tractors, automobile bearings, fittings, wrist watches, watch cases, watch jewels, tape recorders, video and audio cassettes, clinical and industrial thermometers, activated carbon, medicines, fruits and mashroom canning, PVC footwear, ACSR conductors, ACC pipes, high density polythene films etc. The Industries Department has created good infrastructure in the form of industrial estates/industrial areas in the district The State Government has provided liberal incentives to the prospective industrialists for setting up of industrial units in the district. Further industrial estates/areas have been developed at Parwanoo, Baddi, Barotiwala, Solan etc. An export and import park is also coming up at Baddi for promoting industrial development in the district. The district also enjoys proximity to Chandigarh and the states of Punjab and Haryana. The district has excellent road and communication network. In view of the potential undertaking non-farm sector activities exists in the district.

A large number of families in rural areas are also engaged in traditional jobs like blacksmithy carpentry etc. Kunihar block has the largest number of such artisans followed by Nalagarh, Dharampur, Solan and Kandaghat blocks. State Directorate of Industries has identified growth centres viz. Solan, Nalagarh, Parwanoo and Barotiwala. Besides, Dhaampur, Jabli, Kunihar, Kandaghat, Kasauli and Baddi have also been identified as growth centres. The District Industries Centre (DIC) is entrusted with the task of ensuring overall industrial development in the district by way of identification and motivation of suiTable beneficiaries for setting

up of household, village and cottage industries, tiny sector units, small scale industries and large and medium scale industries as well as for providing various incentives as admissible under the Industrial Policy of the State to various industrial units. The centre has been preparing bankable schemes/projects for the beneficiaries for availing financial assistance from the banks. Solan, Parwanoo, Baddi, Barotiwala are the main industrial centres in the district. Besides, DIC is also helping in the implementation of Prime Minister Rozgar Yojna Scheme in the district. The district is first in Himachal Pradesh to achieve 100% of (PMRY) target in respect of disbursement of PMRY loans for the consecutive years. The Industries Department is providing a number of incentives to the entrepreneurs. The department is also conducting entrepreneurship development programmes in coordination with the HIMCON.

Una: There have been no large scale Industrial units in the district due to lack of infrastructural facilities, resources and demand. In the district, Industrial activities are being looked after by the District Industries Centre, Una which was established during 1979 with a an objective to provide all the facilities under one roof such as preparing of the project reports, procuring of raw material and marketing of finished goods, etc. District Industries Centre provides several incentives e.g. 10% subsidy of capital investment, subsidy on rate of interest, margin money, exemption from sales and purchase taxes.

The medium scale industries are engaged in the manufacturing of Liquid Petroleum gas cylinders, coated cotton fabrics, P.V.C. films, P.V.C. sheetings, HDPE, woven fabric socks, decorative & laminated sheets, malted spirits, country liquor and craft paper, etc. The small scale industries are manufacturing steel furniture, gate, grills, building material, wooden furniture, plastic pipes and water tanks, etc.

Industries Department of the State has developed industrial centres in the district where all facilities to set up the industrial units are easily available. The most of industries in the district are located in Mehatpur, Tahliwal, Amb and Gagret.

The district has an I.T.I. and a good number of skilled ex-servicemen are also available in the district. Financial assistance is provided to entrepreneurs and educated unemployed youths. The district has still a good scope for industrial development. Mehatpur, Amb, Tahliwal and Gagret have been added to the industrial area.

Source: Census data, Himachal Pradesh

Industrial Infrastructure: Availability of high quality industrial infrastructure with basic amenities and modern facilities in different industrial areas and estates is most essential for sustaining and accelerating industrial growth. The Industry Department of the State had developed by March 31, 2002, 30 industrial areas and 10 industrial estates in different ??? with only basic amenities as roads, power, sewerage, water and communication. Besides, more industrial areas and estates are proposed to be developed during the Tenth Five Year Plan in different districts. One growth centre with an estimated cost of Rs. 22 crore has been developed at Sansarpur Terrace in Kangra district. Besides, an export promotion industrial park, with an investment of Rs. 20 crore, is being developed at Baddi as a sponsored project by the Union Ministry of Commerce. In addition, the Department of Industries proposed to set up an apparel park, clusters, agri-export zones (AEZ), and special economic zones (SEZ). Effective implementation of the existing and proposed schemes and programmes, encouragement of private sector participation in infrastructure development, and simplification of procedures are necessary to ensure accelerated industrial growth in the state.

Mines and Minerals: The state has considerable mineral resources including rock

salt, limestone, gypsum, silica-sand and baryte. In 2002-03, 5.9 million tonnes of limestone, 5.2 lakh tonnes shale and 7 thousand tonnes slates were produced in the state. Due to the high availability of quality limestone, a key raw material, the cement industry has flourished within the state. Many domestic companies and MNCs have established their manufacturing facilities in Himachal Pradesh. The three big cement plants of ACC, Jay Pee Cements and Ambuja Cements in the state have a total capacity of over 4 million tonnes. They plan to further increase their capacity in future. Jai Prakash Associates plans to set up a unit with an investment of USD 110 million. Besides, there are many other mineral based units like stone crushing, calcium carbonate units, hydrated lime units, etc within the state. Commercially exploitable minerals found in various districts of the State are given below.

Bilaspur: Limestone, dolomitic limestone, shale, brick earth, minor minerals like sand, stone and bajri.
Kangra: Roofing slate, Brick earth and minor minerals like sand, stone and bajri.
Chamba: Limestone, Roofing slate, magnesite and minor minerals like sand, stone and bajri.
Kinnaur: Gypsum and minor minerals like sand, stone and bajri.
Kullu: Roofing slate, quartzite crystal, mineral water & semi-precious stone and minor minerals like sand, stone and bajri.
Lahaul & Spiti: Antimony-ore, gypsum and minor minerals like sand, stone and bajri.
Solan: Lime stone, dolomitic limestone, shale, building stone and minor minerals like sand, stone and bajri
Una: Silica boulders and minor minerals like sand, stone and bajri.
Mandi: Limestone, rock salt, roofing slate, quartzite and minor minerals like sand, stone and bajri.
Hamirpur: Silica boulders and minor minerals like sand, stone and bajri.
Shimla: Limestone, quartzite, slabs slates and minor minerals like sand, stone and bajri
Sirmaur: Limestone, dolomitic limestone arites, gypsum, shale, quartzite and minor minerals like sand, stone and bajri.

Textile industry: Sericulture is one of the key cottage industries in the state besides handloom and handicrafts. During 2003-04, 1, 14,000 kg reeling cocoons were produced. There are about 50,000 handlooms units primarily based on wool. The main products of the textile industry in the state are shawls, tweeds and blankets, woolen carpets, traditional dresses and other handicrafts.

Pharmaceutical Industry: Pharmaceutical units have been set up in Himachal Pradesh since there is special incentives policy pursued by the Government. Ranbaxy, Torrent, Indo Pharma, Nectar Life Sciences, Indo-Swift Pharma (four units), Dr Reddy's Laboratories and Cipla are some of the pharmaceutical companies that have manufacturing facilities in the state. UniChem plans to invest over USD 8.7 million on its third formulation manufacturing facility. Indoco plans a formulation facility whereas Pulse Pharma plans its second plant for therapeutic nutrition in Baddi. Torrent plans to set up a formulations plant at Baddi at a cost of USD 21.7 million. Zydus Cadila plans to establish a facility in Baddi. The Baddi-Barotiwala-Nalagarh belt in Solan district near Chandigarh is fast emerging as an industrial belt. *[Source: IBEF: March 30, 2005]*

Medicinal and Aromatic Herbs: The state is endowed with nature's treasure like valuable herbs, and other plants, etc. Some of these herbs and plants available in the states are *guchhi*, *tej pattą patish*, *bankakari*, *dhoop* roots, *brahmi*, *katha*, *kalajira*, *karu*, *banasha*, *kesar*, *hippophae* and some other species are found in the high reaches. The state has one ayurvedic college and two ayurvedic pharmacies. These pharmacies are manufacturing some traditional medicines, which are supplied to health institutions of the state.

6.2 Patterns of planning and development in the sector

During 1948-52, Himachal Pradesh was Chief Commissioner's Province with 4 Districts i.e. Chamba, Mahasu, Mandi & Sirmaur. In 1952, it became a Part "C" State under Lt. Governor and elected Legislative Assembly. Bilaspur became the fifth District of the State. A Development Officer from erstwhile Punjab was having additional charge of Industries Department in Chief Commissioner's Office. Nahan Foundry at Nahan, Mohan Meakins breweries at Kasauli and Solan, Salt Mines at Darang (Mandi) and Rosin & Turpentine Factories at Nahan and Bilaspur were the main industrial units functioning in Himachal Pradesh. Nahan Foundry was established in 1875 by the then Maharaja of Sirmaur State. It was later made a Joint Sector Enterprise of the Government of India. In the year 1952, this Company was taken over fully by the Government of India and it was registered as a Public Limited Company under the Companies Act on 25.10.1952. In September, 1964 its ownership was transferred by the Government of India to the Himachal Pradesh Government. In SSI sector, four small gun factories were functioning in Mandi District, manufacturing high quality single barrel/double barrel guns.

The State remained Union Territory during the period 1957 to 1971. Additional activities entrusted to the Department included ITIs, Employment Exchanges, Weights and Measures, Rural Industrial Training Institutes, Tea and Sericulture. The District Industries Offices were started in 1957 with one office catering to more than three Districts. Extension Officers (Industries) were also appointed at block level. After reorganization of the State in 1966, District Industries Officers were appointed for newly created Districts of Kinnaur, Kangra and Kullu. The State Aid to Industries Act-1968 was formulated.

Since the Sixth Five Year Plan (1980-85) emphasis has been laid on the co-ordinated development of large and medium, small scale, tiny and cottage industries, with a thrust on package of attractive concessions and subsidies to promote investment; high priority to industries that are based on local raw materials and provide major employment opportunities; thrust on rural industrialisation, small-scale, tiny and cottage industries; creation of quality infrastructure through setting up industrial areas/estates with at least one industrial area/estate established in each district of the state & strengthening support institutions and setting up new industrial projects in the public sector.

The Sixth Five Year Plan (1980-85) provided an outlay of Rs. 20.35 crore for the implementation of various promotional schemes and a package of incentives, concessions, and spent Rs. 20.48 crore. The Seventh Plan (1985-90) continued with the same policy but with greater vigour and thrust. The Seventh Five Year Plan provided an enhanced outlay of Rs. 35.45 crore but the actual expenditure was Rs. 42.62 crore. During the Sixth and Seventh Five Year Plans the industry gained a momentum and grew at a faster pace. During the Eighth Plan (1992-97) an outlay of Rs. 76.2 crore was approved and the expenditure incurred was Rs. 86.46 crore. In this plan, the main emphasis was on providing more infrastructure facilities to the entrepreneurs by establishing industrial areas/estates at the *tehsil* and block levels, thus enabling industrial activity in the rural and far-flung areas of the state. During this period, new industrial policies were introduced in 1991 and 1996. According to the Industrial Policy of 1991, the industrial areas were categorised in A, B or C grade, to bring about a balanced industrial development in the state. The categorisation was based on location and the following parameters:

- Distance from the border of the adjoining states of Punjab, Haryana and Uttar

Pradesh (except within Shimla district).

- Extent of industrial development / industrial backwardness existing in that block.
- Extent of overall backwardness of the block.
- Extent of potential for generating employment for the local people.

The existing development blocks were categorised accordingly. The quantum of concessions and subsidies and the duration of their applicability will depend on the category of the industrial block (A, B or C), the type of industry (tiny/khadi & village/small scale/L&M) or whether these were in the priority or general sector. Based on these parameters, the industrial policy of 1996 also continued to provide the package of incentives and subsidies which included sales tax concessions; electricity duty exemption; capital investment and interest subsidies; special schemes of incentives to specific categories of entrepreneurs like the Schedule Caste, the Schedule Tribes, women, and the physically handicapped; special package of incentives to tiny, cottage and khadi & village industries; up to 15% purchase price preference in government / semi-government organisations to the tiny/SSI sector and up to 3% to the large and medium sector; additional concessions to priority industries like out-of-turn allotment of plots; special schemes and facilities to NRIs and special support and incentives for export promotion; in addition, the Government of India provided 75% transport subsidy to industry.

The beginning of the Ninth Plan (1997-2002), continued with the same concessions and incentives as stated in the Industrial Policy of 1996, but new policy guidelines in 1999, laid emphasis on expansion and upgradation of the infrastructure and ensuring advantages to investors. The plan also envisages a thrust on the development of the tiny, cottage, khadi & village and small-scale industries by graded incentives. According to these guidelines, the state has been divided into two categories, namely "industrially developed areas" and "industrially backward areas" instead of A, B and C categories. The development blocks of Paonta Sahib and Nahan in Sirmaur district and Nalagarh, Dharampur and Solan in Solan district would fall in the category of "industrially developed areas". The rest of the state will be in the category of "industrially backward areas". The industrial policy of 1999 also incorporates, a special package of incentives for fruit, vegetable and maize based units consuming locally available raw material. The Ninth Plan provided an outlay of Rs. 150 crore but utilised only Rs. 91.90 crore. The Tenth Plan (2002-07) has an approved outlay of Rs. 104.73 crore for the industrial sector. Plan-wise approved outlay and actual expenditure and its percentage to the total plan figures are given in the Table 9.

Table 10: Plan wise outlay approved and actual expenditure

Plan Wise Outlay Approved and Actual Expenditure					
Plan	**Period**	**Outlay (in crore)**	**Percentage Share to Total Plan**	**Actual Expenditure (in crore)**	**Percentage Share of Total Expenditure**
6th Plan	1980-85	20.35	3.27	20.49	3.08
7th Plan	1985-90	35.45	3.01	42.62	3.22
8th Plan	1992-97	76.2	3.2	86.54	3.05
9th Plan	1997-02	150.00	2.63	91.90	1.29

Source: Different Five Year Plans, Himachal Pradesh

The highlights of Impact of Industrial Policy Announced by the Government of India (Dated 7 January 2003). The policy will be most beneficial to excisable and profitable units with production of more than Rs. 1 crore. Most entrepreneurs will prefer to set up new units in

the periphery districts as these have close proximity to the neighbouring states and Chandigarh, access to raw materials and better connectivity. These periphery districts will have the same incentives and concessions as are applicable to the inner districts. Most of the units located in the inner districts (backward areas) are in the small-scale, tiny and cottage sectors and are not excisable (production less than Rs. 1 crore). Therefore, the industrial policy notified by the Government of India would not be of much benefit to most of the units located in the inner districts.

A bee-keeping cluster has been promoted by KVIB in Kullu; another for steel / wooden furniture in Mandi district and one for bamboo in Kangra district are under consideration. Similarly, NABARD, and SIDBI have identified clusters for metal, woodcraft, wool weaving and Tibetan handicrafts in Kullu district. SIDBI has appointed Him Bunkar as the implementing agency.

Besides these identified clusters, some of the District Industries Centres (DICs) of the Industry Department have recommended activities, which could be viable under the industrial cluster programme. District wise details of cluster & activities and areas are given in Table 11.

Table 11: District wise Recommended Clusters and Activity in HP

District	Name of the Area	Name of the Activity
Kangra	1) Kandror	Engineering/agriculture implements
	2) Nagri	Wood carving
Lahaul & Spiti	1) Udaipur	Weaving of woollen patti
Kinnaur	1) Tapri	Metal fabrication
Kullu	1) Kullu	Shawl weaving, bamboo craft, pattu making etc.
Mandi	1) Nerchowk	Automobile
	2) Ramnagar	Wooden and steel furniture
Sirmaur	1) Rajgarh	Fruit processing
	2) Sangarh	Limestone
	3) Shillai	Weaving
Shimla	1) Shimla	Food products, pickles, Jam, packaging & potato wrappers (at Theog)
Hamirpur	1) Hamirpur & Nadaun	Shawl making, furniture, hosiery, leather products, card board boxes & herbal processing
Bilaspur	1) Lethwin	Potters
	2) Bhadrog	Weavers

Source:State Industrial Profile of Himachal Pradesh(2001-02) by a Small Industries Service Institute(SISI), Government of India, Solan, Himachal Pradesh.

The industrial developed areas were found in Solan and Sirmaur districts, L&M units account for 88%, investment 70% and employment 34% while in the remaining 10 districts categorised as backward areas/districts, SSI and tiny sector units account for 82%, investment 30% and employment 66%. Another feature is that in Solan and Sirmaur districts. Investment in the SSI sector per unit is Rs.5 lakh to Rs. 6 lakh, while in Kinnaur and Lahaul & Spiti it is as low as Rs. 50,000 per unit and in the remaining districts Rs. 1.5 lakh to Rs. 2 lakh. It also reveals that in the backward districts SSI, tiny and the cottage industry form a major industrial sector and hold the key to large-scale employment and generation of economic activities in remote areas. These industries are based on local raw materials and artisan entrepreneurs.

NABARD has selected Solan as a model district to launch its newly initiated project, "District Rural Industries Project". The purpose of this project is to create rural non-farm sector (RNFS) activities, which will be undertaken in association with different government agencies as well as NGOs.

To create a state of art infrastructure, the

following aspects need priority;

- Modernisation of industrial areas/estates.
- Cluster development around thrust areas.
- Promotion of maximum participation of the private sector in the development of sustainable industrial infrastructure.
- Government as a facilitator through decentralisation, deregulation and self-certification.
- Thrust on fostering clusters around villages, facilitating rural industrialisation.
- Local educated youths should be trained for each cluster, activity and location wise to adopt new designs, testing and marketing techniques for ensuring long-term sustainability of these clusters.

Twenty Point Programme: The new 20 Point Economic Programme was announced by the Prime Minister on 14th January, 1982. It focused attention on some of the most important social and economic programmes included in the sixth plan and sought to impart greater dynamism to them. The 20 Point Programme is the agenda for action before the nation and needs to be implemented in letter and spirit, whole heartedly and with dedication. This programme was again revised in the year 1986 in order to implement this programme more efficiently. While the thrust of the new programme continued to be on providing better living conditions for the less privileged sections of the society, it also aimed at all around improvement in productivity. The Industries Department is implementing two of the points of this programme which are Permanent Registration of SSI Units (now discontinued), assistance to Scheduled Caste families and Assistance to Scheduled Tribe families.

Strategy for Industrial Development: The pattern of industrial development of the State is based on its division into industrially developed and backward areas. Most of the large and medium industries are located in developed areas, while a small-scale, tiny, khadi and village industries are located in backward areas/districts.

Schemes for Industrially Backward Areas/Districts: The industries in these districts are SSI, tiny, khadi and village industries. In addition, artisan entrepreneurs also belong to this category. These industries are mainly based on local raw materials and hold the key to large-scale employment and generation of economic activity. The new industrial policy announced by the Government of India has significantly enhanced the financing pattern and grants for the development of industrial infrastructure in the State. Some schemes are given below.

i. The financing pattern of Integrated Infrastructure Development Centres (IIDC) between the Government of India and SIDBI will change from 2:3 to 4:1, and the GoI funds would be in the nature of grants, so as to provide the required infrastructural support.

ii. Deen Dayal Hathkargha Protsahan Yojna and other incentives of the Ministry of Textiles: The funding pattern between the Government of India and the State will be changed from 50:40 to 90:10 under these schemes. The Ministry of Textiles will extend to Himachal Pradesh its package of incentives, as notified for the North- Eastern States.

iii. Pradhan Mantri Rozgar Yojana (PMRY): The Ministry of Agro & Rural Industries will provide to Himachal Pradesh relaxation under PMRY with respect to age (i.e. 18-40 years from 18-53 years) and subsidy at 15% of the project cost subject to a ceiling of Rs.15,000 per entrepreneur.

Strategy for Industrial Growth in Backward Districts is given below:

- Thrust on setting up small and medium sized clusters around the villages, incorporating state of the art infrastructure, facilitating rural industrialisation. This will further facilitate technological and marketing support at affordable cost to small scale, tiny and cottage industries.
- Set up information hub in each cluster and industrial area to facilitate marketing and product information from international and other related agencies.
- Modernisation of industrial areas and estates.
- Promotion of maximum private participation in the development of sustainable modern industrial infrastructure.
- Appoint a nodal agency to co-ordinate and formulate plans to implement the schemes and programmes of industrial development awarded to state by Government of India so that maximum benefits could be achieved.
- Advisory councils should be constituted for each cluster involving representatives of industries, technical and Research and Development (R&D) institutions.

Developed Areas and Periphery Districts: Most of L&M industries are located in the developed areas, parts of Solan and Sirmaur districts which are categorised as periphery districts. Some of these are also located in Kangra and Una districts. Mostly, these industries have shifted from other states to reap the benefits of incentives and subsidies. The major industries are food products and beverages, textiles and spinning, precision and light engineering, chemical and pharmaceuticals, electronics including magnetic components, paper and paper products, steel and steel products.

The fiscal incentives and measures announced by the Government of India on January 7, 2003, will encourage more industries to set up units in the periphery districts, achieving substantial growth. Sustainability of the migrated industrial units might, however, may be limited to the period during which the incentives are applicable. For long-term sustainability, the State Government has to provide high grade infrastructure, responsive & good governance.

To convert the periphery districts into a hub of the industrial sector and for long-term sustainability, a well thought-out, co-ordinated strategy has to be formulated. The suggestions are given below.

- Industrial clusters and Agri-export Zones (AEZs) should be set up, activity/product wise. This will facilitate building a centralized modern infrastructure. These facilities will significantly upgrade the technological, marketing and management capabilities of SMEs.
- The private sector should be encouraged to participate effectively in setting up clusters, AEZs and modernisation of the existing industrial areas and estates on a sustainable basis with initial financial assistance from the Government of India and support from Government of Himachal Pradesh.
- New industrial units should develop physical as well as institutional infrastructure i.e., the complete product should be manufactured in the State. A monitoring mechanism may be evolved to ensure this.
- Fostering close interaction between entrepreneurs, associations, R&D institutions, design centres, testing centres and technical institutions.

Brief details of employment-oriented industrial groups mainly located in the backward areas are given below.

Agro/Food Processing Industry: The food processing industry is limited mainly to the

traditional processing of agricultural and horticultural raw materials using low-grade technology. Due to conducive agro-climatic conditions, the State has tremendous scope for the production of horticulture products as off-season vegetables, tomatoes, peas, cauliflower, cabbage and seasonal fruits like apple, plums, apricots and olive. There is a large scope for expanding and diversifying food processing industries in the State. Understandably, these industries have been declared priority industries and are given special incentives and concessions in the Industrial Policy of the state. Some fruits and vegetables are processed within the State by public/private sector units such as HPMC, HIMCO, HIMFED, NAFED located at Kullu, Mandi and Parwanoo.

The growth of value-added horticulture/food processing industry is very important for rural employment. The agro/food processing industry has the potential of expansion and growth, if modern tools and techniques are employed. The following need to kept in mind to develop horticulture/food processing industry.

- Integration of the farming sector, processing industry and marketing, i.e., vertical integration of different activities across the agro-business chain.

- Agri-parks and clusters should be set up to facilitate centralised, modern infrastructure, latest processing and packaging techniques and to impart training. These facilities should be available to medium and small-scale industries and the farmers, on a shared basis against a reasonable cost.

Textile and Hosiery Industries: Textile/spinning is one of the important industries which accounts for 60% of the total employment offered in the large and medium sector. It has attracted large investments in the state. These industries are located in the periphery districts. The new Industrial Policy is also likely to attract more textile and hosiery units to the state. The major hosiery industries are in the SSI and Tiny sector located in the backward areas. The main products are shawls, patti, caps, jackets, sweaters and mufflers. Clusters have been suggested at Kullu, Shillai, Udaipur and Hamirpur. These clusters will facilitate for weavers, artisans and entrepreneurs, introduction of new products and designs, technical and marketing support, skills upgradation and training, and liaison with banks and Government Departments. This will greatly enhance the capabilities of the industries resulting in higher production and employment.

Cement Industry: Himachal Pradesh is gifted with natural wealth of vast limestone deposits which are capable of sustaining large numbers of limestone based industries which include cement plants and other industries engaged in the manufacture of calcium carbonate, poultry grit, lime, limestone powder etc. These industries are generally located near to the limestone deposits. In Himachal Pradesh, there are four cement plants in the large and medium (L&M) sector in addition to three mini plants. The position of cement industries as in 2002 is given in Table 12.

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Table 12: Status of Cement Plants in Himachal Pradesh

Name of company	Production Date	Investment (Rs. In crore)	Employment	Production Capacity (lakh tonnes)
M/s ACC Ltd.	(i)12.03.84 (ii)15.09.94	471	918	22
M/s Gujarat Ambuja Cement Ltd.	26.09.95	404	453	10
M/s CCI Ltd.	1.04.80	28	473	2
Total Production Capacity 34 lakh tones				

The domestic requirement of cement is 10 lakh tonnes. The rest is supported to other states. Cement manufacturers were keen that cement clinker should be allowed to be supplied to other states, so that finished cement could be manufactured there. A formula was worked out between the State Government and the manufacturers that clinker and cement could be supported to other state in the ratio of 50:50. However, in the new industrial policy, clinker has been placed in the negative list, i.e., such incentives as excise duty and income tax exemption are not applicable to clinkers, but applicable to cement. In the changed situation, the manufacturers will prefer to manufacture cement in Himachal Pradesh itself, while clinker supply to other states might be limited.

Three more large-scale cement plants, based on limestone, have been approved to be set up in Sundernagar, Alsindi (Mandi District) and Chamba. These plants in the private sector are being set up by:

- M/s Larsen & Toubro Ltd., Chamba.
- M/s Grasim Industries Ltd., at Alsindi (Mandi).
- M/s Harish Chandra Ltd., Sundernagar.

More proposals under consideration are M/s Gujarat Ambuja Cement Ltd. Which has proposed to set up new plants near their plant, already in production in Solan district. In addition, two plants one at Koti and another in Gumma in Shimla district, are also under consideration. In 2008-09, three cement plants (M/s Associated Cements Co. Ltd. Gagal, District Bilaspur, M/s Ambuja Cements, Ltd. Darlaghat, District Solan and M/s Cement Corporation of India, Rajban, District Sirmaur) in large and medium sector, besides 3 mini cement plants, 9 hydrated lime and quick lime calcium carbonate units, 88 numbers of limestone powder/poultry feed have been set up.

To exploit the available limestone deposits for setting up of major cement plants, mining leases and prospecting licenses have been granted in favour of the following companies during the year 2008-09.

1. M/s India Cement Ltd.: The MoU was signed with the company on 11-05-2006 to set up 2 million tonnes capacity cement plant based on Gumma-Rohana limestone deposits in Tehsil Chopal, District. Shimla and a mining lease was granted on 03-06-2008 for an area measuring 977-77-34 ha.
2. M/s Lafarge India Ltd.: The MoU was signed with the company on 08-03-2007 to set up 2 million tonnes capacity cement plant based on Alsindi limestone deposits in Tehsil Karsog, Mandi District and a mining lease was granted on 07-07-2008 and 06-08-2008 respectively for an area measuring 9886-01-19 bighas.
3. M/s Ambuja Cements Ltd.: Prospecting licence over an area of 520 ha was granted on 29-07-2008 to carry out detailed survey of cement grade limestone deposit near village Gyana, Chalyana, Mangu etc. in Tehsil Arki, District Solan to enhance their existing cement production based on these deposits.
4. M/s Dalmia Cement Ltd.: Prospecting license over an area of 25 sq km was granted on 12-09-2008 to out carry detailed survey of cement grade limestone deposit in Kariyali-Kothi-Sal Bagh limestone deposit in Tehsil Sunni of District Shimla for setting up of a large cement plant.

Handloom, Khadi & Village Industries Sector: Handloom is an important cottage industry of Himachal Pradesh and has the second largest employment potential in the rural sector. The importance of the handloom industry in the economy lies in the artistic designs, low-cost investment and family based skills which are passed on from generation to

generation with no formal training. There are about 42,000 handlooms in the state, primarily based on wool and providing gainful employment to about 45,000 weavers. The major products woven on handlooms are woollen ladies' shawls, woollen gents' shawls, woollen tweeds, shirting, dress material and woollen carpets, etc. Weaving activities are mostly undertaken in Kullu, Mandi, Kinnaur, Kangra, Lahaul & Spiti and Chamba districts of the state. The Handloom sector, with a long tradition of excellence in its craftsmanship, occupies a place of eminence in preserving the State's heritage and culture and plays a vital role in the economy. It represents one of the most aesthetic aspects of our existence as the innovative weaver, with his skilful blending of myths, symbols and imagery provides the cloth an appealing dynamism. The level of artistry and intricacy achieved in the handloom cloth is unique. It can meet every need ranging from the exquisite fabrics, which takes months to weave, to popular items of mass production for daily use. The handloom industry in Himachal Pradesh is one of the important cottage industries which are providing gainful employment to about 45000 handloom weavers. The main handloom concentration areas are Kullu, Mandi, Kangra, Kinnaur, Chamba, Shimla and Lahaul Spiti districts. The main handloom products are Shawls, Stoles, Tweeds and Dress material etc. For the survival of Kullu Shawls being woven in Kullu District, the Government of India has registered it under "Geographical Indicators (GI)" Act.

There is a vast potential of development of handloom industry in the state. Keeping in view the changing scenario, there is need to diversify the existing products by introducing new designs according to modern trends. A project named "Hill Area Woollen Development Project" has been taken up in co-operation with Government of India. These programmes includes setting up training-cum-demonstration centres for training weavers on improved looms and equipment, modernisation of traditional pit looms into fly shuttle looms; setting up production-cum-service centres and improving the designs, quality of products and introducing need-based designs according to modern trends. Manufacturing of readymade garments (woollen) on a large scale in the design-cum-fashion centre would also be undertaken. In addition, for the development of the handloom industry in the state, various centrally sponsored schemes like Deen Dayal Hathkargha Protsahan Yojana, Baba Saheb Ambedkar Hastshilp Vikas Yojana sponsored by the office of Development Commissioner of Handlooms, Ministry of Textiles, Government of India are being implemented.

The Department has setup seven sericulture divisions viz. Ghumarwin, Mandi, Palampur, Dehra, Nadaun Sirmaur and Shimla under which 73 Sericulture Extension-cum-chawki centres are functioning. About 89 mulberry farms and 30 mulberry nurseries are functioning in the State. These sericulture centres conduct incubation of silkworm eggs, young age rearing and distribute chawki-reared silkworms to the farmers for late age rearing for production of silk cocoons. Mulberry saplings and technical guidance to the sericulturists are being provided. Currently sericulture is spread over in about 2100 villages and its major concentration is in the district Bilaspur, Kangra, Mandi, Hamirpur, Una and Sirmaur.

New Initiatives: The Department of Industries for the development of sericulture industry in the potential areas of the State has undertaken following new initiatives:

I) The Department of Industries has been propagating high leaf yielding saplings of improved mulberry variety S-146, S-1635, TR-10 etc. for plantation to promote sericulture. Mulberry tree plantation on the wastelands has been tied up under ongoing various afforestation programmes like NREGS, Mild-Himalayan Watershed Development Project (MHWDP) etc.

ii) High yielding bivoltine silkworm races of CSR series, evolved by CSB research institutions have been introduced for improving production and productivity. The Regional CSB Research institution in association departmental farms are also utilized for departmental young age rearing of silkworms before these young silkworms are distributed to the farmers for further rearing to produce silk cocoons. Surplus leaves are utilized by the Sericulture farmers for rearing late age silkworms for production of silk cocoons.

iii) Distribution of silkworm food plants: One year-old mulberry saplings of improved varieties are distributed to the planters at the nominal price of Rs.0.25 each from the Departmental nurseries.

iv) Distribution of silkworm: The Government bears the cost of incubation of silkworm seed. Young silkworms reared for ten days under department technical supervision are distributed to the seri-farmers at the nominal price of Rs. 20 for worms hatched from each ounce of silkworms seed for late age rearing and production of silk cocoons.

v) Disinfection of private rearing houses: Disinfection of private rearing room or spaces rearing equipment free supply of disinfecting material and rodenticide to the sericulturists for prevention of silkworm diseases and pests is provided.

vi) Technical assistance and guidance: Technical assistance and guidance are provided to the sericulturists/ entrepreneurs.

vii) Marketing arrangements: Marketing arrangements are made to fetch a fair price of silk-cocoon produce.

Categorization of the State: The State of Himachal Pradesh has been categorized into three categories 'A', 'B' & 'C' depending upon the location, distance from the border of the State, extent of industrial development, extent of overall backwardness, resource availability & potential for employment generation for local people.

Category "A" areas are partly included in four Development Blocks of Paonta Sahib and Nahan in Sirmaur District and Dharampur and Nalagarh in Solan district excluding backward panchayats notified by the State Government.

Category "B" areas include 49 full Development Blocks located in 10 non-Tribal Districts and part of the four Development Blocks included in Category "A" areas excluding backward panchayats located in these areas.

Category "C" areas (Tax Free Zones) include 24 Development Blocks including all the seven Tribal Development Blocks in Kinnaur, Lahaul & Spiti and Chamba Districts and 17 other Development Blocks in Chamba, Kullu, Mandi, Shimla and Sirmaur Districts and also includes all Backward Panchayats located in Development Blocks under the 'A' and 'B' Category areas. Graded incentives have accordingly been provided for Industry in the New Industrial Policy in terms of fiscal incentives such as Sales Tax, Electricity Duty Concessions. Under Sales Tax Incentives, 1% CST is being charged from all industrial enterprises up to 31.03.2013 or till the CST is not phased out, 100 % deferment or payment of 65 % of the applicable rate of VAT has been provided in 'A' and 'B' category areas for a period of 5/8 years respectively whereas it is exempted in 'C' category areas for 10 years. All new industrial units with connected load up to 100 KVA excluding those units in negative category shall be charged a concessional rate of Electricity Duty at the rate of 10 paisa per unit for a period, of 5 years from the date of commencement of commercial production in category "B" and "C" areas only. This incentive is not admissible to units in A category areas.

Additional incentives have been provided for thrust sector industries in 'B' & 'C' category locks in terms of allotment of land at concessional rates, exemptions from payment of electricity duty & interest subsidy. These include out of turn allotment of plots/land /sheds in industrial areas/estates, exemption from payment of State Excise Duty for a period of 7 years for units manufacturing wine/ cider out of locally produced fruits, total exemption from the payment of Electricity Duty for a period of 10 years from the date of their commencement of production and Interest subsidy @5 % per annum with a ceiling of Rs. 2 Lakhs per annum for a period of 3 years for Horticulture produce, Vegetable produce, Maize based and herbal based industries. Category 'C' areas of the State have been declared as Tax Free Zones, which are exempted from the payment of any State Taxes & Duties excluding levies in the shape of cess, fees, royalties etc., for a period of 10 years.

The following incentives and concessions will be available to such New Enterprises registered on permanent basis as a Specified Category of Activities:

i) Concessional rate of Electricity Duty @ 10 Paisa per unit for a period of 5 years from the date of commencement of commercial production.
ii) Interest subsidy @5 % per annum on term loan and working capital with a ceiling of Rs. 1 Lakh per annum for a period of 3 years.
iii) Fixed Capital Investment Subsidy @ 15% subject to a maximum of Rs. 5 Lakhs on cost of structure, building, plant and machinery.
iv) Sanction of water and electricity connection on priority.
v) Exemption from the payment of Luxury Tax and Entertainment Tax (as applicable) for a period of 5 years from the date of commencement of commercial production.

Central Government Incentives: The Ministry of Commerce & Industry, Department of Industrial Policy & Promotion (DIP&P) notified the following Package of Incentives for the States of Uttarakhand and Himachal Pradesh on 07/01/03. The main highlights of the Package are as under:

- 15% Capital Investment Subsidy on the investment made in plant & machinery subject to a ceiling of Rs. 30 lakhs per unit. This incentive is presently applicable to the units, which commence commercial production or undertake substantial exemption on or after 07.01.2003 and ending before 06.01.2013.

- 100% Income Tax Exemption for initial period of 5 years and thereafter 30% for companies and 25% for other than companies for a further period of 5 years from the date of commencement of commercial production. This incentive is presently applicable to the units, which commence commercial production or undertake substantial exemption on or after 7th day of January, 2003 and ending before 1st day of April 2012.

- 100% outright exemption from payment of Central Excise Duty for a period of 10 years from the date of commencement of commercial production. This incentive is presently applicable to the units, which commence commercial production or undertake substantial exemption on or after 7th day of January, 2003 and ending before 1st day of April 2010.

These incentives are admissible for all locations in case of thrust industries and in specified locations for other industries except 20

categories of industries falling in the negative list.

Central Transport Subsidy: Industrial units located in the State are reimbursed 75% of the cost of transportation of their raw materials/ finished goods to and from the location of their units anywhere in the State to the nearest specified broad gauge rail head under the Central Transport Subsidy scheme. This subsidy is available for a period of the 5 years from the date of commencement of production The H.P. State Industrial Development Corporation Ltd. has been designated as Nodal Agency for channelizing funds to the State under the Scheme.

Major Programmes and Schemes

Small Scale Industries: The spectrum of industries in the country extends from the organized Large Scale industries to modern Micro, Small & Medium Enterprises (MSME) and unorganized traditional industries. The last two i.e. modern MSME and unorganized traditional industries known as Village and Small Industries (V&SI) constitute an important segment of the State economy. The Village and Small Industries Sector provided maximum employment which is next only to the agricultural sector in the State. In terms of value addition it is estimated to contribute about 50% of value added in the manufacturing sector. The growth in this sector, besides resulting in self-employment and wider dispersal of industrial and economic activities, ensures maximum utilization of local resources, both human and material.

The Micro, Small & Medium Enterprises Development Act, 2006 received the assent of the President on 16-06-2006. This Act was made applicable from 02-10-2006 as notified vide notification no. 2(3)/2006 (F) SSI dated 18-7-2006. The definitions of Micro, Small and Medium Scale Industrial enterprises in manufacturing and services sectors were notified vide notification no. 4(1)/2006-MSME Policy I dated 29-09-2006. As per the new definitions, the classification of enterprises is as under:-

Table 13: Classification of Industrial Enterprises

Sr. No.	Classification of industrial enterprises	Limit for manufacturing enterprises (In plant & Machinery)	Limit for services enterprises (In plant & Machinery)
1	Micro enterprises	is up to Rs 25 lakhs	up to Rs.10 lakhs
2	Small enterprises	Above Rs. 25 lakhs and up to Rs.5 crores	Above Rs. 10 lakhs and up to Rs.2 crores.
3	Medium enterprises	Above Rs. 5 crores and up to Rs.10 crores	Above Rs. 2 crores and up to Rs.5 crores.
4	Large enterprises	More than Rs.10 crores	More than Rs.5 crores

Infrastructure Development: In order to provide infrastructural facilities to the entrepreneurs, 38 industrial areas have been established at Bilaspur, Gwalthai, Garnota, Hatli, Hamirpur, Nadaun, Nagrota Bagwan, Sansarpur Terrace, Nagri, Dhaliara, Bain Attarian, Badhal, Raja-Ka-Bag, Nargala Jawali, Shamshi, Reckong Peo, Sauli Khad (Mandi), Ratti, Bhambla, Maigal, Shoghi, Maindli, Jais, Jubber Hatti, Paonta Sahib, Kala Amb, Baddi, Barotiwala, Chambaghat, EPIP Baddi (Ph- I & II), Banalgi, Mamlig, Katha Bhatoli, Mehatpur, Amb, Tahliwal, Gagret and Jeetpur Bheri. Similarly 15 industrial estates have been developed with the relevant infrastructure facilities at Sultanpur, Parel, Shivnagari (Holi), Kangra, Dehra, Jawali, Keylong, Saigloo, Pali, Pandranu, Raighat, Sunda Bhonda, Parwanoo, Chambaghat and Dharampur.

To attract investment in the State and to ensure easy availability of land to prospective

entrepreneurs in various parts of Himachal Pradesh, the Department Industries has constituted a Land Bank comprising of government and private land which are available for setting up of Industries. The private Land Bank comprises of such land whose owners have consented to sell their land to private Entrepreneurs through mutual negotiations. The Department of Industries will provide escort and facilitation services in case the Entrepreneurs are willing to purchase such private land. More than 6,000 Bighas of land has been identified in six districts namely Hamirpur, Sirmaur, Kangra, Una, Mandi & Solan.

Industrial Areas/Estates: Development of industrial infrastructure has been one of the priorities of the State Government. In order to provide infrastructural facilities to the entrepreneurs, 41 Industrial Areas and 15 Industrial Estates have been developed in the State as given in Table 14.

Table 14: District Wise Details of Industrial Areas/Estates

District	Name of Industrial Area	Name of Industrial Estate
Bilaspur	1. Bilaspur	
	2.Golthai (Integrated Infrastructure Development Centre IIDC)	-
Chamba	1. Hatli	1. Shivnagari (Holi)
	2. Garnota	2. Sultanpur
		3. Parel
Hamirpur	1. Hamirpur	
	2. Nadaun	
Kangra	1. Nagrota Bagwan	1. Kangra
	2. Dhaliara	2. Dehra
	3. Nagri	3. Jawali
	4.Sansarpur Terrace (Growth Centre)	
	5. Bain Attarian	
	6. Badhal	
	7. Raja Ka Bagh	
	8.Nargala Jawali	
Kullu	1. Shamshi	
Kinnaur	1. Reckong Peo	
Lahaul & Spiti		1. Keylong
Mandi	1. Ratti	1. Saiglu
	2. Bhambla	2. Palli
	3. Sauli Khad (Mandi)	
Shimla	1. Shoghi	1. Raighat
	2. Maindli	2. Pandranu
	3. Jais	3. Sunda Bhonda
	4. Jubber Hatti	
Sirmaur	1. Kala Amb	
	2. Paonta Sahib	
Una	1. Tahliwal	
	2. Gagret	
	3. Mehatpur	
	4. Amb	
	5. Jeetpur Bheri	
	6. Basal	
Solan	1. Baddi	1. Parwanoo
	2.EPIP Baddi (Ph-I &II)	2. Chambaghat
	3. Barotiwala	3. Dharampur
	4. Chambaghat	

District	Name of Industrial Area	Name of Industrial Estate
	5. Banalagi	
	6. Mamlig	
	7. Katha Bhatoli Kalan	
	8. Vakanaghat	
	9. Lodhi Majra	
	10. Majhol	
Total	**41**	**15**

Source: Department of Industries Website, Himachal Pradesh

Setting up of Trade Centre at Baddi: To facilitate exporting units, a Trade Centre is being set up at Baddi with an investment of Rs. 10.81 crore. Trade Centre will be set up at Baddi with Government of India assistance of Rs. 5.40 crore, the State Government will contribute equity amounting to Rs. 3.2 crore and rest of the share amounting to Rs. 2.21 crore will be contributed BBNIA. The components of this project are construction of two Exhibition Halls with the capacity of 500 and 100 gathering, two Conference Halls with the capacity of 50 & 25 audiences, one Amphitheatre for outdoor meets, office space, toilet/pantry, sufficient parking area and green landscaped area.

Setting up of an Inland Container Depot at Baddi: To provide facilities like warehousing storage custody and handling of cargo to the industrial units established in the State a Memorandum of Understanding (MoU) has signed on 17th October, 2008 for the establishment of Inland Container Depot (ICD) at Baddi by Container Corporation of India (CONCOR). The total cost for its establishment is Rs. 53.00 crores. This will include setting up of warehouses, administrative buildings, railway siding, installation of heavy machinery and equipment etc. The State Government has transferred 86 bighas (65240 sq. mts) of Government land to CONCOR at nominal lease of Re. 1/- per acre per annum for 95 years. CONCOR will be responsible for the storage/custody/cargo handling/custom clearances. It will also manage all warehousing activities and will be responsible for storage, custody, handling of the cargo at Container Freight Station and customs clearance. The CONCOR will also bear the cost of customs. Thus, CONCOR will provide a single window service to customers and fix tariff for booking/delivery/handling/ transporting/warehousing of container and of cargo. The establishment of a Container Freight Station and of ICD in Baddi region of Himachal Pradesh will give a tremendous boost to the development and growth of industries in the region.

Supply of Gas to Industrial Units in the State: For the supply of gas as energy to the industrial, transport and domestic sectors in the state, a Co-operation Agreement/MOU was signed between GAIL (India) Ltd. and Government of Himachal Pradesh on 4.11.2008. In order to assess the demand for Natural Gas Liquid Hydrocarbons & LPG in industrial & transport sector, the major industrial hubs i.e. Baddi, Barotiwala, Nalagarh, Parwanoo, Tahliwal, Mehatpur, Gagret, Amb, Kala Amb, Paonta Sahib, Sansarpur Terrace, Dehra, Raja-ka-Bagh, Damtal, Nagrota Bagwan & Gwalthai have been identified. In addition, the existing Cement plants situated at Barmana in District Bilaspur, Darlaghat in District Solan and Rajban in District Sirmaur have been identified to assess the demand of energy in transport sector.

The demand for Energy in these areas is growing at a tremendous rate for Industrial, Domestic and Transport sector. In this area, the industries and allied sector is consuming almost 400 MW of energy and in near future, the requirement of power for these areas is likely to go up considerably as more industrial activities and educational institutions will be coming up in this corridor due to Special Package of Incentive announced by the

Government of India with respect to Central Excise Duty and Corporate Income Tax Advantages from utilizing NG full form for power and energy generation are as follows:

- Industrial Units situated in Himachal Pradesh can supplement their power requirements by using NG. They can overcome the inconvenience caused by peak load power cuts. They may also not have to install polluting and expensive diesel gensets.
- Many new cement plants are coming up in different areas of the Himachal Pradesh. An estimated 20000 trucks will be required to evacuate the material from these plants. If these HCVs can run on CNG, it will reduce the pollution levels considerably. The same logic applies to other goods and passenger carrying vehicles.
- In the commercial sector, power produced from NG can serve the energy and heating requirements of educational institutions, hotels, shopping malls, housing projects etc. of which many are planned in Himachal Pradesh.
- In the domestic sector, widespread usage of Piped Gas by the households for cooking and heating purposes will reduce the pressure on fossil fuels and fuel wood, thereby contributing to environmental protection.

Strategy of 11th Plan: The main emphasis of the Government of Himachal Pradesh is to take the industries to interiors of the State. For this, availability of good quality infrastructure is very important to attract industry and ensure that these projects are sustainable in the long run. The State Government is laying more emphasis on development of self contained Industrial Areas and Estates where basic amenities like roads, power water, sewerage, drainage, communication etc. are provided. Hence in order to create adequate infrastructure to support the incoming investments and projects during the 11th Five Year Plan, the department shall accord highest priority for the development of infrastructure in the existing as well in new industrial areas and estates by providing better road network, adequate water supply, drainage system, quality and uninterrupted electric supply and other allied services in the State. In order to improve infrastructure for industries in the State, a short term infrastructure plan with an estimated cost of Rs. 20.85 crores from State Plan is being implemented. An amount of Rs. 25.03 crores has been spent on creation of export infrastructure during the last four years in Kala Amb-Baddi-Barotiwala-Nalagarh region which is the main export corridor of the State. The State Government has approved the setting up of an Inland Container Depot (ICD) at the cost of Rs. 24.08 crores through Container Corporation of India at Baddi for the benefit of exporting industries. It is also proposed to set-up three Special Economic Zones at a total cost of Rs. 7642 crores Rs. 510 crore in Kangra district, Rs. 4392 crores in Una and Rs. 2740 crores in Solan district where industries would be set up by the prospective investors. The creation of infrastructure development shall certainly facilitate the establishment of new units and attract more investment to these areas. The development of industrial infrastructure has been and will remain one of the main priorities of the State Government during 11th Plan. A gradual shift from the subsidies to attract industries towards providing infrastructure is envisaged. Escort services are being provided to obtain necessary clearances and approvals from all concerned departments and agencies under a single roof. At the State level, an initiative has been started to liberalise the control. Industries in high technology areas where there is a large value addition, with low volume of raw material involved have been included in private sector. In order to speed up the process of industrialization, main emphasis is being given for promotion of industries based on raw material, establishment of new industries in industrially backward areas, making provision of employment to the people of State, development of industrial infrastructure and address environmental issues. Incentives and Subsidies

are most important attractions to woo investment in the industrially backward State like Himachal Pradesh and to make the industrial units more competitive and viable. Although most of the incentives and subsidies have been discontinued yet there are few incentives and subsidies, which are still being given under the State Industrial Policy, 2004.

The Government of India on 07.01.2003 announced various fiscal, infrastructure and schematic incentives under the notified the Special Package of Incentives for the States of Uttarakhand and Himachal Pradesh. The main highlights of the Package are as under:

A. Fiscal Incentives to industrial units

i) 100% Income Tax Exemption for initial period of 5 years and thereafter 30% for companies and 25% for other than companies for a further period of 5 years from the date of commencement of commercial production*.

ii) 100% outright exemption from payment of Central Excise Duty for a period of 10 years from the date of commencement of commercial production*.

iii) 15% Capital Investment Subsidy on the investment made in plant & machinery subject to a ceiling of Rs. 30 lakh per unit*.

B. Incentives for Infrastructure Development

(I) The funding pattern under the Growth Centre Scheme currently envisaging a central assistance of Rs.10 crore per centre has been raised to Rs.15 crore per centre.

(ii) The financing pattern of Integrated Infrastructure Development Centres (IIDC) between Government of India and SIDBI will change from 2:3 to 4:1, and the Government of India funds would be in the nature of a grant, so as to provide the required infrastructural support.

C. Incentives for other schemes

(I) Under Deen Dayal Hathkargha Protsahan Yojna, the funding pattern between Government of India and the State Govt. has changed from 50:50 to 90:10.

(ii) Under Pradhan Mantri Rozgar Yojana (PMRY), the age limit has been changed/ enhanced from (18-35 years to 18-40 years).

D. Other Incentives being provided by Govt. of India

(I) 75% Freight Subsidy on the transportation of finished goods and raw materials from and to the nearest rail head on broad gauge for a period of 5 years from the date of commercial production. This incentive was applicable up to 31-03-2007.

(ii) 33.33% Investment Subsidy on the investment in plant & machinery and technical civil work subject to a maximum ceiling of Rs.75 lakh for Food Processing industries from the Ministry of Food Processing Industries, Govt. of India.

In order to provide additional incentives to the industries and to ensure equitable industrial development and employment generation, the State Govt. has notified a New Industrial Policy and Incentives Rules-2004 on 30-12-2004. This Policy has become effective from 31-12-2004. The highlights of the new policy are as under:

1. The new policy envisages accelerating the Industrial development, employment generation and creating an environment which attracts additional investment to the State. The new units will have to provide employment to at least 70 % Himachalis to get the incentives.
2. For the equitable Industrial Development, the State has now been categorized into three categories.

3. Khadi produce being produced by village industry in the State will be exempted from the payment of tax.
4. A new category of activities called 'Specified Category of Activities' primarily based on Agricultural and Horticultural produce, Tourism and Allied Sectors has been introduced so as to encourage such activities in the State and provide them incentives.

Besides, the State Government has taken various measures for simplification of Labour laws like enhanced freedom to employ contractual labour by industrial units under the Contract Labour (Regulation & Abolition) Act, 1970, measures aimed at minimization of records, allowing two-shift operation with women workers to enable women workers to work in the night shifts also beyond the prescribed working hours under Section 66 (1) (b) of the Factories Act etc. These measures have not only increased the productivity but also simplified the procedure for maintaining the record under different labour laws enacted by the Central Government and being implemented by the State Government. The States are mostly guided by the policy of the Central Government for major policy issues and have to follow the policy of Government of India. Economic Reforms at macro level, liberalisation of trade and commerce, removal of trade barriers/restructuring of labour laws, the role of different sectors etc. are the main issues which fall under the purview of Government of India and have great bearing on the industrial development.

The Industrial Policy issues and the industrial scenario highlighted by the Planning Commission, Government of India shall be quite relevant in view of emergence of WTO and its conditions which consider protection as discriminatory or barriers to trade and therefore these are also relevant in our case. However, for hilly backward states like Himachal Pradesh, these special incentives such as income tax holiday, freight subsidy, capital investment subsidy should continue during Eleventh Five Year Plan to offset the locational disadvantage which results in high cost of production.

6.3 Technology adopted in the sector along with any changes in technology

The existing Industrial Areas and Estates provide the basic infrastructure, but modern and technological infrastructure is highly inadequate. Modernisation and technological upgradation through innovative Research, Design and Development (RD&D), human resource development through skill upgradation and training, adoption of small and medium sized clusters around the villages for systematic infrastructure development, market-oriented policies, simplified procedures and good governance are essential for the industrial growth of the state.

The State Government has identified administrators and mangers, with technological and professional background, to work as facilitators and co-ordinators for rapid, non-polluting industrialisation, especially in the interior and rural areas.

The Department register certain activities related to commercial exploitation and value addition of Agro/ Horticulture/Animal Husbandry/ Pisciculture/ Sericulture / Floriculture /Bio-Technology/Agri-business /Tourism and other allied sectors as 'Specified Category of Activities'. The SSI and tiny sector uses low-level technology, resulting in low industrial productivity and poor quality of products.

Sericulture is an agro- based labour intensive rural cottage industry, which is providing subsidiary employment to the rural people and income by way of rearing silkworms to produce silk cocoons. Apart from Jammu and Kashmir, Himachal Pradesh has emerged out as exclusively bivoltine silk-cocoon producing state in the country.

6.4 Stakeholder involvement in environment preservation and restoration

The following Board/Corporations are major stakeholder in the Industries Sector

- Department of Industries
- H.P. State Industrial Development Corporation Ltd. (HPSIDC).
- H.P. State Handicrafts & Handloom Corporation Ltd.(HPSH&HC)
- H.P. State Small Scale Industries and Export Corporation Ltd. (HPSSI&EC)
- H.P. General Industries Corporation Ltd.(HPGIC)
- H.P. Khadi and Village Industries Board.(HPKVIB)
- Department of Environment, Science and Technology
- H.P. State Pollution Control Board

M/s Gujarat Ambuja Cement Ltd has proposed to set up new plants near their plant, already in production in Solan district. In addition, two plants one at Koti and another in Gumma in Shimla district, are also under consideration. The installation of these plants may create environmental problems. The emission levels at every stage of the plant should be kept below the permissible level. A state level "environmental impact assessment and monitoring committee should standardise specifications, tools and equipment to be used compulsorily by all cement manufactures for environmental pollution control.

6.5 Critical environment issues / hotspots associated with the sector

Environment and Social issues relating Industries sector are improper siting of industries, impact on air quality, impact on water quality and quantity, noise pollution, inadequate hazardous waste treatment and disposal, land degradation, impact on flora and fauna, and impact on aesthetics.

Improper siting of industries: Industrial Areas in Himachal Pradesh located in the border areas adjoining Punjab, Haryana, Chandigarh, Uttarakhand and Jammu & Kashmir has attracted a large number of projects. This is especially so in case of Industrial Areas of Baddi, Barotiwala, and Parwanoo in Solan District, Mehatpur, Tahliwal and Amb in Una District, Paonta Sahib and Kala Amb Industrial Areas in Sirmaur District, Sansarpur Terrace in Kangra District and Golthai in Bilaspur District. Over 90% of the investments in the medium and large Scale sector are in pipeline and projects coming up in Himachal Pradesh are being implemented in these locations. Baddi, Barotiwala and Nalagarh area in Solan District has come up as a destination especially for Textile, Pharmaceutical and Packaging industry. H.P. State Pollution Control Board has prepared Zoning Atlas for Siting of Industries for all districts of the State, Industrial Estate Planning for Baddi, Barotiwala-Nalagarh in Solan and Paonta Sahib in Sirmaur, Sustainable Tourism Development of Dharamshala, McLeodganj and Bhagsunath areas of district Kangra and State Environmental Atlas of Himachal Pradesh. The State Industrial Policy 2004 states that preference will be given to develop activity specific Industrial Areas like Food Parks, Electronic City, Export Processing Zones, Export Promotion Parks, Bio-Technology parks, Information Technology Parks, Textile Clusters, Pharmaceutical Clusters Housing, Labour Colony, Business Centres multiplexes etc. throughout the State, especially in the areas away from the border areas of the State and procedure for approval of the State Government under Section 118 of the Himachal Pradesh Land Reforms and Tenancy Act will be simplified and approval process

expedited. Top priority will also be given to link such existing Industrial Areas and new clusters with 'A' class quality road to provide efficient inter-State and intra-State connectivity.

Further, Department of Industries has created land banks (both private and government land) in Solan, Una, Kangra, Sirmaur, Hamirpur, Bilaspur, Shimla and Mandi Districts for attracting entrepreneurs and investors to set up industries. The siting of Industries is being done as per the available land bank and not as per the Zoning Atlas for Industries. Moreover, EIAs has an inbuilt mechanism for site selection and has scope of assessing alternate sites as well though the EIA tool has not been adequately used.

Poor ambient air quality: Air Quality Trends in H.P indicates that higher concentration of SPM in Paonta Sahib industrial area is contributed by industrial, construction activities & vehicular movement in the area. Ambient Air quality at Baddi and Kala Amb (Industrial Areas) is very well within the prescribed standards with regard to concentration of gaseous pollutants. However, the concentration of SPM (pollutants) earlier showing increasing trend has shown marginal improvement during the preceded months, which is mainly due to increased infrastructure construction activities in the area.

Removal of vegetation from the area designated for mining and other purposes produces dust, which when air-borne causes an increase in the concentration of SPM in the surrounding areas. Removal, handling, transportation and storage of soils also cause an increase in the concentration of SPM in the atmosphere. The use of diesel equipment in these activities causes an increase in the level of NOx. Drilling and blasting of overburden and mineral contribute to SPM building up and explosive fumes into the atmosphere.

Deteriorating water quality and quantity: With the increasing population, urbanization and industrialization, it is becoming difficult to provide adequate amount of water to the users. At the same time, the problem of water quality has cropped up and has become more important in the recent years rather than quantity of water. It is almost impossible to find pure water in nature as water being a universal solvent readily dissolves and collects all kinds of impurities but the crux of the problem lies in the contamination that is taking place due to human activities. The pollution by human activities emanating either from use of water for domestic or industrial purposes or as a result of ever increasing rate at which organic or inorganic chemicals, pesticides, heavy metals are being used and are being released into the atmosphere or over land whereby they are able to enter the water cycle have degraded though water resources to a large extent. The industrialization coupled with discharge of untreated sewage is responsible for deterioration in water quality.

In the industrial area of Baddi, Barotiwala, Nalagarh, Kala Amb & Parwanoo, the water quality of the River Sirsa, Markanda and Sukhna Nallah is categorized as 'D' because of low levels of oxygen due to organic pollution. River Sirsa is categorized as A to D because industrial and domestic effluent pollutes river in Baddi, Barotiwala and Nalagarh region. River Sukhna is categorized as 'D'' because Industrial and domestic effluent pollutes river in D/S Parwanoo town.

Noise pollution: Noise pollution has become a part of industrial and urban life. Urban people are at constant exposure to such pollution contributed by movement of vehicles and blowing of horns. The State Pollution Control Board monitors noise in Shimla, Solan, Baddi-Barotiwala, Nalagarh and Una/Mehatpur areas. Solan and Baddi-Barotiwala recorded high noise pollution than Shimla. Noise and vibrations due to blasting and operation of the machines drive away wild animals and birds

from the nearby forest.The equipment used in the mines for various purposes including transportation of the overburden and mineral generate continuous noise. Blasting produces impulsive noise.

Inadequate hazardous waste treatment and disposal: Hazardous waste in Himachal Pradesh comprises sludge from Effluent Treatment Plant, Waste Oil, Contaminated Containers, Others (Residual wastes) and Process Residue. There are 1716 industrial units responsible for generation of hazardous wastes (as on 31-03-08). Management/mode of disposal of sludge from Effluent Treatment Plant is 2357.2 T/year and other residual wastes are secured onsite, while used oil is 3622.5 tonnes / year and process residue amounting to 1118.4 tonnes / year are recycled. Contaminated containers of 67604 number / year are also recycled / reused after cleaning and 18860 tonnes of other waste per year. Hazardous Wastes generated by Industries are usually a by-product of industrial operations which involve heavy metals such as arsenic, cadmium, chromium, lead, mercury, etc; processes which utilize different categories of oil and petrochemicals; products such as PVC and plastics; waste products from photocopiers; chemicals such as PCBs; and finally, by-products such as dioxins and furans which are now recognized as extremely toxic substances, affecting all forms of life. As per the report of High Powered Committee (HPC) on Hazardous Wastes set up by Government of India, the Himachal Pradesh generates 2159 Tonnes per Annum (TPA) of Hazardous Waste against a national total of 4434257 TPA. Waste Generated from Pulp & Paper Industry and Calcium Carbide Industry of Paonta & Kala Amb area is being recycled.

Land degradation: Topography and land use change due to digging of open pits and dumping of overburden rock mass in the form of the heaps. The land use pattern undergoes a change due to the use of the land for mining, dumping and other associated activities. The land use in the surrounding areas is also affected due to the impact of mining on water regime. Polluted water from pits affected the characteristics of the topsooil, affecting the end use. The damage pattern on the surface undergoes a change due to the alterations in the surface topography due to mining and associated activities.

Loss of Flora and Fauna: Removal of all vegetation (flora) and fauna from the area is required for mining and other purposes. Pollution of water in the surrounding water bodies, due to flow of debris on the slope, affect the aquatic ecology of water bodies. Dust in the atmosphere is contributed by the mining and associated activities . Dust when deposited on the leaves of the plants in the surrounding areas, retard their growth.

Poor Aesthetics: The removal of vegetation by way of clearing the area for setting Industrial areas and the flow of debris on the slope gives an ugly look.

Inadequate infrastructure and civic amenities in the Industrial areas: The Critical infrastructure and emergency resources for instance fire, police, medical, civil defence, etc. are also not adequately provided in the Industrial areas. The State Industrial Policy 2004 aims to encourage development of State of the Art Industrial Areas, through its agencies like the Industries Department, Himachal Pradesh State Industries Development Corporation, Himachal Pradesh Housing and Urban Development Agency, Area Specific Development Agencies to be set up in potential locations themselves or through Public-Private-Participation mode as also through exclusive participation of private investors. These Industrial Areas will be self contained Industrial Areas equipped with modern basic amenities, well planned taking into account future expansion needs, have high quality, infrastructure like roads, power, water, telecom, sanitation, effluent management and disposal, housing and other social amenities etc. Such projects will be given top priority and time bound clearances ensured. The Industry Policy

2004 also states that the State Government is fully conscious of the need to catalyse the urban rejuvenation process especially in areas of industrial concentration. This would require strengthening of urban local bodies and accessing various Central Government schemes for urban sector reforms including setting up of waste management systems with active involvement of the private sector. Special focus would be laid on creation of Area Specific Statutory Development Agencies which would be entrusted with the task of managing urban growth in areas of their jurisdiction and for ensuring creation and strengthening of planned growth of social, housing, health, commercial and other related infrastructure. Nodal cities will be identified and peripheral towns developed within a specified radius by these statutory agencies.

Inadequate Carrying Capacity based planning process: At the time of the formation of the State, there was virtually no industry in the State of Himachal Pradesh except a few industrial establishments such as Mohan Meakins and Nahan Foundry. Initially, industrialization in the state was aimed at developing and up-dating the existing traditional skills and arts in the cottage and tiny sectors through handlooms and handicrafts. The main objective was to use the traditional skills of the local populace and raise their standards of living. Even in the 70s the state had very little modern manufacturing industries. Till 1977-78 there were only about 5700 SSI units and about 10 Large and Medium units employing just a few thousand people. As on 31/03/2004, there are 30839 Small Scale Industrial Units wherein an investment of about Rs. 746.85 crores is involved and employment opportunities to about 1.34 lakhs people have been generated. However, as per the current Industrial Policy, 2004 of Himachal Pradesh the state has not adequately examined supportive and assimilative capacity of the areas while setting aside areas for industrial development. Prioritisation of Industries in Himachal Pradesh for developing a long term perspective has not been adequately done. This is also partly responsible for the current pattern of Ribbon development pattern of Industries in the state.

Limited technological options to switch to green/clean technologies: Industries based socio- economic development in Himachal Pradesh has exerted pressure on raw materials like water, minerals, forest produce, etc. Capability and skills to manage the natural resources optimally are limited and is further compounded by the lack of adequate and skilled human resources to manage the natural resources optimally. Adoption of cleaner modes of production can help in natural resource conservation and elimination of gaseous, liquid or solid wastes, reduction by reduced consumption of raw materials, modification and upgradation of the technological processes so that optimal utilisation of natural resources is made possible, and helps in adoption of preventive rather than corrective approaches to pollution control.

Impact of Cement industry on tourism and transportation sector: Due to the high availability of quality limestone, a key raw material, the cement industry has flourished within the State. Many domestic companies and MNCs have established their manufacturing facilities here. There are three cement plants (M/s Associated Cements Co. Ltd. Gagal, District. Bilaspur, M/s Ambuja Cements, Ltd. Darlaghat, District. Solan and M/s Cement Corporation of India, Rajban, District. Sirmaur) M/s Jay Pee Cement in large and medium sector which have a total capacity of over 4 million tonnes per annum, besides about 3 mini cement plants, 9 hydrated lime and quick lime calcium carbonate units, 88 numbers of limestone powder/poultry feed have been set up. Besides, four large scale cement plants have been approved to be set up in the State based on limestone deposits at Sunder Nagar, Alsindi (Mandi district), Boroh-Shind (Chamba) Bagga-Bhalag (Solan District) and based on the reject

of the NMDC mine of Arki, District, Solan. One cement plant based on the Gumma limestone deposit (District Shimla) is under consideration.

Most of the limestone quarrying is open cast and causes substantial degradation of the land due to depositing of overburden. The domestic requirement of cement is 10 lakh tonnes. The rest is supplied to other states. Cement manufacturers were of the view that cement clinker should be allowed to be supplied to other states, so that finished cement could be manufactured there. A formula was worked out between the state government and the manufacturers that clinker and cement could be supplied to other state in the ratio of 50:50. However, in the new industrial policy, clinker has been placed in the negative list, i.e., such incentives as excise duty and income tax exemption are not applicable to clinkers, but applicable to cement. In the changed situation, the manufacturers will prefer to manufacture cement in Himachal Pradesh itself, while clinker export to other states might be limited. The cement industry has affected ambient air quality and putting stress on the local infrastructure including roads in the fragile mountainous regions. It has also impacted negatively on the tourist inflow.

Inadequate transport management and infrastructure for transporting industrial and agri-horticulture produce: The current infrastructural facilities for transportation of industrial produce are inadequate as this aspect has not been adequately addressed. Further, truck operators unions prevent free play of market forces in areas of their jurisdiction. The Industrial Policy 2004 aims to addressing issues related to transportation of industrial produce so as to lay the foundation of strong and consistent growth of the industrial sector. For the first time under the State Industrial Policy, setting up of post harvest management infrastructure like, setting up of cold storages, mechanized packing houses, mechanized grading houses, setting up of ropeways exclusively for the transportation of locally produced agriculture and horticultural produce, setting up of servicing centres to render farm related management services and services such as maintenance of farm equipment and machineries will be treated as activities eligible for a specific package of incentives and concessions under this policy.

Issues relating to migration, labour, housing and health: Indiscriminate growth of existing urban clusters has been witnessed in Himachal Pradesh especially in the vicinity of Industrial area. Though the Industrial Policy 2004 has made provision for employment of 70% *bonafide Himachalis* in Industries of the state, there has been demand supply gap for housing especially low cost for migratory industrial labour in new areas which are emerging due to setting up of industry and related commercial activities. Due emphasis has not been given to ensure creation of adequate housing facilities of various categories, including industrial labour. The other required social infrastructure namely schools, medical and other community facilities are also not adequate. With a view to contain indiscriminate growth of existing urban clusters and to ensure availability of adequate housing in new areas emerging due to setting up of industry and related commercial activities, The Industrial Policy 2004 emphasises on ensuring creation of adequate housing facilities of various categories, including industrial labour. Specific areas will be demarcated around such industrial clusters where housing infrastructure could be created both in the government and private sector.

Permission for purchase of land for captive housing would be given in a time bound manner for purchase of land to the industrial units set up in the State. Similarly supply of power and water to such housing complexes would be made on priority. Industries would be actively encouraged to tie up with local adjoining *panchayats* and villages for arranging captive accommodation by helping such

villagers augment their accommodation so as to cater to the specific needs of the workers who could be housed in such units. Further, there are unresolved issues related to muster and attendance roll, minimum wages, and health insurances.

The above identification and analysis of issues has been summarised in Table 15.

Table 15: Summary of identification and analysis of issues

Issues	Causes	Impacts/Risks
1. Siting of industries	Concentration of industries in foothills of Shivalik Himalaya and focus on extraction of few mineral resources The siting of Industries is being done as per the available land bank and not as per the Zoning Atlas for Industries.	Over extraction of mineral resources and environment pollution
2. Poor ambient air quality	Concentration of industries in foothills of Shivalik Himalaya Ancillary development in the industrial area including urban infrastructure entailing construction activities, vehicular emissions and industrial emissions	Exceedence of National Ambient Air quality Standards (NAAQS) Impact on human health particularly industrial workers
3. Deteriorating water quality and quantity	Concentration of industries in foothills of Shivalik Himalaya. Ancillary development in the industrial area including urban infrastructure entailing construction activities, improper discharge of industrial effluents (treated / untreated), sewage and municipal solid wastes Deeper excavation on the surface or underground digging Exposure of fresh rocks due to mining initiates weathering with the inevitable generation of substances which cause water pollution Mining activities increase suspended solids and chemical contamination in the water at the site and downstream	Deterioration of quality water in terms of benchmarks set in Primary Water Quality Criteria and Designated Best Use for Fresh Waters (A-E) Water Table decreases locally, often drastically, resulting in the drying up of wells and springs of the neighborhood. Adversely affect water users and the aquatic ecosystem. The impact is particularly significant if water users downstream of the site are abstracting water for drinking/domestic use. Suspended solids can also significantly increase water treatment costs.
4. Noise pollution	Congregation of industries in a limited area Ancillary development in the industrial area including urban infrastructure entailing construction activities, vehicular	Exceedence of National Ambient Noise levels. Disturbance to wild animals and birds from the nearby forest.

Issues	Causes	Impacts/Risks
	movement, industrial operations, etc Noise and vibrations due to blasting and operation of the machines, equipments used in the mines for various purposes including transportation of the overburden and mineral.	Impact on human health particularly on the Industrial workers
5. Hazardous waste treatment and disposal	Congregation of industries in foothills of Shivalik Himalaya Hazardous waste in Himachal Pradesh comprises sludge from Effluent Treatment Plant, Waste Oil, Contaminated Containers, Residual wastes and Process Residue Gaps in hazardous waste generation and treatment Inadequate number of Effluent Treatment Plant (ETPs) and treatment e.g. there is no CETP for Baddi and Barotiwala area	Gaps between hazardous waste generation and treatment may increase further leading to deterioration of water quality
6. Land degradation	The change in land use due to mining, excavation, dumping and other associated activities Digging of open pits and dumping of overburden rock mass in the form of the heaps Polluted water from pits affect the characteristics of the topsoil, affecting the end use. The damage pattern on the surface undergoes a change due to the alterations in the surface topography due to mining and associated activities.	The land use in the surrounding areas is affected due to the impact of mining on water regime. Change in value of the land and surrounding areas Reduction in water water level Loss of green cover to concrete structures
7. Loss of Flora and Fauna	Removal of all vegetation (flora) and fauna from the area for mining and other purposes. Pollution of water in the surrounding water bodies, due to flow of debris on the slope, affect the aquatic ecology of water bodies. Dust in the atmosphere is contributed by the mining and associated activities. Dust when deposited on the leaves of the	Loss of natural vegetation cover by clear felling, smothering and Ecological imbalance

Issues	Causes	Impacts/Risks
	plants in the surrounding areas, retard their growth	
8. Poor Aesthetics	Overclustering of Industries The removal of vegetation from the mining area and the flow of debris on the slope give an ugly look.	Change in land use Change in value of the land and surrounding areas
9. Inadequate infrastructure and civic amenities in the Industrial areas	Improper siting of Industries/Industrial Areas Inadequate need assessment of infrastructure and civic amenities Inadequacies in Perspective/ Master Plan for Industrial Areas.	Pressure on existing infrastructure and civic amenities Over exploitation of resources beyond recovery
10. Inadequate carrying capacity based planning process	Inadequacies in Perspective/ Master Plan for Industrial Areas Ribbon development Inadequate attention on promoting cluster based approach for development of Industries/Industrial Areas Incompetence of system	Pressure on existing infrastructure and civic amenities Haphazard growth, leading to ribbon development
11. Limited technological options to switch to green/clean technologies	Inadequate incentives for setting/ switching green/clean technologies Inadequate understanding of green/clean technologies which could be introduced in Himachal Pradesh Limited financial resources	Deterioration of baseline environment conditions of land, water, air and noise Increased capital cost and investment for setting /switching to green/clean technologies
12. Impact of Cement industry on tourism and transportation sector	Growth in Cement Industries in State as a result of Industrial Policy focus on utilization of limestone resources Inadequate infrastructure including roads to assimilate the unplanned growth in the cement Industry	Impact on ambient air and noise quality Deterioration of quality of roads and related infrastructure Reduced inflow of tourists
13. Inadequate transport management and infrastructure for transporting industrial and agri-horticulture produce	Inadequate assessment of planning for infrastructure needs including transportation infrastructure	Increased pressure on available infrastructure for transportation of industrial agri-horticulture produce

Issues	Causes	Impacts/Risks
		Deterioration of baseline environment conditions especially of air, noise and water.
14. Issues relating to migration, labour, housing and health	Influx of migratory work force (skill /unskilled) in and around Industrial Areas Inadequate civic amenities in and around Industrial Areas Inadequate Social Infrastructure (Housing facilities, health, education institutions, etc.)	Social unrest in view of increased migration Deterioration of quality of life in the existing urban/peri-urban areas and around Industrial Areas Rise in instances of communicable diseases.

6.6 Environment initiatives taken by the sector to address critical environment issues

Environment Management in Ambuja Cement Plant at Darlaghat: A glass bag house (GBH) has been installed for the control of emissions from the kiln and raw mill section, the most polluting section in a cement factory. The GBH has an efficiency of 99.9% and maintains emissions even below 50 gm/Nm^3. Electrostatic Precipitators (ESPs) have been installed at the clinker cooler and cement mill sections, while bag filters have been installed at the coal mill, cement mill and packing plant, for the control of emissions. The emissions from all the stacks are maintained at much below 100 mg/Nm^3, as against the National Standards of 150 mg/Nm^3 for the cement industry. Bag filters have also been installed at all material handling/ loading/unloading points for the control of fugitive emissions. There is no solid waste generation and all the dust collected in the air pollution control equipment is automatically recycled into the process.

Setting up of a Solid Waste Management Plant: Solid Waste Management Plant has been set up at Village Majra, Tehsil Nalagarh, District Solan with a total cost of Rs. 35.00 crores. A Special Purpose Vehicle (SPV) namely M/s Shivalik Solid Waste Management Ltd. has been incorporated for its construction. The SPV has further awarded this work to M/s United Phosphate Ltd. which will operate this facility on BOT basis and recover user charges from the industries. First phase of the project is completed and Solid Waste Management Plant started receiving the Hazardous Waste from Member Industries in the state of Himachal Pradesh with effect from 20th June, 08 which will definitely result in protection of environment, ecology etc. of the State which are otherwise harmful not only for human lives but for the entire environment, ecology, air and water pollution.

Setting up of a Common Effluent Treatment Plant (CETP): To protect the local environment from industrial pollution, a Common Effluent Treatment Plant (CETP) is being set up at village Sheetalpur, Tehsil Nalagarh District Solan. A Special Purpose Vehicle (SPV) named M/s Doon Infrastructure Ltd. has been incorporated for this purpose by the M/s Baddi-Barotiwala-Nalagarh Industries Association Ltd. A patch of land measuring 30.08 bighas is being leased out to M/s Doon Infrastructure Ltd. (SPV) for setting up of this facility on token lease amount of Re. 1/- per sq m for a period of 50 years. A CETP is proposed to be set up under the Integrated Infrastructure Upgradation Scheme (IIUS)

scheme of Govt. of India with a cost of Rs. 185.00 crores. A detailed project report on this behalf has been sent to Govt. of India for approval/sanction.

Source: Annual administration Report, 2008-09

Policy guidelines for control of location, installation or working of stone crushers and their registration in the state of Himachal Pradesh: Taking into consideration the overriding principle of protection of ecology and environment, to ensure that not a single stone crushing unit in the State causes any pollution of any type and in consonance with the "River/Stream Bed Mining Policy Guidelines for the State of Himachal Pradesh-2004" as notified on 28-02-2004,

Environmental Awareness: In order to make the general masses aware of the environmental issues the following awareness activities were carried out by HPSPCB during the year.

a) World Environment Day 5th June, 2007On occasion of the World Environment Day, the State Board organized the following activities:

(i) Vehicular monitoring in the major towns of the State.
(ii) Activities like quiz competition, drawing competition, slogan writing and debates were organized for the School children by field offices and laboratories. They have also participated in cleaning of natural springs (drinking water sources) campaign in their respective localities.
(iii) Rallies were taken out by the school children carrying banners and signboards on environmental slogans.
(iv) Distribution of pamphlets on vehicular pollution, air pollution and noise pollution amongst general public and students.

b) Advertisement and Publicity: During the year 2007-08 the State Board intensified mass awareness campaign through publication of matter in the leading national, local newspapers, weekly & quarterly magazines.

Action for Improvement of Water Quality: No unit is operating without proper water pollution control system, e.g. Effluent Treatment Plant (ETP). The State Board ensures installation of Effluent Treatment Plants by the industries before Consent to Operate is granted. It is mandatory for Industries having work force more than 100, to install STP or STP cum ETPs.

Implementation of Recycled Plastics (Manufacture and Usage) Rules, 2003

As per the provisions of the Recycled Plastics Manufacture and Usage Rules, 2003, every occupier manufacturing carry bags or containers of virgin plastic or recycled plastic or both shall have to get registered with the State Board. There are 50 Plastic manufacturing units operational in Himachal Pradesh. The State Board processed all the registration applications received and registered 9 units with State Board during 2007-08 for a term of three years. The cumulative number of units registered with the State Board as on 31/03/2008 is 34.

6.7 Environment related studies carried out in the sector

As per State of the Environment Report-Himachal Pradesh, 2000. The State Board has identified 124 units for generating waste falling into the various categories of hazardous wastes listed in Schedule-I under Hazardous Waste (Management and Handling) Rules, 1989. The Board granted authorization to 52 units. Till 2002-2003 the Board has also identified about 480 units responsible for generating waste falling into the various categories of hazardous wastes listed in Schedule-I under Hazardous Waste (Management and Handling) Rules, 1989 and amendment Rules, 2000. All such units were asked to obtain the authorization for in site and secured storage of waste. The Board granted the authorization to 189 units and 218

units have been served with the notice under said Rules for compliance. The remaining cases are under process for grant of authorization
Source Annual Report State Board-2003-04

By 2004-05, the Board has identified about 842 units. Out of which 505 are operational up to March 2005 and responsible for generating waste falling in to the various categories of hazardous wastes listed in Schedule-I under Hazardous Waste (Management and Handling) Rules, 1989 and amendment Rules, 2000 and 2003. All such units were asked to obtain the authorization for in site and undertake secured storage of waste. The Board has granted authorization to 504 units.

6.8 Environment monitoring (key parameters such as air and water pollution) carried out for activities related to the sector

There is no environment monitoring mechanism within the sector. Compliance monitoring of Industries is carried out by HP State Pollution Control Board.

Ambient Air Quality

The monitoring of Ambient Air Quality was started in 1986-87 under the National Ambient Air Quality Monitoring Programme (NAMP) with an objective to find the current status of pollution and to study the trends as a result of increasing industrialization. The general objectives of the programme are:

1. To evaluate the general air quality conditions in the city and to provide the basis for analyzing long term trends of pollution concentrations.
2. To provide the data for subsequent development of air quality standards and pollution prevention and control programme for the city.

The Suspended Particulate Matter is monitored with High Volume Sampler and Respirable Suspended Particulate Matter (RSPM) with the help of Respirable Dust Sampler on the basis of three days per station per week for 24 hours at 6 Towns/Cities covering 11 number of locations in the State. The State Pollution Control Board has received sanction from CPCB for setting up of additional 4 nos of air quality monitoring stations at Dharamshala, Manali, Una & Sundernagar.

Ambient air quality monitoring stations are located in 3 Industrial areas and 4 Residential Areas. Though there is only 1 sensitive location (Tekka bench on Ridge) in Shimla, it is not located in an Industrial area. Ambient air quality monitoring stations are given in Table 16.

Table 16 Ambient Air Monitoring Stations in Himachal Pradesh

Station	City	Location	Category
S-1	Shimla	Takka Bench on Ridge	Sensitive
S-2	Shimla	Shimla Bus Stand	Residential
P-1	Parwanoo	Sector-IV	Residential
P-2	Parwanoo	Sector-I	Industrial
J-1	Jassur	Near PCB Office Damtal	Residential
J-2	Jassur	Old Road Damtal	Residential
PO-1	Paonta Sahib	Paonta Sahib Industrial Area	Industrial
PO-2	Paonta Sahib	Gondhpur Industrial Area	Industrial

Source: Website of HPSEP and PCB

The Central Pollution Control Board (CPCB) has developed Air Quality Criteria for the assessment of air quality. The monitored areas have been divided into three area classes as Industrial Area, Residential, Rural & other Area and Sensitive Area. The air quality is classified on the basis of Exceedence Factor (EF) that is defined as observed annual mean concentration of a criterion pollutant divided by Annual standard for the respective pollutant and area class in terms of Low (Where EF is less than 0.5), Moderate (EF is between 1.0 and 0.5), High (Where EF is between 1.0 and 1.5)

and Critical (EF is more than 1.5). Based on the above 3 classifications, the Air Quality of Himachal Pradesh is given in Table 17.

Table 17: Air Quality Status in Himachal Pradesh in Terms of Air Quality Category by CPCB

Location	Category	1996				2004			
		SO_2	NO_2	SPM	RPM	SO_2	NO_2	SPM	RPM
Shimla, Tekka Bench on Ridge	Sensitive	L	M	H	NOT MONITORED	L	M	L	L
Shimla Bus Stand	Residential	L	L	M		L	L	L	L
Parwanoo Sector-IV	Residential	L	L	H		L	L	C	-
Parwanoo Sector-1	Industrial	L	L	L		L	L	L	M
Jassur Near PCB Office Damtal	Residential	L	L	M		L	L	M	-
Jassur Old Road Damtal	Residential	L	L	H		L	L	H	-
Paonta Sahib Industrial Area	Industrial	L	L	M		L	L	M	-
Paonta Sahib Industrial Area Gondhpur	Industrial	L	L	M		L	L	M	-

Source: NAAQMS/10/1998-99 and Website HPSEP and PCB

A comparison of data of 1996 and 2004 as per Air Quality Criteria laid down by CPCB shows that air quality remains unchanged except for SPM levels in Shimla that show improvement in Air Quality Category. Another positive aspect is that HP PCB has started monitoring RPM at some stations. The Respirable Particulate Matter (RPM) corresponds to particles that are less than 10-micron in size and therefore more important from health point of view as these can reach lungs.

The air quality data pertaining to Industrial, residential, sensitive, rural and other areas from HP PCB's Annual Report 07-08 has been scrutinized for monthly average and peak values for these locations and the trends of monthly average SO_2, NOx and RSPM are shown below.

Ambient Air Quality at Parwanoo: Air quality of Parwanoo town is being monitored at two different locations, one at Sector IV (Station No.1), which falls under Residential Area Zone 'R' and other Station at Sector I (Station No. 2), which falls under Industrial Area Zone 'I'The Data Station No. 1 & 2 shown in Table 18. The monthly mean average values of SO_2 & NOx were observed well below the permissible limit for 24 hour average. However, the peak values of SO_2 were observed as high as 8.3μg/m^3 and 8.2μg/m^3 respectively at both stations and peak values for NOx observed as 28.3 μg/m^3 at Station No. 1 and 32.9 μg/m^3 at Station No. 2. The peak values of RSPM were observed as high as 358.3 μg/m^3 and 407.2 μg/m^3 in the month of May & December, 2007 at both the Stations respectively. However, the monthly mean average values for RSPM ranged between 36.0 μg/m^3 to 101.0 μg/m^3 at Station No. 1 and 41.0 to 128.4 μg/m^3 at Station No. 2. From these observations, it can be concluded that the air quality was poorer at Station No. 2 in comparison to Station No.1. Annual average values for RSPM at Station No. 1 was observed as 63.15 μg/m^3. The annual average value of RSPM is above the permissible limit of 60 μg/m^3 prescribed for residential area whereas the annual average value of RSPM at Station No. 2 was observed as 85.3 μg/m^3 and is below the permissible limit of 120 μg/m^3 for Industrial Area. However in comparison to previous year's data, there is decrease in the level of RSPM at both the locations.

Table 18: Ambient Air Quality at Parwanoo

Month	SO_2 in µg/ m³		NO_X in µg/ m³		RSPM in µg/ m³	
	Monthly Avg.	Peak	Monthly Avg.	Peak	Monthly Avg.	Peak
Station-1						
April, 07	2.3	8.3	7.4	18.6	62.0	116.1
May, 07	2.3	7.4	7.1	16.1	76.0	358.3
June, 07	2.0	2.0	6.8	17.8	64.0	147.0
July, 07	2.1	6.2	5.5	11.7	36.0	72.6
August, 07	2.4	7.4	5.8	14.8	36.0	100.7
Sept., 07	2.0	2.0	8.0	27.3	42.6	92.2
October, 07	2.3	5.7	10.0	18.5	56.0	154.0
Nov., 07	2.6	7.8	10.2	28.3	101.0	239.0
Dec., 07	2.5	6.6	10.3	20.2	75.3	184.1
January, 08	2.1	5.1	6.4	13.65	67.0	116.0
Feb., 08	2.2	6.59	7.6	18.95	69.0	115.0
March, 08	2.1	4.53	8.3	15.12	73.0	287.0
Station-2						
April, 07	2.3	5.1	11.9	32.9	96.0	155.5
May, 07	2.2	5.2	10.2	23.4	103.0	346.6
June, 07	2.1	4.5	10.7	18.7	73.0	243.0
July, 07	2.1	4.5	8.4	15.0	54.0	176.8
August, 07	2.3	5.7	6.2	13.8	41.0	103.2
Sept., 07	2.1	4.5	9.6	14.6	43.2	104.0
October, 07	2.8	6.2	12.8	22.0	85.0	236.0
Nov., 07	3.2	7.9	12.4	23.4	104.0	231.0
Dec., 07	2.8	6.8	12.8	29.3	128.4	407.2
January, 08	2.2	5.1	9.3	21.5	110.0	331.0
Feb., 08	2.7	**8.2**	9.7	22.6	77.0	116.0
March, 08	3.0	7.9	11.5	16.6	109.0	205.0

Ambient Air Quality at Paonta Sahib: Ambient air quality of Paonta Sahib is being monitored at two different locations, one at Paonta Sahib town (Station No.1) and other industrial area Gondpur (Station No. 2). Station No 1 falls under Residential Area Zone 'R' and Station No. 2 falls under Industrial Area Zone 'I'. All the values of SO_2 and NOx remained below the permissible limit prescribed for 24 hour average of 80 µg/m³ at Station No. 1 and 120 µg/m³ at Station No. 2. However, the peak values of SO_2 were observed as 3.9 µg/m³ and 3.4 µg/m³ respectively at both stations and peak values for NOx observed as 27.6 µg/m³ at Station No. 1 and 26.0 µg/m³ at Station No. 2. The monthly average values of RSPM observed above the prescribed 24 hrs standard of 100 µg/m³ in 6 months during April 2007 and November, 2007 to March 2008 at Station No. 1 while at Station No. 2 the average value of RSPM observed above the prescribed 24 hrs standard of 150 µg/m³ throughout the year except in the month of August 2007. Annual average values for RSPM at Station No. 1 & 2 were observed as 86.6 µg/m³ & 173.7 µg/m³ these values of RSPM are above the annual permissible limit of 60 µg/m³ and 120 µg/m³ prescribed for residential and industrial area respectively as given in Table 19. However in comparison to previous year's data, there is a slight decrease in the level of RSPM at both the locations.

Table 19: Ambient Air Quality at Paonta Sahib

Month	SO_2 in µg/ m³		NO_X in µg/ m³		RSPM in µg/ m³	
	Monthly Avg.	Peak	Monthly Avg.	Peak	Monthly Avg.	Peak
April, 07	2.0	3.2	14.3	17.9	202.0	388.0
May, 07	2.0	**3.2**	14.1	19.7	176.0	407.0
June, 07	2.0	3.2	13.2	17.1	173.0	305.0
July, 07	2.0	2.9	13.1	17.1	154.0	318.0
August, 07	2.0	2.0	13.2	19.7	118.0	277.0
Sept., 07	2.0	2.4	13.1	17.1	191.2	394.0
October, 07	2.0	2.9	13.7	22.8	187.0	384.0
Nov., 07	2.0	2.9	14.4	**26.0**	204.0	**551.0**
Dec., 07	2.0	2.0	14.1	22.8	169.0	389.0
January, 08	2.0	**3.4**	12.8	17.1	169.0	321.0
Feb., 08	2.0	2.9	13.4	17.5	162.0	379.0
March, 08	2.0	2.9	13.1	17.1	179.0	380.0

Ambient Air Quality at Kala Amb: Ambient air quality of Kala Amb is being monitored at two different locations, one at Kala Amb (Station No.1) and other at Trilokpur (Station No. 2). Station No.1 stations falls under Industrial Area Zone and Station No.2 falls in Residential Area Zone 'R'. From Table 20 it is revealed that all the values of SO_2 and NOx remained below the permissible limits prescribed for 24 hour average of 120 & 180 µg/m³ at both the stations. Monthly average values of SPM were observed in the range of 249 µg/m³- to 657 µg/m³ at Station no 1 and monthly average at Station No.2 was observed to in the range 51.6 µg/m³ to 253µg/m³ for SPM. The annual average values of SPM at Station no 1 and 2 were observed as 398.4 and 141.7 respectively which are above the permissible limit of 360 µg/m³ and 140 µg/m³ prescribed for industrial and residential area respectively for Station No. 1 & 2.

The monthly mean values of RSPM was observed above the prescribed 24 hour standard of 150 µg/m³ in all the 6 monitoring month's i.e October, 2007 to March 2008 at Station No. 1. Annual average values for RSPM at Station No. 1 & 2 were observed as 240.5 µg/m³ & 96.9µg/m³ respectively. The annual average values of RSPM are above the permissible annual average limit of 120 µg/m³ and 60 µg/m³ for industrial and residential area respectively. However in comparison to previous year's data, there is decrease in the level of SPM at both the locations.

Table 20: Ambient Air Quality at Kala Amb

Month	SO_2 in µg/ m³		NO_X in µg/ m³		RSPM in µg/ m³	
	Monthly Avg.	Peak	Monthly Avg.	Peak	Monthly Avg.	Peak
Station-1						
April, 07	2	**3.2**	14.6	21.9	-	-
May, 07	2	3.2	14.1	17.9	-	-
June, 07	2	3.2	13.5	21.9		**-**
July, 07	2	3.2	13	19.7	-	-
August, 07	2	2	13	19.5	-	-
Sept., 07	2	2.9	12.8	21.1	-	-
October, 07	2	2.9	13.6	21.1	375	628
Nov., 07	2	2.9	13.6	17.1	303	653

Month	SO_2 in µg/ m³		NO_X in µg/ m³		RSPM in µg/ m³	
	Monthly Avg.	Peak	Monthly Avg.	Peak	Monthly Avg.	Peak
Dec., 07	2	2	13	17.9	184	376
January, 08	2	3.38	13	7.88	214	416
Feb., 08	2	3.86	13.5	17.88	179	362
March, 08	2	5.8	13.4	22.76	188	456
Station-2						
April, 07	2	2.4	12.9	12.9	-	-
May, 07	2	2.6	11.7	15.9	-	-
June, 07	2	2.4	11.9	17.5	-	-
July, 07	2	2.1	11.7	15	-	-
August, 07	2	2	11.9	23.4	-	-
Sept., 07	2	2	11.2	19.5	-	-
October, 07	2	2	11.7	15	71	122
Nov., 07	2	6.4	13.9	30.4	103.5	265
Dec., 07	2	2	11.5	16.3	104	215
January, 08	2	3.38	11.16	17.07	110	245
Feb., 08	2	2.9	10.81	14.63	94	151
March, 08	2	2.6	11.2	17.49	99	170

Ambient Air Quality at Baddi: Ambient air quality of Baddi is being monitored continuously at top of the office building of Industries Department which falls under Industrial Area Zone 'I'. Table 21 indicates that all the values of SO_2 and NOx remained below the permissible limit prescribed for 24 hour average of 120 µg/m³. The monthly mean values of RSPM observed above the prescribed 24 hour standard of 150 µg/m³ in all 5 monitoring months i.e November, 2007 to March 2008. The annual average values of RSPM are above the prescribed annual average limit of 120 µg/m³ for industrial area.

Table 21: Ambient Air Quality at Baddi

Month	SO_2 in µg/ m³		NO_X in µg/ m³		RSPM in µg/ m³	
	Monthly Avg.	Peak	Monthly Avg.	Peak	Monthly Avg.	Peak
April, 07	3.1	9.7	13.7	28.3	-	-
May, 07	2.6	8.7	11.8	25.6	-	-
June, 07	2.6	8.4	12.3	24.5	-	-
July, 07	2.4	5.1	10.5	21.1	-	-
August, 07	2.3	6.8	9.9	20.5	-	-
Sept., 07	2.8	6.8	12.4	18.5	-	-
October, 07	3.7	10.2	15.1	38.0	-	-
Nov., 07	3.5	7.9	13.4	22.9	223.0	415.9
Dec., 07	3.4	7.9	13.3	22.9	193.5	426.1
January, 08	2.9	6.8	12.4	20.0	204.0	436.0
Feb., 08	2.8	7.9	12.5	22.4	218.0	1009.0
March, 08	3.4	7.9	12.4	22.5	199.0	571.0

Table 22: Ambient Air Quality of Himachal Pradesh

Location	SO_2 in $\mu g/m^3$	Month											
		April, 2008	May, 2008	June, 2008	July, 2008	August, 2008	Sept.,2008	Oct., 2008	Nov., 2008	December, 2008	January, 2009	February, 2009	March, 2009
DIC Baddi	M. Average	2	3.2	2.4	2.7	2.1	2.2	2.8	2.7	2	2	2	2
	Peak	5.6	7.9	5.1	5.7	4.5	5.1	7.9	5.7	6.8	6.2	7.4	7.4
Housing Board, Baddi	M. Average	-	-	2.6	2.8	2.1	2	3	2.2	2	2	2	2
	Peak	-	-	6.2	5.7	4.5	2	10.2	4.5	5.1	4.5	5.1	5.1
A.H.C. Barotiwala	M. Average	-	-	2.8	2.2	2.1	2	2.5	2	2	2	2	2
	Peak	-	-	7.6	5.1	4.5	2	6.8	2	4.5	5.1	5.7	4.5
Regional Office, Damtal	M. Average	2	2	2	2	2	2	2.1	2	2	2	2	2
	Peak	2	2	2	2	2	2	6.7	2	2	2	2	2
Old Road, Damtal	M. Average	2	2	2	2	2	2	2	2	2	2	2	2
	Peak	2	2	2	2	2	2	2	2	2	2	2	2
Kala Amb	M. Average	2	2	2	2	2	2.9	2	2	2	2	2	3.9
	Peak	3.9	3.9	2.9	3.9	3.9	6.1	4	3.6	5.1	6.1	6.1	6.6
Kala Amb, Trilokpur	M. Average	2	2	2	2	2	1.6	2	2	2	2	2	2
	Peak	2.4	2.4	3.9	2	2	3.3	3.1	2.5	3.1	3.1	2.5	3.1
Paonta Sahib	M. Average	2	2	2	2	2	2.2	2	2	2	2	2	2
	Peak	2.9	2.4	2.4	2	2.4	7.1	4.1	2.5	3.1	3.1	3.1	3.6
Paonta Sahib, Gondpur	M. Average	2	2	2	2	1.8	3.4	2	2	2	2	2	2.9
	Peak	3.4	3.9	2.9	2.9	2.4	9.7	4.1	4.1	4.6	6.1	5.1	5.1
Parwanoo, Sec-4	M. Average	2	2.4	2	2	2.1	2.1	3	2.3	2	2	2	2
	Peak	2	6	4.5	4.5	4.5	4.5	10.2	5.1	4.5	6.4	4.5	5.1
Parwanoo, Sec-1	M. Average	2	2.7	2.4	2.2	2.2	2.2	2.4	3.1	2	2	2	2
	Peak	2	6.8	5.1	4.5	4.5	4.5	4.5	5.7	5.1	5.7	6.8	6.8
Tekka Bench,	M. Average	2.7	3.1	3.1	2.6	2.8	2.9	2.4	2.2	2.5	2.5	2.9	2.8

Location	SO_2 in $\mu g/m^3$	April, 2008	May, 2008	June, 2008	July, 2008	August, 2008	Sept.,2008	Oct., 2008	Nov., 2008	December, 2008	January, 2009	February, 2009	March, 2009
		Month											
Shimla													
	Peak	6.3	12.6	10.7	6.8	7.1	6.8	5.3	5.8	8.7	7.3	7.8	6.8
Bus Stand, Shimla	M. Average	5	3	2.9	3.3	2.8	2.9	2.8	3.6	2.5	2.9	3.6	3.1
	Peak	12.9	10.4	7.3	11.3	7.1	6.8	9.2	11.7	8.7	7.8	9.2	10.2
DIC Baddi	M. Average	14.1	13.2	10.6	11.4	7.1	7.5	9.8	10.1	10.4	10.4	11.8	11.1
	Peak	18.8	24.4	16.6	17.6	15.6	13.7	15.6	15.6	17.1	15.6	15.6	16.1
Housing Board, Baddi	M. Average	-	-	11.8	12.1	7.1	6.4	9.3	8.8	9	7.7	8.4	8.2
	Peak	-	-	17.6	18.5	14.6	10.7	19.5	13.6	13.7	13.2	12.7	14.1
A.H.C. Barotiwala	M. Average	-	-	12.5	11.4	7.6	6.5	9.5	7.8	7.7	8.4	8.5	7.9
	Peak	-	-	16.6	15.6	12.7	10.7	15.6	10.7	11.7	13.7	13.7	12.7
Regional Office, Damtal	M. Average	18.7	18.3	14.7	15.1	14.7	16.2	15.5	15.6	12.4	12.8	14.5	16.7
	Peak	55	24.8	20.9	22.1	22	22	24.7	22.9	17.5	21.5	23	23.9
Old Road, Damtal	M. Average	19.9	21.1	17	17.8	18.8	18.6	21.6	19	18.3	16.4	20	21.1
	Peak	30.1	29.3	23.8	28	25.6	27.5	30.1	28.5	29.9	24.2	26.5	27.5
Kala Amb	M. Average	13.3	14.6	13.9	13.9	13	14.3	13.8	16.1	18.2	19.7	19.9	20.9
	Peak	17.9	17.5	16.7	16.3	15.9	18.6	15.4	19.1	23.6	27.6	23.6	24.5
Kala Amb, Trilokpur	M. Average	11.8	11.6	11.8	11.2	10.7	11.6	12.3	13.5	13.3	14.7	13.4	15.5
	Peak	14.6	14.2	18.7	13.4	13	13.9	15.4	16.3	17.3	17.7	17.2	19.5
Paonta Sahib	M. Average	11.7	12	11.5	11	11.2	10.1	12.6	13.7	14.2	14.8	13.8	15.5
	Peak	16.3	14.6	16.3	13.4	15	14.5	16.8	18.1	17.7	19	17.7	19
Paonta Sahib,	M. Average	13.1	14.6	13.6	13.3	13.2	13	13.6	15.5	17.1	18.8	19.4	18.4

Location	SO_2 in $\mu g/m^3$	April, 2008	May, 2008	June, 2008	July, 2008	August, 2008	Sept.,2008	Oct., 2008	Nov., 2008	December, 2008	January, 2009	February, 2009	March, 2009
		Month											
Gondpur													
	Peak	17.5	17.5	17.1	15.4	17.5	18.1	16.8	19	21.3	22.7	23.2	22.7
Parwanoo, Sec-4	M. Average	10.5	10.2	8.5	7.5	7.1	6.9	10.5	8.9	8	7.4	7.6	7.8
	Peak	12.5	22.1	17.8	21.5	15.6	13.7	27.3	18	13.2	14.3	12.7	13
Parwanoo, Sec-1	M. Average	11	11.1	9.2	8.8	6.8	8.3	9.7	11.6	10.3	9.8	10.8	10.3
	Peak	14.4	18	16.6	12.7	12.7	14.1	14.1	20	14.6	14.6	15.2	19.5
Tekka Bench, Shimla	M. Average	4.7	5.1	6	6.4	8.7	9.6	7.3	6.8	6.4	5.2	6.5	6.2
	Peak	11	14	12.8	22.8	24	23.3	23.8	22.4	18.3	11.9	16.5	14.6
Bus Stand Shimla	M. Average	8.9	8.7	11.7	12.5	8.7	9.6	12.4	9	6.4	9.5	10.7	7.9
	Peak	20.1	21	21.9	30.2	24	23.3	26.5	21.9	18.3	43.4	21.5	18.3
DIC Baddi	M. Average	142	186	134	85.9	46.3	53.7	81	90.3	94.8	102.6	46.4	55.3
	Peak	247	613.5	261.5	172.8	145.7	142.4	171.4	176.6	449.3	559.2	102	125.5
Housing Board, Baddi	M. Average	-	-	101.1	64	28.2	51.7	61.3	86.8	98.8	127.8	49.4	49.3
	Peak	-	-	184.6	195.1	61.6	120.7	145.3	159.1	200.6	274.9	101.4	129.1
A.H.C. Barotiwala	M. Average	-	-	89.8	50.4	39.7	36.6	63.3	43.2	68.6	54.2	96.9	60.2
	Peak	-	-	134.7	131.1	101.8	68.6	106.5	71.8	154.8	87.5	174.6	184.3
Regional Office, Damtal	M. Average	56	70	53	51.3	48	55	66.6	55.7	56.9	53.1	62	67.3
	Peak	06	114	97	88	73	164	194	90	171	157	173	189.5
Old Road, Damtal	M. Average	65	88	68	62.4	66	75	83.6	73.2	88	75.4	71.3	84.7
	Peak	95	159	106	125	101	142	132	124	155	123	129	151
Kala Amb	M. Average	234	236	248	223	225	277	243.6	235.7	312.2	228.5	260.3	284.9

Location	SO_2 in $\mu g/m^3$	April, 2008	May, 2008	June, 2008	July, 2008	August, 2008	Sept.,2008	Oct., 2008	Nov., 2008	December, 2008	January, 2009	February, 2009	March, 2009
		Month											
Kala Amb, Trilokpur	Peak	486	595	472	422	440	465	361	288	766	356	364	472
	M. Average	112	107	110	90	69	60	84	68.2	103.7	110.9	70.1	117
Paonta Sahib	Peak	165	158	177	145	219	151	223	143	185	166	141	258
	M. Average	99	96	105	33	82	68	83.1	90	114	104	86	102.6
Paonta Sahib, Gondpur	Peak	163	187	276	165	166	143	411	165	326	135	142	224
	M. Average	134	191	134	167	178	216	154.1	183	201.6	205.9	179.1	157.3
Parwanoo, Sec-4	Peak	306	385	214	387	351	435	483	273	335	348	271	300
	M. Average	56	75	64	39	31	50	64.5	84.7	86.1	87.3	73.5	71.3
Parwanoo, Sec-1	Peak	101	147	220	158	89	102	168.6	161.3	152	202.1	151.8	136.9
	M. Average	130	113	98	80	43	61	63	99	126.7	109.3	129.4	110.3
Tekka Bench, Shimla	Peak	217	297	185	207	98	114	117	190.4	282.7	293.3	258.7	185.3
	M. Average	62	73	45	40	57	51.5	47	36.7	41.8	51.4	56	83
Bus Stand Shimla	Peak	142	161	85	130	137	116	161	102	125	108	107	142
	M. Average	62	73	65	60	57	51.5	62	46.6	51.3	53	60.3	87.3
	Peak	120	247	124	124	137	116	119	103	91	104	92	221

Water quality: With the increasing population, urbanization and industrialization it is becoming difficult to provide adequate amount of water to the users. At the same time the problem of water quality has cropped up and has become more important in the recent years rather than quantity of water. It is almost impossible to find pure water in nature as water being a universal solvent readily dissolves and collects all kinds of impurities but the crux of the problem lies in the contamination that is taking place due to human activities. The pollution by human activities emanating either from use of water for domestic or industrial purposes or as a result of ever increasing rate at which organic or inorganic chemicals, pesticides, heavy metals are being used and are being released into the atmosphere or over land whereby they are able to enter the water cycle have degraded water resources to a large extent.

The industrialization coupled with discharge of untreated sewage is responsible for deterioration in water quality

The quality of surface water in India are monitored via a network that functions in a 3-tier system; **Tier-I:** Global Environmental

Monitoring System (GEMS); **Tier-II:** Monitoring of Indian National Aquatic Resources Systems (MINARS); **Tier-III:** Water Quality Monitoring by State Pollution Control Boards in addition to GEMS and MINARS. At present it comprises of 784 stations spread over the country. [Source CPCB Annual Report 2002-03]. In Himachal Pradesh it is being monitored at 23 Locations under MINARS over the Rivers Satluj, Beas, Ravi and their tributaries by HPSEP and PCB. The Use-Classification and Primary Water Quality Criteria developed by CPCB for assessing the water quality for fresh water are given in Table 23.

Table 23: Primary Water Quality Criteria and Designated Best use of fresh water

Characteristics	A*	B*	C*	D*	E*
Dissolved Oxygen (DO) mg/l, Minimum	6	5	4	4	-
Biochemical Oxygen Demand (BOD) mg/l, Max.	2	3	3	-	-
Total Coliform (TC) Organism MPN/100 ml, Max. **	50	500	5000	-	-
pH value	6.5 - 8.5	6.5 - 8.5	6 - 9	6.5 - 8.5	6.5 - 8.5
Free ammonia (as N), mg/l, Maximum	-	-	-	1.2	-
Electrical conductivity, micro-mhos per centimetre	-	-	-	-	2250
Sodium Absorption Ratio (SAR), Maximum	-	-	-	-	26
Boron, mg/l Maximum	-	-	-	-	2

*Class-A	Drinking water source without conventional treatment but after disinfection.
Class-B	Outdoor bathing organized.
Class-C	Drinking water source with conventional treatment followed by disinfection.
Class-D	Propagation of wildlife & fisheries.
Class-E	Irrigation, industrial cooling, controlled waste disposal.

A total of 22 parameters are monitored, however, only key parameters are reported in the Table 24& 25. The Surface Water Quality of Rivers in Himachal Pradesh as reported by the State Pollution Control Board is given in Table 24.

Table 24: Month wise variation in River Water Quality (June 2004 to January 2008)

Month-Year	pH	DO (mg/l)	BOD (mg/l)	TC (MPN/ SPC/100ml)
Jun-04	7.15-8.49	6.8-10.6	0.1-2.0	9-418
Oct-04	6.62-8.97	6.9-11.8	0.1-0.8	2-280
Jan-05	4.47-8.81	8.0-13.0	0.1-2.1	2-410
Apr-05	7.2-9.04	1.3-12	0.1-18	1-15000
Jul-05	7.18-9.0	6.2-10.8	0.1-2.4	17-2400
Oct-05	7.42-8.59	4.0-10.8	0.1-3.6	1-5600
Jan-06	0.09-8.94	6.5-12.4	0.1-6.0	2-3800
Apr-06	7.04-9.64	0-12.4	0.1-430	0-30000
Jul-06	6.56-9.42	2.5-9.9	0.1-840	3-420
Oct-06	6.77-8.81	2.2-10.6	0.1-200	1.0-8000
Jan-07	6.67-8.88	1.8-12.8	0.1-1150	0-4200
Apr-07	0.1-8.6	0.2-10.2	0-640	2.0-3800
Jul-07	0.45-8.34	0.3-13.0	0.1-12	0->2400
Oct-07	0.24-9.18	0-12.9	0.1-14	0->2400
Jan-08	0.15-8.58	0-12.5	0.1-540	2->2400

Source: Himachal Pradesh Pollution Control Board

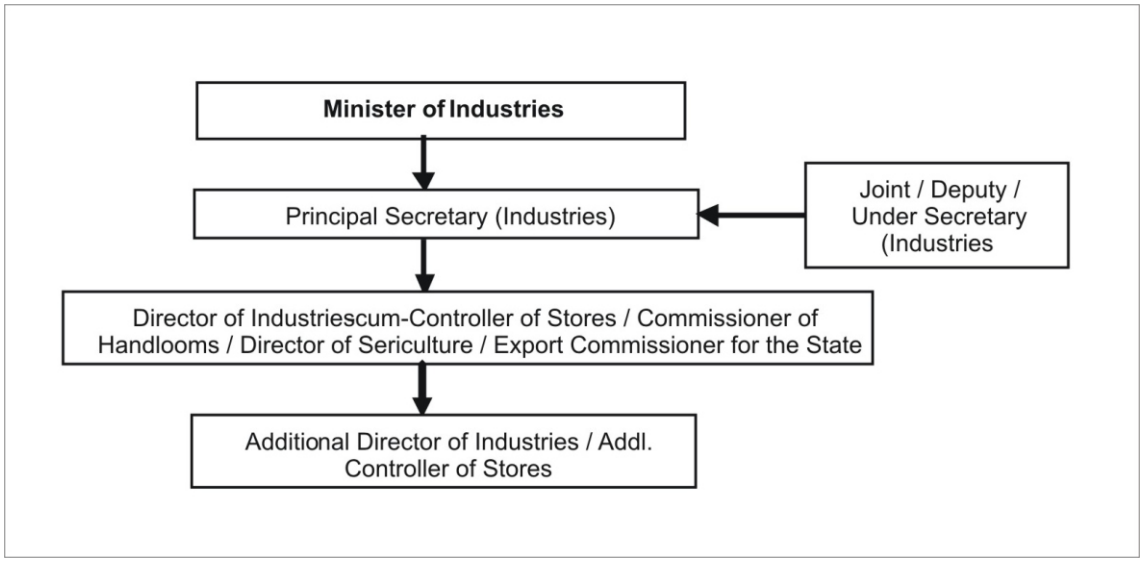
Table 25: River Quality Data (Annual Avg.) Year 2006

Location	Temp (^{0}C)	pH	DO (mg/l)	BOD (mg/l)	FC (MPN/100 ml)
Beas at U/S Manali, H.P.	4	7.49	11	1	2

Location	Temp (^{0}C)	pH	DO (mg/l)	BOD (mg/l)	FC (MPN/100 ml)
Beas at D/S Kullu, H.P.	7	7.66	9.8	0.8	3
Beas at D/S Aut, H.P.	7	7.88	10.6	0.7	2
Beas at U/S Pandoh Dam, H.P.	8	7.86	9.9	0.6	5
Beas at exit of tunnel dehar power house, H.P.	9	7.85	9.5	0.7	4
U/S Mandi, H.P.	15	7.97	8.8	0.7	2
Beas at D/S Mandi, H.P.	16	7.85	8.5	0.9	7
Beas at D/S Palampur, H.P.	19	7.72	7.6	0.7	5
Beas at D/S Dehragopipur, H.P.	21	7.84	7.4	0.8	11
Beas at D/S Pong Dam, H.P.	19	7.83	6.7	0.7	10
River Satluj b/c with river Spiti at Khab, KinnaurDistrict, H.P.	14	8.07	8.5	0.5	
Satluj at Nathpa Jhakri, H.P.	10	8.18	9.8	0.2	
Satluj at U/S Rampur, H.P.	11	8.03	10.3	0.1	28
Satluj at D/S Rampur, H.P.	12	8.18	10.3	0.4	38
Satluj at U/S Tattapani, H.P.	12	8.03	10.1	0.3	37
Satluj at U/S Slapper, H.P.	11	7.96	9	0.7	6
Satluj at D/S Slapper, H.P.	11	8.03	9.1	0.8	7
Satluj at D/S Bhakhra, H.P.	16	8.13	8.7	0.2	4
Ravi at U/S Chamba, H.P.	10	7.85	10.1	0.8	5
Ravi at U/S Madhopur, H.P.	21	7.7	7.6	0.6	5
Parvati before conf. to river Beas, H.P.	7	7.61	10.1	0.4	3
Largi at D/S, H.P.	6	7.78	11	0.7	2
River Sirsa , U/S Sitomajri Nalagarh, H.P.	17	8.11	10.3	1.1	35
River Sirsa , D/S Nalagarh bridge, H.P.	25	8.37	12.4	1.6	395
River Sirsa at D/S Nalagarh district. Solan, H.P.	25	7.85	9.2	23	950
River Yamuna at U/S Paonta Sahib	20	9.12	8	4.6	11
River Yamuna at D/S Paonta Sahib	20	9.22	8.1	4.3	15

6.9 Institutional mechanisms within the sector to address identified environment issues

The Industries Minister (Hon'ble Chief Minister) heads the Industries Department. At the Secretariat level, there is a two tier structure with the Principal Secretary (Industries) and the Joint/Deputy/Under Secretary (Industries). The organisational chart of the Industries Department is as indicated below.



Store Purchase Organisation	Administration	Industrial Development
Additional. Controller of Stores Joint Director of Industries Tehsildar Naib Tehsildar Store Inspection Officers Superintendent Gr.-I S.O. (Audit)	Addl. Director of Industries (Admn.) Assistant Controller (F&A) Superintendent Gr.-I	Industrial Advisor Joint Director of Industries Project Co-ordinator Deputy Directors of Industries Manager

Geological & Mining	Sericulture	Handloom
State Geologist Geologists Assistant Geologists Driller Superintendent Gr.-I S.O (Audit) Assistant Driller Lab Assistant	Project Co-ordinator	Dy. Director of Industries

Field Officer	
District Industries Centre	**Mining**
General Managers Managers/ Member Secretaries, SWCAs, Parwanoo, Baddi, Nalagarh,Paonta Sahib, Kala Amb,Sansarpur Terrace, Gwalthai,& Damtal Industrial Promotion Officers Economic Investigators Extension Officer (Industries) (Block Level)	Mining Officers Mining Inspectors Assistant Mining Inspectors Mining Guards

The following six Board/Corporations are functioning under the administrative control of the Industries Department:

I. H.P. State Industrial Development Corporation Ltd. (HPSIDC).
II. H.P. Financial Corporation Ltd. (HPFC).
III. H.P. State Handicrafts & Handloom Corporation Ltd. (HPSH&HC)
IV. H.P. State Small Scale Industries and Export Corporation Ltd. (HPSSI&EC)

V. H.P. General Industries Corporation Ltd. (HPGIC)
VI. H.P. Khadi and Village Industries Board. (HPKVIB)

State Level Single Window Clearance and Monitoring Authority (SLSWC& MA): The State Govt. has provided a new orientation and accelerated speed to industrial development in the State. With a view to provide umbrella support to existing and new ventures, the State Govt. has notified a State Level Single Window Clearance and Monitoring Authority (SLSWC&MA) under the Chairmanship of Hon'ble Chief Minister, Himachal Pradesh to discuss and solve all contentious and inter-departmental issues regarding setting up of industrial units, monitor and review the progress of units already approved and expedite the approvals (administrative and statutory) of each concerned department necessary for the establishment of the unit in the State. The Single Window Clearance Agencies are functioning at Paonta Sahib in Sirmaur District, Gwalthai in Bilaspur District, Sansarpur Terrace in Kangra District, in addition to SWCAs at Parwanoo and Baddi in Solan District.

6.10 Data / documentation pertaining to addressing demographic issues in the context of the sectors, such as population changes; requirements of populations and changing lifestyles; migratory populations including tourists; transhumants; transit labour population; pressures felt by communities due to degraded environment conditions.

After the notification of Special Package in January 2003, the Department has approved 1019 new investment proposals and 154 expansion proposals in Medium & Large Scale Sector up to 31/3/2011 with combined envisaged investment of Rs. 31206.37 crores and employment potential of 181975 persons. After getting the special package of incentives from the Department of Industries, the growth of Medium & Large Industries has been increased by more than 3.5 times from January, 2003 to March, 2011 with an investment of Rs. 828.5 crores to 31177 crores which provides employment to 170041 (3.82 times increased) person during the same period. The details are given in Table 26, Table 27 and Table 28.

Table 26: District wise details of approval/ registration of New Medium & Large Industrial Projects: (From 07-01-2003 to 31-03-2011)

Sr. No.	District	Number of Units	Investment (Rs. in Lakhs)	Proposed Employment
1.	Bilaspur	12	82852.01	2403
2.	Hamirpur	1	268.53	19
3.	Kangra	29	101753.61	4191
4.	Kullu	2	999.92	130
5.	Shimla	13	115844.94	3702
6.	Solan	669	1699431.85	96332
7.	Sirmaur	205	476748.56	30041
8.	Una	86	468998.22	32343
9.	Chamba	1	80000.00	600
10	Mandi	1	90860.00	280
	Total	**1019**	**3117757.64**	**170041**

Table 27: Details of registered/ approved industrial units by the Industries Department after the special package of incentives. (From 07-01-2003 to 31-03-2011)

Sr. No.	Category	Number of units	Investment (Rs. in Crores)	Proposed Employment
1.	New Medium/ Large Scale projects	1019	31177.57	170041
2.	Expansion of existing units of medium and large scale sector	154	2879.90	11934

Table 28: Year wise details of the approved/registered New Medium & Large Scale Industrial Projects after special package (from 07-01-2003 to 31-03-2011)

Sr. No.	Year	Number of Units	Investment (Rs. in Crores)	Proposed employment
1.	2003-04	284	3946.20	44491
2.	2004-05	225	3355.44	28208
3.	2005-06	244	5411.30	37390
4.	2006-07	145	6728.80	27004
5.	2007-08	28	2746.73	4996
6.	2008-09	48	6230.91	14612
7.	2009-10	30	1321.64	7721
8.	2010-11	15	1436.59	5619
	Total	**1019**	**31177.57**	**170041**

In addition 154 proposals of substantial expansion in Medium & Large Scale industrial Sector involving an investment of Rs. 2879.90 crores and employment potential of 11934 persons were also approved as given in Table 29.

Table 29: Year wise details of the approved/registered Expansion in Medium & Large Scale Industrial Projects after special package (from 07-01-2003 to 31-03-2011)

Sr. No.	Year	No. of projects	Investment (Rs. in Crores)	Proposed Employment
1.	2003-04	15	21.18	384
2.	2004-05	37	356.21	1735
3.	2005-06	15	277.4	1158
4.	2006-07	9	181.3	429
5.	2007-08	3	24.52	126
6.	2008-09	27	951.02	3437
7.	2009-10	35	506.07	2758
8.	2010-11	13	562.2	1907
	Total	**154**	**2879.9**	**11934**

Approval of new Small Scale Industries: Department of Industries has approved 13294 new investment proposals and 257 expansion proposals in Small Scale Industries sector up to 31/3/2011 with combined envisaged investment of Rs. 10239.19 crores and employment potential of 317819 persons. After getting the special package of incentives from the Department of Industries, the growth of small scale Industries has been increased by more than 6 times from January, 2003 to March, 2011 with an investment of Rs. 831.69 crore to 10006.33 crores which provides employment to 314317 (6.5 times increased) person during the same period. The details are given in Table 30, Table 31 and Table 32.

Table 30: District wise details of approval/ registration of New Small Scale Industrial Projects after special package (from 7-1-2003 to 31-03-2011)

Sr. No.	District	Number of Units	Investment (Rs. in Lakhs)	Proposed employment
1.	Bilaspur	582	19989.28	8946
2.	Chamba	242	5342.28	3936
3.	Hamirpur	378	4895.2	3641
4.	Kangra	1088	52973.57	16502
5.	Kullu	511	9505.18	4753
6.	Kinnaur	70	343.03	574
7.	Lahaul & Spiti	25	122.8	130
8.	Mandi	862	10203.09	8215
9.	Shimla	612	13468.35	6222
10.	Solan	5720	621029.9	168215
11.	Sirmaur	1510	130706.37	41120
12.	Una	1694	132054.43	52063
	Total	**13294**	**1000633.48**	**314317**

Table 31: Details of registered/ approved industrial units by the Industries Department after the special package of incentives. (from 07-01-2003 to 31-03-2011)

Sr. No.	Category	Number of units	Investment (Rs. in crores)	Proposed Employment
1.	New Small Scale Units	13294	10006.33	314317
2.	Expansion of existing units of small scale sector	257	232.86	3535

Table 32: Year wise details of the approved/registered New Small Scale Industrial Projects after special package (from 07-01-2003 to 31-03-2011)

Sr. No.	year	Number of Units	Investment (Rs. in Lakhs)	Proposed employment
1.	Upto 2003-04	2140	83169.76	48259
2.	2004-05	2018	162095.8	39522
3.	2005-06	1937	98405.83	39606
4.	2006-07	1867	140981.61	47568
5.	2007-08	1810	141030.97	48077
6.	2008-09	1010	104187.39	34672
7.	2009-10	1679	199554.77	44029
8.	2010-11	833	71207.35	12584
	Total	**13294**	**1000633.48**	**314317**

In addition 257 proposals of substantial expansion in Small Scale Industrial Sector involving an investment of Rs. 23286.20 lakh and employment potential for 3535 persons were also approved as shown in Table 33.

Table 33: Year wise details of the approved/registered expansion in Small Scale Industrial Projects after special package (from 07-01-2003 to 31-03-2011)

Sr. No.	Year	No. of projects	Investment (Rs. in Lakhs)	Proposed Employment
1.	Upto 2004-05	104	1722.78	1138
2.	2005-06	81	4293.8	1845
3.	2006-07	42	869.24	294
4.	2007-08	10	499.47	86
5.	2008-09	7	113.42	34
6.	2009-10	10	15702.29	105
7.	2010-11	3	85	33
	Total	**257**	**23286**	**3535**

State Level Single Window Clearance & Monitoring Authority: With a view to ensure expeditious clearances from the respective Departments for setting up of new industrial units, a State Level Single Window Clearance and Monitoring Authority under the Chairmanship of Hon'ble Chief Minister has been constituted to clear projects and ensure speedy approval from various Departments or Agencies. The Authority has so far held 51 meetings and cleared 864 projects with an investment of Rs. 28412.74 crores and employment potential to about 140031 persons. The year wise details of the meetings are given in Table 34.

Table 34: Year wise details of the meetings
(Status: upto 31-03-2011)

Sr. No.	Year	No. of meetings	No. of units approved.	Proposed investment (Rs in Crores)	Proposed employment
1.	2003-04	2	30	541	4459
2.	2004-05	9	232	3625	28083
3.	2005-06	8	227	5441	36857
4.	2006-07	7	160	4971	25283
5.	2007-08	3	28	3269.31	4712
6	2008-09	7	76	6848.01	21255
7	2009-10	11	79	1649.22	11286
8	2010-11	4	32	2068.2	8096
	Total	**51**	**864**	**28412.74**	**140031**

Rates for the allotment of plots in the industrial areas/estate of the Industries Department for the year 2008-09: The Committee constituted under Rule 6.2 of revised rules regarding Grant of Incentives, Concessions and Facilities to Industrial Units in H.P. 2004 has determined the premium of plots in respect of industrial areas/estates of the Industries Department for the year 2011-12 is given in Table 35. The following rates shall be applicable with immediate effect.

Table 35: District wise rates of developed and un-developed industrial area/ estates

District	Name of Industrial Area (IA)/ Industrial Estates (IE)	Rates in Rs. Per Sq. Mtrs. Developed	Undeveloped
Bilaspur	IA Bilaspur	1210	-
	IA Goalthai	825 1100 (Commercial)	-
Chamba	IA Hatli	330	-
	IA Garnota	-	220

District	Name of Industrial Area (IA)/ Industrial Estates (IE)	Rates in Rs. Per Sq. Mtrs. Developed	Undeveloped
	IE Shivnagri (Holi)	@Rs 2/- per sq ft	-
	IE Sultanpur	550	-
	IE Parel	550	-
Hamirpur	IA Hamirpur	1210	-
	IA Nadaun	1100	-
Kangra	IA Nagrota Bagwan	1375	
	IA Dhaliara	550	-
	IA Nagri	440	-
	IA Sansarpur Terrace	880	-
	IA Bain Attarian	880	-
	IA Raja Ka Bag	880	-
	IA Nargla Jawali	550	-
	IE Jawali	550	-
	IE Kangra	2200	-
	IE Dehra	1100	-
Kullu	IA Shamshi	2750	-
Kinnaur	IA Reckong Peo	825	-
Lahaul & Spiti	IE Keylong	@Rs 1/- per sq ft	-
Mandi	IA Ratti	1320	-
	IA Bhambla	1100	-
	IA Sauli Khud (MND)	1650	-
	IE Siaglu	660	-
	IE Palli	660	-
Shimla	IA Shoghi	1650	-
	IA Jais	-	550
	IE Raighat (Theog)	550	-
	IE Pandranu	275	-
Sirmaur	IA Kala Amb	2420	1650
	IA Gondpur (Paonta Sahib)	2420	1650
Una	IA Tahliwal	1100	605
	IA Gagret	1320	605
	IA Mehatpur	1650	935
	IA Amb	1320	825
	IA Jeetpur Bheri	880	550
	I.A Basal	1100	572
	I.A Deoli Ghanari	-	550
	Aghlour	-	440
	IA Baddi	3300	2200
Solan	EPIP Baddi (Phase I)	3300	2200
	EPIP Baddi (Phase II)	3300	2200
	IA Barotiwala	3300	2200
	IA Katha Bhatolikalan	3300	2200
	IA Lodhimajra	-	1463
	EC .Chambaghat	3850	3080
	IE.Chambaghat	3850	3080
	IA Banalagi	-	825
	IA Mamleeg	-	550
	IA Vaknaghat	-	1100
	IE Dharampur	2420	1815
	IA Parwanoo	7260	4840

List of Industries generating hazardous waste is given in Table 36. The hazardous waste disposed off at TSDF site at Dhabota.

Table 36: Major Hazardous Waste generating Industries in the State

S	Name of Unit	Area
1.	Auro Dying Ltd.	Baddi
2.	Auro Textiles Ltd.	Baddi
3.	Asian Paints	Baddi
4.	Birla Textile Mills	Baddi
5.	Bcc Fuba India Ltd.	Nalagarh
6.	Cadbury India Ltd.	Baddi
7.	Cadila Healthcare Ltd.	Baddi
8.	Cipla Ltd.	Nalagarh
9.	Dabur India Ltd.	Baddi
10.	Dabur Pharma Ltd.	Baddi
11.	Dr. Reddy Lab. Ltd.	Baddi
12.	Glen Mark Pharmaceuticals	Baddi
13.	Godrej Hershey Ltd.	Nalagarh
14.	Goish Remedies	Baddi
15.	Goodrej Consumer Product	Baddi
16.	Groer & Well (I) Ltd.	Barotiwala
17.	Hindustan Unilever Ltd.	Buranwala
18.	Indo Swift Ltd.	Nalagarh
19.	Indo Swift Ltd.	Baddi
20.	Johnson & Johnson Ltd.	Baddi
21.	Johnson Diversey India	Nalagarh
22.	Kandhari Beverages	Baddi
23.	Krishi Rasayan Export	Baddi
24.	Panacea Biotech Ltd.	Baddi
25.	Procter & Gamble Home P	Baddi
26.	Sc Johnson Product Ltd-2	Baddi
27.	Sara Textile Ltd.	Nalagarh
28.	Sarvotam Care	Jharmajri
29.	Torrent Pharmaceuticals	Majra
30.	TVS Motors	Nalagarh
31.	Winsome Textile Industries	Baddi
32.	Wipro Ltd.	Jharmajri
33.	Wockardt Ltd.	Baddi
34.	Wrigley India (P) Ltd.	Baddi
35.	H.M. Steel	Kala Amb
36.	Mahan Group Companies	Paonta
37.	Malwa Cotton	Paonta
38.	Pasupati Spinning Mills	Kala Amb
39.	Case Cold Roll Forming	Kala Amb
40.	Ranbaxy Laboratories	Paonta
41.	International Cars & Mot	Una
42.	Luminous Power	Una
43.	Fermenta Biotech	Mandi
44.	Morpen Laboratories	Parwanoo
45.	Kamla Dial Devices Ltd.	Parwanoo
46.	Faderal Mogul Bearing	Parwanoo
47.	Gabriel India Ltd.	Parwanoo
48.	Ind Swift Ltd.	Parwanoo
49.	Mahle Fileter	Parwanoo
50.	P.A Magnet	Kasauli
51.	Solochrome	Parwanoo
52.	Tafe Motors & Tractors	Parwanoo
53.	Shivalik Biometals Control	Ch. Ghat

Source: HPSPCB

6.11 Information on human resource management issues (which may have relevance to environment management) in the sector such as: manpower, vocational training, awareness levels etc.

The Industries Minister (Hon'ble Chief Minister) heads the Industries Department. At the Secretariat level, there is a two tier structure with the Principal Secretary (Industries) and the Joint/Deputy/Under Secretary (Industries).

(i) Administration and Accounts Wing: The Administrative and Accounts Wings is headed by the Additional Director (Admn.). He reports in administrative/accounts matters to the Director of Industries. He is further assisted by Assistant Controller (F&A), Superintendent(s) Gr.-I & II and by ministerial and other staff.

(ii) Industrial Development Wing: In this wing Industrial Advisor, Joint Director of Industries, Project Co-odinator and Deputy Directors, report to the Director of Industries for the development of industries in the State. The Officers of these wings are further assisted by Manager, Industrial Promotion Officer, Superintendent (s) Gr.-II, ministerial and other staff.

(iii) Sericulture Wing: The Sericulture Wing is headed by the Dy. Director (Sericulture) at the Directorate level. He reports to the Director of Industries for sericulture development. He is further assisted by Superintendent(s) Gr.-II, ministerial and other staff.

(iv) Handloom Wing: The Handloom Wing is headed by a Deputy Director (Handloom) who reports to the Director for Handloom (Director of Industries) and is further assisted by SIO (Textiles), Superintendent Gr.-II, ministerial and other staff.

(v) Geological & Mining Wing: The Geological and Mining Wing is headed by the State Geologist. He reports to the Director of Industries for mineral exploration/regulation works. He is further assisted by Geologists, Assistant Geologists, Superintendent Gr.- I & II, ministerial and other staff. The organisational set up in the field offices of the Department of Industries is as under:-

a) **District Industries Centres**
The District Industries Centre are headed by General Managers. They are further assisted by Managers, Industrial Promotion Officers, Economic Investigators, Extension Officers (Industries) at Block level, ministerial and other staff.

In order to provide facilities to entrepreneurs close to their places of work, Single Window Clearance Agencies were functioning at Parwanoo, Baddi, Nalagarh in Solan District, Paonta Sahib, Kala Amb in Sirmaur District, Gwalthai in Bilaspur District and Sansarpur Terrace, Damtal in Kangra District.

b) **Mining Offices**
The Mining Office is headed by a Mining Officer. He is assisted by Mining Inspectors, Asstt. Mining Inspectors, Mining Guards and ministerial and other staff. Further more, the Drilling operation is headed by Drillers who are

assisted by Asstt. Driller and Laboratory Assistant.

c) **Sericulture Offices**
The Sericulture Wing has 7 divisions. The Deputy Director (Sericulture) heads the Palampur Division, Silk Seed Promotion Officer, Nadaun heads the Nadaun Division besides holding additional Charge of Dehra Division. The Charge of the Shimla Division was with Project Co-ordinator. The General Manager, DICs, Mandi and Sirmaur hold the additional charges of Mandi and Nahan Divisions respectively. The Charge of the Ghumarwin Division was with the Manager, District Industries Centre, Bilaspur. These Officers are further assisted by Sericulture Officers, Development Officers, Technical Officer (Tassar), Sr. Sericulture Inspectors, Extension Officers (Tassar), Technical Assistants (Tassar), ministerial and other staff.

6.12 Regulatory analysis to identify any regulations that have environment implications (negative or positive), and compliance with the same.

Industries sector and cross sector policy and regulatory framework at state level shows the intent of the state government to address the issues relating to improper siting of industries, poor ambient air quality, deteriorating water quality and quantity, noise pollution, inadequate hazardous waste treatment and disposal, land degradation, loss of flora and fauna, and poor aesthetics. A list of policy and programme is given below.

- The Environment (Protection) Act, 1986
- EIA Notification, 2006 and amendments
- Zoning Atlas
- Central Pollution Control Board (CPCB)
- Comprehensive Environment Pollution Index (CEPI)
- The Air (Prevention and Control of Pollution) Act, 1981
- National Ambient Air Quality Standards (NAAQS)
- National Water Policy, 2002
- State Water Policy (Draft)
- The Water (Prevention and Control of Pollution) Act, 1974
- H.P. Ground Water (Regulation and Control of Development and Management Rules, 2007
- The Noise Pollution (Regulation and Control) Rules, 2000 (as amended to date)
- The Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008
- Land Acquisition Act, 1894
- The Forest (Conservation) Act, 1980
- Mining Policy
- The Industrial Policy, 2004
- H.P. Forest Sector Policy & Strategy, 2005
- The Factories Act, 1948
- Minimum Wages Act, 1948
- The Contract Labour (Regulation and Abolition) Act, 1970

References:

- Department of Industries
- State Geologist
- State Environment Report (Year not mentioned)
- Districts Industries Centres
- State Pollution Control Board
- Central Pollution Control Board
- Districts Statistical Abstract
- Department of Planning

CHAPTER 7 ENERGY

7.1 Resource inventory of the existing assets of the sector

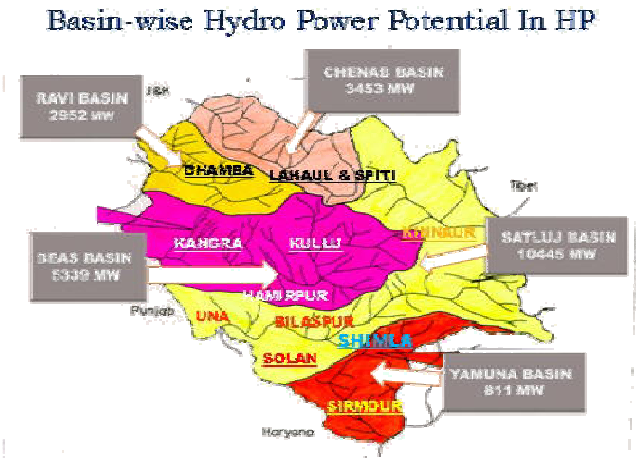
Energy is the most vital infrastructure input for economic, agriculture and industrial development of any country. It is indeed, the fulcrum on which vests the future pace of growth and development. Hence, there has been an increasing demand of energy in its various forms. The most significant of these forms is the electrical energy, availability of which has been recognised as an index of a India's overall economic growth and level of development. Therefore, India needs to accelerate the development of electrical energy sector to meet its aspirations especially in the field of industry, agriculture and also for commercial and domestic activities.

Power can be tapped from renewable and non-renewable resources. The availability of the primary sources of energy in Himachal Pradesh is shown in Table 1:

Table 1: Primary Source of Energy

Renewable resources	
Hydro-power	Yes
Biogas	Yes, limited
Solar	Yes
Wind	Negligible potential
Geo-thermal	Yes
Tidal	No
Non-renewable resources	
Coal	No
Oil	No
Gas	No (not economically viable)

The above table shows that out of various renewable sources of electricity Hydro power, Solar and Geothermal are the major sources of electricity and none of the non renewable sources are useful for power generation.



Hydro Potential	In MW
Projects under Operation (i/c HIMURJA Projects)	6370.12
Projects which are under execution/allotted and planned for 11th Plan Period	5744.10
Projects which have been allotted/under process of allotment and expected to yield benefit during the 12th Plan period	5615.50
Projects which would have to be readvertised	1481.00
Projects which have been abandoned due to environmental considerations	435.00
Projects under investigation for preparation of DPR	46.50
HIMURJA Projects proposed/under execution){750-26.60} [Under Operation - 26.60 MW]	723.40
TOTAL POTENTIAL	**20415.00**

Renewable Resources of Energy used in Himachal Pradesh

Hydro potential status: Himachal Pradesh has been blessed with vast hydroelectric potential in its five river basins, namely Yamuna, Satluj, Beas, Ravi and Chenab. Himachal Pradesh has a vast Hydel potential and through preliminary hydrological, topographical and geological investigation, total power potential so far identified is approximately 21000 MW, which is nearly 14% of the total hydro power potential of the entire country. Basin-wise availability of hydro potential is indicated in Table 2.

Table 2: Basin wise availability of hydel potential

Sr. No.	River Basin	Total Hydro-Potential (MW)	Catchment area (Km²)
1.	Satluj	9450.25	20398
2.	Beas	4604.00	13663
3.	Ravi	2359.00	5528
4.	Chenab	3032.30	7850
5.	Yamuna	591.52	5872
6.	Mini-Micro Projects	750.00	
	Total	**20787.07 equivalent to 21000.00**	

Source: Status note by HPSEB

Out of this available Hydel potential, only 6183.00 MW (31% of the total Hydel potential) has been exploited by various agencies, which also includes 326.20 MW by H.P. State Electricity Board as given in Table 3.

Table 3: Hydel power harnessed by various agencies

Sr. No.	Name of the Projects	Capacity
1	Giri	60.00 MW
2	Bassi	60.00 MW
3	SVP Bhaba	120.00 MW
4	Andhra	16.95 MW
5	Thirot	4.50 MW
6	Binwa	6.00 MW
7	Baner	12.00 MW
8	Gaj	10.50 MW
9	Ghanvi Project	22.50 MW
10	Gumma	3.00 MW
11	Mini/Micros (9 Nos)	10.75 MW
	Total	**326.20 MW**

In addition to own generation of 326.20 MW of power by HPSEB, the State Government also receives free power to the extent of 12% of the installed capacity from Baria Suil, Nathpa Jhakhri, Chamera-I, Chamera-II, Malana, Baspa-I etc., besides its share as a State of the region in various projects and other legal share in BBMB projects.

Present situation: Himachal Pradesh has shown an increase in hydropower generation in (2010) on account of the rising temperature, as the water levels of all Himalayan regions rivers have gone up. Due to water surplus in the River Beas, a single hydropower plant of the Himachal Pradesh State Electricity Board is generating over 10 to 15 percent power above its usual limit.

This year, Himachal Pradesh is estimated to provide a surplus of 2,000 Megawatt of electricity to Delhi, Rajasthan, Haryana and Punjab.

"This electricity, the powerhouse will produce with all its capacity in the month of April - May till August- September. The capacity is 126 megawatt but power works on 130-135. The main reason is melting ice,"

"In lean season, in winters, our power capacity goes down to 35 megawatts and out of three machines, only one works and that machine also work on 32-42 megawatts,".
(Source:-http://www.newkerala.com/news/fullnews-121712.html)

Solar and Geothermal potential status: Himachal Pradesh has the highest heat flow and highest thermal gradient geothermal basin in India. The first pilot binary 5 kW power plant was successfully operated by the Geological Survey of India at Manikaran, which proved the power producing capability of this province. Scientific data from 500 meter drill-holes estimated reservoir temperatures as high as 260ºC. Space heating experiments were also successfully conducted using thermal discharge by the Geological Survey of India.

The non-conventional sources of geo-thermal and solar power have potential for rural and hamlet electrification schemes. However, considering the potential and resource base, HP concentrate on large hydro power projects, mini-and micro-hydel schemes in conventional power.

Biomass as energy resource is used in all the districts of the Himachal Pradesh with majority of it in rural areas as shown in the Table 4.

Table 4: District wise Bio- mass dependency

District	Population 1991	% population using biomass	% rural population using biomass	% urban population using biomass
Bilaspur	2,95,357	90.770	94.85	24.57
Chamba	3,93,286	85.221	80.60	14.56
Hamirpur	3,69,128	91.682	96.51	30.11
Kangra	11,74,072	88.307	91.02	28.78
Kinnaur	71,270	73.517	71.52	0.00
Kullu	3,02,432	85.279	92.62	16.52
Lahaul & Spiti	31,294	84.364	84.30	0.00
Mandi	7,76,372	88.815	95.94	18.92
Shimla	6,17,404	66.187	89.29	6.23
Sirmaur	3,79,695	84.271	92.51	19.45
Solan	3,82,268	73.173	85.00	7.88
Una	3,78,269	91.073	94.86	49.12
Himachal Pradesh	**51,70,847**	**83.967**	**90.96**	**16.78**

Non-Renewable Resources of Energy used in Himachal Pradesh

Consumption trends of Coke & Coal: Both coke and coal is consumed mainly in the cold areas of Chamba, Kinnaur, Lahaul & Spiti and Shimla district. The consumption pattern of the State is given in the Table 5 below. The consumption of coal has actually decreased from 74,283 quintals in 1996, to 69,528 quintals in 2000. This decrease in consumption can be partially attributed to an increase in awareness amongst the people about the potential harmful effects of the burning of coal on the environment and mainly due to the Government's decision to ban the use of coal in all Government offices.

Table 5: Number of Consumers and Consumption of Coal/Coke

District	Consumption (in quintal)		Population 1999	Per capita consumption	
	1996-97	1999-00		(per kg of coal)	Kilo calorie per person
Bilaspur	NA	NA	3,48,865	0.00	NA
Chamba	4124	4815	4,70,472	1.02	4080
Hamirpur	NA	NA	4,21,552	0.00	NA
Kangra	NA	NA	13,67,902	0.00	NA
Kinnaur	18,633	17,992	82,242	21.88	87,520
Kullu	NA	NA	3,62,366	0.00	NA
Lahaul & Spiti	24,286	25,076	35,340	70.96	2,83,840
Mandi	NA	NA	9,14,733	0.00	NA
Shimla	27,240	21,645	7,19,908	3.01	12,040
Sirmaur	NA	NA	452400	0.00	NA
Solan	NA	NA	462442	0.00	NA
Una	NA	NA	438257	0.00	NA
Himachal Pradesh	**74283**	**69528**	**6076479**	**1.14**	**4560**

Consumption trends of Fuelwood

Traditionally, fuel wood has been the main source of energy in the entire State because of its readyly availability. About 6-8 kg of fuel wood is consumed per day per household in the State and its annual per capita consumption has been estimated at 785 kg. The level of fuel wood consumption is mainly

related to the natural resource base and the climatic conditions of an area.

Table 6: Biome wise per capita consumption of Fuel wood

Biome zone	District	Per capita consumption of fuel wood
A	Kinnaur	1000 kg/annum
	Lahaul & Spiti	
B	Kullu	800 kg/annum
	Chamba	
C	Shimla	600 kg/annum
	Kangra	
D	Sirmaur	500 kg/annum
	Solan	
	Bilaspur	
	Una	
	Hamirpur	
	Mandi	

7.2 Patterns of planning and development in the sector

A. Hydro power development in Himachal Pradesh: In Himachal Pradesh, the hydro-power development was started even before it became full fledged State. A small project was commissioned during 1908 by erstwhile Raja of Chamba, another at Chaba near Shimla in 1912, followed by commissioning of Shanan hydro-electric project (110 MW) in District. Mandi during mid twenties by the British Giri Hydel Project (60MW) and Bassi Hydro Electric Project (H.E.P.) (60 MW) were added later on by the then Department of Multi-purpose and Power, Himachal Pradesh Government, HPSEB was subsequently created in September 1971, for investigations and execution of various HEPs, and transmission and distribution of power in the State.

The overarching vision and mission of Himachal Pradesh for the Eleventh Five Year Plan is to accelerate the actualization of its hydro power potential of about 20,000 MW. Such actualization would have the following twin benefits:

(a) The country would gain in ameliorating shortages in this critical infrastructure sector, through enhanced production of "green energy".
(b) The State's financial resources would be augmented in such manner that its financial dependence on Central Government resources would diminish.

Currently, 6183 MW i.e. 31% of the total hydro-potential of the state is actualized. 5676 MW potential (28% of the total) stands allotted and with a greater pace of investment, this potential can be actualized within the Eleventh Plan period. Thus, by 2012, H.P. can hope to actualize 11,859 MW, i.e. 59% of its total potential.

Work on the balance 41% (@8200 MW) needs to be allotted at the earliest and targeted for completion within the Twelfth Plan, i.e. year 2017.

To achieve the actualization of the balance hydro power potential of Himachal Pradesh, a total investment of about Rs.98,000 crores would be required by the various entities of the State Government and Central Government, as well as by the private sector.

During the next 12th Plan, the State Government would like to invest in equity participation for 3,000 MW additional capacity. This would necessitate investment through the State Plan of about Rs. 2500 crores. In addition, the transmission and distribution networks would also need to be considerably strengthened through the APDRP; such schemes would include investment for renovation/modernization of earlier power stations and rural electrification of the few left out villages. An outlay of Rs. 1,000 crore would be necessary for such investments. Thus, the

total power sector outlay for the Eleventh Plan is proposed as Rs. 3500 crore.
(Source: Planning Department, Government of Himachal Pradesh Approach Paper: Eleventh Five-Year Plan (2007-2012) Himachal Pradesh).

The status of hydro-power in the State is slightly better as 6060 MW under various agencies including State Sector through HPSEB has been developed. Projects aggregating 8500 MW installed capacity are at various stages of execution under State through HPSEB, Private, and Central/Joint Sectors for commissioning during 10th and 11th Five Year Plans. Rest of the power potential nearing 10,000 MW would remain to be harnessed.

During 10th Five Year Plan six HEPs namely, Holi (3 MW), Larji (126 MW) and Khauli (12 MW) in State Sector, Nathpa Jhakri (1500 MW), Chamera-II (300 MW) in Joint / Central Sector, Baspa-II (300 MW) in Private Sector and 26.60 MW through HIMURJA have been commissioned which added the generation capacity of 2267.60 MW to National Grid during 10th Five Year Plan.

In the 11th Plan, 5744.10 MW of power is proposed to be added through State Sector (1133.10 MW), Central Sector & Joint Sector (2763.00 MW) and Private Sector (1848.00 MW).It is envisaged to harness the entire identified power potential of Himachal Pradesh by the year 2020.

The basin-wise, numbers of projects in different sectors are given below in Table 7.

Table 7: Basin wise number of Projects

River	Central	Joint	Private	State
CHENAB		-	15	5
RAVI	4	-	11	5
BEAS	6	-	12	9
SATLUJ	2	2	17	12
YAMUNA	1	-	4	7

The details of Hydro-electric Projects already under operation are given in Table 8.

Table 8: Hydro-electric projects under operation

Sr. No.	Name of Project	Basin	No. of Units and Rating (MW)	Installed Capacity (MW)
I	**STATE SECTOR**			
1.	Andhra Project	Yamuna	3x5.65	16.95
2.	Giri Project	-do-	2x30	60.00
3.	Gumma Project	-do-	2x1.15	3.00
4.	Rukti Project	Satluj		1.50
5.	Chaba Project	-do-		1.75
6.	Rongtong Project	-do-		2.00
7.	Nogli Project	-do-		2.50
8.	SVP-Bhaba Project	-do-	2x60	120.00
9.	Ghanvi Project	-do-	2x11.25	22.50
10.	Binwa Project	Beas	2x3	6.00
11.	Gaj Project	-do-	2x3.5	10.50
12.	Baner Project	-do-	2x6	12.00
13.	Uhl-II Project (Bassi Project)	-do-	4x15	60.00
14.	Sal-II Project	Ravi	2x1	2.00
15.	Gharola Project	-do-		0.05
16.	Bhuri-Singh P.H.	-do-		0.45
17.	Holi Project	-do-		3.00
18.	Sissu Project	Chenab		0.10
19.	Billing Project	-do-		0.20
20.	Shansha Project	-do-		0.20
21.	Killar Project	-do-	3x100 KW	0.30
22.	Thirot	-do-	3x1.5	4.50

Sr. No.	Name of Project	Basin	No. of Units and Rating (MW)	Installed Capacity (MW)
	Total			**329.50**
II.	**JOINT SECTOR**			
1.	Bhakra Dam	Satluj		
	Right Bank		5x132	660
	Left Bank		5x108	540
2.	Nathpa-Jhakri	-do-	6x250	1500
3.	B.B.M.B.(Dehar PH)	Beas	6x165	990
4.	Pong Dam	-do-	6x60	360
	Total			**4050**
III.	**CENTRAL SECTOR**			
1.	Baira-Suil	Ravi	3x60+uprating	198
2.	Chamera-I	-do-	3x180	540
3.	Chamera-II	-do-	3x100	300
	Total			**1038**
IV	**PRIVATE SECTOR**			
1.	Malana	Beas	2x43	86
2.	Solang	-do-		01.00
3.	Titang	-do-		0.90
4.	Raskat	-do-		0.80
5.	Manjhi	-do-		4.50
6.	Baspa-II	Satluj	3x100	300
7.	Dehar	-do-		5.00
8.	Bara-gaon	-do-		3.00
	Total			**401.20**
V	**OTHERS**			
1.	Shanan Project	Beas	1x50	110.00
2.	Yamuna Share	-do-	4x15	131.57
	Total			**241.57**
	Grand Total			**6060.27**

Source: Status note of HPSEB.

Table 9: H.E.P. planned for commissioning during 10th Plan (2002-07)

Sr. No.	Name of Project	Basin	Capacity (MW)
I	**STATE SECTOR**		
1.	Larji Project	Beas	126
2.	Keshang-I	Satluj	66
3.	Khauli Project	Beas	12
4.	Holi Project	Ravi	3
5.	Uhl-III Project	Beas	100
6.	Ghanvi-II	Satluj	8
7.	Bhaba Aug. P.H.	Satluj	4.5
	Total		**319.50**
II	**PRIVATE SECTOR**		
1.	Baspa-II	Satluj	300
2.	Fozal Project	Beas	9
3.	Neogal Project	Beas	15
4.	Dhambari-Sunda	Yamuna	70
5.	Patikari	Beas	16
	Total		**410**
III	**JOINT/CENTRAL SECTOR**		
1.	Nathpa-Jhakri	Satluj	1500

Sr. No.	Name of Project	Basin	Capacity (MW)
2.	Chamera-II	Ravi	300
	Total		**1800**
IV	**MINI-MICRO HYDEL SCHEMES**		
1.	Mini-Micro Projects		151
	Grand Total		**2680.50**

Source: Information Collected from HPSEB

The details of the hydel schemes commissioned during 2007, 2012 & up to the year 2020 are given below in Table 10 and 11.

Table 10: Projects planned for commissioning during 11th Five Year Plan (2007-12)

Name of Project	Name of Basin	Installed Capacity in (MW)
STATE SECTOR		
Renuka	Yamuna	40.00
Kashang-I	Satluj	66.00
Kashang-II	-do-	60.00
Kashang-III	-do-	132.00
Kut	-do-	15.00
Jangi Thopan	-do-	480.00
Shong Karcham	-do-	402.00
Thopan Powari	-do-	400.00
Kilhi Bahl	Beas	7.50
Sainj	-do-	100.00
Kuther	Ravi	260.00
Bajoli-Holi	-do-	180.00
Chamba	-do-	125.00
Total		**2267.50**
CENTRAL/JOINT SECTOR		
Chamera-III	Ravi	231.00
Kol-Dam	Satluj	800.00
Rampur	-do-	400.00
Parbati-I	Beas	750.00
Parbati-II	-do-	800.00
Parbati-III	-do-	501.00
Gyspa Dam	Chenab	240.00
Sawra Kuddu	Yamuna	110.00
Total		**3832.00**
PRIVATE SECTOR		
Sai Kothi	Ravi	17.00
Budhil	-do-	70.00
Harsar	-do-	60.00
Bharmour	-do-	45.00
Siul	-do-	13.00
Lambadug	Beas	25.00
Baragaon	-do-	11.00
Fozal	-do-	6.00
Malana-II	-do-	100.00
Dhaula Sidh	-do-	80.00
Allain Duhangan	-do-	192.00
Tirthan	-do-	18.00
Chirgaon-Majhgaon	Yamuna	46.00
Paudital Lassa	-do-	24.00
Tangnu-Romai	-do-	44.00

Name of Project	Name of Basin	Installed Capacity in (MW)
Dhamwari Sunda	-do-	70.00
Shalvi	-do-	7.00
Sorang	Satluj	60.00
Tidong-I	-do-	100.00
Karcham-Wangtoo	-do-	1000.00
Total		**1988.00**
Total I+II+III		**8087.50**

Source: Status note to HPSEB.

Table 11: Projects which have been identified and proposed for commissioning during 12th and 13th Plans (up to Year 2020)

Sr. No.	Name of Project	Name of Basin	Capacity in MW
1.	Rupin	Yamuna	39.00
2.	Bahairari	Satluj	5.50
3.	Tidong-II	-do-	90.00
4.	Baspa-I	-do-	210.00
5.	Luri	-do-	425.00
6.	Kuling Lara	-do-	40.00
7.	Lara	-do-	60.00
8.	Ropa	-do-	60.00
9.	Mani Nadang	-do-	70.00
10.	Lara Sumta	-do-	104.00
11.	Sumta Kathang	-do-	130.00
12.	Chango-Yangthang	-do-	140.00
13.	Khab-I	-do-	450.00
14.	Khab-II	-do-	186.00
15.	Yangthang Khab	-do-	400.00
16.	Gharopa	Beas	85.00
17.	Gara-Gosain	-do-	25.00
18.	Sal-I	Ravi	6.50
19.	Kugti	-do-	45.00
20.	Chanju-I	-do-	40.00
21.	Chanju-II	-do-	23.00
22.	Bara-Bangahal	-do-	200.00
23.	Chattru	Chenab	140.00
24.	Khoksar/Tunsha	-do-	150.00
25.	Seli	-do-	150.00
26.	Bardang/Tingar	-do-	180.00
27.	Sach Khas/Sagpari	-do-	210.00
28.	Patam	-do-	60.00
29.	Teling	-do-	81.00
30.	Tingret	-do-	81.00
31.	Miyar	-do-	90.00
32.	Tandi	-do-	150.00
33.	Rashil	-do-	150.00
34.	Dugar	-do-	360.00
35.	Gondhala/Chandra Bhaga	-do-	270.00
36.	Reoli/Dugli	Chenab	715.00
	Total		**5621.00**

Source: Status Note of HPSEB.

Details of private sector hydro electric projects is given in Table 12.

Table 12: Status of Private Sector Hydro Electric Projects in Himachal Pradesh

Sr. No.	Name of Project/ installed Capacity (MW)	Dependable Year Energy MUs (90%)	Executing Agency	Date of Signing of MOU/IA	Status of Project
			DISTRICT KINNAUR		
1.	Karcham-Wangtu (1000 MW)	4428	M/S Jaipee Karcham Hydro Corporation Ltd.	22.8.1993/ 18.11.1999	Estimated Cost = Rs. 7720 Crores TEC 31.3.2003 E&F 14.9.2001 Acquisition of land and remaining clearances in process. Project works have been started and likely to be commissioned during 2009-10
2.	Titong-I (100 MW)		M/S Nuziveedu Seeds Ltd. Secundrabad	23.9.2004	The company is in process of preparation of DPR.
3.	Sorang (60 MW)		M/S SSJV Projects Pvt. Ltd. Bangalore (Himachal Consortium)	23.9.2004	The company is in process of preparation of DPR.
			DISTRICT SHIMLA		
4.	Sainj (3 MW)		M/S East India Petroleum Ltd.	26.6.2000/ 24.7.2004	TEC 23.4.2002 The project being less than 5 MW stands transferred to HIMURJA. Remaining clearances are in progress.
5.	Paudital Lassa (24 MW)		M/S Shree Jai Lakshmi	6.6.2002	DPR under examination in HPSEB and slated for commissioning in 2009-10.
6.	Tangu Romai (44 MW)	163	M/S PCP International Ltd.	5.7.2002	DPR is under scrutiny in HPSEB and is slated for commissioning during 2009-10.
			DISTRICT MANDI		
7.	Patikari (16 MW)	78	M/S East India Petroleum Pvt. Ltd.	21.6.2000/ 9.11.2001	TEC 27.9.2001 Forest 1.11.2004 Company has commenced project works w.e.f. 2005.
8.	Lambadug (25 MW)		M/S Himachal Consortium	13.6.2002	DPR under scrutiny in HPSEB. Company is in process of obtaining clearances. Detailed S&T works in progress. Project is scheduled for commissioning during 2008-09.
			DISTRICT KULLU		
9.	Allain Duhangan (192 MW)	673	AD Hydro Power Ltd.	28.8.1993/ 22.2.2001	Estt. cost Rs. 922.36 Crore TEC 20.8.2002 E&F 12.12.2000 MoEF 18.10.2002 The project works have been recently commenced and likely to be commissioned during 2009-10.
10.	Malana-II (100 MW)	428	M/S Everest Power Pvt. Ltd.	7.5.2002/ 14.1.2003	Estt. Cost Rs. 581 Crore TEC 15.10.2004 In process of obtaining various statutory / Non statutory clearances and has initiated process for land acquisition. Project is scheduled to be completed during 2008-09.
Sr. No.	**Name of Project/ installed Capacity (MW)**	**Dependable Year Energy MUs (90%)**	**Executing Agency**	**Date of Signing of MOU/IA**	**Status of Project**
11.	Baragaon	54	M/S Padmini	6.6.2002	DPR under examination. Scheduled for

	(11MW)		Traders		commissioning in 2008-09.
			DISTRICT CHAMBA		
12.	Budhil (70 MW)	286	M/S Lanco Green Power Pvt. Ltd. Hyderabad	23.9.2004	Estt., cost 290 Crore DPR under scrutiny in HPSEB
			DISTRICT HAMIRPUR		
13.	Dhaula-Sidh (40 MW)	-	M/S GVK Industries Ltd.	20.6.2002	DPR under scrutiny in HPSEB for TEC. Project slated for commissioning during 2009-10.

B . Small Hydro Projects (SHP's) in Himachal Pradesh (Including Mini-Micro Schemes):

Government of Himachal Pradesh has been laying a great thrust for encouraging generation of power through renewable energy sources with special emphasis of SHPs, including and up to a capacity of 5 MW in the state. Out of the total potential of 750 MW, 469 sites with capacities ranging from 100 KW to 5 MW, has so far, been identified. The State Government has entrusted the implementation of Micro (less than 100 KW), Mini (100 KW-2000 KW) and SHPs (2000 KW-25000 KW) through private investment to HIMURJA (Himachal Pradesh Government Energy Development Agency). For hydel schemes above 5MW capacity, administrative control is with HPSEB, but for liaison work with MNES, HIMURJA will remain the Nodal Agency. The administrative charge of HIMURJA has also been transferred to MPP and Power, during 2000, for better co-ordination of policies at Government level.

Table shows the status of SHPs under HIMURJA is given in Table 13.

Table 13: Abstract of Status of SHPs

S. No.	Description	Total
1.	Total No. of projects for which MOUs signed	235
2.	Total MOUs in operation	186
3.	Total estimated capacity of projects	419.39 MW
4.	Total No. of DPRs received	148
5.	Total No. of DPRs yet to be submitted	25
6.	Total No. of DPRs for which TEC accorded by HPSEB	84
7.	Total No. of projects for which IAs signed	64
8.	Total No. of companies with whom IA signed	43
9.	Total estimated capacity	186.75 MW
10.	Total estimated cost in crores	1120.42
11.	Total No. of PPAs signed	28

Source: A Note From HIMURJA

Out of 64 projects for which IAs have been signed since March 2002, two projects namely Manjhi (4.50 MW) in District Kangra and Baragaon (3.00 MW) in Kullu District have been commissioned in June and July 2004 respectively and works on seven projects is in progress. These schemes are Jiwa (1.00 MW), Aleo (3 MW) and Suman-Sarwari (2.50 MW) in Kullu District, Manjhal (1.00 MW) and Dehar (5.00 MW) in Chamba District, Ching (1.00 MW) in Shimla District and Manal (3.00 MW) in Sirmaur District. Forest clearance cases for 36 projects have been submitted, out of which 18 have been approved. The estimated investment is expected to be approx. Rs. 2186.70 crores.

Further, Govt. of Himachal Pradesh has recently approved revised policy guidelines for SHPs (up to 5MW) which envisage mainly the following points:-

- Micro-hydel projects up to 2 MW capacity will be exclusively reserved for bonafide Himachalis and Co-operative societies.
- Royalty in the form of power to H.P. Govt. will be free up to twelve years @ 12% for the next 13 years and thereafter it would be @ 18%.
- The Independent Power Producers (IPP) would sell power to HPSEB @ Rs. 2.50 per unit.
- The upfront premium up to 2 MW has been prescribed at Rs. 25000.00 per MW with a slab of Rs. 40,000.00. For SHPs above 2 MW, up to 5 MW, the rate of upfront premium shall be Rs. 45000.00 per MW with a ceiling of Rs. 75,000.00.
- The private or Government land shall be on lease basis except for permanent structures, at the rates approved by the Government for the agreement period.
- The registration of employment-related information to the Labour Department and local police station on monthly basis too has been made mandatory for the IPP.
- IPP can be permitted to transfer the project further to any IPP/turn-key contractor subject to the payment of Rs. 75 Lakhs per MW as one-time offer.

C. Development of Non-Conventional Energy Sources:

HIMURJA (Himachal Pradesh Government Energy Development Agency) has been constituted to promote and popularise renewable and provide appropriate energy systems at affordable prices among the larger public and also encourage R&D efforts in the renewable energy sector.

HIMURJA has made concerted efforts to popularise renewable energy through the Integrated Rural Energy Planning Programme (IREP), and has taken up as full-fledged programme in the State with the financial support of MNES, Govt. of India. Initially, the programme was started on a pilot basis in two blocks, Theog and Spiti of the State, and later on extended to 45 blocks in a phased manner.

Efforts are also being made to propagate fuel efficient devices and non-conventional energy devices like solar cookers, solar water heating systems, improved chullahs, improved water mills and photovoltaic lights. The achievements made under different programmes are as under:-

i) Solar Thermal Extension Programme:

- 29,573 Solar Cookers have been provided in the state up to December 2004 to potential beneficiaries.
- 3265 Solar Water Heating Systems of different capacities with a total capacity of
- 5,91,400 (litre per day) LPD have been installed/ booked in different parts of the state.

The State Government has taken a decision to make the installation of Solar Water Heating Systems mandatory in all Government buildings /institutions.

Type of equipment	Number of equipment provided to the state
Solar Cookers	29573
Solar Water Heating Systems	3265
Solar Photovoltaic Street Lighting Systems	2426
Solar PV Domestic Lights	14744

Source: Economic survey-2005 and State of Environment report, Himachal Pradesh

ii) Solar Photo Voltaic Programme:

Though 100% electrification has been achieved in the State, yet there are a number of hamlets and small pockets of houses, which are still un-electrified. Some of these houses are so remotely located that the people living there cannot hope for electrification by conventional means since it is not possible to lay the transmission/distribution lines for covering these areas as it is a very costly proposition. The only alternative for such a multitude of hamlets/pockets of houses is electrification by providing solar photovoltaic systems for decentralized application.

- 2426 Solar P.V. Street Lights, 14744 Domestic P.V. Lights have been provided at subsidized rates in Himachal Pradesh up to December, 2004.
- Efforts were also made to electrify rural/remote villages.

Two villages Chasak Bhatori and Murch in Pangi have been electrified by Solar Photovoltaic Systems. Similarly Bara Bhangal has also been electrified. Domestic Solar Lights have been provided to the villages @ Rs. 500/- per beneficiary household.

D. Transmission and Distribution

The need for strengthening the Transmission & Distribution system in the State is being felt for the last few years for evacuation of power from various inter-state and central projects and for reduction of losses and reliability of supply within the State.

Reliable and efficient transmission system is of utmost importance for any power utility. HPSEB has therefore taken steps to plan and create adequate additional transmission system for power evacuation from upcoming projects and to cater to the requirements of industrial belt besides strengthening of the existing system. However, because of paucity of funds the work on the already sanctioned, transmission and distribution schemes is getting delayed and thus work on new schemes can not be taken up. Schemes under Accelerated Power Development Reform Project (APDRP) have been prepared for all the 12 Circles and stand sanctioned for an amount of Rs. 322.78 crore by Govt. of India. These schemes include new 33 KV Sub-Station, Augmentation of Sub-Station, Renovation and Modernisation of Sub-Stations, Re-conductoring of High Tension (HT) and Low Tension (LT) Lines installation of Electronic Meters and computerised billing etc. Govt. of India/Govt. of H.P has released an amount of Rs. 306.875 crore. The loan component of Rs. 15.89 crore has been arranged by HPSEB from M/S Rural Electrification Corporation (REC) Ltd. An amount of Rs. 313.55 crore has been utilized ending 3/07. Under these schemes HPSEB has completed the works of 13 Nos. 33 KV Sub-Station (New),17 No. Sub-Station (Aug.), 8 Nos. 22 KV Control Points 2194 Km High Tension (HT) Line,1258 Km Low Tension (LT) Line, 2354 Nos. Distribution Sub-Stations (New) and 350 No. Distribution Sub-Stations (Aug.) in the different places of the State. But due to cost escalation, about 80 % of the physical scope of works in the scheme could be achieved. Revised schemes have been prepared for balance works of the original schemes for seven (7) circle for an additional amount of Rs. 73.6 crore under Accelerated Power Development Reform Project (APDRP). The schemes have been approved by Ministry of Power without any financial assistance. Revised schemes for remaining five (5) circles are also under preparation. State has achieved reduction of T&D losses to the level of 18.98% i.e. reduction of 7.63% against target of 4% during last four years. For sustainable development, all out efforts are being made to reduce T&D losses to the level of 15% by the end of Eleventh Plan.

7.3 Technology adopted in the sector along with any changes in technology

Development of Non-Conventional Energy Sources

With the growth in the economy, the demand for energy increases tremendously due to rapid industrialisation, better standard of living and increased infrastructural network. As the conventional sources of energy are limited, there is an immediate need to explore new and alternative sources of energy, encourage the use of proven technologies such as solar water heating system and other efficient energy devices.

HIMURJA has been constituted to promote and popularise renewable and provide appropriate energy systems at affordable prices among the larger public and also encourage R&D efforts in the renewable energy sector.

HIMURJA has made concerted efforts to popularise renewable energy through the Integrated Rural Energy Planning Programme (IREP), and has taken up as full-fledged programme in the State with the financial support of Ministry of Non-conventional Energy Sources (MNES), Govt. of India. Initially, the programme was started on pilot basis in two blocks, Theog and Spiti of the State, and later on extended to 45 blocks in a phased manner.

The State Government has taken a decision to make the installation of Solar Water Heating Systems mandatory in all Govt. buildings/institutions etc.

In order to conserve energy, HIMURJA has provided energy efficient devices like Pressure Cookers, CFL Systems etc. to identified IRDP families in the selected IREP blocks.

Type of equipment	Number of equipment provided to the state
Pressure Cookers	105823
CFL Systems	11196
improved wheels (gharats)	1247

Source: State of Environment report, Himachal Prade sh

Wind Energy

There is little scope for exploitation of wind energy in the State for power generation and other mechanical uses like lifting of ground water. Efforts are being made to strengthen the wind data base through wind monitoring stations.

Development of Mini / Micro Projects

These following projects are executed by HIMURJA executed under the UNDP-GEF scheme

Project	Capacity
Lingti	400 KW
Kothi	200 KW
Juthed	100 KW
Purthi	100 KW
Gharola	100 KW
Bara Bhangal	40 KW
Sach	900KW

Projects executed by private investors

Sural	100 KW
Solang	1000 KW
Raskat	800 KW
Titang	900 KW

These following projects are executed by HIMURJA executed under the State/ MNES scheme

Kunnu Charang	200 KW
Sissu	800 KW
Billing	400 KW
Shansha	400 KW
Chattru	50 KW
Saichu	200 kW
Bagrod Sidhata	1100 kW

Portable Micro Hydel Generator Sets

Fifteen Portable Micro Hydel Generator sets have been commissioned in the State. Out of which, 12 are in Pangi sub division of

Chamba district, 2 in Dodra Kawar and 1 demonstration unit at Sarahan in Shimla district which was damaged in flash floods during July,2003, and is being rehabilitated.

7.4 Stakeholder involvement in environment preservation and restoration

There are various stakeholders involved in the power sector as listed below.

- HP State Electricity Regulatory Commission
- Himachal Pradesh State Electricity Board (HPSEB)
- HIMURJA
- HP Power Corporation Ltd.
- NHPC
- HPPCB
- SJVNL
- Forest & Wildlife
- Department of Environment, Science and Technology
- Department of Fisheries
- I&PH Department
- BBMB
- Rural Development
- Farmers — the largest user group but dispersed in rural areas
- Households — also important consumers and concentrated in urban areas
- Industry – significantly affected by energy cuts; largest firms may pursue alternative sources

7.5 Critical environment issues / hotspots associated with the sector

Vulnerability analysis of the districts indicates that eight districts show pressure due to hydropower development. These districts are Kinnaur, Lahaul & Spiti, Chamba, Kullu, Sirmaur, Mandi, Bilaspur and Kangra. Some of the tehsil indicating high pressure are Nichar, Morang, Sangla, Spiti, Lahaul, Udaipur, Renuka, Balichowki, Jogindernagar, Manali, Bilaspur, Sadar, Indora and Nurpur.

1. Change in natural flow / hydrology and water dynamics of the reservoir/wetland/ water body: Construction of a large number of reservoirs and dams; diversion of streams and rivers and hydroelectric projects lead to reduced flow into wetlands/ water bodies/ reservoir. Further, release of impounded water by dam/reservoir depends on the management authority. Small hydropower projects and other infrastructure development projects requiring water diversion also change the hydrology of the wetland/ water body/ river. The reduced down stream ecological flow leads to ecological imbalance in aquatic flora and fauna including fisheries.

Further, competing water uses both in the upstream and downstream of the reservoir lead to issues of water availability and water quality.

2. Silting of reservoirs due to deteriorating catchment leads to their reduced storage capacity / reduced power generation: Scientific literature show that the normal expectancy of dams in India is assumed to be 100 years but reservoirs in India are estimated to be losing storage capacity at an average annual rate of about 1% due to sedimentation. Data on 116 Indian large dams were analysed to determine the severity of sedimentation. By 2020 over 20% of reservoirs will have lost about 50% of their storage capacity, e.g. the Baira Siul project (3x66MW) in Himachal Pradesh, for instance, handles nearly 10,000 tonnes of silt per day, per machine during critical monsoon days. Material loss alone is 10% by weight. Pong dam is one of the 81 major reservoirs in India, which is monitored by CWC. CWC estimates indicate that the reservoir is experiencing 0.41% as yearly average loss in capacity. Similarly, Department of Civil Engineering, IIT Mumbai

has reported (Journal of spatial Hydrology, Vol 8, No. 2. Fall 2008) that useful life of Govind Sagar Reservoir is about three fourth of the period (142 years) estimated by BBMB.

3. Catchment area disturbance e.g. deforestation/removal of vegetation/grazing is leading to soil erosion and siltation of water body / reservoirs and destruction of aquatic fauna/flora: Continuous deforestation both legal & illegal in the catchment is leading to declining forest cover and degradation of support lands. Further, uncontrolled grazing in meadows & pasture land is leading to increased pressure and reduced water holding capacity of forests and other lands. This is causing continuous soil erosion & siltation. Further, the destruction of habitat of fishes including molluscs (pila, snails, etc.), phytoplankton and zooplankton/ grasses lead to loss of fish productivity and species. The reduced depth of reservoirs due to siltation further add to loss of fish productivity and species. For example in Pong reservoir it has been observed that due to heavy siltation, shallow areas get choked in the periphery leading to destruction of fish feeding grounds. The draw down areas of Pong reservoir is occupied by nomadic graziers and *gujjars* during March-June. Besides stray cattle also graze in the fringe area. Most of the projects in river and tributaries have been planned /under implementation cascade. Presently, CAT plans are being prepared on project to project basis, therefore individual CAT plans of the projects are getting prepared. Further, the flow in the finances in the present systems by CAMPA (managed by GoI) to GoHP is very slow resulting in delays of implementation of CAT plans.

4. Depletion of benthic flora and fauna in reservoir/ water body due to dredging/ desilting: Dredging / desilting leads to high TDS/ turbidity and decreased oxygen level thereby increasing fish mortality. Further, disturbance in benthic flora and fauna leads to decreased fish productivity.

5. Change in land use in the catchment and fringe areas / buffer zone e.g. submergence and promotion of agriculture / horticulture activities is leading to adverse impacts on reservoirs/water bodies: Submergence is leading to loss of land resulting in change in land use in the catchment. Further, shift in land use and increased agricultural production patterns in the catchment, buffer zone e.g. submergence and promotion off agriculture / horticulture activities is leading to adverse impacts on reservoirs/water bodies.

Submergence not only causes change in land use but also create Rehabilitation & Resettlement issues. Shift in land use and agricultural production patterns in the catchment, buffer zone and fringe areas is leading to adverse impacts on wetlands/ reservoir/ water body in Himachal Pradesh e.g. shorelines of lakes/ wetlands are farmed during the draw down phase in Pong reservoir. The water bodies become recipient of insecticides, pesticides, fertilizers and heavy metals. Depleted oxygen and higher nutrients level may lead to decline in fisheries. Further, bioaccumulation may lead to potential health risk e.g. It has been reported in Pong wetland report of Forest Department that the chemicals such as CAN, Urea, 12-32-16, DAP, Sulphur Phosphate and insecticides such as nuvan, etc. pollute water reservoir and deteriorates flora and fauna.

6. Inadequate enforcement of regulated activities due to involvement of multiple agencies e.g. operation of reservoir is managed by power utility, forest areas / wetlands come under jurisdiction of department of fisheries, tourism promotion under Department of Tourism etc.: Lack of coordination between multiple agencies to poor enforcement of regulated activities leading to water pollution and impacts on aquatic and terrestrial flora and fauna.

7. Inadequate flow monitoring at each reservoir leads to sub-optimal flow management: Lack of flow measurement in the river basin leads to sub-optimal flow management and variation downstream flow through the year. An online command and control regime can assist in flood management as well as maintenance of ecological flow in the river.

8. Hazardous waste generation due to CFL disposal: Since CFL contains mercury, lack of used CFL collection and disposal mechanism will lead to increased generation of household hazardous waste.

9. Inadequate usage of non-conventional sources of energy: Lack of usage of non-conventional sources of energy e.g. solar energy at household as well as at commercial establishments (tourist / hotels / resorts / offices) is leading to higher consumption of fossil fuel resulting in greater emissions both in rural and urban areas.

10 Inadequate bio-energy utilization in the State: Among various types of natural biomasses, *Pinus* trees are abundantly found in Himachal Pradesh up to an altitude of 5500 feet. Pine needles of these trees are a major cause of fire during summer season when plants shed these needles. A majority of the fires are reported from the pine forests since during the summer the trees shed pine needles that are highly inflammable due to the rich content of turpentine oil The burning of this biomass causes not only environmental pollution, GHG emissions and also destroy the other flora and fauna. Very little work has been done on utilizing these pine needles as reinforcing material in the polymer composites. Pine needles have a potential ability to work as the reinforcement for polymer matrix. The mechanical properties of pine needles reinforced polymer matrix are higher than that of matrix polymer. High weight content of pine needles enables the *Pinus* composites to increase their strength in the most effective way, when the pine needles are modified into the 'particle size'. The pine needles have the potential to be an ideal substitute fiber of synthetic fibers for synthesis of green composites. These composites can be future materials for the fabrication of eco-friendly materials. This precious wealth of nature is not exploited for better end products. This can also be attributed to inappropriate pricing of pine needles and collection mechanism in State.

11. Disaster management during Construction phase and Operation phase

An extremely important issue pertains to dam failure. It is well known that the Alaknanda catchment lies in the geo-dynamically sensitive Himalayan region (Seismic zone IV; IS 1893:2000), thus naturally prone to disasters. Earthquakes magnitude of 8.5 on Richter Scale have been recorded in the Himalayas. In wake of the kind of developmental interventions associated with hydropower projects,it may be noted that any serious manmade/natural disaster due to failure of dam/s may occur. The reasons of the dam failure could be technical flaw in the design or extreme rainfall event, earthquake etc.

There are four major points for disaster during the construction and operation phase.

- Man made failure
- Natural calamities
- Cavity Collapse in underground construction (Tunnel, power house, etc.)
- Oil spillage from Transformers, etc.

An analysis of the issues, impacts has been carried out and has been summarized in Table 14.

Table 14: Issues, Cause and Impacts

Issues	Causes	Impacts/risks
01. Change in natural flow/hydrology and water dynamics of the reservoir/wetland/ water body	Construction of a large number of reservoirs and dams; diversion of streams and rivers and hydro-electric projects lead to reduced flow into wetlands/ water bodies/ reservoir. Further, release of impounded water by dam/reservoir depends on the management authority. Small hydropower projects and other infrastructure development projects requiring water diversion also change the hydrology of the wetland/ water body/ river.	Changes in Hydrological regime leading to variation in ecology of the small stream/khud which in turn affects large streams and rivers. Ecological imbalance in aquatic flora and fauna including fisheries. Drying up of areas downstream Dam/ Diversion
02. Silting of reservoirs due to deteriorating catchment leads to their reduced storage capacity / reduced power generation	Continuous soil erosion in the catchment area	Reduced power generation Reduced life of reservoir Ecological imbalance in the catchment and downstream Dam/ Diversion
03. Catchment area disturbance e.g. deforestration / removal of vegetation/grazing is leading to soil erosion and siltation of water body / reservoirs and destruction of aquatic fauna/flora	Continuous deforestation both legal & illegal in the catchment is leading to declining forest cover and productivity of forests and support lands. Further, uncontrolled grazing in meadows & pasture land is leading to increased pressure and reduced water holding capacity of forests and other lands. This is causing continuous soil erosion & siltation.	Siltation leading to reduction of capacity of reservoir/dam/ wetland. Loss of habitat/ biodiversity/ productivity. Disturbance to feeding, breeding and nesting of birds including migratory birds.
04. Depletion of benthic flora and fauna in wetlands/ reservoir/ water body due to dredging/ desilting	Depletion of benthic flora and fauna in wetlands/ water body/ reservoir due to dredging/ desilting.	Disturbance to wetland/ ecology and food chain. Disruption of breeding and feeding of fish. Alteration in water flow Decrease in water retention leads to high TDS/ turbidity and decreased oxygen level thereby increasing fish mortality.
05. Change in land use in the catchment and fringe areas / buffer zone e.g. submergence and promotion of agriculture / horticulture activities is leading to adverse impacts on reservoirs/water bodies	Submergence causes change in land use. Shift in land use and agricultural production patterns in the catchment, buffer zone and fringe areas. It has been reported in Pong wetland report of forest department that the chemicals such as CAN, Urea,-32426, DAP, Sulphur Phosphate and insecticides such as nuvan, etc. pollute water for reservoir and deteriorates flora and fauna.	Potential health risk across the entire food chain. Fish mortality and decline in productivity. Rehabilitation and resettlement issues Ecological imbalance due to loss of forest land
06. Inadequate enforcement of regulated activities due to involvement of multiple agencies e.g. operation of reservoir is managed by power utility, forest areas / wetlands	– Lack of coordination between agencies. – Lack of implementation of integrated basin plan.	Loss of fish species. Ecological imbalance in aquatic flora and fauna including fisheries. Loss of wetland/ water body/ reservoir area due to

Issues	Causes	Impacts/risks
come under jurisdiction of department of fisheries, tourism promotion under department of tourism etc.		institutional gaps. Deteriorate surface water quality.
07. Inadequate flow monitoring at each reservoir leads to sub-optimal flow management:	– Lack of basin planning approach and basin plans.	Reduced availability of ecological flow Ecological imbalance
08. Hazardous waste generation due to CFL disposal	Lack of collection and disposal mechanism for CFL Inadequate awareness on the impact of unscientific disposal of hazardous waste	Hazardous waste generation Public health risk Water contamination and Air pollution
09. Inadequate usage of non-conventional sources of energy	Lack of awareness Lack of mass replications Technology constraints Expensive option	Impacts due to hydropower development Higher emission of air pollutions Excessive exploitation of conventional resources leaving the resources depleted
10 Inadequate Bio-energy utilization in the state	Inappropriate pricing of pine needle and its collection mechanism	Non utilization of pine needles leading to forest fires and GHG emissions
11 Disaster during Construction phase and Operation Phase	Man made failure Natural calamities Cavity collapse in underground construction (Tunnel, power house, etc.) Oil spillage from Transformers, etc.	Flooding Damage to Properties Loss of lives

7.6 Environment initiatives taken by the sector to address critical environment issues

1. Environment Safeguards

Some of the major environmental aspects and their safe-guards are briefly described as under:-

- During construction period of the hydel scheme, the muck generated from excavation is being disposed off at the earmarked dumping sites.
- Effective ventilation system in underground structures, wetting of un-metalled roads frequently to prevent generation of dust, etc. are being provided.
- Engineering measures like gully control, bench terracing land-slide control, hill slope stabilisation and cut are being stabilised by proper shortcreting and rock-bolting etc.
- Whenever possible, fish passage is being provided, especially on the hydel schemes located on the main rivers. Also Aquaculture facilities are being provided on the hydel schemes having reservoirs.
- Himachal Pradesh Government has already notified suitable instructions to all the existing and upcoming hydel projects in the State to release and maintain minimum water flow of fifteen percent of lowest inflow downstream into the river body throughout the year, for separate drinking water, irrigation arrangements, environmental and ecology etc.
- It is further made mandatory on the part of all hydel project authorities to install appropriate instruments or devices to keep

the record of water flow on a day-to-day basis.

- Social impacts including loss of homes and agriculture areas are compensated based on Resettlement and Rehabilitation Policy of Himachal Pradesh Government.
- Anti-poaching laws are enforced to protect wildlife with the help and guidance of State Forest Department.
- Loss of forests and habitats for wildlife are compensated by carrying out compensatory afforestation in and around the project area and also in the catchment area as per plan and provision in Catchment Area Treatment Plan (CAT) for concerned river basin, biological measures such as nursery development, horticulture plantation and silvipastoral plantation in catchment areas of the project and also creation of greenbelts around the reservoir, are being taken under Environment Management Plan of the Project.
- Adequate funds are being provided for habitat improvement, conservation of endangered species and enrichment of flora and fauna.
- About 1.5 percent of the estimated cost of the project shall be spent on socio-economic development of the area.

2. Energy Conservation Programme under HIMURJA: In order to conserve energy, HIMURJA has provided energy efficient devices like Pressure Cookers, Nutan Stoves and Nutan Jyoti to identified IRDP families in the selected IREP blocks. So far 105823 Pressure Cookers, 11,196 CFL Systems, 26881 Nutan Jyoti and 41,579 Nutan Stoves have been provided to identified families at a subsidized rate:-

- 1247 improved wheels (gharats) with improved efficiency have also been installed/booked in different parts of the State up to December, 2004.

Type of equipment	Number of equipment provided to the state
Pressure Cookers	105823
CFL Systems	11196
improved wheels (gharats)	1247

Source: State of Environment Report, Himachal Prade sh

Solar Energy: The State Government has made it mandatory for all government buildings situated at 2000m above MSL to have passive solar techniques incorporated in them.

Table 15: List of buildings using renewable energy and energy conservation measures

S. No.	Name of the building	Location	Features
1	Himurja Office	Shimla	Water heating, PV for lighting
2	HP State Co-operative Bank	Shimla	Air heating
3	MLA Hostel	Shimla	Integrated solar cooker, water heating

Source: - http://mnre.gov.in/booklets/solar-energy/ch6.pdf

The Central Government has decided to develop two Himachal Pradesh towns as solar cities and two educational institutes as energy parks. The Central Government has agreed in principle to develop Shimla and Hamirpur towns as solar cities and the Dr.Y.S. Parmar University of Horticulture and Forestry at Nauni in Solan district and the National Institute of Technology at Hamirpur as energy parks under the Ministry of New Renewable Energy's programmes.

Atal Bijli Bachat Yojna launched by Himachal Pradesh: The ambitious Atal Bijli Bachat Yojna has launched by the Government of Himachal Pradesh to save on power consumption and power bills by domestic consumers which have been provided four CFL bulbs per family free of cost.

The endeavour of Himachal Pradesh Government is to promote CFL use at such a massive scale was indeed a herculean task which the State had accomplished successfully. Although the Union Government had also launched one Bachat Lamp Yojna on 25th February, 2009, which was somewhat different to that of Atal Bijli Bachat Yojna since it was facilitating the domestic consumers of the state with four free CFL bulbs per family. The objective of both the schemes was similar since it aimed at power saving by every consumer. The power thus saved would be of immense value to the states which were power deficit during summer season.

3. Remote Village Lighting Programme: The Remote Village Electrification Programme of the Ministry was initiated for electrification through renewable energy sources of those unelectrified remote villages and remote unelectrified hamlets of electrified census villages where grid connectivity is either not feasible or not cost effective.

Around 3330 unelectrified census villages and 830 unelectrified hamlets of electrified villages have been provided with basic electricity facilities. System installation work is currently going on in 1670 remote villages and 630 remote hamlets. State-wise details of projects sanctioned and completed are given in Table 16.

Table 16: Physical progress of implementation of Remote Village Electrification Programme

Sr. No.	State	Total Villages Sanctioned since 2001	Villages Completed upto July 07	On going villages	Total hamlets sanctioned	Hamlets completed upto July 2007
1.	Himachal Pradesh	21	1	20	1	

4. Rajiv Gandhi Grameen Vidyutikaran Yojna - Scheme of Rural Electricity Infrastructure and Household Electrification:

This new scheme has been launched by the Ministry of Power, Govt. of India, to provide access to electricity for all rural households in five years for reaching the goals of the National Common Minimum Programme (NCMP). The approval of the Govt. of India has already been accorded in March, 2005.

The highlights of the programme are as follows:

- The scheme will be implemented through the Rural Electrification Corporation (REC) and act as a nodal agency.
  Ninety percent capital subsidy would be provided by the Central Government for overall cost of the project.
- Below Poverty Line (BPL) households to get electricity connection free of charge.
  Revenue sustainability of electricity supply to be ensured through franchises, which might be NGOs, users associations, co-operatives or individual entrepreneurs with association of Panchayati Raj Institutions.
- No discrimination in the hours of supply between rural and urban households.
- Services of Central Public Sector Undertakings (CPSUs) made available to states willing to utilize their services for implementing of the programme.
- The scheme will create the necessary information through:-

a) Rural Electricity Distribution Backbone (REDB):-
Provision of 33/11 KV (or 66/11 KV) sub-stations of adequate capacity and lines in blocks where these do not exist.

b) Creation of Village Electrification Infrastructure (VEI)

Electrification of un-electrified villages.
Electrification of un-electrified habitations.
Provision of distribution transformers with the appropriate capacity in electrified villages/ habitations.

5. Environment Management in SJVNL – A Perspective

a) The "Environment" comprises all entities, natural or manmade, external to oneself, which provide value, now or perhaps in the future, to humankind. Environmental concerns relate to their degradation through actions of humans.

b) The present day consensus reflects three foundational aspirations. First, that human beings should be able to enjoy a decent quality of life; second, that humanity should become capable of respecting the finiteness of the biosphere; and third, that neither the aspiration for the good life, nor the recognition of biophysical limits should preclude the search for greater justice in the world.

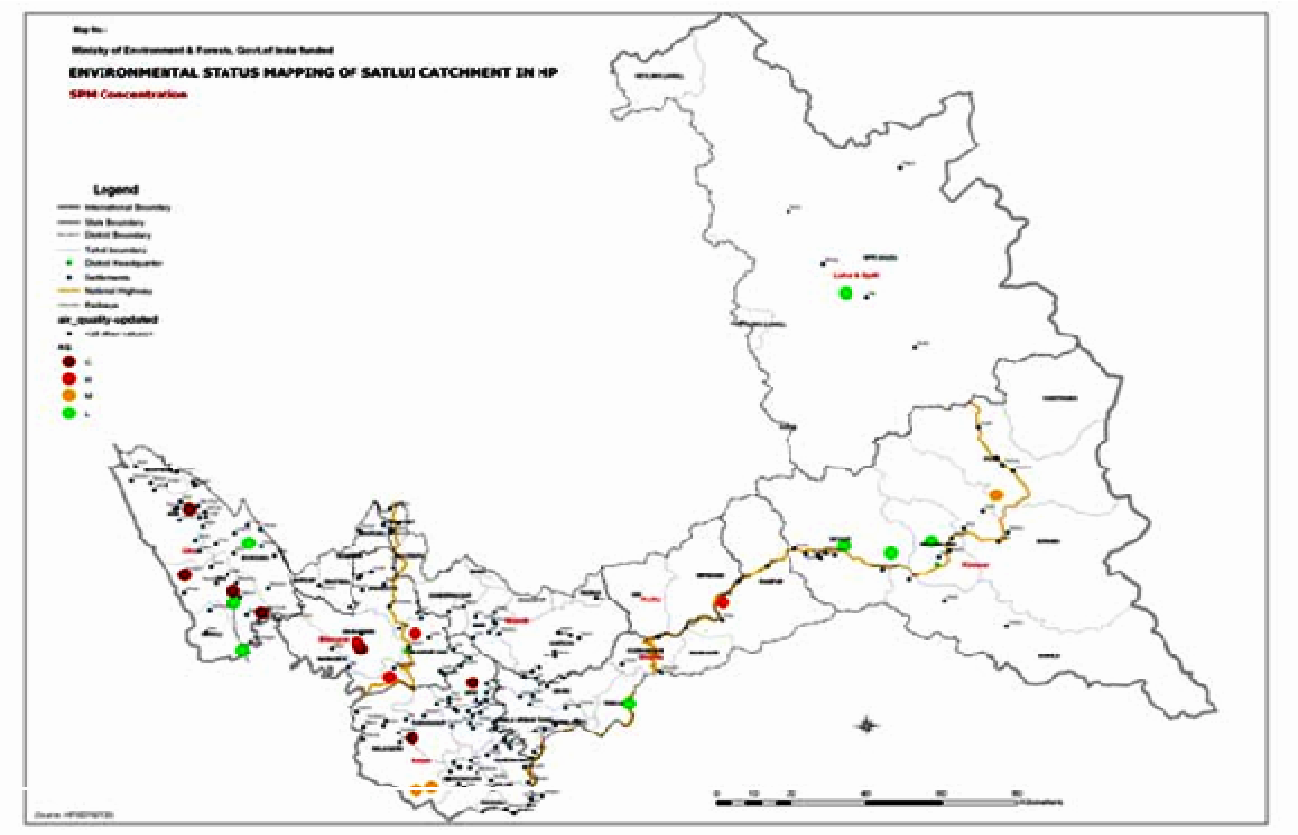
7.7 Environment related studies carried out in the sector

1. Environmental Surveillance and Monitoring of Hydroelectric Projects: In view of the amount of work involved in the Environmental Monitoring of Hydroelectric Projects, the State Pollution Control Board has been finding it increasingly difficult to conduct the proper surveillance and monitoring of Hydroelectric Projects from its own resources in terms of manpower and mobility. At the same time in view of the public concerns and the requirement of mandatory provisions of the Water Act, 1974, Air Act, 1981 and Environmental Clearance; it is essential that the periodic monitoring is conducted and regular checks are exercised on the activities of Hydel Projects which have adverse impacts from Water & Air besides muck/debris management. In this regard the State Board at the time of evaluating the EIA/EMP of the proposed projects ensures that costs in respect of monitoring of Environmental Management Plan with reference to checking of muck management, restoration plan, water and air quality monitoring are in-built in the EIA/EMP. This approach has also been upheld and endorsed by the State Government. At present seven projects have been approved namely: 1. Parbati (Stage-II) Hydroelectric Project, Kullu District 2. Kol Dam Hydroelectric Project, Bilaspur District 3. Chamera (Stage-III) Hydroelectric Project, Chamba District 4. Karcham Wangtu Hydroelectric Project, Kinnaur District; 5 Rampur Hydel Project, Shimla/Kullu District; 6 Budhil Hydroelectric Project, Chamba District; 7. Sawda-Kuddu Hydroelectric Project, Shimla District, 8. Sorang Hydroelectric Project, Kinnaur District; 9. Tidong Hydroelectric Project, Kinnaur District and Uhl Stage-III Hydroelectric Project, Mandi District.

2. Environmental Status Mapping of Satluj Catchment in Himachal Pradesh

The Ministry of Environment and Forests, Government of India is doing a pilot study, in view of increasing development activities in the catchment of Satluj. The main objective of this study is to prepare an environmental status report of the Satluj catchment and to identify the environmental issues and conservation measures required for resolving these problems. Besides, the outcome of this environmental resource inventory/spatial environmental information database would be helpful to the development agencies and

user institutions of the State in their decision-making wherein, all aspects related to environment are considered in relation to the entire catchment system and to achieve the development targets which are compatible with the environmental setting of the catchment. This composite view of environmental status mapping and conservation priorities of the region/catchment would also be useful to the environmental regulators to have a neutral opinion in decision making while granting environmental clearances to the development projects at the State and Central level.



HP State Council for Science, Technology and Environment has done remote sensing based studies for Tidong-I & II hydroelectric projects in Kinnaur district, for ***HPJVVNL*** . As per survey carried out by CRRID in 2002, some branches need to be given priority and added at degree level; one of them is Environmental Engineering.

- Environmental Impact Assessment Study for Integrated Kashang Hydro-electric Project (243 MW) of Himachal Pradesh.
- Environmental Impact Assessment Study for Lambadung Hydro-electric Project (25 MW), Kangra District, Himachal Pradesh.
- Environmental Impact Assessment Study for MTPA Central Plant, Himachal Pradesh.
- Environmental Impact Assessment Study for MTPA Lime Stone Production at Mandi District, Himachal Pradesh.
- Environmental Impact Assessment Study for Exploratory Drilling of Oil Exploration in Nahan-Solan District, Himachal Pradesh.

- Environmental Impact Assessment Study for Shongtong-Karchan Hydro-electric Project (402 MW), Himachal Pradesh.
- Environmental Impact Assessment Study for Exploratory Drilling of Oil Exploration in Kangra-Mandi District, Himachal Pradesh.
- Environmental Impact Assessment Study for MTPA Cement Grinding Unit and 30 MW multifuels based power plant at Solan District, Himachal Pradesh.
- Environmental Impact Assessment Study for Vardhana Roofing, Himachal Pradesh.
- Environmental Impact Assessment Study for Natural Mineral Development Cooperation, Himachal Pradesh.
- Environmental Impact Assessment Study for Metro Trade India Limited, Himachal Pradesh.

7.8 Environment monitoring (key parameters such as air and water pollution) carried out for activities related to the sector

There is no environment monitoring mechanism within the sector but environment monitoring is carried out by the HP Pollution Control Board within the State.

Air Pollution: Ambient Air Quality is being monitored in the State in terms of SO_2 (Sulfur dioxide), NOx (Nitrogen Oxides), SPM (Suspended Particulate Matter) and RSPM (Respirable Suspended Particulate Matter) by the State Pollution Control Board under the Project – National Ambient Air Monitoring Programme (NAMP).

Air Quality Trends in H.P.: The recent trend of air quality revealed that higher concentration of SPM/RSPM in Residential areas such as Station No-1 in Paonta Sahib, Station No-1 in Jassur and Sector – IV in Parwanoo is mainly due to more traffic movement in these areas. Whereas, higher concentration of SPM in Paonta Sahib Industrial Area is contributed by industrial, construction activities & vehicle movement in the area. Station-wise details of concentration of SPM/RSPM, SO_2 and NOx are given below.

Air Quality at Shimla: Air quality at Shimla is within the prescribed standards so far as concentration of gaseous pollutants (SO_2,NOx) are concerned. However, there is a sharp rise in the concentration of SPM during 2006 resulting in to poor air quality of the city, which is mainly arising out of fuel combustion in automobile sector, which has increased exponentially.

Air Quality at Damtal (Jassur, Kangra): Air quality at Damtal has shown a marginal improvement and concentration of SPM is close to the prescribed standard limit, whereas, concentration of gaseous pollutants is below the standards.

Summary of river basin-wise monitoring points and status of overall surface water quality with respect to important water quality parameters are given below in Table 17.

Table 17: River-Wise Water Quality Status (January2007)

Sr. No.	Rivers	Monitoring point	Status of water quality	Remarks
1	Beas	12	A to C	Untreated sewage pollutes river D/S of Kullu & Mandi town.
2	Ravi	2	A	Water quality is very good.
3	Satluj	9	A to B	Water quality is good. Though, untreated sewage from Rampur and Bilaspur pollute the river.
4	Parvati	1	A	Water quality is very good.
5	Pabber/Tons	1	A	Water quality is very good.
6	Yamuna	2	A	Water quality is very good.

Sr. No.	Rivers	Monitoring point	Status of water quality	Remarks
7	Sirsa	3	A to D	Industrial and domestic effluent pollutes river in Baddi, Barotiwala and Nalagarh region.
8	Renuka Lake	1	A	Water quality is very good.
9	Sukhana	1	D	Industrial and domestic effluent pollutes river in D/S Parwanoo town.
10	Lift Nala MSW site	1	D	Effluents from hotels and domestic sources pollute river in D/S Shimla town.
11	Swan	2	A to B	Water quality is good.
12	Markanda	1	A	Water quality is very good.

Source: HPSPCB Shimla

Water Quality Index of Rivers of Himachal Pradesh:

Water quality index has been calculated on the basis of data taken from the CPCB to know the status of water quality of rivers and some reservoir or Lakes which are either flowing or situated in the state. After calculation of water quality indices summary of results are given below in Table 18.

Table 18: Results of Water Quality Index of Various Rivers Flowing through H.P region

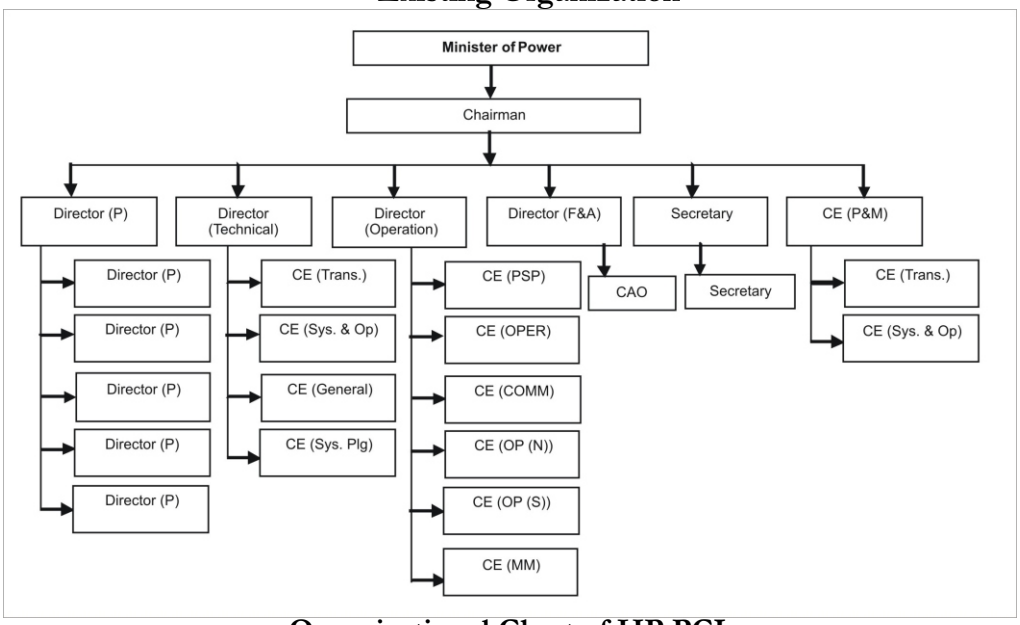
RIVER	LOCATION	Water Quality Index							
		2003		2004		2005		2006	
		Value	Criteria	Value	Criteria	Value	Criteria	Value	Criteria
Beas river in H.P									
BEAS	Beas at U/S Manali H.P	75	Good	84	Good	88	Good	92	Excellent
BEAS	Beas at U/S Kullu H.P	74	Good	85	Good	87	Good	89	Good
BEAS	Beas at D/S Kullu H.P	77	Good	85	Good	86	Good	92	Excellent
BEAS	Beas at U/S Pandoh Dam, H.P	81	Good	85	Good	85	Good	88	Good
BEAS	Beas at exit of Tunnel Dehar Power House, H.P	80	Good	89	Good	85	Good	89	Good
BEAS	U/S Mandi, H.P	80	Good	82	Good	88	Good	91	Excellent
BEAS	Beas at D/S Mandi, H.P	68	Medium	83	Good	86	Good	87	Good
BEAS	Beas at D/S Alampur, H.P	84	Good	91	Excellent	91	Excellent	88	Good
BEAS	Beas at D/S Dehra Gopipur, H.P.	80	Good	90	Good	88	Good	85	Good
BEAS	Beas at D/S Pong dam H.P	89	Good	88	Good	87	Good	82	Good
Satluj river in H.P									
SATLUJ	Satluj at Nathpa Zakhri, H,P	86	Good	89	Good	91	Excellent	89	Good
SATLUJ	Satluj at U/S	77	Good	78	Good	80	Good	90	Good

RIVER	LOCATION	Water Quality Index							
		2003		2004		2005		2006	
		Value	Criteria	Value	Criteria	Value	Criteria	Value	Criteria
	Rampur, H.P								
SATLUJ	Satluj at D/S Rampur H.P	75	Good	77	Good	77	Good	84	Good
SATLUJ	Satluj at U/S Tattapani, H.P	77	Good	79	Good	79	Good	82	Good
SATLUJ	Satluj at U/S Slapper H.P	77	Good	85	Good	84	Good	83	Good
SATLUJ	Satluj at D/S Slapper H.P	78	Good	86	Good	88	Good	86	Good
SATLUJ	Satluj at D/S Bhakhra, H.P	91	Excellent	89	Good	82	Good	85	Good
Ravi river in H.P									
RAVI	Ravi at U/S Chamba, H.P	84	Good	94	Excellent	94	Excellent	89	Good
RAVI	Ravi at U/S Madhopur, H.P	88	Good	90	Good	90	Good	89	Good
Parvati river in H.P									
PARVATI	Parvati before conf. to River Beas H.P	77	Good	89	Good	87	Good	91	Excellent
Largi river in H.P									
LARGI	Largi at D/S H.P	79	Good	89	Good	87	Good	93	Excellent
Sirsa river iIn H.P									
SIRSA	River Sirsa U/S Sitomajri Nallah H.P	78	Good	83	Good	84	Good	79	Good
SIRSA	River Sirsa D/S Nalagarh Bridge H.P	74	Good	70	Medium	67	Medium	56	Medium
Yamuna river in H.P									
YAMUNA	River Yamuna U/S Paonta Sahib, H.P	71	Good	73	Good	74	Good	69	Good
YAMUNA	River Yamuna D/S Paonta Sahib, H.P	64	Medium	70	Medium	69	Good	68	Good

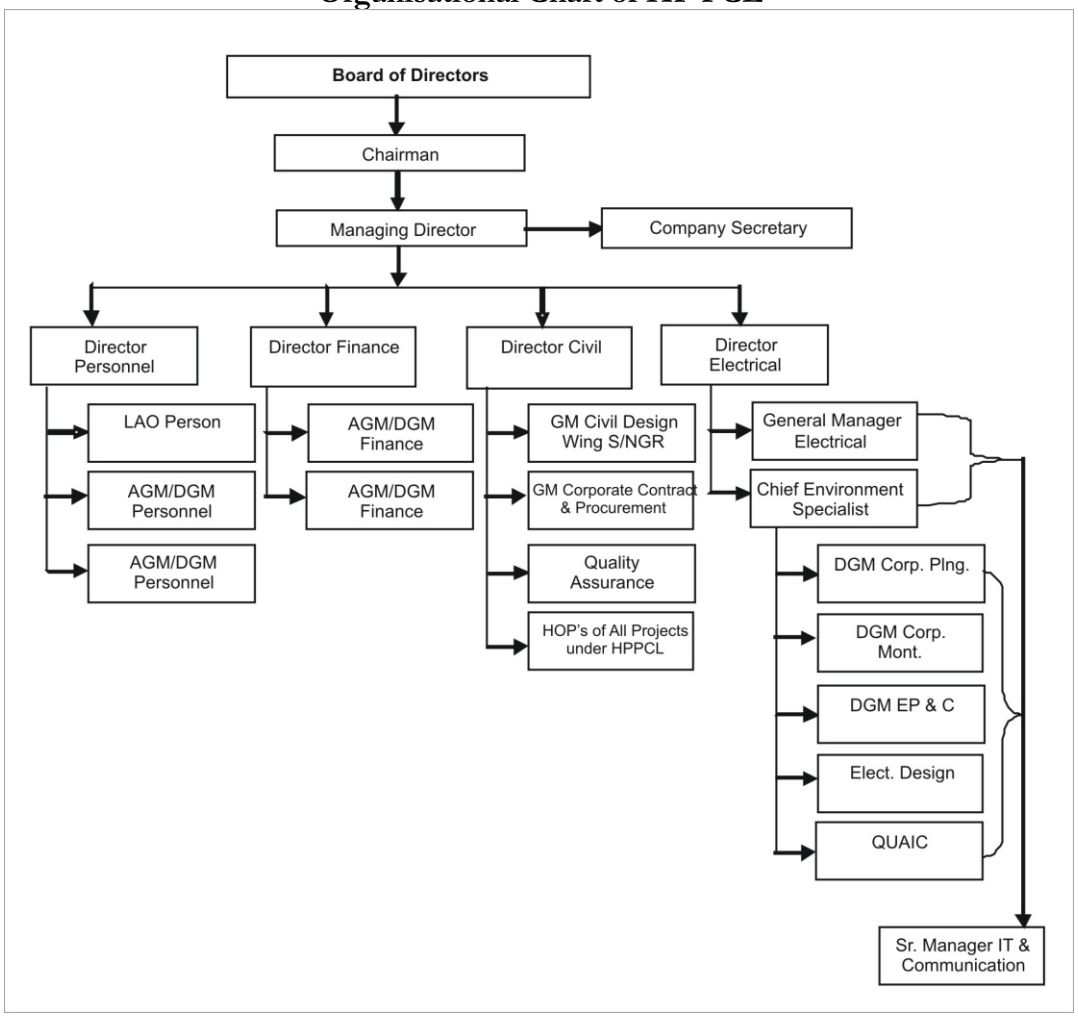
7.9 Institutional mechanisms within the sector to address identified environment issues

The State Electricity Board in accordance with the provisions of Electricity Supply Act (1948) was formed in 1971. Accordingly, all functions of the Department of Multipurpose Power Projects, such as generation, execution of hydro electric projects except functions of flood control and minor irrigation were transferred to the Board. The organizational chart of HP State Electricity Board given below:-

Himachal Pradesh State Electricity Board Limited
Existing Organization



Organisational Chart of HP PCL



7.10 Data / documentation pertaining to addressing demographic issues in the context of the sectors, such as population changes; requirements of populations and changing lifestyles; migratory populations including tourists; transhumants; transit labour population; pressures felt by communities due to degraded environment conditions.

Details of Hydro-Power in HP in State, Central, Joint sector, Private sector HIMURJA projects are given in Table 19.

Table 19: Projects under operation

Sr.No.	Name of Project	Name of Basin	Installed capacity (MW)
A. State Sector			
1	Andhra	Yamuna	16.95
2	Giri	Yamuna	60.00
3.	Gumma	Yamuna	3.00
4.	Rukti	Satluj	1.50
5.	Chaba	Satluj	1.75
6.	Rongtong	Satluj	2.00
7.	Nogli	Satluj	2.50
8.	Bhaba	Satluj	120.00
9.	Ganvi	Satluj	22.50
10.	Binwa	Beas	6.00
11.	Gaj	Beas	10.50
12.	Baner	Beas	12.00
13.	Uhl-II (Bassi)	Beas	60.00
14.	Larji	Beas	126.00
15.	**Khauli ***	Beas	12.00
16.	Sal-II	Ravi	2.00
17.	Holi	Ravi	3.00
18	Bhuri Singh P/House	Ravi	0.45
19	Killar	Ravi	0.30
20	Thirot	Ravi	4.50
	Total		**466.95**
B. Central/ Joint Sector			
1.	Yamuna Project (HP Share)	Yamuna	131.57
2.	Bhakhra	Satluj	1325.00
3.	Nathpa Jhakhri	Satluj	1500.00
4.	Baira Siul	Ravi	198.00
5.	Chamera-I	Ravi	540.00
6.	Chamera-II	Ravi	300.00
7.	Uhl-I (Shanan)	Beas	110.00
8.	Pong Dam	Beas	396.00
9.	B.S.L.	Beas	990.00
	Total		**5490.57**
C. Private Sector			
1.	Malana	Beas	86.00
2.	Baspa-II	Satluj	300.00
	Total		386.00
	Total A+B+C		**6343.52**

Sr.No.	Name of Project	Name of Basin	Installed capacity (MW)
D. HIMURJA Projects			
1	Dehar	Beas	5.00
2	Maujhi	Beas	4.50
3.	Raskat	Beas	0.80
4.	Baragran	Beas	3.00
5.	Aleo	Beas	3.00
6.	Marthi	Beas	5.00
7.	Titang	Satluj	0.90
8.	Lingti	Satluj	0.40
9.	Ching	Yamuna	1.00
10	Manal	Yamuna	3.00
	Total		**26.60**
	Total A+B+C+D		**6370.12**

Details of projects under execution, allotted planned for 11th plan period is given in Table 20.

Table 20: Projects under execution/allotted and planned for 11 th plan period

Sr.No.	Name of Project	Name of Basin	Installed capacity (MW)
A. State Sector			
1	Bhaba Aug. PH	Satluj	4.50
2	Kashang-I	Satluj	130.00
3	Kashang-II	Satluj	65.00
4	Kashang-III	Satluj	48.00
5	Ganvi-II	Satluj	10.00
6	Shongtong Karcham	Satluj	402.00
7	Uhl-III	Beas	100.00
8	Sainj	Beas	100.00
9	Khauli-II	Beas	6.60
10	Sawra Kuddu	Yamuna	111.00
11	Chirgaon Majhgaon	Yamuna	46.00
12	Dhamwari Sunda	Yamuna	70.00
13	Renuka	Yamuna	40.00
	Total		**1133.10**
B. Central / Joint Sector			
1	Chamera-III	Ravi	231.00
2	Kol-Dam	Satluj	800.00
3	Rampur	Satluj	412.00
4	Parbati-II	Beas	800.00
5	Parbati-III	Beas	520.00
	Total		**2763.00**
C. Private Sector			
1.	Allain Duhangan	Beas	192.00
2.	Malana-II	Beas	100.00
3.	Patikari	Beas	16.00
4	Neogal	Beas	15.00
5.	Lambadug	Beas	25.00
6.	Baragaon	Beas	11.00
7	Fozal	Beas	9.00
8	Baner-II	Beas	6.00

Sr.No.	Name of Project	Name of Basin	Installed capacity (MW)
9	Tidong-I	Satluj	100.00
10	Sorang	Satluj	100.00
11	Karcham Wangtoo	Satluj	1000.00
12	Raura	Satluj	8.00
13	Paudital Lassa	Yamuna	24.00
14	Tangnu Romai	Yamuna	50.00
15	Sai Kothi	Ravi	17.00
16	Harsar	Ravi	60.00
17	Bharmaur	Ravi	45.00
18	Budhil	Ravi	70.00
	Total		**1848.00**
		Total:A+B+C:	**5744.10**

Details of projects allotted/under process of allotment during 12th plan period is given in Table 21.

Table 21: Projects which have been allotted/under process of allotment and expected to yield benefit during the 12th Plan period

Sr.No.	Name of Project	Name of Basin	Installed capacity(MW)	Remarks
A. Central /Joint Sector				
1	Khab-I	Satluj	450.00	Allotted to SJVNL
2	Khab-II	Satluj	186.00	Allotted to SJVNL
3	Luhri	Satluj	750.00	Allotted to SJVNL
4	Parbati-I	Beas	750.00	Allotted to NHPC
		Total:	**2136.00**	
B. Private Sector				
1	Chanju-I	Ravi	25.00	Allotted
2	Chanju-II	Ravi	17.00	Allotted
3	Bara Banghal	Ravi	200.00	Allotted
4	Bajoli-Holi	Ravi	180.00	Allotted
5	Kuther	Ravi	260.00	Allotted
6	Suil	Ravi	13.00	Under process of allotment
7	Sal-I	Ravi	6.50	Allotted
8	Bardang	Chenab	126.00	Under process of allotment
9	Chattru	Chenab	108.00	Allotted
10	Miyar	Chenab	90.00	Under process of allotment
11	Tingret	Chenab	81.00	Under process of allotment
12	Teling	Chenab	69.00	Under process of allotment
13	Tandi	Chenab	104.00	Under process of allotment
14	Rashil	Chenab	102.00	Under process of allotment
15	Gondhala	Chenab	144.00	Under process of allotment
16	Khoksar	Chenab	90.00	Under process of allotment
17	Ropa	Satluj	60.00	Under process of allotment
18	Mane Nadang	Satluj	70.00	Under process of allotment
19	Lara	Satluj	60.00	Under process of allotment
20	Bahairari	Satluj	5.50	Allotted
21	Chango Yangthang	Satluj	140.00	Allotted

Sr.No.	Name of Project	Name of Basin	Installed capacity(MW)	Remarks
22	Yangthang Khab	Satluj	261.00	Under process of allotment
23	Sumta Kathang	Satluj	130.00	Under process of allotment
24	Kut	Satluj	24.00	Allotted
25	Tidong-II	Satluj	60.00	Allotted
26	Jangi thopan	Satluj	480.00	Allotted
27	Thopan Porari	Satluj	480.00	Allotted
28	Kilhi-Balh	Beas	7.50	Under process of allotment
29	Dhaula-Sidh	Beas	40.00	Allotted
30	Shalvi	Yamuna	7.00	Under process of allotment
31	Rupin	Yamuna	39.00	Allotted
		Total:	**3479.50**	
	TOTAL (A+B)		**5615.50**	

Details of projects which have to be re-advertised are given in Table 22.

Table 22: Projects which have to be readvertised

Sr.No.	Name of Project	Name of Basin	Installed capacity(MW)
1	Patam	Chenab	60.00
2	Seli	Chenab	454.00
3	Dugar	Chenab	236.00
4	Gyspa	Chenab	170.00
5	Sach-Khas	Chenab	149.00
6	Reoli/Dugli	Chenab	268.00
7	Kuling Lara	Satluj	40.00
8	Lara Sumta	Satluj	104.00
	Total		**1481.00**

Details of abandoned due to environmental consideration are given Table 23.

Table 23: Projects which have been abandoned due to environmental considerations

Sr. No.	Name of Project	Name of Basin	Installed capacity(MW)	Remarks
1	Baspa-I	Satluj	210.00	Abandoned due to Environmental/social reasons and was proposed in Central/Joint Sector
2	Chamba	Ravi	126.00	Abandoned due to environmental considerations
3	Gharopa	Beas	99.00	Abandoned due to environmental considerations
	Total		**435.00**	

Details of projects under investigation for preparation of DPR are given in Table 24.

Table 24: Projects under investigation for preparationof DPR

Sr. No.	Name of Project	Name of Basin	Installed capacity(MW)	Remarks
1	Devi Kothi-II	Ravi	13.50	PFR has been prepared.S&I works to be taken up for preparation of DPR.
2	Channi	Ravi	18.00	PFR has been prepared. S&I works to be taken up for

				preparation of DPR.
3	Sai Kothi-II	Ravi	15.00	PFR has been prepared.S&I works to be taken up for preparation of DPR.
	Total		**46.50**	

Milestones Achieved

- First hill state in the country to achieve **100% electrification of all** census village in the year 1988.
- Consumer coverage has touched **98%** as per REC's survey & HPSEB has been adjudged **one of the best Board's** in India.
- Installed and commissioned a power house which is at the **highest altitude** in the world (Rongtong Power House at an altitude of approx. 12,000 ft.)
- Installed and commissioned a totally **underground Power House** which is unique in Asia (Bhaba Power House - 120 MW).

District wise details of requirement of different sources of energy in 2001 are given in Table 25.

Table 25: District-wise Requirement of Different Sources of Energy in Year 2001

District	Electricity (million kWb)	LPG (million kg)	Kerosene (million kltr)	Coal (tonnes)	Fuel wood (thousand tonnes)
Bilaspur	31.73	0.25	0.40	0.00	181.84
Chamba	14.79	0.19	0.63	501.87	393.62
Hamirpur	8.35	0.48	0.52	0.00	217.89
Kangra	16.19	1.18	1.82	0.00	852.70
Kinnaur	1.85	0.10	0.56	1865.05	85.24
Kullu	6.30	0.23	0.13	0.00	303.30
Lahaul & Spiti	0.79	0.47	0.07	2585.14	36.43
Mandi	7.69	0.65	1.03	0.00	476.51
Shimla	19.42	0.96	1.11	2251.75	448.85
Sirmaur	26.32	0.38	0.52	0.00	236.33
Solan	73.98	0.57	0.79	0.00	242.49
Una	11.85	0.47	0.56	0.00	227.31
Himachal Pradesh	**219.26**	**5.93**	**8.14**	**7203.81**	**3702.51**

The State Government has opened up power sector to private sector. NTPC and NHPC have also been given large projects like Chamera-II (300 MW), Kol Dam (800 MW) and Parbati (2051 MW) schemes for execution. The State Government is also encouraging co-operative sector by reserving sites in the small and micro-hydel sectors, which will involve local community and increase the employment opportunities to local people. The State would get 12% free power on all new installations which will increase the resources of the State to a significant extent. Details of energy generated & consumed during 2006-2009 is given in Table 26.

Table 26: Energy Generated & Consumed (Million Unit)

Item	2006-07	2007-08	2008-09
1	2	3	4
1. Energy generated	1,432.37	1,864.94	2,075.14
2. Energy consumed in stations auxiliaries	6.08	5.94	6.07
3. Energy Purchased for other	5,056.95	5,433.37	6047.50

states			
4. Energy available for sale	6,442.78	7,196.80	8014.50
5. Energy sold:			
I- With in the state			
(a) Domestic	947.19	1,057.90	1088.52
(b) Non-Domestic and Non-Commercial	63.386	77.349	80.585
(c) Commercial	225.776	248.252	274.663
(d) Industrial	2,553.52	3,100.40	3,385.30
(e) Public Lighting	11.35	12.61	13.01
(f) Agricultural	26.40	26.65	28.74
(g) Bulk & Misc.	127.461	146.505	177.05
(h) Govt. Irrigation and Water Supply Scheme	324.881	334.973	389.331
(i) Temporary Supply	19.37	23.407	22.705
(j) Antyodaya	1.118	0.458	0.596
Total	**4,300.44**	**5,018.436**	**5,460.51**
II- Outside the state	1,255.27	1,198.620	1,498.21
Total Energy Sold	**5555.708**	**6,227.276**	**6958.717**

Source: Himachal Pradesh Electricity Board.

Details of HEPs planned for commissioning during 10th FYP is given in Table.....

Table 27: H.E.P. Planned for Commissioning During 10 th Plan (2002-07)

Sr. No.	Name of Project	Basin	Capacity (MW)
I	**State Sector**		
1.	**Larji Project**	Beas	126
2.	Keshang-I	Satluj	66
3.	Khauli Project	Beas	12
4.	Holi Project	Ravi	3
5.	Uhl-III Project	Beas	100
6.	Ghanvi-II	Satluj	8
7.	Bhaba Aug. P.H.	Satluj	4.5
	Total		**319.50**
II	**Private Sector**		
1.	Baspa-II	Satluj	300
2.	Fozal Project	Beas	9
3.	Neogal Project	Beas	15
4.	Dhambari-Sunda	Yamuna	70
5.	Patikari	Beas	16
	Total		**410**
III	**Joint/Central Sector**		
1.	Nathpa-Jhakri	Satluj	1500
2.	Chamera-II	Ravi	300
	Total		**1800**
IV	**Mini-Micro Hydel Schemes**		
1.	Mini-Micro Projects		151
	Grand Total		**2680.50**

Source: Information Collected from HPSEB

Out of above Nathpa-Jhakri (1500 MW), Baspa-II (300MW) and Holi (3MW) hydel schemes have already been completed, whereas Larji project (126 MW) and Khauli project (12 MW) are scheduled to be commissioned during 2005-06.

Hydro Power generation in the State has been accorded top priority and has adopted multi pronged strategy so as to meet the increasing power demand within the State, also to bridge the gap in the demand and supply in the northern region as a whole. In view of this, a phased programme to take up various major, medium, small and mini/micro schemes in the State, to harness the balance identified potential has been prepared. It is planned to harness 2680.50 under 10th Plan, 8087.50 MW during 11th Plan and 5621 MW during 12th and 13th Plan (up to year 2020). The commissioning of these hydel schemes can play a major role in power development programmes in the northern region, which will provide an economic base for overall development of Himachal Pradesh.

7.11 Information on human resource management issues (which may have relevance to environment management) in the sector such as: manpower, vocational training, awareness levels etc.

Human Resources of HPERC is described below.

H.P. Electricity Regulatory Commission (HPERC)

Sr. No.	Designation
1.	Chairman
2. (i)	Secretary, HAS
(ii)	I.A.S.
3.	Executive Director (TFA)
4	Executive Director (TFA)
5.	Director (T&D)
6.	PAO
7.	Dy. Director (TA)
8.	Dy. Director
9	Dy. Director (TE)
10.	Sr. AO
11.	Reader
12.	APS
13.	Supdt. (Gr.-II)
14.	Sr. Asstt.
15.	Sr. Asstt.
16.	P.A.
17.	P.A.
18.	Computer Operator
19.	Record Keeper
20.	P.A.
21.	Jr. Scale Stenographer
22.	Driver
23.	Driver
24.	Driver
25.	Driver
26.	Clerk (against the post of Sr. Scale Stenographer)
27.	Peon
28.	Peon
29.	Peon
30.	P.A.

HP State Electricity Board

Chairman cum Managing Director					
Director (P)	**Director(Technical)**	**Director(operation)**	**Director (F&A)**	**Secretary**	**CE(P&M)**
CE (Arbitration)	CE (Trans)	CE (PSP)	**CAO**	**Secretary**	Director P&M Electrical
CE (I&P)	CE(Sys. Op)	CE (OPER)			Director P&M Civil
CE (Design)	CE(Gen.)	CE (Comm)			
CE (Proj.)	CE(Sys.Plg)	CE (OP(N))			
CE (Larjee)		CE (OP(S))			
		CE(MM)			

Satluj Jal Vidhyut Nigam Limited (SJVN)

Board of Directors: For carrying out its business, SJVN is headed by a full time Chairman & Managing Director and four functional Directors viz, Director (Personnel), Director (Finance), Director (Electrical) and Director (Civil). In addition, there are three senior officers of the Government of India and two senior officers of the Government of Himachal Pradesh, as part time Govt. Directors. Also, there are three independent Non-Official Directors.

- Part Time Government Directors
- Independent Directors

Sub-Committees of the Board:
Board of Directors has the following sub-committees:

a. Audit Committee.
b. Share Allotment and Transfer Committee.
c. Committee of Directors for Investment of Surplus Funds
d. Investors Grievance Committee
e. Remuneration Committee

The compositions of the Sub-Committees of the Board are given below:

a)T Audit Committee

b) Share Allotment and Transfer Committee.
c) Committee of Directors for Investment of Surplus Funds
d) Investors Grievance Committee.
e) Remuneration Committee.

Key Executives

- Chief Vigilance Officer, VIGILANCE
- General Manager, Commercial & Systems Operation
- Company Secretary, Secretary
- General Manager ,Corporate Monitoring & Coordination
- Additional GM, (Civil Contracts & DRB) ,Corporate Civil Contracts
- Additional General Manager (Electrical Contracts), Corporate Electrical Contracts
- GM, Corporate Planning
- Executive Director, Personnel & Administration
- General Manager (F&A), Finance & Accounts
- Executive Director , Civil Design
- GM, Electrical Design
- Deputy General Manager, Consultancy

- GM, QA&I
- Deputy General Manager , Mechanical & Gates
- Additional GM , Information Technology & Communications

Project Sites

- Additional General Manager, RHEP
- GM, NJHPS
- GM, LHEP
- Additional GM , Dhalasidh HEP

1. HPPCL

- Board of Directors
- Chairman
- Managing Director
- Company Secretary
- Director (Personal)
- Director (Finance)
- Director (Civil)
- Director (Electrical)
- AGM/DGM(Personal)
- AGM/DGM (Personal)
- AGM/DGM(Finance)
- AGM/DGM(Finance)
- Chief Environment Specialist
- DGM (Corp. Plang.)
- DGM (Corp. Mont.)
- DGM (EP&C)
- GM (Civil)
- GM (Corporate)
- GM (Electrical)
- Sr. Manager IT &C
- LAO
- Quality Assurance
- HOP's of all Projects
- Electrical (Design)
- QA

7.12 Regulatory analysis to identify any regulations that have environment implications (negative or positive), and compliance with the same

Hydropower and Non-conventional energy sector and cross sector policy and regulatory framework at state level shows the intent of the State Government to address inadequate Service delivery and quality in order to reduce demand and supply gap. A list of policy and programme is given below.

- National Water Policy, 2002
- State Water Policy (Draft)
- National Hydropower Policy
- State Hydropower Policy, 2006
- NAPCC (Conservation) Act
- Indian Forests Act / River Stream Bed Mining Policy, NWCP/NLCP
- HP Forest Sector Policy & strategy, 2005
- National Biosphere Reserve Programme.
- Catchment Area Treatment Plans
- Biological Diversity Act, 2002
- The Wildlife (Protection) Act, 1972
- National Biodiversity Action Plan

- Water (Prevention and Control of Pollution) Act, 1974
- National Policy on Resettlement and Rehabilitation
- National Wetlands Conservation Programme,
- The Wetlands (Conservation and Management) Rules, 2010
- State Eco-tourism Policy, 2005
- National Environment Policy - 2006
- Energy Conservation Act, 2001
- Hazardous Waste (Management, Handling & Transboundary Movement) Rules, 2008
- *Atal Bijli Bachat Yojana*
- Environment Protection Rules
- The Electricity Act, 2003
- National Disaster Management Guidelines Management of Landslides and Snow Avalanches

Reference

- Department of Energy
- HP Electricity Regulatory Commission
- HP State Electricity Board
- HP Power Corporation Ltd.
- HIMURJA
- HP NHPC
- Department of Fisheries
- Department of Forest & Wildlife
- Department of Environment, Science and Technology
- HP State Pollution Control Board
- Department of Planning
- Ministry of New and Renewable energy GoI

CHAPTER 8 MARKET INFRASTRUCTURE

8.1 Resource inventory of existing assets of the sector

The agricultural produce sector has been one of the most important components of the Indian economy. The increasing trend of agricultural production has brought, in its wake, new challenges in terms of finding market for the marketed surplus. There is also a need to respond to the challenges and opportunities, that the global markets offer in the liberalised trade regime. To benefit the farming community from the new global market access opportunities, the internal agricultural marketing system in the country needs to be integrated and strengthened. Government of India is striving to prepare the Indian agricultural markets and marketing environment so as to provide maximum benefit to the producers and in turn, compete with the global markets. Agriculture and agricultural marketing need to be re-oriented to respond to the market needs and consumer preferences. Agricultural marketing reforms and creation of marketing infrastructure has been initiated to achieve the above purpose.

Agriculture contributes around 25% of the GDP and employs 65% of the workforce in the country. Significant strides have been made in agriculture production since independence. The agriculture production of food grains increased from 51 million tonnes in 1950-51 i.e. before beginning of the 1st Five Year Plan to 213 million tonnes in 2003-04. The output of oilseeds went up to 23 million tonnes. Similarly, the production of fruit and vegetables also increased to more than 134 million tonnes. The subject of agriculture and agricultural marketing is dealt with both by the States as well as the Central government in the country.

There are 10 Agricultural Produce Market Committees (APMC) in the State established under the Himachal Pradesh Agricultural and Horticultural Produce Marketing (Development and Regulation) Act, 2005 (Act No.20 of 2005). There are one Principal market yard, one or more sub yards and collection centres in each market. The H.P. State Agricultural Marketing Board exercises superintendence and control over the A.P.M.Cs.

With a view to coping up with the need to handle increasing agricultural production, the number of regulated markets have also been increasing in the country. While by the end of 1950, there were 286 regulated markets in the country, the number stands at 7521 by the end of March, 2005. The Central Government advised all the State Governments to enact Marketing Legislation to promote competitive and transparent transactional methods to protect the interests of the farmers. Barring a few, most of the States and Union Territories embarked upon a massive programme of regulation of markets after enacting the legislation. Most of these regulated markets are wholesale markets. There are in all 7293 wholesale markets in the country. Besides, the country has 27294 rural periodical markets, about 15% of which function under the ambit of regulation. The advent of regulated markets has helped in mitigating the market handicaps of producers/sellers at the wholesale assembling level. But, the rural periodic markets in general, and the tribal markets in particular, remained out of its developmental ambit.

Farmers have to travel long distances with their produce to avail the facility of regulated markets. The National Commission on Agriculture (1976) had recommended that the facility of regulated market should be available to the farmers within a radius of 5 km and if this is considered a bench mark, the command area of a market should not exceed 80 sq km. However, in the existing scenario, except Delhi, Punjab, Chandigarh and Pondicherry, in no State, the density of regulated markets is close to the norm.

Both covered and open auction platforms exist in only two-thirds of the regulated markets. Presently only one-fourth of the markets have common drying yards. Trader modules viz. shop, godown and platform in front of shop exist in 63% of the markets. The cold storage units exist only in 9% of the markets and grading facilities exist in less than one-third of the markets. The basic facilities viz. internal roads, boundary walls, electric lights, loading and unloading facilities and weighing equipment are available in more than 80% of the markets. Farmers' rest houses exist in more than half of the regulated markets. It is evident from the above that there is considerable gap in the facilities available in the market yards. The status of the market infrastructure in the state is given below.

APMC Bilaspur

Dissemination of Market Information

The daily whole sale rates of 24 notified Agriculture Produce was sent to the Director of Agriculture Shimla, which are broadcasted on AIR Shimla daily. Apart from Akashvani None Doordarshan Shimla is also telecasting the market rates. APMC Bilaspur also has been linked with AGMARKNET Portal. Where any farmer can excess the arrivals and Prices is this market along markets in the Country.

Principal market yard Bilaspur. (Main features)		
(a)	Area	1196 Sq. Mtr.
(b)	No of Shops	25
(c)	No of Booths	20
(d)	Farmer Rest House	3 Rooms & Dormitory (20 Beds)
(e)	Other Facilities	Toilet, Light, Drinking water, Parking place & Canteen.

Sub Market Yard Namhol (Main Features)		
(a)	Area	3 Bighas 7 Biswa
(b)	No of shops	6 No
(c)	Office	1 No
(d)	Booth/Store	4 No.
(e)	Cold Room	1 No
(f)	Covered Auction platform	338m^2 (approx.)

Annual Arrival

Annual arrival of fruit & vegeTable recorded during the year.

Year	Fruit	Vegetable
2002-03	5918 Qts	13675 Qts
2003-04	5433 Qts	13712 Qts
2004-05	5485 Qts	12826 Qts

APMC Hamirpur

Annual arrivals

Annual arrivals of fruit & vegetables recorded during the year 2001-2002, 2002-2003 & 2003-2004 is given below in Table 1.

Table 1: Annual arrivals of fruits & vegetables in APMC Hamirpur

Year	Fruits	Vegetables
2001-2002	3515.7 MT.	13118.8 MT.
2002-2003	3399.4 MT.	12766.5 MT.
2003-2004	3445.8 MT.	13959.1 MT.
2004-2005	being compiled	being compiled

PMC Solan

Annual Arrival

Annual arrival of fruit & vegetables recorded during the year 2002-2003 to 2005-06 up to 31st December, 2005 is given below in Table 2.

Table 2: Annual arrivals of fruits & vegetables in APMC Solan

Year	Fruits	VegeTables
2002-2003	1879.4 MT	19577.4 MT
2003-2004	3288.7 MT	21758.1 MT
2004-2005	5530 MT	25896 MT
2005-2006 upto12/05)	10125.8 MT	21279.1 M.T

Dissemination of Market information: Daily whole sale rates of 24 notified Agricultural Produce items are sent to the Director of Agriculture Shimla, which are broadcasted on

All India radio Shimla daily. This market has also been linked with AGMARKNET PORTAL where any farmer can excess the arrivals and prices in this market along other markets in the country.

Principal Market Yard Solan Kather (Main feature)		
(a)	Area	10047 Sq. mtr.
(b)	No. of Shops	50
(c)	Covered auction Platform	2
(d)	Other facilities provided	Toilet, light , drinking water, Banking ,farmer Rest House,(6 Double Bed Set,2 VIPs Set, 3 Dormitory, canteen & 2 STD Booth

8.2 Patterns of planning and development in the sector

With a view to provide to electronic connectivity to all the important wholesale markets in the country, the Marketing Research & Information Network Department is implementing a Marketing Information Network Scheme viz. 'AGMARKNET'. The aim of the scheme is to collect and disseminate (price and market related) information in respect of agricultural commodities. The scheme was launched in the year 2000-01 and as on date 1269 markets from all over the country have been linked to a central portal. It is planned to connect 2700 important markets to the AGMARKNET Portal by March 2007.

The Scheme is planned to be continued during the XI Plan period by enhancing its scope to cover 500 additional markets including remaining principal regulated markets, if any, farmer/ consumer markets, private markets, panchayat markets, urban markets and special commodity markets. Following activities are also proposed to be undertaken while implementing the Scheme during the XI Plan to fully achieve various objectives of the Scheme:

(i) Information regarding export documentation, export infrastructure, transportation facilities, exporters, marketing experts, agri-business corporate, quality standards, grading/ packhouse infrastructure, plant quarantine facilities, package of best marketing practices, seasonality of commodities will be provided on the portal.

(ii) Information on contract farming, direct marketing opportunities, value addition facilities etc. to be enriched and tie-ups between farmers/ growers and sponsors/ buyers will be facilitated through the portal by evolving a specific software system through outsourcing of work to an expert agency. It would be developed as an interactive query based system to educate the farmers on issues raised by them and would serve as a national clearing house for buyback and contract farming arrangements.

(iii) Information on warehouses along with addresses, accreditation facilities and their distance, pledge financing facilities, etc. will also be provided on the portal.

(iv) Area specific Success Stories will be loaded at the portal so that farmers get knowledge and can plan for trading of their produce.

(v) GIS based Atlas will be expedited for the content enrichment and system will be put in place for regular data updating.

(vi) A data validation software will be developed to identify the wrong reporting and for removal of undesirable data from the central data base.

(vii) Electronic display boards will be provided at every networked market for displaying minimum and maximum price of important commodities, arrivals, temperature, etc. These efforts would be dovetailed, as far as possible, with the action being taken by the Forward Market Commission under the

Scheme of the Department of Consumer Affairs.

(viii) An aggressive publicity campaign of AGMARKNET will be launched for efficient and timely utilization of information by the farmers, traders, etc.

(ix) The programme of capacity building of different stakeholders of the Scheme will be taken up with the help of NIAM/ MANAGE/ SAMETIs/ ATMAs/ KVKs. The programmes for sensitization of farmers and training of stakeholders and extension functionaries of the States will also be taken up under the Scheme.

(x) The translation of contents of portal into regional languages is necessary and this work be undertaken through the concerned State Marketing Boards/ Directorates.

(xi) Strategic alliances will be developed with corporate, telecom players and private users for strengthening market intelligence services.

(xii) The programme initiated under Common Service Centres (CSC) Scheme of DIT would help in achieving wider dissemination of information on establishment of linkage of AGMARKNET portal with the proposed IT kiosks at CSCs.

(xiii) To ensure timely collection and regular transmission of market information from each node, the personnel engaged by State Marketing Directorates/ Boards would be given monetary incentive and best market functionaries/ Boards/ Directorates would be given recognition (awards).

(xiv) DMI will collaborate with the agencies of Ministry of IT & Communications and others for facilitating dissemination of market information at grass root level through mobile telecom service providers.

(xv The price forecasting software developed by NIAM will be strengthened by outsourcing the work to a competent agency and will be integrated with AGMARKNET.

(xvi) After ensuring consistent and timely reporting of data with the help of the State Governments/ Marketing Boards and achieving the optimum coverage, infrastructure and strength for the portal, the revenue model recommended in the Evaluation Study will be evolved and implemented towards the end of the XI Five Year Plan.

The State Government/ Marketing Board will provide to the DMI the list of markets to be covered for computer connectivity under the scheme. The selected markets will provide site for installation comprising (1) Dust free computer room; (2) Power Requirement; (i) Electrical points- 3 (15 Amp 6 pin sockets with switches), input to be protected by 6 Amp MCB; (ii) 220/230 Volt power supply; (iii) Line, neutral and Earth connection on the specified socket terminals; (iv) Proper Earth Pit copper wire earthing (with earth to neutral voltage less than 3 V) with an exclusive phase; (3) Computer Operator; (4) One telephone with STD facility, wherever required Market Committees/ Controlling authorities of AGMARKNET node at market level would continue to collect relevant data and information, feed it and transmit it to the State level and AGMARKNET portal. NIC will train suiTable persons from each node in operating computer & handling software package.

Market Intervention Scheme (MIS): The Government of Himachal Pradesh has introduced the policy of Market Intervention Scheme (MIS) for the procurement of Mango, Apple and Citrus Fruits in the State. In order to implement the (MIS) of the State Government, the HPMC, being the premier fruit marketing agency, procures the unmarkeTable fruits which are processed under most hygienic conditions in its processing plants. The efforts made by the Corporation have resulted in stabilizing the prices of the fruits in the market.

Apart from fruits procured under MIS, HPMC also procures other fruits like Peach, Pear, Plum, Litchi, Almonds, strawberry, kiwi etc. grown in the State, for marketing and processing to increase the capacity utilisation of the Plants and to assist the farmers of the State in getting remunerative returns for their produce. Procurement prices of the fruits under the MIS for last five years are given in Table 3.

Table 3: Procurement Prices of the Fruits (Rate: Rs./Kg.)

Year	Mango		Apple	Kinnow/Orange		Galgal
	Seedless	Grafted		'B' Grade	'C' Grade	
2001-2002	3.08	3.75	3.75	4.35	3.75	2.6
2002-2003	3.33	4	4	4.6	4	2.85
2003-2004	3.33	4	4	4.6	4	2.85
2004-2005	3.58	4.25	4.25	4.85	4.25	3.1
2004-2005	3.58	4.25	4.25	4.85	4.25	3.1
2005-2006	3.58	4.25	4.25	4.85	4.25	3.15
2007-2008	4.08	4.75	4.75	5.35	4.75	3.65
2008-2009	4.58	5.25	5.25	5.85	5.25	4.15
2009-2010	4.5	5.25	5.25	5.85	5.25	4.15

Export of Fruit and Fruit Products: At present, Himachal Pradesh produces over 4.00 lakh tonnes of Apples annually which is cultivated at an altitude ranging between 6,000 to 10,000 ft. above sea level and is free from pollution. The quality of Himachal Apple meets the entire export standards. In the past HPMC has exported quality apples to Iran, UAE, Sri Lanka, Singapore and U.K. Fresh apples are available from August to November on firm demand.

Scheme for development/strengthening of agricultural marketing infrastructure, grading and standardization

This scheme has been formulated to develop marketing infrastructure in the country to cater to the post-harvest requirement of production and marketable surplus of various farm products. An expert committee set up by the Ministry of Agriculture has estimated that an investment requirement of Rs.11,172 crores in next 10 years would be necessary for infrastructure development in agricultural marketing. A major portion of this investment is expected to come from private sector, for which an appropriate regulatory and policy environment is necessary.

Objectives

The main objectives of the Scheme are:

i. To provide additional agricultural marketing infrastructure to cope up with the large expected marketable surpluses of agricultural and allied commodities including dairy, poultry, fishery, livestock and minor forest produce.
ii. To promote competitive alternative agricultural marketing infrastructure by inducement of private and cooperative sector investments that sustain incentives for quality and enhanced productivity thereby improving farmers' income.
iii. To strengthen existing agricultural marketing infrastructure to enhance efficiency.
iv. To promote direct marketing so as to increase market efficiency through reduction in intermediaries and handling channels thus enhancing farmer's income.
v. To provide infrastructure facilities for grading, standardization and quality certification of agricultural produce so as to ensure price to the farmers commensurate with the quality of the produce.
vi. To promote grading, standardization and quality certification system for giving a

major thrust for promotion of pledge financing and marketing, credit, introduction of negotiable warehousing receipt system and promotion of forward and future markets so as to stabilize market system and increase farmers' income.

vii. To promote direct integration of processing units with producers.

viii. To create general awareness and provide education and training to farmers, entrepreneurs and market functionaries on agricultural marketing including grading, standardization and quality certification.

Salient Features of the Scheme

Scheme linked to Reforms

(i) The scheme will be implemented in those States which amend the APMC Act, wherever required, to allow direct marketing and contract farming and to permit setting up of markets in private and cooperative sectors.

(ii) Credit linked back-ended subsidy shall be provided on the capital cost of general or commodity specific infrastructure for marketing of agricultural commodities and for strengthening and modernization of existing agricultural markets, wholesale, rural periodic or in tribal areas. State Agricultural Produce Marketing Boards/ Committees or other State agencies will be free to decide as to the quantum of loan or invest their own funds in lieu of loan as per their requirement.

Marketing Infrastructure

(iii) 'Marketing Infrastructure' for purpose of the scheme may comprise of any of the following:

(a) Functional infrastructure for collection/ assembling, drying, cleaning, grading, standardization, SPS (Sanitary & Phytosanitary) measures and quality certification, labeling, packaging, ripening chambers, retailing and wholesaling, value addition facilities (without changing the product form) etc. Transportation facility will not be covered under the scheme. However, reefer vans, or any other refrigerated vans used for transporting agricultural produce, which are essential for maintaining cold supply chains, shall be eligible for assistance under the Scheme.

(b) Market user common facilities in the project area like shops/offices, platforms for loading/ unloading/ assembling and auctioning of the produce, parking sheds, internal roads, garbage disposal arrangements, boundary walls, drinking water, sanitation arrangements, weighing & mechanical handling equipments, etc.;

(c) Infrastructure for Direct marketing of agricultural commodities from producers to consumers/processing units/ bulk buyers, etc.

(d) Infrastructure for supply of production inputs and need-based services to the farmers;

(e) Infrastructure (equipment, hardware, gadgets, etc) for E-trading, market intelligence, extension and market oriented production planning; and

(f) Mobile infrastructure for post-harvest operations (excluding transport equipment) will be eligible for assistance under the scheme. However, exclusion of transport equipment shall not affect the development of cold chain infrastructure and reefer vans, or any other refrigerated vans used for transporting agricultural produce, which are essential for maintaining cold supply

chains, shall be eligible for assistance under the Scheme.

8.3 Technology adopted in the sector along with any changes in technology

Strengthening of farmer through Market Information: To establish a nation-wide information network for speedy collection and dissemination of market information and data for its efficient and timely utilization & to facilitate collection and dissemination of information related to better price realization by the farmers, ministry of Agriculture, Government of India, has launched the ICT based Central Sector Scheme of Agricultural Marketing Information Network (AGMARKNET). Market information is needed by farmers in planning production and marketing, and equally needed by other market participants in arriving at optimal trading decisions. The existence and dissemination of complete and accurate marketing information is the key to achieve both operational and pricing efficiency in the marketing system. Advancement in Information and Communication Technology (ICT) has made the world a smaller place and a larger market at one go. On AGMARKNET portal (http://agmarknet.nic.in) over 300 plus markets are regularly reporting price related which is being disseminated through the portal. 14 nodes of Himachal Pradesh are also sending the data to this portal. Any farmer/ orchardist can access the rates of their produce in the markets of the country by only clicking on this website.

Plant Tissue Culture Laboratories: For the rapid propagation of horticulture and floriculture planting material, the State Department of Horticulture has promoted two plant tissue culture laboratories, one each in the public and private sector. The details of these laboratories are given in Table 4.

Table 4: Plant Tissue Culture Laboratory Details in the State

Sr. No.	Name and Address of the Laboratory	Approximate plant propagation capacity
1.	Agrigene International, Highway Home, Sanjauli, Shimla 171006	Two lakh micro plants
2.	Department of Biotechnology, Dr. Y S Parmar University of Horticulture and Forestry, Nauni, District Solan, HP.	50000 virus free plants per year

Olive Stations: For promoting the development of olives in the State, three Olive Stations have been established with the objective of collection of varieties and development of suitable package of practices for its cultivation. The description of these stations is given in Table 5.

Table 5: Description of Olive Stations in the State

Sr No	Name of Station	Area (hectares)	No's of Olive plants
1.	Olive Station, Panarsa, District Mandi, Himachal Pradesh.	4.80	1000
2.	Olive Station, Lanji, District Chamba, Himachal Pradesh	8.09	1900
3.	Olive Station, Jerva, District Sirmaur, Himachal Pradesh.	6.36	399

Walnut Development Stations: A walnut development station has been established at Nohra in district Sirmaur for the collection of walnut varieties and to develop and adapt technology for the cultivation of this fruit. The station has an area of 4.40 ha with 351 walnut plants.

Plant Protection Centres: 337 Plant Protection Centres have been established in the

different fruit growing regions of the State with the objectives of serving as (i) supply/sale centres for plant protection chemicals and equipments and (ii) extension units for the dissemination of technical information to the local farmers. The district wise details of plant protection centres are given in Table 6.

Table 6: District wise Plant Protection Centres

Sr No	Name of Districts	No's of units
1.	Shimla	78
2.	Kinnaur	20
3.	Solan	23
4.	Bilaspur	16
5.	Mandi	47
6.	Sirmaur	13
7.	Kangra	16
8.	Una	13
9.	Hamirpur	16
10.	Chamba	47
11.	Kullu	42
12.	Lahaul & Spiti	6
	Total	**337**

8.4 Stakeholder involvement in environment preservation and restoration

Himachal Pradesh Horticultural Produce Marketing and Processing Corporation Ltd. (HPMC): HMC has established two Fruit Processing Plants with a combined capacity to process about 20,000 MT of fruit every year and has acquired a third on lease hold basis. These plants are located at Jarol (Sundernagar) in Mandi District and Parwanu in Solan District. The Parwanoo Plant has all the latest systems like aseptic bulk packaging, tetrapak filling, spiraflow equipment, hi-tech continuous pulper line and pomace drying unit. HPMC has also taken over FP Jabli on lease basis from the HIMPROCESS during the year 2003 and this has helped in increased production of juices, drinks and other fruit based products.

The HPMC has set up a chain of Packing Houses, at Gumma, Rohru, Jarol-Tikkar, Oddi, Bhunter and Patlikuhl, Grading Houses at Rajgarh, Chindi, Rekong Peo and Chailchowk. Cold Storages in producing areas are at (Gumma, Rohru, Jarol-Tikkar, Oddi and Patlikuhl). At present HPMC has pre-cooling facilities at Oddi and Patlikuhl. Beside, these Cold Storages in producing areas, HPMC has established Cold Storages in terminal markets at Parwanoo, Delhi, Mumbai, and Chennai. It has Transhipment Centres, Canning Units and Sales Offices in all the principal fruit markets of the country. HPMC is also making Himachal Apples available to world community through exports. The Stakeholders involvement within the sector is summarised below in Table 7.

Table 7: Stakeholder's Role / Involvement in the Sector

Stakeholder Name	Role/Involvement
Farmers	Helps to procure seeds to Agriculture Department
The Himachal Pradesh State Cooperative Marketing And Consumer's Federation Ltd. (HIMFED)	Provides fertilizers to Fruit Growers.
Agriculture Department	Impart latest technology to farmers for increasing

Stakeholder Name	Role/Involvement
	agricultural production. To ensure timely supply of agricultural inputs. To educate farmers about soil & water conservation technologies To impart training regarding Integrated Pest Management and use of farmers friendly bio-fertilizers. To create irrigation facilities through minor/tank irrigation schemes to obtain maximum returns from their land.
Horticulture Department	Provides Fertilizers & Pesticides
HPMC	Helps in marketing fresh fruits and vegetables, processing the un-marketable surplus and marketing the processed products. In near future H.P.M.C. is planning to link its offices with Internet to help farmers to sell their fruits directly to various markets in India.
ATMA	Involved For Sustainable Agriculture Development

8.5 Critical environment issues / hotspots associated with the sector

1. Inadequacy of system approach in agriculture/ horticulture marketing practices leads to spoilage/ wastage: Trading and marketing structure is traditional consisting of a long chain of intermediaries. As many as 75% of the farmers sell their produce at the farm level. They cannot afford to go to distant *mandis* on account of inadequacy of facilities, expensive transportation and malpractices in the assembling markets. The long marketing channel is detrimental to quality and safety of those perishable products. The multiple handling add costs and increase post-harvest losses, adversely affecting the income of farmers and making produce comparatively costlier to the consumers. To minimize these losses, improvements are required at various levels, viz.: harvesting; grading; transport; storage; processing, packing and marketing. Therefore, marketing criteria should be an important aspect of developing systems approach for agriculture/ horticulture marketing practices. It's also important to understand that waste is a resource that can be managed as part of the integrated system approach in developing future agriculture/ horticulture marketing infrastructure.

2. Inadequate market infrastructure and inadequacy of access to markets leads to spoilage and wastage of products: Assessment of current infrastructural and marketing conditions for agricultural produce indicate that inadequacy of marketing infrastructure facilities including marketing yards, transportation facilities, collection facilities, storages, grading and packing facilities, difficulty in transportation of agricultural products due to difficult terrain and sparse population in interior areas, high cost of surface transport produce to the consuming markets; and poor communication

network due to hostile terrain lead to spoilage and wastage of products.

3. Inadequate market infrastructure due to shift in cropping patterns by market-driven forces and climate change: Though, soil productivity has declined. However, 18% area increase under vegetables and fruits has been recorded in the state. According to a report published in 2000, the field studies in districts of Bilaspur, Hamirpur, Kangra, Sirmaur, Shimla and Solan reported that, with the provision of irrigation, there are clear cut shifts in the cropping pattern. The major shift is from cereal crops to vegetable crops. Besides, multiple cropping has been introduced in irrigated areas. The crops which are replacing traditional crops are generally cash crops and have become a predominant factor in small farm management to earn cash in order to meet their input requirements and family monetary needs. However, in certain situations this trend may be detrimental to meet food demands. Challenges in practicing and maintaining traditional mixed cropping and mixed farming is due to growing trend of raising single crop (mono-cropping) which is good for commercial interests. The threats from climate change can further threaten sustainable farming of such a shift in cropping pattern. Inadequacy of adequate market infrastructure to address these changes lead to wastage/ spoilage with an overall long term repercussion on farm income and employment and farm based livelihoods.

4. Inadequate packing and packaging mechanism leads to spoilage and wastage of products: Packing and packaging methods can greatly influence air flow rates around the commodity, thereby affecting temperature and relative humidity management of produce while in storage or in transit. It is difficult to maintain the quality and safety of horticulture crops during packaging. Packaging protects the produce from mechanical injury, and contamination during marketing. It's important to develop effective modes of disposal and prevent contamination of the products. The use of packaging materials made of plastics need to be reviewed/ assessed, alternatives developed and suitable strategies including identification and adoption of good practices need to be developed so as to reduce/eliminate waste generation.

5. Inadequacy of storage and warehousing infrastructure near to production and in markets lead to spoilage and wastage of products: The storage of fruits and vegetables require special maintenance which includes like temperature, relative humidity, etc. Without the maintenance of these factors, the protection of produce during storage is difficult. Temperature is the most important environmental factor that influences the deterioration of harvested commodities. Most perishable horticultural commodities have an optimal shelf-life at temperatures of approximately 0 °C. Temperatures either above or below the optimal range for fresh produce can cause rapid deterioration due to the following disorders:

Freezing Perishable commodities are generally high in water content, and possess large, highly vacuolate cells. The freezing point of their tissues is relatively high (ranging from -3 °C to -0.5 °C), and disruption caused by freezing generally results in immediate collapse of their tissues and a total loss of cellular integrity. Freezing occurs in cold storage systems either due to inadequate refrigerator design, or to thermostat failure. Chilling injury is manifested in a variety of symptoms including surface and internal discoloration, pitting, water soaking, failure to ripen, uneven ripening, development of off flavors and heightened susceptibility to pathogen attack

Relative humidity (RH) RH can influence water loss, decay development, the incidence of some physiological disorders, and uniformity of fruit ripening. Condensation of moisture on the commodity (sweating) over long periods of time is probably more important in enhancing decay than is the RH of ambient air.

Drying: Inadequacy of moisture in apple, peach, plum, apricot and almond orchards because of inadequate snow and rain during this season is not good for the crops. The sudden rise in day temperature in March has further reduced the moisture content of the soil. About 81% of the total cultivated area in the state is rain-fed.

Although, India produces a wide variety of fruits and vegetables, in the absence of adequate post harvest and marketing infrastructure viz. irradiation facilities, storage/cold storage and cold chain facilities, the horticulture produce suffer heavy post harvest losses. The problem is further complicated due to the fact that there is no storage facilities at the farm level and the farmers are forced to dispose off the entire produce immediately on harvesting. This creates a glut situation in the market. The margins of the wholesalers and retailers are therefore much higher in our country. The entire burden of the distress sale in the form of low prices falls on farmers.

6. Wastage and loss of products due to inadequate road infrastructure and maintenance leading to its delayed transportation to the markets and wastage/ spoilage of products: Hundreds of apple farmers are facing trouble in Himachal Pradesh, as their produce is not able to reach markets on time due to bad road conditions in Kotkhai subdivision of Shimla. The cultivators inform that due to poor road conditions and landslips the apple-loaded trucks get stuck in long traffic jams. They further said that sometimes the trucks, instead of reaching in a day, take almost three days to reach the markets in Delhi and other cities, which damage the fruit. It's important to undertake research and development to reduce/eliminate post harvesting losses to optimize the returns on cultivation of high value cash crops. There is a need to identify and adapt good practices in reducing the post harvesting practices in the context of Himachal Pradesh.

7. Inadequacy of sewage & solid waste management infrastructure at markets lead to public health risk: Due to inadequate or inefficient infrastructure, all of the waste does not get collected and transported to the final dumpsites. If at this stage, the management and disposal is improperly done, it can cause serious impacts on health and problems to the surrounding environment like: Excreta and other liquid and solid waste are a serious health hazard and lead to the spread of infectious diseases; Unattended waste lying around attracts flies, rats, and other creatures that in turn spread disease; The wet waste that decomposes and releases a bad odour. This leads to unhygienic conditions and thereby to a rise in the health problems; Plastic waste is another cause for ill health. Colored plastics are harmful as their pigment contains heavy metals that are highly toxic. The group at risk from the unscientific disposal of solid waste include – the population in areas where there is no proper waste disposal method, especially the pre-school children; waste workers; and workers in facilities producing toxic and infectious material. Other high-risk groups include population living close to a waste dump and those, whose water supply has become contaminated either due to waste dumping or leakage from landfill sites. Uncollected solid waste also increases risk of injury, and infection.

8. Inadequacy of systematic market survey and planning in agriculture and horticulture sector at state level leads to inadequate market infrastructure planning and operation: Inadequacy of systematic market survey and planning leads to non-profitable and non-sustainable agriculture/ horticulture, medicinal plants and non timber forest produce. Market research and planning for the hills requires, assessment of resource crunch to small and marginal farmers, rainfed nature of crop growing, agro-climatic or agro- ecological potentials, communication systems in the hills, and market access. The research outcomes must show feasibility from farmer's field and should be

within the reach of average farmers who constitute the majority. It has been reported that in a certain year, a good tomato crop was raised in Mandi in and around Rewalsar, but they ultimately suffered losses. The promotion of new crops such as kiwi has not benefitted people as they have not been informed about its use or market avenues and consequently many enthusiastic farmers end in despair when face with queries on use and wise marketing.

Indiscriminate use of Chemicals leading to over ripening/ spoilage and wastage of agriculture/ horticulture produce and public health risk: Wide use of chemicals, chemical pesticides, fungicides, and herbicides or weedicides pose public health risk due to because of their indiscriminate use, excessive quantities and substandard quality or quantity. For pesticides, toxicity level is hardly taken care of. Substandard fungicides and pesticides are on sale because of their cheap rates and are used by farmers in large amounts. Their extensive usage is leading to greater spoilage/ wastage while toxicity leads to increasing public health risk.

9. Inadequacy of awareness and usage of ICT tools: Inadequacy of education and understanding of farmers has been instrumental in getting information on market infrastructure and market price and post harvest management. The small and marginal farmers reveal that traditional varieties or crops could do better under adverse conditions than high yielding varieties or crops bred for better conditions. In certain pockets in the hills pulses were of high quality and could have generated good income to farmers under prevailing conditions when pulse prices are soaring.

8.6 Environment initiatives taken by the sector to address critical environment issues

Laboratory based support services are made available to the farmers on plant health problems. The following infrastructure has been created:

1. **Plant Tissue Analysis Laboratories:** These laboratories provide free advisory service on fruit plant nutrition based upon latest plant tissue analysis technologies Fertilizer schedule based on nutrient status of plants in an orchards are accordingly formulated and advised to the concerned farmers for adoption. Three such laboratories are functioning in the fruit production areas. Their details are given in Table 8.

Table 8: Description of available Plant Tissue Laboratories

Location	Year of Establish-ment	Analysis Capacity (Nos. of Samples)	Districts Covered	Analysis Facility Available
Naubahar, Shimla	1975	10000	Shimla, Kinnaur, Solan, Sirmaur, Bilaspur	Macro and Micro Nutrients
Bajaura (Kullu)	1987	5000	Kullu, Mandi, Lahaul and Spiti	Macro and Micro Nutrients
Dharamsala (Kangra)	1983	5000	Kangra, Una, Hamirpur, Chamba	Macro and Micro Nutrients

2. **Plant Health Clinics:** Four plant health clinics have been/are being established in the fruit growing areas to provide diagnostic services to the fruit growers on plant health problems based on visual and limited preliminary laboratory investigation. Their locations are given in Table 9.

Table 9: Description of Plant Health Clinics

Sr. No.	Name of District	Location
1.	Shimla	Kotkhai
2.	Mandi	Mandi
3.	Kangra	Dharamshala
4.	Kullu	Bajaura

3. **Biological Control Laboratory :** A Biological Control Laboratory has been set up at Rajhana (near New Shimla) in the Shimla district for promoting the use of natural enemies for the control of pests of horticultural crops. The predators/parasites of some of the major pests shall be reared in the laboratory for further release in the field for control of the pests. This will help in decreasing the use of chemicals in pest control and thereby reducing environmental pollution. Details of Bio control agents being multiplied/released by the Biological Control Laboratory are given in Table 10.

Table 10: Description of Bio Control Agents

Sr. No.	Bio-agent	Effective against the pest
1.	*Aphytis sp.*procila group	Sanjose Scale
2.	*Pharocymnus flexibilis*	Sanjose Scale
3.	*Chrysoperla carnea*	Wooly apple aphid
4.	*Trichogramma chilonis*	Anar butterfly
5.	*Aphelinus mali*	Wooly apple aphid

4. Introduction to Improved Plant Material: The Department of Horticulture has been making efforts from the seventh Five-Year Plan for the introduction of the improved varieties of fruits from the advanced countries as well as the other states of India for

i) Improving the quality and the productivity of fruit crops
ii) Diversification in crop production and
iii) Improving the economic viability of fruit farms.

5. Soil Testing: Department of Agriculture has 11 Soil Testing Labs besides 4 Mobile Soil Testing Labs to provide free soil testing facilities to the farmers. About 1, 25,000 No's sample are analyzed annually.

6. Quality Seed Multiplication and Distribution: Department of Agriculture owns 21 Seed Multiplication Farms where Foundation Seeds of Kharif and Rabi crops are produced. Annually about 3500 to 4000 qtls. seed of Cereals , Pulses and Vegetables are produced. Further about 1,00,000 quintals of Certified Seeds of various crops are distributed to the farmers in the State.

7. Farmers Trainings & Education The Department of Agriculture runs two Training Centers one at, Mashobra, District Shimla and other at Sundernagar, District Mandi. Besides this farmers training camps are organized at Village, Block and District level.

8.7 Environment related studies carried out in the sector

State Agriculture Plan: In the State Agriculture Plan (SAP) a modest attempt has been made to combine the District Agriculture Plans (DAPs) so as to present a consolidated and coherent view of all the DAPs to the possible extent. The most important feature of the plan is that it accords highest priority to natural resource rejuvenation, conservation and management through such measures as soil conservation, water harvesting and watershed development and land development. As such 49.0% of the total plan outlay is earmarked for this sector. Of the total outlay, 12.48% is proposed for the development of the crop sector so as to undertake measures such as promotion of high yielding varieties, improvement of soil health, crop protection, improving water use efficiency, etc. Around

13.72% of the plan outlay is earmarked for the development of livestock sector while horticulture sector accounts for nearly 4.79%. A substantial allocation of 11.54% has been set aside for need based infrastructure development which is the basic necessity for the development of hill agriculture.

District Agriculture Plan: The Department of Agriculture, Government of Himachal Pradesh, entrusted the task of preparing the District Agriculture Plans (DAPs) of eleven districts except Una and State Agriculture Plan (SAP) to the H.P. Agricultural University, Palampur. The plans have been prepared as per the guidelines laid down by the Planning Commission in Comprehensive District Agriculture Plan Manual (C-DAP). Each DAP document contains a plethora of information on various aspects of agricultural development such as cropping patterns, cropping systems, input use, yield gaps, diseases, constraints and required R&D interventions, projected rates of growth for major agricultural crops and agricultural sector including horticulture and animal husbandry and projected input requirements. DAP documents also contain estimates on rural roads, available irrigation potential including water harvesting, soil conservation, human resource requirement and researchable issues that require attention to boost agricultural production and productivity of agricultural sector.

8.8 Environment monitoring (key parameters such as air and water pollution) carried out for activities related to the sector

At present, there is no mechanism for Environmental Monitoring within the Sector. It is recommended that in the future, the following parameters should be monitored.

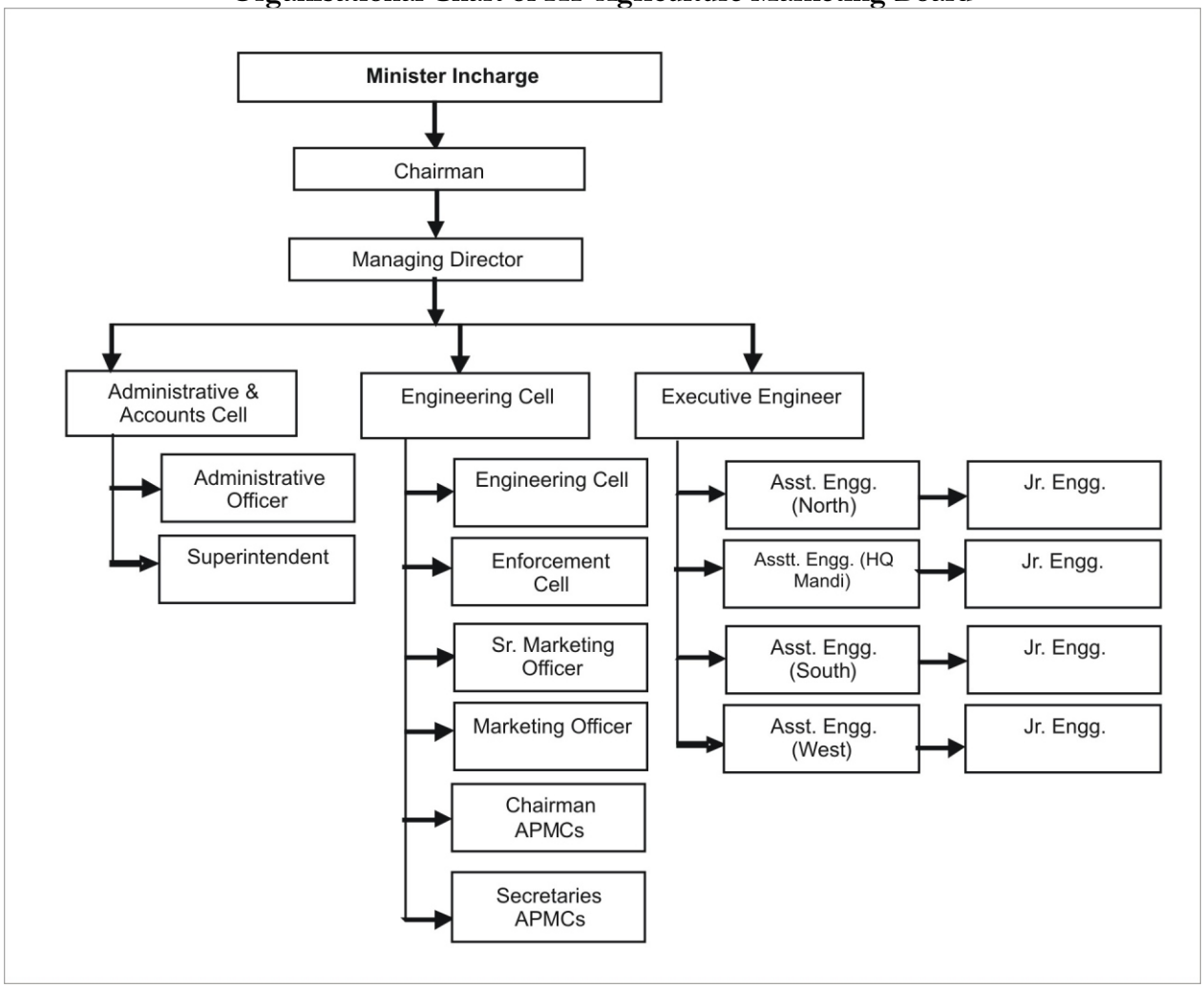
- Solid Waste Management at the Processing Unit
- Air Quality Monitoring
- Water Quality Monitoring
- Noise Pollution Monitoring

8.9 Institutional mechanisms within the sector to address identified environment issues

Himachal Pradesh State Agriculture Marketing Board

Enforcing the improved regulation of sale and purchase of Agricultural Produce brought for sale or purchase in the notified market area/yards. Implementation and arrangement of better marketing system to provide competitive prices, correct weighment, payment and creating exploitation fee atmosphere by stopping illegal activities in the marketing of Agricultural Produce through its Agricultural Produce Market Committees. The Board acts a liaison agency between the Agricultural Produce Market Committees and the State Government of Himachal Pradesh for all round development of agricultural marketing system in the State.

Organisational Chart of HP Agriculture Marketing Board



8.10 Data / documentation pertaining to addressing demographic issues in the context of the sectors, such as population changes; requirements of populations and changing lifestyles; migratory populations including tourists; transhumants; transit labour population; pressures felt by communities due to degraded environment conditions.

The state has made significant progress in the development of Horticulture. The topographical variations and altitudinal differences coupled with fertile, deep and well drained soils favour the cultivation of temperate to sub tropical fruits. The region is also suitable for cultivation of ancillary horticultural produce like flowers, mushroom, honey and hops. During the year 2010-11 upto December, 2010, 9.60 lakh tonnes of fruits were produced in the state and it is envisaged to bring 4000 hectares of additional area under fruit plants against which 4017 hectares of area has already been brought under plantation and

9.72 lakh fruit plants of different species were distributed up to December, 2010. Growing of off-season vegetables has also picked up in the state. During the year 2009-10, 12.06 lakh tonnes of vegetables were produced as against 10.90 lakh tonnes in 2008-09 recording a growth rate of 10.6%. It is anticipated that the production of off season vegeTables will be of the order of 12.50 lakh tonnes in 2010-11.

During the year 2010-11 up to 31st December, 2010 HPMC has sold about ` 1109.98 lakh processed products in the domestic market. Under Market Intervention Scheme (MIS) HPMC has procured about 65624.82 MT of apples out of which about 10167 MTs of Apple was processed in the HPMC plants and about 794.90 MT of apple juice concentrate have been produced. During the year the Corporation purchased quality apple worth of 435.38 lakh which was marketed through its net work in the country. The Corporation did not received any Mango fruit from the growers due to good return from the open Market and procured 15.00 MT of citrus fruits from the growers out of which 7 .00 MT fruit was sold in the market and 8.00 MT was processed in the HPMC Plant. HPMC is supplying its products to Indian Airlines, Railways, Northern Command H.Q, Udhampur, M/s Parley and Patanjli Yog Peeth Haridwar. Upto 31st December, 2010 HPMC has supplied products worth Rs. 348.43 lakh to these institutions. HPMC also continued supplying fruits and vegeTables to ITDC Hotels and institutions in Metro cities Delhi and Mumbai and Chandigarh. As on 31.12.2010 HPMC has supplied fruits and vegetables worth Rs. 308.83 lakhs to these institutions. Similarly as on 31st December, 2010 HPMC has sold material worth ` 410.61 lakh to the growers in the state. The Corporation has generated revenue of ` 301.87 Lakhs through its Cold Stores at Delhi, Mumbai, Chennai, Parwanoo and five cold stores at producing area of Himachal Pradesh. Upgradation of HPMC Apple Pack Houses at Reckong-Peo (Kinnaur) Jarol –Tikkar (Kotgarh), Gumma (Kotkhai), Oddi (Kumarsain) and PatliKuhal (Kullu) with 100% financial assistance of Rs. 797.30 lakh received from APEDA (Government of India).

District wise Market Profile

CHAMBA

Rail/Road Connectivity

(i)	Name of the nearest railway station	Pathankot
(ii)	Distance of the railway station from the market(in Kms)	120
(iii)	Name of the Nearest National /State Highway	Pathankot to Chamba State Highway

Market Area

(i)	Notified area of Market Committee	CHAMBA
(ii)	Subyard (If any) and It's exact location	No Sub market yard
(iii)	Farthest place in the Hinterland	
(iv)	Nearest place in the Hinterland	
(v)	Commodity Wise Processing Units in the Market area	
(vi)	Number of Cold Storages available	0
(vii)	Capacity of Cold Storages available	0
(viii)	Number of Commodities notified under regulation	99
(ix)	Average daily dispatches to outside markets during the season	1000
(x)	Average daily dispatches to outside markets during the peak period	2500
(xi)	Names of traditional markets(important) to which produce is sent	AZADPUR MANDI DELHI JALANDHAR PATHANKOT JAMMU AMIRTSAR

Name of 10 commodities important in terms of Arrivals/Dispatches

Sr. No.	Name of Commodity	Annual Production
1	Peas (Green)	6960
2	Tomato	3090
3	French bean	4917
4	Bhindi	558
5	Capsicum	278
6	Cucurbits	742
7	Apple	6800

8	Potato	500
9	Cabbage	1400
10	Cauli flower	255

Marketing season commodity wise for 10 important commodities

Name of Commodity	Season(From-To)	Peak Season(From-To)
1.Peas (Green)	Feb - Aug	July - Aug
2.Tomato	May - July	May - July
3.French bean	May - Sept	May - July
4.Bhindi	May - July	May - July
5.Capsicum	May - July	May - July
6.Cucurbits	May - July	May - July
7.Apple	Aug - Oct	Aug- Oct
8.Potato	May - Oct	Aug - Oct
9.Cabbage	May - July	May - July
10.Cauli flower	July - Nov	July - Nov

Average daily arrivals in Metric Tonnes throughout season of all commodities

Name of Commodity	Average Daily Arrivals
1.Peas (Green)	4
2.Tomato	3
3.French bean	6
4.Bhindi	0.5
5.Capsicum	0.5
6.Cucurbits	0.5
7.Apple	10
8.Potato	3
9.Cabbage	4
10.Cauli flower	4

Maximum daily arrivals in the market

Name of Commodity	Maximum Daily Arrivals In The Market
1.Peas (Green)	6
2.Tomato	5
3.French bean	10
4.Bhindi	0.7
5.Capsicum	0.8
6.Cucurbits	0.7
7.Apple	20
8.Potato	4
9.Cabbage	5
10.Cauli flower	7

Minimum daily arrivals in the market

Name of Commodity	Minimum Daily Arrivals In The Market
1.Peas (Green)	1
2.Tomato	1
3.French bean	4
4.Bhindi	0.2
5.Capsicum	0.3
6.Cucurbits	0
7.Apple	7
8.Potato	1
9.Cabbage	2
10.Cauli flower	1

Name of Commodity	Total Annual Arrivals		
	2007-08	2008-09	2009-10
Peas (Green)	260	151	292
Tomato	245	163	216
French bean	77	62	205
Bhindi	122	82	104
Capsicum	136	78	112
Cucurbits	37	35	29
Apple	6630	3087	1757
Potato	466	336	90
Cabbage	335	105	133
Cauli flower	523	147	102

Transportation		
(i)	Modes of transport generally adopted for the market	TRUCK TEMPO PICK UP ETC.
(ii)	Modes of transport for despatches to various stations	TRUCK TEMPO PICK UP ETC.
(iii)	Modal Mix% Mode Wise	

Storage			
(i)	Storage facilities available in the market with trade as well as APMC	Yes	
(ii)	Availability of Ripening Chambers if available	Number	Capacity
	0	0	

KANGRA

Rail/Road Connectivity		
(i)	Name of the nearest railway station	KANGRA MANDIR
(ii)	Distance of the railway station from the market(in Kms)	3
(iii)	Name of the Nearest National /State Highway	NH 88

Market Area		
(i)	Notified area of Market Committee	DISTRICT KANGRA
(ii)	Subyard (If any) and It's exact location	NAGROTA BAGWAN PALAMPUR BAIJNATH JASSUR

		JAWALAMUKHI
(iii)	Farthest place in the Hinterland	NAGROTA SURIAN
(iv)	Nearest place in the Hinterland	KANGRA
(v)	Commodity Wise Processing Units in the Market area	
(vi)	Number of Cold Storages available	0
(vii)	Capacity of Cold Storages available	
(viii)	Number of Commodities notified under regulation	99
(ix)	Average daily dispatches to outside markets during the season	1800
(x)	Average daily dispatches to outside markets during the peak period	4200
(xi)	Names of traditional markets(important) to which produce is sent	HOSHAIRPUR PATHANKOT JALANDHAR JUMMU KASHMIR ETC

Arrivals / Dispatches

(i)	Name of 10 commodities important in terms of arrivals:	Name of Commodity	Annual Production
	1.	CAULIFLOWER	1800
	2.	PALAK	1800
	3.	BHINDI	600
	4.	TURNIP	400
	5.	RADDISH	1000
	6.	MANGO	900
	7.	TOMATO	3000
	8.	LITCHI	900
	9.	BRINJAL	1500
	10.	CABBAGE	2500

(ii)	Marketing season commodity wise for 10 important commodities	Name of Commodity	Season(From To)	Peak Season(From-To)
		1.Cauliflower	December To March	January To Febuary
		2.Palak	November To March	January To February
		3.Bhindi	March To Sept.	May To July
		4.Turnip	October To Feberuary	January
		5.Raddish	November To February	December To January
		6.Mango	June To August	July
		7.Tomato	July To September	August To September
		8.Litchi	June To July	20 June To 20 July
		9.Brinjal	March July	April To June
		10.Cabbage	December To March	January To February

(iii)	Average daily arrivals in Metric Tonnes throughout season of all commodities:	Name Of Commodity	Average Daily Arrivals
		1.CAULIFLOWER	15
		2.PALAK	10
		3.BHINDI	12
		4.TURNIP	5
		5.RADDISH	10
		6.MANGO	12
		7.TOMATO	20
		8.LITCHI	8
		9.BRINJAL	5
		10.CABBAGE	18

(iv)	Maximum daily arrivals in the market:	Name of Commodity	Maximum Daily Arrivals In The Market
		1.CAULIFLOWER	20
		2.PALAK	12
		3.BHINDI	25
		4.TURNIP	5
		5.RADDISH	12
		6.MANGO	15
		7.TOMATO	30
		8.LITCHI	10
		9.BRINJAL	22
		10.CABBAGE	20

(v)	Minimum daily arrivals in the market:	Name of Commodity	Minimum Daily Arrivals In The Market
		1.CAULIFLOWER	5
		2.PALAK	5
		3.BHINDI	10
		4.TURNIP	2
		5.RADDISH	5
		6.MANGO	8
		7.TOMATO	10
		8.LITCHI	6

	9.BRINJAL	12
	10.CABBAGE	8

Name of Commodity	Total Annual Arrivals		
	2006-07	2007-08	2008-09
CAULIFLOWER	5051	5460	5910
PALAK	1850	1975	2210
BHINDI	2850	3120	3340
TURNIP	765	625	875
RADDISH	3476	3830	4210
MANGO	1480	1650	1355
TOMATO	5048	5219	5410
LITCHI	800	725	875
BRINJAL	2530	2435	2615
CABBAGE	4420	4690	4980

Transportation		
(i)	Modes of transport generally adopted for the market	TRUCK TEMPO THREE WHEELER ETC
(ii)	Modes of transport for despatches to various stations	TRUCK TEMPO THREE WHEELER ETC
(iii)	Modal Mix% Mode Wise	

Storage			
(i)	Storage facilities available in the market with trade as well as APMC	No	
(ii)	Availability of Ripening Chambers if available	Number	Capacity

KULLU

Rail/Road Connectivity		
(i)	Name of the nearest railway station	Jogindernagar
(ii)	Distance of the railway station from the market(in Kms)	128
(iii)	Name of the Nearest National /State Highway	N.H.-21

Market Area		
(i)	Notified area of Market Committee	Kullu & Lahaul -Spiti
(ii)	Subyard (If any) and It's exact location	kullu ,Bhunter,ChauriBehal ,Patlikuhal & Khegsu
(iii)	Farthest place in the Hinterland	Keylong
(iv)	Nearest place in the Hinterland	Kullu
(v)	Commodity Wise Processing Units in the Market area	Nil
(vi)	Number of Cold Storages available	1
(vii)	Capacity of Cold Storages available	20Trucks
(viii)	Number of Commodities notified under regulation	99
(ix)	Average daily dispatches to outside markets during the season	200 tons
(x)	Average daily dispatches to outside markets during the peak period	300 tons
(xi)	Names of traditional markets(important) to which produce is sent	Chandigarh,Punjab,Haryana & Delhi Markets.

Arrivals / Dispatches			
(i)	Name of 10 commodities important in terms of arrivals:	Name of Commodity	Annual Production
	1.	APPLE	0
	2.	TOMATO	0
	3.	ONION	0
	4.	CAULIFLOWER	0
	5.	PEARS	0
	6.	CABBAGE	0
	7.	PEAS WET	0
	8.	POTATO	0
	9.	GARLIC	0
	10.	PLUM	0

(ii)	Marketing season commodity wise for 10 important commodities:	Name of Commodity	Season (From-To)	Peak Season (From-To)
		1.Apple	July to Sept.	August
		2.Tomato	April to March	July to August
		3.Onion	April to March	April & May
		4.Cauliflower	April March	March
		5.Pears	July to August	July
		6.Cabbage	April to March	March to May
		7.Peas Wet	April to May	April

	8.Potato	April to March	Oct. to Nov.
	9.Garlic	May to July	June
	10.Plum	May to July	June

(iii)	Average daily arrivals in Metric Tonnes throughout season of all commodities:	Name Of Commodity	Average Daily Arrivals
		1.APPLE	40
		2.TOMATO	10
		3.ONION	12
		4.CAULIFLOWER	5
		5.PEARS	6
		6.CABBAGE	12
		7.PEAS WET	5
		8.POTATO	15
		9.GARLIC	3
		10.PLUM	3

(iv)	Maximum daily arrivals in the market:	Name of Commodity	Maximum Daily Arrivals In The Market
		1.APPLE	70
		2.TOMATO	20
		3.ONION	25
		4.CAULIFLOWER	10
		5.PEARS	25
		6.CABBAGE	20
		7.PEAS WET	15
		8.POTATO	30
		9.GARLIC	4
		10.PLUM	5

(v)	Minimum daily arrivals in the market:	Name of Commodity	Minimum Daily Arrivals In The Market
		1.APPLE	5
		2.TOMATO	5
		3.ONION	5
		4.CAULIFLOWER	2
		5.PEARS	2
		6.CABBAGE	2
		7.PEAS WET	3
		8.POTATO	10
		9.GARLIC	2
		10.PLUM	4

Name of Commodity	Total Annual Arrivals		
	2006-07	2007-08	2008-09
APPLE	2543	5459	975
TOMATO	2154	8620	2793
ONION	1762	2205	2032
CAULIFLOWER	625	937	1437
PEARS	400	1342	172
CABBAGE	4600	483	1059
PEAS WET	438	1471	709
POTATO	1578	2338	2212
GARLIC	62	100	171
PLUM	168	127	175

Transportation		
(i)	Modes of transport generally adopted for the market	By Road
(ii)	Modes of transport for despatches to various stations	By Road
(iii)	Modal Mix% Mode Wise	.

Storage			
(i)	Storage facilities available in the market with trade as well as APMC	Yes	
(ii)	Availability of Ripening Chambers if available	Number	Capacity
	0	0	

SHIMLA

Rail/Road Connectivity		
(i)	Name of the nearest railway station	SHIMLA
(ii)	Distance of the railway station from the market(in Kms)	10
(iii)	Name of the Nearest National /State Highway	NH - 22

Market Area		
(i)	Notified area of Market Committee	SHIMLA & KINNAUR
(ii)	Subyard (If any) and It's exact location	THEOG, RAMPUR, KOTI, ROHRU, NERWA
(iii)	Farthest place in the Hinterland	
(iv)	Nearest place in the Hinterland	
(v)	Commodity Wise Processing Units in the Market area	
(vi)	Number of Cold Storages available	0
(vii)	Capacity of Cold Storages available	
(viii)	Number of	14

	Commodities notified under regulation	
(ix)	Average daily dispatches to outside markets during the season	
(x)	Average daily dispatches to outside markets during the peak period	
(xi)	Names of traditional markets(important) to which produce is sent	AZADPUR MANDI NEW DELHI, MUMBAI, CHENNAI, AMRITSAR,AMBALA, CHANDIGARH,KOLKATTA.

Arrivals / Dispatches			
(i)	Name of 10 commodities important in terms of arrivals:	Name of Commodity	Annual Production
		1. apple	0
		2. tomato	0

(ii)	Marketing season commodity wise for 10 important commodities:	Name of Commodity	Season (From-To)	Peak Season (From-To)
		1.apple		
		2.tomato		

(iii)	Average daily arrivals in Metric Tonnes throughout season of all commodities:	Name Of Commodity	Average Daily Arrivals
		1.apple	
		2.tomato	

(iv)	Maximum daily arrivals in the market:	Name of Commodity	Maximum Daily Arrivals In The Market
		1.apple	0
		2.tomato	0

(v)	Minimum daily arrivals in the market:	Name of Commodity	Minimum Daily Arrivals In The Market
		1.apple	0
		2.tomato	0

Name of Commodity	Total Annual Arrivals 2001-2002	2002-2003	2003-2004
apple	0	0	0
tomato	0	0	0
	0	0	0

Transportation		
(i)	Modes of transport generally adopted for the market	ROAD TRANSPORTERS
(ii)	Modes of transport for despatches to various stations	ROAD TRANSPORTERS
(iii)	Modal Mix% Mode Wise	100% ROAD TRANSPORT

Storage			
(i)	Storage facilities available in the market with trade as well as APMC	No	
(ii)	Availability of Ripening Chambers if available	Number	Capacity
	0	NA	

SOLAN

Rail/Road Connectivity		
(i)	Name of the nearest railway station	SOLAN
(ii)	Distance of the railway station from the market (in Kms)	1
(iii)	Name of the Nearest National /State Highway	NH 22

Market Area		
(i)	Notified area of Market Committee	WHOLE THE DISTRICT(---- KMS)
(ii)	Subyard (If any) and It's exact location	13
(iii)	Farthest place in the Hinterland	Nalagarh
(iv)	Nearest place in the Hinterland	Saproon
(v)	Commodity Wise Processing Units in the Market area	HPMC Pwn+Himalayan juice
(vi)	Number of Cold Storages available	0
(vii)	Capacity of Cold Storages available	
(viii)	Number of Commodities notified under regulation	99
(ix)	Average daily dispatches to outside markets during the season	270 ton
(x)	Average daily dispatches to outside markets during the peak period	470 ton

(xi)	Names of traditional markets (important) to which produce is sent	Delhi, Patiala, Amritsar, Panipat, Saharanpur

Arrivals / Dispatches

(i) Name of 10 commodities important in terms of arrivals:	Name of Commodity	Annual Production
1.	Tomato	0
2.	Capsicum	0
3.	French Bean	0
4.	Ginger	0
5.	Peas	0
6.	Garlic	0
7.	Cabbage	0
8.	Cauliflower	0
9.	Potato	0
10.	Apple	0

(ii) Marketing season commodity wise for 10 important commodities:	Name of Commodity	Season (From-To)	Peak Season (From-To)
	1.Tamato	June-Nov	July-Sept
	2.Capsicum	June-Nov	July-Sept
	3.French Bean	June-Nov	July-Sept
	4.Ginger	Sept-Jan	Oct-Nov
	5.Peas	March-Nov	April-May
	6.Garlic	May-Oct	June-July
	7.Cabbage	March-Nov	May-Sept
	8.Carliflower	Feb-Nov	March-June
	9.Patato	May-Nov	June-Oct
	10.Apple	July-Nov	Aug-Sept

(iii) Average daily arrivals in Metric Tonnes throughout season of all commodities:	Name Of Commodity	Average Daily Arrivals
	1.Tamato	80
	2.Capsicum	10
	3.French Bean	5
	4.Ginger	10
	5.Peas	10
	6.Garlic	12
	7.Cabbage	5
	8.Carliflower	5
	9.Patato	10
	10.Apple	20

(iv) Maximum daily arrivals in the market:	**Name of Commodity**	**Maximum Daily Arrivals In The Market**
	1.Tamato	260
	2.Capsicum	15
	3.French Bean	10
	4.Ginger	40
	5.Peas	60
	6.Garlic	40
	7.Cabbage	20
	8.Carliflower	20
	9.Patato	30
	10.Apple	120

(v) Minimum daily arrivals in the market:	**Name of Commodity**	**Minimum Daily Arrivals In The Market**
	1.Tamato	10
	2.Capsicum	5
	3.French Bean	4
	4.Ginger	5
	5.Peas	8
	6.Garlic	10
	7.Cabbage	3
	8.Carliflower	4
	9.Patato	8
	10.Apple	10

Name of Commodity	**Total Annual Arrivals**		
	2006-2007	**2007-2008**	**2008-2009**
Tomato	0	228782	222143
Capsicum	0	28854	16137
French Bean	0	19772	13757
Ginger	0	5067	2134
Peas	0	38476	32514
Garlic	0	12336	29129
Cabbage	0	4804	5644
Cauliflower	0	4770	8519
Potato	0	28348	28704
Apple	0	101630	182897

Transportation

(i)	Modes of transport generally adopted for the market	Truck, Canter, Tempo, Utility

(ii)	Modes of transport for despatches to various stations	do
(iii)	Modal Mix% Mode Wise	50% -50%

Storage			
(i)	Storage facilities available in the market with trade as well as APMC	No	
(ii)	Availability of Ripening Chambers if available	Number	Capacity
	0		

MANDI

Rail/Road Connectivity		
(i)	Name of the nearest railway station	Joginder Nagar
(ii)	Distance of the railway station from the market(in Kms)	60
(iii)	Name of the Nearest National /State Highway	N.H.21

Market Area		
(i)	Notified area of Market Committee	Distt Mandi
(ii)	Subyard (If any) and It's exact location	Mandi
(iii)	Farthest place in the Hinterland	Mandi
(iv)	Nearest place in the Hinterland	Mandi
(v)	Commodity Wise Processing Units in the Market area	99
(vi)	Number of Cold Storages available	0
(vii)	Capacity of Cold Storages available	
(viii)	Number of Commodities notified under regulation	0
(ix)	Average daily dispatches to outside markets during the season	
(x)	Average daily dispatches to outside markets during the peak period	
(xi)	Names of traditional markets(important) to which produce is sent	CHD Punjab etc

Arrivals / Dispatches		
(i)	Name of 10 commodities important in terms of arrivals:	Name of Commodity / Annual Production
	1. Bottle Guard	1942
	2. Cabbage	6982
	3. Apple	829
	4. Tomato	585
	5. Banana	6782
	6. Brinjal	1264
	7. Cucumber	2161
	8. Mango	5130
	9. Cauliflower	3868
	10.Green Peas	2917

(ii) Marketing season commodity wise for 10 important commodities:	Name of Commodity	Season(From-To)	Peak Season(From-To)
	1.Bottal Guard	April	August
	2.Cabbage	January	December
	3.Apple	July	September
	4.Tomato	January	December
	5.Banana	January	December
	6.Brinjal	April	September
	7.Cucumber	April	December
	8.Mango	April	August
	9.Califlower	January	December
	10.Green Peas	March	December

(iii) Average daily arrivals in Metric Tonnes throughout season of all commodities:	Name Of Commodity	Average Daily Arrivals
	1.Bottal Guard	15
	2.Cabbage	13
	3.Apple	10
	4.Tomato	9
	5.Banana	21
	6.Brinjal	5
	7.Cucumber	16
	8.Mango	39
	9.Califlower	23
	10.Green Peas	8

(iv) Maximum daily arrivals in the market:	Name of Commodity	Maximum Daily Arrivals In The Market
	1.Bottal Guard	20
	2.Cabbage	20
	3.Apple	15
	4.Tomato	15
	5.Banana	25
	6.Brinjal	12
	7.Cucumber	20
	8.Mango	40
	9.Califlower	23
	10.Green Peas	12

(v)	Minimum daily arrivals in the market:	Name of Commodity	Minimum Daily Arrivals In The Market
		1.Bottal Guard	3
		2.Cabbage	5
		3.Apple	3
		4.Tomato	3
		5.Banana	15
		6.Brinjal	2
		7.Cucumber	2
		8.Mango	5
		9.Califlower	5
		10.Green Peas	2

Name of Commodity	Total Annual Arrivals		
	2006	2007	2008-09
Bottle Guard	0	0	1942
Cabbage	0	0	6982
Apple	0	0	829
Tomato	0	0	585
Banana	0	0	6782
Brinjal	0	0	1264
Cucumber	0	0	2161
Mango	0	0	5130
Cauliflower	0	0	3868
Green Peas	0	0	2917

Transportation		
(i)	Modes of transport generally adopted for the market	By Road
(ii)	Modes of transport for despatches to various stations	By Road
(iii)	Modal Mix% Mode Wise	100%

Storage		
(i)	Storage facilities available in the market with trade as well as APMC	Yes
(ii)	Availability of Ripening Chambers if available	NumberCapacity

BILASPUR

Rail/Road Connectivity		
(i)	Name of the nearest railway station	Kiratpur
(ii)	Distance of the railway station from the market(in Kms)	65
(iii)	Name of the Nearest National /State Highway	0 ON N.H.21

Market Area		
(i)	Notified area of Market Committee	1167 Sq. Kms.
(ii)	Subyard (If any) and It's exact location	Namohal
(iii)	Farthest place in the Hinterland	Bhakhra
(iv)	Nearest place in the Hinterland	Bilaspur
(v)	Commodity Wise Processing Units in the Market area	Wheat-Flour Mill Fruits/Veg.-One Canning Unit In Public Sector Fruit/Veg.
(vi)	Number of Cold Storages available	0
(vii)	Capacity of Cold Storages available	0
(viii)	Number of Commodities notified under regulation	99
(ix)	Average daily dispatches to outside markets during the season	25 QTS
(x)	Average daily dispatches to outside markets during the peak period	70QTS
(xi)	Names of traditional markets(important) to which produce is sent	NIL

Arrivals / Dispatches			
(i)	Name of 10 commodities important in terms of arrivals:	Name of Commodity	Annual Production
		1. Capsicum	18.3
		2. Lady Finger	36.1
		3. Arum	17.4
		4. Cucumber	95.9
		5. Ginger	12.6
		6. Tomato	129
		7. Cauliflower	182
		8. Green Peas	73.7
		9. Brinjal	43
		10. Bitter Guard	15.1

(ii) Marketing season commodity wise for 10 important commodities:	Name of Commodity	Season(From-To)	Peak Season(From-To)
	1.Capsicum	April	September
	2.Lady Finger	April	September
	3.Aurm	July	March
	4.Cucumber	April	December

(ii) Marketing season commodity wise for 10 important commodities:	Name of Commodity	Season(From-To)	Peak Season(From-To)
	5.Ginger	April	July
	6.Tomato	April	October
	7.Califlower	January	December
	8.Green Peas	January	December
	9.Brinjal	April	September
	10.Bitter Guard	April	September

(iii) Average daily arrivals in Metric Tonnes throughout season of all commodities:	Name Of Commodity	Average Daily Arrivals
	1.Capsicum	0.1
	2.Lady Finger	0.1
	3.Aurm	0.2
	4.Cucumber	0.3
	5.Ginger	0.090
	6.Tomato	0.3
	7.Califlower	0.9
	8.Green Peas	0.07
	9.Brinjal	0.105
	10.Bitter Guard	0.1

(iv) Maximum daily arrivals in the market:	Name of Commodity	Maximum Daily Arrivals In The Market
	1.Capsicum	0.125
	2.Lady Finger	0.016
	3.Aurm	0.3
	4.Cucumber	0.5
	5.Ginger	0.2
	6.Tomato	0.4
	7.Califlower	1.2
	8.Green Peas	0.1
	9.Brinjal	0.23
	10.Bitter Guard	0.15

(v) Minimum daily arrivals in the market:	Name of Commodity	Minimum Daily Arrivals In The Market
	1.Capsicum	0.06
	2.Lady Finger	0.8
	3.Aurm	0.16
	4.Cucumber	0.25
	5.Ginger	0.06
	6.Tomato	0.2
	7.Califlower	0.06
	8.Green Peas	0.05
	9.Brinjal	0.09
	10.Bitter Guard	0.05

Name of Commodity	Total Annual Arrivals		
	2006	2007	2008
Capsicum	20	24	28
Lady Finger	41.5	32.5	36.1
Arum	28	16	17.4
Cucumber	112.5	89.6	95.9
Ginger	15.6	14.5	12.6
Tomato	131	124	129
Cauliflower	184	191	182
Green Peas	64	80	73.7
Brinjal	50	38	43
Bitter Guard	21	18	15.5

Transportation		
(i)	Modes of transport generally adopted for the market	By Road
(ii)	Modes of transport for despatches to various stations	By Road
(iii)	Modal Mix% Mode Wise	100%

Storage			
(i)	Storage facilities available in the market with trade as well as APMC	Yes	
(ii)	Availability of Ripening Chambers if available	Number	Capacity
	2	10 M.T.	

HAMIRPUR

Rail/Road Connectivity		
(i)	Name of the nearest railway station	Jawalamukhi Road
(ii)	Distance of the railway station from the market(in Kms)	55
(iii)	Name of the Nearest National /State Highway	N.H.88

Market Area		
(i)	Notified area of Market Committee	1118 Sq. Kms.
(ii)	Subyard (If any) and It's exact location	Nadaun At Nagahrda & Under Construction At Jahu
(iii)	Farthest place in the Hinterland	Deotsidh
(iv)	Nearest place in the Hinterland	Dugha
(v)	Commodity Wise Processing Units in the Market area	0
(vi)	Number of Cold Storages available	0
(vii)	Capacity of Cold Storages available	0
(viii)	Number of Commodities notified under regulation	91
(ix)	Average daily dispatches to outside markets during the season	15 M.T.

(x)	Average daily dispatches to outside markets during the peak period	25 M.T.
(xi)	Names of traditional markets(important) to which produce is sent	Palampur, Sarkaghat, Ghumarwin Etc.

Arrivals / Dispatches

(i) Name of 10 commodities important in terms of arrivals:	Name of Commodity	Annual Production
	1. Potato	2500
	2. Onion	850
	3. Cabbage	300
	4. Bottle Gourd	475
	5. Brinjal	300
	6. Tomato	2000
	7. Cauli Flower	900
	8. Radish	250
	9. Peas	480
	10.Lady Finger	750

(ii) Marketing season commodity wise for 10 important commodities:	Name of Commodity	Season(From-To)	Peak Season(From-To)
	1.Potato	Oct.- March	Dec.- Jan
	2.Onion	April- June	May
	3.Cabbage	Oct.- Feb.	Dec.- Jan.
	4.B.Gourd	April-July	May-June
	5.Brinjal	March- July	May-June
	6.Tomato	April-June	May
	7.C.Flower	Nov.- March	Dec.-Jan.
	8.Raddish	Oct.-March	Nov.-Jan.
	9.Peas	Nov.- March	Dec.-Jan.
	10.L. Finger	March-July	May-June

(iii) Average daily arrivals in Metric Tonnes throughout season of all commodities:	Name Of Commodity	Average Daily Arrivals
	1.Potato	7.2
	2.Onion	6
	3.Cabbage	1.3
	4.B.Gourd	1.5
	5.Brinjal	1.5
	6.Tomato	2.3
	7.C.Flower	2.5
	8.Raddish	0.9
	9.Peas	1.6
	10.L. Finger	1.3

(iv) Maximum daily arrivals in the market:	Name of Commodity	Maximum Daily Arrivals In The Market
	1.Potato	8
	2.Onion	7
	3.Cabbage	2
	4.B.Gourd	2
	5.Brinjal	2
	6.Tomato	3
	7.C.Flower	3
	8.Raddish	1
	9.Peas	2
	10.L. Finger	2

(v) Minimum daily arrivals in the market:	Name of Commodity	Minimum Daily Arrivals In The Market
	1.Potato	2.5
	2.Onion	2
	3.Cabbage	0.5
	4.B.Gourd	0.7
	5.Brinjal	0.5
	6.Tomato	1
	7.C.Flower	1
	8.Raddish	0.3
	9.Peas	0.4
	10.L. Finger	0.3

Name of Commodity	Total Annual Arrivals		
	2007-2008	2008-2009	2009-2010
Potato	2600	2300	2500
Onion	2195	1960	2195
Cabbage	476	584	874
Bottle Gourd	523	532	432
Brinjal	555	667	549
Tomato	847	1072	883
Cauli Flower	902	1011	1027
Raddish	330	435	594
Peas	567	648	551
Lady. Finger	460	273	307

Transportation

(i)	Modes of transport generally adopted for the market	Truck, Tempo, LCV, Three wheeler
(ii)	Modes of transport for despatches to various stations	MPC
(iii)	Modal Mix% Mode Wise	

Storage	
(i) Storage facilities available in the market with trade as well as APMC	No
(ii) Availability of Ripening Chambers if available	NumberCapacity

UNA

Rail/Road Connectivity	
(i) Name of the nearest railway station	UNA
(ii) Distance of the railway station from the market(in Kms)	2
(iii) Name of the Nearest National /State Highway	NH 25

Market Area	
(i) Notified area of Market Committee	1549 Sq. Kms.
(ii) Subyard (If any) and It's exact location	Santoshgarh
(iii) Farthest place in the Hinterland	Marwari
(iv) Nearest place in the Hinterland	Mehatpur
(v) Commodity Wise Processing Units in the Market area	Fruits & Veg. 4 Katha - 3 Wheat - 6
(vi) Number of Cold Storages available	4
(vii) Capacity of Cold Storages available	5000 MT
(viii) Number of Commodities notified under regulation	136
(ix) Average daily dispatches to outside markets during the season	180 qntls
(x) Average daily dispatches to outside markets during the peak period	650 qntls
(xi) Names of traditional markets(important) to which produce is sent	Delhi, Jalandhar, Chandigarh, Ferozepur, Moga, Malerkotala, Amritsar, Hoshiarpur

Arrivals / Dispatches		
(i) Name of 10 commodities important in terms of arrivals:	Name of Commodity	Annual Production
	1. Cabbage	870
	2. Turnip	380
	3. Brinjal	990
	4. Bottle Gourd	1510
	5. Radish	405
	6. Bitter Gourd	270
	7. Carrot	410
	8. Cauliflower	1090
	9. Potato	2700
	10. Lady finger	610

(ii) Marketing season commodity wise for 10 important commodities:	Name of Commodity	Season (From-To)	Peak Season (From-To)
	1.Cabbage	Nov to Apr	Dec to Mar
	2.Turnip	Oct to Feb	Nov to Jan
	3.Brinjal	Oct to July	Apr to June
	4.Bottle Gourd	Apr to Aug	May to July
	5.Radish	Oct to April	Dec to Jan
	6.Bitter Gourd	Apr to Aug	May to June
	7.Carrot	Nov to Mar	Dec to Jan
	8.Cauliflower	Sept to April	Nov to Mar
	9.Potato	Nov to Apr	Jan to Apr
	10.Lady finger	Apr to Sept	May-Aug

(iii) Average daily arrivals in Metric Tonnes throughout season of all commodities:	Name Of Commodity	Average Daily Arrivals
	1.Cabbage	2.8
	2.Turnip	0.7
	3.Brinjal	1.5
	4.Bottle Gourd	4
	5.Radish	1
	6.Bitter Gourd	1.5
	7.Carrot	2
	8.Cauliflower	6.65
	9.Potato	10.50
	10.Lady finger	1.4

(iv) Maximum daily arrivals in the market:	Name of Commodity	Maximum Daily Arrivals In The Market
	1.Cabbage	4.5
	2.Turnip	2
	3.Brinjal	2.7
	4.Bottle Gourd	7.1
	5.Radish	2
	6.Bitter Gourd	3
	7.Carrot	4
	8.Cauliflower	8.1

	9.Potato	12.6
	10.Lady finger	2.5

(v) Minimum daily arrivals in the market:	Name of Commodity	Minimum Daily Arrivals In The Market
	1.Cabbage	0.8
	2.Turnip	0.3
	3.Brinjal	0.5
	4.Bottle Gourd	2.5
	5.Radish	0.4
	6.Bitter Gourd	0.9
	7.Carrot	1.5
	8.Cauliflower	5
	9.Potato	7.5
	10.Lady finger	0.7

Name of Commodity	Total Annual Arrivals		
	2007-08	2008-2009	2009-2010
Cabbage	286	236	212
Turnip	140	137	152
Brinjal	365	338	368
Bottle Gourd	673	507	571
Radish	580	450	396
Bitter Gourd	208	219	261
Carrot	279	361	264
Cauliflower	641	920	958
Potato	2115	2778	2467
Lady finger	320	275	243

Transportation		
(i)	Modes of transport generally adopted for the market	Trucks and Small Vehicles
(ii)	Modes of transport for despatches to various stations	By Road
(iii)	Modal Mix% Mode Wise	100 %

Storage			
(i)	Storage facilities available in the market with trade as well as APMC	Yes	
(ii)	Availability of Ripening Chambers if available	Number	Capacity
	2	1500 MT	

Source: http://agmarknet.nic.in/profile/profile_online/combo3.asp

Table 11: Market Infrastructure of Himachal Pradesh

General Information						Administration	Rail/Road Connectivity			Market Area	
District	Year	City	Year of establishment	Population served	Geographical area served by Market (No. of Villages etc.)	Regulated/Unregulated	Name of the nearest railway station	Distance of the railway station from the market (in Kms)	Name of the Nearest national/State Highway	Notified area of market Committee	Subyard (if any) and it's exact location
Bilaspur	2006	Bilaspur	1979	340735	106	Regulated	Kiratpur	65	ON N.H.21	1167 Sq. Kms	Namhol
Chamba		Chamba	1981	0		Regulated	Jassur	100		Chamba	No sub market yard
Hamirpur		Hamirpur (Nadaun)	2003	0		Regulated	Jwalamukhi road	28	N.H.88	1118 Sq. Kms	
Kangra		Kangra	1981	495218	487	Regulated	Kangra Mandir	3	NH 88	Dist. Kangra	Nagrota, Bagwan Palampur, Baijnath, Jassur, Jwalamukhi
Kullu		Kullu	1977	381571	172	Regulated	Jogindernagar	128	NH21	Kullu & Lahaul-Spiti	Kullu, Bhuntar, & Khegsu
Kinnaur											

District	Year	General Information				Administration	Rail/Road Connectivity				Market Area	
		City	Year of establishment	Population served	Geographical area served by Market (No. of Villages etc.)	Regulated/Unregulated	Name of the nearest railway station	Distance of the railway station from the market (in Kms)	Name of the Nearest national/State Highway	Notified area of market Committee	Subyard (if any) and it's exact location
Lahaul & Spiti											
Mandi		Mandi	2009			Regulated	Jogindernagar	60	NH21	Distt. Mandi	Mandi
Shimla		Shimla	0	0		Regulated	Shimla	10	NH22	Shimla & Kinnaur	Theog, Rampur, Koti, Rohru, Nerwa
Sirmaur		Bagthan	2005	10000	50	Regulated	Jagadhari (HR)	90		Sirmaur	
Solan		Solan	1975	500557	2551	Regulated	Solan	1	NH22	Whole the dist. Kms	13
Una		Una	1978	447967	866	Regulated	Una	2	NH22	1549 Sq. Kms	Santoshgarh

District	Commodity Wise Processing Units in the Market area	Number of Cold Storages available	Capacity of Cold Storages available	Number of Commodities notified under regulation	Average daily dispatches to outside markets during the season	Average daily dispatches to outside markets during the peak period	Transportation			Storage		Facilities and Services		
							Modes of transport generally adopted for the market	Modes of transport for dispatches to various stations	Modal Mix% Mode Wise	Storage facilities available in the market with trade as well as APMC	Availability of Ripening Chambers if available	Information Notice Board/Electric Display Board	Public Address System	Are the prices displayed on the notice board
Bilaspur	Wheat-Flour Mill Fruits/Veg.-One Canning Unit in Public Sector Fruit/Veg.	0	0	99	25 Qts	70 Qts	By road	By road	100%	Yes	No. 10 M.T. Cap. 2	Yes	No	Yes
Chamba		0	0	99	1000	2500	Truck, Tempo pick up etc.	Truck, Tempo pick up etc.		No		No		No
Hamirpur		0		99	7	8	Truck, Tempo, LCV	By road	100%	No		Yes	Nil	Yes
Kangra				99	1800	4200	Truck, Tempo, Three Wheeler etc.	Truck, Tempo, Three Wheeler etc.		No		Yes		Yes
Kullu		0		99						Yes		Yes		Yes

District	Commodity Wise Processing Units in the Market area	Number of Cold Storages available	Capacity of Cold Storages available	Number of Commodities notified under regulation	Average daily dispatches to outside markets during the season	Average daily dispatches to outside markets during the peak period	Transportation			Storage		Facilities and Services		
							Modes of transport generally adopted for the market	Modes of transport for dispatches to various stations	Modal Mix% Mode Wise	Storage facilities available in the market with trade as well as APMC	Availability of Ripening Chambers if available	Information Notice Board/Electric Display Board	Public Address System	Are the prices displayed on the notice board
Kinnaur														
Lahaul & Spiti														
Mandi	99	0		0			By road	By road	100%	Yes		Yes		Yes
Shimla		0		14			Road Transporters	Road Transporters	100% road transport	No		Yes	Yes	Yes
Sirmaur				99	Seasonable market	Seasonable market	Pickup Van & Mini truck	Pickup Van, Truck/Mini truck		No		No		No
Solan	HPMC Pwn+ Himalayan juice	0		99	270 ton	470 ton	Truck, Canter, Tempo, Utility	do	50%-50%	No		Yes	Tikker board	Yes
Una	Fruits & Veg. 4 Katha-3 Wheat-6	4	500 metric tons	99	180 Qntls	650 Qntls	Small vehicles	By road	100%	Yes		Yes		Yes

Market Intervention Scheme: (MIS) : The Government of Himachal Pradesh has introduced the policy of Market Intervention Scheme (MIS) for the procurement of Mango, Apple and Citrus Fruits in the State. In order to implement the Market Intervention Scheme of the State Government, the HPMC, being the premier fruit marketing agency, procures the unmarketable fruits which are processed under most hygienic conditions in its Processing Plants. The efforts made by the Corporation have resulted in stabilizing the prices of the fruits in the market. Apart from fruits procured under MIS, HPMC also procures other fruits like Peach, Pear, Plum, Litchi, Almonds, strawberry, kiwi etc. grown in the State, for marketing and processing to increase the capacity utilisation of the Plants and to assist the farmers of the State in getting remunerative returns for their produce. Procurement prices of the fruits under the Market Intervention Scheme for last five years are given in Table 12.

Table 12: Procurement Prices ***(Rate: Rs./Kg.)***

Year	Mango		Apple	Kinnow/Orange		Galgal
	Seedless	Grafted		'B' Grade	'C' Grade	
2001-2002	3.08	3.75	3.75	4.35	3.75	2.60
2002-2003	3.33	4.00	4.00	4.60	4.00	2.85
2003-2004	3.33	4.00	4.00	4.60	4.00	2.85
2004-2005	3.58	4.25	4.25	4.85	4.25	3.10
2004-2005	3.58	4.25	4.25	4.85	4.25	3.10
2005-2006	3.58	4.25	4.25	4.85	4.25	3.15
2007-2008	4.08	4.75	4.75	5.35	4.75	3.65
2008-2009	4.58	5.25	5.25	5.85	5.25	4.15
2009-2010	4.50	5.25	5.25	5.85	5.25	4.15

Source: HPMC

Horticultural Production Infrastructure

Progeny - cum Demonstration Orchards (PCDOs) /Nurseries: These have been developed for different fruits in 98 locations in State to serve as growth centres for Horticulture development in their impact zone of normally 10 km radius. The district wise positions of these PCDO's are given in Table 13.

Table 13: District wise Progeny-cum Demonstration Orchards (PCDOs)/Nurseries

Sr. No.	District	No. of Units	Total Area (Sq.Km)	Kinds of plants propagated
1	Bilaspur	6	0.17	Mango, Litchi, Citrus, Guava, Peach, Pear Etc.
2	Chamba	14	0.55	Apple, Stone Fruits, Mango, Citrus, Walnut, Pear, Guava Etc.
3	Hamirpur	5	0.11	Mango, Citrus, Pear
4	Kangra	8	0.36	Mango, Litchi, Citrus Fruits, Low Chilling Varieties Of Stone Fruits, Guava, Pecan Nut, Aonla, Grapes Etc.
5	Kinnaur	8	0.40	Apple, Stone Fruits, Almond, Apricot, Grapes
6	Kullu	5	0.37	Apple, Stone Fruits, Cherry, Pomegranate, Persimmon, Kiwi Fruit, Strawberry, Clonal Rootstocks Of Apple, Cherry, Pear, Stone Fruits Etc,
7	Lahaul & Spiti	3	0.07	Apple, Apricot, Almond, Hops
8	Mandi	11	0.49	Apple, Stone fruits, Mango, Citrus fruits, Kiwi fruit, Walnut, Strawberry etc
9	Shimla	14	0.88	Apple, Stone fruits, Pear, Cherry, Pomegranate
10	Sirmaur	14	1.16	Apple, Stone fruits, Kiwi fruit, Mango, Citrus fruits etc.
11	Solan	9	0.42	Stone fruits, Kiwi fruit, Hazelnut, Persimmon, , Pear, Mango, Citrus
12	Una	1	0.34	Mango. Pear, Citrus, Papaya, Pomegranate etc.
	Total	**98**	**5.32**	

Private Registered Nurseries

Propagation of fruit plant material is regulated under Himachal Pradesh Fruit Nurseries Registration Act, 1973. So far 732 nurseries have been registered under this act of which 662 are in private & 70 in Public Sector. About 2 million fruit plants are propagated in these nurseries per annum. The district wise positions of these private registered nurseries are given in Table 14.

Table 14: District wise private registered nurseries

Sr. No.	District	No. of Units	Total Area (Sq. Km)	Kinds of plants propagated
1	Bilaspur	23	0.10	Mango, Litchi, Guava, Amla, Pear, Papaya, Grapes
2	Chamba	67	0.22	Apple, Stone Fruits, Mango, Walnut, Pear, Guava, Kiwifruit
3	Hamirpur	21	0.07	Mango, Citrus, Pear
4	Kangra	68	0.31	Mango, Citrus, Litchi, Pecan Nut, Grapes Stone Fruit, Amla, Guava, Loquat
5	Kinnaur	34	0.10	Apple, Pear, Apricot, Almond, Grapes, Kiwifruit
6	Kullu	130	0.32	Apple, Pear, Stone Fruits, Pomegranate, Persimmon, Olive, Cherry, Kiwifruits
7	Lahaul & Spiti	1	0.003	Apple, Apricot, Almond, Hops
8	Mandi	110	0.28	Apple, Stone Fruits, Mango, Guava, Litchi, Walnut, Pomegranate, Strawberry, Olive, Pecanut
9	Shimla	117	0.33	Apple, Pear, Cherry, Apricot, Peach, Almond, Kiwifruit, Strawberry, Walnut, Pomegranate
10	Sirmaur	64	0.20	Stone Fruits, Apple, Mango, Citrus, Kiwifruit
11	Solan	12	0.04	Stone Fruits, Apple, Kiwi Fruits, Mango, Citrus, Guava, Pear
12	Una	15	0.06	Mango, Pear, Papaya, Pomegranate, Banana, Peach, Strawberry.
	Total	**662**	**2.033**	

Present capacity of fruit and vegetable processing units

At present the government of Himachal Pradesh has capacity of processing about 75000 MT of fruits as described in Table 15.

Table 15: Present capacity of fruit and vegetable processing units

Sr. No.	Particulars	No. of Units	Capacity(MT)
1	HPMC	3	28,200
2	Cooperative Units		400
3	Private/Joint Sector Units		46,000
4	Departmental Units(small scale)	9	400
5		*Total*	*75000*
6	Honey Processing Units	1	120
7	Hop processing Units	5	24MT/day

Infrastructure Requirement: Projections of production and marketed surplus of various farm products show that the quantities, which the marketing system will be required to handle in future, are quite large. A marketing system backed by strong, adequate infrastructure is at the core of agricultural marketing. Market infrastructure is important not only for the performance of various marketing functions and expansion of the size of the market but also for transfer of appropriate price signals leading to improved marketing efficiency. High investment and entrepreneurial skills required for creation and management of modern markets has to come from private sector. The situation of control by the state has to be eased to facilitate greater participation of the private sector, particularly to engender massive investments required for the development of marketing infrastructure and supporting services. Investment requirement for the development of marketing, storage and cold storage infrastructure in the country during 10th Plan has been estimated by a Task Force to be of the order of Rs. 12,230 crores.

With a view to induce large investment in the development of marketing infrastructure as envisaged above, the Ministry has formulated a scheme for "Development/Strengthening of Agricultural Marketing Infrastructure, Grading and Standardization". Under this scheme investment subsidy is provided on the capital cost of general or commodity specific infrastructure for marketing of agricultural commodities and for strengthening and modernization of existing agricultural markets, wholesale, rural and periodic or in tribal areas. The scheme is reform linked, to be implemented in those States/UTs that amend the APMC Act wherever required to allow setting up of agricultural markets in private and cooperative sectors. The States of Madhya Pradesh, Tamil Nadu, Kerala, Manipur, Himachal Pradesh, Andhra Pradesh, Punjab, Sikkim, Nagaland and Andaman & Nicobar Islands (U.T.) have so far been notified for implementation of the Central Sector Scheme, being the reforming States. Under the scheme, back ended subsidy @ 25% of capital cost of the project is provided in all States and @ 33.3% of capital cost in case of NE States, hilly areas and SC/ST entrepreneurs. In respect of infrastructure projects of State Agencies, there is no upper ceiling on subsidy to be provided under the scheme. There is central allocation of Rs. 190.00 crore under the scheme 10th Plan. An amount of Rs. 25 crore has been released under the scheme during 2004-05. Efforts are being made to make the people aware about the scheme through newspaper advertisement, distribution of publicity material and by arranging awareness programmes for officials of States and Banks.

Storage Infrastructure: Storage infrastructure is necessary for carrying over the agricultural produce from production periods to rest of the year. Lack of adequate scientific storage facilities cause heavy losses to farmers in terms of wastage in quantity and quality of produce in general and of fruit and vegeTables in particular. It is well known that small farmers do not have the economic strength to retain produce with them till the market prices are favourable. There is a felt need in the country to provide the farming community with facilities for scientific storage so that wastage and produce deterioration are avoided and also

to enable it to meet its credit requirement without being compelled to sell the produce at a time when the prices are low. Among the principal agencies engaged in warehousing and storage, FCI constructs godowns for their own needs of procurement and public distribution, the storage of CWC/ SWCs is by and large utilised by FCI, traders and for stocking fertilizers. These principal agencies have, therefore, by and large tended to bypass the requirement of farming community in the rural areas. To consider various aspects of the problems relating to storage of agricultural produce and to improve the country's storage capacity and also storage technology, the Govt. constituted a High level Expert Committee which inter alia recommended that about 20 lakh tonne storage capacity may be created in rural/semi-urban areas. Creation of storage facilities for agricultural produce, particularly in the rural area has also been emphasized in the National Agriculture Policy. An Inter-Ministerial Task Force constituted by the Ministry of Agriculture has in its report inter alia recommended in 2002 that in addition to 78.83 million tonne available storage capacity in the country, additional storage capacity of 130 lakh tonne may be created during 10th plan period. Of this 90 lakh tonne capacity is to be created in private and cooperative sector.

Accordingly the capital investment subsidy scheme titled 'Gramin Bhandaran Yojana' has been launched w.e.f. 01.04.2001. The main objectives of the scheme include creation of scientific storage capacity with allied facilitiesin rural areas to meet out various requirements of farmers for storing farm produce, processed farm produce, agricultural inputs, etc., and prevention of distress by creating the facility of pledge loan and marketing credit.

Initially scheme was approved for two years i.e. 2001 to 2003. Since there had been huge response to the scheme, it was extended up to 30.09.2004. Beyond this date the scheme has been approved for continuation up to 31.03.2007 with some modifications. Under the pre-revised scheme, back ended subsidy @ 25% of capital cost of the project has been provided. In case of NE States, hilly areas and SC/ ST entrepreneurs, subsidy has been provided @ 33.33% of the capital cost of the project. Under the revised scheme, subsidy @ 25% will be given to all categories of farmers, Agriculture graduates, cooperatives & CWC/ SWCs. All other categories of individuals companies and corporations would be given subsidy @ 15% of the project cost. In case of NE States/hilly areas & SC/ST entrepreneurs and their cooperatives, subsidy shall be 33.33%.

Though a total of 90 lakh tonne capacity of Rural Godown was targeted during 10th Plan period, the same has now been revised upwards to 140 lakh tonne on the target of 90 lakh tonne capacity was already achieved during 2004-05 itself. Increased requirement of Rural Storage has been necessitated on account of increase in the production of food grain and its continuing increasing trend. During last three years 9483 storage projects having a capacity of 141.83 lakhs tonne have already been sanctioned under the scheme by now. The capacity-wise break-up of godown are given below:-

Capacity-wise breakup of sanctioned project

100-500 tonne	501-1000 tonne	1001-5000 tonne	5000-10000 tonne	Total
5602	1224	2221	436	9483

Out of 9483 godowns sanctioned so far, 335 godowns are in public sector, 2376 are in farmers cooperative, 5050 godowns belong to farmers and 1722 godowns are owned by others like traders, companies, etc.

The year-wise physical and financial performance under the scheme is given below in Table 16.

Table 16: Year wise Physical and Financial Performance

Year	Target	Achievement	Financial (Rs. in Crores) R.E.	Expenditure
2001-03	20	67.35	84.86	84.86
2003-04	27	37.57	80.00	80.00
2004-05	38	36.91	100.00	100.00
2005-06	26	--	80.00	--
2006-07	10	--	35.00	--
Total	**121**	**141.83**	**369.86**	**264.86**

The scheme has now been made farmers' friendly by allowing subsidy for smaller godowns of 50 MT size in general and of 25 in hilly areas. Five lakh tones capacity to be created is reserved for small farmers and the target of construction in the Tenth Plan is enhanced from 90 to 140 lakh tonne.

Constraints of Present Markets: The purpose of regulation of agricultural markets was to protect farmers from the exploitation of intermediaries and traders and also to ensure better prices and timely payment for his produce. Over a period of time these markets have, however, acquired the status of restrictive and monopolistic markets, providing no help in direct and free marketing, organized retailing, smooth raw material supplies to agro – processing, competitive trading, information exchange and adoption of innovative marketing systems and technologies.

Under the APMC Act, only State Governments are permitted to set up markets. Monopolistic practices and modalities of the State-controlled markets have prevented private investment in the sector. The licensing of traders in the regulated markets has led to the monopoly of the licensed traders acting as a major entry barrier for a new entrepreneur. The traders, commission agents and other functionaries organise themselves into associations, which generally do not allow easy entry of new persons, stifling the very spirit of competitive functioning.

8.11 Information on human resource management issues (which may have relevance to environment management) in the sector such as: manpower, vocational training, awareness levels etc.

The status of human resources in different agencies is given below.

H.P. State Agriculture Marketing Board involves:-

a. Constitution of the Board

The Board consists of

- Chairman , who is appointed by the State Government
- Twenty Members including Vice-Chairman of whom

1. Ten ex-officio members and
2. Ten non-official members nominated by the State Government

(1) ***Ex-officio members***

(i) The Secretary (Agriculture) HP Government Vice-Chairman of Board

(ii) The Secretary (Horticulture) HP Government

(iii) The Secretary (Finance) HP Government

(iv) The Secretary (Forest) HP Government

(v) The Principal Chief Conservator of Forests, Himachal Pradesh;

(vi) Director of Agriculture, Himachal Pradesh;

(vii) Director of Horticulture, Himachal Pradesh;

(viii) Registrar, Cooperative Societies, Himachal Pradesh;
(ix) Chief General Manager of National Bank for Agriculture and Rural Development, Shimla
(x) Managing Director of the Himachal Pradesh State Agricultural Marketing Board.

(2) ***Non-official members***

(i) Two shall be Chairman of the Committees;
(ii) Four shall be other progressive agriculturists/farmers.
(iii) Two shall be from such traders registered under section 40 of this Act
(iv) Two shall be from experts having experience in agricultural marketing

b. Constitution of the Committee

Committee shall consist of sixteen members of whom;

- Six shall be ex-officio members and
- Ten non-official members.

Ex-officio members

(i) Deputy Commissioner- Vice Chairman;
(ii) Deputy Director of Agriculture;
(iii) Deputy Director of Horticulture;
(iv) Deputy Director of Animal Husbandry;
(v) In charge, Krishi Vigyan Kendra; and
(vi) Secretary of the Committee.

Non Official Members

The non-official members shall be appointed by the State Government out of a panel of names given by the Deputy Commissioner concerned equal to twice the number of vacancies to be filled up, in the manner provided hereunder:-

(i) Nine non-official members from the producers of the notified market area; and
(ii) One non-official member from the traders registered under section 40, from the notified market area.

APMC Bilaspur

Present Staff Position of Market Committee, Bilaspur		
Sr. No.	**Name of Post**	**No. of Post**
(a)	Secretary	1
(b)	Market Supervisor	1
(c)	Auction Recorder	1.
(d)	Jr. Assistant	1
(e)	Pean cun Chowkidar	2
Total		**6**

APMC Solan

Present Staff Position		
Sr. No.	**Name of the Post**	**No. of Post**
1	Secretary	1 (On deputation)
2	Market supervisor	3
3	Sr. Asstt.	1
4	Steno	1
5	Jr.Asstt.	1
6	Clerk	1
7	Auction Recorder	6
8	Peon	1
9	Peon Cum Chowkidar	5
Total		**20**

APMC Hamirpur

Present Staff Position		
Sr. No.	**Name of the Post**	**No. of Post**
1	Secretary	1 (On deputation)
2	Market Supervisor	1
3	Sr. Assistant	1
4	Auction Recorder	1
5	Jr. Assistant	1
6	Peon cum Chowikidar	2
Total		**7**

8.12. Regulatory analysis to identify any regulations that have environment implications (negative or positive), and compliance with the same.

Market infrastructure sector and cross sector policy and regulatory framework at state level shows the intent of the state government to address inadequate service delivery in order to reduce the disease burden in the state. A list of policy, regulations are given below.

- Himachal Pradesh Agricultural and Horticultural Produce Marketing (Development and Regulation) Act, 2005 (Act No.20 of 2005)
- Himachal Pradesh Agricultural Produce Markets Act,1969
- Himachal Pradesh Agricultural and Horticultural Produce Marketing (Financial) Rules, 2006
- APMC Agriculture Produce Marketing Committees Act, 1963
- National Water Policy, 1987
- Agricultural Produce (Grading and Marking) Act, 1937, 1986
- The Indian Sale of Goods Act 1930
- Consumer Protection Act, 1986
- Agriculture policy, 2000
- Market Intervention Schemes (MIS)
- Agriculture Produce Marketing Committee (APMC) Act,2006
- The Agricultural and Processed Food Products Export Development Authority Act, 1985
- Agricultural Produce (Grading and Marking) Act 937 (Act No. 1 of 1937) as amended up to 1986.
- The Packaged Commodities Order 1975
- Essential Commodities Act, 1955
- The Environment (Protection) Act,1986
- National Environment Policy, 2006
- Fruit Protection Act 1935
- The Air (Prevention & Control of Pollution) Act, 1981
- Standards of Weights and Measures Act, 1976
- Fruit Nurseries Registration Act, 1973
- Warehouse Act
- Post harvest handling and cold chain management and procession
- National Horticultural Mission (NHM).
- Health and Safety at Work etc Act 1974
- IPM Act & Regulation 2004
- The MSW (M&H) Rules,2000
- Insecticides Act, 1968
- HP Agricultural Pests, diseases & Noxious weeds Act 1969
- IPM Act & Regulation 2004
- Fertilizer control order 1985 Act
- District Institutes of Education and Training (DIETs)
- Pradhan Mantri Gramodya Yojana (PMGY)
- National Policy on Education, 1986.

Reference

- Department of Agriculture
- Department of Horticulture
- HP Agriculture Marketing Board
- HPMC
- Districts Statistical Abstract
- HP Statistical Hand Book
- Department of Transport and Department of Planning

CHAPTER 9 RURAL PLANNING

9.1 Resource inventory of existing assets of the sector

Rural development and poverty alleviation have been the major areas of concern and thrust for the nation since independence. The Community Development Programme consisting of various sets of schemes was launched on 2nd October, 1952 throughout the country with the objective of overall development of rural areas with the active participation of the community. Development Blocks were created and considered pivotal for planning and implementation of various rural development schemes.

The State Rural Development Department is engaged in the implementation of different rural development and poverty alleviation programmes. Development Blocks are the pivot for planning and implementation of various rural development schemes.

The most important aim of planning is to identify a process of development which will raise living standards and create new opportunities for a richer and more prosperous life. The basic objectives of planning can be grouped under four heads namely growth, modernization, self reliance and social justice. In one form or another but possibly with varying emphasis, these objectives reflect the views of all sections of the population and represent a national consensus on the aim of planning.

Table 1 describes the demographic features of the state. The population of the Himachal Pradesh as per 2011 census is 68, 56, 509 of which 34, 73,892 are male and 33, 82, 617 are females. There are 974 females per 1000 males recorded in 2011 as against 968 per 1000 males in 2001. The percentage decadal growth during 2001-11 is 12.81 as against 17.54 during 1991-11. The density of population rose from 109 per sq km in 2001 to 123 per sq km in 2011. Himachal Pradesh has the highest percentage of rural population among all the States of the country.

Himachal Pradesh is a small hilly State with very little flat land. At present out of 59 towns, 40 towns are located in valleys, 13 on hill tops, 2 on spurs and 2 in the gaps. The towns of Himachal Pradesh have small populations, and may be considered insignificant if compared with the cities and the towns in the rest of the country. Nevertheless, the towns of Himachal Pradesh are important due to their unique characteristics and their tourism Potential.

Table 1: Area and population (2011 Census)

Sr. No.	District	Area (sq.km.)	Population Total	Population Rural	Population Urban	Population Density
1.	Bilaspur	1,167	382056	356930	25126	327
2.	Chamba	6,528	518844	482653	36191	80
3.	Hamirpur	1,118	454293	422880	31413	406
4.	Kangra	5,739	1507223	1420864	86359	263
5.	Kinnaur	6,401	84298	84298	-	13
6.	Kullu	5,503	437474	396216	41258	79
7.	Lahaul & Spiti	13,835	31528	31528	-	2
8.	Mandi	3,950	999518	936894	62624	253
9.	Shimla	5,131	813384	611884	201500	159
10.	Sirmaur	2,825	530164	472926	57238	188
11.	Solan	1,936	576670	474592	102078	298
12.	Una	1,540	521057	476140	44917	338
	H.P.	**55,673**	**6856509**	**6167805**	**688704**	**123**

Source:- Census of India, 2011

Literacy Rate: The proportion of total literates in the state (83.78%) is higher than the all-India average of 74.04%, according to the 2011 census. Table 2 shows that the literacy rate in Himachal increased by 13.37% from 1991 to 2001 and by 6.65% during the last 10 years.

Table 2: Literacy Rate, 1951-2011

Year	Persons	Males	Females
1951	7.98	-	-
1961	21.3	-	-
1971	31.96	43.19	20.23
1981	42.48	53.19	31.46
1991	63.86	75.36	52.13
2001	77.13	86.02	68.08
2011	83.78	90.83	76.60

Source: Census of India, Provisional Population Totals, Paper 1 of 2011, Himachal Pradesh.
*Note: * Excludes 0-6 population.*

Table 3 shows that Chamba district has the lowest literacy rate, followed by Lahaul & Spiti and Sirmaur district. The highest literacy rate found in Hamirpur followed by Una districts The other districts with literacy rates above the state average of 83.78% are Kangra, Bilaspur, Solan and Shimla.

Table 3: Literacy Rates by Residence and Sex, 2011

State/district	Total		
	Person	Male	Female
Chamba	73.19	84.19	62.14
Kangra	86.49	92.55	80.62
Lahaul & Spiti	77.24	86.97	66.5
Kullu	8014	88.8	71.01
Mandi	82.81	91.51	74.33
Hamirpur	89.01	95.28	83.44
Una	87.23	92.75	81.67
Bilaspur	85.67	92.39	78.9
Solan	85.02	91.19	78.02
Sirmaur	79.98	86.76	72.55
Shimla	84.55	90.73	77.8
Kinnaur	80.77	88.37	71.34
HP	**83.78**	**90.83**	**76.6**

Source: Census of India, Provisional Population Totals, Paper 2 of 2011, Himachal Pradesh.

Table 4 describes decadal variation of literacy rates from 1991 to 2011, It can be inferred that, Himachal Pradesh has tremendously improved its literacy percentage of both Male and Female. However, the literacy of females in some districts needs particular government attention.

Table 4: District-wise literacy rates

District	Literacy Rates (%)								
	Male			Female			Total		
	1991	2001	2011	1991	2001	2011	1991	2001	2011
Bilaspur	77.97	87.13	92.39	56.55	70.53	78.9	67.17	78.8	85.67
Chamba	59.96	77.22	84.19	28.57	49.7	62.14	44.7	63.73	73.19
Hamirpur	85.11	90.86	95.28	65.9	76.41	83.44	74.88	83.16	89.01
Kangra	80.12	88.19	92.55	61.39	73.57	80.62	70.57	80.68	86.49
Kinnaur	72.04	N.A.	88.37	42.04	N.A.	71.34	58.36	N.A.	80.77
Kullu	69.64	84.55	88.8	38.53	61.24	71.01	54.82	73.86	80.14
Lahaul & Spiti	71.78	82.76	86.97	38.05	60.94	66.5	56.82	73.17	77.24
Mandi	76.65	86.67	91.51	49.12	65.36	74.33	62.74	75.86	82.81
Shimla	75.96	87.72	90.73	51.75	70.68	77.8	64.61	79.68	84.55
Sirmaur	63.2	79.73	86.76	38.45	60.93	72.55	51.62	70.85	79.98
Solan	74.67	85.35	91.19	50.69	67.48	78.02	63.3	77.16	85.02
Una	81.15	88.49	92.75	61.01	73.85	81.67	70.91	81.09	87.23
HP	**75.36**	**86.02**	**90.83**	**52.13**	**68.08**	**76.6**	**63.86**	**77.13**	**83.78**

Source: Census of India, 2011

Table 5 describes the educational infrastructure from 1999 till 2009 at primary / junior, middle / senior, high/higher secondary and college level.

Table 5: Educational Institutions

Year	Primary/Junior Basic*	Middle/Senior Basic	High/Higher Secondary & +2	Colleges of general Education
1999-00	10,633	1486	1,484	37
2000-01	10,633	1,672	1,506	37
2001-02	10,633	1,673	1,514	40
2002-03	10,650	1,814	1,524	40
2003-04	10,651	2,192	1,580	40
2004-05	10,652	2,193	1,647	41
2005-06	10,613	2,112	1,654	47
2006-07	10,607	2,168	1,851	65
2007-08	10,734	2,299	2047	68
2008-09	10,738	2291	2,058	67
2009-10	10,751	2339	2100	67

Source: - Statistical Outline, HP-2010

Table 5 indicates that number of educational institutions have increased gradually during the last ten years. Table 6 describes the status of technical medical and other institutions of higher learning.

Table 6: Number of Recognized Institutions (Other than schools)

Type of Institutions	2008-09		2009-10	
	Govt.	Private	Govt.	Private
Universities	3	3	3	8
Art & Science Colleges	64	29	64	29
Medical Colleges	3	0	3	0
Colleges of Education	4	67	4	69
Sanskrit Institutions	5	18	5	18
Teachers Training Schools	12	0	12	15
Law Colleges	2	5	3	6
Poly-Technic Institutions	8	17	9	17
Dental Colleges	1	4	1	4

Source: - Statistical Outline, HP-2010

Table 7 & Table 8 describe health infrastructure in the state. Table 7 describes the public and private hospitals empanelled under Rashtriya Swasthya Bima Yojana (RSBY) in the state in 2010.

Table 7: List of Public and Private Hospitals empanelled under RSBY in Himachal Pradesh

Sr. No.	District	No. of Inst./Hospitals	Area	
			Rural	Urban
1	Bilaspur	7	5	2
2	Chamba	12	9	3
3	Kullu	7	4	3
4	Kangra	20	11	9
5	Shimla	19	8	11
6	Solan	9	5	4
7	Hamirpur	7	4	3
8	Lahaul & Spiti	5	5	0
9	Mandi	17	12	5
10	Kinnaur	5	4	1
11	Sirmaur	8	5	3
12	Una	8	5	3

Source:- http://hphealth.gov.in/2010BasicPackageRSBY.pdf

Table 8 describes district wise public health centres (PHC) in rural areas in the state.

Table 8: District-wise Public Health Institutions

Sr. No.	District	Hospitals	AHC	HHC	UHC	AC	NCC	Total
1	Bilaspur	2	65	2	-	-	-	69
2	Chamba	2	100	2	-	-	-	104
3	Hamirpur	3	69	1	-	-	-	73
4	Kangra	5	228	1	1	-	-	235
5	Kinnaur	1	40	1	-	2	-	44
6	Kullu	1	65	1	-	-	-	67
7	Lahaul & Spiti	1	20	1	-	2	-	24
8	Mandi	2	163	1	-	-	-	166

Sr. No.	District	Hospitals	AHC	HHC	UHC	AC	NCC	Total
9	Shimla	3	144	1	1	-	-	149
10	Sirmaur	1	78	1	-	-	-	80
11	Solan	1	77	1	1	-	-	80
12	Una	3	69	1	-	-	1	74
	Total	**25**	**1118**	**14**	**3**	**4**	**1**	**1165**

Source: Department of ISMH

Note: AHC: Ayurvedic Health Centre; HHC: Homeopathy Health Centre; UHC: Unani Health Centre; AC: Amchi Clinic; NCC: Nature Cure Centre

Table 9 & Table 10 describe status of drinking water infrastructure in the state.

Table 9: Status of drinking water facility (Census 2001)

District	% of water available
Chamba	99.1
Bilaspur	99.8
Hamirpur	99.8
Kangra	99.8
Kinnaur	52.6
Kullu	100
Lahaul & Spiti	92.7
Mandi	100
Shimla	98.8
Sirmaur	98.4
Solan	97.2
Una	99.1

Table 10: Different Sources of Drinking Water (Rural)

District	Type of Area	Population	Total No of Household	Source of drinking water				No. of Households being served by safe drinking water source
				Tap	Hand pump	Tubewell	Well	
Chamba	Total	460,887	87,699	76,952	1,120	60	512	78,644
	Rural	426,345	80,574	70,159	1,017	52	510	71,738
	Urban	34,542	7,125	6,793	103	8	2	6,906
Kangra	Total	1,339,030	272,697	220,154	16,571	1,206	19,843	257,774
	Rural	1,266,745	257,467	205,599	16,372	1,190	19,727	242,888
	Urban	72,285	15,230	14,555	199	16	116	14,886
Lahaul & Spiti	Total	33,224	9,155	7,803	533	3	25	8,364
	Rural	33,224	9,155	7,803	533	3	25	8,364
	Urban	0	0	0	0	0	0	0
Kullu	Total	381,571	78,362	68,731	1,047	44	1,242	71,064
	Rural	351,478	70,565	61,355	843	41	1,218	63,457
	Urban	30,093	7,797	7,376	204	3	24	7,607
Mandi	Total	901,344	186,571	170,740	2,603	274	5,638	179,255
	Rural	840,362	171,299	155,962	2,437	269	5,525	164,193
	Urban	60,982	15,272	14,778	166	5	113	15,062
Hamirpur	Total	412,700	87,596	74,037	4,962	151	6,168	85,318
	Rural	382,494	81,097	68,445	4,283	135	6,043	78,906
	Urban	30,206	6,499	5,592	679	16	125	6,412
Una	Total	448,273	88,869	70,464	8,515	1,660	7,312	87,951
	Rural	408,849	80,790	63,890	7,779	1,197	7,056	79,922
	Urban	39,424	8,079	6,574	736	463	256	8,029
Bilaspur	Total	340,885	67,195	56,357	3,030	173	2,947	62,507

District	Type of Area	Population	Total No of Household	Source of drinking water				No. of Households being served by safe drinking water source
				Tap	Hand pump	Tubewell	Well	
Solan	Rural	318,934	61,648	50,993	2,924	170	2,908	56,995
	Urban	21,951	5,547	5,364	106	3	39	5,512
	Total	500,557	98,519	78,034	3,219	1,951	5,227	88,431
Sirmaur	Rural	409,362	77,414	58,205	2,857	1,431	5,161	67,654
	Urban	91,195	21,105	19,829	362	520	66	20,777
	Total	458,593	82,543	60,450	5,967	435	4,243	71,095
Shimla	Rural	410,923	72,664	51,217	5,702	390	4,163	61,472
	Urban	47,670	9,879	9,233	265	45	80	9,623
	Total	722,502	160,646	142,661	1,539	192	5,624	150,016
Kinnaur	Rural	555,269	114,066	98,406	928	160	5,275	104,769
	Urban	167,233	46,580	44,255	611	32	349	45,247
	Total	78,334	20,781	17,347	166	9	240	17,762
	Rural	78,334	20,781	17,347	166	9	240	17,762
	Urban	0	0	0	0	0	0	0
State Total	**Total**	**6,077,900**	**1,240,633**	**1,043,730**	**49,272**	**6,158**	**59,021**	**1,158,181**
	Rural	**5,482,319**	**1,097,520**	**909,381**	**45,841**	**5,047**	**57,851**	**1,018,120**
	Urban	**595,581**	**143,113**	**134,349**	**3,431**	**1,111**	**1,170**	**140,061**

Table 10 indicates that well is the major source of drinking water accounting for 52% of source followed by 43% by tap and 5% by hand pumps. Data on taps also indicate the coverage of population by piped water supply.

Sewage: The Government of Himachal Pradesh has launched a comprehensive strategy to tackle the sanitation challenge based on motivating rural communities to end the traditional practice of open defecation and adopt safe sanitation through implementation of the Total Sanitation Campaign (TSC). There has been a remarkable increase in rural sanitation coverage from less than 30% in 2001 to close to 85% in 2009. Under the Nirmal Gram Puraskar (NGP), awards won by Gram Panchayats from the state had increased from 'nil' in 2005 to 267 Nirmal Gram Panchayats in 2008. To further encourage Gram Panchayats which have done excellent work in sanitation, an annual state competition called *Maharishi Valmiki Sampoorna Swachata Puraskar (MVSSP)*is being implemented in the state since 2007. This competition selects the cleanest Gram Panchayat at all the administrative tiers i.e. block, district, division and state levels in a competitive manner and recognizes and rewards the efforts of the village communities (winners at Divisional and State level) during Independence Day celebrations each year. School and Anganwadi Sanitation and Hygiene Education (SHE) is one of the key components of the Total Sanitation Campaign and offers opportunities to create functional sanitation facilities in schools and adoption of safe sanitation practices by the students. In order to ensure sustainable sanitation and hygiene outcomes in schools across the state, it is proposed to launch a competition based reward scheme at block and district levels for the cleanest Schools. Introduction of a reward scheme for schools would help recognize those Schools whose efforts and outcomes have helped achieve the goal of*Nirmal Himachal*, as well as create the future citizens of the Nirmal State.

Animal Husbandry

The status of animal husbandry has been described during 1997, 2003 & 2007 in Table 11. Table 11 indicates that overall livestock population has increased in the state. The population of cross bred cattle has increase while the population of indigenous cattle has decreased. The population of female buffaloes is

showing declining trend. The population of sheep is showing declining trend while the population of goat has increased. Population of poultry also showing increasing trend.

Table 11: Livestock and Poultry

Livestock and poultry	Livestock census 1997	2003	2007
1. Cattles			
(a) Cross Bred Cattle	5,38,402	6,50,743	8,02,683
1. Bulls	1,56,614	1,34,779	1,50,767
(i) Under 1 year	23,452	42,040	61,545
(ii) Upto to 1 to 2.5 years	24,679	21,354	19,803
(iii) Over 2.5 years	1,08,483	71,385	69,419
Used for breeding only	8,037	2,777	2,810
Used for work only	84,408	65,767	52,352
Others	16,038	2,841	14,257
2. Cows	3,81,788	5,15,964	6,51,916
(i) Under 1 year	74,021	1,02,638	1,24,486
(ii) Up to 1 to 2.5 years	62,251	70,514	88,127
(iii) Over 2.5 years	2,45,516	3,42,812	439303
In milk	1,75,180	2,43,206	315965
Dry	55,020	76,142	93296
Others	15,316	44,277	30,042
(b) Indigenous cattle	14,63,424	15,45,795	14,76,197
1. Bulls	7,72,639	7,90,356	7,42,280
(i) Under 1 year	64,217	63,078	7,04,93
(ii) Up to 1 to 2.5 years	94,196	78,676	84,720
(iii) Over 2.5 years	6,14,226	6,48,602	5,87,067
Used for Breeding only	50,794	9,738	10,505
Used for work only	4,77,549	6,11,053	4,91,415
Others	85,883	27,811	85,147
2. Cows	6,90,785	7,55,439	7,33,917
(i) Under 1 year	1,25,971	1,29,182	1,28,005
(ii) Up to 1 to 2.5 years	1,15,826	1,08,944	97872
(iii) Over 2.5 years	4,48,988	5,17,313	5,08,040
In milk	2,88,693	2,77,948	2,91,247
Dry	1,20,404	1,97,860	1,68,684
Others	39,891	41,505	48,109
Total Cattle (a+b)	20,01,826	21,96,538	22,78,880
II. Buffaloes			
(a) Male	43,820	47,140	58,179
(i) Under 1 year	21,280	33,122	45,780
(ii) Upto 1 to 3 years	14,169	8,299	6,926
(iii) Over 3 years	8,371	5,719	5,473
Used for Breeding only	4,633	4,235	3,857
Used for work only	2,136	981	1,139
Others	1,602	503	477
(b) Females	6,08,553	7,26,089	7,03,410
(i) Under 1 year	84,785	1,23,745	1,22,965
(ii) Upto 1 to 3 years	98,666	1,02,149	1,03,550
(iii) Over 3 years	4,25,102	5,00,195	4,76,895
In milk	3,02,299	3,39,338	3,34,114
Dry	1,02,096	1,26,244	1,13,523
Others	20,707	34,613	29258
Total Buffaloes (a+b)	6,52,373	7,73,229	7,61,589
IV Goats	9,46,529	11,15,587	12,40,836

Livestock and poultry	Livestock census 1997	2003	2007
V Horses and Ponies	22,026	17,144	13155
VI Other livestock			
(i) Mules	24,404	23,938	18,985
(ii) Donkeys	6,639	8,859	7,376
(iii) Camels	168	137	56
(iv) Pigs	4,670	2,795	2,493
(v) Yaks	2,548	1,590	1,705
(vi) Mithuns	731	200	14
(vii) Rabbits	-	4,393	6,620
Total Livestock**	**45,70,745**	**50,46,044**	**52,26,388**
VII Poultry	8,64,055	7,64,136	8,09,132
VIII Dogs	1,70,147	2,08,254	2,11,900

Source: Statistical Outline HP, 2010

Table 12 indicates district wise available land resources.

Table 12: District wise Land Resources (ha)

	Land Resources									
	Total Geographical Area			Not available for cultivation			Other Cultivable land excluding current fallows			
Year/District	By professional survey	By village Survey	Forests	Barren and Un-culturable land	Land put to non-agricultural uses	Total	Culturable waste	Permanent pastures and other grazing land	Land under misc. tree crops, etc.	Total
1998-99	5,567.30	4,530.2	1,092.40	905.8	233.1	1,138.90	107.4	1,491.0	67	1,665.40
1999-00	5,567.30	4,531.8	1,094.20	856.9	302.2	1,159.10	119.4	1,471.5	64.2	1,655.10
2000-01	5,567.30	4,547.3	1,093.50	807.2	313.7	1,120.90	124.5	1,529.2	56.8	1710.5
2001-02	5,567.30	4,542.8	1,098.70	806.6	317.5	1,124.10	122.1	1,518.7	60.2	1701
2002-03	5,567.30	4,543.1	1,099.60	806.2	453.5	1,125.50	122.2	1,518.0	58	1,698.20
2003-04	5,567.30	4,544.1	1,099.10	672.5	453.5	1,126.00	128.4	1,515.0	62.5	1,705.90
2004-05	5,567.30	4,544.7	1,101.10	671.9	458.1	1,130.00	127.2	1,500.5	68.6	1,696.30
2005-06	5,567.30	4,545.3	1100.8	647.8	481	1,128.80	131.5	1,499.9	68.1	1,699.50
2006-07	5,567.30	4,544.4	1099.7	653.5	471.6	1125.1	128	1,514.0	61.1	1,703.10
2007-08	5,567.30	4,389,704.0	1083121	657505	444133	1101638	123214	1,434,256.0	67028	1,624,498.00
Bilaspur	116.7	111776	14013	4395	14931	19326	6169	38890	144	45203
Chamba*	651.5	692420	272008	5241	12827	18068	6443	351155	17	357615
Hamirpur	111.8	110221	18282	13581	17081	30662	12179	6914	1	19094
Kangra	573.9	577681	232485	14619	77647	92266	29070	87495	8275	124840
Kinnaur	655.3	624215	37530	133335	117743	251078	3488	322281	116	325885
Kullu*	550.3	54754	877	1169	6589	7758	2416	1437	1830	5683
Lahaul & Spiti	1,369.30	911195	135369	415831	135760	551591	597	220097	127	220821
Mandi	395.1	397823	175229	20967	4141	25108	4503	96254	341	101098
Shimla*	513.1	508900	130411	15681	16638	32319	21234	228567	11817	261618
Sirmaur	282.6	224743	48313	8529	10464	18993	12531	56941	37307	106779
Solan	193.7	21053	451	1925	1488	3413	1402	11636	3	13041
Una	154	154923	18153	22232	28824	51056	23182	12589	7050	42821

Source: Statistical Outline HP, 2010

Table 13, Table 14, Table 15 and Table 16 describe the transport and road infrastructure in the state till 2009 – 10. Chamba, Kullu & Solan districts show significant gap between current and required road density. Overall road and transport infrastructure has increased in the state.

Table 13: Transport & Communication Roads Including National Highways

Year	Motorable		Jeepable	Less than Jeepable	Total
	Double Lane	Single Lane			
As on 31st March					
1999	2,309	18,491	1,001	4,572	26,373
2000	2,329	19,145	950	4,310	26,734
2001	2,332	19,874	906	4,105	27,217
2002	2,336	20,427	781	3,959	27,503
2003	2,336	21,100	598	3,771	27,805
2004	2,344	21,648	481	3,611	28,084
2005	2,355	22,567	442	3,103	28,467
2006	2,369	23,599	390	2,653	29,011
2007	2,374	25,210	381	2,299	30,264
2008	2,374	26,783	365	1,990	31,512
2009	2,377	27,925	345	1,803	32,450
2010	2384	28832	300	1655	33171

Source: Statistical Outline HP, 2010

Table 14: District wise roads Length (2009-10)

District	Motorable		Jeepable	Less than Jeepable	Total
	Double Lane	Single Lane			
Bilaspur	128	1390	0	10	1528
Chamba	96	2070	265	685	3116
Hamirpur	52	1696	0	0	1748
Kangra	468	4892	1	8	5369
Kinnaur	177	571	15	240	1003
Kullu	128	1455	3	50	1636
Lahaul & Spiti	260	934	2	18	1214
Mandi	191	4587	10	468	5256
Shimla	339	4637	2	17	4995
Sirmaur	216	2621	1	75	2913
Solan	173	2429	1	84	2687
Una	156	1520	0	0	1706

Source: Statistical Outline HP, 2010

Table 15: District Level Connectivity of Roads

District	Position as on 31.03.09				For complete Connectivity	
	2008-09	2008-09	2008-0	Road density	Required Density	Total road length Kms.
	Metalled	Unmetalled	Total	per 100 Sq.Km. of Area	per 100 Sq.Km. of Area	Total
Chamba	1098	987	2085	31.94	69.91	4564
Bilaspur	1036	437	1473	126.22	133.76	1561
Hamirpur	1352	362	1714	153.31	169.23	1892
Kangra	4080	1188	5268	91.79	116.83	6705
Kinnaur	439	287	726	11.34	13.92	891
Kullu	765	747	1512	27.48	40.78	2244

District	Position as on 31.03.09				For complete Connectivity	
	2008-09 Metalled	2008-09 Unmetalled	2008-0 Total	Road density per 100 Sq.Km. of Area	Required Density per 100 Sq.Km. of Area	Total road length Kms. Total
Lahaul & Spiti	512	657	1169	8.45	10.27	1421
Mandi	2166	2440	4606	116.61	157.22	6210
Shimla	2000	2820	4820	93.94	103.16	5293
Sirmaur	1123	1641	2764	97.84	116.60	3294
Solan	1263	1244	2507	129.49	165.81	3210
Una	1456	202	1658	107.66	114.29	1760
H.P.	**17290**	**13012**	**30302**	**54.43**	**70.13**	**39045**

Table 16: Road Density in HP

District	Existing Road density (till 31.03.09) per 100 Sq. Kms of Area	Complete connectivity		
		Required Density per 100 Sq. Km. of Area	Length (Km)	Year of Completion
Chamba	31.94	69.91	4564	2043
Bilaspur	126.22	133.76	1561	2012
Hamirpur	153.31	169.23	1892	2012
Kangra	91.79	116.83	6705	2021
Kinnaur	11.34	13.92	891	2021
Kullu	27.48	40.78	2244	2023
Lahaul & Spiti	8.45	10.27	1421	2020
Mandi	116.61	157.22	6210	2020
Shimla	93.94	103.16	5293	2013
Sirmaur	97.84	116.60	3294	2016
Solan	129.49	165.81	3210	2020
Una	107.66	114.29	1760	2014
Himachal Pradesh	**54.43**	**70.13**	**39045**	**2020**

Rural Electrification: In Himachal Pradesh, out of the population of 5.2 millions, 91% population is residing in villages, similarly out of 9,59,453 number households in the State 8,53,130 households (89%) are rural households. Considering it as a social compulsion, Himachal Pradesh, through HPSEB, completed 100% electrification of its villages way back in the year 1988. As per 1991 census, the number of villages have increased.

16,997 villages are further identified and out of which 16,891 Nos. (99.37%) have been electrified till March 2004. Out of 4182 identified hamlets 4009 (95.86%) stand electrified as on March 2004.

9.2 Patterns of planning and development in the sector

A number of rural development programs are being implemented in the state. The details of these programmes are given below.

1. Community Development Programme: The present set up of the schemes under Community Development Programme is based on old community development concept, which aims at the development of community with the initiative and participation of the community itself. The grant -in-aid is being provided to the Panchayat Samitis under the head "Social Education" and "General Education" for developmental activities in the social educational fields. Funds are provided to the Blocks for the construction/ completion of

staff residential buildings and Gram Sewak huts. Besides, the funds are also provided for completion of on-going office buildings. Provision of funds is made for providing staff salary of the employees posted at various levels. Grants are also provided for the promotion / strengthening of Mahila Mandals, incentive awards to Mahila Mandals and organisation of awareness camps for non-officials etc. During the year 2008-09, an amount of Rs. 1227.87 lakh was spent on the above set of schemes up to 31st March, 2009.

2. Swarnjayanti Gram Swarozgar Yojana (SGSY): "Swaranjayanti Gram Swarozgar Yojana" has been launched from the year 1999-2000. This Yojana is a holistic package covering all aspect of self-employment such as organisation of poor into Self Help Groups, Training, Credit, Technology, Infrastructure and Marketing. The beneficiaries under this scheme are called "Swarozgaries". The objective of SGSY is to bring the assisted poor families above the poverty line, by providing them income-generating assets. This scheme is a credit-cum-subsidy programme. Subsidy under SGSY is uniform at 30% of the project cost subject to a maximum limit of Rs.7500/-. In respect of SCs / STs and disabled persons, the maximum limit is 50% and Rs.10000/- respectively. For groups of swarozgaries (SHGs), the subsidy is 50% of the project cost subject to per capita subsidy of Rs.10, 000/- or Rs.1.25 lakhs whichever is less. The focus of SGSY is on the vulnerable groups among the rural poor. Accordingly, the SC/STs account for 50% of swarozgaries, women for 40%, the disabled for 3% and minority community for 15%. The scheme is being implemented on 75:25 cost sharing basis between Central and State Government. Table 17 and Table 18 describe the status of district wise financial progress of SGSY in 2008-09.

Table 17: The district wise financial progress during the year 2008-09

(Rs. in Lakh)

Sr. No.	District	Target of credit mobilization(Rs in Lakh)	Credit disbursed to (Rs. in Lakh)		Total(Rs. in lakh)	Subsidy disbursed to (Rs. in Lakh)		Total(Rs. in Lakh)
			SHGs	Individual		SHGs	Individual	
1	Bilaspur	118.13	168.85	52.49	221.34	55.66	10.85	66.51
2	Chamba	316.11	415.01	149.17	564.18	96.73	29.91	126.64
3	Hamirpur	132.96	155.41	101.56	256.97	40.42	16.98	57.40
4	Kangra	430.97	624.55	115.95	740.498	184.40	20.55	204.95
5	Kinnaur	19.24	25.65	7.86	33.51	6.74	2.55	9.29
6	Kullu	76.77	154.54	19.49	174.03	42.52	3.31	45.83
7	Lahaul & Spiti	16.35	0.00	13.42	13.42	0.00	4.70	4.70
8	Mandi	281.68	431.44	111.38	542.82	115.21	23.38	138.59
9	Shimla	215.88	292.37	127.75	420.12	73.07	22.48	95.55
10.	Sirmaur	93.32	136.38	48.90	185.287	44.25	10.42	54.67
11.	Solan	119.10	112.41	128.88	241.29	28.44	22.83	51.27
12.	Una	103.51	146.30	61.31	207.61	37.18	11.84	49.02
Total		**1924.02**	**2662.91**	**938.16**	**3601.075**	**724.62**	**179.80**	**904.42**

Table 18: District Wise detail of Swarozgaries Assisted in SHGs and Individuals benefited for the year 2008-09

Sr. No.	District	No. of SHGs formed	SHGs taken up economic activity	No. of members in SHGs				Dis-abled	individual Swarozgaries assisted				Dis-abled
				Total	SC	ST	Women		Total	SC	ST	Women	
1	Bilaspur	22	46	530	200	11	432	1	131	53	0	63	1
2	Chamba	93	161	1408	310	363	466	28	372	91	112	59	8
3	Hamirpur	62	53	649	281	0	633	5	228	93	0	78	8
4	Kangra	253	232	2510	856	134	2259	24	254	91	12	41	17

Sr. No.	District	No. of SHGs formed	SHGs taken up economic activity	No. of members in SHGs				Dis-abled	individual Swarozgaries assisted				Dis-abled
				Total	SC	ST	Women		Total	SC	ST	Women	
5	Kinnaur	4	12	95	70	25	46	0	26	16	10	7	0
6	Kullu	515	70	622	310	16	382	12	39	23	0	7	3
7	Lahaul & Spiti	0	0	12	0	12	12	0	58	0	58	20	0
8	Mandi	141	148	1463	614	16	982	13	253	194	0	34	3
9	Shimla	86	102	1044	539	0	685	5	270	102	0	38	4
10.	Sirmaur	40	56	515	224	0	453	12	136	40	8	41	11
11.	Solan	117	30	421	236	9	380	0	258	132	23	93	0
12.	Una	69	48	407	110	12	353	0	162	25	2	59	0
Total		**1402**	**958**	**9676**	**3750**	**598**	**7083**	**100**	**2187**	**860**	**225**	**540**	**55**

3. SGSY Special Projects

a. Installation of Hydrams: The Government of India has approved a Project for Installation of 400 Hydrams under SGSY Special Project Component with a total Project Cost of Rs. 1047.20 Lakhs which includes subsidy of Rs. 770.48 Lakhs, Rs. 161.40 Lakhs as loan component and Rs. 115.32 lakhs as beneficiaries share. The subsidy component will be shared by Centre and State Government on 75:25 sharing basis. Up to March 2006, 268 Hydrams have been procured out of which 208 Hydrams have been installed. Rs. 376.116 Lakhs have been spent on the installation of Hydrams.

b. Marketing of Rural Goods: The Government of India has approved a Project titled Marketing of Rural Goods in Himachal Pradesh under SGSY Special Project Component with a total Project Cost of Rs. 914.52 Lakhs which includes subsidy of Rs.769.52 Lakhs, Rs. 145.00 Lakhs as loan component. Centre and State Government will share the subsidy component on 75:25 sharing basis. Under this project 50 Himachal Gramin Bhandars and 1 Central Gramin Bhandar will be constructed in the State. Up to March 2006, construction work of 10 Gramin Bhandars has been completed, 8 are near completion and construction work at 12 sites is in progress. So far an expenditure of Rs. 290.06 Lakhs has been incurred.

c. Gold Mines Project: The Government of India has approved a Project titled "Gold Mines in Bilaspur" District under SGSY Special Project Component with a total Project Cost of Rs. 840.35 lakh which includes subsidy of Rs.327.76 lakh, and Rs. 512.59 lakh as loan component. Centre and State Government will share the subsidy component on 75:25 sharing basis. Under this project three activities viz., Floriculture, Sericulture and Mushroom Cultivation are being taken. Up to March 2006 and expenditure of Rs. 203.66 lakh have been incurred. 385 beneficiaries have been benefited under floriculture, Sericulture and Mushroom cultivation.

d. Milch Livestock Improvement : The Government of India has approved a Project titled Milch Live Stock Improvement for District Solan under SGSY Special Project Component with a total Project Cost of Rs. 886.95 lakhs which includes subsidy of Rs.715.15 lakhs, Rs. 171.80 lakhs as loan component. Centre and State Government will share the subsidy component on 75:25 sharing basis. Under this Project activities for the development of Dairy Farm will be taken up. So far Rs.286.054 lakhs have been provided to DRDA Solan for the implementation of this project. Rs. 261.50 lakhs have been spent up to March, 2006. Under this project 9595 cattles have been treated in 95 field levels camps and 12273 breeders have been trained. Besides this 6715 quintals fodder seed have also been distributed to the farmers.

e. Rural Development through Diversification in Agriculture: The Government of India has approved a Project titled Rural Development through Diversification in Agriculture under SGSY Special Project Component with a total Project Cost of Rs. 1385.32 lakhs which includes subsidy of Rs.1086.25 lakh, Rs. 299.07 lakhs as loan component. Centre and State Government will share the subsidy component on 75:25 sharing basis. Under this Project the following activities have been undertaken:-

1.u Cultivation of Medicinal plants, Aromatic plants, Flowers and Orchids
2.u Sericulture
3.u Innovative practices in Animal Husbandry

So far Rs.481.60 lakhs have been provided to DRDA Mandi for implementation of this project. Out of which an expenditure of Rs. 512.10 lakhs has been incurred up to March, 2006. Under Cultivation of Medicinal plants, Aromatic plants, Flowers and Orchids components of this project 10 poly houses have been constructed. One tissue culture laboratory at Chontra is under construction and one oil extraction unit at Sauli khud has been constructed. Under Sericulture component 3 technical service stations have been established and 3 nurseries are also being established. Under Innovative practices in Animal Husbandry component of the project all the 105 non AI centres, have been converted into AI centres.

f. Self Reliance through Sericulture and Dairy Development The Government of India has approved a Project titled Self Reliance through sericulture and Dairy Development for District Hamirpur under SGSY Special Project Component with a total Project Cost of Rs. 1499.981 lakhs which includes subsidy of Rs. 993.371 lakhs, Rs. 506.61 lakhs as loan component. Centre and State Government will share the subsidy component on 75:25 sharing basis. Under this Project Sericulture and Dairy Development will be taken up. So far Rs. 784.93 lakhs have been provided to DRDA Hamirpur for the implementation of this project. Out of which an expenditure of Rs. 403.24 lakhs have been incurred up to March, 2006. Under Sericulture component of the project 62 Self Help Groups have been provided assistance. Under Dairy Development component fodder seeds and mineral mixture have also been distributed to the farmers besides organising training camps.

g. Green Gold: The Government of India has approved a Project titled Green Gold in respect of District Chamba under SGSY Special Project Component with a total Project Cost of Rs.1488.73 lakhs which includes subsidy of Rs.1361.23 lakh, Rs. 127.50 lakhs as loan component and beneficiaries share. Centre and State Government will share the subsidy component on 75:25 sharing basis. Under this Project the following activities will be undertaken:-

1. Cultivation of Medicinal plants, Aromatic plants, Flowers and Orchids
2. Cultivation of Off Season vegetables.
3. Cultivation of Mushroom
4 Improved Dairy Management

So far Rs.544.491 lakh have been provided to DRDA Chamba for the implementation of this project, out of which Rs. 342.07 lakh have been spent up to March, 2006. Under Cultivation of Medicinal plants, Aromatic plants, Flowers and Orchids component of the project. 6 numbers nurseries have been established and 165 SHGs have been trained. Under Cultivation of off Season vegetables components 6 nurseries have been established and fertilizers, seeds and chemicals etc. have been provided to the farmers. Under Cultivation of Mushroom component 8 SHGs have been imparted training. Under Improved Dairy Management component of the project various training and workshops have been organised and fodders seeds have also been provided to the farmers.

h. Intensive Dairy Development Project: The Government of India has approved a

Project titled Intensive Dairy Development Project for District Kangra under SGSY Special Project Component with a total Project Cost of Rs 1301.25 lakh which includes subsidy of Rs.1151.40 lakh, Rs. 149.85 lakh as loan component and beneficiaries share. Centre and State Government will share the subsidy component on 75:25 sharing basis. Under this Project Dairy Development activity will be taken up. So far Rs.460.56 lakh have been provided to DRDA Kangra for the implementation of this project out of which Rs. 370.708 lakh have been spent up to March, 2006.

i. Skill Development of Rural Youths through Gramin Labs: The Government of India has approved a project titled, "SKILL DEVELOPMENT OF RURAL YOUTHS THROUGH GRAMEEN LABS" for the State as a whole with a total Project cost of Rs.250.00 lakh. This project is 100% centrally sponsored. Under this project total of 5000 rural youths will be trained as per their requirement. The project is being implemented through Dr. Reddy's foundation, Hyderabad. For the implementation of this project funds to the tune of Rs. 100.00 lakhs have been so far released by the Government of India.

The Government of India has approved a Project titled Intensive Dairy Development Project for District Kangra under SGSY Special Project Component with a total Project Cost of Rs 1301.25 lakhs which includes subsidy of Rs.1151.40 lakhs, Rs. 149.85 lakhs as loan component and beneficiaries share. Centre and State Government will share the subsidy component on 75:25 sharing basis. Under this Project Dairy Development activity will be undertaken. So far Rs.460.56 lakhs have been provided to DRDA Kangra for the implementation of this project out of which Rs. 370.708 lakhs have been spent up to March, 2006.

j. The Mahatma Gandhi National Rural Employment Guarantee Scheme: The Mahatma Gandhi National Rural Employment Guarantee Act was notified by the Government of India on September, 2005 and was made effective from 2nd February 2006. In the first phase, the National Rural Employment Guarantee scheme (NREGS) was introduced in District Chamba and Sirmaur on 2nd February, 2006. In second phase NREGS was started in District Kangra and Mandi w.e.f. 1st April 2007. Now in the third phase all the remaining 8 districts of the State have been covered under the scheme w.e.f. 1st April 2008.

k. Rural Electrification in Himachal Pradesh: According to 1991 census, the number of census villages was 19,388. Of these, 2391 villages were un- inhabited and the rest 16,997 villages were inhabited. The state achieved 100% rural electrification target during 1988-89 in the then 16,807 inhabited census villages. After 1991 census, 255 more villages have been declared as un-electrified. However, 157 of these were electrified by the end of November 2005, 20 still remain to be electrified whereas 78 are de-populated/ nonexistent with migrated population. In addition to above, 4025 hamlets (out of total of 4182 as per 1988 survey) also stand electrified up to November 2005. Besides above 438 un- identified hamlets have also been electrified in the Pradesh.

l. Rural Electrification Scheme: Under Bharat Nirman Yojna, Rajiv Gandhi Gramin Vidyutikaran Yojna (RGGVY) has been launched to provide electricity in every house under Rural Infrastructure Development Programme. This new scheme has been launched by Ministry of Power, Government of India, to provide access to electricity to all rural households in five years for the attainment of the goals of the National Common Minimum Programme (NCMP). The approval of Government of India has already been accorded during March, 2005.

The highlights of the programme are as follows:-

• Ninety percent capital subsidy would be provided by the Central Government for overall cost of the project.

• Below Poverty Line (BPL) households to get electricity connection free of charge.

• Revenue sustainability of electricity supply to be ensured through franchises, who could be NGOs, users associations, co-operatives or individual entrepreneurs with association of Panchayati Raj Institutions.

• No discrimination in hours supply between rural and urban households.

• Services of Central Public Sector Undertakings (CPSUs) made available to states willing to utilize their services for implementation of the programme.

• The scheme would create the necessary information through:-

a) Rural Electricity Distribution Backbone (REDB): Provision of 33/11 KV (or 66/11 KV) sub-stations of adequate capacity and lines in blocks where these do not exist.

b) Creation of Village Electrification Infrastructure (CVEI)
   - Electrification of un-electrified villages
   - Electrification of un-electrified habitations
   - Provision of distribution transformers appropriate capacity in electrified villages/habitations.

c) Decentralised Distributed Generation (DDG) and Supply: - System for villages where grid connectivity is either not possible or not cost effective.

Under the above scheme, H.P. Government through HPSEB will provide one transformer for each village in the State for maintaining reliable and efficient power supply. Also a 33 KV sub-stations would be installed in every block in the State. District-wise schemes are already under preparation in HPSEB, to be submitted to Ministry of Power, Govt. of India to take and avail maximum funds shortly. So far schemes for seven districts have been submitted to the Centre and for remaining five districts are being formulated.

Cent-percent village electrification as per 1981 Census was achieved in Himachal Pradesh during 1988-89 (June 1988). As per 2001 Census out of total 17495 villages, 17169 have been electrified ending 3/2007. Under Bharat Nirman Yojna, Rajiv Gandhi Gramin Vidyutikaran Yojna (RGGVY) has been launched to provide electricity in every house under Rural Infrastructure Development Programme. In order to provide electricity in every house in the state, HPSEB has formulated District-wise electrification schemes under "Rajiv Gandhi Gramin Vidyutikaran Yojna" (RGGVY) for further submission to M/S Rural Electrification Corporation (REC) for sanction having provision of 90% capital subsidy. Implementation of these schemes would cover electrification of all un-electrified villages/habitations. These schemes also envisage strengthening of Distribution System in rural areas of all Districts by providing 33/11 KV (or 66/11 KV) sub-stations of adequate capacity and lines in blocks where these do not exist. This would ensure reliable and quality power supply in rural areas. These schemes would also cover un-electrified Below Poverty Line (BPL) houses to be financed with 100% capital subsidy.

These schemes on sanction would be executed on Turnkey basis as per guidelines of Rural Electrification Corporation (REC). This would facilitate in an early completion of electrification works thereby benefiting the rural areas. Schemes for all twelve districts amounting to Rs 457.80 Crore have been formulated and submitted to M/S Rural Electrification Corporation (REC). There is a provision of 8 Nos. 66 KV Sub-Stations, 2 Nos. 33 KV Sub-Stations, 293 Kms 66 KV Lines, 4600 Kms High Tension (HT) Lines,

and 8418 Kms Low Tension (LT) Lines in these schemes. In these schemes in addition to provisions of 10 Nos. 33/11 KV (66/22 KV) sub-station in blocks where these do not exist at present, electricity access to 44496 rural households has also been envisaged. Out of these 12483 are Below Poverty Line (BPL) households and will be provided free electric connection as well. So far only one scheme of District Chamba amounting to Rs. 25.02 crore has been sanctioned by M/S Rural Electrification Corporation (REC) and 1st installment of Rs. 7.33 crore was released during March, 2007. Other schemes are at various stages of sanction.

n. Rural Infrastructure Development Fund (RIDF)

The Rural Infrastructure Development Fund (RIDF) was introduced by the Government of The State Government has been availing the NABARD's Loan Assistance on the following :

- C/O Rural Road and Bridges.
- C/O Minor Irrigation Schemes.
- C/O Flood Protection Works.
- C/O School Buildings.
- C/O Drinking Water Supply Schemes.
- Establishment of Information Centres.
- Establishment of IT Project.

o. Norms for Providing Potable Drinking Water in Rural areas:

While implementing the Rural Water Supply Schemes, the following norms are adopted for providing potable drinking water to the population:

40 litres per capita per day (lpcd) for humans to meet the following requirements.

Purpose Quantity (LPCD)

Drinking 3
Cooking 5
Bathing 15
Washing utensils & house 7
Ablution 10

With normal output of 12 litres per minute, one hand pump or stand post is estimated to provide water for every 250 persons. In case of an independent habitation / hamlet / Wadi / Tola / Majra / Mohra etc, if their population is less than 250 persons and there is no potable water source within its location, one source may be provided. A rural habitation not having any safe water source with a permanently settled population of 20 households or 100 persons, whichever is more, is taken as the unit for coverage with funds under the ARWSP. However, the State Government could cover any habitation regardless of its size/population/number of households with funds under State Plan.

p. Integrated Wastelands Development Programme (IWDP):

(A) Integrated Wastelands Development Programme is being implemented in 9 districts of the State viz: Chamba, Hamirpur, Kangra, Kullu, Development Blocks Nichar and Kalpa of district Kinnaur, Mandi, Shimla Sirmaur and Development Block Kandaghat, Solan and Nalagarh of district Solan on watershed approach since 1995-96. These projects were funded 100% by the Central Government upto March 2000. Since April 2000 these projects are being funded on sharing basis @ Rs. 5500:500 per ha between Central & State Governments respectively. The district wise status of IWDP is given in Table 19.

Table 19: Project wise Financial Status

Sr. No.	Name of Project	Funds Released during the year 2008-09 (Rs. in Lakhs)			Expenditure during the year (Rs. in Lakhs)	Physical Achievement during the year (in Ha)
		Centre	State	Total		
Integrated Wastelands Development Programme :						
1.	Chamba-II	4832840.00	0	4832840.00	1.236	0
2.	Chamba-III	4811506.00	0	4811506.00	38.439	1083
3.	Chamba-IV	0	0	0	21.324	390
4.	Chamba-V	6649610.00	618000.00	7267610.00	36.385	756
5.	Chamba-VI	8244147.00	750000.00	8994147.00	36.602	713
6.	Hamirpur-I I	0	0	0	0	0
7.	Hamirpur-III	0	0	0	35.89	455.64
8.	Hamirpur-IV	0	0	0	48.60	700.20
9.	Hamirpur-V	2641095.00	260000.00	2901095.00	35.92	521.66
10.	Hamirpur-VI	6847500.00	622500.00	7470000.00	59.16	992
11.	Hamirpur-VII	8208998.00	750000.00	8958998.00	51.53	711.65
12.	Hamirpur-VIII	7371922.00	657000.00	8046922.00	37.96	674
13.	Kangra-II	0	0	0	0	0
14.	Kangra-III	0	0	0	13.888	251
15.	Kangra-IV	5048753.00	940100.00	5988853.00	18.13	356
16.	Kangra-V	3870138.00	375000.00	4245138.00	39.513	116
17.	Kangra-VI	3586826.00	375000.00	3961826.00	29.81	491
18.	Kangra-VII	8206585.00	0	8206585.00	49.179	815.88
19.	Kangra-VIII	0	0	0	59.381	1101
20.	Kangra-IX	8195301.00	750000.00	8945301.00	40.111	675
21.	Kangra-X	0	0	0	28.784	302
22.	Kangra-XI	0	0	0	51.16	677
23.	Kangra-XII	4441010.00	407100.00	4848110.00	16.958	231.10
24.	Kangra-XIII	0	0	0	35.589	334
25.	Kangra-XIV	0	0	0	17.85	281
26.	Kangra-XV	0	644100.00	644100.00	38.854	561
27.	Kangra-XVI	0	448500.00	448500.00	37.423	605
28.	Kangra-XVII	8736105.00	798000.00	9534105.00	21.136	345
29.	Kangra-XVIII	0	650400.00	650400.00	50.340	872
30.	Kinnaur-I	0	0	0	0	0
31.	Kinnaur-II	0	0	0	25.70	375
32.	Kinnaur-III	12755069.00	1200000.00	13955069.00	83.30	1381
33.	Kullu-I	5991100.00	567100.00	6558200.00	86.57	3404
34.	Kullu-II	6770000.00	596400.00	7366400.00	87.15	894
35.	Kullu-III	3824535.00	375000.00	4199535.00	77.38	1564
36.	Kullu-IV	8200781.00	750000.00	8950781.00	88.29	1540
37.	Kullu-V	8323621.00	762450.00	9086071.00	102.62	633
38.	Mandi-I	0	0	0	0	0
39.	Mandi-II	0	0	0	35.25	393
40.	Mandi-III	4561683.00	455325.00	5017008.00	44.10	428
41.	Mandi-IV	9553483.00	900000.00	10453483.00	20.76	372
42.	Mandi-V	8031549.00	837450.00	8868999.00	48.48	778
43.	Mandi-VI	8998388.00	837450.00	9835838.00	47.07	813.68
44.	Mandi-VII	9282223.00	871650.00	10152223.00	19.69	223.24
45.	Shimla-I	0	0	0	18.50	497
46.	Shimla-II	10048600.00	931500.00	10980100.00	32.31	549
47.	Shimla-III	0	0	0	19.95	507
48.	Shimla-IV	11357209.00	1050000.00	12407209.00	39.20	754
49.	Shimla-VII	0	900000.00	900000.00	75.29	1389
50.	Shimla-VIII	8195269.00	750000.00	8945269.00	24.93	541
51.	Shimla-IV	7243277.00	675000.00	7918277.00	17.38	591
52.	Sirmaur-I	0	0	0	0	0
53.	Sirmaur-II	6381227.00	599500.00	6980727.00	79.71	1523.80
54.	Sirmaur-III	3100958.00	300000.00	3400958.00	68.24	1886.88

Sr. No.	Name of Project	Funds Released during the year 2008-09 (Rs. in Lakhs)			Expenditure during the year (Rs. in Lakhs)	Physical Achievement during the year (in Ha)
		Centre	State	Total		
Integrated Wastelands Development Programme :						
55.	Sirmaur-IV	7801864.00	450000.00	8251864.00	80.44	1884.35
56.	Sirmaur-V	8205156.00	750000.00	8955156.00	66.12	925
57.	Sirmaur-VI	8206250.00	750000.00	8956250.00	21.28	311.65
58.	Solan-II	0	0	0	2.223	0
59.	Solan-III	6360264.00	0	6361914.00	43.925	771
60.	Solan-IV	3914172.00	37 5000.00	4289172.00	29.221	528
61.	Solan-V	8205962.00	750000.00	8955962.00	43.585	758
62.		267004976	25479525	292502501	2470.716	43100.73

q. Construction of ropeways is a major thrust area in the state

Rs. 100 lakh have been released to DRDAs Kinnaur, Mandi, Shimla, Sirmaur and Solan for construction of Ropeways. The progress made so far given in Table 20.

Table 20: Status of Ropeways ***(Rs. in Lakhs)***

Sr. No.	District	Funds released	Ropeways constructed	Span in meters	Exp. incurred
1.	Shimla	30.00	1	2100	21.74
2.	Mandi	40.00	6	5711	33.08
3.	Sirmaur	15.00	7	4000	16.46
4.	Solan	15.00	3	3500	10.00
	Total	**100.00**	**17**	**15311**	**81.28**

4. Drought Prone Area Programme (DPAP): Drought Prone Area Programme is being implemented in 3 district of the state viz Bilaspur Una and Development Block Kunihar and Dharampur of district Solan. Upto the year 1998-99, the programme was being funded by Central and State Governments on 50:50 sharing basis but from April 1999, the Government of India have changed the funding pattern from 50:50 to 75:25.

Under this programme, 412 micro watersheds have been taken up for development for a period of five years. The detail of funds released, expenditure incurred and area treated during the year 2008-09 is given in table 21.

Table 21: Project wise Financial Status under DPAP

Sr. No.	Name of project	Funds Released during the year 2008-09 (Rs. in Lakhs)			Expenditure during the year (Rs. in Lakhs)	Physical Achieve-ment during the year (in ha)
		Centre	State	Total		
1	2	3	4	5	6	7
Drought Prone Area Programme						
1.	Bilaspur 5th Batch	0	0	0	33.426	746
2.	Bilaspur 6th Batch	84.13107	28.04369	112.17476	47.455	632
3.	Bilaspur 7th Batch	0	0	0	40.941	612
4.	Bilaspur 8th Batch	49.64243	16.54748	66.18991	44.577	596
5.	Bilalspur Hariyali 1st	0	0	0	78.92	1023
6.	Bilalspur Hariyali 2nd	0	0	0	71.22	1046
7.	Bilalspur Hariyali 3rd	0	0	0	77.817	1102

Sr. No.	Name of project	Funds Released during the year 2008-09 (Rs. in Lakhs)			Expenditure during the year (Rs. in Lakhs)	Physical Achieve-ment during the year (in ha)
		Centre	State	Total		
1	2	3	4	5	6	7
8.	Bilalspur Hariyali 4th	93.56838	31.18946	124.75784	43.782	525
9.	Solan 1st Batch	0	0	0	0.20	0
10.	Solan 2nd Batch	52.28	17.426	69.706	0	0
11.	Solan 5th Batch	0	0	0	1.316	0
12.	Solan 6th Batch	38.15790	12.719	50.8769	22.89	363
13.	Solan 7th Batch	26.61	8.87	35.48	26.281	342
14.	Solan 8th Batch	33.65169	11.21723	44.86892	26.953	430
15.	Solan Hariyali 1st	50.93406	16.978	67.91206	25.283	407
16.	Solan Hariyali 2nd	0	0	0	20.508	343
17.	Solan Hariyali 3rd	66.4317	22.1439	88.5756	41.556	775
18.	Solan Hariyali 4th	66.46821	22.15607	88.62428	21.742	351
19.	Una 6th Batch	115.91612	38.638	154.55412	61.11	1002
20.	Una 7th Batch	58.15968	19.38656	77.54624	29.49	504
21.	Una 8th Batch	0	0	0	87.77	1543
22.	Una Hariyali 1st	0	0	0	99.85	1780
23.	Una Hariyali 2nd	129.01538	43.05127	172.06665	51.88	814
24.	Una Hariyali 3rd	0	0	0	117.37	2287
25.	Una Hariyali 4th	0	0	0	70.41	1072
		864.96662	288.36666	1153.33328	1142.747	18295

5. Desert Development Programme (DDP.) Under DDP 552 Micro Watersheds have been taken up for development in district Lahaul & Spiti and Pooh block of District Kinnaur. The detail of funds released, expenditure incurred and area treated during the year 2008-09 is given in table 22.

Table 22: Project wise Financial Status under DDP

Sr. No.	Name of project	Funds Released during the year 2008-09 (Rs. in Lakhs)			Expenditure during the year (Rs. in Lakhs)	Physical Achievement during the year (in ha)
		Centre	**State**	**Total**		
1	**2**	**3**	**4**	**5**	**6**	**7**
Desert Development Programme						
1.u	Lahaul & Spiti 5th Batch	77.54	21.60	99.14	18.09	211.78
2.u	Lahaul & Spiti 6th Batch	129.03	45.00	174.03	112.20	1279.22
3.u	Lahaul & Spiti 7th Batch	197.98	28.13	225.91	64.80	560.52
4.u	Lahaul & Spiti 8th Batch	142.06	38.13	180.19	43.09	473.78
5.u	Lahaul & Spiti Hariyali 1st Tandi	0	0	0	0	0
6.u	Lahaul L & Spiti Hariyali 1st	0	0	0	7.46	15
7.u	Lahaul & Spiti Hariyali 2nd	0	0	0	14.01	160.21
8.u	Lahaul & Spiti Hariyali 3rd	0	0	0	23.04	219.59
9.u	Lahaul & Spiti Hariyali 4th	0	0	0	4.58	0
10.u	Kinnaur 6th Batch	0	38.94	38.94	96.11	756
11.u	Kinnaur 7th Batch	0	0	0	0.62	4
12.u	Kinnaur 8th Batch	0	0	0	80.29	597
13.u	Kinnaur Hariyali 1st	0	0	0	0.05	0

14.u	Kinnaur Hariyali 2nd	98.21	32.73	130.94	4.75	27
15.u	Kinnaur Hariyali 3rd	0	0	0	33.65	258
16.u	Kinnaur Hariyali 4th	0	0	0	7.76	60
	Total	**644.82**	**204.53**	**849.15**	**510.5**	**4622.10**

6. Total Sanitation Campaign Projects (TSC): With a view to ensure Total Sanitation in the rural areas, the department is implementing Total Sanitation Campaign Projects in all the districts of the State. A new sanitation strategy for the State has been approved. This strategy aims at introduction of a holistic concept of sanitation, to have a demand oriented, outcome based approach, to generate awareness of a 'need' for sanitation amongst people individually and as a community, involvement and ownership of the community, shift from individual subsidies to community incentives, local bodies undertaking responsibility for sustainable delivery of services, identifying appropriate institutional arrangements for delivery of services including partnership with NGOs/CBOs and address inter departmental co-ordination, emphasize on monitoring and evaluation to determine success and outcomes. A key component of the new State Sanitation Strategy is a Reward Scheme, to identify cleanest Gram Panchayat in each Block, District, Division and the State for being eligible for the reward. Under the scheme the District wise physical and financial progress for the year 2008-09 is given in table 23.

Table 23: Component wise Expenditure during Financial Year 2008-2009

(Rs. in Lakhs)

Sr. No.	State/District	IHHL	Sanitary Women	School Toilet	Balwadi Toilet	Startup	RSM/PC	Administration	IEC
		Exp	Exp	Exp	Exp	Exp	Exp	Exp	Exp
	HIMACHAL PRADESH								
1	BILASPUR	0.00	0.00	33.60	4.63	0.00	0.00	4.15	28.79
2	CHAMBA	0.00	0.00	0.00	2.55	0.00	0.00	9.22	25.22
3	HAMIRPUR	0.68	2.10	13.64	2.05	0.00	0.00	4.00	18.55
4	KANGRA	0.00	0.00	29.26	21.00	0.00	3.89	5.32	74.66
5	KINNAUR	0.00	0.00	7.96	0.00	0.00	0.00	0.02	8.40
6	KULLU	0.00	13.22	25.00	8.00	4.56	0.00	3.83	15.92
7	LAHAUL & SPITI	0.00	0.20	0.18	0.16	0.00	0.00	0.00	0.00
8	MANDI	211.33	0.00	2.76	0.00	0.00	0.00	2.31	25.52
9	SHIMLA	13.85	3.50	62.25	6.40	1.25	2.08	7.50	9.91
10	SIRMAUR	0.00	0.00	7.00	0.00	0.00	0.00	6.10	7.15
11	SOLAN	0.00	7.17	16.51	4.01	0.35	0.00	1.88	13.41
12	UNA	0.00	0.00	47.40	1.25	0.00	2.50	0.57	18.24
	STATE TOTAL	**225.86**	**26.19**	**245.56**	**50.05**	**6.16**	**8.47**	**44.90**	**245.76**

9.3 Technology adopted in the sector along with any changes in technology

1. New and Renewable Energy Technologies for Electrification of Villages: The Main Technological Options Available for the Electrification of Remote Villages Using New and Renewable Energy Sources are given below.

- Small hydro power plants.
- Biomass gasification systems in conjunction with 100% producer gas engines or with dual-fuel engines using non-edible vegeTable oils.
- Non-edible vegeTable oil based engines.
- Biogas engines
- Solar photovoltaic power plants.
- SPV Home lighting Systems

In many situations, particularly in very small and very remote villages, no other renewable energy option except SPV home lighting systems may prove to be feasible. The Rural Electrification Policy has now laid down that in "villages/habitations where grid connectivity would not be feasible or not cost effective, off-grid solutions based on stand-alone systems may be taken up for supply of electricity. Where these also are not feasible and if only alternative is to use isolated lighting technologies like solar photovoltaic, these may be adopted. However, such remote villages may not be designated as electrified".

Solar Energy in Shimla: To expand its green energy options, Himachal Pradesh has cleared state's first solar power project at Verra Dol, near Naina Devi in Bilaspur. The 2 MW project to be set-up on pilot basis will cost nearly Rs 40 crores and will be completed by 2012. The solar project marks the drive of Himachal to tap energy from non-conventional resources, which have so far remained untapped for years, even as the state has huge potential for solar power.

2. Bio-engineering in Slope Stabilisation and Protection: The development of the hill regions in the Himachal Pradesh (HP) is impaired by difficult topography for road access. The rugged mountain topography, the complex and fragile nature of geological structures together with soft soil cover, intensive precipitation during the monsoon season and frequent earthquakes make the region vulnerable to landslides, debris flows, soil erosion and other mass wasting phenomena. Some of the important factors which are constraints to road development in HP are large volume of soil erosion, landslides and slope failures. So, appropriate measures are necessary to preserve and protect the roads. Therefore, bioengineering is being promoted in the state.

Bio-engineering is the use of vegetation, either alone or in conjunction with civil engineering structures, to reduce instability and erosion on slopes. Because of the steep and dynamic slopes found in the Himalayas, most hill roads are engineered near to the margin of safety. Bio-engineering is an effective way of enhancing civil engineering structures to increase stability as far as possible. It is relatively low in cost uses local materials and skill, and provides livelihoods benefits through economically useful products.

3. Action Plan for Implementation of Solid & Liquid Waste Management in Gram Panchayat of Himachal Pradesh: Within the Panchayat, waste generation could be attributed to its inhabitants, transit population and also commercial establishment which exist within its jurisdiction Under sections 12, 13 and 15 of the H.P. Panchayat Raj Act 1994, it is the duty of the Panchayat. In case waste management arrangements require the coordinated efforts of more than one Panchayat (large producers/scattered area mechanism) then in such circumstances the Panchayat Samiti will be obliged to coordinate the waste management activities of these Panchayats with the support of the local administration.

9.4 Stakeholder involvement in environment preservation and restoration

There are three major stakeholders involved in rural development.

1. Government Sector

- Department of Planning
- Department of Rural development
- Department of town & Country planning
- Department of Public Work (PWD)
- Municipal Corporation
- Health Department
- Department of Education
- Department of Industry
- Department of IPH
- Department of IT

- Department of Agriculture & Horticulture

2. Public and Private sector

Private companies implementing

3. NGO's

Brief description of major government departments are given below.

Department of Planning: The most important aim of Planning is to identify a process of development which will raise living standards and open out to the people new opportunities for a richer and more prosperous life. The basic objectives of planning can be grouped under four heads: modernization, growth, self reliance and social justice. Department of planning is looking after all the planning aspects in the state.

Department of Rural development: The State Rural Development Department is engaged in the implementation of different rural development and poverty alleviation programmes. Development Blocks are the pivot for planning and implementation of various rural development schemes.

Department of Town & Country planning: The Town and Country Planning was created as a small cell in Himachal Pradesh, Public Works Department in the year 1964. During 1979, it was created as in independent Directorate headed by Chief Engineer of Himachal Pradesh Public Works Department till 1993 when independent Director was appointed as Head of Department. Its **Objectives** are: To encourage planned and systematic urban and rural growth in a comprehensive manner and to stop haphazard constructions.

Department of Public Work (PWD): The department is engaged in planning, construction and maintenance of roads, bridges, ropeways and buildings (both residential and non-residential of various Govt. departments) in the State. The department further executes engineering work on behalf of Local Bodies, Public Undertakings, Boards & other Institutions under Himachal Pradesh Government as "Deposit works".

Department of Irrigation & Public Health (IPH): The Department is also responsible for the operation and maintenance of the following systems: Drinking Water Supply Schemes, Sewerage Systems, Irrigation systems through source development, lifting water, boring of tube wells & providing distribution systems and Flood protection works to protect life and property in the State.

Department of Education The department of Technical Education, Vocational and Industrial Training plays a vital role in socio-economic development of the state. In this era of liberalization, industrialization and globalization, skilled manpower of world class standard is of upmost necessity. The department is involved in the development, implementation & operation of education sector in the state.

Department of Agriculture: The Department of Agriculture is dedicated to serve the farming community by implementing various Developmental Programmes and disseminating the relevant technology to increase productivity, production and profitability of field crops. The natural endowments like soil, land, water etc. are being harnessed in such a way that goals of ecological sustainability, economic upliftment of farming community are achieved.

Department of Horticulture: The State Department of Horticulture functions with the objective of building a prosperous Himachal through scientific development of horticulture by harnessing the natural resources for the development of a sustainable system of agriculture in the hilly areas.

9.5 Critical environment issues / hotspots associated with the sector

Following environmental and social issueshave been identified which needs to be adequately addressed and considered in rural planning while developing policies, plans, programmes and projects.

1. Inadequacy and lack of mainstreaming of environment in development planning of rural areas: According to Census, the population of the state has grown from 60.77 lakhs in 2001 to 68, 56,509 in 2011. A majority of the population resides in the rural areas and survives on agriculture and allied activities. About 77% of the total labour force lives in the rural areas. Out of the total workforce, about 58.4% are engaged in agriculture alone.

In Himachal Pradesh, the head count ratios for the poor have remained higher in rural areas as compared to those for the urban areas. While, over time, the head count ratios of the poor both in rural and urban areas have come down considerably, the number of poor hardly changed during the last two decades in Himachal Pradesh. In fact, Himachal Pradesh along with Haryana, Orissa and Mizoram is among is one of the states where the total number of poor has roughly remained unchanged during the last two decades. Agriculture being the main livelihood of the rural population of Himachal Pradesh, incidence of higher head count ratios of the poor in the rural areas of the State indicates the occupational composition of poverty in the State.

2. Decreasing farm productivity (including agriculture, horticulture, animal husbandry, fisheries related sectors, etc) with increasing population: Agriculture dominate the economy of the State though only a little over 10% of the total land area is cultivated. Population pressure on cultivated land is high and holdings of most of the cultivators are small and scattered. There are more than 84.5% of the small and marginal farmers in the State. Most of the holdings are self- cultivated. About 20% of the cultivated area is under irrigation and remaining 80% is rainfed. The cultivation is carried out right from 300 to 3000 meters above sea level. Decreased farm & horticulture productivity leads to dependence on natural resources. This leads to higher pressure on natural resources in rural areas. Further, increasing population migration to urban areas leads to higher pressure on civic services & increased pollution load. This requires identification of alternate opportunities and diversification into other areas e.g. Herbs, animal husbandry, floriculture and usage of biotechnology for improving farm productivity.

3. Inadequate rural infrastructure planning & implementation from environmental perspective: Inadequate development of rural / farm roads, power availability, telecommunications, transport, banking, market infrastructure, warehousing of farm produce, inadequate post harvest management is limiting the potential of generation of employment opportunities. With limited railway network and lack of water transport, roads are the only means of communication in pre-dominantly hill State of Himachal Pradesh. This sector suffers from high unit cost for road development and maintenance due to difficult terrain and remote locations. Further, there are concerns about the need to remove the micro level regional disparities/ imbalances in terms of creation of infrastructural facilities in Backward Areas. Identification of certain backward and remote and inaccessible has been undertaken which remained neglected due to their inaccessibility and other difficult geographical and harsh climatic conditions. The basic criteria decided for this purpose was remoteness, inaccessibility, coupled with visual perception of the level of socio- economic development and infrastructural backwardness. However, this criteria needs to include environmental sensitivity as well as safeguard mainstreaming in

order to ensure sustainable development. Further, existing watershed based planning with integrated approach can be strengthened to develop infrastructure and livelihood in rural areas.

4. Inadequate education and health facilities: Literacy and education are important tool for economic growth and effective decision making which ultimately result in empowerment of the population including women and SC/ST. Quality of life and human development attainments invariably are high in the States, which have invested in education.

Physical infrastructure for providing health and education to the rural population needs translation into quality service delivery in order to take care of the human development aspect of the population. State Government intends to make Himachal Pradesh an 'Education Hub'. However, it faces challenges of infrastructure and quality education. In so far as quality education is concerned, the State Govt. needs to address teacher's absenteeism and improve teacher's trainings. For educational institutions appropriate infrastructure, buildings, laboratories, equipments and furnitures etc. is needed to be provided on priority to ensure their continuity. Further increased environmental education mainstreamed with vocational / technical / basic / higher education system will address the need for implementing any developmental activity in the state.

Himachal Pradesh has better health indicators than many other States of India. However, there are some areas where the State needs improvement in performance. The Health Department perceives infrastructure shortages in the State. There are more than 1000 PHCs and Sub-Centres which are functioning on rented buildings or on space provided by Panchayats/Trusts. Besides, there are many hospital buildings under construction for the last many years which are required to be completed in a time bound manner. Improved rural health infrastructure / services and awareness will lead to decreased burden of diseases and reduced pollution load in rural areas in Himachal Pradesh.

Therefore, provision of wage employment needs to be supplemented with access to education, basic health services, and neat and clean environment and capacity enhancement to ensure sustainability of livelihood strategies adopted for the poor.

5. Inadequate institutional finance and credit flows (including micro finance) in environmentally sustainable economic activities: There are two main delivery channels for microfinance services. The first one is SHG (Self Help Group)-Bank Linkage Channel (SBLC), which was developed from field experiments in the early 1990s by NABARD (National Bank for Agricultural and Rural Development) through credit and other initiatives. The second channel is Micro Finance Institution (MFI). The first MFI in India was set up in 1974, but the momentum was achieved only during the 1990s. Initially the formal financial institutions were reluctant to be involved with the MFIs, and social entrepreneurship was also in short supply. In recent years banks and other institutions, helped by supportive public policies have become more aware of the commercial viability of the micro finance services

A major gap in the services provided by the sector is that due to regulatory restrictions, savings products have not been offered until now. Financial inclusion should involve both savings and credit products. The provision of savings products will enable MFIs to offer a more complete suite of products to low income groups. There is disproportionate reliance on group lending. The MFIs in particular need to shift from group to individual-based lending. This will require focus on development of appraisal skills and more modern management information systems.

There is inadequate institutional finance and credit for developing village and cottage industries and agro-horticultural industries in the state. In Education & Health Sectors, funds allocation can be made for capital works as a measure of special drive to create infrastructural facilities so as to make the new institutions functional.

6. Inadequate skills among rural population: Experience of first four decades of planning has revealed that the process of economic development and modernization has not benefited the weaker section to the extent it did to the other communities, though growth with social justice has been accepted as the main objective for the planned economic development. The fruits of progress and flow of benefits have not reached the majority of Scheduled Castes to the extent these should have been. They have suffered from the dual disabilities of severe economic exploitation and social discrimination. They have very few assets and are totally dependant upon agricultural pursuits and other low income generating occupations like shoe making, sweeping, bamboo basket making, black smithy, weaving, poultry, piggery, etc.

Inadequacy of skills among rural populace because of inadequate research and extension services are hampering chances of maximizing the opportunities for diversification of livelihood options and opportunities. Though most of development programmes/ schemes intend to develop skills of the communities, its impact is largely measured as number of programmes/schemes beneficiaries (from all sections of the society). The current programme/schemes' beneficiaries doesn't adequately develop skills of the beneficiaries which can help them to sustain the benefits of said programmes/schemes and improve their livelihoods and access basic services.

Therefore, there is a need to impart new skills to the rural population e.g. in cleaner technologies / cleaner production, which can lead to achieve reduced pollution & improved environment.

7. Inadequate capacity of Institutions like Panchayat, Cooperatives and others for planning and implementation of rural development programmes: After the enactment of 73rd Constitutional Amendment Act & Himachal Pradesh Panchayati Raj Act 1994, 3 tiers Panchayati Raj System has been set up at grass root level in the State. These are Gram Panchayats, Panchayat Samitis at block level and Zila Parishad at the district level. There are 3243 Gram Panchayats, 75 Panchayat Samitis and 12 Zila Parishads in the State. Panchayati Raj Institutions at various levels are being involved in the planning and execution of poverty alleviation and employment generation programmes so that it is ensured that the benefits under these programmes percolate to the needy at the grass root level. The Development Block is pivotal for the implementation of various rural development programmes and overall development of families living below the poverty line in the rural areas.

Under the provision of Article 243 ZD and Section 185 of Himachal Pradesh Panchayati Raj Act 1994, District Planning Committees have been constituted in each district. As per the mandate of the constitution, planning process has to be started at each tier of PRI and these plans will be consolidated at the district level by the District Planning Committees. Preparation of plan is a technical work as such technical assistance and funds are required to be provided for this purpose. Therefore, the panchayat / district planning functionaries need capacity building to develop village block level development plans with mainstreamed environmental safeguards for development.

Due to inadequate capacity of officials / officials at the district & block levels, development programs & projects are conceptualized & implemented in a limited

manner. This leads to either non utilization of allocated funds during the planned period.

8. Inadequate social cohesion leading to unequal participation in the rural development: Among the social groups, scheduled castes, scheduled tribes and backward castes accounted for 81% of the rural poor in 1999-2000 at all India level, considerably more than their share in the rural population. The proportion of poor belonging to the scheduled caste, scheduled tribe and backward classes to the corresponding population is much higher than the head count ratio of all the poor in rural and urban areas both in Himachal Pradesh and at all India level. This combined with other deprivations increases the vulnerability of the scheduled caste, scheduled tribe and backward classes population of the state leading to social incohesiveness. This is reflected in inadequate collective participation of all social groups, in rural development activities, developing common programmes for village upliftment to minimize economic and gender disparities in the rural societies. This leads to unequal & non optimal utilization of resources.

Pressure on account of increasing gaps and slow implementation of policy, programs, plans and projects is leading to emergence of sector specific issues and risks/impacts.

9.6 Environment initiatives taken by the sector to address critical environment issues

Some of the major environmental initiatives

1. Guiding Principles for Sustenance of Nirmal Panchayats under Total Sanitation Campaign: The State of Himachal Pradesh has been implementing the Sanitation Campaign since year, 2000 when the campaign was first started in the District Sirmaur of the State. After the implementation of the Sanitation Campaign for the last ten years, the State has emerged as one of the leading States which have not only adopted the Total Sanitation Campaign as a part of its State Policy but, has also been in the forefront as far as achieving targets set by the GOI, in the field of Individual House Hold Latrines (IHHL). With the present coverage of more than 90% in the field of Individual House Hold Latrines (IHHL) now the focus of the Total Sanitation Campaign in Himachal is to achieve the following;

- Sustenance of the already achieved open defecation free status/ open defection free societies.
- Inclusion of the left out/ newly added households in the Sanitation Campaign.

2. Revised Guidelines for Mahila Mandal Protsahan Yojana under Total Sanitation Campaign: Total Sanitation Campaign in Himachal Pradesh is being implemented in all the 12 districts of the State with the objective of improving the quality of life of the rural people and also to provide dignity to women. This campaign envisages making the villages free from open defecation; ensuring School & Anganwari Sanitation; Establishing Sanitary Complexes exclusively for women and ensuring Total Environmental Sanitation in villages, as it is the women, children and the elderly population in the rural area which are most affected by the lack of Sanitation facilities. In order to give wide coverage to the goals of the State to provide Sanitation Facilities to all for a successful Sanitation campaign, the involvement of Government officials, CBOs, Gram Panchayats, Mahila Mandals and other Non-Governmental Organization is a pre-requisite who should be given some type of incentives for facilitating its sustainability.

3. Central Rural Sanitation Programme (Total Sanitation Campaign): Individual Health and hygiene is largely dependent on adequate availability of drinking water and proper sanitation. There is, therefore, a direct relationship between water, sanitation and

health. Consumption of unsafe drinking water, improper disposal of human excreta, improper environmental sanitation and lack of personal and food hygiene have been major causes of many diseases in developing countries. Prevailing High Infant Mortality Rate is also largely attributed to poor sanitation. It was in this context that the Central Rural Sanitation Programme (CRSP) was launched in 1986 primarily with the objective of improving the quality of life of the rural people and also to provide privacy and dignity to women. The main objectives of the TSC are as under:

- Bring about an improvement in the general quality of life in the rural areas.
- Accelerate sanitation coverage in rural areas.
- Generate felt demand for sanitation facilities through awareness creation and health education.
- Cover schools/ Anganwadis in rural areas with sanitation facilities and promote hygiene education and sanitary habits among students.
- Encourage cost effective and appropriate technologies in sanitation.
- Eliminate open defecation to minimize risk of contamination of drinking water sources and food.
- Convert dry latrines to pour flush latrines, and eliminate manual scavenging practice, wherever in existence in rural areas.

4. Reward Scheme for the Cleanest Primary and Middle Schools in Himachal Pradesh at Block and District Level under the Total Sanitation Campaign: School and Anganwadi Sanitation and Hygiene Education (SSHE) is one of the key components of the Total Sanitation Campaign and offers opportunities to create functional sanitation facilities in schools and adoption of safe sanitation practices by the students. The school students could become change agents and can be one of the medium to reach to the communities. Improvement in the school sanitation facilities is also important as these provide enabling facility for adopting safe sanitation practices by the children, while in schools.

In order to ensure sustainable sanitation and hygiene outcomes in schools across the State, it is proposed to launch a competition based reward scheme at block and district levels for the cleanest schools. Introduction of a reward scheme for schools would help recognize those Schools whose efforts and outcomes have helped achieve the goal of Nirmal Himachal, as well as create the future citizens of the Nirmal State.

5. Himachal Pradesh Maharishi Valmiki Sampoorna Swachata Puraskar: The Government of Himachal Pradesh has launched a comprehensive strategy to tackle the sanitation challenge based on motivating rural communities to end the traditional practice of open defecation and adopt safe sanitation. In pursuance of this strategy, the State Government has introduced the Maharishi Valmiki Sampoorn Swachata Puruskar (MVSSP) to select the cleanest Gram Panchayat at block, district, division and state level, based on an annual competition. Winning Gram Panchayats at State and Divisional levels receive the prize at the hands of the Hon'ble Chief Minister of Himachal Pradesh, and district and block levels at the hands of senior dignitaries, during Independence Day celebrations each year.

9.7 Environment related studies carried out in the sector

Watershed Development Programmes

1. Drought Prone Area Programme This programme is basically an area development programme and aims at integrated development of natural resources like land, water, vegetation etc. by taking up watershed development projects. The programme is being implemented

in 10 blocks of the State. Upto the year 1998-99, the programme was being funded by Central and State Governments on 50:50 sharing basis but from April 1999 the Government of India have changed the funding pattern from 50:50 to 75:25. Under this programme 318 micro watersheds have been taken up for development in district Bilaspur, Solan and Una for a period of 5 years. During the year 2005-2006, 40 new micro watersheds have been sanctioned by the Government of India under the programme.
http://hprural.nic.in/watershed.html - top

2. Desert Development Programme (DDP): Under DDP, 420 Micro watershed have been taken up for the development in district of Lahaul & Spiti and Pooh Block of district Kinnaur. The Government of India has sanctioned 38 new micro watershed projects under this programme during the current financial year. (23 micro watersheds for Lahaul & Spiti and 15 Micro watersheds for Kinnaur district).

3. Integrated Wasteland Development Programme: Integrated Wasteland Development Programme is being implemented in all the districts of the State except Bilaspur, Una and Lahaul & Spiti. Prior to April 2000, the watershed projects under this programme were being funded 100% by the Central Government. However the projects sanctioned after April 2000, are being funded Rs. 5500/-per ha by the GOI and Rs. 500/- per ha. by the State Government. During the year 2004-05 the Government of India has sanctioned two new projects with a total project outlay of Rs. 900.00 Lakhs for treatment of 15,000 ha. of land.

9.8 Environment monitoring (key parameters such as air and water pollution) carried out for activities related to the sector

At present no environment monitoring has been carried out by the department of rural development as well as department of planning. But Environment monitoring is carried out by HPPCB and other agencies within the State.

9.9 Institutional mechanisms within the sector to address identified environment issues

(A) Organisation of Planning Department

The State Planning Department determines the State Plan priorities, fixes overall plan size,

Organisational Structure: The organisational structure of Planning Department consists of following three tiers: 1. Headquarters 2. District Offices. 3. State Planning Board. 1. Headquarters: At the Headquarters, Seceratry (Planning), to the Government H.P. is the Head of the Department. Under him various divisions viz. Plan Formulation, Project Formulation, Plan Implementation, NORAD, Computerisation, Evaluation, Manpower and Employment, Administration, Regional & District Planning and Backward Area Sub-Plan are functioning.uu

These divisions are headed by Additional Director, Joint Director and Deputy Directors. According to rule of business, the following structure exists in the department for transaction of official business:-

1. Hon'ble Chief Minister
(Planning Minister)
|
2. Pr. Secretary (Planning).
|
3. Secretary (Planning).

2. District Offices: -Under the decentralised scheme of planning; Field Offices have been opened in the Pradesh except the two tribal districts of Lahaul-Spiti and Kinnaur. These offices are functioning under the control of the concerned Deputy Commissioners and have been provided with a staff set-up of one District Planning Officer, one Credit Planning

Officer, one Assistant Research Officer, One Statistical Assistant, one Assistant (two in the case of Shimla, Kangra and Mandi), one Steno-typist, one Clerk and one Peon.

3. State Planning Board : State Planning Board strives to determine the Plan priorities for State in the light of overall national objectives. These are described below.

- To assess the man-power and financial resources and their organisational and institutional capabilities.
- To assess the level of development in important sectors for the State as a whole as well as for various districts and regions.
- In the light of above, formulate a long term perspective plan for the most effective and balanced utilization of State resources.
- To assist the State Government in the formulation of the five year plans and annual plans and evolve a short term strategy (Five Year Plan) for planned development after examination of different approaches so as to achieve maximum growth rate keeping in view Social justice.
- To identify factors which tend to retard the economic and Social development of the State and determine conditions to be established for successful execution of the plan.
- To suggest policies and programmes for removing the imbalances prevailing in various regions in the State and to assist in the formulation of the district plans/area Plans.
- To review the progress of implementation of the plan programmes and recommend, such adjustments in policies and measures as the review may indicate.
- To make critical appraisal of on-going programmes leading to a determination of the extent to which some of the identified on-going programmes of projects would need to be continued.
- To review the implementation of plan projects and other development schemes.
- To advise on the problem of unemployment and suggest ways and means for tackling it.
- To advise on such other matters connected with the economic development as may be assigned by the State Government.
- To make such interim or ancillary recommendations as appear to it to be appropriate for facilitating the discharge of duties assigned or on a consideration of the prevailing economic conditions, current policies, measures and development programmes or an examination of such specific problems as may be referred to it for advice by the State Government.
- To collect and analyse information/data regarding plan schemes.
- To review the working of Government Corporations, Boards and suggest means for their improvement.
- To highlight difficulties being faced in the implementation of the plan schemes at district level and suggestions to over come them.
- To evaluate various projects/ corporations according to the directions of Chairman.

Organizational Chart of Planning Department

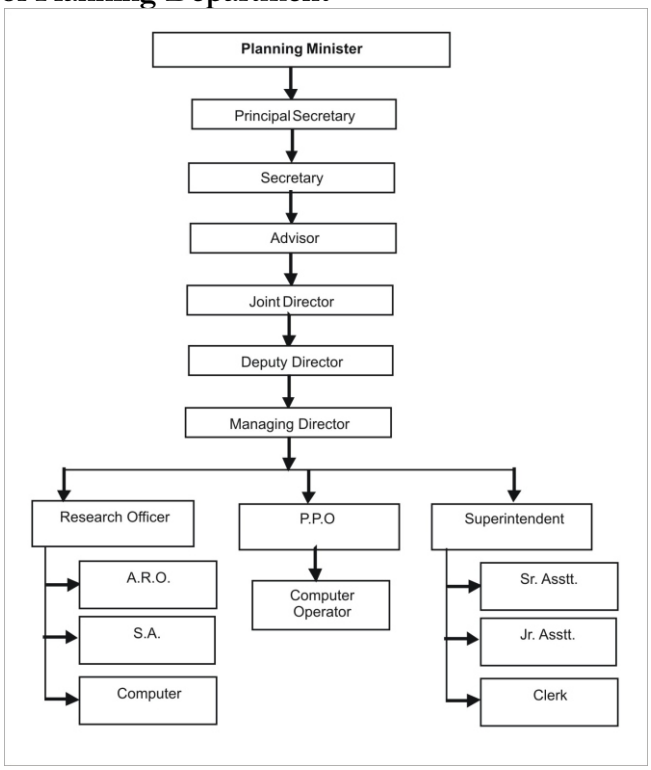


Figure 1: Organizational Chart of Planning Department

District Planning Cell

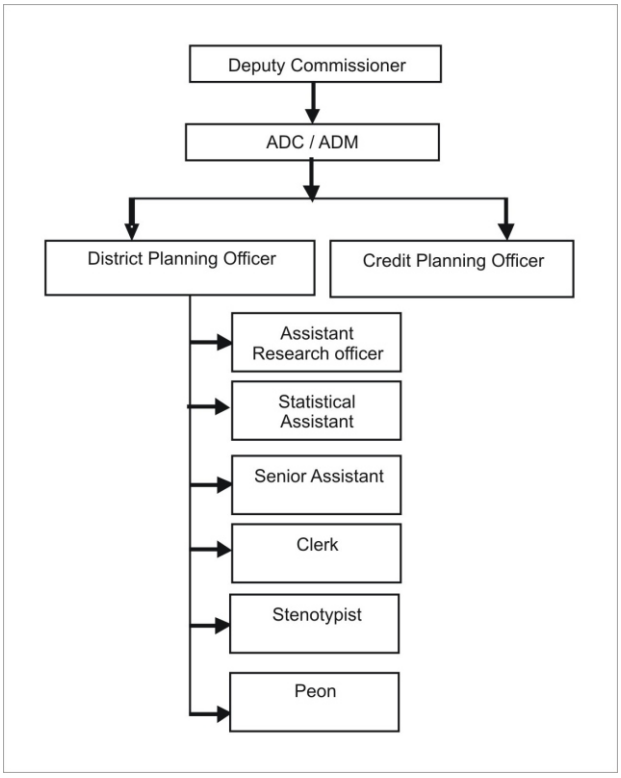


Figure 2: District Planning Cell

(B) Rural Development Department: For the implementation of different rural development programmes, Rural Development Department has the following administrative structure at various levels as shown in figure 3.

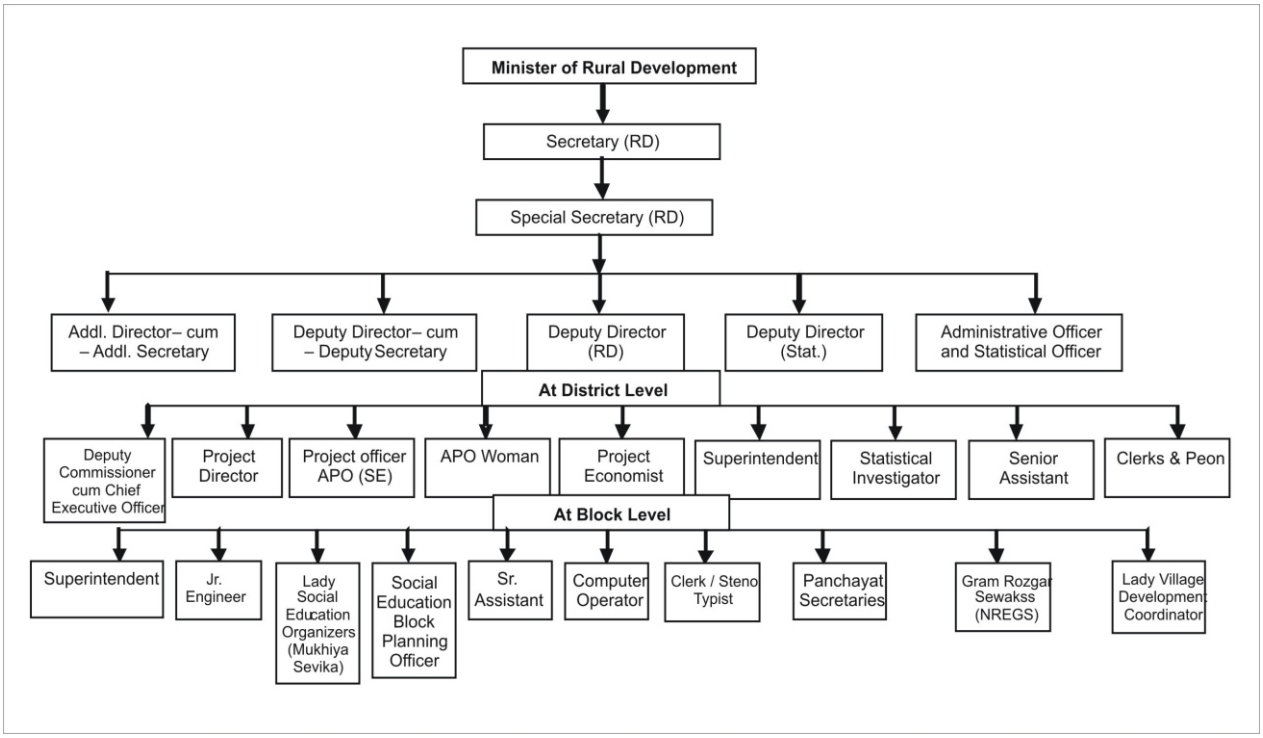


Figure 3: Organization Structure of Rural Development Department

For the implementation of different rural development programmes, Rural Development Department has following administrative structure at various levels and also shown in Figure 3.

State Level

The Department is functioning under the over all control of the Secretary (RD) at the Government level assisted by the Special Secretary (RD), Additional Director-cum-Additional Secretary (RD) Deputy Director-cum-Deputy Secretary (RD), Deputy Director (RD), Deputy Director (Stat) Administrative Officer and Statistical Officer (RD).

District Level

At district level, DRDAs are responsible for the implementation and monitoring of all rural development programmes. The Deputy Commissioner-cum-Chief Executive Officer of the DRDA is assisted by the Project Director, Project Officer, APO(SE), APO(Women), APO (Watershed), Project Economist, Superintendent, Statistical Investigator, Senior Assistant, Clerks and Peon DRDA in the execution of various developmental activities Besides this, at district level there is a governing body of DRDA under the Chairmanship of Zila Parishad. This body is responsible for monitoring of various Rural Development Programmes.

Block Level

At the Block level, the Block Development Officer is the main catalyst with the following administrative set up:-

1. Superintendent

2. Junior Engineers
3. Lady Social Education Organisers (Mukhiya Sevika)
4. Social Education & Block Planning Officer
5. Senior Assistant
6. Computer Operator
7. Clerk/Steno Typist
8. Panchayat Secretaries
9. Gram Rozgar Sewaks (NREGS)
10. Lady Village Development Coordinator
11. Driver
12. Peons
13. Frash / Chowkidar

Besides the above departmental staff, the following staff from other departments is also functioning under the administrative control of the Block Development Officer with regard to ACRs, tour programmes and casual leave:-

1. Agriculture Development Officer (Agriculture)
2. Horticulture Development Officer (Horticulture)
3. Extension Officer (Co-operative)
4. Extension Officer (Industries)
5. Panchayat Inspector
6. Assistant Development Officer/ Junior Engineer (Soil Conservation)

Engineering Services of the Department

In order to, provide technical guidance for construction works under rural development programmes, additional 3 posts of Executive Engineers, 24 posts of Assistant Engineers and 167 posts of Junior Engineers, 3 posts of Head Drafts-men and 21 posts of Drafts-men have been created during 1996-97. At State level, Engineering Cell is consisting of Executive Engineer, Assistant Engineer and 2 Junior Engineers and other ministerial staff. As per the norms of the Government, one Junior Engineer has been posted after every 15 Panchayats and one Assistant Engineer has been provided on 6 Junior Engineers. Zonal Offices at Dharamshala, Mandi and Shimla are functioning with the staff strength of the Executive Engineer, Superintendent, Senior Assistant, Steno-Typist, Clerk, Driver and Peon.

Based on the above institutional structure, gaps have been identified within the existing institutional framework which is described in Institutional Mechanism report Institutional Mechanism Report. Further, institutional responsibilities to implement actions identified and approved by the nodal department and line departments have also been described in Institutional Mechanism Report. In order to address environmental issues identified in concerned sectoral guideline, a number of interventions are required from the nodal department with identified line departments.

9.10 Data / documentation pertaining to addressing demographic issues in the context of the sectors, such as population changes; requirements of populations and changing lifestyles; migratory populations including tourists; transhumants; transit labour population; pressures felt by communities due to degraded environment conditions.

Demographic Trends: The population of the State registered a decadal growth of 12.81% as against 17.64% at All-India level during the decade 2001-11, thus recording a decline of 4.73% as compared to the preceding decade 1991-01. This has been possible through a three-pronged strategy of intensive health cover, improvement in literacy rates, especially among the women and making family planning a people's movement along with a positive thrust of incentives. The important comparative

demographic indicators are presented in the Table 24.

Table 24: Growth in general population

Year	Population	Decennial growth rate	Density of population	Literacy rate
1901	19,20,294	..	34	..
1911	18,96,944	(-)1.22	34	..
1921	19,28,206	1.65	35	..
1931	20,29,113	5.23	36	..
1941	22,63,245	11.54	41	..
1951	23,85,981	5.42	43	..
1961	28,12,463	17.87	51	21.27
1971	34,60,434	23.04	62	31.96
1981	42,80,818	23.71	77	42.48
1991	51,70,877	20.79	93	63.86
2001	60,77,900	17.54	109	76.5
2011	68,56,509	12.81	123	83.78

Source:- (i) Census of India, 1981, Series-7, Himachal Pradesh, Part-II,
(ii) Census of India, 1991, Series-9, Himachal Pradesh, Paper-1,
(iii) General population Tables-ILA Census of India-1971
(iv) Census of India-2001 H.P.
(v) Census of India, 2011

Roads and Bridge: During the First Five-Year Plan (1951-56), "Roads" were given highest priority. During this period, Rs. 225.41 lakh were spent on the development of roads, which amounted to 42.75% of the total plan investment of Rs. 527.25 lakh. With this investment, the state achieved an additional 2413 K.M. length of roads. The progress made in the development of roads by 1971 at the time of formation of a full-fledged State and level reached by the end of Sixth, Seventh, Eighth and Ninth and Tenth Five Year Plans and achievements made by the end of 31st March, 2009 is given in the following Table 25.

Table 25: Road Construction in Himachal Pradesh

Sr. No.	Description	Unit	1971	6th Plan	7th Plan	8th plan	9th Plan	10th Plan	31st March 2009
1	Motorable roads	Kms	7609	14663	16883	19760	22763	27584	30302
2	Roads provided with cross drainage	Kms	2755	6245	7493	8917	11697	17250	20748
3	Metalled and tarred length	Kms	2218	5300	6392	8094	11441	15772	17291
4	Bridges	No.	232	598	742	968	1206	1483	1604
5	Villages connected with Roads								
a.	Above 1500 population	No.		165	175	184	186	199	202
b	1000-1500 population	No.		198	214	223	224	239	262
c	500-1000 population	No.		756	809	827	849	977	1151
d	200-500 population	No.		2324	2413	2479	2588	2848	3092
e	Less than 200 population	No.		3640	3805	3914	4063	4268	4536
	Total			**7083**	**7416**	**7627**	**7910**	**8531**	**9243**

Besides increase in the motorable road density from 13.66 Kms. per 100 sq. kms. of area in 1971 to 40.89 kms. between 1971-2002, the quality of this crucial infrastructure has also improved significantly. Whereas only 29.14% of the motorable roads were metalled and tarred in 1971, the percentage at the end of March, 2009 stands at 57.06%. Similarly, the percentage of roads with cross drainage increased from 36.2% in 1971 to 68.47 % by the end of March, 2009. The following data given in Table 26 depicts the position of road length from 1971 to 2009:

Table 26: Position of Road Length

Type of Road	Position as on 31st March, 2009							
	1971	1981	1991	2001	2002	2007	2008	2009
Motorable Double Lane	1765	1994	1994	2332	2336	2374	2374	2377

Type of Road	Position as on 31st March, 2009							
	1971	1981	1991	2001	2002	2007	2008	2009
Motorable Single Lane	5844	10611	15296	19874	20427	25210	26783	27925
Total Motorable Roads	**7609**	**12605**	**17290**	**22206**	**22763**	**27584**	**29157**	**30302**
Jeepable	608	633	826	906	781	381	365	345
Less than Jeepable	2400	4195	4329	4105	3959	2299	1990	1803
Total	**10617**	**17433**	**22445**	**27217**	**27503**	**30264**	**31512**	**32450**

Water Supply: All 16997 villages in the State as per census 1991 were provided with safe drinking water facility by March, 1994. Thereafter, the focus shifted from village to habitation. As per the survey of 2003, which was finalized in March, 2005, 51,848 habitations were identified. Of these, 20,112 were categorized as fully covered (FC) and 31,736 habitations as non-covered and partially covered (9389 NC and 22347 PC). These 31,736 habitations have been categorized as slipped back habitations as per revised guidelines of the Central Government. The Bharat Nirman programme also includes drinking water supply as one of the component. The year-wise status of covered and balance habitations to be covered is given in the following Table 27:-

Table 27: Status of Water Supply

Sr. No.	Period	NC (0-10 lpcd)	PC (11-39 lpcd)	FC	Total
1	Status as on 01-04-2005	9389	22347	20112	51848
2	Habitations covered during 2005-06 under State & Central Sector	1123	827		1950
3	Status as on 01-04-2006	8266	21520	22062	51848
4	Habitations covered during 2006-07 under State & Central Sector	1678	2016		3694
5	Status as on 01-04-2007	6588	19504	25756	51848
6	Habitations covered during 2007-08 under State & Central Sector	1533	2977		4510
7	Status as on 01-04-2008	5055	16527	30266	51848
8	Habitations covered during 2008-09 under State & Central Sector	1423	4106		5529
9	Status as on 01-04-2009	3632	12421	35795	51848

Source: Department of Planning of HP

With the coming up of National Rural Drinking Water Supply guidelines w.e.f. April 2009, after realignment/mapping of habitations, there are 53205 habitations in the State. Out of these, 19473 habitations (7632 habitations with population coverage >0 and <100+11841 habitations with 0 population coverage) are having inadequate drinking water. The criteria of coverage of habitations have been changed to population coverage to ensure water security at household level. All these 19473 habitations will be covered in a phased manner by March, 2012 in line with Govt. of India guidelines. As per data realignment, the status of habitations as on 01-04-2009 is given below in Table 28.

Table 28: Habitation Coverage as per 2009 data

Total No. of Habitations	Habitations with 100% population coverage	Habitations with population coverage >0 & <100	Habitations with 0 population coverage	Total (col. 2 &4)
53205	33732	7632	11841	19473.00 %
	63.40%	14.34%	22.25%	36.60%

Rural Electrification

- As per Census 2001, there were 17495 census villages in Himachal Pradesh. Of these, 110 census villages were un-electrified. Under RGGVY schemes, 108 villages of seven districts namely Chamba, Kangra, Shimla, Mandi, Kinnaur, Lahaul & Spiti and Sirmaur have been covered and one village (Vari Koksar) of Lahaul Block has been covered for electrification under R.V.E. plan by Director (Himurja). Only one village Chandori Dhar of Mehla Block of District Chamba having migratory population still remains to be covered.
- In addition to above, 4036 hamlets (out of total of 4182 as per 1988 survey) also stand electrified upto September, 2009. Besides, 587 un-identified hamlets have also been electrified.
- In order to provide electricity in every household in the State, scheme for all the 12 districts has been sanctioned by the Ministry of Power, Govt. of India within a provision of Rs. 341.80 crores.
- Schemes for 11 districts namely Kangra, Hamirpur, Bilaspur, Una, Mandi, Sirmaur, Shimla, Solan, Kullu, Kinnaur and Lahaul & Spiti have been sanctioned during 11th Plan amounting to Rs. 275.53 crores and Rs. 82.81 crores have been released as 1st installment. The awards for these 11 districts have been placed and work is in progress. These schemes are proposed to be completed within 18 months.

Animal Husbandry: The livestock census data for the last 5 livestock census is given below in Table 29 which indicates that the total livestock population has declined by about 1 lakh heads between 1987 & 2008. It is a pointer to two trends. One is that the pastoral and livestock based livelihood is declining in number and the other that the stock is improving in quality as the output is increasing:-

Table 29: Category wise Cattle as per Livestock Census

Sr. No.	Category	1987	1992	1997	2003	2008
1	Cattle	22.45	21.65	21.74	21.96	22.79
2	Buffaloes	7.95	7.04	7.48	7.73	7.62
3	Sheeps	11.14	10.79	10.8	9.06	9.01
4	Goats	11.2	11.18	11.68	11.16	12.41
5	Horses and Ponies	0.2	0.14	0.13	0.17	0.13
6	Mules and Donkeys	0.31	0.24	0.26	0.33	0.26
7	Pigs	0.18	0.07	0.07	0.03	0.02
8	Other Livestock	0.02	0.06	0.08	0.02	0.02
	Total	**53.45**	**51.17**	**52.24**	**50.46**	**52.26**

Source: Department of Planning, HP

Table 30: Veterinary Institutions

Sr. No.	Institutions	6th Plan	7th Plan	8th Plan	9th Plan	10th Plan	As on 31st March 2009
1	Hospitals	197	230	303	303	306	283
2	Dispensaries	395	514	1585	1585	1787	1753
3	Central Vety. Dispensaries			25	25	25	30
4	Mobile Dispensaries	14	14	14	14	14	14
5	Polyclinics				7	7	7
6	State Vety. Hospitals						1
7	Sub-Divisional Vety. Hospitals						45

Health Infrastructure: The growth of Health Institutions in Himachal Pradesh from 1971 onwards is depicted in the following Table.

Table 31: Health Facilities

Sr. No.	Item	1971	1980	1985	1990	1995	1997	2002	2003	2004	2005	2006	2007	2008	2009
1	Allopathic Hospitals	39	58	73	73	72	74	89	89	89	89	89	92	93	93
2	Ayurvedic Hospitals							23	24	25	25	25	25	25	27
3	PHC/CHC/RH/SHCs	72	77	145	225	275	310	369	507	504	505	505	514	522	522
4	Allopathic Dispensaries	119	186	214	197	165	167	155	21	22	22	22	22	41	41
5	Ayurvedic Colleges		1	1	1	1	1	1	1	1	1	1	1	1	1
6	Ayurvedic Dispensaries	363	404	431	458	611	981	1133	1139	1139	1139	1126	1126	1126	1126
7	HSCs	256	856	1299	1851	1907	1980	2068	2067	2067	2068	2069	2071	2071	2071
8	Dental College	0	0	0	0	1	1	1	1	1	1	1	1	1	1
9	Nursing	0	0	0	3	4	4	6	6	6	6	6	6	6	6
	Total	**849**	**1582**	**2163**	**2808**	**3036**	**3518**	**3845**	**3855**	**3854**	**3856**	**3844**	**3858**	**3886**	**3888**

9.11 Information on human resource management issues (which may have relevance to environment management) in the sector such as: manpower, vocational training, awareness levels etc.

1. The Town & Country Planning Department has proposed to upgrade the Offices at District Headquarters of Una, Bilaspur and Chamba to Divisional Office. Detail of sanctioned/filled and vacant posts in the town & country planning department, as in 2009 is given below in Table 33.

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Table 32: Detail of Sanctioned/Filled Vacant Post

Sr. No.	Name of Post	Sanctioned posts	Filled	Vacant	Remarks
1	Director	1	1	-	-
2	State Town Planner	1	1	-	-
3	Town & Country Planner	8	2	6	
4	Asstt. Town Planner	14	8	6	
5	Planning Officer	19	15	4	-
6	Supdt.Gr.I	1	1	-	-
7	Law Officer	1	1	-	-
8	Tehsildar	1	-	1	-
9	Research Officer	2	2	-	-
10	Supdt.Gr.II	2	2	-	-
11	Personal Assistant	1	1	-	.
12	Sr. Planning Draughtsman	13	9	4	
13	Junior Engineer	29	21	8	
14	Draughtsman	5	5	-	-
15	Sr.Scale Stenographer	1	1	-	-
16	Sr. Assistant	11	11	-	-
17	Research Assistant	2	2	-	-
18	Jr. Assistant	13	13	-	-

Sr. No.	Name of Post	Sanctioned posts	Filled	Vacant	Remarks
19	Field Investigator	3	1	2	
20	Jr. Draughtsman	22	22	-	-
21	Surveyor	2	2	-	-
22	Steno Typist	15	11	4	
23	Driver	7	7	-	-
24	Clerk	14	11	3	
25	Ferro Printer	3	3	-	-
26	Patwari	19	15	4	
27	Peon	16	16	-	-
28	Process server	1	1	-	-
29	Chowkidar-cum-Sweeper	7	7		-
30	Chainman	24	24	-	-
31	Sweeper	1	1	-	-
	Total	**259**	**216**	**43**	**-**

2. Rural Development (RD): The Department is functioning under the over all control of the Secretary (RD) at the Government level assisted by the Director-cum-Special Secretary(RD) , Additional Director-cum- Joint Secretary (RD), Deputy Director (RD), Deputy Director (Stat), Administrative Officer and Statistical Officer (RD).

At the district level, District Rural Development Agencies are responsible for the implementation and monitoring of all rural development programmes. The Deputy Commissioner-cum-Chief Executive Officer of the District Rural Development Agency is assisted by the Project Director, Project Officer, Assistant Project Officer (Self Employment), Assistant Project Officer (Women), Assistant Project Officer (Watershed), Project Economist, Superintendent, Statistical Investigator, Senior Assistant, Clerks and Peon of the DRDA in the execution of various developmental activities. Besides this, at the district level there is a Governing body of DRDA under the Chairmanship of Zila Parishad. This body is responsible for monitoring of various Rural Development Programmes.

Block Level: At the Block level, the Block Development Officer is assisted by following officials.

1. Superintendent
2. Junior Engineers
3. Lady Social Education Organizers (Mukhiya Sevika)
4. Social Education & Block Planning Officer
5. Senior Assistant
6. Senior Assistant (P)
7. Clerk/Steno Typist
8. Panchayat Secretary
9. Computer Operator
10 Gram Rozgar Sewak
11. Lady Village Development Coordinator
12 Driver
13. Peons
14 Frash / Chowkidar

Engineering Services of the Department: In order to provide technical guidance for construction works under rural development programmes, 3 posts of Executive Engineers, 24 posts of Assistant Engineers and 167 posts of Junior Engineers, 3 posts of Head Draughtsman and 21 posts of Draughtsman have been created during 1996-97. At the State

level, engineering cell consisting of Executive Engineer, Assistant Engineer and 2 Junior Engineers and other staff has been functioning. As per the norms of the Government, one Junior Engineer has been posted after every 15 Panchayats and one Assistant Engineer has been provided for every six Junior Engineers. Zonal Offices at Dharamshala, Mandi and Shimla are functioning with the staff strength of the Executive Engineer, Superintendent, Senior Assistant, Steno-Typist, Clerk, Driver and Peon.

9.12 Regulatory analysis to identify any regulations that have environment implications (negative or positive), and compliance with the same

Himachal Pradesh has a large population, consisting of marginal and small farmers, Scheduled Castes, Scheduled Tribes and backward classes. Social status of women in society like Himachal Pradesh having thousands years of cultural traditions is an outcome of enormous variety of social conditions and multiplicity of factors. Himachal Pradesh is also characterized as a male dominated society. This segment of the population has to be brought into focus for their uplift with special emphasis on their skill upgradation, removal of unemployment and poverty and vertical growth, to acquire productive assets for better living on a sustainable basis. A list of policy and program is given below.

- National Rural Employment Guarantee Scheme
- Member of Parliament Local Area Development Scheme (MPLADS)
- Backward Area Sub Plan
- Border Area Development Programme (BADP)
- Sectoral Decentralised Planning Programme in Himachal Pradesh
- Sectoral Decentralised Planning– Revised Guidelines-2004
- Rashtriya Sam Vikas Yojana
- Mukhya Mantri Gram Path Yojana
- The Rural Infrastructure Development Fund (RIDF)
- Rural Water Supply
- Hand pumps Installation Programme
- Vikas Mein Jan Sahyog (VMJS)
- District Plans
- National Health Policy, 2002
- Central Rural Sanitation Programme (TSC)
- National Rural Health Mission
- Sarva Shiksha Abhiyan, Government of Himachal Pradesh
- NABARD, Commercial Banks, Co-operative, Banks, Co-operative Credit Societies and Regional Rural Banks (RRB), Himachal Grameen Bank
- The Himachal Pradesh Panchayati Raj Act, 1994
- Panchayats (Extension to the Scheduled Areas) Act, 1996
- Himachal Pradesh Panchayati Raj (Extension to the Scheduled Areas) Rules, 2011
- Manual on devolution of Powers, functions and responsibilities released by Department of Panchayti Raj
- GTZ Project for Micro Planning at Panchayat Level
- Mahila Mandal Protsahan Yojana

- Special Component Plan (SCP) renamed as Scheduled
- Castes Sub Plan (SCSP) for the Scheduled Castes

Reference

- Department of Rural Development
- Department of Panchayti Raj Institutions
- Department of Planning
- Ministry of Drinking water
- Department of Education
- Department of Health & Family Welfare
- Department of Public Works Department
- HP Statisicals outline
- Districts Statistical Abstract

CHAPTER 10 URBAN PLANNING

10.1 Resource inventory of existing assets of the sector

Rapid urbanisation all over India has led to a shortage of basic infrastructure in urban areas. Himachal Pradesh has also witnessed a high growth in urban population. In 1901, there were 21 towns in the State, which increased to 57 in 1991. The urban population was 0.08 million in 1901, which increased to 0.44 million in 1991.

Himachal Pradesh is a small hilly State with very little flat land. At present out of 57 towns, 40 towns are located in valleys, 13 on hill tops, 2 on spurs and 2 in the gaps. The towns of Himachal Pradesh have small populations, and may be considered insignificant if compared with the cities and the towns in the rest India. Nevertheless, the towns of Himachal Pradesh are important due to their unique characteristics and their tourism value.

Due to increase in urban population, the pressure on the existing urban areas is increasing. The land available for expansion within urban areas is very limited. As a result, growth is taking place in rural areas surrounding the urban areas. This growth is mostly seen in the form of corridors along main roads leading to the urban area. The growth is only of residential or commercial structures without any addition to basic infrastructure and basic amenities. As a result the pressure on facilities in the main urban area increasing.

There is thus a need for good planned new townships which are self contained in terms of basic amenities like water supply, basic education, medical facilities, recreational facilities etc. and have to depend to the nearest town only for special services like higher education and specialized medical treatment, etc.

Certain towns in Himachal Pradesh are growing because of tourism. Some towns are growing because of large power projects coming up in their neighbourhood. These require new townships of a similar nature in order to reduce pressure and control haphazard and unplanned growth.

Himachal Pradesh has a good climate and environment which can be developed for tourism, high value recreation, good health care facilities, educational facilities and attendant commercial services. Districtwise area and population of Himachal Pradesh is given in Table 1.

Table 1: Area and population – 2011 Census

Sr. No.	District	Area (sq.km)	Population Total	Population Rural	Population Urban	Population Density
1.	Bilaspur	1,167	382056	356930	25126	327
2.	Chamba	6,528	518844	482653	36191	80
3.	Hamirpur	1,118	454293	422880	31413	406
4.	Kangra	5,739	1507223	1420864	86359	263
5.	Kinnaur	6,401	84298	84298	-	13
6.	Kullu	5,503	437474	396216	41258	79
7.	L & S	13,835	31528	31528	-	2
8.	Mandi	3,950	999518	936894	62624	253
9.	Shimla	5,131	813384	611884	201500	159
10.	Sirmaur	2,825	530164	472926	57238	188
11.	Solan	1,936	576670	474592	102078	298
12.	Una	1,540	521057	476140	44917	338
	H.P.	**55,673**	**6856509**	**6167805**	**688704**	**123**

Source:- Census of India, 2011

Literacy Rate: The proportion of total literates in the State (83.78%) is higher than the all-India average of 74.04%, according to the 2011 census. Table 2 shows that the literacy rate in Himachal Pradesh increased by 13.37% points from 1991 to 2001 and by 6.65% points during the last 10 years.

Table 2: Literacy Rate, 1951-2011

Year	Persons	Males	Females
1951	7.98	-	-
1961	21.3	-	-
1971	31.96	43.19	20.23
1981	42.48	53.19	31.46
1991	63.86	75.36	52.13
2001	77.13	86.02	68.08
2011	83.78	90.83	76.60

Source: Census of India, Provisional Population Totals, Paper 1 of 2011, Himachal Pradesh.

Note: * Excludes 0-6 population

Chamba district has the lowest literacy rate, followed by Lahaul & Spiti and Sirmaur district the highest, and closely followed by Hamirpur and Una districts. The other districts with literacy rates above the state average of 83.78% are Kangra, Bilaspur, Solan and Shimla as given in Table 3.

Himachal Pradesh has tremendously improved its literacy percentage of both Male and Female. However, the literacy of females in some districts needs government attention.

Table 3: District wise Literacy Rates -2011

State/district	Total		
	Person	Male	Female
Chamba	73.19	84.19	62.14
Kangra	86.49	92.55	80.62
Lahaul & Spiti	77.24	86.97	66.5
Kullu	8014	88.8	71.01
Mandi	82.81	91.51	74.33
Hamirpur	89.01	95.28	83.44
Una	87.23	92.75	81.67
Bilaspur	85.67	92.39	78.9
Solan	85.02	91.19	78.02
Sirmaur	79.98	86.76	72.55
Shimla	84.55	90.73	77.8
Kinnaur	80.77	88.37	71.34
HP	**83.78**	**90.83**	**76.6**

Source: Census of India, Provisional Population Totals, 2011

District wise details of literacy rates are given below in Table 4.

Table 4: District-wise literacy rates

District	Literacy Rates (%)								
	Male			Female			Total		
	1991	2001	2011	1991	2001	2011	1991	2001	2011
Bilaspur	77.97	87.13	92.39	56.55	70.53	78.9	67.17	78.8	85.67
Chamba	59.96	77.22	84.19	28.57	49.7	62.14	44.7	63.73	73.19
Hamirpur	85.11	90.86	95.28	65.9	76.41	83.44	74.88	83.16	89.01
Kangra	80.12	88.19	92.55	61.39	73.57	80.62	70.57	80.68	86.49
Kinnaur	72.04	N.A.	88.37	42.04	N.A.	71.34	58.36	N.A.	80.77
Kullu	69.64	84.55	88.8	38.53	61.24	71.01	54.82	73.86	80.14
Lahaul & Spiti	71.78	82.76	86.97	38.05	60.94	66.5	56.82	73.17	77.24
Mandi	76.65	86.67	91.51	49.12	65.36	74.33	62.74	75.86	82.81
Shimla	75.96	87.72	90.73	51.75	70.68	77.8	64.61	79.68	84.55
Sirmaur	63.2	79.73	86.76	38.45	60.93	72.55	51.62	70.85	79.98
Solan	74.67	85.35	91.19	50.69	67.48	78.02	63.3	77.16	85.02
Una	81.15	88.49	92.75	61.01	73.85	81.67	70.91	81.09	87.23
HP	**75.36**	**86.02**	**90.83**	**52.13**	**68.08**	**76.6**	**63.86**	**77.13**	**83.78**

Source: Census of India, 2011

Land Acquisition: As far as possible, barren government land will be used for urbanisation and will be provided at market rate. In case government land is not available in an area, 'Ghasni' and least productive land will be utilized by acquisition through negotiations.

Thereafter, agricultural land may be considered. Incentives like provision of developed plots to individuals, engagement of heirs of land owners in jobs in new townships etc. may be provided. In cases where negotiations do not materialise the Government may go in for acquisition on behalf of the agency developing the township.

In areas where public sentiments are posing hindrance and urbanisation is inevitable, Land Pooling and reconstitution schemes through public participation are proposed to be initiated. Productive agricultural land will be acquired only if absolutely essential. The agency taking up the development of new township will acquire the total land required for the project before starting development on it. Government may also consider giving some Government land on lease if considered essential. The developer may also include forest land in the plan without acquiring it and only keeping it as green area with ownership remaining with Government.

Source:- http://himachal.nic.in

District wise land resources in the state are given below in Table 5.

Table 5: District wise Land Resources (ha)

Year/District	Total Geographical Area			Land Resources Not available for cultivation			Other Cultivable land excluding current fallows			
	By professional survey	By village Survey	Forests	Barren and Un-culturable land	Land put to non-agricultural uses	Total	Culturable waste	Permanent pastures and other grazing land	Land under misc. tree crops, etc.	Total
1998-99	5,567.30	4,530.2	1,092.40	905.8	233.1	1,138.90	107.4	1,491.0	67	1,665.40
1999-00	5,567.30	4,531.8	1,094.20	856.9	302.2	1,159.10	119.4	1,471.5	64.2	1,655.10
2000-01	5,567.30	4,547.3	1,093.50	807.2	313.7	1,120.90	124.5	1,529.2	56.8	1710.5
2001-02	5,567.30	4,542.8	1,098.70	806.6	317.5	1,124.10	122.1	1,518.7	60.2	1701
2002-03	5,567.30	4,543.1	1,099.60	806.2	453.5	1,125.50	122.2	1,518.0	58	1,698.20
2003-04	5,567.30	4,544.1	1,099.10	672.5	453.5	1,126.00	128.4	1,515.0	62.5	1,705.90
2004-05	5,567.30	4,544.7	1,101.10	671.9	458.1	1,130.00	127.2	1,500.5	68.6	1,696.30
2005-06	5,567.30	4,545.3	1100.8	647.8	481	1,128.80	131.5	1,499.9	68.1	1,699.50
2006-07	5,567.30	4,544.4	1099.7	653.5	471.6	1125.1	128	1,514.0	61.1	1,703.10
2007-08	5,567.30	4,389,704.0	1083121	657505	444133	1101638	123214	1,434,256.0	67028	1,624,498.00
Bilaspur	116.7	111776	14013	4395	14931	19326	6169	38890	144	45203
Chamba*	651.5	692420	272008	5241	12827	18068	6443	351155	17	357615
Hamirpur	111.8	110221	18282	13581	17081	30662	12179	6914	1	19094
Kangra	573.9	577681	232485	14619	77647	92266	29070	87495	8275	124840
Kinnaur	655.3	624215	37530	133335	117743	251078	3488	322281	116	325885
Kullu*	550.3	54754	877	1169	6589	7758	2416	1437	1830	5683
Lahaul & Spiti	1,369.30	911195	135369	415831	135760	551591	597	220097	127	220821
Mandi	395.1	397823	175229	20967	4141	25108	4503	96254	341	101098
Shimla*	513.1	508900	130411	15681	16638	32319	21234	228567	11817	261618
Sirmaur	282.6	224743	48313	8529	10464	18993	12531	56941	37307	106779
Solan	193.7	21053	451	1925	1488	3413	1402	11636	3	13041
Una	154	154923	18153	22232	28824	51056	23182	12589	7050	42821

Source: Statistical Outline HP, 2010

Table 6: Transport & Communication Roads Including National Highways

Year	Motorable		Jeepable	Less than Jeepable	Total
	Double Lane	Single Lane			
As on 31st March					
1999	2,309	18,491	1,001	4,572	26,373
2000	2,329	19,145	950	4,310	26,734
2001	2,332	19,874	906	4,105	27,217

Year	Motorable		Jeepable	Less than Jeepable	Total
	Double Lane	Single Lane			
2002	2,336	20,427	781	3,959	27,503
2003	2,336	21,100	598	3,771	27,805
2004	2,344	21,648	481	3,611	28,084
2005	2,355	22,567	442	3,103	28,467
2006	2,369	23,599	390	2,653	29,011
2007	2,374	25,210	381	2,299	30,264
2008	2,374	26,783	365	1,990	31,512
2009	2,377	27,925	345	1,803	32,450
2010	2384	28832	300	1655	33171

Source: Statistical Outline HP, 2010

District wise road length is given in Table 7.

Table 7: District Wise Roads Length – 2009-10

District	Motorable		Jeepable	Less than Jeepable	Total
	Double Lane	Single Lane			
Bilaspur	128	1390	0	10	1528
Chamba	96	2070	265	685	3116
Hamirpur	52	1696	0	0	1748
Kangra	468	4892	1	8	5369
Kinnaur	177	571	15	240	1003
Kullu	128	1455	3	50	1636
Lahaul – Spiti	260	934	2	18	1214
Mandi	191	4587	10	468	5256
Shimla	339	4637	2	17	4995
Sirmaur	216	2621	1	75	2913
Solan	173	2429	1	84	2687
Una	156	1520	0	0	1706

Source: Statistical Outline HP, 2010

District wise details of roads connectivity level in the state are given below in Table 8.

Table 8: District Level Connectivity of Roads

District	Position as on 31.03.09				For complete Connectivity	
	2008-09	2008-09	2008-09	Road density	Required Density	Total road length Kms.
	Metalled	Unmetalled	Total	per 100 Sq.Kms. of Area	per 100 Sq.Kms. of Area	Total
Chamba	1098	987	2085	31.94	69.91	4564
Bilaspur	1036	437	1473	126.22	133.76	1561
Hamirpur	1352	362	1714	153.31	169.23	1892
Kangra	4080	1188	5268	91.79	116.83	6705
Kinnaur	439	287	726	11.34	13.92	891
Kullu	765	747	1512	27.48	40.78	2244
Lahaul-Spiti	512	657	1169	8.45	10.27	1421
Mandi	2166	2440	4606	116.61	157.22	6210
Shimla	2000	2820	4820	93.94	103.16	5293
Sirmaur	1123	1641	2764	97.84	116.60	3294
Solan	1263	1244	2507	129.49	165.81	3210
Una	1456	202	1658	107.66	114.29	1760

District	Position as on 31.03.09				For complete Connectivity	
	2008-09	2008-09	2008-09	Road density	Required Density	Total road length Kms.
	Metalled	Unmetalled	Total	per 100 Sq.Kms. of Area	per 100 Sq.Kms. of Area	Total
H.P.	**17290**	**13012**	**30302**	**54.43**	**70.13**	**39045**

District wise details of road density in the State are given below in Table 9.

Table 9: Road Density in HP

District	Existing Road density (till 31.03.09) per 100 sq. kms. of Area	Complete connectivity		
		Required Density per 100 sq. kms. of Area	Length (mm)	Year of Completion
Chamba	31.94	69.91	4564	2043
Bilaspur	126.22	133.76	1561	2012
Hamirpur	153.31	169.23	1892	2012
Kangra	91.79	116.83	6705	2021
Kinnaur	11.34	13.92	891	2021
Kullu	27.48	40.78	2244	2023
Lahaul & Spiti	8.45	10.27	1421	2020
Mandi	116.61	157.22	6210	2020
Shimla	93.94	103.16	5293	2013
Sirmaur	97.84	116.60	3294	2016
Solan	129.49	165.81	3210	2020
Una	107.66	114.29	1760	2014
Himachal Pradesh	**54.43**	**70.13**	**39045**	**2020**

District wise details of sources of drinking water are given in Table 10

Table 10: Different Sources of Drinking Water (urban and rural)

District	Type of Area	Population	Total No of Household	Source of drinking water				No. of Households being served by safe drinking water source
				Tap	Hand pump	Tubewell	Well	
Chamba	Total	460,887	87,699	76,952	1,120	60	512	78,644
	Rural	426,345	80,574	70,159	1,017	52	510	71,738
	Urban	34,542	7,125	6,793	103	8	2	6,906
Kangra	Total	1,339,030	272,697	220,154	16,571	1,206	19,843	257,774
	Rural	1,266,745	257,467	205,599	16,372	1,190	19,727	242,888
	Urban	72,285	15,230	14,555	199	16	116	14,886
Lahaul & Spiti	Total	33,224	9,155	7,803	533	3	25	8,364
	Rural	33,224	9,155	7,803	533	3	25	8,364
	Urban	0	0	0	0	0	0	0
Kullu	Total	381,571	78,362	68,731	1,047	44	1,242	71,064
	Rural	351,478	70,565	61,355	843	41	1,218	63,457
	Urban	30,093	7,797	7,376	204	3	24	7,607

District	Type of Area	Population	Total No of Household	Source of drinking water				No. of Households being served by safe drinking water source
				Tap	Hand pump	Tubewell	Well	
Mandi	Total	901,344	186,571	170,740	2,603	274	5,638	179,255
	Rural	840,362	171,299	155,962	2,437	269	5,525	164,193
	Urban	60,982	15,272	14,778	166	5	113	15,062
Hamirpur	Total	412,700	87,596	74,037	4,962	151	6,168	85,318
	Rural	382,494	81,097	68,445	4,283	135	6,043	78,906
	Urban	30,206	6,499	5,592	679	16	125	6,412
Una	Total	448,273	88,869	70,464	8,515	1,660	7,312	87,951
	Rural	408,849	80,790	63,890	7,779	1,197	7,056	79,922
	Urban	39,424	8,079	6,574	736	463	256	8,029
Bilaspur	Total	340,885	67,195	56,357	3,030	173	2,947	62,507
	Rural	318,934	61,648	50,993	2,924	170	2,908	56,995
	Urban	21,951	5,547	5,364	106	3	39	5,512
Solan	Total	500,557	98,519	78,034	3,219	1,951	5,227	88,431
	Rural	409,362	77,414	58,205	2,857	1,431	5,161	67,654
	Urban	91,195	21,105	19,829	362	520	66	20,777
Sirmaur	Total	458,593	82,543	60,450	5,967	435	4,243	71,095
	Rural	410,923	72,664	51,217	5,702	390	4,163	61,472
	Urban	47,670	9,879	9,233	265	45	80	9,623
Shimla	Total	722,502	160,646	142,661	1,539	192	5,624	150,016
	Rural	555,269	114,066	98,406	928	160	5,275	104,769
	Urban	167,233	46,580	44,255	611	32	349	45,247
Kinnaur	Total	78,334	20,781	17,347	166	9	240	17,762
	Rural	78,334	20,781	17,347	166	9	240	17,762
	Urban	0	0	0	0	0	0	0
State Total	**Total**	**6,077,900**	**1,240,633**	**1,043,730**	**49,272**	**6,158**	**59,021**	**1,158,181**
	Rural	**5,482,319**	**1,097,520**	**909,381**	**45,841**	**5,047**	**57,851**	**1,018,120**
	Urban	**595,581**	**143,113**	**134,349**	**3,431**	**1,111**	**1,170**	**140,061**

Well is the major source of drinking water accounting for 52% of source followed by 43% by tap and 5% by hand pumps. Data on taps also indicate the coverage of population by piped water supply. District/circle wise status of installed & non-functional hand pumps are given below in Table 11.

Table 11: District / Circle Wise Status of Installed and Non Functional Hand-Pump Upto 01.02.2010

Sr. No.	District	Circle	Total Handpumps installed upto 31.03.09	Total Handpumps installed upto 31.01.2010	No. of Non Functional Handpumps due to				Quality Problem/ Excess iron
					Repairable	Non Repairable	Water level down	Total (6+7+8)	
1	Shimla	R/Peo	123	133	1	0	5	**6**	0
		Rohru	538	642	23	12	14	**49**	0
		Shimla	515	577	19	10	0	**29**	0
		Shimla-U/Area	44	44	0	0	0	**0**	0
		Total:-	**1220**	**1396**	**43**	**22**	**19**	**84**	**0**
2	Solan	Shimla	610	645	12	5	4	**21**	0
		Nahan	1122	1288	21	5	0	**26**	0
		Total:-	**1732**	**1933**	**33**	**10**	**4**	**47**	**0**
3	Sirmaur	Nahan	**1422**	**1518**	**21**	**75**	**0**	**96**	**0**
4	Kinnaur	R/Peo	**141**	**160**	**6**	**8**	**0**	**14**	**0**
5	L&S	Kullu	99	112	3	0	0	**3**	0
		R/Peo	241	246	0	1	0	**1**	0
		Total:-	**340**	**358**	**3**	**1**	**0**	**4**	**0**
6	Hamirpur	Hamirpur	**2023**	**2246**	**50**	**4**	**5**	**59**	**61**
7	Bilaspur	Bilaspur	**1471**	**1605**	**17**	**21**	**26**	**64**	**50**
8	Una	Una	**1240**	**1360**	**12**	**71**	**51**	**134**	**2**
9	Mandi	Hamirpur (S/Ghat)	566	675	0	0	16	**16**	20
		Sundernagar	1380	1541	68	30	28	**126**	17
		Total:-	**1946**	**2216**	**68**	**30**	**44**	**142**	**37**
10	Kullu	Kullu	**569**	**598**	**16**	**18**	**18**	**52**	**8**
11	Chamba	Chamba	937	986	24	7	4	**35**	5
		Chamba-Tribal	75	78	0	0	0	**0**	0
		Total:-	**1012**	**1064**	**24**	**7**	**4**	**35**	**5**
12	Kangra	Nurpur	1218	1218	23	35	0	**58**	0
		Dharamshala	2499	2733	19	64	0	**83**	0
		Hamirpur (Dehra)	818	909	18	33	0	**51**	19
		Total:-	**4535**	**4860**	**60**	**132**	**0**	**192**	**19**
		G.Total:	**17651**	**19314**	**353**	**399**	**171**	**923**	**182**

Sewerage Sector: As towns in the State mostly serve as health resorts, environment improvement assumed special significance particularly to avoid pollution of the rivers and other water bodies of the State. Secondly, to abolish carrying of night soil on head load and scavenging system in India/States, the government has given top priority to connect dry latrine system into water pour system. Hence, the sewerage programme has assumed immense importance. Under this programme, sewerage facilities are proposed to be provided in all towns of the State.

13 sewerage schemes have been completed (Shimla, Palampur, Mandi, Jawalamukhi Shri Naina Devi Ji, Chamba, Bilaspur, Rohroo, Ghumarwin, Manali, Joginder nagar, Arki, Rampur and 2 rural schemes (Reckong-Peo and Sarahan). The work on 24 schemes is in progress (Una, Solan, Sundernagar, Paonta, Sarkaghat, Kullu, Mehatpur, Santokhgarh, Dalhousie, Chowari, Bhuntar, Dharamshala, Hamirpur, Kangra, Nagrota, Jubbal, Sujanpur, Nadaun, Kotkhai, Narkanda, Theog, Nurpur, Suni and Dehra). It is proposed to commission sewerage scheme in Sarkaghat and Sujanpur during the year 2010-11.

Development activities: For planned development of various towns/ growth centres, the Himachal Pradesh Town and Country

Planning Act, 1977 has been extended to 21 Planning Areas and 34 Special Areas as given in Table 12.

Table 12: Areas of Planning

Sr. No.	Name of Planning Area	Name of Special Area			
		Sr. No.	Areas	Sr. No.	Areas
1	Shimla	1	Reckong Peo	22	Jabli
2	Rampur	2	Keylong	23	Barog
3	Rohroo	3	Kaza	24	Kandaghat
4	Theog	4	Pangi (Killar)	25	Bir Billing
5	Parwanoo	5	Bharmaur	26	Paonta Sahib
6	Kasauli	6	Chamera	27	Una
7	Solan	7	Pandoh	28	Baba Balaknath
8	Waknaghat	8	Hatkoti	29	Pong Dam
9	Nahan	9	Khajjiar	30	Trilokpur
10	Paonta Sahib	10	Sarahan	31	Garli-Paragpur
11	Hamirpur	11	Kufri	32	Nagar
12	Dharamshala	12	Udaipur	33	Harat
13	Palampur	13	Manikaran	34	Nalagarh and Baddi-Barotiwala
14	Chamba	14	Chail		
15	Dalhousie	15	Ghanahatti		
16	Una	16	Tabo		
17	Mehatpur	17	Rohtang		
18	Mandi	18	Solang		
19	Bilaspur	19	Shoghi		
20	Kullu- Valley	20	Chamunda		
21	Kamand	21	Ner Chowk		

Source: Town & Country Planning, HP

10.2 Patterns of planning and development in the sector

The Directorate of Urban Development has been entrusted upon to implement the various developmental schemes/ projects both funded by State Government and Centre Government through 1 Municipal Corporation, 20 Municipal Councils & 28 Nagar Panchayats throughout the State. The Directorate has established its Engineering & Project Cell to monitor & implement these schemes/ projects. Following Schemes/Projects are being implemented by the Directorate:

Centrally Sponsored Schemes

- Swarnjayanti Shahari Rozgar Yojana (SJSRY)
- Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT)
- Integrated Housing & Slum Development Programme (IHSDP)
- Jawahar Lal Nehru Urban Renewal Mission (JNNURM)

State Sponsored Schemes

- National Slum Development Programme (N.S.D.P) / Environmental Improvement of Urban Slums (E.I.U.S.)
- Solid Waste Management Projects of 5 Town
- Rajiv Gandhi Urban Renewal Facility (RGURF) for Infrastructure & Sanitation Improvement
- Maintainance of Urban Local Body Roads
- Sewerage Scheme

In the financial year 2010-11, on the recommendations of the 3rd State Finance Commission, a sum of Rs. 46,12,00,000/- has been provided to the ULBs in the State. This amount includes development grant, for maintenance of assets created by the Urban Local Bodies like roads, streets, street lights, public toilets etc. During current financial year 2011-12, in the budget a provision of Rs.51,88,00,000/- under this award for the ULBs has been made.

During the financial year 2010-11, a sum of Rs.7.63 crores, has been provided to all the ULBs under 13th Finance Commission's Award for construction of Solid Waste Management Plant. During the current financial year i.e. 2011-12, there is total budget provision of Rs. 24.30 crores as given below.

Table 13: Budget Provision (Year 2011 -12)

Head	Amount
Non Plan	11.80 crores
Plan	09.38 crores
SOOS	3.12 crores

Swarnjayanti Shahari Rozgar Yojana (SJSRY)

Under Swarnjayanti Shahari Rozgar Yojana (SJSRY), an amount of Rs.12.02 crores has been provided to the ULBs till date, a details of which, with physical & financial progress, is given in Table 14.

Table 14: Status of Funding under SJSRY

Component(As per old Guidelines)	Funds Provided		Funds Utilized	Unspent Balance	Physical Progress	Position of Unspent Balances	
Urban Wage Employment Programme (UWEP)		76571254	76571254		6.11 Lakhs Mandays	Sarkaghat	50000
Urban Self Employment Programme	USEP(Subsidy)	12696674	12624574	72100	2255 Urban Poor	Jogindernagar	22100
	USEP (Training)	10501115	10417115	84000	5219 Urban poor	Solan	34000
Development of Women & Children(DWCUA):		4046826	3921826	125000	60 Nos.	Sundernagar	5000
Thrift and Credit Societies		450000	450000		37 Nos	Dharamshala	125000
Community Structure		7452759	7452759		37 Halls. 5 shops& 21 rooms		
Infrastructure Support		2587369	2587369				
8% A&OE and Strengthening of ULBs:		4682696	4682696				
Total:-	118988693	118707593	281100				
Year 2010-11(New Guidelines)	1242000	75000					
G. Total:-	**120230693**	**118782593**					

Financial Progress (year 2010-11): Funds to the tune of 12.42 Lakhs were released to six ULBs on dated 24.11.2010, the detail is given in Table 15.

Table 15: Financial Progress (year 2010-11)

Components (New Guidelines)	USEP (Subsidy)		STEP-UP		UWSEP (Subsidy)		UWSP (Revolving Fund)	
	Amt. Released	Exp.	Amt. Released	Exp.	Amt. Released	Exp.	Amt. Released	Exp.
1 MC Nahan	77600	12500	0	0	0	0	0	0
2 MC Chamba	40000	0	60000	0	0	0	0	0
3 MC Una	40000	12500	60000	0	20000	0	20000	0
4 MC Dharamshala	50000	0	15000	0	0	0	0	0
5 MC Bilaspur	50000	50000	20000	0	0	0	0	0
6 NP Mehatpur	50000	0	74400	0	15000	0	20000	0
Total:-	**307600**	**75000**	**544400**		**35000**		**40000**	

Integrated Development of Small and Medium Towns (IDSMT) scheme started from the year 1992 and was closed in the year 2005, however this schemes was with this department only since 1995. Up till now, 7 IDSMT Projects are completed functional whereas 14 projects are still in-progress. the financial progress is as under:-

Table 16: Status of Fund under IDSMT ***(Rs. in Lakhs)***

Sr. No	Name of Town	Year of Sanction	Approved Project Cost	Sharing of Funds			Position of Funds released			Exp.	Status
				Centre Share	State Share	F.I. Loan	Central	State	Total		
1	Nahan	1995-96	177.36	79.81	52.21	45.34	79.65	56.00	135.65	198.13	C
2	Una	1996-97	94.46	45.34	30.23	18.89	45.29	32.40	77.69	105.57	C
3	Rampur	1997-98	100.32	48.00	32.00	20.32	48.00	35.65	83.66	71.67	P
4	Dharamshala	1998-99	216.65	90.00	60.00	66.65	90.00	60.00	150.00	207.40	P
5	Solan	1999-2000	209.65	90.00	60.00	59.65	90.00	60.00	150.00	175.07	P
6	Chamba	1999-2000	161.30	48.00	32.00	81.30	48.00	32.00	80.00	295.28	C
7	Theog	1999-2000	82.60	39.65	26.43	16.52	39.64	26.43	66.07	48.49	P
8	Kullu	1999-2000	126.25	48.00	32.00	46.25	48.00	32.00	80.00	73.27	P
9	Palampur	2000-01	107.89	48.00	32.00	27.89	48.00	32.00	80.00	80.00	P
10	Nalagarh	2000-01	145.79	48.00	32.00	65.79	48.00	32.00	80.00	143.45	P
11	Jawalamukhi	2001-02	114.74	48.00	32.00	34.74	48.00	32.00	80.00	55.00	P
12	Paonta	2001-02	139.96	48.00	32.00	59.96	47.99	32.00	80.00	112.27	P
13	Bilaspur	2001-02	140.80	48.00	32.00	60.80	48.00	32.00	80.00	60.12	P
14	Kotkhai	2002-03	136.34	48.00	32.00	56.34	48.00	32.00	80.00	77.50	P
15	Sundernagar	2002-03	230.95	90.00	60.00	80.95	90.00	60.00	150.00	152.68	P
16	Manali	2002-03	135.64	48.00	32.00	55.64	48.00	32.00	80.00	123.66	C
17	Baddi	2002-03	141.05	48.00	32.00	61.05	48.00	32.00	80.00	141.66	C
18	Narkanda	2003-04	136.01	48.00	32.00	56.01	14.00	46.83	81.01	08.45	P
19	Nurpur	2003-04	130.24	48.00	32.00	50.24	48.00	32.00	80.00	84.67	C
20	Mehatpur	2004-05	109.80	48.00	32.00	29.80	24.00	36.83	81.02	31.58	P
21	Santokhpur	2004-05	101.93	48.00	32.00	21.93	24.00	56.00	89.63	107.15	C
Total:-			**2939.73**	**1154.80**	**768.87**	**1016.06**	**1072.57**	**822.14**	**1944.73**	[illegible]	

C-Completed, P-In Progress

Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT): Scheme has commenced from 2005 and the scheme period is upto 2012.This scheme is for the towns other than JNNURM towns. A total of 1680.27 Lakhs has been spent against the release of 1400.35 lakhs the financial progress under this scheme are given in Table 17.

Table 17: Status of Fund under UIDSSMT

(Rs. in Lakhs)

Name of Town	Project Cost Approved by SLSC	Central Share released	State Share released	Total released	Expenditure
MC Dharamshala	190.18	155.00	19.02	97.95	161.65
MC Hamirpur	1234.65	443.49	123.00	347.25	473.02
MC Mandi	1281.58	531.86	127.98	659.84	1045.60
Total:-	**2706.41**	**1130.35**	**270.00**	**1105.04**	**1680.27**

The proposed projects of towns for approval of Government of India and has been sanctioned by SLSC: Seven more towns namely Sundernagar, Dharamsala, Nahan, Solan, Parwanoo, Chamba & Bilaspur are proposed to be covered under this scheme with total project cost of Rs. 6733.82 Lakhs. These project proposals had been approved by the State Level Steering Committee (SLSC) for project cost of Rs. 4981.74 lakh.

Progress under Jawaharlal Nehru Urban Renewal Mission (JNNURM)

Details of approved projects / schemes under JNNURM are given below.

(A). Infrastructure and Governance (UIG) Under JNNURM (for Shimla Town only). Status of funds under JNNURM is given in Table 18.

Table 18: Status of funds under JNNURM ***(Rs. In lakh)***

Sr. No	Name of work	Project cost approved	Date of approval	Amount released Centre Share	State Share	Total release to HIMUDA	Expenditure	Executing Agency
1	Widening and lowering of existing tunnel near Aukland House School on Motor round road Shimla	1009.06	19.03.07	807.25	100.91	908.16	504.53	HPPWD
2	Setting up of Solid Waste Management Improvement of Shimla city.??	1604.00	09.03.07	320.80	351.81	672.61	263.28	MC Shimla
3	Strengthening of Transport System in the City.	675.00	26.02.09	547.33	152.04	Rs. 699.37. released to H.P.Transpo--rt Corpn. Shimla	675.00	H.P.Transport Corpn.Shimla
4	Rehabilitation of water supply distribution system for Shimla city	7236.00	20.02.09	1447.20	144.72	1591.92	0.86	MC Shimla
5	Rejuvenation of Sewerage	5474.00		970.00	263.10	1233.10	0.00	MC Shimla

Sr. No	Name of work	Project cost approved	Date of approval	Amount released Centre Share	State Share	Total release to HIMUDA	Expenditure	Executing Agency
	network in missing lines and left out areas/worn out sewerage in various zones of Shimla							
	Total			**4092.58**	**1012.58**	**5105.16**	**1443.67**	

(B). Details of basic services to Urban Poor (BSUP) under JNNURM (for Shimla Town only) is given in Table 19.

Table 19: Basic services to Urban Poor ***(Rs. In lakh)***

Sr. No	Name of work	Project cost approved	Date of approval	Amount released Centre Share	State Share	Total release to HIMUDA	Expenditure	Executing Agency
1	Ashiana-I (252 Flats at Tuttu) a Housing Scheme for the Poor of Shimla town.	999.07	21.03.07	176.36	88.98	265.34	1.07	HIMUDA
2	Ashiana-II (384 Flats at Dhalli) a Housing Scheme for the Poor of Shimla town.	1401.48	27.02.08	280.30	35.03625	315.3363	156.66	HIMUDA
	Total	**2400.55**		**456.66**	**124.0163**	**580.6763**	**157.73**	

There is a budgetary provision of Rs.1199.99 lakhs for the year 2011-12.

Progress under Integrated Housing & Slum Development Programme (IHSDP)

HIMUDA is the Executing Agency for these projects. The details are given in Table 20.

Table 20: Status of funds under IHSDP ***(Rs. In lakh)***

Sr. No	Name of work	Dwelling units	Project cost Approved	Date of approval	Central share released	State Share released	Total release to HIMUDA	Exp.
1	IHSDP Project at Hamirpur	152	443.32	27.02.08	341.19	102.13	443.32	138.51

2	IHSDP Project at Dharamshala	328	942.31	27.02.08	312.92	34.76	347.68	0
3	IHSDP Project at Solan	336	958.3	27.02.08	325.99	36.23	362.22	0
4	IHSDP Project at Baddi	480	475.39	21.02.09	445.42	232.28	677.70	0
5	IHSDP Project at Parwanoo	192	1167.98	21.02.09	822.22	345.76	1167.98	370.47
6	IHSDP Project at Nalagarh	128	549.59	21.02.09	187.69	69.60	257.29	0.30
	Total:-		**2343.93**		**2435.43**	**820.76**	**3256.19**	**509.28**

There is a budgetary provision of Rs.500.00 lakh under the scheme for the year 2011-12.

Progress under Rajiv Gandhi Urban Renewal Facility (RGURF): During financial year 2010-11, there was a budgetary provision of Rs.671.00 lakhs under Rajiv Gandhi Urban Renewal Facility (RGURF) for infrastructure and sanitation improvement in urban areas.

During financial year 2008-09, 2009-10 and 2010-11, the following towns were covered. Year wise details are given in Table 21.

Table 21: Status of fund under RGURF (2008-2009)

Sr. No	Name of ULBs	Amount Released (Rs.)	Name of work
1	Mehatpur	46,50,000	Construction of Parking
2	Rampur	59,55,000	Construction of Parking
3	Una	20,11,000	Development of Parking.
4	Sundernagar	40,00,000	Construction of Parking
5	Jawalamukhi	32,30,000	Construction of Parking
6	Santokgarh	23,00,000	Construction of Parking
7	Jogindernagar	46,20,000	Construction of Parking
8	Jubbal	50,00,000	Construction of Parking
9	Dharamshala	50,00,000	Construction of Parking
	Total:-	**3,57,55,000**	

Status of fund under RGURF (2009-2010)

Sr. No	Name of ULBs	Amount Released (Rs.)	Name of work
1	Una	60,00,000	Construction of Parking
2	Santokhgarh	10,00,000	Development of Park
3	Solan	08,00,000	Development of Parking
4	Sarkaghat	40,00,000	Development of 2 Parks
5	Nurpur	20,00,000	Development of Park
6	Mandi	11,72,666	Construction of 2 toilets
	Total:-	**1,49,72,666**	

Status of fund under RGURF (2010-2011)

Sr. No	Name of ULBs	Amount Released (Rs.)	Name of work
1	Una	14,00,000	Development of Park
2	M.C. Mandi	20,00,000	Parking near D.C. Office
3	M.C. Rohru	32,00,000	Parking
4	M.C. Sundernagar	12,00,000	Parking
5	M.C. Parwanoo	28,00,000	Parking
6	N.P. Sarkaghat	1,25,00,000	i. Rs.100.00 Lakhs for

			Parking ii. Rs.25.00 Lakhs for Park at Behad
7	N.P. Arki	20,00,000	Parking
8	N.P. Rewalsar	15,00,000	Parking
9	N.P. Jubbal	5,00,000	Parking
	Total	**271,00,000**	

There is budgetary provision of Rs. 143.00 lakhs under this scheme for the year 2011-12.

Progress under Maintenance of Roads: There are about 2579.3 Kms roads / paths / streets/drains being maintained by 49 Urban Local Bodies. An amount of Rs. 5.00 crores was provided to all the ULB's for maintenance of Urban Local Bodies Roads in proportion to the length of roads maintained by them during 2006-07. An amount of Rs.5.00 crores has been released to all the ULB's during the financial year 2007-08 for maintenance of Urban Local Bodies Roads. The funds have been released to the ULB's in proportion to the area and population of the ULB's. A sum of Rs. 6.00 crores has been released to all the ULBs during year 2009-10 and 2010-11. There is a budgetary provision of Rs.6.00 crores during 2011-12.

During 2010-11, Rs 294.00 lakhs were released to all the ULBs under **Environment Improvement of Urban Slum (EIUS)** scheme to benefit 3600 BPL families by providing basic amenities & infrastructure viz. Community taps, hand pumps, street lights, community bathrooms & latrines, road pavements, sewerage & storm water drainage rehan baseras etc. in slum areas.

The mission of the Department of Urban Development is to give green, clean and sustainable environment in the Urban Local Bodies of the State. Garbage treatment is an important part of the Urban sanitation. The Department of Urban Development is aware of the problem of the garbage being generated with increased volumes every year because of rampant urbanization and difficulties being faced in its scientific management / disposal. The Department of Urban Development is facing the problem of garbage which is being generated in the urban areas, the garbage being generated in the urban areas is to be handled in a proper manner so that the environment could be saved but due to non availability of land and financial constraints, the department is not able to manage Municipal Solid Waste effectively. There are 49 ULBs in the State i.e. 1 Municipal Corporation 25 MCs and 23 NPs. 11 SWM plants are functional covering 14 ULBs and SWM plants are under construction in the following ULBs. Status of funds under EIUS is given in Table 22.

Table 22: Status of Fund ***(Rs. In lakh)***

Sr. No	Name of Town	Year of Sanction	Estimated Cost	Funds provided	Exp.	Funding agency
1	Mandi	2005-06 P-I	108.75	108.25	109.66	This is a model project funded by the HP State Pollution Control Board through CPCB.
		2009-10 P-II	325.00	70.00 (under 12th FC)	0	70 Lakhs has been provided by UD Deptt. under 12th FC and rest of the funds will be provided by the CPCB.DPR is prepared by NBCC and submitted to CPCB.
2	Parwanoo	2005-06 2008-09	257.00	51.29 57.43	66.37	Award for 12th Finance Commission
3	Paonta	2005-06	71.90	51.29	12.78	Award for 12th Finance Commission
4	Palampur	2006-07	85.85	53.33	8.04	Award for 12th Finance

Sr. No	Name of Town	Year of Sanction	Estimated Cost	Funds provided	Exp.	Funding agency
		2008-09		32.25		Commission
5	Nalagarh	2006-07	71.00	53.33	0	Award for 12th Finance Commission
6	Solan	2007-08	160.00	160.00	13.41	Award for 12th Finance Commission
7	Sundernagar	2008-09	132.52	70.00	18.64	Award for 12th Finance Commission
8	Ghumarwin	2009-10	143.18	90.00	5.45	Award for 12th Finance Commission

Sewerage Scheme to provide Sewerage facilities in the towns is being implemented by the IPH Department, funds amounting to Rs. 22.00 crores were released to the IPH Department for implementing sewerage scheme in 30 towns and Rs. 50.00 lakhs have been released to the Municipal Corporation, Shimla for its Solid Waste Management Project. In 2009-10 there was a budget provision of Rs. 36.00 crores (general plan=24.00 + SCSP=12.00 crores) out of which 32.55 crores was released to IPH and the remaining Rs. 3.45 crores was allocated to the Hamirpur & Jogindernagar. In the year 2010-11, there was a budget provision of Rs. 37 crores (Gerneral Plan=25 + SCSP=12 crores) under this scheme out of which 35.35 crores was released to the ULBs and the approval to convert the rest of amount (1.65 crores) for rural schemes to urban schemes is awaited.

NORAD

Origin of the Scheme: In order to tackle the problem of garbage in a proper manner, the State Government with the assistance of Norwegian Government under NORAD. The scheme was started in Urban Local Bodies in Himachal Pradesh in 1994-95 and completed 1999-2000. .

Main objective of the scheme: The main objective of this scheme was to provide various equipment for garbage handling to the Urban Local Bodies and to handle the garbage problem in scientific manner. There were two sub-heads of this scheme namely:

2. IHD-056 meant for all the Urban Local Bodies of the State.
3. IHD-063 meant for Municipal Corporation, Shimla and now Kullu-Manali.

Vidhayak Kshetra Vikas Nidhi Yojna (VKVNY): The State Government launched a new programme called "Vidhayak Kshetra Vikas Nidhi Yojna" in 1999-2000. This scheme was discontinued in the year 2001-02 due to some constraints but re-started in 2003-04. The main objectives of this scheme are given below.

(I) Funds are provided to DCs enabling MLAs to make recommendations for sanctioning of development schemes in their constituencies.

(ii) As the schemes / works will be formulated / determined by the Hon'ble MLAs, they will also take keen interest in the implementation and monitoring of each scheme thereby resulting in effective utilisation of the limited financial resources.

The scheme/works of the following nature can be under-taken under this programme:-

a. Construction of buildings of Educational Institutions.
b. Construction of Ayurvedic Dispensaries, Veterinary Institutions & Health Sub-Centres etc.
c. Installation of Hand Pumps.
d. Construction of Motorable / Jeepable link roads in rural areas.

e. Construction of Community Bhawan in rural areas.
f. Providing of other important infrastructural facilities for the benefit of people at large such as X-Ray Plants, Ultra Sound machines and ECG machine, etc.
g. Purchase of Ambulance for Health Institutions.
h Construction of Foot Bridges in rural areas.
I. Construction of paths in rural areas for two wheelers.
j. Drinking Water Supply Schemes for left out villages.
k. Local Irrigation Schemes.
l. Construction of toilets in the Schools.
m. Construction of concrete based or black topped path.
n. Drinking water supply schemes to the left-out basties habitation where there is a requirement of public taps by laying down additional pipes.

The scheme envisaged allocation of Rs.15 lakhs per MLA during 1999-2000 but was enhanced to Rs. 20 lakhs in 2000-01, Rs. 24 lakhs in 2003-04 and Rs. 25 lakh per MLA in 2004-05 and 2005-06. This has further been enhanced to Rs. 30.00 lakh in the year 2008-09.

It is ensured by the Deputy Commissioners that schemes, recommended by the concerned MLAs of the area are sanctioned within a month's time and funds utilized within one year of the sanction. The district-wise details of funds released and actual expenditure incurred under this programme in 2005-06, 2006-07 and 2007-08 are given below in Table 23.

Table 23: District-wise Actual Expenditure 2006-07, 2007-08 and Approved Outlay 2008-09

Sr. No.	Name of District	Actual Expenditure (Rs. In lakh)		Approved Outlay 2008 -09 (Rs. In lakh)
		2006 - 07	2007 - 08	
1	Bilaspur	100.00	100.00	120.00
2	Chamba	105.00	105.00	126.12
3	Hamirpur	125.00	125.00	150.00
4	Kangra	400.00	400.00	480.00
5	Kullu	75.00	75.00	90.00
6	Mandi	250.00	250.00	300.00
7	Shimla	200.00	200.00	240.00
8	Sirmaur	125.00	125.00	150.00
9	Solan	125.00	125.00	150.00
10	Una	125.00	125.00	150.00
	Total	**1630.00**	**1630.00**	**1956.12**

District Plans in the Eleventh Five Year Plan: The Eleventh Five Year Plan (2007-12) lays considerable emphasis on the formulation of district plans from the panchayat level based on participatory approach which need to be got approved from the District Planning Committee (DPC) as per recommendations of the Expert Group on planning at grass root level. As a first step, Himachal Pradesh has constituted the District Planning Committees in all the districts. The Panchayati Raj Department has been entrusted with the function of the preparation of District Plans by involving all the Deputy Commissioners and the District Planning units in this exercise.

Approved Development Plans

List of Interim Development Plans, Development Plans and Revised Development Plans are; Kasauli, Hamirpur, Manali, Dalhouise, Palampur, Dharamshala, Mandi, Barotiwala, Solan, Nahan, Bilaspur and Report on Shimla Heritage Town

10.3 Technology adopted in the sector along with any changes in technology

1. Promotion of Solar Energy in Shimla: To expand its green energy options, Himachal Pradesh has cleared state's first solar power project at Verra Dol, near Naina Devi in Bilaspur. The 2 MW project to be set-up on pilot basis will cost nearly Rs 40 crores and will be completed by 2012.

The solar project marks the drive of Himachal to tap energy from non-conventional resources,

which have so far remained untapped for years, even as the State has huge potential for solar power.

Main objective of this project is to consider its enormous solar power potential Himachal Pradesh can generate at least 50 MW of solar power by getting right expertise and funding. Since solar power is costly, there is need for subsidy or other grants.

To mobilise funds for solar projects, the State Government has approached Central Government help seek external funding in its drive to tap green energy.

The solar mission also proposes to ease duty on import of related items and fiscal incentives to private players.

At present the cost of solar power is estimated to be Rs 15 to 16 per unit, which, experts believe, could be brought down to Rs 6 per unit if the government gives incentives to solar power players.

Some private investors have already submitted proposals to the State government to manufacture solar-based equipment.

Once the project at Bilaspur makes headway, the government expects lots of players coming forward." Tamil Nadu has been a pioneer in solar energy and some of the companies, which have shown interest to invest in Himachal, are from southern states.

The Government is also in touch with international experts for drawing plans for tapping solar and wind energy.

2. Strengthening of rain water harvesting operation and management system in Himachal Pradesh: The Decision regarding rain water harvesting was taken by the Himachal Pradesh Government for making compulsory, the collection of rain water from the roof tops of buildings in the urban areas including commercial/industrial buildings located in the State.

Collection of Rain Water from the Roof of Building: - For rain water harvesting a tank in the proposed building shall be constructed by connecting it with the gutter at the top of the roof. The capacity of the rain water harvesting structure shall be proposed in the plan as under:-

Roof top area (sq. mtrs.)	Capacity in Ltrs.
100	2,000
150	3,000
200	4,000
500	10,000
1000	20,000

So far following 12 ULBs has incorporated the provision of rain water harvesting in their building bye-laws namely; M. Corp. Shimla, MC Rampur, MC Dalhousie, MC Hamirpur, MC Nainadevi ji, NP Bhotta, MC Ghumarwin, MC Nurpur, MC Nagrota Bhagwan, NP Rajgarh, NP Talai & NP Sujanpur.

The remaining 37 ULB's are in the process of preparation / amendment of their building bye-laws to incorporate the provision of rain water harvesting.

3. Sewage and Solid Waste Management System: As towns in the State mostly serve as health resorts, environment improvement assumes special significance particularly to avoid pollution of the rivers and other water bodies of the State. Secondly, to abolish carrying of night soil on head load and scavenging system in India, the Government has given top priority to connect dry latrine system into water pour system. Hence, the sewerage programme has assumed immense importance. Under this programme sewerage facilities are proposed to be provided in all towns of the State.

The Solid Waste generation in Urban local Bodies is an alarming problem which is posing a serious challenge to all the Urban Local

Bodies. The pace of urbanisation and unprecedented influx of tourist from all over India has put Municipal bodies under pressure.

So, keeping in view the problem of Solid Waste, the Solid Waste Management Projects for scientific disposal of Biodegradable Solid Waste in the Urban Local Bodies are being taken up in phased manner. During the year 1998-99, five towns were selected under Solid Waste Management projects.

Towns to be covered under funding from H.P. Pollution Control board are; Dharamshala, Hamirpur, Una, Kangra & Nahan.

ULBs covered under 12th Finance Commission Award are; MC Paonta, MC Parwanoo, NP Mehatpur/Santokhgarh, MC Chamba, MC Palampur, MC Nalagarh, MC Solan.

10.4 Stakeholder involvement in environment preservation and restoration

Some stakeholder involves are:

1.Govt. sector- it includes:

- Department of Planning
- Department of Urban Development
- Department of Town & Country Planning
- Department of Public Work (PWD)
- Municipal Corporation & other ULBs
- Health Department
- Department of Education
- Department of Industry
- Department of IPH
- Department of IT

2. Public and Private sector

3. NGO's

Department of Planning: The most important aim of planning is to identify a process of development which will raise living standards and open out to the people new opportunities for a richer and more prosperous life. The basic objectives of planning can be grouped under four heads: modernization, growth, self reliance and social justice.

Department of Urban Development: Himachal Pradesh is predominantly a hilly region and with the development of network of various infrastructures, the urban areas in the State are now fast growing. In order to meet out these challenges & requirement of urbanization, the Directorate of Urban Development is taking steps towards efficient urban administration in a phased and coordinated manner**.**

Department of Town & Country Planning: The Town and Country Planning was created as a small cell in Himachal Pradesh, Public Works Department in 1964. During 1979, it was created as in independent Directorate headed by Chief Engineer of Himachal Pradesh Public Works Department till 1993 when independent Director was appointed as Head of Department. Its objectives are; to encourage planned and systematic urban and rural growth in a comprehensive manner, to stop haphazard constructions.

Department of Public Work (PWD): The Department is engaged in planning, construction and maintenance of roads, bridges, ropeways and buildings (both residential and non-residential of various government departments) in the State. The Department further executes engineering work on behalf of Local Bodies, Public Undertakings, Boards & other Institutions under Himachal Pradesh Government as "Deposit works".

Department of IPH: The Department is also responsible for the operation and maintenance of; Drinking Water Supply Schemes, Sewerage Systems, Irrigation systems through source development, lifting water, boring of tube wells & providing distribution systems and flood

protection works to protect life and property in the State.

10.5 Critical environment issues / hotspots associated with the sector

Currently critical urban planning namely issues relates to inadequate provision of basic urban services especially for the poor, water, sewerage, sanitation, solid waste management, affordable housing, parking space, green areas and open space, and public transport. This has been partly because of poor land management strategies which is key for good urban planning and development as well as financing urban infrastructure development. Further, a vicious trend of ribbon development and urban corridors, affecting transport efficiency has emerged as a fall out of the land use policies and land use changes. In the context of Himachal Pradesh being a special category state, following issues also becomes critical namely, private sector investment is relatively subdued that implies greater role for public investment, infrastructure gaps lead to higher cost of goods and services, which necessitates accelerated efforts to develop infrastructure, high proportion of forest cover and mountain eco-systems become constraints on rapid development. Forest clearances are difficult to get and the state has to pay Net Asset Value. The State also demands monetary compensation for providing "eco services" to the nation, state's share for Centrally Sponsored Schemes (CSS) to contribute normal state share under many CSS unlike NE states which contribute mostly 10% as state share to CSS.

1. Inadequate Water Supply: Himachal Pradesh is no exception to the critical urban water supply position in the major states of India. Water supply in the urban areas is inadequate, in terms of quantity as well as quality. According to the State of Environment Report (SOER) -HP, 'the water supply systems in most of the towns are quite old and have outlived their utility, their sources need augmentation and the distribution systems in almost all the supply schemes need replacement and rehabilitation. Though all the towns of Himachal Pradesh have water supply facility, yet the per capita availability of water in a large number of towns is well below the desired norms. The major populated towns, i.e., Shimla, Solan, Mandi, Hamirpur, Bilaspur, and Dharamshala have a per capita water supply of less than 80 lpcd and the industrial towns of Baddi, Paonta Sahib and Nalagarh have a per capita water supply of less than 50 lpcd. Not all households have individual water connections in most of the towns and not all localities and areas are covered by the water distribution network. The supply is unreliable due to irregular supply, inadequacy, short duration as well as the poor quality of water. A large number of people use drinking water from traditional sources without ascertaining the quality of the water. Due to the unreliability of the water supply, consumers have made additional investments on installing individual tubewells, handpumps, storage facilities (ground as well as overhead), pumping sets, booster pumps and filtration systems.

In a survey of drinking water in the six towns of Chamba, Dharamshala, Manali, Mandi, Shimla and Solan done by the Health Department in 1994, it was found that water-borne diseases were a major health problem in the urban areas of the state. Nearly one- third of the water samples tested was found contaminated with enteric bacterial pathogens as per State of Environment Report, Himachal Pradesh. The situation is no better in other towns as a large number of cases of water-borne diseases are reported in hospitals every year.

The deficiencies of water supply multiply in summer due to the increase in demand and the drying up of several sources. Shimla's water crisis in summer is well known. The supply of water is not volumetric in all towns and it is a major factor in its wastage. Rich and poor

sections pay the same rates and hence the consumption of more water by the higher income groups becomes a 'social good' for them as they get it at a nominal cost. There is no system of cross subsidisation. The cost is not linked with consumption and the rates are not revised periodically with the hike in electricity charges, labour charges, and the cost of material. The principle of cost recovery has not been applied to the water supply and plan allocations have been inadequate to cope with the demand. The arrears of Rs. 17.13 crores are due at ULBs on account of water bills to be paid to IPH.

One of the crucial aspects of water supply in Himachal Pradesh is that in most of the towns it is maintained either by the Irrigation and Public Health (IPH) Department (49 towns) or the Cantonment Boards (6 towns) or the Himachal Pradesh Housing Board (1 town) and not by the ULBs. Only in Shimla, Solan (distribution of water) and Palampur (O&M and distribution of water), ULBs have this function under their jurisdiction but in a limited manner. Though the 74th Constitutional Amendment envisages the transfer of water supply to the ULBs, yet even after the passage of this amendment, water supply in Himachal Pradesh continues to be looked after by the IPH Department of the State Government. It is time to transfer this function along with funds and functionaries to the ULBs. Their active involvement in prioritising the works according to the needs of the people can help to provide potable water to the citizens in an efficient manner. The involvement of the local people in the operation and maintenance of the water supply systems can be secured through water users associations.

Current efforts for water conservation, treatment and recycling of waste water, rain water harvesting and water supply are inadequate to tide over the crisis and sustain the water supply system in the urban centres of Himachal Pradesh in the long run.

2. Inadequate Sewerage System: The sewerage system in the urban areas of Himachal Pradesh is grossly inadequate. Sewage treatment facilities exist only in seven towns i.e., Shimla, Palampur, Sri Naina Devi, Chamba, Mandi, Bilaspur and Rohroo. Untreated sewage in other towns is disposed of in rivers. It is polluting the drinking water and damaging the ecology of the State. The cost of water treatment is also going up as river water, which is used for drinking purposes in several towns, is becoming polluted day by day due to the disposal of untreated sewage. The pollution level in the major rivers of Himachal Pradesh viz. Beas, Satluj, Ravi and Parbati is on the rise and it has serious implications on the health of the people of Himachal Pradesh and of the neighboring states.

3. Inadequate Solid Waste Management: There are serious deficiencies in solid waste management (SWM) in the urban areas and environmental decline is visible in almost all towns. The sudden influx of tourists puts tremendous pressure on the sanitary services. The SWM services are inadequate and the accumulation of garbage can be seen in most of the towns. Diseases like diarrhoea and malaria breaks out frequently in many towns due to the poor sanitary conditions. The situation has been worsening despite the favourable climatic and environmental conditions in Himachal Pradesh. The municipalities complain of the shortage of sanitation staff but discussions with the local people in several towns reveal that the existing sanitation staff do not work or irregularly sweep the streets and collect the garbage. The cost of collection, transportation and disposal is high due to certain outdated practices and old technologies. Unscientific disposal of waste is common and biodegradable waste is not taken care of at the household level.

One of the factors for poor SWM in the urban areas is the gap in the physical targets and achievements in several SWM activities i.e. construction of dustbins, toilets, purchase of

vehicles and construction of waste treatment plants. This gap is likely to increase with the existing fiscal, institutional and functional deficiencies in the development of the urban infrastructure.

Though the ULBs of Shimla, Kullu, Manali, Nahan and Solan have solid waste treatment plants, the problem of poor SWM continues due to the lack of support of the local people in providing segregated waste to the sanitary staff. These ULBs have to segregate waste at the sites of treatment plants, which is a costly and time-consuming affair. In a few towns i.e. Una, Hamirpur, Dharamshala and Kangra works for construction of treatment plants are in progress. A large number of towns do not have treatment facilities and are creating environmental pollution. Heaps of polythene bags are seen in all major towns. The tourists leave a lot of garbage including polythene bags in the urban areas, which is affecting the ecology of the state. The Himachal government is the first to enact legislation to manage non-biodegradable garbage but the law has not been implemented effectively. Throwing of garbage in drainage channels/nallahs and in the streets is a common practice and the ULBs have to start special campaigns to desilt the nallahs/channels time and again. Sanitation charges are collected by a few municipalities, which are grossly inadequate to maintain even O&M of Solid Waste Management.

The need of funds for providing adequate treatment facilities and covering the uncovered areas is colossal. The Municipal Solid Waste (Management and Handling) Rules, 2000, formulated by the Ministry of Environment and Forests, Government of India call upon the ULBs to take urgent steps to address problems relating to solid waste management. No doubt the ULBs are making efforts to improve the sanitary conditions in their areas but still a lot remains to be done to create a people-friendly sustainable environment in the urban areas of Himachal Pradesh.

4. Inadequate Energy Efficient measures and practices in building design and construction: Energy management measures and practices have not been adequately encouraged in the planning of buildings. Buildings and Townships that are energy efficient and use sustainable energies like solar and wind energies has not been adequately considered in design and implementation. Further, use of solar energy and other new and renewable sources of energy, water recycling techniques, rain water harvesting techniques and waste management practices have not been adequately promoted in an integrated manner in the new buildings and townships in residential and commercial areas. Further, provision of green spaces and open areas in new townships are not adequately provided in residential and commercial areas factoring in the hill conditions.

5. Inadequate Energy Efficient measures and practices in transport sector: The transportation system is not adequately energy efficient and has limited options of types of fuels and conformity with emission standards e.g. Bharat Stage norms. Further, provision of parking norms, as per ECS norms in residential and commercial areas have not been adequately considered factoring in the hill conditions in Buildings and Townships.

The area falling along the National Highway-22 is highly eco-fragile and most of the constructions are neither in accordance with the hill architecture nor environment friendly. The areas, which have been found to be most prone to this ribbon development and urban corridors, include the valleys of Kangra, Kullu, Poanta, Balh in Mandi and the belts falling in the Shimla-Parwanoo, Bhota-Hamirpur, Mehatpur-Una, Barotiwala-Nalagarh and Ghaggas-Barmana areas. It is a very undesirable trend as a result of which the back land is getting locked and wasted and most importantly the efficiency of transportation is getting affected.

6. Inadequate equality in provision of services: There is a gap of demand and supply of urban land, housing and other basic services. The demand supply gap makes basic services further inaccessible to the urban poor. These factors also threaten livelihoods and employment of urban poor and proliferation of slums and encroachments for sustenance of livelihoods. Provisioning and management of basic services in the urban planning does not adequately reduce inequality in services between rich and poor. The concept of commercial viability does not hold for social services. City/town development and the basic amenities do not adequately take into account social conditions. For *e.g.* urban poor could face challenges to pay for the full cost of water, in the event of reduction in grant/subsidy of the government and introduction of private sector to provide such services in this sector. Benefits of certain subsidies schemes in the past have not accrued to the poor sections of the society in the urban areas.

Pressure on account of increasing gaps and slow implementation of policy, programs, plans and projects is leading to emergence of sector specific issues and risks/impacts. An analysis of the issues, causes and impacts has been carried out and summarized in Table 24.

Table 24: Issues, Causes and Impacts

Issues	Causes	Impacts/Risks
Inadequate Water Supply	Increase in urban population Migration from rural to urban areas Remoteness and inaccessibility of habitation Scanty and uneven distribution of rainfall Siltation of water bodies	Increased pressure on existing water resources Increasing gaps between demand and supply
Inadequate Sewerage System	Inadequate Sewerage network coverage (between new and old city/towns Poor sanitary conditions in towns/wards which are not covered by sewerage networks	Pollution of receiving water bodies from disposal of untreated sewage Unhygeinic condition affect tourism sector Spread of diseases due to contamination
Inadequate Solid Waste Management	Poor sanitary conditions in towns/wards which are not covered by SWM services Inadequate fund allocation and fund generation for setting up of sewerage system	Increased instances of outbreak of diseases like diarrhea and malaria, etc due to indiscriminate dumping and improper disposal of solid waste, for instance, incineration
Inadequate Energy Efficient measures and practices in building design and construction	Use of wood /fuel in heating of buildings (residential / commercial) Understanding of ECBC is limited ECBC being voluntary for its adoption and implementation has a tardy pace of implementation in HP	Increased energy demand Increased green house gas emissions

Issues	Causes	Impacts/Risks
	Understanding of new and renewable energy sources is limited High cost of setting and operating appliances and equipments run on new and renewable energy sources Lack of awareness & understanding of the long term benefit of such measures	
Inadequate Energy Efficient measures, cleaner fule technology and practices in transport sector	Dependence on road transport in the urban and transport planning in view of the hilly terrain Limited options alternate modes of transport High cost of fuels in remote and inaccessible areas in HP due to high transportation cost Preference for diesel in transport sector	Inclusive growth may not be achieved as the inadequate interventions for improvement of public and non-motorized transport will make the services inaccessible to the poorer sections of society who are the major users of these modes It will also decrease productivity (due to increased congestion) and poor safety on the road Increased use of rail freight, non-motorized and public transport modes and introduction of cleaner vehicles and fuels may contribute greatly to air pollution Energy Security may be jepoardised because of increased fuel consumption Non Conformity to the emission standards.
Inadequate equality in provision of services	Inadequate focus on planning basic services for urban poor	Continued alienation of urban poor and inaccessibility and high cost of accessibility to the basic urban services for the poor

10.6 Environment initiatives taken by the sector to address critical environment issues

1. Clean Polythene Campaigns: Random disposal of polythene bags routinely choke sewerage and drainage systems. The non-biodegradable waste remained on hill slopes marring the beauty of the State for years. The State Government has totally banned carrying all type of polythene in the State vide notification No. STE-F (4)-2/2008 dated 07.07.2009.

However, the first State wide campaign to collect Polythene was launched in all the Urban Local Bodies of H.P. w.e.f 21.12.2009 to 26.12.2009 in which 23964.80 Kg of Polythene was collected by the ULBs.

Thereafter, 2nd Campaign was launched w.e.f. 22.4.2010 to 29.4.2010 in which 18822.20 Kg of polythene was collected and the 3rd campaign was launched w.e.f. 25.09.2010 to 02.10.2010 and 10805.56 Kg polythene was collected by the ULBs.

In addition to this, Municipal Councils of tourist hubs like Kullu and Manali collected about 40 tonnes & 6.7 tonnes of plastic respectively at their solid waste management plants. MC Kullu had executed an agreement for supplying all plastic waste to ACC Barmana for incineration in their kiln in lieu of other fuels. Nearly 9.8 tonnes of plastics (7 trucks) have been sent to ACC Barmana at transportation cost of 12,000/- per truck which is borne by MC Kullu and about 25 tonnes plastic has been handed over to PWD. MC Manali has also sent polythene nearly about 4 tonnes to Punjab through rag pickers for recycling.

The HP Public Works Department, as per State Government decision has been procuring plastic from ULBs for reinforcing the bitumen to black top the roads @ 4/- per kg. So far nearly 72 tonnes (40 tonnes upto January, 2011) plastic has been handed over to HPPWD by the ULBs for this purpose. The plastic is being handed over to HPPWD periodically by the ULBs.

To enhance consciousness about the need to segregate waste and avoid use of random littering of polythene, vehicles were stopped at the entry point to HP, and their rubbish was procured in exchange for a cloth bag that they could reuse and read the messages printed thereon against proliferating plastic waste. 195 challans (150 challans by January, 2011) have been done by the ULBs and a sum of Rs.1,09,700/- collected against Rs. 79,700 till January, 2011 as fine. Citizen from all walks of life voluntarily took a pledge to raise awareness about its negative environmental impacts.

2. Strengthening of rain water harvesting operation and management system in Himachal Pradesh: The decision regarding rain water harvesting was taken by the Himachal Pradesh Government for making compulsory, the collection of rain water from the roof tops of buildings in the urban areas including commercial/industrial buildings located in the State.

3. Rules for Installation of Communication Towers: Location of communication towers is governed by radio frequency system and cellular operators shall avoid residential areas for erection of the same. The location shall be decided as follows:-

- **(i)** First preference shall be given to the location of tower in the Forest areas.
- **(ii)** Second preference shall be given to the location of tower in the open or public areas away from residential locations.
- **(iii)** Where it is not possible to avoid the location of the tower in residential area, the same shall be located in open space or park, with prior consent of owners of adjoining residential houses.
- **(iv)** Erection of tower shall not be allowed within a radius of 100 metres from residential building, school and hospital.

10.7 Environment related studies carried out in the sector

Department of Urban Development has prepared Detailed Project report of Solid Waste Management System as well sewerage system through different schemes for the various towns in the State. The main objective of these projects is to make Urban Local Bodies capable of using scientific methods to handle biodegradable Solid Waste in their area covered are; Dharamshala, Hamirpur, Una, Kangra, Nahan, MC Paonta, MC Parwanoo, NP Mehatpur/Santokhgarh, MC Chamba, MC Palampur, MC Nalagarh, MC Solan, Shimla.

10.8 Environment monitoring (key parameters such as air and water pollution) carried out for activities related to the sector

At present, no environment monitoring is carried out by the Department of Urban

Development as well as Department of Planning. However, environmental monitoring is carried out by HPPCB, I & PH and other agencies within the State.

10.9 Institutional mechanisms within the sector to address identified environment issues

(A) Organisation of Planning Department: The organisational structure of Planning Department consist of following three tiers: 1. Headquarters 2. District Offices. 3. State Planning Board.

1. Headquarters:- At the Headquarters, Seceratry (Plannning), to the Government of Himachal Pradesh is the Head of the Department. Under him/her various divisions viz. Plan Formulation, Project Formulation, Plan Implementation, NORAD, Computerisation, Evaluation, Manpower and Employment, Administration, Regional & District Planning and Backward Area Sub-Plan are functioning.

These divisions are headed by Additional Director, Joint Director and Deputy Directors. According to rule of business, the following structure exists in the department for transaction of official business:-

1. Hon'ble Chief Minister
(Planning Minister)
|
2. Pr. Secretary (Planning).
|
3. Secretary (Planning).

2. District Offices:- Under the decentralised scheme of planning; field offices have been opened in Himachal Pradesh except the two tribal districts of Lahaul & Spiti and Kinnaur. These offices are functioning under the control of the concerned Deputy Commissioners and have been provided with a staff set-up of one District Planning Officer, one Credit Planning Officer, one Assistant Research Officer, One Statistical Assistant, one Assistant (two in the case of Shimla, Kangra and Mandi), one Steno-typist, one Clerk and one Peon.

3. State Planning Board:- During the year (2003-04) State Planning Board has been constituted under the Chairmanship of Chief Minister, Himachal Pradesh by nominating

- To determine the plan priorities for State in the light of overall national objectives.
- To assess the man-power and financial resources and their organisational and institutional capabilities.
- To assess the level of development in important sectors for the State as a whole as well as for various districts and regions.
- In the light of above, formulate a long term perspective plan for the most effective and balanced utilization of State resources.
- To assist the State Government in the formulation of the Five Year Plans and annual plans and evolve a short term strategy (Five Year Plan) for planned development after examination of different approaches so as to achieve maximum growth rate keeping in view the social justice.
- To identify factors which tend to retard the economic and social development of the State and determine conditions to be established for successful execution of the plan.
- To suggest policies and programmes for removing the imbalances prevailing in various regions in the State and to assist in the formulation of the district plans/area Plans.

- To review the progress of implementation of the plan programmes and recommend, such adjustments in policies and measures as the review may indicate.
- To make critical appraisal of on-going programmes leading to a determination of the extent to which some of the identified on-going programmes of projects would need to be continued.
- To review the implementation of plan projects and other development schemes.
- To advise on the problem of unemployment and suggest ways and means for tackling it.
- To advise on such other matters connected with the economic development as may be assigned by the State Government.
- To make such interim or ancillary recommendations as appear to it to be appropriate for facilitating the discharge of duties assigned or on a consideration of the prevailing economic conditions, current policies, measures and development programmes or an examination of such specific problems as may be referred to it for advice by the State Government.
- To collect and analyse information/data regarding plan schemes.
- To review the working of Government Corporations, Boards and suggest means for their improvement.
- To highlight difficulties being faced in the implementation of the plan schemes at district level and suggestions to over come them.
- To evaluate various projects/corporations according to the directions of Chairman

Organizational Chart of Planning Department

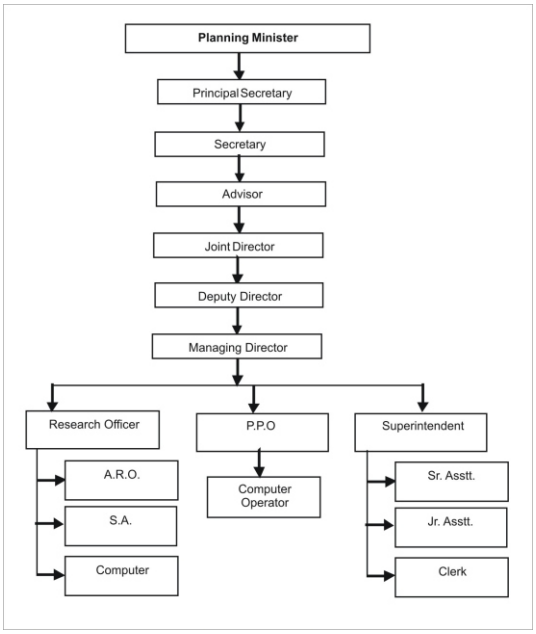


Figure 1: Organizational Chart of Planning Department

District Planning Cell

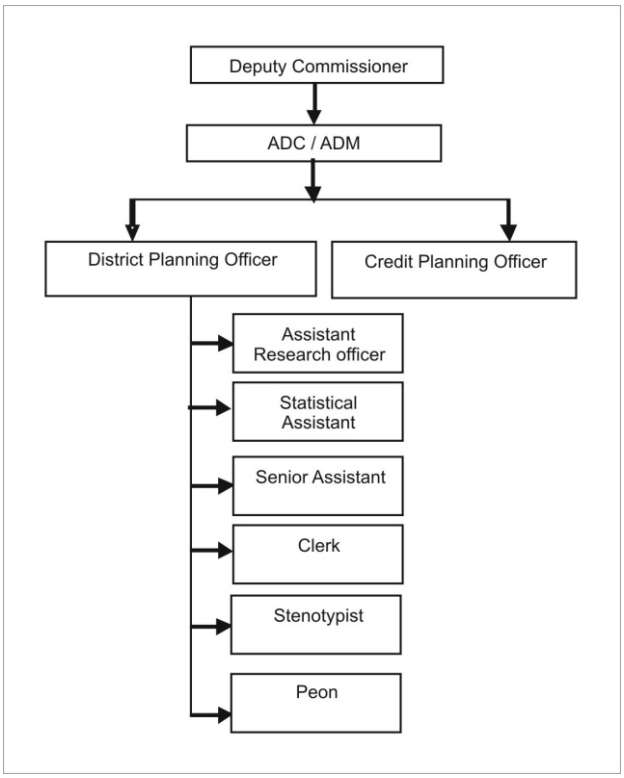


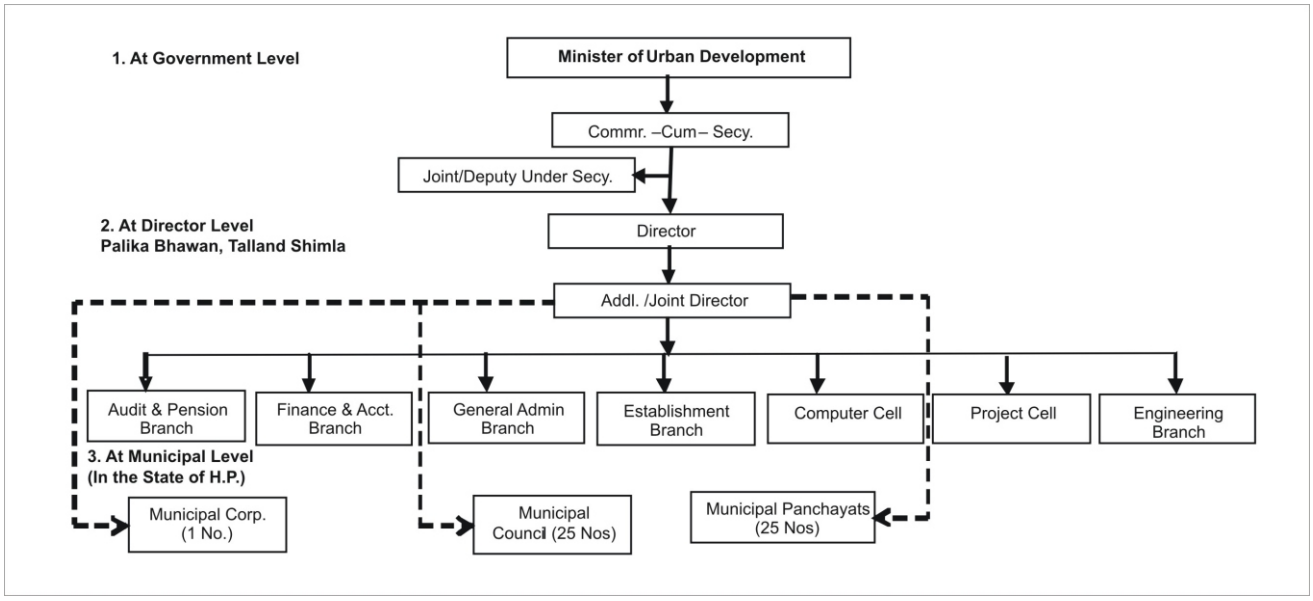
Figure 2: District Planning Cell

(B) The **Town & Country Planning** Department, It has seven Divisional Town and Country Planning Offices and 5 Sub-Divisional Town Planning Offices. The Divisional offices are headed by Town and Country Planners and Sub-Divisional offices by Assistant Town Planners. The Divisional as well as Sub-Divisional offices are located in following towns as given in table 25.

Table 25: Location of Divisional & Sub-divisional officers

Divisional Offices		Sub-Divisional Offices	
Sr. No.	Name of Offices	Sr. No.	Name of Offices
1	Shimla	1	Una
2	Solan	2	Chamba
3	Dharamshala	3	Rampur Bushehar
4	Mandi	4	Parwanoo
5	Kullu	5	Bilaspur
6	Hamirpur		
7	Nahan		

(C) Urban Development: The Urban Development Department has been completely recognised and formed as the Apex Administrative Unit to regulate, control, advice, guide, administer, coordinate and monitor the entire functioning of the Urban Local Bodies.



10.10 Data / documentation pertaining to addressing demographic issues in the context of the sectors, such as population changes; requirements of populations and changing lifestyles; migratory populations including tourists; transhumants; transit labour population; pressures felt by communities due to degraded environment conditions.

Demographic Trends: The population of the State registered a decadal growth of 12.81 percent as against 17.64 percent at All-India level during the decade 2001-2011, thus recording a decline of 4.73 percent as compared to the preceding decade 1991-2001. This has been possible through a three-pronged strategy of intensive health cover, improvement in literacy rates, especially among the women and making family planning a people's movement along with a positive thrust of incentives. The important comparative demographic indicators are given in the following table 26.

Table 26: Growth in general population

Year	Population	Decennial growth rate	Density of population	Literacy rate
1901	19,20,294	..	34	..
1911	18,96,944	(-)1.22	34	..
1921	19,28,206	1.65	35	..
1931	20,29,113	5.23	36	..
1941	22,63,245	11.54	41	..
1951	23,85,981	5.42	43	..
1961	28,12,463	17.87	51	21.27
1971	34,60,434	23.04	62	31.96
1981	42,80,818	23.71	77	42.48
1991	51,70,877	20.79	93	63.86
2001	60,77,900	17.54	109	76.5
2011	68,56,509	12.81	123	83.78

Source:- (i) Census of India, 1981, Series-7, Himachal Pradesh, Part-II,
(ii) Census of India, 1991, Series-9, Himachal Pradesh, Paper-1,
(iii) General population Tables-II.A Census of India-1971
(iv) Census of India-2001 H.P.
(v) Census of India, 2011

Table 27: Trends in Urbanisation in Himachal Pradesh

Census Year	Total Population (in Lac)	Urban Population (in Lac)	Rural Population (in Lac)	% of Urban Population	Compound Annual Growth Rate (%)**		No. of Towns
					Rural	Urban	
1971	34.6	2.42	32.18	6.99	1.98	3.12	36
1981	42.81	3.26	39.55	7.69	4.15	3.02	47
1991	51.71	4.49	47.22	8.69	1.79	3.25	58
2001	60.77	5.95	54.82	9.79	1.5	2.86	57
2011	71.42	7.89	63.64	11.05	1.5	2.86	
2021	83.93	10.45	73.88	12.45	1.5	2.86	

Source: Himachal Pradesh Development Report

Table 28: District wise Educational Facilities (High School & above) in Himachal Pradesh

District	Govt. High Schools	Govt. Sr. Sec. Schools	Pvt. High Schools	Pvt. Sr. Sec. Schools	No. of Govt. Colleges	No. of Medical Institutions
Bilaspur	NA	NA	NA	NA	NA	NA
Chamba	NA	NA	NA	NA	NA	NA
Kangra	202	96	44	44	18	-
Hamirpur	NA	NA	NA	NA	NA	NA
Kinnaur	25	12	-	-	1	-
Kullu	51	22	11	-	2	-
Lahaul & Spiti	16	8	-	-	1	-
Mandi	144	67	38	38	7	86
Shimla	156	65	31	12	12	-
Sirmaur	68	29	-	2	2	-
Solan	-	33	-	11	4	10
Una	60	34	15	14	6	31

Source: Department of Education, H. P. (Census, 2001)

Table 29: District wise Educational Facilities (Primary & above) in Himachal Pradesh

Sr. No.	District	Primary School	Middle School	High School	Colleges
1	Bilaspur	588	123	138	3
2	Chamba	1079	222	157	3
3	Hamirpur	509	126	191	8
4	Kangra	1755	377	527	17
5	Shimla	1614	310	333	11
6	Sirmaur	965	171	122	5
7	Solan	756	157	175	4
8	Una	506	114	148	7
9	Lahaul & Spiti	205	33	29	1
10	Kinnaur	NA	NA	NA	NA
11	Kullu	727	107	49	2
12	Mandi	1705	254	145	7

Source: Government of HP, 2005-06

Table 30: Educational institutions in Himachal Pradesh (1997-98 to 2005-06)

Year	Primary/ Junior Basic	Middle/ Senior Basic	High/Higher Secondary &+2	Colleges of General Education
1997-98	9,005	1,056	1,339	52
1998-99	10,211	1,474	1,444	57
1999-00	10,408	1486	1,484	65
2000-01	10,499	1,709	1,832	64
2001-02	10,546	1,768	1,954	65
2002-03	10,563	1,833	2,053	69
2003-04	10,606	2,076	2,140	69
2004-05	10,613	2,012	2,341	69
2005-06	10,613	2,112	..	..

Source: - Education Department, Himachal Pradesh.

Growth of Educational Institutions The decadal achievements of Educational Institutions upto 2000-01 and Annual Plan wise achievements till 2008-09 are given below in Table 31.

Table 31: Educational Institution till 31st March 2009

Sr. No.	Item	1970-1971	1980-81	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
1	Primary Schools	3768	6093	10633	10633	10634	10651	10651	10652	11525	10682	10751
2	Middle Schools	742	1032	1674	1674	1814	2194	2199	2186	2324	2399	2338
3	High Schools	435	582	860	978	962	952	949	953	860	835	835
4	Senior Secondary Schools		3	150	536	572	687	696	708	991	1223	1223
5	Colleges	15	25	25	37	40	40	41	47	70	72	70
6	B.Ed. Colleges										1	1
	Total	**4960**	**7735**	**13342**	**13858**	**14022**	**14524**	**14536**	**14546**	**15770**	**15212**	**15218**

Table 32: Technical Institutions

Sr. No.	Item	1997	1998	2000	2001	2002	2003	2005	2006	2007	2008	2009
1	NIT	1	1	1	1	1	1	1	1	1	1	1
2	Govt. B. Pharmacy College								1	1	1	1
3	Govt. Engg. College								1	1	1	1
4	Polytechnics	6	6	6	7	7	7	7	6	6	8	9
5	Industrial Training Institutes	34	34	34	44	44	50	50	51	54	76	76
6	Motor Driving & Heavy Earth Moving Operator Training Institute					1	1	1	1	1	1	1
	Total	**41**	**41**	**41**	**52**	**53**	**59**	**59**	**61**	**64**	**88**	**89**

Health Infrastructure: The growth of Health Institutions in Himachal Pradesh from 1971 onwards is given in Table 33.

Table 33: Health Facilities

Sr. No.	Item	1971	1980	1985	1990	1995	1997	2002	2003	2004	2005	2006	2007	2008	2009
1	Allopathic Hospitals	39	58	73	73	72	74	89	89	89	89	89	92	93	93
2	Ayurvedic Hospitals							23	24	25	25	25	25	25	27
3	PHC/CHC/RH/SHCs	72	77	145	225	275	310	369	507	504	505	505	514	522	522
4	Allopathic Dispensaries	119	186	214	197	165	167	155	21	22	22	22	22	41	41
5	Ayurvedic Colleges		1	1	1	1	1	1	1	1	1	1	1	1	1
6	Ayurvedic Dispensaries	363	404	431	458	611	981	1133	1139	1139	1139	1126	1126	1126	1126
7	HSCs	256	856	1299	1851	1907	1980	2068	2067	2067	2068	2069	2071	2071	2071
8	Dental College	0	0	0	0	1	1	1	1	1	1	1	1	1	1
9	Nursing	0	0	0	3	4	4	6	6	6	6	6	6	6	6
	Total	**849**	**1582**	**2163**	**2808**	**3036**	**3518**	**3845**	**3855**	**3854**	**3856**	**3844**	**3858**	**3886**	**3888**

Roads and Bridge: During the First Five-Year Plan (1951-56), Roads were given highest priority. During this period, Rs. 225.41 Lakhs were spent on the development of roads, which amounted to 42.75% of the total plan investment of Rs. 527.25 lakhs. With this investment, the State achieved an additional 2413 K.M. length of roads. The progress made in the development of roads by 1971 at the time of formation of a full-fledged State and level reached by the end of Sixth, Seventh, Eighth and Ninth and Tenth Five Year Plans and achievements made by the end of 31st March, 2009 is given in the following Table 34.

Table 34: Road Construction in Himachal Pradesh

Sr. No.	Description	Unit	1971	6th Plan	7th Plan	8th plan	9th Plan	10th Plan	31st March 2009
1	Motorable roads	Kms	7609	14663	16883	19760	22763	27584	30302
2	Roads provided with cross drainage	Kms	2755	6245	7493	8917	11697	17250	20748
3	Metalled and tarred length	Kms	2218	5300	6392	8094	11441	15772	17291
4	Bridges	No.	232	598	742	968	1206	1483	1604
5	Villages connected with Roads								
a.	Above 1500 population	No.		165	175	184	186	199	202
b	1000-1500 population	No.		198	214	223	224	239	262
c	500-1000 population	No.		756	809	827	849	977	1151
d	200-500 population	No.		2324	2413	2479	2588	2848	3092
e	Less than 200 population	No.		3640	3805	3914	4063	4268	4536
	Total			**7083**	**7416**	**7627**	**7910**	**8531**	**9243**

Besides increase in the motorable road density from 13.66 Kms. per 100 sq. kms. of area in 1971 to 40.89 kms. between 1971-2002, the quality of this crucial infrastructure has also improved significantly. Whereas only 29.14% of the motorable roads were metalled and tarred in 1971, the percentage at the end of March, 2009 stands at 57.06%. Similarly, the percentage of roads with cross drainage increased from 36.2% in 1971 to 68.47 % by the end of March, 2009.

The following data given the position of road length from 1971 to 2009:

Table 35: Position of Road Length

Type of Road	Position as on 31st March, 2009							
	1971	1981	1991	2001	2002	2007	2008	2009
Motorable Double Lane	1765	1994	1994	2332	2336	2374	2374	2377
Motorable Single Lane	5844	10611	15296	19874	20427	25210	26783	27925
Total Motorable Roads	**7609**	**12605**	**17290**	**22206**	**22763**	**27584**	**29157**	**30302**
Jeepable	608	633	826	906	781	381	365	345
Less than Jeepable	2400	4195	4329	4105	3959	2299	1990	1803
Total	**10617**	**17433**	**22445**	**27217**	**27503**	**30264**	**31512**	**32450**

National Highways in Himachal Pradesh:
There are eleven National Highways with a total length of 1470.606 kms.

Table 36: List of National Highways

Sr No.	Name of National Highways	NH No.	Name of Circle	Name of Division	Length in Division (in Kms)
1	Jallandhar Panthankot Jammu Srinagar road	1-A	Shahpur	Jogindernagar	10.000
2	Pathankot Chakki Mandi road	20	Shahpur	Jogindernagar	196.800
3	Pinjore Nalagarh Swarghat road	21-A	Shimla	Solan	48.875
4	Chandigarh Mandi Manali road	21	Shahpur	Pandoh	240.835
5	Ambala Kalka Shimla Wangtoo Kaurik road	22	Shimla	Solan =122.916 Rampur =172.00	294.916
6	Jallandhar Hoshiarpur Gagret Mubarikpur Amb Nadaun Hamirpur Taunidevi Awahdevi Tihra Dharampur Kotli Mandi road	70	Shahpur	Hamirpur	206.560
7	Ambala Naraingarh Kala Amb Paunta Dehradun Rishikesh Haridwar road	72	Shimla	Solan	57.00
8	Shimla Brahampukhar Ghagus Hamirpur Nadaun Ranital Kangra (Mataur) road	88	Shimla Shahpur	Solan = 60.600 Hamirpur= 137.100	197.700
9	Laldhank Bata Chowk road	73-A	Shimla	Solan	7.420
10	Paonta Rajban Shillai Menus Hatkoti road, Km 0/0 to108/0 & 149 to 160/500(41.0Km in Uttaranchal)	72-B	Shimla	Solan	119.500
11	Nagrota Ranital Dehra Mubarikpur road, Km. 0/0 to 91/0	20A	Shahpur	Jogindernagar	91.000
	Total	**1470.606 Km.**			

There are 48 Major District Roads (MDR) in the state

Table 37: List of National Highways

Sr. No.	Name of Road	District	Length (in Kms)	SH. No.
1	Lal Dhank Paonta Rajban Hatkoti (except NH portion and RD 133/0 to 171/0 in Uttaranchal	Shimla	26.00	1
2	Kumarhatti-Sarahan-Nahan (Dosarka)	Sirmaur/Solan	78.00	2
3	Chhaila Neripul Yashwant Nagar Oachghat Kumarhatti	Shimla/Sirmaur/Solan	86.30	6
4	Sainj Chopal Nerwa Shallu	Shimla	90.00	8
5	Shalaghat Arki Kunjhar Barotiwala	Solan	80.40	9
6	Theog Kotkhai Hatkoti Rohru	Shimla	80.00	10
7	Sainj Ani Banjar Aut	Kullu/ Mandi	96.00	11
8	Shimla Tattapani Mandi	Shimla/ Mandi	185.60	13
9	Shimla Kunihar Ramshehar Nalagarh Ghanoli	Shimla/Solan	112.30	16
10	Dharamsala Dadh Palampur Holta Chadhiar	Kangra/Mandi	90.00	17

Sr. No.	Name of Road	District	Length (in Kms)	SH. No.
	Sandhol (Except NH portion)			
11	Jogindarnagar Sarkaghat Ghumarwin (except NH portion)	Mandi/Bilaspur	83.00	19
12	Jawalamukhi Dehra Jawali Raja-ka-Talab	Kangra	79.60	22
13	Mehatpur Una Mubarikpur Daulatpur H.P. Boundary (except NH portion)	Una	67.00	25
14	Pong Dam Fatehpur Jassur	Kangra	53.00	27
15	Nurpur Lahru Tunuhatti	Kangra/Chamba	42.20	28
16	Una-Aghar Barsar Jahu Bhambla Nerchowk	Una/Hamirpur/Mandi	126.30	32
17	Pathankot Banikhet Chamba Tissa	Chamba	139.00	33
18	Hamirpur Sujanpur Thural Maranda	Hamirpur /Kangra	59.00	39
19	Shahpur Sihunta Chowari	Chamba	52.00	43
	Total	1625.70		
There are following Major District Roads (MDR) in the State :				
1	Nahan Dadahul Haripurdhar	Sirmaur	87.00	1
2	Solan Meenus (except State Highway-6 portion)	Sirmaur/Solan	98.00	2
3	Banethi Rajgarh Chandol	Sirmaur	127.00	3
4	Markanda bridge Suketi Park Kala Amb Trilokpur	Sirmaur	21.50	4
5	Kolar Bilaspur	Sirmaur	13.00	5
6	Parwanoo Kasauli Dharampur Sabhathu Solan	Solan	65.32	6
7	Barotiwala Baddi Sai Ramshar	Solan	44.95	7
8	Kufri Chail Kandaghat	Solan/Shimla	57.00	8
9	Solan Barog Kumarhatti	Solan	13.00	9
10	Dharampur Kasauli	Solan	10.50	10
11	Arki Dhundan Bhararighat	Solan	18.70	11
12	Nalagarh Dhabota Bharatgarh	Solan	9.40	12
13	Shogi Mehli Junga Sadhupul	Shimla	49.40	13
14	Mashobra Bhekhalti	Shimla	18.00	14
15	Narkanda Thanadbar Kotgarh Bithal	Shimla	44.00	15
16	Rampur Mashnoo Sarahan Jeori	Shimla	62.00	19
17	Bakrot Karsog (Sanarli) Sainj	Mandi	41.80	21
18	Salapper Tattapani Suni Luhri	Mandi/Shimla	120.80	22
19	Mandi Kataula Bajaura	Mandi	51.00	23
20	Mandi Gagal Chailchowk Janjehli	Mandi	45.80	24
21	Chailchowk Gohar Pandoh	Mandi	29.60	25
22	Mandi Rewalsar Kalkhar	Mandi	28.00	26
23	Nore Wazir Bowli	Kullu	37.00	28
24	Kullu Nagar Manali (left Bank)	Kullu	39.40	29
25	Jia Manikarn	Kullu	33.50	30
26	Swarghat Nainadevi Bhakhra	Bilaspur/Una	55.70	31
27	Naina Devi Kaula Da Toba	Bilaspur	12.20	32
28	Bamta Kandrour	Bilaspur	6.70	33
29	Nagaon Beri	Bilaspur /Solan	37.00	34
30	Hamirpur Bhoranj Jahu	Hamirpur	30.00	35
31	Nadaun Sujanpur	Hamirpur	21.00	36
32	Barsar Deothsidh	Hamirpur	11.30	37
33	Sujanpur Sandhol Marhi	Hamirpur /Mandi	45.00	38
34	Nangal Santokhgarh Tahliwal Polian Jaijon (HP Boundary)	Una	17.50	39
35	Una Hoshiarpur Bankhandi Hoshairpur	Una	15.00	40
36	Tahliwal Garhshankar (H.P Boundary)	Una	8.00	41
37	Bharwain Chintpurni Kandrori Damtal	Una /Kangra	95.56	42
38	Baijnath Ladbharol Kandapattan	Kangra/Mandi	33.00	43
39	Gaggal Chetru Dharamsala Mcleodganj	Kangra	24.00	44

Sr. No.	Name of Road	District	Length (in Kms)	SH. No.
40	Rait Charhi Dharamsala	Kangra	20.00	45
41	Kaloha Pragpur Dhaliara Dadasiba Sansarpur	Kangra	60.92	46
42	Kandwal Damtal	Kangra	16.50	47
43	Dadh Malan	Kangra	4.00	48
44	Banikhet Dalhouse Khajiar	Chamba	29.00	49
45	Chamba Bharmaur	Chamba	45.00	52
46	Baijnath-Lahla-Darati-Gopaipur-Ballah-Rakh-Ghamroat-Jayun-Sukeri-Kandi-Bundla-Palampur road.	Kangra	33.375	55
47	Baijnath-Jatehar-Goiwan-Draman-Anju-Chowki-Sainthal-Dohag-Joginder Nagar.	Kangra	85.00	56
48	Sandhapattan-Bharol-Bagora Bagla-Hard-Ropri-Kalang -Traimbli-Basahi-Drubbal-Charonj - Banwar-Kun ka Tar-Mandonkhar-Bhargaon-Kotli road.	Kangra	85.00	57
	Total	**1969.370**		

Water Supply: Water Supply system of towns in H.P. is quite old and there is an urgent need to carry out the rehabilitation/augmentation of these old schemes. There are 56 towns in the State of which water supply to 6 towns namely Yol, Kasauli, Subathu, Dagshai, Dalhausie and Bakloh is being looked after by Cantonment Board in Parwanoo by H.P. Housing Board and in Palampur by Municipal Committee, Palampur. It is important to mention that in Shimla and Solan, the distribution system is being maintained by the respective Urban Local Bodies. Augmentations of water supply schemes of 43 towns have been completed. These towns are Shree Naina Devi Jee, Nadaun, Rampur, Una, Chowari, Kangra, Jawalamukhi, Nahan, Rohru, Santokhgarh, Mehatpur, Dehra, Chamba, Rewalsar, Arki, Daulatpur, Jogindernagar, Manali, Kullu, Kotkhai, Sujanpur, Ghumarwin, Chopal, Suni, Palampur, Gagret, Nagrota, Hamirpur, Mandi, Nalagarh, Narkanda, Nurpur, Paonta, Theog, Dalhousie, Shah Talai, Rajgarh, Sarkaghat, Bhota, Solan, Bhunter, Jubbal and Dharamshala. It is proposed to commission water supply to Nahan during the year 2010-11.

Table 38: Completed Water Supply Schemes

District	Zone	Circle	Division	Nos. of Schemes reported			
				Gravity	Lift	T/Well	Total
Shimla	Shimla	Shimla	Shimla	409	62	0	471
Solan			Arki	136	77	0	213
Shimla			Suni	269	37	0	306
							0
							0
			TOTAL	814	176	0	990
		Rohru	Rohru	317	15	0	332
			Jubbal	405	19	0	424
			Nerwa	284	4	0	288
			TOTAL	1006	38	0	1044
Sirmaur		Nahan	Nahan	148	100	7	255
			Naradhar	282	44	0	326
			Paonta	185	76	16	277
Solan			Solan	108	130	0	238
			Nallagarh	73	56	29	158
			TOTAL	796	406	52	1254
Shimla		R/Peo	Rampur	266	6	0	272

District	Zone	Circle	Division	Nos. of Schemes reported			
				Gravity	Lift	T/Well	Total
Kinnaur			R/Peo	107	0	0	107
Kinnaur			Pooh	71	0	0	71
L&S			Kaza	123	0	0	123
			TOTAL	567	6	0	573
			TOTAL	**3183**	**626**	**52**	**3861**
Bilaspur	HMR	Bilaspur	Ghumarwin	30	89	3	122
			Bilaspur	70	81	2	153
			TOTAL	100	170	5	275
Una		Una	Una-I	0	5	56	61
			Una-II	9	22	39	70
			TOTAL	9	27	95	131
Hamirpur		Hamirpur	Hamirpur	0	81	2	83
Kangra			Dehra	8	75	7	90
Hamirpur			Barsar	1	69	0	70
Mandi			Sarkaghat	122	86	2	210
			TOTAL	**131**	**311**	**11**	**453**
			TOTAL	**240**	**508**	**111**	**859**
Kullu	Mandi	Kullu	Ani	138	0	0	138
			Kullu No.1	197	0	0	197
			Kullu No.II	192	4	0	196
L&S			Keylong	192	0	0	192
			TOTAL	719	4	0	723
Mandi		SNR	Baggi	80	57	12	149
			Karsog	328	7	0	335
			SNR	276	35	9	320
			Mandi	260	42	0	302
			Padhar	225	33	0	258
			TOTAL	**1169**	**174**	**21**	**1364**
			G.Total	**1888**	**178**	**21**	**2087**
Kangra	D/Shala	Nurpur	Nurpur	6	48	10	64
			Indora	0	38	10	48
			Jawali	1	16	25	42
			TOTAL	7	102	45	154
		D/Shala	Thural	16	30	0	46
			Dharamshala	19	27	2	48
			Palampur	68	17	3	88
			Shahpur	18	34	0	52
			TOTAL	121	108	5	234
Chamba		Chamba	Chamba	294	0	0	294
			Dalhousie	172	2	0	174
			Salooni	275	2	0	277
			TOTAL	**741**	**4**	**0**	**745**
			TOTAL	**869**	**214**	**50**	**1133**
				6180	1526	234	7940
			G. TOTAL	**7940**			

Sewerage Scheme: As towns in the State mostly serve as health resorts, environment improvement assumes special significance particularly to avoid pollution of the rivers and other water bodies of the State. Secondly, to abolish carrying of night soil on head load and scavenging system in India/State's, the Government has given top priority to connect dry latrine system into water pour system. Hence, the sewerage programme has assumed immense importance. Under this programme, sewerage facilities are proposed to be provided in all towns of the State.

Though the subject matter of sewerage projects pertains to IPH Department but during last financial year i.e. 2008-09, the budget provision for the implementation of on going projects reflected in the name of Urban Development Department.

Details of the ongoing sewerage schemes are given in Table 39.

Table 39: Status of ongoing sewerage schemes (STP)

Sr. No.	District	Name of Scheme	Sewerage Treatment Plants		Remarks(Status)
			Nos.	Capacity (Mld)	
1	**Hamirpur**	Hamirpur	3	3.13	Commissioned
				1.35	Commissioned
				0.68	98% work completed
		Sujanpur	2	1.5	40% completed
				1.75	Work awarded
		Nadaun	3	1.31	Tender to be recalled
				0.2	do
				0.27	do
		Total	8	10.19	
2	**Kullu**	Kullu	3	2.5	Commissioned
				2.57	95% completed.
				0.38	Commissioned
		Bhunter	3	0.99	70% completed
				0.46	100% completed.
				0.87	47% completed
		Total	6	7.77	
3	**Sirmaur**	Paonta	3	0.44	Completed but to be commissioned
				1	95% completed.
				1.72	Estimate under process.
		Total	3	3.16	
4	**Solan**	Solan	3	2.81	New proposal for zone A C D & E
				2.9	Submitted for approval
				2.98	Zone B, 2.9 MLD commissioned.
		Total	3	8.69	
5	**Mandi**	Sundernagar	1	3.55	Completed
		Sarkaghat	2	1.35	Yet to be started
				1.67	40% completed
			3 Septic tank		Commissioned
		Total	4	**6.57**	
6	**Una**	Una	2	0.63	98% completed
				2.53	90% completed
		Mehatpur	3	0.94	Work yet to be started.
				0.73	-
				0.09	Work yet to be started

Sr. No.	District	Name of Scheme	Sewerage Treatment Plants		Remarks(Status)
			Nos.	Capacity (Mld)	
		Santokhgarh	1	1.6	
		Total	6	6.52	
7	**Chamba**	Chowari	1		Treatment was divided into 3 zones. Now as per instruction of CE (NZ), the scheme will be based on single T/unit, for which capacity of T/plan is to be finalized. Treatments were divided into 4 zones. Now as per instruction of CE (nz), the scheme will be based on single T/unit, for which capacity of T/plant is to be finalized.
		Dalhousie	1		
		Total	2		
8	**Shimla**	Jubbal	1	0.65	Tender for STP awarded
		Kotkhai	1	0.57	Working estimate under process
		Narkanda	1	0.44	Material arranged.
		Suni	1	0.51	-
		Theog	2	0.93	-
				0.66	-
		Total	6	3.76	
9	**Kangra**	Kangra	3	1.68	Tender under progress
				1.46	do
				0.54	DNIT got approved
			1 (Septic Tank)	0.12	-
		Dehra	1	1.38	Technical approval under process
		Nagrota	1	1.34	85% work completed
		Nurpur	1	3.05	Tender received & under process.
		Total	**7**	**9.57**	
		Grand Total		**56.23**	

Source: IPH, Himachal Pradesh

Solid Waste Management: The Solid Waste generation and its management in urban areas is an alarming problem which is posing a serious challenge to all the Urban Local Bodies. The pace of urbanisation and unprecedented influx of tourist from all over India has put municipal administration under pressure.

So, keeping in view the problem of Solid Waste, the Solid Waste Management Projects for scientific disposal of Biodegradable Solid Waste in the Urban areas are being taken up in phased manner. During the year 1998-99, five towns were selected under Solid Waste Management projects given in Table 40.

Table 40: Towns to be covered under funding from HPPCB

Sr. No.	Towns to be covered under funding from H.P. Pollution Control board
1.	Dharamshala
2.	Hamirpur
3.	Una
4.	Kangra
5.	Nahan

ULBs covered under 12th Finance Commission Award is given in Table 41.

Table 41: Towns covered under 12th Finance Commission Award

Sr. No.	Towns covered under 12th Finance Commission Award
1.	MC Paonta

2.	MC Parwanoo
3.	NP Mehatpur/Santokhgarh
4.	MC Chamba
5.	MC Palampur
6	MC Nalagarh
7	MC Solan

Status of Rain water is given in Table 42.

Table 42: Status of Rain Water Harvesting upto 30/06/11

		Status of Cases	Status of approved cases					No. of buildings approved with provision of RWHS				Buildings provided with RWHS at site				RWHS working or not				NOC issued				Action taken		
St. No.	Name of Area	Total	1999 to 12/05 RWHS was not mandatory under law	1/06 to 11/10 RWHS was not mandatory under law	12/10 TO 3/11	04/11 TO 06/11	Total	1999 TO 11/10	12/10 TO 03/11	4/11 TO 6/11	Total	1999 TO 11/10	12/10 TO 03/11	4/11 TO 6/11	Total	1999 to 11/10	Old	New	Total	1999 to 11/10	Old	New	Total	Old	New	Total
1	2	3	4 (i)	4 (ii)	4 (iii)	4 (iv)	4 (v)	5 (i)	5 (ii)	5 (iii)	5 (iv)	6 (i)	6 (ii)	6 (iii)	6 (iv)	7 (i)	7 (ii)	7 (iii)	7 (iv)	8 (i)	8 (ii)	8 (iii)	8 (iv)	9 (i)	9 (ii)	9 (iii)
Govt. Building																										
1.	Planning Area	392	144	204	02	43	393	187	02	43	232	43	01	01	45	43	NA	NR	43	73	19	02	94	NA	31	31
2.	Special Area	35	24	06	01	13	44	12	01	13	26	02	01	Nil	03	02	NA	NR	02	28	04	01	33	NA	13	13
Total		**427**	**168**	**210**	**03**	**56**	**437**	**199**	**03**	**56**	**258**	**45**	**02**	**01**	**48**	**45**	**NA**	**NR**	**45**	**101**	**23**	**03**	**127**	**NA**	**44**	**44**
Private Building																										
1.	Planning Area	8591	5377	3214	57	164	8812	7423	57	164	7644	564	08	07	579	564	NA	NR	564	3841	62	15	3918	NA	95	95
2.	Special Area	3077	1622	1455	18	73	3168	2513	18	66	2604	333	01	Nil	334	333	NA	NR	333	1734	32	01	1767	NA	36	36
Total		**11668**	**6999**	**4669**	**75**	**237**	**11980**	**9936**	**75**	**237**	**10248**	**897**	**09**	**07**	**913**	**897**	**NA**	**NR**	**897**	**5575**	**94**	**16**	**5685**	**NA**	**131**	**131**
Total Govt. Buildings		427	168	210	03	56	437	199	03	56	258	45	02	01	48	45	NA	NR	45	101	23	03	127	NA	44	44
Total Private Buildings		11668	6999	4669	75	237	11980	9936	75	237	10248	897	09	07	913	897	NA	NR	897	5575	94	16	5685	NA	131	131
Grand total		**12095**	**7167**	**4879**	**78**	**293**	**12417**	**10135**	**78**	**293**	**10506**	**942**	**11**	**08**	**961**	**942**	**NA**	**NR**	**942**	**5676**	**117**	**19**	**5812**	**NA**	**175**	**175**

10.11 Information on human resource management issues (which may have relevance to environment management) in the sector such as: manpower, vocational training, awareness levels etc.

1. Department of Urban Development

Director
Additional /Joint /Deputy Director
Executive Engineer
Joint Controller(F&A)
Assistant Engineer
Project Officer
Supdt. Grade
Asstt. Town Planner

Jr. System Analystcum-Programmer
Personal Assistant
Supdt. Grade- II.
Law Officer
Sr. Assistant
Junior Engineer
Statistical Assistant
Computer Operator
Jr. Scale Steno
Jr. Assistant /Clerk
Driver
Peon

Urban Local Bodies

DISTRICT SHIMLA

1. Municipal Corporation Shimla.
2. Municipal Council Rampur.
3. Municipal Council Theog.
4. Municipal Council Rohru.
5. Nagar Panchayat Narkanda.
6. Nagar Panchayat Suni.
7. Nagar Panchayat Chopal.
8. Nagar Panchayat Kotkhai.
9. Nagar Panchayat Jubbal.

DISTRICT SOLAN

1. Municipal Council Solan.
2. Municipal Council Nalagarh.
3. Municipal Council Parwanoo.
4. Municipal Council Baddi
5. Nagar Panchayat Arki.

DISTRICT SIRMAUR

1. Municipal Council Nahan.
2. Municipal Council Poanta.
3. Nagar Panchayat Rajgarh.

DISTRICT BILASPUR

1. Municipal Council Bilaspur.
2. Municipal Council Naina Devi ji.
3. Municipal Council Ghumarwin.
4. Nagar Panchayat Talai.

DISTRICT UNA

1. Municipal Council Una.
2. Nagar Panchayat Gagret.
3. Nagar Panchayat Daulatpur.
4. Nagar Panchayat Mehatpur.

DISTRICT HAMIRPUR

1. Municipal Council Hamirpur.
2. Nagar Panchayat Nadaun.
3. Nagar Panchayat Sujanpur.
4. Nagar Panchayat Bhotta.

DISTRICT KANGRA

1. Municipal Council Kangra.
2. Municipal Council Dharamshala.
3. Municipal Council Palampur..
4. Municipal Council Nurpur.
5. Municipal Council Nagrota
6. Nagar Panchayat Dehra
7. Nagar Panchayat Jawalamukhi.

DISTRICT CHAMBA

1. Municipal Council Chamba.
2. Municipal Council Dalhousie.
3. Nagar Panchayat Chowari.

DISTRICT MANDI

1. Municipal Council Mandi.
2. Municipal Council Sundernagar.
3. Nagar Panchayat Sarkaghat.
4. Nagar Panchayat Joginder Nagar.
5. Nagar Panchayat Rewalsar.

DISTRICT KULLU

1. Municipal Council Kullu.
2. Municipal Council Manali.
3. Nagar Panchayat Bhuntar.
4. Nagar Panchayat Banjar.
5. Nagar Panchayat Santokgarh

3. The Town & Country Planning Department has proposed to upgrade its Offices at District Headquarters of Una, Bilaspur and Chamba to Divisional Office. The position of Staff is shown in Table given below:-

Detail of sanctioned/filled and vacant posts in the Town & Country Planning Department, as on 31-05-2009 is given in table 43.

Table 43: Sanctioned / filled and vacant post in T&CP Department

Sr. No.	Name of Post	Sanctioned posts	Filled	Vacant	Remarks
1	Director	1	1	-	-
2	State Town Planner	1	1	-	-
3	Town & Country Planner	8	2	6	
4	Asstt. Town Planner	14	8	6	
5	Planning Officer	19	15	4	-
6	Supdt. Gr. I	1	1	-	-
7	Law Officer	1	1	-	-
8	Tehsildar	1	-	1	-
9	Research Officer	2	2	-	-
10	Supdt.Gr.II	2	2	-	-
11	Personal Assistant	1	1	-	.
12	Sr. Planning Draughtsman	13	9	4	
13	Junior Engineer	29	21	8	
14	Draughtsman	5	5	-	-
15	Sr. Scale Stenographer	1	1	-	-
16	Sr. Assistant	11	11	-	-
17	Research Assistant	2	2	-	-
18	Jr. Assistant	13	13	-	-
19	Field Investigator	3	1	2	
20	Jr. Draughtsman	22	22	-	-
21	Surveyor	2	2	-	-
22	Steno Typist	15	11	4	
23	Driver	7	7	-	-
24	Clerk	14	11	3	
25	Ferro Printer	3	3	-	-
26	Patwari	19	15	4	
27	Peon	16	16	-	-
28	Process server	1	1	-	-
29	Chowkidar-cum-Sweeper	7	7		-
30	Chainman	24	24	-	-
31	Sweeper	1	1	-	-
	Total	**259**	**216**	**43**	**-**

4. Planning Department

Manpower and Employment Division

- Preparation of Profile of Employment and Unemployment Situation in H.P. for Annual Plans.
- Preparation of Quick Estimates on Employment in Organised and Un-Organised Sector under Employment Market Information Programmes.
- Preparation of **Fact sheets. Book on Manpower**

10.12 Regulatory analysis to identify any regulations that have environment implications (negative or positive), and compliance with the same.

Urban Planning sector and cross sector policy and regulatory framework at state level shows the intent of the state government to address urban planning issues. A list of policy and program is given below:-

- The National Water Policy, 2002
- State Water Policy (Draft)
- National Health Policy, 2002
- The Water (Prevention and Control of Pollution) Act 1974, (Amended -1988)
- Notification on protection and improvement of quality of environment in the Himalayas, 2001
- The Himachal Pradesh Municipal Corporation Act, 1994, Act No. 12 of 1994
- The Himachal Pradesh Municipal Act, 1994, (Act no. 13 of 1994)
- The Himachal Pradesh Ground Water (Regulation and Control of Development and Management) Rules, 2007
- Notification No. IPH-B (F) 10-3/2004, dated 23.3.3007,
- Himachal Pradesh Municipal Business Bye-Laws, 2006
- Jawahar Lal Nehru National Urban Renewal Mission (JNNURM)
- Urban Infrastructure Development Scheme for Small & Medium Towns (UIDSSMT)
- Accelerated Urban Water Supply Programme (AUWSP)
- Hand pumps Installation programme
- The Environment (Protection) Act, 1986
- The Municipal Solid Wastes (Management and Handling) Rules, 2000
- Himachal Pradesh Non-Biodegradable Garbage (Control) Act, 1995
- National Electricity Policy, 2005
- National Electricity Act, 2003
- Energy Conservation Act, 2001
- Environment Impact Assessment (EIA) Notification, September 14, 2006
- National Urban Housing and Habitat Policy 2007
- Policy on Development of New Townships in Himachal Pradesh
- The Himachal Pradesh Town and Country Planning Rules, 1978
- Himachal Pradesh Town and Country Planning (Amendment) Rules, 2009
- Shimla Urban Transport Management Society (SUTMS)
- National Urban Transport Policy
- The Air (Prevention and Control of Pollution) Act 1981/1987
- Transport Policy
- Interest Subsidy Scheme for Housing the Urban Poor (ISSHUP
- Rajiv Awaas Yojana
- Environment Improvement of Urban Slums (EIUS)
- Swarnjayanti Shahri Rojgar Yojana (SJSRY)
- Rajiv Gandhi Urban Renewal Facility (RGURF)

Reference

- Department of Planning
- Department of Urban Development
- Department of I & PH
- HP State Pollution Control Board
- Ministry of Urban Development
- Ministry of Drinking Water and Sanitation
- Department of Town & Country Planning
- Department of Land Resources
- Department of Education
- Districts Statistical Abstract

CHAPTER 11 MUNICIPAL SOLID WASTE

11.1 Resource Inventory of existing assets of the sector

Municipal Solid Waste (MSW) has been identified as one of the major sectors of concern in Himachal Pradesh. The increasing local population coupled with consumption leads to higher generation of MSW. The increasing trend of population in the State is shown in Table 1 & 2. Trend in urbanization in the State is given in table 3. MSW if not collected and disposed in a scientific manner leads to a number of environmental and associated health problems. These problems get aggravated by the influx of floating population like tourist inflow in the State. As a result, an increased pressure develops on the existing MSW management system in the towns and districts of the State. Any future planning requires an assessment of likely MSW generation scenarios, existing management system and likely options for its management in future. The following sections describe each of these items at the state, district and town level. MSW falls under the jurisdiction of urban local bodies (ULB). There is One Corporation, 20 Municipal Councils and 28 Nagar Panchayats in the State of Himachal Pradesh.

Table 1: Area and population – 2011 Census

Sr. No.	District	Area (sq. km)	Population			Population Density
			Total	Rural	Urban	
1.	Bilaspur	1,167	382056	356930	25126	327
2.	Chamba	6,528	518844	482653	36191	80
3.	Hamirpur	1,118	454293	422880	31413	406
4.	Kangra	5,739	1507223	1420864	86359	263
5.	Kinnaur	6,401	84298	84298	-	13
6.	Kullu	5,503	437474	396216	41258	79
7.	L & S	13,835	31528	31528	-	2
8.	Mandi	3,950	999518	936894	62624	253
9.	Shimla	5,131	813384	611884	201500	159
10.	Sirmaur	2,825	530164	472926	57238	188
11.	Solan	1,936	576670	474592	102078	298
12.	Una	1,540	521057	476140	44917	338
	H.P.	**55,673**	**6856509**	**6167805**	**688704**	**123**

Source:- Census of India, 2011

Table 2: Growth in general population

Year	Population	Decennial growth rate	Density of population	Literacy rate
1901	19,20,294	..	34	..
1911	18,96,944	(-)1.22	34	..
1921	19,28,206	1.65	35	..
1931	20,29,113	5.23	36	..
1941	22,63,245	11.54	41	..
1951	23,85,981	5.42	43	..
1961	28,12,463	17.87	51	21.27
1971	34,60,434	23.04	62	31.96
1981	42,80,818	23.71	77	42.48
1991	51,70,877	20.79	93	63.86
2001	60,77,900	17.54	109	76.5
2011	68,56,509	12.81	123	83.78

Source:- *(i) Census of India, 1981, Series-7, HP - Part II* *(iv) Census of India-2001 H.P.*
(ii) Census of India, 1991, Series-9, HP Paper I *(v) Census of India, 2011*
(iii) General population Tables-ILA Census of India 1971

Table 3: Trends in Urbanisation in Himachal Pradesh

Census Year	Total Population (in Lac)	Urban Population (in Lac)	Rural Population (in Lac)	% of Urban Population	Compound Annual Growth Rate (%)**		No. of Towns
					Rural	Urban	
1971	34.6	2.42	32.18	6.99	1.98	3.12	36
1981	42.81	3.26	39.55	7.69	4.15	3.02	47
1991	51.71	4.49	47.22	8.69	1.79	3.25	58
2001	60.77	5.95	54.82	9.79	1.5	2.86	57
2011*	71.42	7.89	63.64	11.05	1.5	2.86	
2021*	83.93	10.45	73.88	12.45	1.5	2.86	

Source: Himachal Pradesh Development Report

Studies have revealed that waste generation rate varies from 0.12 to 0.60 kg per capita per day. Analysis of physical composition indicates total compostable matter in the waste is in the range of 40-60% while recyclable fraction was observed between 10 and 25%. The moisture content in the MSW was observed to vary from 30% to 60% while the C: N ratio was observed to be in the range of 20-40.

CPCB with the assistance of NEERI has conducted survey of solid waste management in 59 cities (35 metro cities and 24 state Capitals: 2004-05). Shimla was one of them city where survey conducted by NEERI Quantities and waste generation rate of Shimla is given in table 4.

Table 4: Quantities & waste generation rate in Shimla

City	Population as per 2001	Area (sq km)	Waste Quantity (TPD)	Waste Generation Rate (kg/c/day)
Shimla	142555	20	39	0.27
		Waste Characterization		
Compostable (%)	**Recyclable**	**C/N**	**HVC (k cal/kg)**	**Moisture (%)**
43.02	36.64	23.76	2572	60

Source: Management of MSW, CPCB

Resource inventory of Municipal Solid Waste includes Collection, transportation, waste processing and disposal system. The detail of the existing system for MSW has been summarized in the table 5.

Table 5: Existing MSW Management System

Hot Spot (Town)	Name	Collection	Transportation	Waste Processing	Disposal
Chamba	1.Municipal Council Chamba.	Partial	Partial		
	2.Municipal Council Dalhousie.	Partial	Partial	AG	AG
	3. Nagar Panchayat Chowari.	Partial	Partial		AG
Bilaspur	1. Municipal Council Bilaspur.	Partial	Partial	AG	AG
	2.Municipal Council Naina Devi	Partial	Partial		AG
	3. Nagar Panchayat Ghumarwin.	Partial	Partial	AG	AG
	4. Nagar Panchayat Talai.	Partial	Partial		AG
Hamirpur	1. Municipal Council Hamirpur.	Partial	Partial	Installed	AG
	2. Nagar Panchayat Nadaun.	Partial	Partial		AG

Hot Spot (Town)	Name	Collection	Transportation	Waste Processing	Disposal
	3. Nagar Panchayat Sujanpur.	Partial	Partial		AG
	4. Nagar Panchayat Bhotta.	Partial	Partial		
	1. Municipal Council Kangra.	Partial	Partial	Installed	AG
	2.Municipal Council Dharamshala.	Partial	Partial	AG	AG
	3. Municipal Council Palampur.	Partial	Partial	AG	
Kangra	4. Municipal Council Nurpur.	Partial	Partial		AG
	5. Nagar Panchayat Dehra.	Partial	Partial	AG	AG
	6. Nagar Panchayat Nagrota.	Partial	Partial	Installed	AG
	7. Nagar Panchayat Jawalamukhi.	Partial	Partial		AG
	1. Municipal Council Kullu.	Partial	Partial	Installed	
Kullu	2. Nagar Panchayat Manali.	Partial	Partial	Installed	AG
	3. Nagar Panchayat Bhuntar.	Partial	Partial	Installed	AG
	4. Nagar Panchayat Banjar.	Partial	Partial		
	1. Municipal Council Mandi.	Partial	Partial	AG	AG
	2. Municipal Council Sundernagar.	Partial	Partial		
Mandi	3. Nagar Panchayat Sarkaghat.	Partial	Partial		AG
	4.Nagar Panchayat Joginder Nagar.	Partial	Partial		AG
	5. Nagar Panchayat Rewalsar	Partial	Partial		
	1. Municipal Corporation Shimla.	Partial	Partial	Installed	
	2. Municipal Council Rampur.	Partial	Partial		
	3. Municipal Council Theog.	Partial	Partial		AG
	4. Nagar Panchayat Narkanda.	Partial	Partial		
Shimla	5. Nagar Panchayat Suni.	Partial	Partial		AG
	6. Nagar Panchayat Chopal.	Partial	Partial		AG
	7. Nagar Panchayat Kotkhai.	Partial	Partial		AG
	8. Nagar Panchayat Jubbal.	Partial	Partial		
	9. Nagar Panchayat Rohru	Partial	Partial		
	1. Municipal Council Nahan.	Partial	Partial	Installed	AG
Sirmaur	2. Municipal Council Poanta.	Partial	Partial		AG
	3. Nagar Panchayat Rajgarh	Partial	Partial		
	1. Municipal Council Solan.	Partial	Partial	Installed	AG
	2. Municipal Council Nalagarh.	Partial	Partial		
Solan	3. Municipal Council Parwanoo.	Partial	Partial	AG	AG
	4. Nagar Panchayat Arki.	Partial	Partial		AG
	5. Nagar Panchayat Baddi.	Partial	Partial		
	1. Municipal Council Una.	Partial	Partial	Installed	AG
	2. Nagar Panchayat Gagret.	Partial	Partial		AG
Una	3. Nagar Panchayat Daulatpur.	Partial	Partial		AG
	4. Nagar Panchayat Mehatpur.	Partial	Partial		
	5. Nagar Panchayat Santokhgarh	Partial	Partial		
Cantonment Boards					
Chamba	Cantonment Board Bakloh	Partial	Partial		AG
	Cantonment Board Dalhousie	Partial	Partial		AG
Kangra	Cantonment Board Mant Khas	Partial	Partial		
	Cantonment Board Yol	Partial	Partial		AG
	Cantonment Board Dagshai	Partial	Partial	AG	
Solan	Cantonment Board Kasauli	Partial	Partial	AG	
	Cantonment Board Subathu	Partial	Partial	AG	

Note: AG means authorization Granted by HPPCB

Municipal Solid Waste (**MSW**) is a waste type that includes predominantly household waste (domestic waste) with sometimes the addition of commercial wastes collected by a municipality within a given area. They are in either solid or semisolid form and generally exclude industrial hazardous wastes. The term residual waste relates to waste left from

household sources containing materials that have not been separated out or sent for reprocessing.

- Biodegradable waste: food and kitchen waste, green waste, paper (can also be recycled).
- Recyclable material: paper, glass, bottles, cans, metals, certain plastics, etc.
- Inert waste: construction and demolition waste, dirt, rocks, debris.
- Composite wastes: waste clothing, Tetra Packs, waste plastics such as toys.
- Domestic hazardous waste (also called "household hazardous waste") & toxic waste: medication, e-waste, paints, chemicals, light bulbs, fluorescent tubes, spray cans, fertilizer and pesticide containers, batteries, shoe polish.

MoEF and CPCB have instituted a scheme for setting up of demonstration project for solid waste management in accordance with MSW Rule. Objective of the scheme is to demonstrate implementation of MSW Rule in an integrated manner. The scheme is based on cost sharing basis where concerned local body is required to contribute 50% of the total cost of the project. In Himachal Pradesh, Mandi town is selected for starting project for solid waste management. The typical MSW composition is given in table 6.

Table 6: MSW Composition

Sr. No.	Composition	Percentage
1	Biodegradable	52%
2	Metals Scrap, Rubber, Textiles, Leather etc	11%
3	Stones and Rubbles	8%
4	Fine Earth and Sand	23%
5	Plastics	1%
6	Paper and Paper Products	5%

Source: Management of Municipal Solid Waste, CPCB;(2006-2007)

Transportation: Transportation of waste is carried out mainly through dumper placers and tipper trucks. About 14 vehicles are utilized for transportation of waste, which includes 10 dumper placers, 3 tippers and 1 truck. The average distance to be traveled to disposal site by transport vehicles is 14 km. Of the 14 vehicles available with SMC for transportation, 4 vehicles are more than 10 years old and 6 vehicles are more than 8 years old. Transportation of waste is done in single shift with dumper placer making 6-8 trips and tipper only making 1 trip in a shift. The ratio of number of dumper containers to number of dumper placers is 14. Only 25% of the dumper containers are lifted in day. The cost of transportation is estimated to be Rs. 250 /T excluding manpower cost.

Source: Management of Municipal Solid Waste, CPCB ;(2000)

Waste Processing/Disposal Facility

Only Eight numbers of waste processing facilities have been installed by Municipal Authorities at Shimla, Solan, Kullu/Bhuntar, Manali, Una, Kangra/Nagrota and Hamirpur in the State. None of the Municipal Authorities has set up proper waste disposal facility for the disposal of non-biodegradable waste in the State. These engineered landfill need to be identified and developed on priority basis.

Plastic Waste Management: The State Government has imposed ban on use of plastic carry bags of specified size and thickness under HP Non-biodegradable Garbage (Control) Act 1995. Number of Units Manufacturing Plastic Bags in the State is given in table 7.

Table 7: Number of units manufacturing plastic bags

Number of Units Manufacturing carry Bags/plastic container in the state	88
Number of Units consented/ registered with HPPCB	64/34
Number of Closed Units	29

Source: *State Environment Report-2010, HP*

11.2 Patterns of planning and development in the sector

The Solid Waste generation in urban areas is an alarming problem which is posing a serious challenge to all the Urban Local Bodies. So, keeping in view the problem of Solid Waste, the Solid Waste Management Projects for scientific disposal of Biodegradable Solid Waste in the Urban Local Bodies are being taken up in phased manner. During the year 1998-99, five towns were selected under Solid Waste Management projects. The main objective of these projects is to make Urban Local Bodies capable of using scientific methods to handle Biodegradable Solid Waste in their area.

Funding Pattern of the Scheme:

The funds are being provided by the Himachal Pradesh State Pollution Control Board and 12th Finance Commission for MSW management.

Towns to be covered under funding from Himachal Pradesh State Pollution Control Board are given below.

1. Dharamshala
2. Hamirpur
3. Una
4. Kangra
5. Nahan

ULBs covered under 12th Finance Commission Award in the state are given below.

1. MC Paonta
2. MC Parwanoo
3. NP Mehatpur/Santokhgarh
4. MC Chamba
5. MC Palampur
6. MC Nalagarh
7. MC Solan

ULB covered under Jawaharlal Nehru National Urban Renewal Mission (JNNURM)

1.u Shimla

Responsible Agencies for Planning: There are four main authorities which are involved in planning for MSW management. These are Municipal Authorities and State Govt. Authorities, Central Pollution Control Board (CPCB), State Pollution Control Board (SPCB). The roles & responsibilities of each of these agencies are given below in table 8.

Table 8: Roles & Responsibilities of Agencies

Sr. No.	Agencies/ Authorities	Responsibility
1.	Municipal Authorities	I. Ensuring that municipal solid wastes to be handled as per MSW rules. ii. Seeking authorization from State Pollution Control Board (SPCB) for setting up waste processing and disposal facility including landfills. iii. Furnishing annual report. iv. Complying with Schedule I, II, III and IV of the rules
2.	**State Government** i) Secretary In-Charge of Department of Urban Development ii) District Magistrates/ Deputy Commissioner	 Overall responsibility for the enforcement of the provisions of the rules in the metropolitan cities. Overall responsibility for the enforcement of the provisions of the rules within the territorial limits of their jurisdiction.
3.	Central Pollution Control Board (CPCB)	i. Co-ordinate with State Boards and Committees with reference to implementation and review of standards and guidelines and compilation of monitoring data. ii. Prepare consolidated annual review report on management

		of municipal solid wastes for forwarding itrato Cent Government along with its recommendations before the 15th of December every year. iii. Laying down standards on waste processing/ disposal technologies including approval of technology.
4.	State Pollution Control Board (SPCB)	i. Monitor the compliance of the standards regarding ground water, ambient air, leachate quality and the compost quality including incineration standards as specified under Schedule II, III & IV. ii. Issuance of authorization to the municipal authority or an operator of a facility stipulating compliance criteria and standards. iii. Prepare and submit to the CPCB an annual report with regard to the implementation of the rules

Source: Management of Municipal Solid Waste, CPCB; (2006-2007)

Urban Infrastructure Scenario in Himachal Pradesh: There are serious deficiencies in Solid Waste Management (SWM) in the urban areas and environmental decline is visible in almost all towns. The sudden influx of tourists puts tremendous pressure on the sanitary services. The SWM services are inadequate and the accumulation of garbage can be seen in most of the towns. The municipalities complain of the shortage of sanitation staff but discussions with the local people in several towns reveal that the existing sanitation staff do not work or irregularly sweep the streets and collect the garbage. The cost of collection, transportation and disposal is high due to certain outdated practices and old technologies. Unscientific disposal of waste is common and biodegradable waste is not taken care of at the household level.

One of the factors for poor SWM in the urban areas is the gap in the physical targets and achievements in several SWM activities i.e. construction of dustbins, toilets, purchase of vehicles and construction of waste treatment plants during the Ninth Five Year Plan. This gap is likely to increase with the existing fiscal, institutional and functional deficiencies in the development of the urban infrastructure. Though the ULBs of Shimla, Kullu, Manali, Nahan and Solan have solid waste treatment plants, the problem of poor SWM continues due to the lack of support of the local people in providing segregated waste to the sanitary staff. These ULBs have to segregate waste at the sites of treatment plants, which is a costly and time-consuming affair. In few towns i.e. Una, Hamirpur, Dharamshala and Kangra works for construction of treatment plants are in progress. A large number of towns do not have treatment facilities and are creating environmental pollution. Heaps of polythene bags are seen in all major towns. The tourists leave a lot of garbage including polythene bags in the urban areas, which is affecting the ecology of the State. According to India Infrastructure Report (1996), the cost of collection, treatment and disposal of solid waste is to be reduced through various mechanisms.

Technological innovations to improve the reusability of the recycled waste will increase the returns and make the projects viable. Privatisation of as many operations as feasible will improve efficiency and reduce the cost.

The report suggest inter alia:

- Greater attention to segregation of different kinds of waste at the collection point to reduce the cost of disposal.
- Biodegradable waste should be tackled locally to avoid storage and transportation over long distances.
- Wherever environmentally acceptable, disposal can be decentralised to reduce the transportation cost.

- Separate collection and disposal of toxic waste.
- Use of right technologies to improve the quality of processed waste.
- Landfills can be scientifically organized to minimize pollution.

(a) Urban Development: Consequent upon the 74th Constitutional amendment, the rights, powers and activities of the Urban Local Bodies have increased manifold. There are 57 ULBs in Himachal Pradesh including Municipal Corporation, Shimla. The State Government is providing grant-in-aid every year to these local bodies to enable them to provide civic amenities to the general public. The following schemes are being implemented by the department under plan:

(i) Jawahar Lal Nehru National Urban Renewal Mission (JNNURM): The mission aims at creating economically productive, efficient, equitable and responsive cities in an integrated framework with economic and social infrastructure, basic services to urban poor and strengthening of various municipal organizations and their functioning. Under this mission only Shimla town being the State Capital has been covered by the Government of India. H.P. Housing & Urban Development Authority (HIMUDA) has been nominated as the nodal agency for this purpose. The activities like development of roads, sewerage, parking, tunnels and garbage management etc. will be taken up for execution under this programme. There is a budgetary provision of Rs. 1036.00 lakhs under the scheme during the financial year 2008-09 as State's share.

The following projects for the State have been approved by the Government of India:

1. Capacity building activities including research and training towards implementation of BSUP & IHSDP under JNNURM.
2. Widening and lowering of existing tunnel near Aukland House School on motor round road Shimla.
3. Ashiana a housing scheme for the poor of Shimla town.
4. Setting up of Solid Waste Management Improvement of Shimla city.

(ii) Environment Improvement of Urban Slums (EIUS): Under the Environment Improvement of Urban Slums, there is a budgetary provision of Rs. 244.00 lakhs for benefiting 3200 slum dweller families. The funds under this scheme are meant for providing basic amenities such as community baths, latrines and night shelters to avoid further environmental degradation of the towns.

(iii) Urban Infrastructure Development Scheme for Small & Medium Towns (UIDSSMT): The Government of India has restructured the old scheme of IDSMT and renamed it as Urban Infrastructure Development Scheme for Small & Medium Towns (UIDSSMT) for implementation from the year 2006-07. HIMUDA has been declared the Nodal Agency for plan formulation and execution of the scheme. Three towns namely; Hamirpur, Dharamshala and Mandi have been covered under the scheme. Though the project of Chamba town has been approved by the Government of India during the year 2007-08, but no funds have been released. For the implementation of this scheme, a sum of Rs.50.00 lakhs as State Share has been kept in the budget for 2008-09. Efforts are afoot to cover more towns under this scheme during the current financial year.

(v) Rajiv Gandhi Urban Renewal Facility (RGURF): During financial year 2006-07, the State Government had announced for setting up of Rajiv Gandhi Urban Renewal facility for infrastructure and sanitation improvement in all urban areas of the State other than Shimla. Under this, car parking, solid waste management, parks and community toilets will

be constructed in the ULBs under the scheme. A sum of Rs. 100.00 lakhs was kept in the budget for the implementation of this scheme during the financial year 2008-09.

Special scheme for solid waste management in villages: Himachal Pradesh has initiated a special scheme for solid waste management to maintain hygienic living condition in villages. A special Incentive Fund of Rs 40 crores has been set up by the State Government for giving a grant to those panchayats that evolve a system for management of solid waste and its scientific disposal.

At present there is no system for management of solid waste in rural areas and suburbs. Due to weak financial position of panchayats villages are not able to handle such problems. By implementing the special incentive additional resources can be mobilized to undertake such activities independently.
The idea was suggested by the third State Finance Commission in its recommendations. The commission recommended the Gram Panchayats could avail the incentive against the net fresh additional resource mobilization by these bodies and Rs 10 crores would be spent annually.

11.3 Technology adopted in the sector along with any changes in technology

The existing MSW management system in towns/ ULB's of the state has been assessed based on the following parameters.

1. Collection system
2. Transportation system
3. Waste processing
4. Waste disposal

Municipal Solid Waste can be used to generate energy. Several technologies have been developed that make the processing of MSW for energy generation cleaner and more economical than ever before, including landfill gas capture, combustion, pyrolysis, gasification, and plasma arc gasification. While older waste incineration plants emitted high levels of pollutants, recent regulatory changes and new technologies have significantly reduced this concern.

Landfilling

There is one landfill site in Himachal Pradesh at Shimla as shown in table 9.

Table 9: Landfill site at Himachal Pradesh

Sr. No	Name of city	No. of landfill sites	Area of landfill (ha)	Life of landfill (Years)	New site proposed
1	Shimla	1	0.6	-	No

(Source: International landfill database)

The disposal of waste is carried out through open landfilling along the hill slopes near the processing and treatment plant. About 1200 sq.m. area is being used for landfilling. About 170-300 MT per month of inert material from processing plant (which amounts to 18%-22% of total waste received) is disposed at landfill site. The construction wastes and debris which is collected separately and disposed off at the landfill site is used as cover material

Composting: Bioconversion Process is followed at Darni-ka-Bagicha, Shimla district. Existing waste processing site is located on the valley side of bye pass, at Darnika- Bagicha, Lalpani, Shimla. The site is about 5 Km from central Shimla and has an area of around 1200 Sq. metres. There are 12 towns which have composting treatment facility in opearation and 2 are proposed in State. Table 10 describes the

status of composting facility in the urban centre of the State.

Table 10: Status of Composting Facilities

Towns	Composting Facilities In operation	Proposed
Shimla	YES	
Kullu	YES	
Bhuntar	YES	
Mandi	YES	
Solan	YES	
Kangra	YES	
Nagrota	YES	
Nahan	YES	
Bilaspur	YES	
Ghumawin	YES	
Una	YES	
Sirmaur	YES	
Dharamshala		YES
Hamirpur		YES

Source: CPCB

11.4 Stakeholder involvement in environment preservation and restoration

Major stakeholders, which are involved in the environment preservation & restoration in the state are government sector, public & private sector & NGOs.

1. Government sector it includes:

- Department of Planning
- Department of Urban development
- Department of Town & Country Planning
- Municipal Corporation
- Department of Health and Family Welfare
- Department of Education
- Department of IPH
- HP State Pollution Control Board
- Department of Environment, Science and Technology

2. Public and Private sector

3. NGO's

Department of Planning: The most important aim of planning is to identify a process of development, which will raise living standards and open out to the people new opportunities for a richer and more prosperous life. The basic objectives of planning can be grouped under four heads: modernization, growth, self reliance and social justice.

Department of Urban Development: Himachal Pradesh is predominantly a hilly region and with the development of network of various infrastructures, the urban areas in the State are fast growing. In order to meet out these challenges of urbanization, the Directorate of Urban Development is a step forward towards efficient urban administration in a phased and coordinated manner.

Department of Town & Country Planning: The Town and Country Planning was created as a small cell in Himachal Pradesh Public Works Department in the year 1964. During 1979, it was created as an independent Directorate headed by Chief Engineer of Himachal Pradesh Public Works Department till 1993 when independent Director was appointed as Head of Department. Its objectives are to encourage planned and systematic urban and rural growth in a comprehensive manner and to stop haphazard constructions.

Department of IPH: The Department is also responsible for the operation and maintenance of the following systems: Drinking Water Supply Schemes, Sewerage Systems, Irrigation systems through source development, lifting water, boring of tube wells & providing distribution systems and flood protection works to protect life and property in the State.

Department of Education The Department of Technical Education, Vocational and Industrial Training plays a vital role in socio-economic development of the country. In this era of liberalization, industrialization and globalization, skilled manpower of world class standard is of upmost necessity.

11.5 Critical Environment Issues / Hotspots associated with the sector

1. Increasing gap in MSW generation versus collection, treatment and disposal (rural and urban) is leading to increased pollution load: The gap in rural and urban municipal solid waste generation, collection and treatment at State level is about 758 tonnes per day (tpd) and 185 tpd respectively. At district level, it ranges from 4.2 tpd in Lahaul & Spiti to 157.7 tpd in Kangra in rural areas. Similarly, it ranges from 4.8 tpd in Bilaspur & Kullu to 104.5 tpd in Solan in urban areas.

2. Increased public health risk due to discharge and disposal of untreated waste on land and water body: Both surface and groundwater quality is deteriorating due to extensive and severe pollution from domestic and agricultural sources. The point sources of untreated MSW and diffused sources of pollutants deteriorate the quality of surface and groundwater. Nearly all traditional sources are contaminated in the State due to unhygienic methods of handling water. At the state level, cases of admission in hospitals due to diarrhea increased from 16,263 in 1995 to 16,602 in 2002. Similarly cases of admission in hospitals due to Hepatitis increased from 379 in 1995 to 421 in 2002. At district level, Chamba, Hamirpur, Kinnaur, Kullu, Lahaul & Spiti, Mandi, Sirmaur and Una reported increase in admission in hospitals due to diarrhea during 1995 to 2002. Similarly, Bilaspur, Chamba, Kangra, Kinnaur and Una reported increase in admission in hospitals due to Hepatitis during 1995 to 2002.

3. Increased public health risks due to solid waste littering and improper disposal (MSW collection, treatment and disposal) at trekking routes, tourist units/tourist destination / religious places / heritage sites /trekking routes / tourist circuits / transportation routes: The expected additional MSW generation due to tourist arrivals will exceed 3479 tonnes per day in 2011 and 5354 tonnes per day in 2021 in the top field to tourist destination. Vulnerability analysis indicates that vulnerability analysis shows that sewage infrastructure in Shimla, Kangra & Chamba districts, Kullu, Ghumarwin & Bilaspur sadar tehsils is already under stress. Additional tourist load will increase pressure on existing waste infrastructure.

4. MSW littering in the vicinity catchment of water body leads to pollution: Infrastructure development and poor management of waste (Municipal Solid Waste and Waste Water) in the catchment and in vicinity of wetland/ water bodies/ reservoirs leads to water pollution and increased influx of organic waste which leads to water pollution & eutrophication.

5. Poor segregation of Municipal Solid Waste (MSW) at source:: Due to lack of segregation of municipal solid waste at source on even at collection along with difficult terrain and climate conditions limit the technical options available for treatment and disposal.

6. Inadequate finance to accelerate /upgrade/implement MSW/Sanitation infrastructure leads to poor sanitation: There is no separate sanitation fee, charged for augmenting the financing MSW infrastructure in the state. Existing financial/cost recovery mechanisms can not cater to improved services delivery.Economic incentives and subsidies have not been beneficial in terms of promoting SWM. The result in all sectors has been higher consumption and insufficient cost recovery for sanitation.

7. Gaps in Institutional Mechanism related to MSW/sanitation leads to reduced efficiency: A number of agencies are involved at the state, district, tehsil and village level rfo management of MSW/sanitation. Lack of

coordination and integrated planning leads to gaps in infrastructure development and operational inefficiency.

8. Inadequate private sector/ PRIs participation in MSW/Sanitation sector leads to reduced coverage of sanitation services: Lack of private and PRIs participation waste collection and treatment is indicative of gaps in policy implementation. Besides PRI, sanitation committees are an alternative institutional mechanism being suggested, though relationship between them and PRI bodies is not yet clearly articulated. Participation of NGOs might be limited on account of their technical deficiencies while large-scale private participation is unlikely until new policies are firmly in place.

9. Inadequate awareness leads to few community/NGOs participation in MSW service and sanitation: Since the government has the responsibility for providing sanitation service, community initiatives are minimal in the sanitation sector. Under difficult terrain and dispersed habitation, managing a sanitation service can become very expensive if sufficient social development input is not provided. There are few NGOs working in the area of sanitation.

10. Inadequacy of skilled personnel in MSW managements: Informal sector operations over the complete MSW management starting from collection, transportation, recovery and recycling is leading to resource loss, increased pollution load and failure of sustainability of formal MSW business model.

11. Inadequate Site for Solid Waste Management Facility: The Department of Urban Development is facing the problem of garbage disposal or treatment facility sites. The garbage being generated in the urban areas is to be properly handled in a proper manner so that the environment could be saved. This department has made its best efforts to implement the Solid Waste Management Projects .The Solid Waste Management Projects are being presently implemented in seventeen Urban Local Bodies of the Pradesh. As per MSW rules, 2000, there are special provisions for site selection in hilly areas i.e. cities and towns located on hills shall have location-specific methods evolved for final disposal of solid wastes by the municipal authority with the approval of the concerned State Board or the Committee. The municipal authority shall set up processing facilities for utilization of biodegradable organic wastes. The inert and non-biodegradable waste shall be used for building roads or filling-up of appropriate areas on hills. Because of constraints in finding adequate land in hilly areas, wastes not suiTable for road-laying or filling up shall be disposed of in specially designed landfills.

11.6 Environment initiatives taken by the sector to address critical environment issues

Himachal's novel scheme for Plastic Waste Management: Himachal Pradesh has shown the way in eco-friendly use of plastic waste and save the environment from the resultant pollution caused by plastic waste. A key initiative, **'Polythene Hatao- Paryavaran Bachao'** campaign was organized in the State from 21st December to 26th December 2009 to collect the plastic waste littered on the hill slopes, forest areas and near rivers and nullahs etc. This shows the government's concern to do away with the hazardous practices posing a major threat to the environment.1381 Quintals of polythene was collected in the State, which would be sufficient to mettle a stretch of approx. 138 kms. The State Government has asked all the concerned agencies to adopt zero waste management strategy and take appropriate action with respect to littering of non- biodegradable waste. This campaign would be continued in a sustainable manner

and would go a long way in making 'Himachal Clean Green and Polythene Free'.

The Government banned the use, sale and manufacture of polythene/plastic carry- bags made up of non-biodegradable material in the State. The ban came into effect from 2nd October, 2009. Triggered by complaints of choked drainage due to plastic bags, the State Government has taken stringent measures from time to time. Earlier in the year 1999, the Government imposed prohibition on the traders, retailers and vendors in the State for using coloured polythene carry bags manufactured from recycled plastic, food packaging, and the goods traded/sold by them. Then again, Government of Himachal Pradesh imposed prohibition on the stockists, traders, retailers and vendors for all kinds of commodities within the State of Himachal Pradesh for using carry bags made of non-biodegradable material of thickness less than 70 microns and size less than 12"x 18" from 14th June, 2004.

Secretariat waste management scheme by MoEF: The Council has taken number of initiatives under Solid Waste Management Programme like Secretariat waste management scheme, waste survey and assessment in towns, Installation of micro waste recycling units in schools, bio conversion plant at Solan and organising teacher training workshops. Under the NORAD project, 14 Micro Waste Recycling Units have been installed in School. The Council is also disseminating other Waste Recycling / Treatment Technologies.

Special scheme for solid waste management in villages: Himachal Pradesh has initiated a special scheme for solid waste management to maintain hygienic living condition in villages. A special incentive fund of Rs 40 crores has been set up by the State Government for giving a grant to those panchayats that evolve a system for management of solid waste and its scientific disposal. Government would reward double the money spent by panchayats annually.

At present there is no system for management of solid waste in rural areas and suburbs. Due to weak financial position of panchayats, villages are not able to handle such problems. By implementing the special incentive additional resources can be mobilized to undertake such activities independently.

The idea was suggested by the third State Finance Commission in its recommendations. The commission recommended the Gram Panchayats could avail the incentive against the net fresh additional resource mobilization by these bodies and Rs 10 crores would be spent annually.

11.7 Environment related studies carried out in the sector

Solid Waste Management in Shimla: The capital of the State and the most important tourist town of Himachal has serious deficiencies in SWM. According to a study (CRRID, 1999), the per capita collection of solid waste declined from 294 gm. to 286 gm. during the period 1992-93 to 1997-98. Though solid waste collected as a per cent of the waste generated increased from 64% in 1992-93 to 67% in 1997-98, it has now decreased to 60% (in 2002-03). The uncollected waste is degrading the environmental conditions of Shimla.

The study also reveals that the per capita revenue expenditure on sanitation and conservancy grew from Rs.105.82 in 1992- 93 to Rs. 173.94 in 1997-98, which affected the capital works for augmentation of sanitation services. The SWM services are still poor, as the revenue receipts of the SMC are not growing in proportion and the corporation has been depending on the State Government for financing its growing revenue expenditure and committed liabilities on SWM. The

recommendations of the committee, constituted by the Supreme Court of India, to improve SWM in Class I towns, have not been considered and implemented seriously by the Class-I corporation town of Shimla. A waste treatment plant has been set up for bioconversion of waste, but it is not getting enough segregated wastes. The time consumed in conversion is long and people's participation is poor in providing segregated waste. The non-biodegradable/ hazardous waste is not disposed of scientifically, which is affecting ecology of the city as well as neighboring areas. Poor collection efficiency of the solid waste, various problems with compost plant like poor functioning due to unsuitable (low) temperatures of for entire year and its closeness to the city/town area are some major concerns.

So, keeping in view the problem of Solid Waste, the Solid Waste Management Projects for scientific disposal of Biodegradable Solid Waste in the Urban areas are being taken up in phased manner. During the year 1998-99, five towns were selected under Solid Waste Management projects. The main objective of these projects is to make Urban Local Bodies capable of using scientific methods to handle Biodegradable Solid Waste in their area.

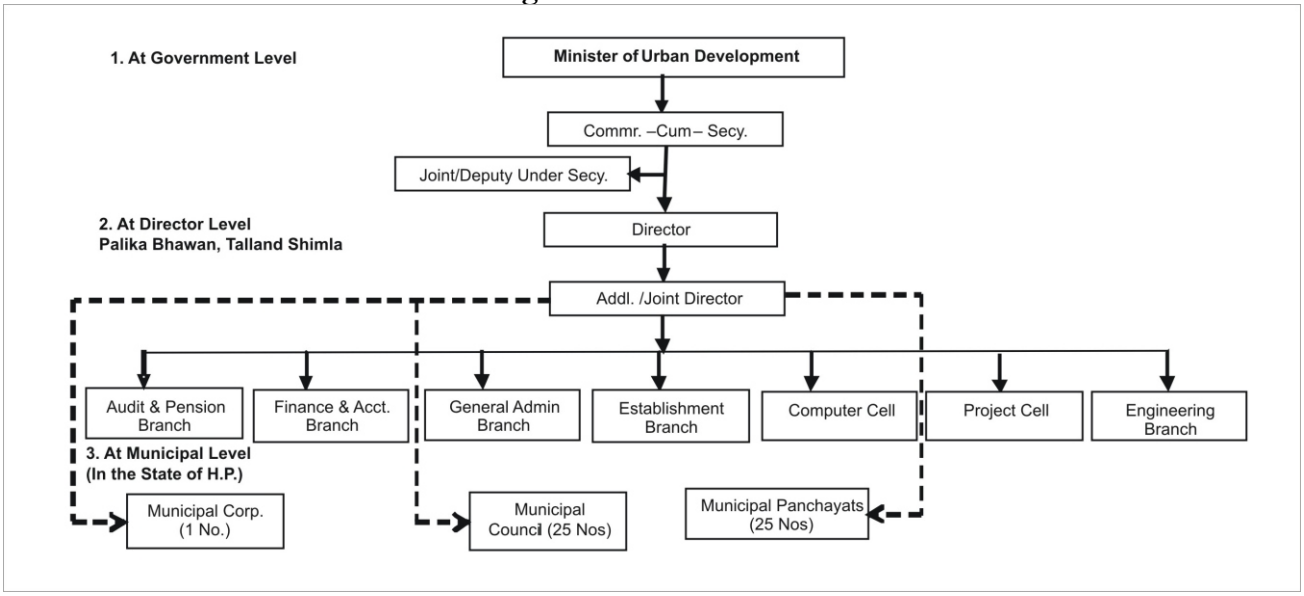
11.8 Environment monitoring (key parameters such as air and water pollution) carried out for activities related to the sector

At present, no environmental monitoring is carried out by the Department of Urban Development, however, CPCB, SPCB and other agencies within the State carry out such monitoings.

11.9 Institutional Mechanisms within the sector to address identified environment issues

Urban Development: The Directorate has been completely recognised and formed as the Apex Administrative Unit to regulate, control, advice, guide, administer, coordinate and monitor the entire functioning of the Urban Local Bodies.

Organization Structure



11.10 Data / Documentation pertaining to addressing demographic issues in the context of the sectors, such as population changes; requirements of populations and changing lifestyles; migratory populations including tourists; transhumants; transit labour population; pressures felt by communities due to degraded environment conditions.

Demographic Trends: The population of the State registered a decadal growth of 12.81% as against 17.64% at all-India level during the decade 2001-11, thus recording a decline of 4.73% as compared to the preceding decade 1991-01. This has been possible through a three-pronged strategy of intensive health cover, improvement in literacy rates, especially among the women and making family planning a people's movement along with a positive thrust of incentives. The important comparative demographic indicators are presented in the following table:-

Considering floating population of tourists, a number of initiatives taken up in the sector are described in table 11, 12, 13, 14, 15 & 16.

Table 11: Setting up of Landfill Facilities for Waste Disposal

Sr. No.	Landfill constructed	Initiatives taken	No. of sites identified
1	None	Shimla,Chowari, Chamba, Nalagarh, Palampur	52525222522222 52

Source: Management of Municipal Solid Waste, CPCB;(2006-2007)

Table 12: Implementation Status of Schedule-II

Local bodies taken initiatives for improving collection, segregation, storage and Transportation of waste
1. Initiated at Shimla, Mandi and Hamirpur

Source: Management of Municipal Solid Waste, CPCB;(2006-2007)

Table 13: Summary of demonstration project on implementation of MSW Rules

Sr. No	City/Town	Area of City/ Town (sq. km)		Quantity of waste generation (MT/day)	No. of wards	Project components for Demo-Project	Date of start & Duration	Remarks
1.	Mandi	4.26	35,000	24	13	collection, segregation, storage and transportation. Phase-II: DPR for Processing and disposal to be prepared	14.09.05 36 months	Tools/equipment are under procurement

Source: Management of Municipal Solid Waste, CPCB;(2006-2007)

Table 14: Demonstration Projects

Sr. No.	Town	Status as on 30th November, 2007
1.	Mandi	▯ Procured 10 lit. of twin-bins for source segregation and distributed to 8000 families and procured 100lit. bins for shops. ▯ Procured Hand-carts, wheel barrows and other tools/tackles for primary

collection.

- Procured MS container for secondary storage at community level.
- Procured dumper placer for transportation.
- Mass awareness carried out through printing, banners, pamphlets, rallies, cleanliness drive, etc.

Source: Management of Municipal Solid Waste, CPCB;(2006-2007)

Table 15: Implementation Status of Schedule IV

Sr. No.	Compost Plants		Vermi compost	
	Commissioned	Planned/proposed/ UC	Commissioned	Planned
1.	Shimla, Kullu/ Bhuntar, Manali, Solan, Kangra/ Nagrota, Nahan, Una and Hamirpur	Dharamshala, Paonta, Palampur, Nalagarh and Mandi	-	-

Source: Management of Municipal Solid Waste, CPCB;(2006-2007)

Table 16: Status of Authorisations granted by SCPBs/PCCs to Himachal Pradesh

Sr. No	No. of local bodies	Authorizations granted during 2006-07		Cumulative valid authorization
		No. of applications	Nos. Granted	
1.	56	56 (18+38)	28(11+17)	41

Source: Management of Municipal Solid Waste, CPCB;(2006-2007

Operation & Maintenance of existing Bio-Conversion Plant at Darni-ka-Bagicha, Lalpani, Shimla.

Municipal Corporation, Shimla planned a project for the Operation & Maintenance (O&M) of the existing 100 MT/day capacity Bio-Conversion Plant based on Controlled Aerobic Technology commonly known as Excel Technology installed at Darni-Ka-Bagicha, Lalpani, Shimla. The main purpose of this plan is to:

1.) Operation & Maintenance of 100 MT/day capacity Bio- Conversion Plant of Excel Technology for Municipal Solid Waste.
2.) Segregation of recyclable materials, production of compost and also its marketing.

Scope of Work

5. Scientific operation & maintenance of the plant for the conversion of city waste into organic manure as per Municipal Solid Wastes (Management & Handling) Rules, 2000.
6. Pre-operative segregation of waste i.e. biodegradable and nonbiodegradable waste.
7. Scientific disposal of all the inert & non-biodegradable rejects emanated waste after the operation of the plant to the landfill site.
8. Testing/sale/disposal of manure. The revenue generated by sale of manure shall be retained by the successful bidder. Proper records will be maintained in this regard.
9. Obtaining authorization from competent authority for the production and sale of manure.

Sanitary Land Fill Site in the Municipal Corporation, Shimla (SMC): Municipal Commissioner, Shimla, Himachal Pradesh, planned to prepare DPR for Sanitary Land Fill Site. The main purpose is to manage the

municipal waste at Shimla. Since a couple of years, Shimla Municipal Corporation has chosen a sanitary landfill and already initiated an approval procedure. The proposed sanitary landfill area is located at Bhariyal, along Taradevi-Totu bypass road, Maujja, Shimla having coordinates of 31º05'06" N and 77º7'44" E. The site has an area of 9.9219 Ha. The annual average rain is 1,089 mm and average daily evaporation is approximately 4 mm. The landfill site is a natural valley of a depth of approx. 80 m below the bypass road. The nearest residential area is more than 500 m away from the downstream end of the site. It is a rocky terrain with no access road for vehicle traffic. Pedestrian tracks are visible at the site. The site needs filling to ensure that the minimum 2.0 m barrier from the highest water table, as per the MSW (M&H) Rules, 2000 is ensured. There is also a need to notify the buffer zone on the periphery as a 'No Development Zone' under the H.P. Town & Country Planning Act, 1977.

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Solid Waste Management at Shimla: SMC has commissioned a solid waste processing and treatment plant with a capacity of 100 Mt/day at the cost 3.72 Crores in 2001 at Darni-ka-Bagicha in Lalpani. The treatment is based on Excel aerobic composting technology. The plant receives about 912 MT per month wastes during normal season and 1266 MT per month wastes during peak season amounting to 30-45 Mt/day. The amount of compost produced is about 15-20 MT per month. SMC has established common biomedical waste treatment facility comprising of incinerator for treatment and disposal of biomedical wastes. In absence of autoclave shredder and burial pits, the facility is not able to provide a complete treatment and disposal for all types of biomedical wastes. The disposal is carried out through open landfilling along the hill slopes near the processing and treatment plant. About 1200 sq.m. area is being used for landfilling. About 170-300 MT per month of inert material from processing plant (which amounts to 18%-22% of total waste received) is disposed at landfill site. The construction wastes and debris which is collected separately and disposed off at the landfill site is used as cover material.

11.11 Information on human resource management issues (which may have relevance to environment management) in the sector such as: manpower, vocational training, awareness levels etc.

1. Department of Urban Development

- Director
- Additional /Joint /Deputy Director
- Executive Engineer
- Joint Controller(F&A)
- Assistant Engineer
- Project Officer
- Supdt. Grade
- Asstt. Town Planner
- Jr. System Analystcum-Programmer
- Personal Assistant
- Supdt. Grade- II.
- Law Officer
- Sr.Assistant
- Junior Engineer
- Statistical Assistant
- Computer Operator
- Jr. Scale Steno
- Jr. Assistant /Clerk
- Driver
- Peon

11.12 Regulatory Analysis to identify any regulations that have environment implications (negative or positive), and compliance with the same

Waste management sector and cross sector policy and regulatory framework at national & state level.

- National Urban Sanitation Policy
- National Rural Health Mission
- Municipal Solid Wastes (Management and Handling) Rules, 2000
- State Water Policy (Draft)
- State Tourism Policy
- HP Municipal Act, 1994
- HP Town and Country Planning Act, 1977
- Panchayati Raj Act, 1994
- The Air (Prevention and Control of Pollution) Act,1981
- The Water (Prevention and Control of Pollution) Act,1974
- State Sector Reforms
- EIVS/IHDSP/UIDSMT/RGURF/JNURM
- Rural Tourism Infrastructure Development Scheme
- HP Non-Biodegradable (Control) Act, 1995
- HP Eco-tourism Policy, 2005
- National Rural Health Mission
- HP Ground Water (Regulation and Control of Development and Management) Act, 2005
- Health Vision, 2008
- HP Municipal Act/ HP Municipal Bye-Law
- Total Sanitation Campaign

Reference

- Central Pollution Control Board
- HP State Pollution Control Board
- Department of Urban Development
- Department of Environment, Science & Technology
- Department of Education
- Department of Health & Family Welfare
- Department of I & PH
- Department of Planning
- Department of Tourism & Civil Aviation

CHAPTER 12 HAZARDOUS WASTE (HW)

12.1 Resource Inventory of existing assets of the sector

Hazardous Waste (HW) has been identified as one of the major sectors of concern in Himachal Pradesh.

The increasing industrial growth leads to higher generation of HW. Poor collection, transportation and disposal infrastructure for Hazardous Waste (HW) in the urban/rural areas is leading to increased pollution load in the State. Hazardous Waste generated by Industries are usually a by-product of industrial operations which involve heavy metals such as arsenic, cadmium, chromium, lead, mercury, etc; processes which utilize different categories of oil and petrochemicals; products such as PVC and plastics; waste products from photocopiers; chemicals such as PCBs; and finally, by-products such as dioxins and furans which are now recognized as extremely toxic substances, affecting all forms of life. As per the report of High Powered Committee (HPC) on Hazardous Wastes set up by Government of India, the Himachal Pradesh generates 2159 tonnes per annum (TPA) of Hazardous Waste against a national total of 4434257 TPA.

Increasing gap in HW generation and collection, treatment and disposal services is leading to water, air and land pollution and increased burden of diseases. HW generation and disposal poses a major problem in the State of HP. Because of high altitude terrain and undulating topography, HW finds its way into surface water and ground water by generation of leachate leading to pollution of water sources. Lack of awareness about hazardous waste also contributes to pollution load.

The State Pollution Control Board, HP has identified 1241 industrial units responsible for generation of hazardous wastes as on 31.10.2007, under the Hazardous Waste (Management & Handling) Rules, 1989. Management/mode of disposal of sludge from Effluent Treatment Plant of 18505.8 T/Year and other residual wastes are secured onsite storage, while waste oil of 644.588 KL / Year and process residue amounting 669.4 T/Year are recycled. Contaminated containers of 50268 No./Year is also recycled/reused after cleaning. Status of category-wise hazardous waste types, quantity generated and mode of disposal is listed below:

Table 1: Hazardous Waste Generation

Sr. No	Type of Hazardous Wastes	Quantity/ Annum	Management/ Mode of Disposal
1	Sludge from Effluent Treatment Plant	18505.574 T/ Year	Secured onsite storage and finaldisposal in the TSDF site
2	Waste Oil	644.588 KL/ Year.	Recycled
3	Contaminated Containers	50268 No. / Year.	Recycled (Reused after cleaning)
4	Others (Residual wastes)	18849.939 T/ Year.	Secured onsite storage and finaldisposal in the TSDF site
5	Process Residue	669.488 T/Year	Recycling

[Source: HPSPCB Shimla, as given in State of Environment Report, HP)

Status of Industry in Himachal Pradesh: During the last few years, the industrialization in the State of H.P. has made significant progress. Today, we have about 37835 (37364 Small Scale and 471 Medium & Large Scale) Industrial Units with an investment of about Rs. 13492.14 crores and employment of about 2.554 lakh persons registered with the Deptt. of Industries. The district wise details of registered industrial units are as under:-

Table 2: District wise details of industrial units registered in the Small, Medium & Large scale (Upto 31-03-2011)

Sr. No.	District	No of units	Investment(Rs. in lakhs)	Employment
1	Bilaspur	2280	53827.71	9904
2	Chamba	1763	3303.43	6102
3	Hamirpur	2768	6264.33	9966
4	Kangra	8873	35226.71	40160
5	Kullu	2489	7303.15	13235
6	Kinnaur	571	514.62	1789
7	Lahaul& Spiti	576	321.79	1589
8	Mandi	3824	10427.32	15813
9	Shimla	3392	24029.91	13028
10	Solan	4871	937064.98	96909
11	Sirmaur	3170	164142.95	27533
12	Una	3258	106787.37	19377
	Total	**37835**	**1349214.27**	**255405**

Source: Department of Industries

Table 3: Year wise details of units registered in the Small Scale Sector:-

(upto 31-03-2011)

Sr. No.	Year	No of units set up	Investment (Rs. in lakhs)	Employment generated
1	up to 02-03	30176	70977.48	129871
2	2003-04	663	3708.48	3769
3	2004-05	913	8891.44	6412
4	2005-06	914	12217.3	6611
5.	2006-07	952	45272.78	10665
6.	2007-08	842	70637.33	11302
7.	2008-09	909	73795.48	10939
8.	2009-10	1032	75320.01	10011
10	2010-11	963	96539.36	10002
	Total	**37364**	**457359.66**	**199582**

Source: Department of Industries

Table 4: Year wise details of units registered in Medium & Large Scale - *(upto 31-03-2011)*

Sr. No.	Year	No of units set up	Investment (Rs. in lakh)	Employment generated
1	up to 02-03	196	237806	29823
2	2003-04	15	3494	762
3	2004-05	35	30287	3473
4	2005-06	64	50159.24	4606
5.	2006-07	46	61525.9	4568
6.	2007-08	19	48263.61	1923
7.	2008-09	46	114103.26	4225
8.	2009-10	23	134382.42	2703
10	2010-11	27	211833.6	3740
	Total	**471**	**891855.03**	**55823**

Source: Department of Industries

Approval of new Industries: After the notification of Special Package in January 2003, the Department of Industries has approved 1019 new investment proposals and 154 expansion proposals in Medium & Large Scale Sector and 13294 new investment proposals and 257 expansion proposals in SSI sector up to 31/3/2011 with combined envisaged investment of Rs. 44296.66 crores and employment potential of 499827 persons. The details are as under:- District wise details of approval/ registration of New Medium & Large Industrial Projects: - (From 7/1/2003 to 31/03/2011)

Table 5: District wise details of approval/ registration of New Medium & Large Industrial Projects

Sr. No.	District	Number of Units	Investment (Rs. in Lakhs)	Proposed employment
1.	Bilaspur	12	82852.01	2403
2.	Hamirpur	1	268.53	19
3.	Kangra	29	101753.61	4191
4.	Kullu	2	999.92	130
5.	Shimla	13	115844.94	3702
6.	Solan	669	1699431.85	96332
7.	Sirmaur	205	476748.56	30041
8.	Una	86	468998.22	32343
9.	Chamba	1	80000.00	600
10	Mandi	1	90860.00	280
	Total	**1019**	**3117757.64 or (31177.57 crores)**	**170041**
	Expansion Proposals	**154**	**2879.90**	**11934**

Source: Department of Industries

Details of registration/ approval of industrial units by the Industries Department after the special package of incentives. (From 7/1/2003 to 31/03/2011)

Table 6: Details of Registration of Industries

Sr. No.	Category	Number of units	Investment (Rs. in crores)	Proposed Employment
1.	New Medium/ Large Scale projects	1019	31177.57	170041
2.	Expansion of existing units of medium and large scale sector	(154)	2879.90	11934
3.	New Small Scale Units	13294	10006.33	314317
4.	Expansion of existing units of small scale sector	(257)	232.86	3535
	Total	**14313 (411)**	**44296.66**	**499827**

Year wise details of the approved/registered New Medium & Large Scale Industrial Projects after special package (from 07/01/2003 to 31/03/2011).

Table 7: Year wise details of new industries

Sr. No.	Year	Number of Units	Investment (Rs. in crores)	Proposed employment
1.	2003-04	284	3946.20	44491
2.	2004-05	225	3355.44	28208
3.	2005-06	244	5411.30	37390
4.	2006-07	145	6728.80	27004
5.	2007-08	28	2746.73	4996
6	2008-09	48	6230.91	14612
7	2009-10	30	1321.64	7721
8	2010-11	15	1436.59	5619
	Total	**1019**	**31177.57**	**170041**

Source: Department of Industries

In addition 154 proposals of substantial expansion in Medium & Large Scale Industrial Sector involving an investment of Rs. 2879.90 crores and employment potential of 11934 persons were also approved. The details of which is as under:

Table 8: Year wise Investment

Sr. No.	Year	No of projects	Investment (Rs. in crores)	Proposed Employment
1.	2003-04	15	21.18	384
2.	2004-05	37	356.21	1735
3.	2005-06	15	277.4	1158
4.	2006-07	9	181.3	429
5.	2007-08	3	24.52	126
6	2008-09	27	951.02	3437
7	2009-10	35	506.07	2758
8	2010-11	13	562.2	1907
	Total	154	2879.9	11934

Source: Department of Industries

District wise details of approval/ registration of New Small Scale Industrial Projects after special package (from 07/01/2003 to 31/03/2011)

Table 9: District wise details of new industries

Sr. No.	District	Number of Units	Investment (Rs. in Lakhs)	Proposed employment
1.	Bilaspur	582	19989.28	8946
2.	Chamba	242	5342.28	3936
3.	Hamirpur	378	4895.2	3641
4.	Kangra	1088	52973.57	16502
5.	Kullu	511	9505.18	4753
6.	Kinnaur	70	343.03	574
7.	Lahaul & Spiti	25	122.8	130
8.	Mandi	862	10203.09	8215
9.	Shimla	612	13468.35	6222
10.	Solan	5720	621029.9	168215
11.	Sirmaur	1510	130706.37	41120
12.	Una	1694	132054.43	52063
	Total	**13294**	**1000633.48**	**314317**

Year wise details of the approved/registered Small Scale Industrial Projects after special package (from 7/1/2003 to 31/03/2011)

Table 10: Year wise details of approved small scale industries

Sr. No.	Year	Number of Units	Investment (Rs. in Lakhs)	Proposed employment
1.	Upto 2003-04	2140	83169.76	48259
2.	2004-05	2018	162095.8	39522
3.	2005-06	1937	98405.83	39606
4.	2006-07	1867	140981.61	47568
5.	2007-08	1810	141030.97	48077
6.	2008-09	1010	104187.39	34672
7.	2009-10	1679	199554.77	44029
8.	2010-11	833	71207.35	12584
	Total	**13294**	**1000633.48**	**314317**

Source: Department of Industries

In addition 257 proposals of substantial expansion in Small Scale Industrial Sector involving an investment of Rs. 23286.20 lakhs and employment potential for 3535 persons were also approved. The details of which is as under:-

Sr. No.	Year	No of projects	Investment (Rs. in Lakhs)	Proposed Employment
1.	Upto 2004-05	104	1722.78	1138
2.	2005-06	81	4293.8	1845
3.	2006-07	42	869.24	294
4.	2007-08	10	499.47	86
5.	2008-09	7	113.42	34
6.	2009-10	10	15702.29	105
7.	2010-11	3	85	33
	Total	**257**	**23286**	**3502**

Source: Department of Industries

State Level Single Window Clearance & Monitoring Authority:

With a view to ensure expeditious clearances from the respective departments for setting up of new industrial units, a State Level Single Window Clearance and Monitoring Authority under the Chairmanship of Hon'ble Chief Minister has been constituted to clear projects and ensure speedy approval from various Departments or Agencies. The Authority has so far held 51 meetings and cleared 864 projects with an investment of Rs. 28412.74 crores and employment potential to about 140031 persons. The year wise details of the meetings are as under:-

Table 11: Details of meetings for unit's approval

(upto 31-03-2011)

Sr. No.	Year	No. of meetings	No. of units approved.	Proposed investment (Rs in crores)	Proposed employment
1.	2003-04	2	30	541	4459
2.	2004-05	9	232	3625	28083
3.	2005-06	8	227	5441	36857
4.	2006-07	7	160	4971	25283
5.	2007-08	3	28	3269.31	4712
6	2008-09	7	76	6848.01	21255
7	2009-10	11	79	1649.22	11286
8	2010-11	4	32	2068.2	8096
	Total	**51**	**864**	**28412.74**	**140031**

Source: Department of Industries

No of units set up after the notification of Special Package: After the notification of a special Package in January 2003, out of total projects approved including expansion proposals, 7398 new industrial units and 218 implementation of expansion in SSI sector and 275 new units and 76 implementation of expansion in Medium and Large Scale sector have been set up in the State with an actual total investment of about Rs. 10883.88 crores generating employment to 100685 persons. The sector wise details are as under:-

Details of number of industrial units in production (issued COP/PMT) after the special package of incentives.(from 07/01/ 2003 to 31/03/2011)

Sr. No.	Category	Number of units	Investment (Rs. in crores)	Employment		
				Him	Non Him	Total
1.	New Medium/ Large Scale projects	275	6540.88	19867	6133	26000
2.	Expansion of existing 76 units of medium and large scale sector	Existing units	436.86	1723	583	2306
3.	New Small Scale Units	7398	3868.96	57407	13251	70658
4.	Expansion of existing 218 units of small scale sector	Existing units	37.56	1377	344	1721
	Total	**7673**	**108838.88**	**80374**	**20311**	**100685**

Source: Department of Industries

Industrial Areas/Estates: Development of industrial infrastructure has been one of the priorities of the State Govt. In order to provide infrastructural facilities to the entrepreneurs, 41 Industrial Areas and 15 Industrial Estates have been developed in the State.

Table 12: District Wise Details of Industrial Areas/Estates

Name of District	Name of Industrial Area	Name of Industrial Estate
Bilaspur	1. Bilaspur	
	2. Golthai (Integrated Infrastructure Development Centre-IIDC)	
Chamba	1. Hatli	1. Shivnagari (Holi)
	2. Garnota	2. Sultanpur
		3. Parel
Hamirpur	1. Hamirpur	
	2. Nadaun	
Kangra	1. Nagrota Bagwan	1. Kangra
	2. Dhaliara	2. Dehra
	3. Nagri	3. Jawali
	4. Sansarpur Terrace (Growth Centre)	
	5. Bain Attarian	
	6. Badhal	
	7. Raja Ka Bagh	
	8.Nargala Jawali	
Kullu	1. Shamshi	
Kinnaur	1. Reckong Peo	
Lahaul & Spiti		1. Keylong
Mandi	1. Ratti	1. Saiglu
	2. Bhambla	2. Palli
	3. Sauli Khad (Mandi)	
Shimla	1. Shoghi	1. Raighat
	2. Maindli	2. Pandranu
	3. Jais	3. Sunda Bhonda
	4. Jubber Hatti	
Sirmaur	1. Kala Amb	
	2. Paonta Sahib	
Una	1. Tahliwal	
	2. Gagret	
	3. Mehatpur	
	4. Amb	
	5. Jeetpur Bheri	
	6. Basal	
Solan	1. Baddi	1. Parwanoo
	2.EPIP Baddi (Ph-I &II)	2. Chambaghat
	3. Barotiwala	3. Dharampur
	4. Chambaghat	
	5. Banalagi	
	6. Mamlig	
	7. Katha Bhatoli Kalan	
	8. Vakanaghat	
	9. Lodhi Majra	
	10. Majhol	
Total	**41**	**15**

Source: Department of Industries

Rates for the allotment of plots in the industrial areas/estate of the Industries Department for the year 2008-09. The Committee constituted under Rule 6.2 of revised rules regarding Grant of Incentives, Concessions and Facilities to Industrial Units in H.P.-2004 has determined the premium of plots in respect of Industrial areas/estates of the Industries Department for the year 2011-12 as under. The following rates shall be applicable with immediate effect :-

Table 13: Rates for the allotment of plots in the industrial Areas/Estate

Name of the District.	Name of Industrial Area/Estates	Rates in Rs. Per Sq. mtrs.		
		Developed	Un-Developed	
Bilaspur	1	IA Bilaspur	1210	-
	2	IA Goalthai	825 1100 (Commercial)	-
Chamba	1	IA Hatli	330	-
	2	IA Garnota	-	220
	3	IE Shivnagri (Holi)	@Rs 2/- per sq ft	-
	4	IE Sultanpur	550	-
	5	IE Parel	550	-
Hamirpur	1	IA Hamirpur	1210	-
	2	IA Nadaun	1100	-
Kangra	1	IA Nagrota Bagwan	1375	
	2	IA Dhaliara	550	-
	3	IA Nagri	440	-
	4	IA Sansarpur Terrace	880	-
	5	IA Bain Attarian	880	-
	6	IA Raja Ka Bag	880	-
	7	IA Nargla Jawali	550	-
	8	IE Jawali	550	-
	9	IE Kangra	2200	-
	10	IE Dehra	1100	-
Kullu	1	IA Shamshi	2750	-
Kinnaur	1	IA Reckong Peo	825	-
Lahaul & Spiti	1	IE Keylong	@Rs 1/- per sq ft	-
Mandi	1	IA Ratti	1320	-
	2	IA Bhambla	1100	-
	3	IA Sauli Khud (MND)	1650	-
	4	IE Siaglu	660	-
	5	IE Palli	660	-
Shimla	1	IA Shoghi	1650	-
	2	IA Jais	-	550
	3	IE Raighat (Theog)	550	-
	4	IE Pandranu	275	-
Sirmaur	1	IA Kala Amb	2420	1650
	2	IA Gondpur (Paonta Sahib)	2420	1650
Una	1	IA Tahliwal	1100	605
	2	IA Gagret	1320	605
	3	IA Mehatpur	1650	935
	4	IA Amb	1320	825
	5	IA Jeetpur Bheri	880	550
	6	I.A Basal	1100	572
	7	I.A Deoli Ghanari	-	550
	8	Aghlour	-	440
Solan	1	IA Baddi	3300	2200
	2	EPIP Baddi (Phase I)	3300	2200
	3	EPIP Baddi (Phase II)	3300	2200
	4	IA Barotiwala	3300	2200
	5	IA Katha Bhatolikalan	3300	2200
	6	IA Lodhimajra	-	1463
	7	EC .Chambaghat	3850	3080

Name of the District.	Name of Industrial Area/Estates	Rates in Rs. Per Sq. mtrs.	
8	IE.Chambaghat	3850	3080
9	IA Banalagi	-	825
10	IA Mamleeg	-	550
11	IA Waknaghat	-	1100
12	IE Dharampur	2420	1815
13	IA Parwanoo	7260	4840

Source: Department of Industries

Table 14: Inventory of Hazardous Waste Operational Units in HP (as on 31.03.2010)

Name of Area	No. of Units Inventorized	Closed	Unit Authorized/Operational	Cases of Unit Under COE	Cases of Unit Under COP	Hazardous Waste Generation				
						Used Oil (Ltrs/ Year	Empty Drums (No./ Year)	ETP Sludge (Kg/Year)	Process Residue (Kg/Year)	Others (kg/year)
RO Baddi	565	14	447	22	82	140980	52618	4138925	657193	285356
RO Barotiwala	132	17	88	3	22	19315	17658	51222	20814	1855600
RO Nalagarh	442	14	354	7	67	154779	137104	955778	756961	1102164
RO Parwanoo	247	27	194	8	18	73089	18791	105187	10694	33648
RO Paonta Sahib	487	25	371	31	60	49773	58243	16612835	403592	4927682
RO Una	128	15	79	5	29	46100	625	143865	40360	4366271
RO Bilaspur	29	0	23	3	3	24532	4	18770	0	600
RO Mandi	38	4	35	0	0	81715	73	7400	0	4048
RO Kullu	43	2	32	0	9	14354	0	42	3913	0
RO Jassur	68	5	50	3	10	16270	1300	19542	153870	42132
RO Chamba	11	3	7	0	1	3775	0	0	0	500
RO Shimla	68	14	54	0	0	38178	0	1440	12	5880
RO Rampur	19	5	12	0	2	51470	0	0	0	0
Grand Total	**2277**	**145**	**1746**	**82**	**303**	**714330**	**286416**	**22055006**	**2047409**	**12623881**

Source: HP Pollution Control Board

12.2 Patterns of planning and development in the sector

Eleventh Plan 2007-12 and Annual Plan 2008 -2009

The Plan outlays for the 10th and 11th Plan are given in the Table below.

The Plan outlay for the 11th Plan has been enhanced from Rs. 95.73 crores (revised to Rs. 73.99 crores) to Rs 177.68 crores.

Plan outlays (Rs. in crores)

Sr. No.	Head of Development	Approved outlay 10th Plan 2007-12	10TH Plan Expenditure 2007-2009
1.	Village & Small Industries	173.45	43.71
2.	Medium & Large Scale Industries	3.95	1.75
3.	Mineral Development	0.28	0.11
	TOTAL	**177.68**	**45.57**

Source: Annual Administrative Report of Industries- 2008-09

Table 15: Annual Plan 2008-09

Sr. No.	Head of Development	Annual Plan 2008-09 Approved outlay	Revised outlay	Expenditure
Village & Small Industries				
1	Indl. Promotion & Training	24.00	13.77	13.77
2.	Industrial Estate	1375.75	1336.21	1336.19
3	District Industries Centre			
i	DIC Bldgs	40.00	40.00	40.00
ii	Indl. Schemes	46.90	47.60	47.18
iii	RIP/RAP	97.12	87.24	86.74
4.	Deendayal Hathkargha Protsahan Yojana	33.00	45.02	45.55
5	Workshed	2.05	0.85	0.85
6	Sericulture Industry.	89.00	84.56	84.45
7	Integrated Handloom Development Scheme	80.00	32.21	30.33
8	State Award to Craft person & Handloom weavers	2.00	1.25	1.25
9	Subsidy to SSI units	32.60	7.60	7.60
10	Development of Handloom Inds.	7.00	98.36	98.36
11	Development of Khadi Inds.	3.00	3.00	3.00
12	Health Insurance Scheme to Weavers	3.00	11.00	8.80
	TOTAL V&SI	1835.42	1808.67	1804.07
B	Large & Medium Industries			
1	Direction & Administration.	7.00	7.00	7.00
2	Industrial Area Development. & Promotion	20.00	20.19	20.19
3	Arts & Exhibition	75.86	72.25	72.21
	Total L&M	102.86	99.44	99.40
C	Mineral Development.	5.00	5.00	4.98
	Industry & Minerals	1943.28	1913.11	1908.45

Twenty Point Programme: The new 20 Point Economic Programme was announced by the Prime Minister on 14th January, 1982. It focused attention on some of the most important social and economic programmes included in the sixth plan and sought to impart greater dynamism to them. The 20 Point Programme is the real agenda for action before the nation and needs to be implemented in letter and spirit, whole heatedly and with dedication. This programme was again revised in the year 1986 in order to implement this programme more efficiently. While the thrust of the new programme continued to be on providing better living conditions for the less privileged sections of the society, it also aimed at all around improvement in productivity. The Industries Department is implementing two of the points of this programme which are as under: -

(i) Point No. 1 (c) – Permanent Registration of SSI Units(now discontinued). (i) Point No. 11 (a) – Assistance to Scheduled Caste families.

(ii) Point No. 11 (b) – Assistance to Scheduled Tribe families.

Other Schemes

1. State Awards Scheme: Under it, the State Level Selection Committee has selected three entries of handicrafts artisans of Mandi, Chamba and Kangra Districts for State Awards-2008.

2. Prime Minister's Employment Generation Programme (PMEGP): The Government of India has approved the introduction of a new credit linked subsidy programme called Prime Minister's Employment Generation Programme (PMEGP) by merging the two schemes that were in operation till 31.03.2008 namely Prime Minister's Rozgar Yojana (PMRY) and Rural Employment Generation Programme (REGP) for generation of employment opportunities through establishment of micro enterprises in rural as well as urban areas. PMEGP will be a central sector scheme to be administered by the Ministry of Micro, Small and Medium Enterprises (MoMSME). The Scheme will be implemented by Khadi and Village Industries Commission (KVIC), a statutory organization under the administrative control of the Ministry of MSME as the single nodal agency at the National level. At the State level, the Scheme will be implemented through State KVIC Directorates, State Khadi and Village Industries

Boards (KVIBs) and District Industries Centres (DICs) and banks.

Objectives:

- To generate employment opportunities in rural as well as urban areas of the country through setting up of new self-employment ventures/projects/micro enterprises.
- To bring together widely dispersed traditional artisans/ rural and urban unemployed youth and give them self-employment opportunities to the extent possible, at their place.
- To provide continuous and sustainable employment to a large segment of traditional and prospective artisans and rural and urban unemployed youth in the country, so as to help arrest migration of rural youth to urban areas.
- To increase the wage earning capacity of artisans and contribute to increase in the growth rate of rural and urban employment.

Quantum and Nature of Financial Assistance

Levels of funding under PMEGP

Categories of beneficiaries under PMEGP	Beneficiary's contribution (of project cost)	Rate of Subsidy (of project cost)	
Area (location of project/unit)		Urban	Rural
General Category	10%	15%	25%
Special (including SC / ST / OBC /Minorities/Women, Ex- servicemen, Physically handicapped, NER, Hill and Border areas etc.	05%	25%	35%

Note:
(1) The maximum cost of the project/unit admissible under manufacturing sector is Rs. 25 lakh.
(2) The maximum cost of the project / unit admissible under business / service sector is Rs. 10 lakh.
(3) The balance amount of the total project cost will be provided by Banks as term loan

Rural Industrial Programme/Rural Artisans Programme: The main objective of Rural Industries Programme/Rural Artisans Programme is the up gradation of skills of rural artisans by providing them required training in improved techniques and tools and settling them in their trades, so that they are able to increase their earnings. The following categories of persons are eligible for assistance under this programme:-

(I) All Rural Artisans and their family members.
(ii) All farmers who have less than 5 acres of land and their family members.
(iii) All landless labourers who are willing to become artisans.
(iv) All Scheduled castes and Scheduled Tribes people.

Achievements during the last three years

Sr. No.	Financial year	Target (Nos,)	Achievement No. of beneficiaries
1.	2006-07	4300	6099
2.	2007-08	5500	6908
3.	2008-09	6000	7220

Industrial Growth Centre: An Industrial Growth Centre Project for Sansarpur Terrace in District Kangra was approved by the Govt. of India in 1997. The project is being implemented in phases at the following split locations:-

Sr. No.	Name of the location	Approximate areas
1	Sansarpur Terrace, Phase-I	66-00-00 hectares
2	Bain Attarian, Phase-II	07-81-70 hectares
3	Raja-ka-Bag, Phase-III	102-62-43 hectares
4	Gwalthai, Phase-IV	05-53-00 hectares
5	Banalgi, Phase-V	41-47-08 hectares

Setting up of Trade Centre at Baddi: To facilitate exporting units a Trade Centre is being set up at Baddi with a cost of Rs. 10.81 crores. Trade Centre will be set up at Baddi with GOI assistance of Rs. 5.40 crores, the State Govt.

will contribute equity amounting to Rs. 3.2 crores and rest of the share amounting to Rs. 2.21 crores will be contributed BBNIA. The components of this project are construction of two Exhibition Halls with the capacity of 500 and 100 gathering, two Conference Halls with the capacity of 50 & 25 audiences, one Amphitheatre for outdoor meets, office space, toilet/pantry, sufficient parking area and green landscaped area.

Setting up of an Inland Container Depot at Baddi: To provide facilities like warehousing storage custody and handling of cargo to the industrial units established in the State a Memorandum of Understanding (MOU) has been signed on 17th October, 2008 for the establishment of Inland Container Depot (ICD) at Baddi by Container Corporation of India (CONCOR). The total cost for its establishment is Rs. 53.00 crores. This will include setting up of warehouses, administrative buildings, railway siding, installation of heavy machinery and equipment etc. The State Government has transferred 86 bighas (65240 Sq. Mtr.) of Government land to CONCOR at nominal lease of Re. 1/- per acre per annum for 95 years. CONCOR will be responsible for the storage/custody/cargo handling/custom clearances. It will also manage all warehousing activities and will be responsible for storage, custody, handling of the cargo at Container Freight Station and customs clearance. The CONCOR will also bear the cost of customs. Thus CONCOR will provide a single window service to customers and fix tariff for booking/delivery/handling/ transporting/warehousing of container and of cargo. The establishment of a Container Freight Station and of ICD in Baddi region of Himachal Pradesh will give a tremendous boost to the development and growth of industries in the region.

Responsible Agencies for Planning: There are four main Authorities which do planning for hazardous waste management, these are Industries, State Govt. Authorities, CPCB, SPCB as shown in table below:

Table 16: Showing main Authorities

Sr. No.	Agencies/ Authorities	Responsibility
1.	Department of Industries	i. Ensuring that hazardous wastes are handled as per rules. ii. Seeking authorization from State Pollution Control Board (SPCB) for setting up waste processing and disposal facility including landfills. iii. Furnishing annual report.
2.	State Government	Overall responsibility for the enforcement of the provisions of the rules in the metropolitan cities. Overall responsibility for the enforcement of the provisions of the rules within the territorial limits of their jurisdiction.
3.	Central Pollution Control Board (CPCB)	i. Co-ordinate with State Boards and Committees with reference to implementation and review of standards and guidelines and compilation of monitoring data. ii. Prepare consolidated annual review report on management of municipal solid wastes for forwarding it to Central Government along with its recommendations every year. iii. Laying down standards on waste processing/ disposal technologies including approval of technology.
4.	State Pollution Control Board (SPCB)	i. Monitor the compliance of the standards regarding ground water, ambient air leachate quality. ii. Prepare and submit to the CPCB an annual report with regard to the implementation of the rules

Source: Management of Municipal Solid Waste, CPCB, (2006-2007)

12.3 Technology adopted in the sector along with any changes in technology

Common Treatment Storage & Disposal Facility is an essential component of proper hazardous waste management activity for ultimate disposal of the hazardous wastes in an environmentally sound manner. The Himachal Pradesh has one Common Treatment Storage & Disposal Facility at M/s Shivalik Solid Waste Management Ltd. Village Majra, P.O. Dabhota, Teh. Nalagarh, Distt Solan and to prevent the industrial effluents from polluting the local environment, a Common Effluent Treatment Plant (CETP) is being set up at Village Sheetalpur, Tehsil Nalagarh Distt Solan for Hazardous Waste Management.

12.4 Stakeholder involvement in environment preservation and restoration

Some stakeholder involves are:

1. Govt. sector- it includes:

- Department of Industries
- Department of Urban development
- Department of town & Country planning
- Health Department
- HP Pollution Control Board

2. Public and Private sector

3. NGO's

12.5 Critical Environment Issues / Hotspots associated with the sector

Environment and Social issues relating to hazardous waste from Industries are improper siting of industries, impact on air quality, impact on water quality and quantity, inadequate hazardous waste treatment and disposal, land degradation, impact on flora and fauna, limited technological options to switch to green/clean technologies and occupation health of workers in industries handling hazardous waste

1. Improper siting of industries Industrial Areas in Himachal Pradesh located in the border areas adjoining Punjab, Haryana, Chandigarh, Uttarakhand and Jammu & Kashmir has attracted a large number of projects. This is especially so in case of Industrial Areas of Baddi, Barotiwala, and Parwanoo in Solan District, Mehatpur, Tahliwala and Amb in Una District, Paonta Sahib and Kala Amb Industrial Areas in Sirmaur District, Sansarpur Terrace in Kangra District and Golthai in Bilaspur District. Over 90% of the investments in the medium and large Scale sector are in pipeline and projects coming up in Himachal Pradesh are being implemented in these locations. Baddi, Barotiwala and Nalagarh area in Solan District has come up as a destination especially for Textile, Pharmaceutical, and Packaging industry. HP State Pollution Control Board has prepared Zoning Atlas for Siting of Industries for all districts of the State, Industrial Estate Planning for Baddi, Barotiwala-Nalagarh in Solan and Paonta Sahib in Sirmaur, Sustainable Tourism Development of Dharamsala, McLeodganj and Bhagsunath areas of district Kangra and State Environmental Atlas of Himachal Pradesh, The State Industrial Policy 2004 states that preference will be given to develop activity specific Industrial Areas like Food Parks, Electronic City, Export Processing Zones, Export Promotion Parks, Bio-Technology parks, Information Technology Parks, Textile Clusters, Pharma Clusters Housing, Labour Colony, Business Centers multiplexes etc. throughout the State, especially in the areas away from the border areas of the State and procedure for approval of the State Government under Section 118 of the Himachal Pradesh Land Reforms and Tenancy Act will be simplified and approval process expedited . Top priority will also be given to

link such existing Industrial Areas and new clusters with 'A' class quality road to provide efficient inter-State and intra-State connectivity.

Further, Department of Industries has created land banks (both private and government land) in Solan, Una, Kangra, Sirmaur, Hamirpur, Bilaspur, Shimla and Mandi Districts for attracting entrepreneurs and investors to set up industries. The siting of Industries is being done as per the available land bank and not as per the Zoning Atlas for Industries. Moreover, EIAs has an inbuilt mechanism for site selection and has scope of assessing alternate sites as well, the EIA tool has not been adequately used.

2. Poor ambient air quality: Air quality trends in H.P indicates that higher concentration of SPM in Paonta Sahib industrial area is contributed by industrial, construction activities & vehicle movement in the area. Ambient air quality at Baddi and Kala Amb (Industrial Areas) is very well within the prescribed standards with regard to concentration of gaseous pollutants. However, the concentration of SPM (pollutants) earlier showing increasing trend has shown marginal improvement during the preceded months, which is mainly due to increased infrastructure construction activities in the area.

Removal of vegetation from the area designated for mining and other purposes including TSDF produces dust which when air-borne causes an increase in the concentration of SPM in the surrounding areas. Removal, handling, transportation and storage of soils also cause an increase in the concentration of SPM in the atmosphere. The use of diesel equipment in these activities causes an increase in the level of NOx. Drilling and blasting of overburden and mineral contribute SPM and explosive fumes into the atmosphere.

3. Deteriorating water quality and quantity: With the increasing population, urbanization and industrialization it is becoming difficult to provide adequate amount of water to the users. At the same time the problem of water quality has cropped up and has become more important in the recent years rather than quantity of water. It is almost impossible to find pure water in nature as water being a universal solvent readily dissolves and collects all kinds of impurities but the crux of the problem lies in the contamination that is taking place due to human activities. The pollution by human activities emanating either from use of water for domestic or industrial purposes or as a result of ever increasing rate at which organic or inorganic chemicals, pesticides, heavy metals are being used and are being released into the atmosphere or over land whereby they are able to enter the water cycle have degraded our water resources to a large extent. The industrialization coupled with discharge of untreated sewage is responsible for deterioration in water quality.

In the industrial area of Baddi, Barotiwala, Nalagarh, Kala Amb & Parwanoo, the water quality of the River Sirsa, Markanda and Sukhna Nallah is categorized as 'D' because of low levels of oxygen due to organic pollution. River Sirsa is categorized as A to D because industrial and domestic effluent pollutes river in Baddi, Barotiwala and Nalagarh region. River Sukhana is categorized as 'D" because Industrial and domestic effluent pollutes river in D/S Parwanoo town.

4. Inadequate hazardous waste treatment and disposal: For effective management of hazardous waste, the Govt.of Himachal Pradesh has notified a TSDF Site near village Majra, Tehsil Nalagarh, Distt-Solan (HP) vide letter No-Ind-A(F) 15-4/2003-11 dated 07.03.2007.

Hazardous waste in HP comprises sludge from effluent treatment plant, waste oil, contaminated containers, others (Residual wastes) and process residue. Management / mode of disposal of sludge from effluent treatment plant is 2357.2 T/year and other residual wastes are secured onsite storage, while used oil is

3622.5 tonnes / year and process residue amounting 1118.4 tonnes /year are recycled. Contaminated containers of 67604 number/year are also recycled/reused after cleaning and 18860 tonnes of other waste per year.

Out of total of 25,958.1 tons of hazardous waste generated every year, about 9% is stored onsite / disposal in TSDF; 13.9 % is recycled / incinerated; 4.3 % is recycled / reused and 72.6 is stored onsite / incinerated. Though hazardous waste from industries gets treated/disposed /recycled, household hazardous waste e.g. dry cell, batteries, tetra packs, packet of snacks food, plastic waste, pet bottles add to the pollution load lead to disposal problem.

Hazardous Wastes generated by Industries are usually a by-product of industrial operations which involve heavy metals such as arsenic, cadmium, chromium, lead, mercury, etc; processes which utilize different categories of oil and petrochemicals; products such as PVC and plastics; waste products from photocopiers; chemicals such as PCBs; and finally, by-products such as dioxins and furans which are now recognized as extremely toxic substances, affecting all forms of life. As per the report of High Powered Committee (HPC) on Hazardous Wastes set up by Government of India, the Himachal Pradesh generates 2159 tonnes per annum (TPA) of Hazardous Waste against a national total of 4434257 TPA. Waste Generated from Pulp & Paper Industry and Calcium Carbide Industry of Paonta & Kala Amb area is being recycled.

5. Land degradation: Topography and land use change due to setting up of TSDFs/CETPs, digging of open pits and dumping of overburden rock mass in the form of the heaps. The land use pattern undergoes a change due to the use of the land for mining, dumping and TSDF activities. The land use in the surrounding areas is also affected due to the impact of mining on water regime. Polluted water from pits affected the characteristics of the topsoil, affecting the end use. The damage pattern on the surface undergoes a change due to the alterations in the surface topography due to mining and setting up and activities of TSDFs/ CETPs facility.

6. Loss of Flora and Fauna: Removal of all vegetation (flora) and fauna from the area is required for mining and other purposes including setting up of TSDFs and CETPs facility. Pollution of water in the surrounding water bodies, due to flow of debris on the slope, affect the aquatic ecology of water bodies. Dust in the atmosphere is contributed by the mining and TSDF activities. Dust when deposited on the leaves of the plants in the surrounding areas, retard their growth.

7. Limited technological options to switch to green/clean technologies: Industries based socio- economic development in Himachal Pradesh has exerted pressure on raw materials like water, minerals, forest produce. Capability and skills to manage the natural resources optimally are limited and is further compounded by the lack of adequate and skilled human resources to manage the natural resources optimally. Adoption of cleaner modes of production can help in natural resource conservation and elimination of gaseous, liquid or solid hazardous wastes, reduction by reduced consumption of raw materials, modification and upgradation of the technological processes so that optimal utilisation of natural resources is made possible, and helps in adoption of preventive rather than corrective approaches to pollution control arising out of generation of hazardous waste.

8. Occupation health of workers in industries handling hazardous waste: Data from labor bureau, Government of Himachal Pradesh indicate negligible occurrence of "occupational disease" as per Factory Act 1948. This has been attributed to low level of reporting both by employers or employee to the respective agency. However the CEPI data from CPCB and hospital admission statistics for districts having major industries in Himachal Pradesh

indirectly indicate occupational health issues of industrial workers.

The above identification and analysis of issues has been summarised in Table 17.

Table 17: Summary of Issues and their impacts

Issues	Causes	Impacts/Risks
1. Improper siting of industries	Concentration of industries in the foot hills of Shiwalik Himalaya and focus on extraction of few mineral resources The siting of Industries is being done as per the available land bank and not as per the Zoning Atlas for Industries.	Over extraction of mineral resources and generation of hazardous waste
2. Poor ambient air quality	Concentration of industries in Shiwalik Himalaya and focus on extraction of few mineral resources Ancillary development in the industrial area including urban infrastructure entailing construction activities, vehicular emissions and industrial emissions	Accidence of National Ambient Air quality Standards (NAAQS) Impact on human health particularly industrial workers
3. Deteriorating water quality and quantity	Concentration of industries in Shiwalik Himalaya and focus on extraction of few Mineral resources. Ancillary development in the industrial area including urban infrastructure entailing construction activities, improper discharge of industrial effluents (treated/untreated), sewage and municipal solid wastes Deeper excavation on the surface or underground digging Exposure of fresh rocks due to mining initiates weathering with the inevitable generation of substances which cause water pollution Mining activities increase suspended solids and chemical contamination in the water at the site and downstream	Further, deterioration of quality water in terms of benchmarks set in Primary Water Quality Criteria and Designated Best Use of Fresh Waters (A-E) Water Table decreases locally, often drastically, resulting in the drying up of wells and springs of the neighborhood. Adverse affect on water users and the aquatic ecosystem. The impact is particularly significant if water users downstream of the site are abstracting water for drinking/domestic use. Suspended solids can also significantly increase water treatment costs.
4. Inadequate hazardous waste	Congregation of industries in Shiwalik	Gaps between hazardous waste

Issues	Causes	Impacts/Risks
treatment and disposal	Himalaya and focus on extraction of few mineral resources Hazardous waste in HP comprises Sludge from Effluent Treatment Plant, Waste Oil, Contaminated Containers, Others (Residual wastes) and Process Residue Gaps in hazardous waste generation and treatment Inadequate number of Common Effluent Treatment Plant (Copts) and treatment e.g. there is no CETP for Bade and Baronial area	generation and treatment may increase further leading to deterioration of water quality
5. Land degradation	The land use pattern undergoes a change due to the use of the land for mining, excavation, dumping and other associated activities Digging of open pits and dumping of overburden rock mass in the form of the heaps Polluted water from pits affected the characteristics of the topsoil, affecting the end use. The damage pattern on the surface undergoes a change due to the alterations in the surface topography due to mining and associated activities.	The land use in the surrounding areas is affected due to the impact of mining on water regime. Change in value of the land and surrounding areas
6. Loss of Flora and Fauna	Removal of all vegetation (flora) and fauna from the area for mining and other purposes. Pollution of water in the surrounding water bodies, due to flow of debris on the slope, affect the aquatic ecology of water bodies. Dust in the atmosphere is contributed by the mining and associated activities. Dust when deposited on the leaves of the plants in the surrounding areas, retard their growth	Loss of natural vegetation cover by clear felling, smothering and dust
7 Limited technological options to switch to green/clean technologies	Inadequate incentives for setting/ switching green/clean technologies Inadequate understanding of green/clean technologies which could be introduced in Himachal Pradesh	Deterioration of baseline environment conditions of land, water, air and noise Increased capital cost and investment for setting /switching to green/clean technologies
8 Occupation health of workers in industries handling hazardous waste	Inadequate usage of PPE Inadequate safety systems in industries	Increased health risk / burden disease

12.6 Environment initiatives taken by the sector to address critical environment issues

Setting up of a Common Effluent Treatment Plant (CETP):-

To prevent the industrial effluents from polluting the local environment, a Common Effluent Treatment Plant (CETP) is being set up at Village Sheetalpur, Tehsil Nalagarh Distt Solan. A Special Purpose Vehicle (SPV) named M/s Doon Infrastructure Ltd. has been incorporated for this purpose by the M/s Baddi-Barotiwala-Nalagarh Industries Association Ltd. A patch of land measuring 30.08 bighas is being leased out to M/s Doon Infrastructure Ltd. (SPV) for setting up of this facility on token a lease amount of Re. 1/- per sq m for a period of 50 years. A CETP is proposed to be set up under the Integrated Infrastructure Up-gradation Scheme (IIUS) scheme of Govt. of India with a cost of Rs. 185.00 crores. A detailed project report in this behalf has been sent to Govt. of India for approval/sanction.

Setting up of a Common Treatment Storage & Disposal Facility: Common Treatment Storage & Disposal Facility is an essential component of proper hazardous waste management activity for ultimate disposal of the hazardous wastes in an environmentally sound manner. The Himachal Pradesh has one Common Treatment Storage & Disposal Facility at M/s Shivalik Solid Waste Management Ltd. Vill Majra, P.O. Dabhota, Teh. Nalagarh, Distt Solan

12.7 Environment related studies carried out in the sector

The Central Pollution Control Board has carried out Environment related studies with collaboration of HPSPCB for the State i.e. Status of Hazardous Waste Generation Treatment and Disposal in Himachal Pradesh.

12.8 Environment monitoring (key parameters such as air and water pollution) carried out for activities related to the sector

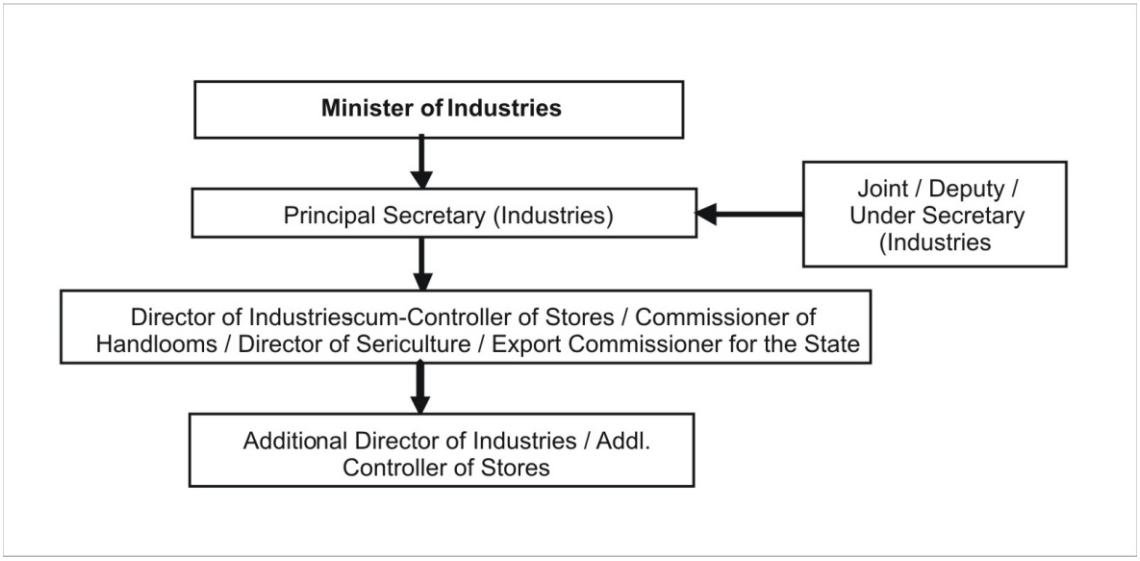
Environment monitoring is carried out by HP Pollution Control Board.

12.9 Institutional Mechanisms within the sector to address identified environment issues

H.P. State Pollution Control Board (HPSPCB)

H.P. State Pollution Control Board (HPSPCB) was constituted in 1975 to perform regulatory functions as prescribed under various environmental legislations. The State Board has eleven Regional Offices at Shimla, Parwanoo, Paonta Sahib, Nalagarh, Baddi-Barotiwala, Una, Rampur, Jassur, Chamba, Kullu and Bilaspur. There is a Central Laboratory at Parwanoo and three Regional Laboratories at Paonta Sahib, Jassur and Sunder Nagar for providing scientific support to the regulatory functions.

Department of Industries



Store Purchase Organization	Administration	Industrial Development
Additional. Controller of Stores Joint Director of Industries Tehsildar Naib Tehsildar Store Inspection Officers. Superintendent Gr. –I S.O. (Audit)	Addl. Director of Industries (Admn.) Assistant Controller (F & A) Superintendent Gr. -1	Industrial Advisor Joint Director of Industries Project Co-ordinator Deputy Directors of Industries Manager

Field Offices

District Industries Centre	Mining	Sericulture
General Managers, Managers/Members, Secretaries, SWCAs, Parwanoo, Baddi, Nalagarh, Paonta Sahib, Kala Amb, Sansarpur Terrace, Gwalthai, & Damtal Industrial Promotion Officers Economic Investigators Extension Officer (Industries) (Block Level)	Mining officers Mining Inspectors Assistant Mining Inspectors Mining Guards	Deputy Director (Seri)/ GMDICs / Managers Silk Seed Production Officers Sericulture Officers Development Officers Technical Officer (Tassar) Sr. Sericulture Inspectors Extension Officer (Tassar) Technical Assistant (Tassar)/Sericulture Inspector.

12.10 Data / Documentation pertaining to addressing demographic issues in the context of the sectors, such as population changes; requirements of populations and changing lifestyles; migratory populations including tourists; transhumants; transit labour population; pressures felt by communities due to degraded environment conditions.

Growth of Industries in HP: The growth and the share of industries in the State GDP has increased from 1.1% in 1950-51 to over 17% during 2006-07.

Table 18: Industrial Growth

Growth of Industry in Himachal Pradesh									
Year2	*Units (No.)2*			*Employment (No.)2*			*Investment (in crores) Current Prices2*		
	SSI	*L&M2*	*Total2*	*SSI*	*L&M2*	*Total2*	*SSI*	*L&M2*	*Total2*
1979-80	6969	22	6991						
1990-91	20545	110	20655	86227	15125	101352	150.54	200.84	351.38
1991-92	21518	112	21630	89997	15280	105277	222.38	224.00	446.38
1992-93	22440	114	22554	93577	15747	109324	289.28	265.00	554.28
1993-94	23265	121	23386	96779	17824	114603	350.20	404.33	754.53
1994-95	24121	129	24250	100119	19693	119812	412.40	761.27	1173.67
1995-96	24845	147	24992	103269	22467	125736	465.10	1447.40	1912.50
1996-97	25617	160	25777	106665	23895	130560	485.34	1595.66	2081.01
1997-98	26378	173	26551	110112	25988	136100	518.78	2031.14	2549.92
1998-99	27253	174	27427	114491	26103	140594	564.43	2085.41	2649.84
1999-00	28045	182	28227	119618	28930	148548	613.56	2288.49	2902.05
2000-01	28731	188	28919	122745	29047	151792	643.50	2310.52	2954.03
2001-02	29479	191	29670	126594	29382	155976	685.48	2363.34	3048.82

Source: Director of Industries Himachal Pradesh

District wise details of industrial units registered in the Small, Medium & Large scale Sector (up to 31-03-2008) is given in the Table

Table 19: Industrial units registered in the Small, Medium & Large scale Sector

Sr. No.	District	No of units	Investment (Rs. in Lakhs)	Employment
1	Bilaspur	2156	42265.76	9015
2	Chamba	1696	2702.83	5910
3	Hamirpur	2617	5316.04	9505
4	Kangra	8545	22398.71	38065
5	Kullu	2338	6004.96	11973
6	Kinnaur	544	428.22	1695
7	Lahaul & Spiti	563	285.72	1530
8	Mandi	3538	8836.66	14558
9	Shimla	3171	9530.96	12413
10	Solan	3930	425592.5	70837
11	Sirmaur	2830	90012.22	22463
12	Una	2907	29865.98	15821
	Total	**34835**	**643240.56**	**213785**

Table 20: Year wise details of units registered in the Small Scale Sector:

Sr. No.	Year	No of units set up	Investment (Rs. in Lakhs)	Employment generated
1	up to 02-03	30176	70977.48	129871
2	2003-04	663	3708.48	3769
3	2004-05	913	8891.44	6412
4	2005-06	914	12217.3	6611
5	2006-07	952	45272.78	10665
6	2007-08	842	70637.33	11302
	Total	**34460**	**211704.81**	**168630**

Table 21: Year wise details of units registered in Medium & Large Scale Sector:-

(upto 31-03-2008)

Sr. No.	Year	No of units set up	Investment (Rs. in Crores)	Employment generated
1	up to 02-03	196	2378.06	29823
2	2003-04	15	34.94	762
3	2004-05	35	302.87	3473

Sr. No.	Year	No of units set up	Investment (Rs. in Crores)	Employment generated
4	2005-06	64	501.59	4606
5	2006-07	46	615.26	4568
6	2007-08	19	482.63	1923
	Total	**375**	**4315.35**	**45155**

Table 22: Details of registration/ approval of industrial units by the Industries Department after the special package of incentives. ***(from 07/01/2003 to 31/03/2008)***

Sr. No.	Category	Number of units	Investment (Rs. in crores)	Proposed Employment
1	New Medium/ Large Scale projects	926	22188.47	142089
2	Expansion of existing units of medium and large scale sector	79	860.61	3832
3	New Small Scale Units	9772	6256.83	223032
4	Expansion of existing units of small scale sector	237	73.85	3363
	Total	**10698**	**29379.76**	**372316**

Table 23: District wise details of approval/ registration of New Medium & Large Industrial Projects after special package ***(from 07/01/2003 to 31/03/2008)***

Sr. No.	District	Number of Units	Investment (Rs. In Lakhs	Proposed Employment
1	Bilaspur	11	80402.01	2317
2	Hamirpur	1	2658.3	19
3	Kangra	26	25034.51	2799
4	Kullu	2	999.92	130
5	Shimla	10	104857.94	2051
6	Solan	623	1215901.58	86486
7	Sirmaur	187	366350.27	24388
8	Una	64	254172.74	23019
9	Chamba	1	80000	600
10	Mandi	1	90860	280
	Total	**926**	**2218847.5**	**142089**

Table 24: Year wise details of the approved/registered New Medium & Large Scale Industrial Projects after special package ***(from 07/01/2003 to 31/03/2008)***

Sr. No.	Year	Number of Units	Investment (Rs. in crores)	Proposed employment
1	2003-04	15	21.18	384
2	2004-05	225	3355.44	28208
3	2005-06	244	5411.3	37390
4	2006-07	145	6728.8	27004
5	2007-08	28	2746.73	4996
	TOTAL	**926**	**22188.47**	**142089**

Industrial Areas/Estates: Development of industrial infrastructure has been one of the priorities of the State Govt. In order to provide infrastructural facilities to the entrepreneurs, 38 Industrial Areas and 15 Industrial Estates have been developed in the State.

District wise details of industrial areas/estates

Name of District	Name of Industrial Area	Name of Industrial Estate
Bilaspur	1. Bilaspur	
	2. Golthai	
Chamba	1. Hatli	1. Shivnagari (Holi)
	2. Garnota	2. Sultanpur
		3. Parel
Hamirpur	1. Hamirpur	
	2. Nadaun	
Kangra	1. Nagrota Bagwan	1. Kangra
	2. Dhaliara	2. Dehra

Name of District	Name of Industrial Area	Name of Industrial Estate
	3. Nagri	3. Jawali
	4. Sansarpur Terrace	
	5. Bain Attarian	
	6. Badhal	
	7. Raja Ka Bagh	
	8. Nargala Jawali	
Kullu	1. Shamshi	
Kinnaur	1. Reckong Peo	
Lahaul & Spiti		1. Keylong
Mandi	1. Ratti	1. Saiglu
	2. Bhambla	2. Palli
	3. Sauli Khad (Mandi)	
	4. Maigal	
Shimla	1. Shoghi	1. Raighat
	2. Maindli	2. Pandranu
	3. Jais	3. Sunda Bhonda
	4. Jubber Hatti	
Sirmaur	1. Kala Amb	
	2. Paonta Sahib	
Una	1. Tahliwal	
	2. Gagret	
	3. Mehatpur	
	4. Amb	
	5. Jeetpur Bheri	
Solan	1. Baddi	1. Parwanoo
	2.EPIP Baddi (Ph-I &II)	2. Chambaghat
	3. Barotiwala	3. Dharampur
	4. Chambaghat	
	5. Banalagi	
	6. Mamlig	
	7. Katha Bhatoli	
Total	**38**	**15**

Source: Status of Industries, 2008

12.11 Information on human resource management issues (which may have relevance to environment management) in the sector such as: manpower, vocational training, awareness levels etc.

Himachal Pradesh State Pollution Control Board: H.P. State Pollution Control Board (HPSPCB) was constituted in 1975 to perform regulatory functions as prescribed under various environmental legislations. The State Board has eleven Regional Offices at Shimla, Parwanoo, Paonta Sahib, Nalagarh, Baddi-Barotiwala, Una, Rampur, Jassur, Chamba, Kullu and Bilaspur. There is a Central Laboratory at Parwanoo and three Regional Laboratories at Paonta Sahib, Jassur and Sunder Nagar for providing scientific support to the regulatory functions.

Department of Industries: The Industries Minister (Hon'ble Chief Minister) heads the Industries Department. At the Secretariat level, there is a two tier structure with the Principal Secretary (Industries) and the Joint/Deputy/Under Secretary (Industries).

(i) Store Purchase Organisation: The Store Purchase Organisation is headed by the Additional Controller of Stores. He reports to the Controller of Stores (Director of Industries) in the matters concerning Store Purchase Organisation. He is further assisted by Senior

Technical Officer (Mech.), Store Inspection Officer (Textile), Joint Director of Industries, Superintendent(s) Gr.-I & II, ministerial and other staff. He is further assisted by the Tehsildar (Recovery), Naib Tehsildar in the matter of recovery of loans and land acquisition.

(ii) Administration and Accounts Wing: The Administrative and Accounts Wings is headed by the Additional Director (Admn.). He reports in administrative/accounts matters to the Director of Industries. He is further assisted by Assistant Controller (F&A), Superintendent(s) Gr.-I & II and by ministerial and other staff.

(iii) Industrial Development Wing: In this wing Industrial Advisor, Joint Director of Industries, Project Co-odinator and Deputy Directors, report to the Director of Industries for the development of industries in the State. The Officers of these wings are further assisted by Manager, Industrial Promotion Officer, Superintendent (s) Gr.-II, ministerial and other staff.

(iv) **District Industries Centres:** The District Industries Centre are headed by General Managers. They are further assisted by Managers, Industrial Promotion Officers, Economic Investigators, Extension Officers (Industries) at Block level, ministerial and other staff.

In order to provide facilities to entrepreneurs close to their places of work, Single Window Clearance Agencies were functioning at Parwanoo, Baddi Nalagarh in Solan District, Paonta Sahib, Kala Amb in Sirmaur District, Gwalthai in Bilaspur District and Sansarpur Terrace, Damtal in Kangra District.

12.12 Regulatory Analysis to identify any regulations that have environment implications (negative or positive), and compliance with the same

Industries and Hazardous Waste Management sector and cross sector policy and regulatory framework at state level shows the intent of the state government to address the issues relating to improper siting of industries, poor ambient air quality, deteriorating water quality and quantity, inadequate hazardous waste treatment and disposal, land degradation, loss of flora and fauna and limited technological options to switch to green/clean technologies. A list of policy and programme is given below:-

- Environment (Siting for Industrial Projects) Rules, 1999
- The Environment (Protection) Act, 1986
- EIA Notification, 2006 and amendments
- Zoning Atlas
- Notification of Critically Polluted Areas identified by CPCB
- Comprehensive Environment Pollution Index (CEPI) developed by CPCB and MoEF
- The Air (Prevention and Control of Pollution) Act, 1981
- National Ambient Air Quality Standards (NAAQS)
- The Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008
- Land Acquisition Act, 1894
- The Forest (Conservation) Act, 1980

- Mining Policy
- The Industrial Policy, 2004
- Forest Sector Policy and Strategy, 2005
- Industry Policy 2004, Himachal Pradesh
- The Municipal Solid Wastes (Management and Handling) Rules, 2000
- The Factories Act, 1948
- The Water (Prevention & Control of Pollution) Act, 1974

Reference

- Central Pollution Control Board
- HP State Pollution Control Board
- Department of Urban Development
- Department of Environment, Science & Technology
- Department of Planning

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