Chapter 2
Geographic and Socio-Economic Realities of Himachal Pradesh, Northwestern Himalaya

R.B. Singh and Pankaj Kumar

Abstract Himachal Pradesh is situated in the north-western part of Himalaya, covering an area of 55,673 km^2. Administratively, the state has been divided into 12 districts. Himachal Pradesh is a hill state, having wide variations in altitude ranging from plains to mountain peaks. Varying aspects and altitudes results into considerable variation in temperature and rainfall, soil, and vegetation, and cropping patterns of the state vary spatially because of altitude, aspect, slope and micro-climatic conditions. Most of the area of the state is drained by five major streams; i.e., Satluj, Beas, Chenab, Yamuna and Ravi. It is primarily an agrarian state where agriculture and horticulture are major economic activities. Tourism activities, both religious and adventurous, are another source of livelihoods in the state. The concentration of population is high in the southern plain area, while very sparse in the northern part of the state. The state is vulnerable to various hazards such as earthquakes, flash floods, avalanches, landslides, glacial lake outburst floods (GLOFs), etc., due to active plate tectonic margins and altered climatic conditions.

Keywords Agrarian economy • Altitude • Hazards • Himalaya • Tourism

R.B. Singh (✉)
Department of Geography, Delhi School of Economics, University of Delhi, Delhi 110007, India
e-mail: rbsgeo@hotmail.com

P. Kumar
Department of Geography, Shaheed Bhagat Singh College, University of Delhi, New Delhi 110017, India
e-mail: pankajdsedu@gmail.com

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2.1 Introduction

Himachal Himalaya extends from the Shiwalik hills in the south to the Great Himalayan range, including a slice of Trans-Himalaya in the north. Geographically, the latitudinal and longitudinal extent of Himachal Pradesh is situated between 30°22′44″ to 33°12′40″ N and 75°45′55″ to 79°04′20″ E. The state is compact in shape and almost wholly mountainous, with altitude varying from 300 m in plains of Kangra and Una to nearly 7,000 m in Central Himalayan range of Lahaul and Spiti. It covers a geographical area of 55,673 km^2, which is about 1.69 % of India's total area (Census of India 2011a, b, c). Administratively, Himachal Pradesh is divided into 12 districts (Fig. 2.1). Lahaul and Spiti district is the biggest, while Hamirpur is the smallest one.

2.2 Physical Landscape

The area covered by Himachal Pradesh lies in most complicated geological regions of (1) Outer or sub-Himalayan zone, (2) Lower Himalayan zone, (3) Higher Himalayan zone, and (4) Tethys Himalayan zone (Wadia 1966). The highest relative relief (more than 5,100 m) is found in the eastern part of the state, covering the western part of Kinnaur, the northeastern margin of Shimla, and the southeastern extreme of Kullu districts. In the peripheral area of this belt, a very narrow belt showing high

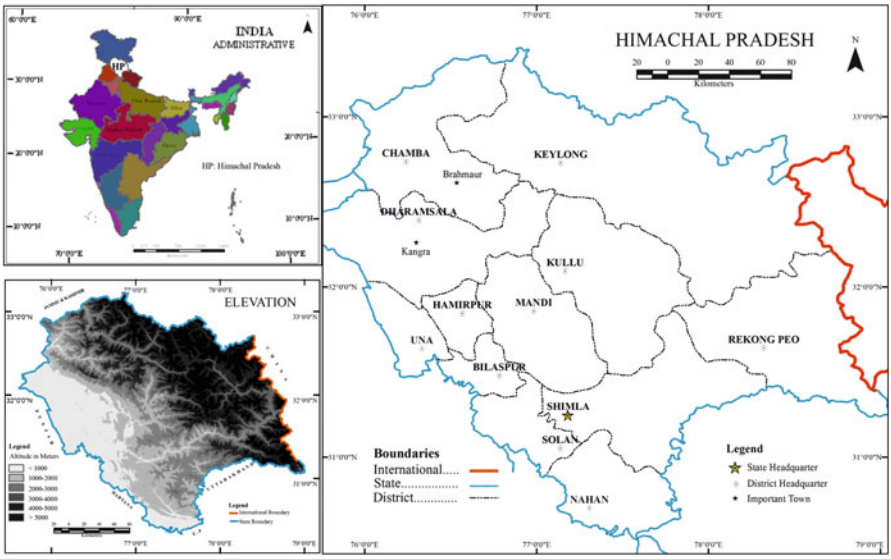

Fig. 2.1 Location, administrative division, and altitudinal variation (extracted from SRTM data) of Himachal Pradesh

relative relief (between 3,400 and 4,200 m) is noticeable. Another belt of high relative relief (between 2,400 and 3,300 m) extends over the state from north to southeast direction and it includes the northeastern part of Chamba, Bara Bhangal area of Kangra, western and southwestern portions of Lahaul and Spiti, eastern part of Shimla, and major portions of Kinnaur and Kullu districts.

In the northwestern portion of the state, the relative relief is mainly between 2,000 and 2,700 m. In the northern, central, and southeastern parts of the state, the value of relative relief ranges between 1,300 and 2,000 m. The areas with comparatively low relative relief, between 600 and 1,300 m, are the northwestern and central parts of Kangra, the eastern portion of Hamirpur and Bilaspur districts, the most part of Mandi, the entire Solan district, the western and central portions of Shimla district, and the northwestern and central parts of Sirmaur district. Relative relief less than 600 m is found in the western and southern margins of the state (Jreat 2006).

Located entirely in the western Himalaya, Himachal Pradesh not only has diversity in relief features but also in slope of the land. Nearly 70 % of the state area is covered by steep to very steep sloping land, about 19 % is covered by moderate to moderately steep slope, and only about 11 % is covered by gentle to nearly level slopes. Almost the entire districts of Lahaul and Spiti and Kinnaur (except a narrow strip along the rivers) have rock outcrops and very steep slopes. The district of Chamba, northern Kangra, Kullu and parts of Shimla, and Sirmaur and Solan districts are characterized by steep slopes and moderately steep slopes. Moderate sloping land is seen along the river valleys in the Kullu and Shimla districts. Level to gentle sloping land is limited to the southern Kangra and parts of Mandi district, the dun valleys of Una, Hamirpur, Bilaspur, Solan and Sirmaur districts (Jreat 2006).

2.2.1 Topography

On the basis of elevation and slope, geographers have grouped Himachal Pradesh into three distinct topographical regions. These are: (1) Shiwalik Hills, (2) Mountains—Lesser Himalaya, Greater Himalaya and Trans Himalaya, (3) Valleys—Shiwalik dun valleys, fluvial, and glacio-fluvial valleys, and (4) Mountain Passes.

Shiwalik Hills: These are the outermost ranges separating Himachal Himalaya from the Punjab plain. The altitude ranges from 600 to 1,200 m. These ranges are the youngest of the Himalayan ranges and are made up of tertiary sediments consisting of sand, clay, and boulder conglomerates brought down by the rivers from the main Himalayan ranges situated further north. They are composed almost entirely of tertiary and upper tertiary sedimentary river deposits.

Mountains: Deep gorges and V-shaped valleys, abruptly rising bare crags and sharp pyramidal peaks of the Greater Himalaya, which are in contrast to the even crest line of the Shiwalik hills, characterize this zone. The mountains of Himachal can be classified in three categories, viz., Lesser Himalaya, Greater Himalaya, and Trans Himalaya.

Lesser Himalaya: The Middle or Lesser Himalaya is located north of Shiwalik range. They form an intricate and rugged mountain system about 60–80 km wide and 1,000–4,000 m high. Several peaks rise to nearly 5,000 m and remain snow-covered throughout the year. The Lesser Himalaya lies between the "main boundary" and the "central Himalayan" thrusts. Most of this zone consists of granite and other crystalline rocks of unfossiliferous sediments. Similar to the Shiwalik range, Lesser Himalaya are not a continuous range but consist of a number of smaller ranges like Dhauladhar, Pir Panjal, Churdhar, and Shimla ranges.

Great Himalaya: The Inner or Great Himalaya is the highest mountain ranges that run along the north eastern border of Himachal, through Lahaul, Spiti, and Kinnaur districts. The Great Himalaya is most prominent in the eastern section of the state, particularly in the southern part of Spiti. The Great Himalayan range has a mean elevation of 5,500 m with several peaks rising over 6,000 m. These glaciers are a source of water to many important rivers; such as, the Chandra, the Bhaga, the Baspa and the Spiti.

Trans-Himalaya: Beyond the almost inaccessible snow-covered Great Himalayan ranges lies the cold arid region of Kinnaur, Lahaul, and Spiti. The trans-Himalayan area of the Spiti valley is composed of continuous series of highly fossiliferous marine residue rocks of earliest Palaeozoic to the Eocene age. The average elevation of the Trans-Himalaya is over 3,000 m. This region is cold and arid because the monsoon winds cannot reach here because of the lofty Greater Himalayan range. Zanskar range is the most prominent range of the Trans-Himalaya, separating Spiti and Kinnaur from Tibet.

Valleys: The state has number of valleys of various elevations, which are formed by tectonic forces as well as by the work of rivers and glaciers. The valleys of Himachal can be grouped into: (1) Shiwalik duns, and (2) Fluvial, glacio-fluvial valleys of outer, inner, and greater Himalaya. The Kangra valley is the most prominent valley of the outer Himalaya. The Kangra valley is an extensive dun-type valley of tectonic origin located between the Dhauladhar range in the north and the Shiwalik in the south. This beautiful valley extends down the southern slopes of the Dhauladhar range, covered with forests of pines, tea gardens, and terraced fields. The valleys at higher elevation are found along the major rivers and their tributaries.

Mountain Passes: Himachal Pradesh, being a hilly state, is bounded on many sides by high hills and there are several inhabited valleys enclosed around by high mountains (Attri 2000).

2.2.2 Glaciers

There are more than 5,230 glaciers in the Himalaya, out of which nearly 2,550 glaciers are in Himachal Pradesh (see Chap. 3 Kumar and Singh). The glaciers of Himachal hold 387.3 cubic km of ice reserves. This much of ice reserves can cater

18 % of fresh water demand of India. Most glaciers in Himachal (945 glaciers) are in the Satluj basin, followed by Chenab and Beas. They are natural reservoirs of fresh water which feed the north Indian rivers. They are located in altitudes of over 4,000 m above msl in the Pir Panjal, Greater Himalaya, Dhauladhar, and Zanskar ranges. A majority of them are small in size, with accumulation zone of 2–4 km^2. They are linear in form, varying in length from 2 to 25 km. The major glaciers in Chenab basin are Bara Shigri, Samudra Tapu, Mulkila, Ghhudong, Miyar, Chota Shigri, and Sona Pani. The largest four glaciers in Beas basin are Dudhen, Sara Umga, Trichu, and Dibhika.

2.3 Drainage

The state is drained by a number of rivers and streams (Fig. 2.2). Most important among them are the Chenab, the Ravi, and the Beas, located in Middle and Great Himalayan ranges. The Satluj is another important river that rises in Tibet.

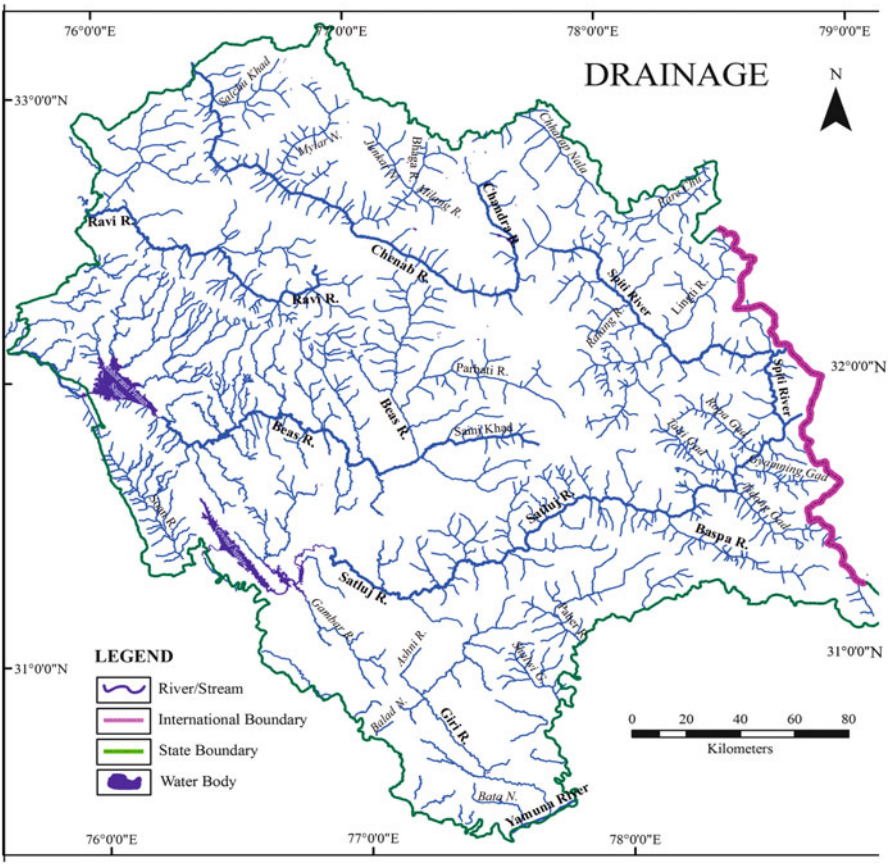

Fig. 2.2 Drainage of Himachal Pradesh

This Trans-Himalayan river is a typical example of antecedent drainage. All four rivers join the Indus river system. A small southeastern section east of the Satluj river is drained by the Giri, the Pabbar, and the Tons rivers, which drain into the Yamuna and ultimately into the Ganga river system. Most of the rivers in the state are perennial rivers, originating from glaciers and snow fields. Only the rivers originating in the Shiwalik and lower hills like the Ghaggar, Soan, and Ghambar are seasonal streams.

2.4 Soils

The soils of the state have not been classified properly so far because of lack of information and a great deal of heterogeneity (Singh and Bhandari 2000). According to Raychaudhary and Govinda Rajan (1971), these soils have been shown as brown hill soils in the old system of classification. These soils have been termed as Cambisols as a broad soil region in FAO-UNESCO soil map of the world (Anonymous 1977). However, based on their development and physico-chemical properties, the soils of the state can be broadly divided into 13 groups (Yadava and Thakur 1972; Verma 1979; Verma and Tripathi 1982; Verma et al. 1985; Singh et al. 1996). The 13 modified categories were derived out of 95 class soil map prepared by National Bureau of Soil Survey and Land Use Planning (ICAR), Nagpur (Fig. 2.3).

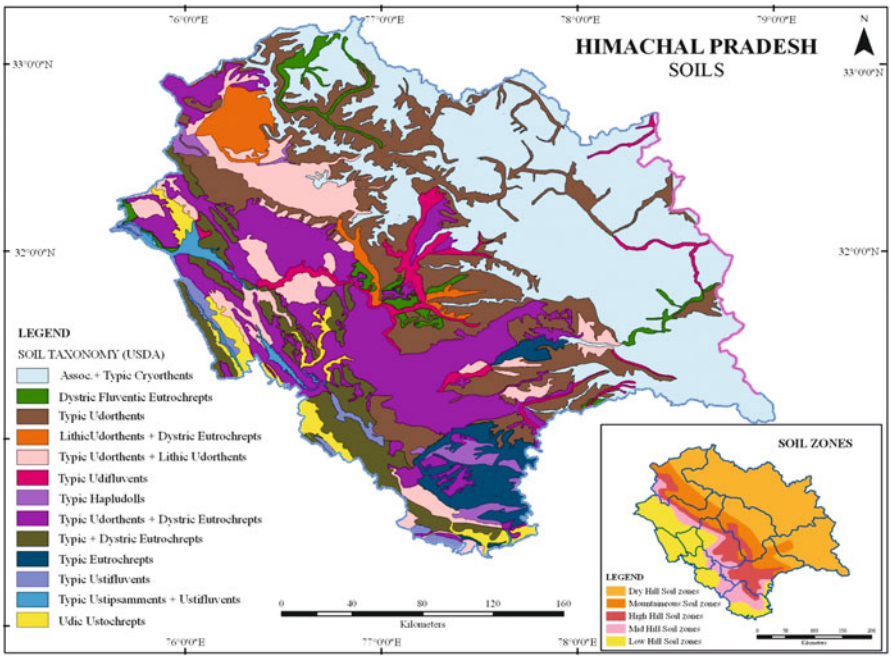

Fig. 2.3 Soils of Himachal Pradesh

2.5 Forest Cover

As we move from lower to higher altitude in the state, variation in vegetation pattern can be noticed easily (Table 2.1). Dry scrub vegetations are prominent at lower altitude, alpine meadows at higher altitude. Dry deciduous forest, moist deciduous forest, pine, oak, and deodar mixed coniferous and temperate broad-leaved forest zones are found in between these two extremes. Altogether, 20 different vegetation zones can be identified in the state. Generally, these vegetation zones are synchronous to altitudinal stratification. Micro-climatic changes, due to the effect of slope and aspect, break the continuity in vegetation zones in some part of the state.

2.5.1 Types of Forest

The forest of Himachal Pradesh are characterized by temperate conifer, mixed forest (moist and dry temperate forest), subalpine forest, tropical forest (moist deciduous, swamp, and subtropical pine forest) and broad-leaved forest (tropical dry deciduous and subtropical dry evergreen forest) (Table 2.2). The forests of Himachal can be classified into nine forest types.

Table 2.1 Altitudinal zone-wise forest cover of Himachal Pradesh

Altitudinal zones (m)	Very dense forest	Moderately dense forest	Open forest	Total area (km^2)
0–500	13	424	311	748
500–1,000	237	1,594	1,148	2,979
1,000–2,000	569	1,479	1,470	3,518
2,000–3,000	1,860	1,950	1,124	4,934
>3,000	545	936	1,008	2,489
Total	3,224	6,383	5,061	14,668

Source: India State of Forest Report (2009)

Table 2.2 Geographical distribution of forest of Himachal Pradesh

	Area (km^2)	Percentage of geographical area (%)	Percentage of forest area (%)
Geographical area	55,673	100	
Forest area	37,033	66.52	100
Area under tree cover	14,668	26.35	39.61
Very dense forest	3,224	5.79	8.71
Moderate dense forest	6,383	11.47	17.24
Open forest	5,061	9.09	13.66

Source: Forest Survey of India Report (2009)

Dry Alpine Forests: are found in the Lahaul, Spiti, Kinnaur, and Pangi region of Chamba district. Extensive alpine pastures are the characteristic feature of this forest type. These alpine pastures are generally devoid of trees. Some junipers and birches can be found along the river margins, or in watery patches of rocks, due to scarcity of precipitation. The pastures support large herds of sheep and goats during the summer months and remain snow-covered during winter. **Moist Alpine Scrub Forests**: are found above the tree line and consist of evergreen scrub growth forming a dense cover in patches, and broken by grasses in-between. The flora is fairly rich, and medicinal plants grow in a narrow zone at the margin of melting glaciers. **Subalpine Forests**: are found above the altitude of 3,500 m and below the alpine scrub forest. These types of forests are covered with rhododendrons and junipers. The lower linings are marked with blue pine forest and deciduous scrub. Parkland, which is characterized by grasslands scattered with misshapen, stunted trees of kharsu oaks, maples, etc., are used as grazing grounds by the migratory herds of sheep and goats. **Himalayan Temperate Forests**: occupy a large area of the state between 1,500 and 3,000 m. These forests are further sub-grouped into (a) Himalayan moist temperate forests, (b) dry temperate forests, (c) temperate coniferous forests, and (d) temperate deciduous forests. The moist temperate forests are the most valuable timber forests of the state. The area contains scattered trees and bushes such as chilgoza pine, willow, robinia, poplars and alpine pastures. Deodar is the dominant species of the temperate coniferous forest. **Wet Temperate Forests**: are confined to the wet slopes of the Dhauladhar ranges of the Kangra district. These include various temperate species and have some major pasture lands. The annual rainfall varies from 100 to 250 cm, with snowfall during the winters. The maximum temperature during summers ranges between 15 and 20 °C, and during winters temperature falls to minus 10 °C. **Subtropical Pine Forests**: occur in the lower Himalaya between 1,000 and 2,200 m. Chir pine is the most dominant species of this zone. **Subtropical Broad-leaved Hill Forests**: are found around Mandi town along the Beas river below the 1,200 m altitude. **Tropical Dry Deciduous Forests**: occurs up to 1,200 m in the lower hills, extending into the interior valleys along the rivers. Sal is the dominant species and is primarily found in the Nahan region of Sirmaur district. **Tropical Thorny Forests**: occur in small pockets, especially in Nalagarh region of Solan district, and in some parts of Sirmaur district. They are found in areas where the summer temperature goes up to 40 °C and rainfall varies between 50 and 75 cm. This zone is characterized with thorny forests mostly of xerophytic species.

2.6 Climate

The great diversity in relief, variation in elevation, and the geographical location of Himachal Pradesh has given the state diverse climatic conditions. In addition, local sight factors, such as aspect and proximity to forest and water bodies influence the climate. Geographically, the state is located roughly within the 30° north latitude,

which corresponds to the warm temperate zone of Mediterranean region, but the high Himalayan mountain ranges and the southwest monsoons play an important role in modifying the climate. The influence of altitude modifies the climate into a mountainous type, while southwest monsoon winds make it more humid than the Mediterranean type of climate.

2.6.1 Temperature

There are striking variations in the mean annual temperature in the state. Mean annual temperature is higher in western parts of the state and it decreases gradually towards north and eastern parts, as the altitude increases. The maximum mean annual temperature of above 25 °C is recorded in the southern and western part of Una district, the western parts of Bilaspur district, and the extreme southwestern part of Solan district. The average annual temperature lies between 20° and 25 °C in the remaining parts of Una and Bilaspur districts, the northwestern part of Solan district, parts of Hamirpur district, and the extreme western part of Mandi district. In the eastern parts of Mandi district, parts of Kullu district, Kangra valley area, and the northeastern part of Solan district, the variation in mean annual temperature is between 15 and 20 °C. In the remaining parts of the state, the mean annual temperature is less than 15 °C. Temperature in general decreases from south to north. The average monthly temperature of the summer months varies from 26 °C in the lower outer valleys to 14 °C in the inner valley zone, and that of winter months from 13 °C to −4 °C. Temperature also decreases with increasing altitude.

2.6.2 Rainfall

Most of the rainfall in Himachal Pradesh originates from the southwestern monsoon, starting in June and stretching up to September. Maximum rainfall occurs during the months of July and August. During winter months, a fairly good amount of rainfall and snowfall is also received from western disturbances throughout the state. Spatially, in general, rainfall follows altitudinal patterns and increases from plains to the hills.

Due to rain shadow effect of the Dhauladhar and Pir Panjal ranges, rainfall starts decreasing towards Lahaul-Spiti and Kinnaur. Spiti valley is closed from all sides by high mountains and therefore it is driest. Rainfall distribution varies from less than 50 mm in the drier part of Lahaul-Spiti and Kinnaur districts to over 3,000 mm in the area around Dharamsala. Dharamsala receives the highest rainfall in the state. The peripheral areas of Dharamsala region, the southwestern part of Chamba, and the southern part of Sirmaur receive annual rainfall above 2,000 mm. From these regions, the rainfall declines gradually towards the northern and eastern parts of the state. In the central, southwestern and southeastern parts of the state, rainfall ranges

between 1,000 and 2,000 mm. In the northwestern and eastern parts of Chamba, the south-western portion of Lahaul-Spiti, the southern and western parts of Kinnaur, and parts of eastern Kullu, the annual rainfall varies between 50 and 100 mm.

2.7 Demographic Profile

Himachal Pradesh, much like other states of India, is experiencing a demographic transition. Such transition (along with forces of migration) is affecting population size, growth rate, density, age structure, sex composition and distribution patterns that are important indicators of human resources in the state (Kant 1995). According to the 2011 census, the state accounted for a very meager share of total population of India (0.59 %), more or less the same as in 2001.

2.7.1 Population Growth, Population Density and Sex Ratio

The total population of the state is 6,856,509 as per the census record. Out of the total population, 3,473,892 are males and 3,382,617 are females. The total population in the state grew from 1.9 million in 1901 to 6.8 million by 2011, making a net addition of 4.9 million in the 110-year period. The average annual population growth rate crossed the two-percent mark and peaked at 2.37 % during 1971–1981. The last two decades recorded definite signs of deceleration in the momentum of population growth in Himachal Pradesh, with the mean annual growth rate (1.28 %) falling not only below the "standard" two-percent mark but also to pre-1951 level. Much of this population expansion in the state has been indigenous; the contribution of in-migration from other states in India and from countries outside India was insignificant. As far as district level analysis is involved, in the last decade, population growth has been greatest in Una district (+16.24) while Lahaul and Spiti district (−5.10) have shown negative growth rate. Decadal growth of population has increased substantially from 1901 to 2011 (Fig. 2.4).

Density of population is a better measure of understanding the variation in the distribution of population than the mere number of people. The density of population in the state was 123 persons/km^2 in the 2011 census against 109 persons/km^2 in 2001. Thus, there was a net addition of 14 persons/km^2 in the state during 2001–2011. This density of population is quite low when compared to India's average of 382 persons/km^2—and there are wide spatial variations in the density pattern even within the state. At the one end, Lahaul-Spiti district has population density of 2 persons/km^2, while at the other end in Hamirpur district it is 406 persons/km^2. The state's density pattern can be grouped into four categories. Very Low Density (less than 100 persons/km^2): Lahaul and Spiti, Kinnaur, Kullu, and Chamba districts. Low Density (100–200 persons/km^2): Shimla and Sirmaur districts. Moderate Density (200–300 persons/km^2): Kangra,

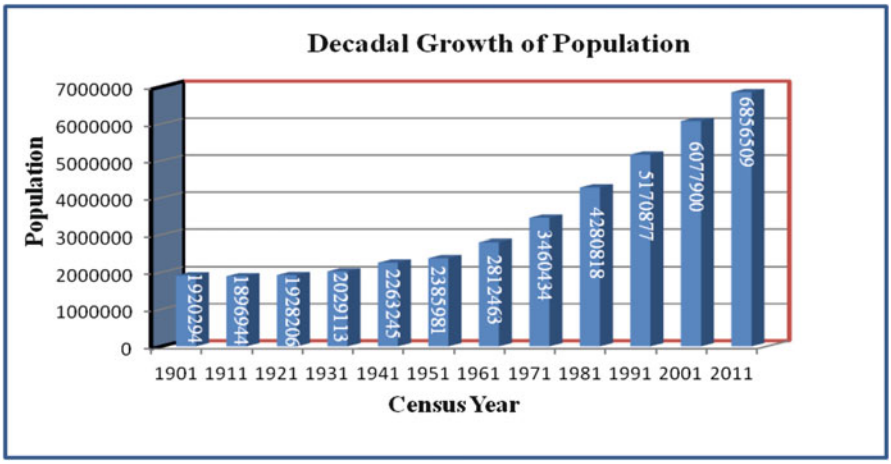

Fig. 2.4 Decadal growth of population

Solan, and Mandi districts. High Density (above 300 persons/km^2): Hamirpur, Bilaspur, and Una districts.

Sex ratio is helpful in determining the proportion of females in the total population. In the state, sex ratio is not in favour of females. In the year 2011, the proportion of females per 1,000 males in the state is 974. The numbers of males and females are 3,473,892 and 3,382,617 respectively. The sex ratio in the state has, however, been showing an increasing trend since 1951 census. It was 968 in the year 2001 and has increased to 974 in the census year 2011, which could be due to good health and hygiene conditions of female children. District-wise assessment of sex ratio shows that in some districts (Hamirpur, Mandi and Chamba) females do outnumber males (Table 2.3).

2.7.2 Literacy

Literacy is an index of human development and quality of life. Poor literacy hinders economic development, and, in case of females, even retards the progress of family planning programmes. As per the census of the year 2011, total percentage of literacy in the state is 83.78 %. Male and female literacy percentages are 90.83 % and 76.60 % respectively. Comparing to the national literacy rate, which is 74.04 %, the state has much higher literacy; it is also improving faster than the national figure. High literacy rates coincide with the districts of higher percentage of males, indicating a very strong correlation between literacy rate and sex ratio. Hamirpur district has the highest literacy rate of 89.01 %, followed by Una (87.23 %), Kangra (86.49 %), Bilaspur (85.67 %), and Solan (85.02 %). Chamba has the lowest literacy rate of 73.19 %, followed by Lahaul and Spiti, Kullu, Kinnaur, and Shimla.

Table 2.3 Distribution of population, decadal growth rate, sex-ratio, and population density of years 2001–2011

S/No.	Name	Population			Growth rate 2001–2011	Population density (persons/km^2)		Sex ratio (females per 1,000 males)	
		Persons	Males	Females		2001	2011	2001	2011
1	2	3	4	5	6	7	8	9	10
	Himachal Pradesh	6,856,509	3,473,892	3,382,617	+12.81	109	123	968	974
01	Chamba	518,844	260,848	257,996	+12.58	71	80	959	989
02	Kangra	1,507,223	748,559	758,664	+12.56	233	263	1,025	1,013
03	Lahaul and Spiti	31,528	16,455	15,073	−5.10	2	2	802	916
04	Kullu	437,474	224,320	213,154	+14.65	69	79	927	950
05	Mandi	999,518	496,787	502,731	+10.89	228	253	1,013	1,012
06	Hamirpur	454,293	216,742	237,551	+10.08	369	406	1,099	1,096
07	Una	521,057	263,541	257,516	+16.24	291	338	997	977
08	Bilaspur	382,056	192,827	189,229	+12.08	292	327	990	981
09	Solan	576,670	306,162	270,508	+15.21	259	298	852	884
10	Sirmaur	530,164	276,801	253,363	+15.61	162	188	901	915
11	Shimla	813,384	424,486	388,898	+12.58	141	159	896	916
12	Kinnaur	84,298	46,364	37,934	+07.61	12	13	857	818

Source: Series-3 Provisional Population Totals Paper-1 of Census 2011a

2.7.3 Occupational Structure

Agriculture is the main occupation of Himachal Pradesh. About 67 % of the population directly depends on agriculture for their livelihood. Due to hilly topographic condition, terraced cultivation is widely prevalent in the state. Small and marginal farmers comprise 80 % of the total holdings of the state. During the past three decades, due to ideal climatic condition, a well-diversified farm economy has developed in the state. As per census of year 2001, the share of main workers in the total population is 32.31 % and that of cultivators within main workers 55.45 %. Agricultural labourers comprise a 1.22 % share in total workers. During the decade 1991–2001, the work force has increased 35.18 %, while the population has increased 17.54 %. The decadal increase of the work force is, thus, 6.42 % (Census of India 2001).

2.8 Economic Characteristics

Over the years, the economy of the state has kept pace with the economic environment in the country as well as across the globe. Gross State Domestic Product (GSDP) registered a growth of 6 % per annum between 1994–1995 and 1999–2000. This growth rate was higher than the growth rate achieved at national level. The share of the primary sector has declined from 35.1 % in 1990–1991 to 27.4 % in 2000–2001.

2.8.1 Agriculture

Himachal Pradesh is situated in the north-western part of Himalaya. Most of the geographical area of the state comes under forest, pasture, and grazing land; agriculture is possible only on less than ten percent of the state's net area. The physiography and climatic condition in the state favours diversified potential for farming and allied activities. Due to the undulating terrain condition ranging from plains to high hills, mixed farming is predominant. Most of the farming activities are concentrated along the channels of major rivers and their tributaries.

The state has been divided into four agro-ecological zones based on precipitation, altitude, and irrigation (Table 2.4). Each agro-ecological zone has its distinct climatic and soil conditions. Different type of climatic conditions result into varied cropping patterns. Monsoon season in Himachal Pradesh receives more than 70 % of its total rainfall. Therefore, for the rest of the year, there is water shortage and agriculture requires irrigation. Zone II supports most of the agricultural activities, since rainfall and irrigation are highest in this zone while; they are lowest in Zone IV.

Table 2.4 Characteristics of agro-ecological zones

Character	Zone I	Zone II	Zone III	Zone IV
Ecology	Low-hill Subtropical	Mid-hill Subtropical Humid	High-hill Temperate Wet	High-hill Temperate Dry
Geographical area (%)	35	32	25	8
Cropped area (%)	33	53	11	3
Irrigated area (%)	17	18	8	5
Altitude (m asl)	Up to 914	915–1,523	1,524–2,472	2,476–70,000
Rainfall (cm)	100–150	150–300	100–200	20–50
Area (District)	Kangra, Hamirpur, Solan, Sirmaur	Kangra, Mandi, Solan, Shimla, Sirmaur	Kangra, Mandi, Sirmaur, Shimla, Kullu, Bilaspur, Chamba	Lahaul-Spiti, Kinnaur, Chamba

Source: Agricultural Statistics at a Glance, Himachal Pradesh (2001)

Different varieties of crops are being cultivated in the state. Among the cereals, wheat, rice, maize, and barley are important. The state also produces pulses and oilseeds. Cash crops are also becoming important, since fair amounts of potato, ginger, tea, and peas come from the state. Fruits, dry fruits, and a variety of vegetables are grown in the state. In addition, there is cultivation of medicinal plants and herbs, which is also being promoted by the government. Cropping intensity of the state is over 175 %.

2.8.2 Industry and Mineral Resources

Himachal Pradesh is primarily an agricultural state. Industrialization in the state is a comparatively recent development. Due to the globalization and liberalization policies in the last two or three decades, industrial development has started taking shape. The state, as well as central government, policies of providing monetary and fiscal benefits in the form of subsidies and incentives, further promoted private and public sector organizations to establish their industries in the state. In addition, better infrastructural facilities, in the form of ready-to-use plots, power, and better connectivity to big markets, have played a crucial role in the industrial development of the state.

The contribution of the secondary sector has grown significantly from INR 7,740 million in 1995–1996 to INR 19,200 million in 2001–2002. In terms of percentage, the share of the manufacturing sector in the Gross State Domestic Product (GSDP) has increased from 12.18 % in 1995–1996 to 14.38 % in 1999–2000. The industrial

activity is still dominated by small-scale industries which provide the bulk of employment to the working population. In August, 2007, there were about 33,888 small units employing 161,408 people,and 369 large units employing 44,665 people.

Spatially, industries are not evenly distributed in the state. The entire state is industrially fairly underdeveloped, except for the southern periphery of the state. The state can be classified into two categories. Firstly, there is the industrially developed area, which includes the developed blocks of Paonta Sahib and Nahan in Sirmaur, Nalagarh, Dharampur, and Solan districts. Secondly, there is the industrially backward area, which covers the rest of the state. Most industries are concentrated in a belt spanning Paonta Sahib, Kala Amb, Parwanoo, Baddi, and Nalagarh. This industrial belt has well-developed transport links and a prosperous agricultural region. Other areas of industrial concentration are found close to the towns of Solan, Mandi, Kullu, Shimla, and Kangra. At the district level, Solan district has the largest number of medium and large-scale industrial units (Economic Survey 2011). Himachal Pradesh is endowed with several minerals like limestone, high grade limestone, quartzite, gold, pyrites, copper, rock salt, natural oil and gas, mica, and iron ore. Himachal Pradesh is the only state in India where rock salt is mined.

2.8.3 Tourism

Pilgrimage as well as adventure tourism has good potential in the state, on account of the presence of many religious shrines and the large number of trekking routes. Domestic as well as international tourist inflow has been increasing in the last three decades because of various government initiatives to promote tourism in the state. According to State Tourism Policy 2005, the state aims "to make tourism the prime engine of economic growth by positioning the state as a leading global destination by the year 2020". To promote tourism in the state, the State Tourism department created a new slogan, *Himachal for all seasons and reasons*, to further attract tourists.

Tourist arrival statistics indicate that there has been a steady increase in tourist arrival to the state over the years. The total tourist traffic increased from only 1.94 million in 1990 to 13.26 million in 2010. Domestic tourists by far outnumbered foreign tourists in the state. Statistics reveal that foreign tourist arrival, which was only 0.019 million in 1990, gained slight momentum in year 2000 when it reached 0.11 million. Since year 2000, foreign tourist arrival has shown a steady increase and touched 0.45 million in 2010. In December, 2010, there are 2,169 hotels having bed capacity of 55,928 registered with the State Tourism department. The total tourist traffic concentrates markedly on a few selected districts. The most prominent tourist destinations are Shimla, Kullu, Manali, Dharamsala, Dalhousie, and Kasauli.

2.9 Conclusion

The lush green valleys of Himachal Pradesh and snow clad mountain peaks attract tourists throughout the year. In northern mountains, surplus snowfall results into the permafrost condition, and geologically unstable nature frequently poses threats to the inhabitants of the region. Changes in temperature and rainfall in this area result in multi-faceted, both negative and positive impacts on living organisms. The natural endogenetic and exogenetic forces coupled with human-induced climate change result in increased frequency, and magnitude of, multiple hazards like GLOFs, avalanches, landslides, earthquakes, flash floods, etc. Therefore, for sustainable development of this mountainous terrain, it is essential to study its various characteristics in detail and formulate any plans according to demand.

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