

Vulnerability Analysis

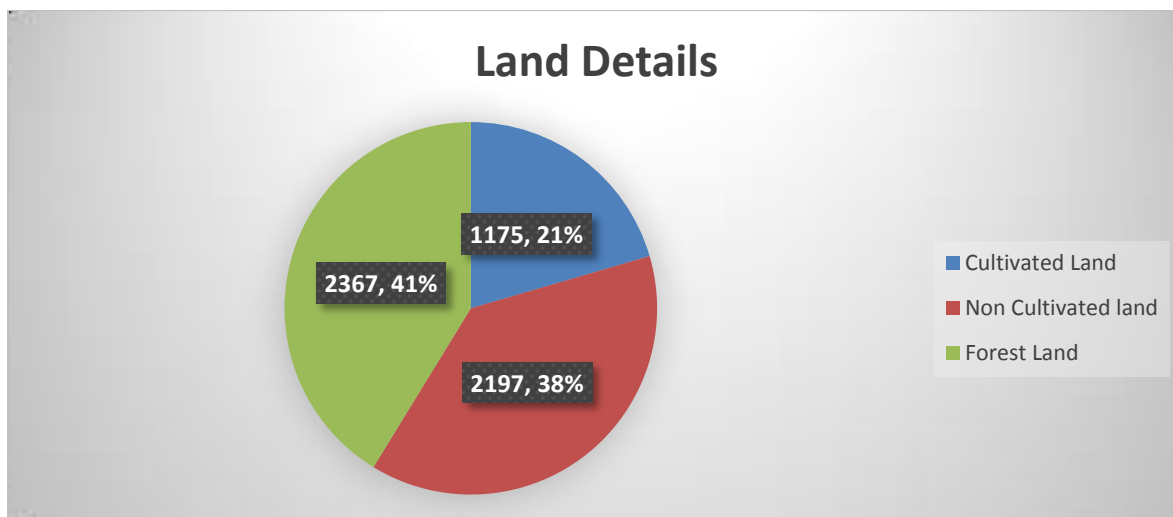
Kangra district is highly vulnerable to certain natural and Human Induced disasters. The Kangra district is prone to major disasters like: Earthquake, Landslide, flash floods, fire accidents, drought, road accidents, Industrial hazard, and stampede.

1. Physical Vulnerability

The risk of any region depends on the exposed vulnerable elements in that area. Major important elements management plan is the inventory of important facilities and wide road network to reach each and every house in town and village. If road network will not be wide it is difficult to approach the area during an earthquake. In order to prepare the earthquake risk map of Kangra district it is important to prepare different vulnerable elements in different layers in GIS format. Especially old building and road network in Kotwali bazar, Kangra Mandir Bazar. The age and construction material used of the building are more important to decide their vulnerability.

Further Mcleodganj town is most vulnerable to such hazard because it is situated not only south of MBT but an active fault is also passing in NW-SE direction crossing through the center of the Mcleodganj Bazar and extending up to Naddi after passing through the Dal lake. The road network in surrounding villages is also very poor; it is very difficult to even take ambulance at each house, which will be great hindrance to earthquake disaster management. Second most important aspect is use of building code in different coming up constructions. A lot of wood is used in the house construction in the district hence the houses are also vulnerable to fire hazard resulting due to earthquake shaking. Steep slopes in the district would result into landslides and block the arteries of the district resulting in delay in emergency response.

Out of total villages 3869A total of 544 villages were identified as 'high' forest fire sensitive, 1218 as medium forest fire sensitive, 1502 as low forest fire sensitive and 41 as very low forest fire sensitive villages (Table 5). Jaisinghpur tehsil was observed to possess highest number (91) of 'high' forest fire-prone villages. The maximum number of 'medium' forest fire-prone villages was found in Khundian (150).



- Roads - Total Length 5887 KMS
- Schools
- Hospitals - 1228
- Bridges -

- Houses - 338887
- Transmission lines
- Water lines
- Critical Buildings as follow

Table: 2.8 List of Critical Buildings with Numbers

Critical Structures	Numbers
Hospital (Ayurvedic & Allopathic)	815
DC office	1
Bus stand	9
Airport/ Helipads	14
BSNL Communication Center	-
Community Hall Cum Development center	-
Monuments	9
Central Water storage tank / Electrical sub stations	-
Fire stations	7
Schools and college	2571
Secretariat	10
Railway station	5
Police control room	1
All India Radio Center	1
Jail/ Prision	1
DFSC warehouse / storage	-
Dam	1

2. Social Vulnerability

District Kangra of Himachal Pradesh is the most populated district and hence the district covers substantial numbers of different sections. Total migrated labour contributing in social vulnerability in district Kangra arrived during 2015-16 was 706. 47.71% of the total population of district Kangra is employed while 167041 people are unemployed leading to social vulnerability.

Table: 2.9 Education details

Education (2015-2016)	
Primary Schools	1712 No. (4020 teachers and 43403 students)
Middle Schools	333 No. (2128 teachers and 38620 students)
High/ Sr. Sec. Schools	491 No. (6066 teachers and 70759 students)
Colleges	21 No. Govt./ Pvt. Colleges
ITI / Training Institutes	14
Literacy rate (%)	85.7

Table: 2.10 Social Factors

Social/ Demographic Factors in Figure	
Population	1510075 Growth from 2001 (12.77%)
Male	750591
Female	759484
Rural	1,423,794
Urban	86,281
Sex Ratio	1012 (No. of females per 1000 males)
0-6 population	Total = 164,607: Male – 87,741; Female – 76,866
Density of Population	263 per sq. km.
Person With Disability	33756
Families under Below Poverty Lines	63250 (21.87%)
Scheduled Tribes	84564
Scheduled Caste	319385

Table: 2.11 Total number of disabled persons District Kangra (Source Census 2011)

	Males	Females	Persons
Rural	17994	13915	31909
Urban	1099	748	1847
Total	19093	14663	33756

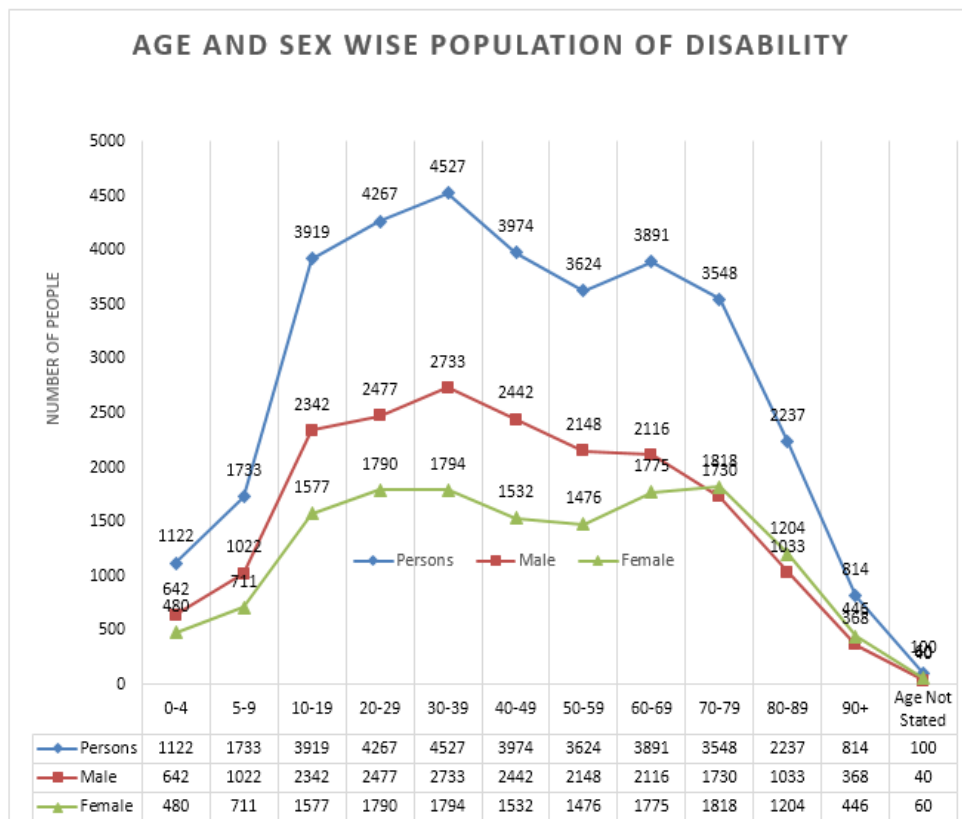


Chart: 2.1 Detail of Disabled person in District Kangra (Source: Census–2011)

1. Economic Vulnerability

As per Census 2011, 21% of the land is cultivated and Majority of the people resides in rural area depending on the Agricultural and Horticultural Produce, Animal husbandry is also vital for livelihoods of the people of Kangra which are vulnerable to Monsoons and major hazards such as Earthquake, Landslide, Fire that results in substantial amount of loss to the people. The production as mentioned in following table bears the direct risk of seasons as well as topography in extreme weather affecting transportation of the produce for income. Kangra being a home in Exile to Tibetan Guru Dalai Lama, and religious cum Tourist place the impacts of major hazards directly reflects on the tourist inflow and economy. The Arrival of tourist for the year 2015 both **Indian + Foreigner was 2509813** reflecting part of population exposed to various hazards discussed above.. However the Numbers of Industries in the district are increasing annually. Which increases the economical vulnerability of the district.

Table: 2.12 Area and Production in District Kangra.

Production	
Area Under Agriculture	212943 hectare
Total Production	304.06 thousand metric ton
Area Under Horticulture	39440 Hectare
Total Production	52186 Metric ton

Table: 2.13 Employment in District Kangra.

Employees District Kangra	Numbers
Permanent	30528
Temporary	8402
Semi Govt	6037
M.C. Worker	293
Total	45260
Total Workers Skilled and Non- Skilled	675170 (44.71% of total population)

2. Overall Vulnerability of the District

On the basis of above analysis the overall vulnerability of the district is high. The figure below which the HP State Council for compiled for the State shows Kangra to be very high vulnerable district for hazard susceptibility.

Table: 2.14 Showing Overall Vulnerability of District Kangra to various Hazards

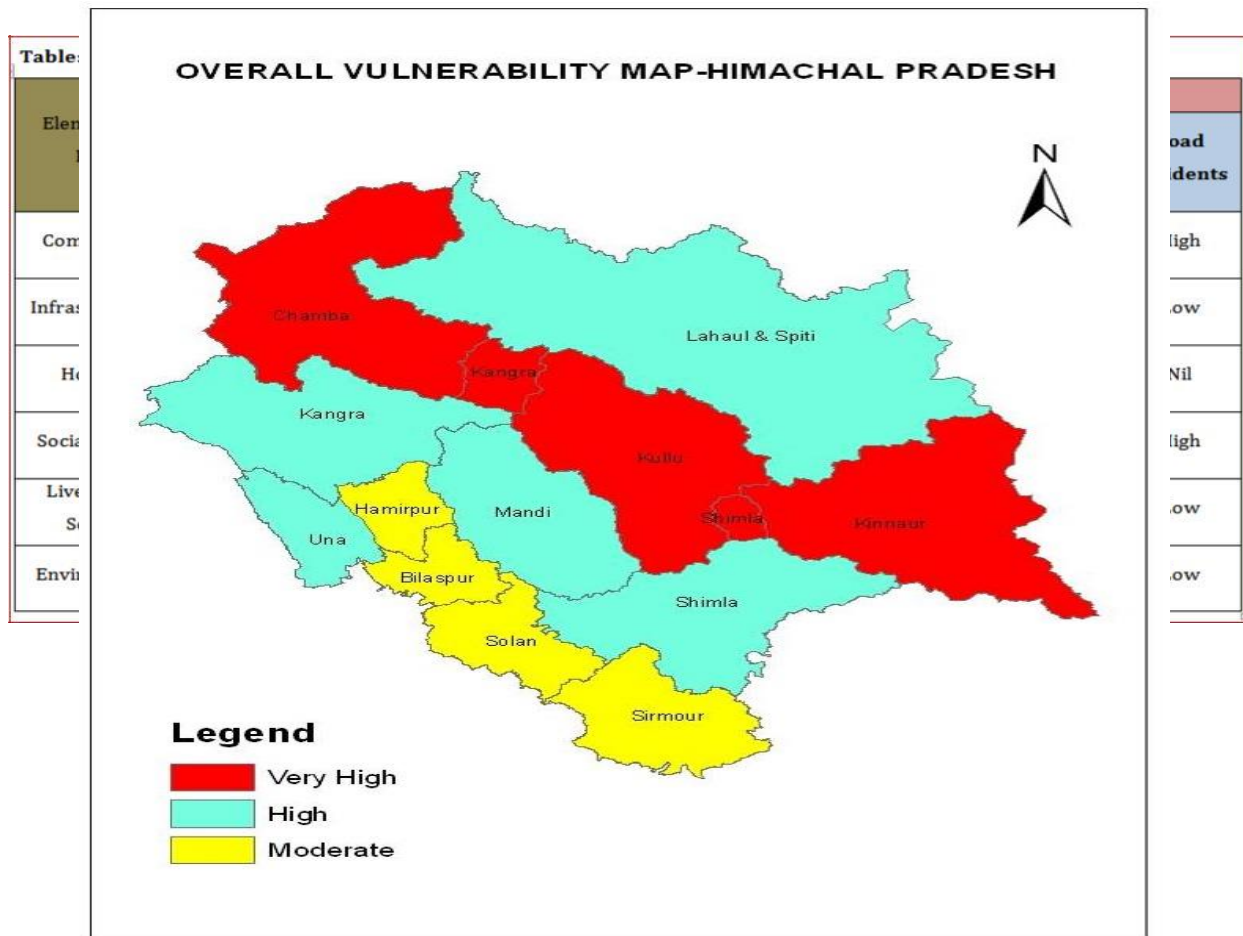


Fig: Overall Vulnerability of Himachal Pradesh Source: HP state Council for Env. Sc. & Tech

2.5 Capacity and Resource Analysis

The vulnerability of the district to various hazards is high to very high. In view of the hazard and vulnerability profile of the district the capacity and resource analysis of the district to deal with various disasters is important. And hence the capacities within the district are listed below:

1. Fire Stations

District Kangra has seven fire stations/ posts. But these fire stations have limited resources to deal with forest fire during summer season. Some areas of district are situated between the dense pine forest and during the forest fire they lose property as well as life. Due to limitation of firefighting equipment in fire department they are unable to overcome from these situations. These fire stations can be trained and equipped for multi-hazard response.

Table: 2.15 Location of Fire Stations/ Posts

SN	Fire Station	Fire Post
1	Dharamshala	Nurpur
2	Kangra	Jawalamukhi
3	Palampur	Baijnath
4		Jaisinghpur

(A post/ station is proposed to be opened at Jawali.)

2. Home Guards

Ninth Battalion of Home Guards, training center is stationed at Dhano, District Kangra with the total strength of 917. This human resource is trained in DM. But they are deployed for non-disaster duty. Sometime they are unable to provide there service for disaster related matters. Present deployed cop's details as per **Table: 2.16**

Table: 2.16 Home Guards Strength in District Kangra

SN	Company Placed in	Strength	Man	Women
1	Dharamshala (2 Coy.)	231	139	92
2	Palampur	110	110	-
3	Indora	100	110	-
4	Nurpur	110	110	-
5	Kangra	110		
6	Shahpur	110	110	-
7	Dehra	110	110	-
8	Technical	26		

Table: 2.17 Home Guards Strength in District Kangra (2015-16)

SN	Company Placed in	Strength	Man	Women
1	In Police Duties	322	265	57
2	Other Duties	391	375	16

3. Police Network in Kangra

District Kangra has one Police training center at Daroh and 17 Police stations and 18 Police posts. 01 Company of 3rd IRB Battalion is situated at Sakoh. Resources Such as Wireless and VHF are available with department As on Year 2015 the total strength of police force in the district was 1388 and the break-up of the same is given as under:-

Table: 2.18 Police Strength in District Kangra (2015-16)

Police Staff (2015-2016)	Number
ASI and above	153
Head Constables	211
Constables	974
Cook	14
Other staff (Technical) Govt -12 other - 24	36

4. Army Network and Central Paramilitary Forces

The district has good presence of army at Yol Cantt Dharamshala 9thCore Army, one unit at Palampur and of Seema Sashastra Bal (SSB) at Sapri, Jwalamukhi. Both have good coordination with the local administration. During the disaster these army plays valuable role to save the victims. They may be provided with key resources so that trained manpower could deal with any type of disaster.

5. Health Infrastructure, Medical Facilities and Manpower

Health Infrastructure in Kangra District for year –2014 to 2015 is provided in **Table 2.19** and the Manpower/ Staff and other details are provided in **Table – 2.20**

Table: 2.19 Health Infrastructure in Kangra District for year –2014 to 2015

Category	Medical / Health Centers
Allopathic– 579	<ul style="list-style-type: none"> i) Tanda Medical College - 1 ii) Regional Hospital- 1 iii) Civil Hospital-6 iv) Community health centre-15 v) Primary Health Centre-97 vi) Health Sub Center - 440 vii) Private Hospital/Nursing Homes – 19
Ayurvedic– 236	<ul style="list-style-type: none"> i) College /Hospital-1 ii) District Hospital-1 iii) Dispensary -234 (includes 1 homeopathy)
Bed Capacity	Allopathic – 1139 + Ayurvedic – 60 = Total 1169.
Veterinary– 413	<ul style="list-style-type: none"> i) Hospital - 60 ii) Dispensaries -338 iii) other (Farms, diagnostic center, institutions etc) – 15

6. Power Projects

The district has five power projects under the HPSEB Palampur circle. These projects are Khouli HEP 12.00 MW, Gaj HEP 10.5 MW, Banner HEP 12.00 MW and Binwa HEP 6.00 MW. -The project management has trained manpower and has machinery and equipment too to deal with emergencies. These resources can be requisitioned by the district administration during emergencies.

7. Early Warning System Network

District Kangra have no any machinery mechanism for Early Warning System. All departments have manual mechanism e.g. security guard, VHF etc. for early warning the power projects have their own networks too. The IMD department has also installed rain and snow gauges and temperature monitoring equipment at Naddi. However, the lack of coordination and mechanism of sharing information is a serious impediment in acting timely on the information so received.

8. Landing Sites

The list of landing sites which can be of immense help in disaster is given below. However, non-availability of re-fueling facility in the area may hinder the smooth operations of air relief operations.

Table: 2.22 List of Helipads in Kangra

SN	Name of Helipad/ Station	Latitude	Longitude	REF	Altitude
1	BAIJNATH	32.03	76.38		930
2	DHARAMSALA	32.10.35	76.18.28		4000 ft.
3	GAGAL	32.09.9	76.15.8	A.323/78	2600
4	JAISINGPUR	31.53.9	36.35.8	A.328/55	1800
5	NURPUR	32.11.0	75.53.6	A.317/96	
6	PALAMPUR (AR)	32.07.0	76.33.5	A.332/68	4500
7	PALAMPUR (UN)	32.06.1	76.32.9	A.331/67	4000
8	PONG DAM	32.01.0	75.54.1	A.305/84	
9	REHAN	32.09.7	75.54.5	A.314/90	1700
10	SAPRI	31.53.5	76.17.9	A.317.64	1600
11	YOL	32.09.5	76.22.2	A.326/75	3700
12	DHARAMSHALA ARMY GROUND	32.15	76.1		1630M
13	DHALIARA	31. 50.85	76. 11. 371		
14	SHAHID BHUVNESH DOGRA GROUND DEHRA	31. 52. 53.6 N	76. 12. 46.4 E		

9. Connectivity

District Kangra is covered by the road network of 5746 Kilometers and the other connecting links for district are as below:

- Air** Dharamshala to Gagal (Kangra) Air Port at to distance 13 k. m
Dharamshala to Pathankot, Air Port, Punjab. Total =103 k .m.
- Rail** Single narrow gage line from Pathankot (Punjab) to Joginder Nagar 153 km (Distt. Mandi) passes through district as shown in map. Rail Junction at Pathankot & Delhi= 480 km Jammu Route
- Roads** National High way passing through Distt.
NH-1-A-Jalandhar to Shrinagar-Short stretch 505.06 km
NH-20-from Pathankot to Mandi. 316 km
N-88 – From Matour to Shimla. 242 .km