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# **Demographic Features in Indian Hill States (2011)**

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#### Abstract

Demography refers to structure, composition, size and distribution of population over space. It was useful for government to understand social, culture and economic trends of population and for formation of policies and programmes. Hill States as a Region recorded substantially lower population density than national average in 2011. It recorded marginally higher population growth during 2001-2011 than national average. The Region, Non-Hill States as a Region, and India recorded similar sex ratio. The Region recorded higher literacy in 2011 than Non-Hill States as a Region and India. The region recorded lower urbanisation than Non-Hill States as a Region and India in 2011. Hill States as a Region recorded substantially lower proportion of non-scheduled population in 2011 than Non-Hill States as a Region and India. Non-scheduled population were concentrated in western hill states whereas north-east hill states were dominated by scheduled population.

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#### I. Introduction

Indian hill States have been facing various problems on account of severe weather conditions, difficult terrain, extensive forest cover & rugged rocky areas, low suitable cultivable land, scattered population, small and under-developed urban centres, long and disturbed international borders etc. Furthermore, these states suffer from one directional poor connectivity with the rest of India due to long disturbed international border. The cost of delivery of public services in these states is much higher than other states due to hilly terrain, snow bound areas, inaccessibility and remoteness. Consequently, it is often reflected in many sectors of development in hill states.

Demography plays a vital role to understand the society. The structure, composition, size and distribution of population over space vary time to time. Population density, growth, literacy, sex ratio, work force etc. are important features of society. The states coterminous with hill terrain were given a status of 'special category states'. There were eleven special category states. These were Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Meghalaya, Tripura, and Assam. Except Assam, all special category states were hill states. After 14th Finance Commission recommendations, the status of special category states ceased to exist.

Demography is useful for governments to understand social, culture and economic trends of population and for formation of policies and programmes.

#### **Objectives**

The major objective of the study is to:

• Understand spatial patterns of demographic feature among and within hill states.

#### **Research Question**

The following major research question is forwarded for investigation:

• What are the patterns of demographic features among and within hill states?

#### The Study Area

The present study was focused on the Indian hill states. They were Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, and Meghalaya. They have geographical contiguity. This region is known as Hill States as a Region. And the rest part of India is known as Non-hill States as a Region in this study. It is spread between 21°57′N to 37°5′N latitudes and 72°40′E to 97°25′E longitudes covering an area of 515 thousand Km². Administratively, there are 106 districts in 2011 that share one-seventh (15.67 per cent) of total geographical area of India and contains 3.64 per cent of total population of the country. The Jammu and Kashmir Reorganized Act 2019 passed on 5<sup>th</sup> August, 2019

bifurcated the Jammu & Kashmir into two union territories i.e. Jammu and Kashmir and Ladakh. However, the present study is based on erstwhile Jammu & Kashmir state.

#### II. Data and Methodology

Methodology is an important tool to achieve the objective formulated for the study. The research was based on secondary data. The secondary data was collected from Census of India, Central Statistical Organization.

#### **Demographic Features in Indian Hill States (2011)**

The demographic components of population are both determinants and consequences of the development of any region. Some of the demographic features of hill states were discussed as under;

### (i) Population Distribution

The total population of Hill States as a Region recorded 44.06 millions in 2011. It accounts for 3.64 per cent to the total population of India. On the other hand, Non-Hill States as a Region recorded 1166.80 millions. It constitutes 96.36 per cent of total population of India The average population size of Indian hill states was 4.41 millions in 2011. Among hill states, Jammu & Kashmir recorded the largest population (12.54 millions) and the least in Sikkim (0.61 million). Jammu & Kashmir was larger by more than 20 times than Sikkim. All western hill states (Jammu & Kashmir, Himachal Pradesh, and Uttarakhand) recorded large population size than average population size of Indian hill states. Contrary to it, all north-east hill states had small population size. Comparing with the average population size of Indian States/ Union Territories (34.60 millions), all the hill states had small population size (Table 1).

Hardwar (1.89 million) from Uttarakhand recorded the largest population and the smallest in Dibang Valley (0.008 million) from Arunachal Pradesh not only across districts of hill states but also in India in 2011. Across districts of hill states, the five districts of the largest population were Hardwar, Dehradun, Udham Singh Nagar from Uttarakhand; West Tripura from Tripura; and Jammu from Jammu & Kashmir. Contrary to it, the least five districts were Dibang Valley, Anjaw, Upper Siang from Arunachal Pradesh; Lahul & Spiti from Himachal Pradesh; and North District from Sikkim. The average population size of districts of hill states was 0.42 million in 2011. About 64 per cent districts of hill states recorded lower population size than average of districts of hill states. It reflects that majority of districts in hill states recorded lower population size than average of districts of hill states. Comparing with the national average population size (1.89 million) of districts of India, all the districts in hill states had small population size.

#### (ii) Population Growth

Hill States as a Region (19.36 per cent) recorded higher population growth than Non- Hill States as a Region (17.65 per cent) and India (17.71 per cent) during 2001-2011 (Table1). Across hill states, Meghalaya (27.95 per cent) recorded the highest population growth during 2001-2011 and the lowest in Nagaland (-0.58 per cent). Five out of ten hill states recorded higher population growth than India. These were Uttarakhand, Mizoram, Jammu &Kashmir, Arunachal Pradesh, and Meghalaya while Tripura, Himachal Pradesh, Sikkim, Manipur, and Nagaland recorded lower population growth. Nagaland recorded the negative growth (-0.58 per cent) not only across hill states but also in India (Table 1). It is worth mentioning that Nagaland (64.41 per cent) recorded the highest population growth during last decade (1991-2001) of previous century. This unprecedented growth (positive and negative) over last two decades was a cause of serious concern to the policy makers, planners, and demographers. This pendulum type growth needs deep research to analyze the exact cause of population growth.

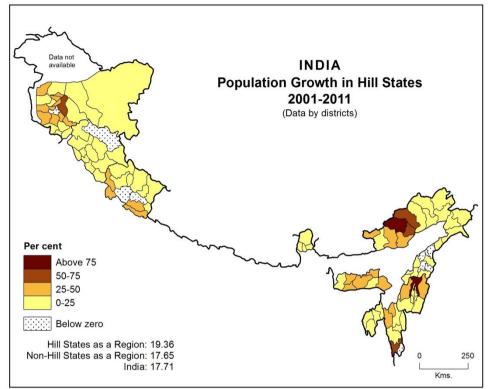
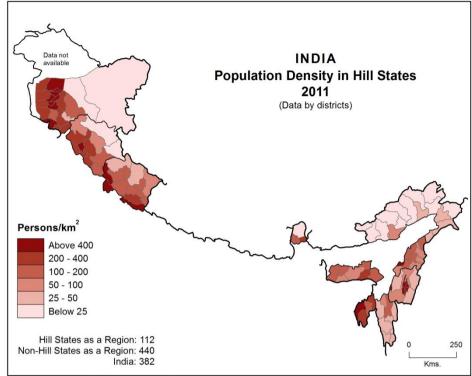


Fig. 1

Across districts of hill states, the five districts of the highest population growth were Senapati (206.14 per cent) from Manipur, Kurung Kumey (113.83 per cent), Upper Subansiri (50.78 per cent) from Arunachal Pradesh, Lawngtlai (60.14 per cent) from Mizoram, and Anantnag (54.41 per cent) from Jammu & Kashmir during 2001-2011. About 43 per cent districts of hill states recorded higher population growth than India. It reflects that majority of districts in hill states recorded lower population growth than national average. It was worth mentioning that ten districts recorded the negative growth during the first decade of the 21<sup>st</sup> century. These were Longleng, Kiphire, Mokokchung, Zunheboto, Mon from Nagaland; Kulgam from Jammu & Kashmir; Saiha from Mizoram; Lahul & Spiti from Himachal Pradesh; and Garhwal, Almora from Uttarakhand.

#### (iii) Population Density

The population density of Hill Sates as a Region (112 persons /km²) was substantially lower than Non-Hill States as a Region (440 persons /km²) and India (382 persons / km²) in 2011 (Table 1). The hilly and mountainous terrain, unfavourable climatic conditions, and inaccessibility are major factors for contributing lower density in Hill States as a Region.



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It was found that all the hill states recorded lower population density than India in 2011. It varies from 17 persons/ km² in Arunachal Pradesh to 350 persons /km² in Tripura. It reflects that Tripura recorded the highest population density and the lowest in Arunachal Pradesh across hill states. Seven out of 10 hill states recorded higher population density than Hill States as a Region. These were Manipur, Nagaland, Himachal Pradesh, Jammu & Kashmir, Meghalaya, Uttarakhand, and Tripura in 2011. Contrary to it, three hill states recorded lower population density than Hill States as a Region. These were Sikkim, Mizoram, and Arunachal Pradesh (Table1).

Across districts of hill states, the most five densely populated districts were Ganderbal, Bandipore, Kulgam, Shupiyan from Jammu & Kashmir; and Imphal West from Manipur in 2011. Seventeen per cent districts of hill states recorded higher population density than India. It reflects that most of the districts had sparse population in hill states. The least five densely populated districts in hill states were Dibang Valley, Anjaw, Upper Siang from Arunachal Pradesh; Lahul& Spiti from Himachal Pradesh; and Leh from Jammu & Kashmir in the corresponding period of time.

### **Sex Ratio**

The composition of population by gender is one of the principal demographic characteristics of human population around which meaningful analysis is woven. The sex ratio is the result of the interplay of sex differentials in natality, mortality, and migration. The sex composition of population reflects socio-economic and cultural pattern of a society in many ways. Hill States as a Region, Non-Hill States as a Region, and India recorded similar sex ratio in 2011. It was 943.

Among hill states, Meghalaya (989) recorded the highest sex ratio in 2011 and the lowest in Jammu & Kashmir (889). Six out of 10 hill states recorded higher sex ratio than India and Hill States as a Region. These were Tripura, Uttarakhand, Himachal Pradesh, Mizoram, Manipur, and Meghalaya. Contrary to it, four hill states recorded lower sex ratio than India and Hill States as a Region. These were Arunachal Pradesh, Nagaland, Sikkim, and Jammu & Kashmir (Table 1).

Almora (1139) from Uttarakhand recorded the highest sex ratio and the lowest in Leh (690) from Jammu & Kashmir. It was the lowest not only across districts of hill states but 2<sup>nd</sup> position in India after Daman (534) from Daman and Diu in 2011. It was worth mentioning that Tawang (714) from Arunachal Pradesh; and North District (767) from Sikkim, both districts of hill states had third and fourth position respectively from the bottom across districts of India. Among districts of hill states,

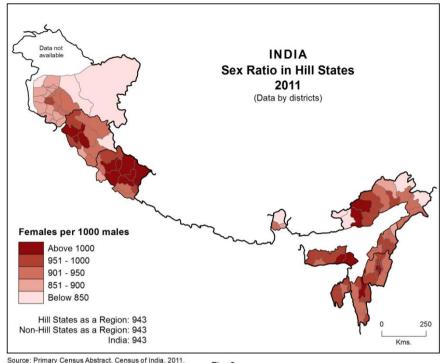


Fig. 3

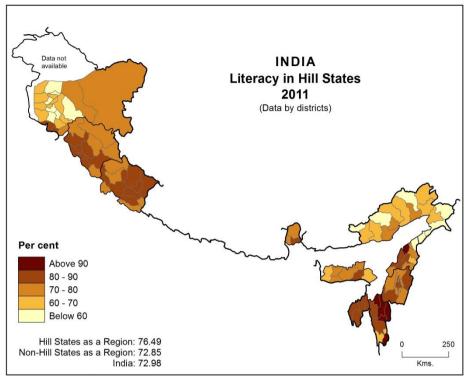
about one-fourth districts recorded sex ratio below 900 in 2011 census. It is an alarming picture. This issue needs serious consideration by policy makers. Contrary to it, 17 per cent districts recorded sex ratio above 1000. Almora (1139) and Rudraprayag (1114) had 1<sup>st</sup> and 2<sup>nd</sup> ranks across districts of hill states and 2<sup>nd</sup> and 6<sup>th</sup> positions among districts of India respectively in 2011.

#### (iv) Literacy

The literacy rate of Hill States as a Region (76.49 per cent) was marginally higher than Non-Hill States as a Region (72.85 per cent) and India (72.98 per cent) in 2011. It reflects that Hill States as a Region performed better than other regions (Table 1).

Across hill states, Mizoram (91.33 per cent) recorded the highest literacy in 2011 and the lowest in Arunachal Pradesh (65.38 per cent). Both hill states belong to the north-east hill states. It reflects that the glaring disparity in literacy among the north-east hill states. Eight out of 10 hill states recorded higher literacy than India. These were Meghalaya, Manipur, Uttarakhand, Nagaland, Sikkim, Himachal Pradesh, Tripura, and Mizoram. Contrary to it, Jammu & Kashmir and Arunachal Pradesh recorded lower literacy than India (Table 1).

Across districts of hill states, Serchhip (97.91 per cent) from Mizoram recorded the highest literacy in 2011 and the lowest in Kurung Kumey (48.75 per cent) from Arunachal Pradesh. Among the highest five districts in literacy rate, four districts were from Mizoram and one from Nagaland. These were Serchhip, Aizawl, Champhai, Kolasib from Mizoram; and Mokokchung from Nagaland. On the other hand, the least five districts were Kurung Kumey, Tirap from Arunachal Pradesh; and Ramban, Badgam, Kishtwar from Jammu & Kashmir. About sixty per cent districts of hill states recorded higher literacy than national average. It was found that majority of districts in Arunachal Pradesh recorded lower literacy than national average. Most of languages in Arunachal Pradesh do not have script of their own. It was not surprising that the literacy levels in the state were extremely low across hill states. But the progress in literacy during last two decades had been remarkable. However, it was still laggard.



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# (v) Urban Population

Urbanisation and economic growth are generally accepted as having positive correlation. Hill States as a Region (25.37 per cent) recorded substantially lower urbanisation in 2011 than Non-Hill States as a Region (31.36 percent) and India (31.14 per cent). One of every four inhabitants of hill states lives in urban settlements. It reflects that Hill States as a Region was mainly inhabited by rural population (Table 1).

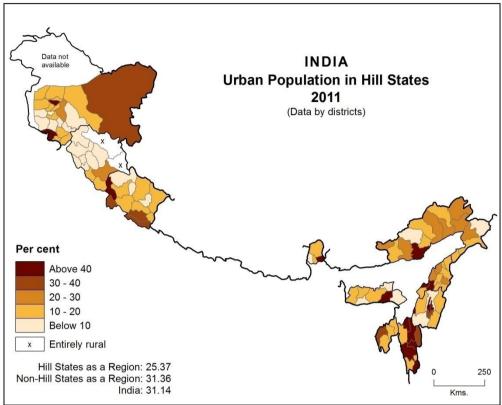
Table 1
India: Demographic Features in Hill States, 2011

Sr.	Hill State	Total Population	Population Growth During 2001-2011 (per cent)	Population Density (persons/ km²)	Sex Ratio (females per thousand males)	Literacy (per cent)	Urban Population (per cent)	Workforce (per cent)	Non- Scheduled Population (per cent)	SC Population (per cent)	ST Population (per cent)	Population Share to the Total Population of Hill States as a Region (per cent)	Population Share to the Total Population of India (per cent)
		1	2	3	4	5	6	7		8	9	10	11
1	Jammu & Kashmir	12541302	23.64	124	889	67.16	27.38	34.47	80.71	7.38	11.91	28.65	1.04
2	Himachal Pradesh	6864602	12.94	123	972	82.8	10.03	51.85	69.1	25.19	5.71	15.68	0.57
3	Uttarakhand	10086292	18.81	189	963	78.82	30.23	38.39	78.35	18.76	2.89	23.04	0.83
4	Sikkim	610577	12.89	86	890	81.42	25.15	50.47	61.57	4.63	33.8	1.39	0.05
5	Arunachal Pradesh	1383727	26.03	17	938	65.38	22.94	42.47	31.21	0	68.79	3.16	0.11
6	Nagaland	1978502	-0.58	119	931	79.55	28.86	49.24	13.52	0	86.48	4.52	0.16
7	Manipur	2855794	12.05	128	985	76.94	29.21	45.68	55.71	3.41	40.88	5.87	0.21
8	Mizoram	1097206	23.48	52	976	91.33	52.11	44.36	5.46	0.11	94.43	2.51	0.09
9	Tripura	3673917	14.84	350	960	87.82	26.17	40.00	50.41	17.83	31.76	8.39	0.30
10	Meghalaya	2966889	27.95	132	989	74.43	20.07	39.96	13.27	0.58	86.15	6.78	0.25
Hill States as a Region		44058808	19.36	112	943	76.49	25.37	41.02	62.97	12.13	24.9	100	3.64
Non-Hill States as a Region		1166796169	17.65	440	943	72.85	31.36	39.75	75.18	16.8	8.02	N/A	96.36
India		1210854977	17.71	382	943	72.98	31.14	39.80	74.74	16.63	8.63	N/A	100.00

Source: Primary Census Abstract, Census of India, 2011.

Note: Pakistan and China together occupied 120849 km² area in erstwhile Jammu & Kashmir. This area has been excluded while calculating the density of Jammu & Kashmir, Hill States as a Region, and India.

Across hill states, Mizoram (52.11 per cent) was the most urbanised state in 2011 and second in India after Goa (62.17 per cent). Against it, Himachal Pradesh (10.03 per cent) recorded as least urbanised state not only across hill states but in India also. It reflects higher disparity in urbanisation across hill states. Except Mizoram, all the hill states recorded lower urbanisation than India. However, Mizoram recorded substantially higher urbanisation (Table 1).



Source: Primary Census Abstract, Census of India, 2011.

Fig. 5

At district level, the striking disparities existed in urbanisation in hill states in 2011. Srinagar from Jammu & Kashmir recorded the highest urbanisation (98.60 per cent) while Kinnaur and Lahul & Spiti from Himachal Pradesh had no urban population. Srinagar from Jammu & Kashmir; Aizawl, Kolasib from Mizoram; Imphal West, Thoubal from Manipur; Dehradun from Uttarakhand; Papum Pare from Arunachal Pradesh; and Dimapur from Nagaland recorded majority urban population. Nearly one-fifth districts across hill states recorded higher urbanisation than India.

#### (vi) Workforce

Hill States as a Region (41.02 per cent) recorded higher workforce than Non-Hill States as a Region (39.75 per cent) and India (39.80 per cent) in 2011. It reflects that the region performed better in transformation of economy than Non-Hill States as a Region and India (Table 1). There was a wide variation of workforce across hill states in 2011. It was ranging from nearly half of the total population in Himachal Pradesh to one-third in Jammu & Kashmir. It was interesting to note that the highest three states of India in workforce belong to hill states. These were Himachal Pradesh (51.85 per cent), Sikkim (50.47 per cent), and Nagaland (49.24 per cent). Contrary to it, Jammu & Kashmir (34.47 per cent) was the lowest across hill states and at fifth rank from the bottom in India. All north-east hill states recorded higher workforce than India. It reflected that North-East hill states recorded lower dependency ratio, which is the healthy sign of proper utilization of human resources. In contrast, Jammu & Kashmir (34.47 per cent) and Uttarakhand (38.39 per cent) were at the bottom in terms of workforce across hill states resulting a significant dependency ratio (Table 1)

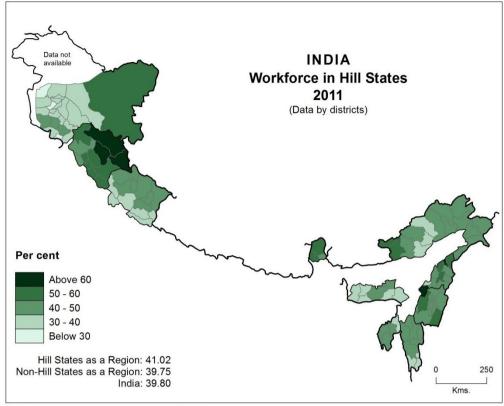


Fig. 6

Across districts of hill states, Kinnaur (66.90 per cent) from Himachal Pradesh recorded the highest workforce in 2011 and the least in Kupwara (26.32 per cent) from Jammu & Kashmir. The highest five districts were Kinnaur, Kullu, Lahul & Spiti from Himachal Pradesh; and Peren, Longleng from Nagaland. Across hill states, majority of districts recorded higher workforce than India. At the same time, the situation in other districts of hill states has been disconcerting. Among least ten districts, nine belong to Jammu & Kashmir and one from Uttarakhand. These were Kupwara, Badgam, Samba, Baramula, Ramban, Kathua, Srinagar, Shupiyan, Jammu from Jammu & Kashmir; and Hardwar from Uttarakhand. Consequently, low workforce is a matter of concern for the policy makers and planners at state and national level.

# (vii) Non-Scheduled Population

Non-scheduled population of Hill Sates as a Region was 27.74 millions in 2011. It accounts for 62.97 per cent of the region while India recorded 74.74 per cent. The region recorded substantially lower non-scheduled population than India (Table 1).

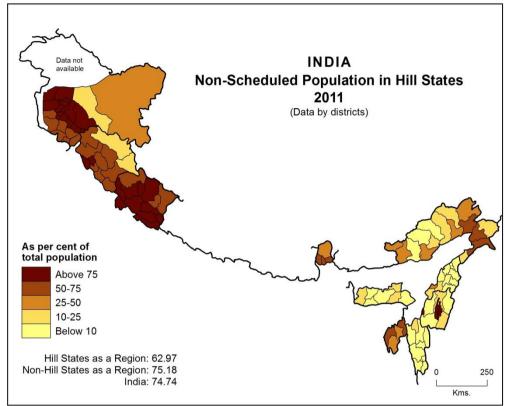


Fig. 7

There was unequal spatial distribution of non-scheduled population among and within hill states of India in 2011. The western hill states had 82.09 per cent of the total non-scheduled population of the region (Jammu & Kashmir 36.50 per cent, Uttarakhand 28.49 per cent, and Himachal Pradesh 17.10 per cent). On the other hand, all north-east hill states contribute 17.91 per cent non- scheduled population of the region. All northeast hill states (Tripura 6.68 per cent, Manipur 5.66 per cent, Arunachal Pradesh 1.56 per cent, Meghalaya 1.48 per cent, Sikkim 1.36 per cent, Nagaland 0.96 per cent, and Mizoram 0.21 per cent) recorded lower proportion of non-scheduled population than average of the region.

At the state level, except Jammu & Kashmir (80.71 per cent) and Uttarakhand (78.35 per cent), all the hill states recorded lower percentage of non-scheduled population than India in 2011. It was worth mentioning that all western hill states (Jammu & Kashmir, Uttarakhand, and Himachal Pradesh) recorded higher percentage of non-scheduled population than Hill States as a Region (63.37 per cent). Six out of 10 hill states had more than fifty per cent non-scheduled populations. These were Jammu & Kashmir, Uttarakhand, Himachal Pradesh, Sikkim, Manipur, and Tripura (Table 1).

Across districts of hill states, Srinagar (99.19 per cent) from Jammu & Kashmir recorded the highest non-scheduled population in 2011 and the lowest in Kurung Kumey (1.42 per cent) from Arunachal Pradesh. The highest five districts in non-scheduled population were from Jammu & Kashmir. These were Srinagar, Badgam, Baramula, Pulwama, and Kulgam. Contrary to it, the least five districts were Kurung Kumey from Arunachal Pradesh; Champhai from Mizoram; West Khasi Hills from Meghalaya; and Tuensang, Zunheboto from Nagaland. Twenty nine out of 106 districts of hill states recorded higher non-scheduled population than India. It was found that majority of districts had lower non-scheduled population than national average.

#### (viii) Scheduled Castes Population

Hill States as a Region recorded lower scheduled castes (SC) population (12.13 per cent) in 2011 than Non-Hill States as a Region (16.80 per cent) and India (16.63 per cent). India recorded one-sixth SC population to the total population (Table 1).

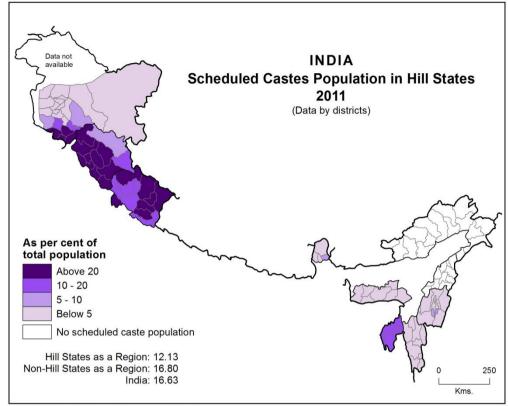


Fig. 8

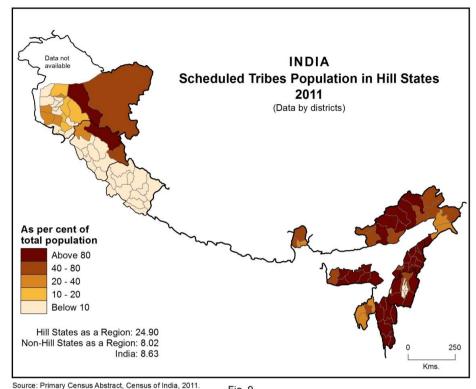
Among hill states, Himachal Pradesh (25.19 per cent) recorded the highest proportion of SC population in 2011 and second after Punjab (31.90 per cent) in India. Contrary to it, two north-east hill states had no SC population. These were Arunachal Pradesh and Nagaland. Five out of 10 hill states recorded the lower SC population than India. These were Jammu & Kashmir, Sikkim, Manipur, Meghalaya, and Mizoram. Except Tripura, all north-east hill states recorded lower SC population than Hill States as a Region (12.13 per cent) and India (16.63 per cent). On the other hand, among western hill states, Himachal Pradesh and Uttarakhand recorded the higher SC population than Hill States as a Region and India while Jammu & Kashmir recorded lower (Table 1).

Twenty seven out of 106 districts had no SC population in 2011. It accounts 25.47 per cent districts of hill states. They belong to north-east districts of hill states. The districts with above 20 per cent SC population were concentrated in Himachal Pradesh, Uttarakhand and Jammu & Kashmir. It reflects that SC population are mainly concentrated in the western hill states. Among the highest five districts in SC population, four districts from Himachal Pradesh and one from Jammu & Kashmir. These were Sirmaur, Mandi, Solan, and Kullu from Himachal Pradesh; and Samba from Jammu & Kashmir.

# (ix) Scheduled Tribes Population

Hill States as a Region had 24.90 per cent Scheduled Tribes (ST) population to the total population in 2011. It was nearly three times higher than Non-Hill States as a Region (8.02 per cent) and India (8.63 per cent).

As far as the ST population was concerned, the highest four states of India belong to north-east hill states in 2011. These were Mizoram, Nagaland, Meghalaya and Arunachal Pradesh. Contrary to it, Uttarakhand was the lowest among hill states and fifth position in India from the bottom. All North-East hill states recorded higher ST population than the region (24.90 per cent) and India (8.63 per cent). On the other hand, Himachal Pradesh and Uttarakhand among western hill states recorded lower ST population than the region and India. However, Jammu & Kashmir recorded lower ST population than the region and higher than India.



It was worth mentioning that ST population showed its presence in each district of hill states in 2011. However, 27 districts of hill states recorded less than five per cent ST population. On the other hand, 38 districts of hill states recorded more than 80 per cent ST population. Except Lahul & Spiti from Himachal Pradesh, the highest 37 districts belong to north-east hill states. The least five ST population districts of hill states belong to Uttarakhand. These were Tehri Garhwal, Rudraprayag, Almora, Garhwal, and Hardwar.

#### III. **Conclusions**

Hill States as a Region recorded substantially lower population density than national average in 2011. Region recorded marginally higher population growth during 2001-2011 than national average. The region, Non-Hill States as a Region, and India recorded similar sex ratio. Among districts of hill states, Almora from Uttarakhand recorded the highest sex ratio in 2011 and the lowest in Leh from Jammu & Kashmir. It was the lowest not only among the districts of hill states but 2nd position in India after Daman from Daman and Diu. The region recorded higher literacy in 2011 than Non-Hill States as a Region and India. The region recorded lower urbanisation than Non-Hill States as a Region and India in 2011.

Hill States as a Region recorded substantially lower proportion of non-scheduled population in 2011 than Non-Hill States as a Region and India. The western hill states recorded 82.09 per cent of total nonscheduled population of the region and north-east hill states contributed 17.91 per cent. It reflects that 30 per cent hill states contributed more than 80 per cent non-scheduled population and 20 per cent non-scheduled population live in 70 per cent hill states.

### **BIBLIOGRAPHY**

- Census of India (1991): 'Primary Census Abstract', Office of the Registrar General & Census Commissioner, India. Census of India (2001): 'Primary Census Abstract', Office of the Registrar General & Census Commissioner, India. [1].
- [2].
- [3]. Census of India (2011): 'Administrative Atlas of India', Office of the Registrar General & Census Commissioner, India.
- [4]. Census of India (2011): 'Primary Census Abstract', Office of the Registrar General & Census Commissioner, India.
- [5]. Human Development Report (2004):State Planning and Coordination Department, Government of Nagaland.
- [6]. Human Development Report (2005): Department of Economics, Rajiv Gandhi University Department of Planning, Government of Arunachal Pradesh, Itanagar.
- [7]. Human Development Report (2013): 'The Rise of the South: Human Progress in a Diverse World', United Nations Development Programme, New York.
- Mohan, K. (2005): 'Addressing Regional Backwardness: An Analysis of Area Development Programmes in India', Manak [8]. Publication, New Delhi.