



DEMOGRAPHIC CHARACTERISTICS OF HIMACHAL PRADESH: A DISTRICT LEVEL GIS BASED ANALYSIS

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Cite This Article: Rajiv Sindhu, "Demographic Characteristics of Himachal Pradesh: A District Level GIS Based Analysis", International Journal of Interdisciplinary Research in Arts and Humanities, Volume 3, Issue 1, Page Number 397-404, 2018.

Abstract:

Demographic attributes of population are providing important data and guidelines to the administrators or those responsible for implementing the family planning program. Consequently, it is important to know more about the factors which affect the all aspects of a population. In recent the geospatial technology is very well useful in exploring demographic study. The GIS is not only a display tool; it can also be used to attach spatial information such as geographic co-ordinates and attribute data describes the non-spatial information also. In the present paper an attempt has been made to assess the various demographic aspects in the state of Himachal Pradesh by using GIS base application with open source software. The district wise secondary data of population have been collected from Census of India, 2011. District wise density of population, male and female literacy rate have been calculated by Query Analysis using QGIS and presented in tabular form and choropleth maps. The study reveals that in 2011 the population density of the state is 123 persons per square kilometer being highest in Hamirpur district and lowest in Lahaul-Spiti district. There is a considerable regional variation in level of literacy also. 89.53 percent males are literate while this figure is 75.93 for females.

Key Words: Demographic Attributes, Geospatial Technology, GIS, Himachal Pradesh, Secondary Data, Density of Population, Literacy Rate, Regional Variation

Introduction:

Demographic attributes of population are providing important data and guidelines to the administrators or those responsible for implementing the family planning program. Analysis of growth of population reveals that the age composition of any given population results from the history of these components. Demographers have included all the aspect like growth, density, literacy and so on, which has the greatest effect on the age composition of a population. Consequently, it is important to know more about the factors which affect the all aspects of a population. The choice of the government, the society, and the people at large is whether to allow the positive checks to play their part or make the effort to convince people to accept the preventive checks.

In recent, the geospatial technology is very well useful in displaying in demographic study that why the selection of open source software is well suitable. Quantum GIS is a free and open source GIS utility, in the query analysis, one can learn about spatial querying. Spatial query selects geographical features based on location and spatial relationships. It uses spatial logic or spatial relationships among the data-sets such as adjacency, intersect and containment within etc. Scholars can focus on building spatial queries to retrieve the information in a useful form and export the results as new shape files. The GIS is not only a display tool; it can also be used to attach spatial information such as geographic co-ordinates and attribute data describes the non-spatial information also. Query in GIS is a logical expression that selects and displays only the features or the attributes satisfying the criteria defined by the user.

The Study Area:

Extending from 30⁰22'40"N to 33⁰12'40"N latitudes and 75⁰45'55"E to 79⁰04'20"E longitudes, the study area is the state of Himachal Pradesh (Fig1). The altitudes in the Pradesh, a wholly mountainous region in the lap of Himalayas range from 350 meters to 6975 meters above mean sea level. It is bordered by Jammu & Kashmir to the north, Punjab to the west, Haryana to the south, and Uttarakhand to the southwest.

According to Surveyor General of India, the total area of Himachal Pradesh is 55673 square Kilometer which is divided into twelve administrative districts. Out of this total area, 32,271 square Kilometer is measured area according to revenue records of the Pradesh. Area-wise, Hamirpur is the smallest district of the Himachal Pradesh which covers an area of 1,118 square Kilometer (2.01%) and Lahaul-Spiti has the largest area of 13,835 square Kilometer (24.85%).

The Kinnaur and Lahaul-Spiti district has on the Eastern boundary whereas Tibet is on western part, now it is a part of China. Although a relatively small state within the Indian Union, it manifests with ranges in altitudes, climate and geology. Whilst significant areas of the state are mountainous and above the tree line, including the "cold desert" areas, it also includes temperate and sub – tropical zones. Lahul and Spiti is a big district having international boundary with Tibet. In present times Himachal Pradesh has emerged as the socially and economically most developed state of the Indian union.

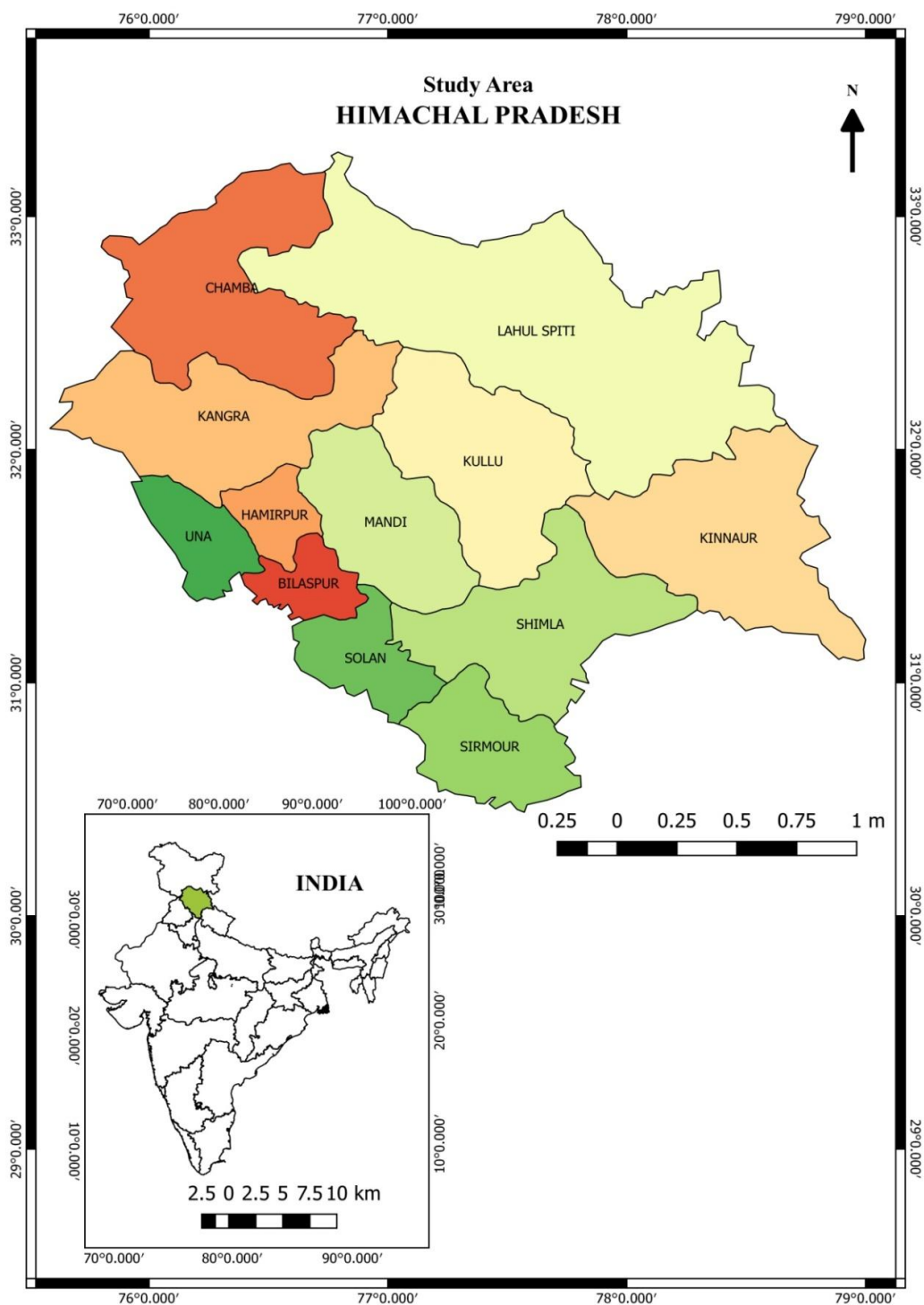


Figure 1

Objectives of the Study:

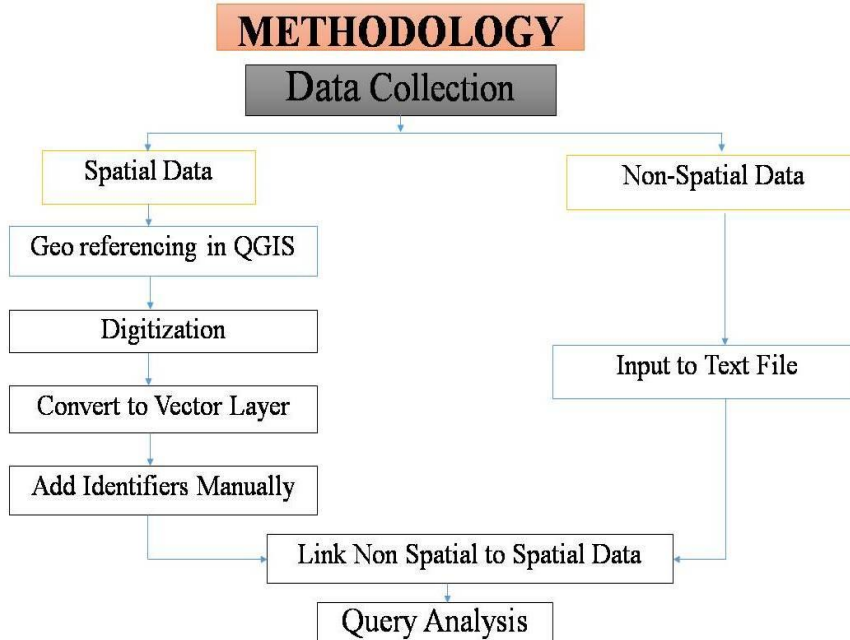
In the present paper an attempt has been made to assess the various demographic aspects of the state of Himachal Pradesh by using GIS based application with open source software.

Method and Material:

The present study is based on secondary data. The data pertaining to district level population, area, sex ratio and literacy has been collected from Census of India, 2011. Population density is calculated as ratio between total population and total area and the literacy rates have been computed by dividing the number of literates by respective population minus 0-6 age group population by field calculator using QGIS and presented in tabular form and choropleth maps.

The methodology adopted in the paper is as under:

- Secondary Data of population from census of India for the year 2011
- Scanning of secondary data.
- Shorting and Manipulating data from row data to metadata.
- Digitization of map to creation of shape files.
- Exporting the data on map using QGIS.
- Analysis of data by Using Query analysis with QGIS.



Results and Discussion:

Population composition is a vast field which refers to the physical, socio-cultural and economic attribute of population, such as literacy, density, growth and categorized distribution of population.

Density of population is a better measure of understanding the variation in the distribution of population. It is expressed as number of persons per unit area. In other words, it is the ratio of total population to the total area of the part thereof. Population density means ratio between total population of the region and total area of the region. The density of population shows the relationship between population and the area and also refers to the population pressure per aerial unit (Singh, 1985).

Density of population helps us for understanding nature of distribution of population density of population indicates population and land ratio and nature of balance between population of the region and its natural resources. Density of population plays an important role in any scheme related to health, trade, agricultural, social or economic aspects and development of region. The density of population of a region is influenced by accessibility, physiography, and climate, socio-economic and cultural condition of the region.

The analysis of density of population plays an important role in studies related to population characteristics in geographic context. The density of population is the outcome of collective influences of several natural or geographical or environmental and social, culture and economic factors.

Table 1: Himachal Pradesh Density of Population 2011

S.No	District Name	Area (Sq. Km.)	Total Population	Population Density
1	Mandi	3950	999777	253
2	Kinnaur	6401	84121	13
3	Solan	1936	580320	300
4	Sirmaur	2825	529855	188
5	Shimla	5131	814010	159
6	Bilaspur	1167	381956	327
7	Lahaul-Spiti	13835	31564	2
8	Una	1540	521173	338
9	Kullu	5503	437903	80
10	Chamba	6528	519080	80
11	Kangra	5739	1510075	263
12	Hamirpur	1118	454768	407
State		55673	6864602	123

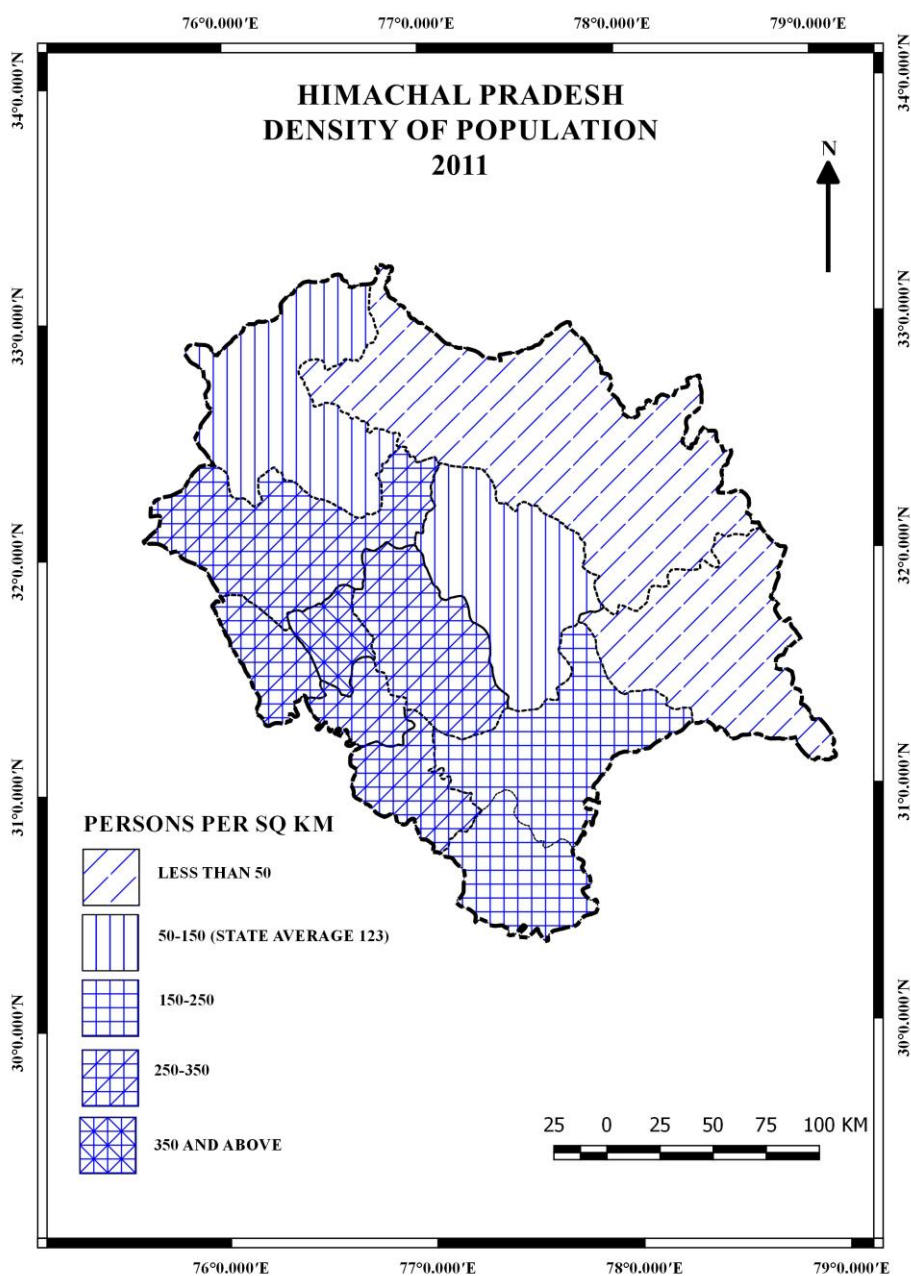


Figure 2

It is evident from Table 1 and Figure 2 that there are 123 persons living in per square kilometer in the state of Himachal Pradesh in 2011. There are perceptible spatial variations in terms of density of population. The highest population density is found in Hamirpur district. Una, Bilaspur, Solan, Kangra and Mandi are the districts having population density ranging between 250 to 350. Sirmaur and Shimla are the other districts having population density more than the state average. Lowest population density is recorded in Lahaul-Spiti district followed by Kinnaur district.

The study of the literacy is important to know the social and cultural development of the society. P. Michael Penn (1997) explained the inter-relation between education and development of the society. Literacy is an important indicator of development of any country or region. Literacy influences the composition of the population, i.e. fertility, mortality, migration and cultural and economic development of region. Literacy also influences the growth of population in the region. Therefore, literacy plays an important role in the study of population characteristics.

Table 2: Himachal Pradesh Literacy Rate 2011

S.No	District Name	Literacy Rate		
		Total	Male	Female
1	Mandi	81.53	89.56	73.66

2	Kinaur	80.00	87.57	70.96
3	Solan	83.68	89.57	76.97
4	Sirmaur	78.80	85.61	71.36
5	Shimla	83.64	89.59	77.13
6	Bilaspur	84.59	91.16	77.97
7	Lahaul-Spiti	76.81	85.69	66.84
8	Una	86.53	91.89	81.11
9	Kullu	79.40	87.39	70.91
10	Chamba	72.70	82.59	61.67
11	Kangra	85.67	91.49	80.20
12	Hamirpur	88.15	94.36	82.62
State		82.18	89.53	75.93

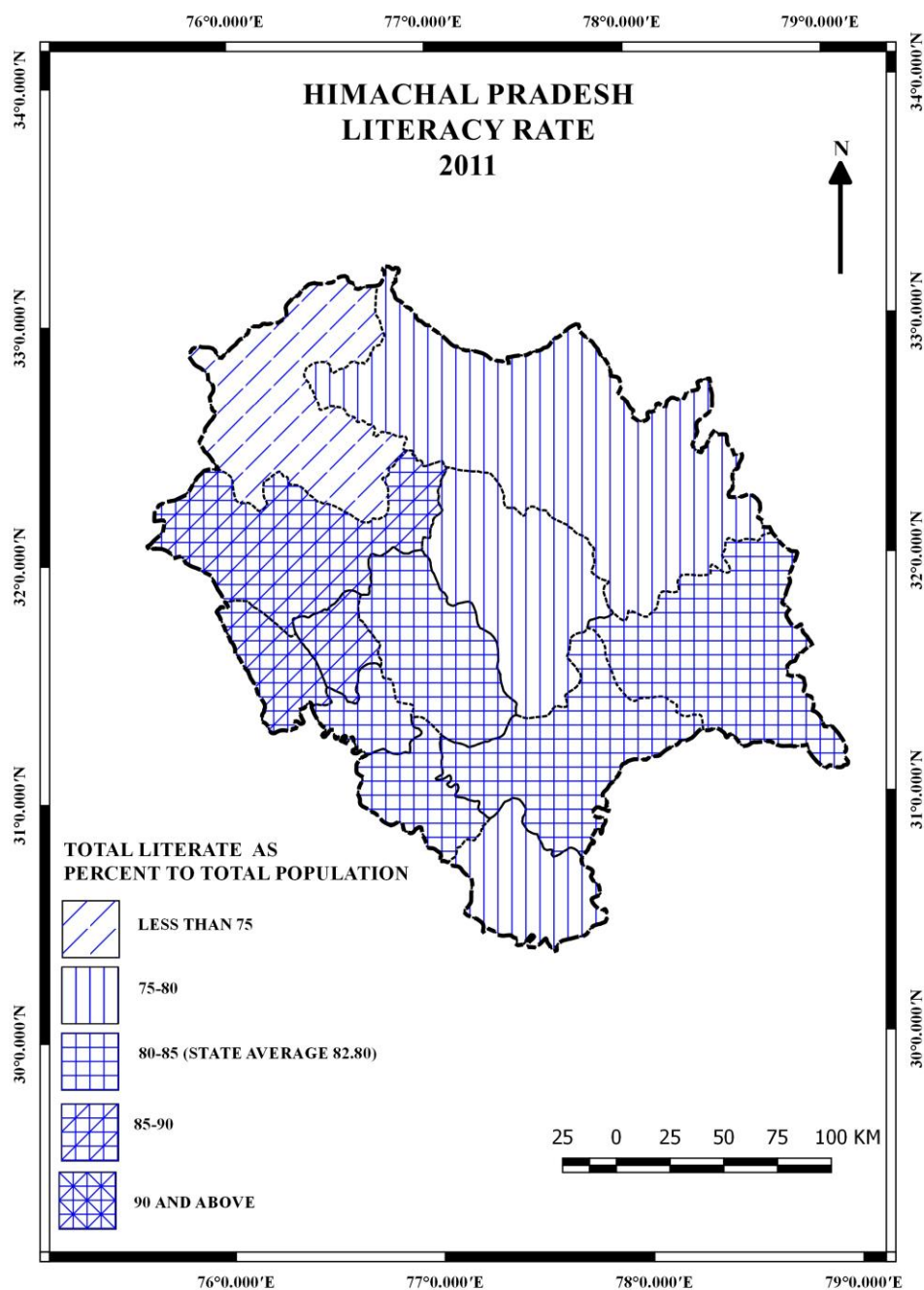


Figure 3

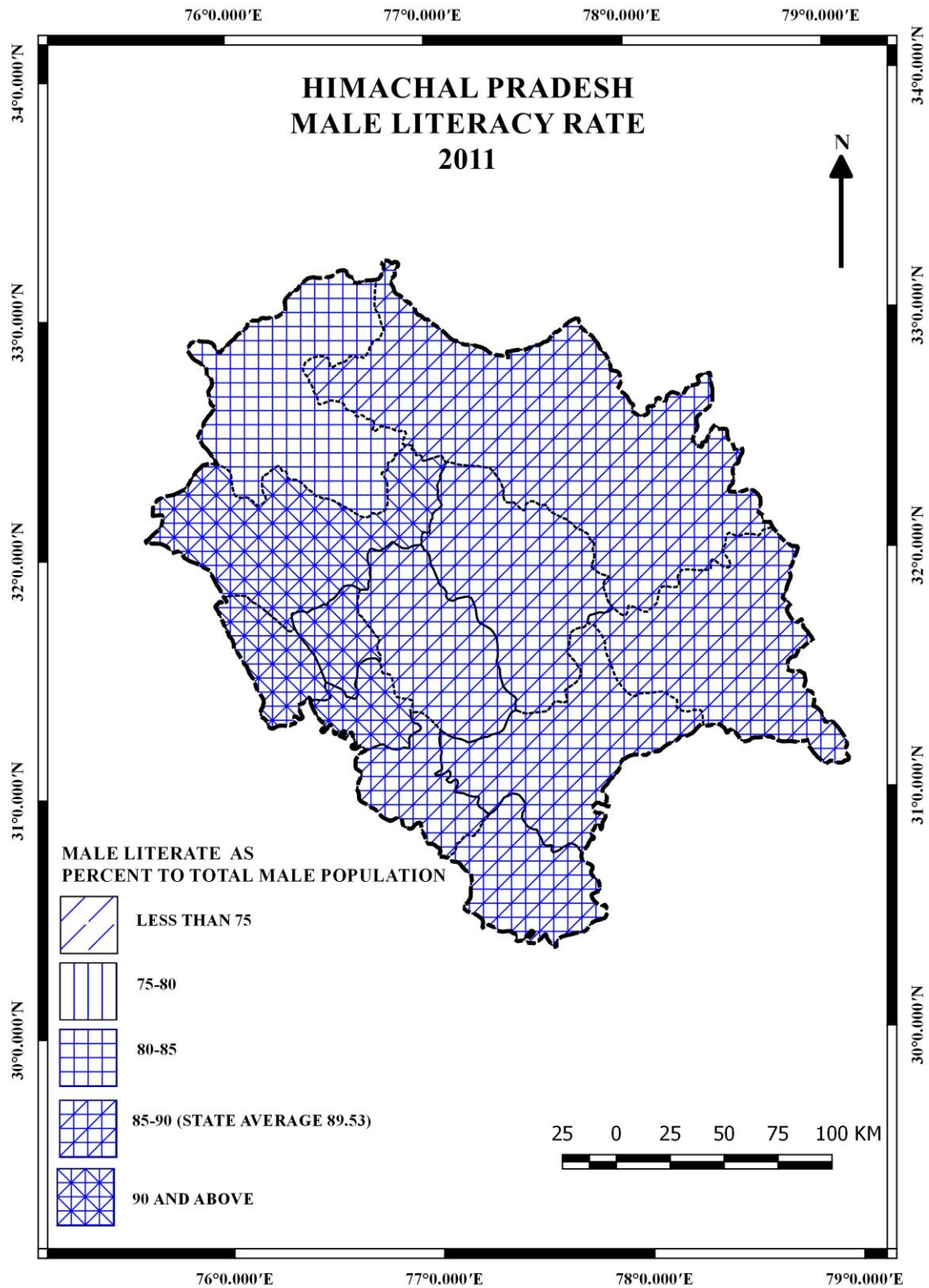


Figure 4

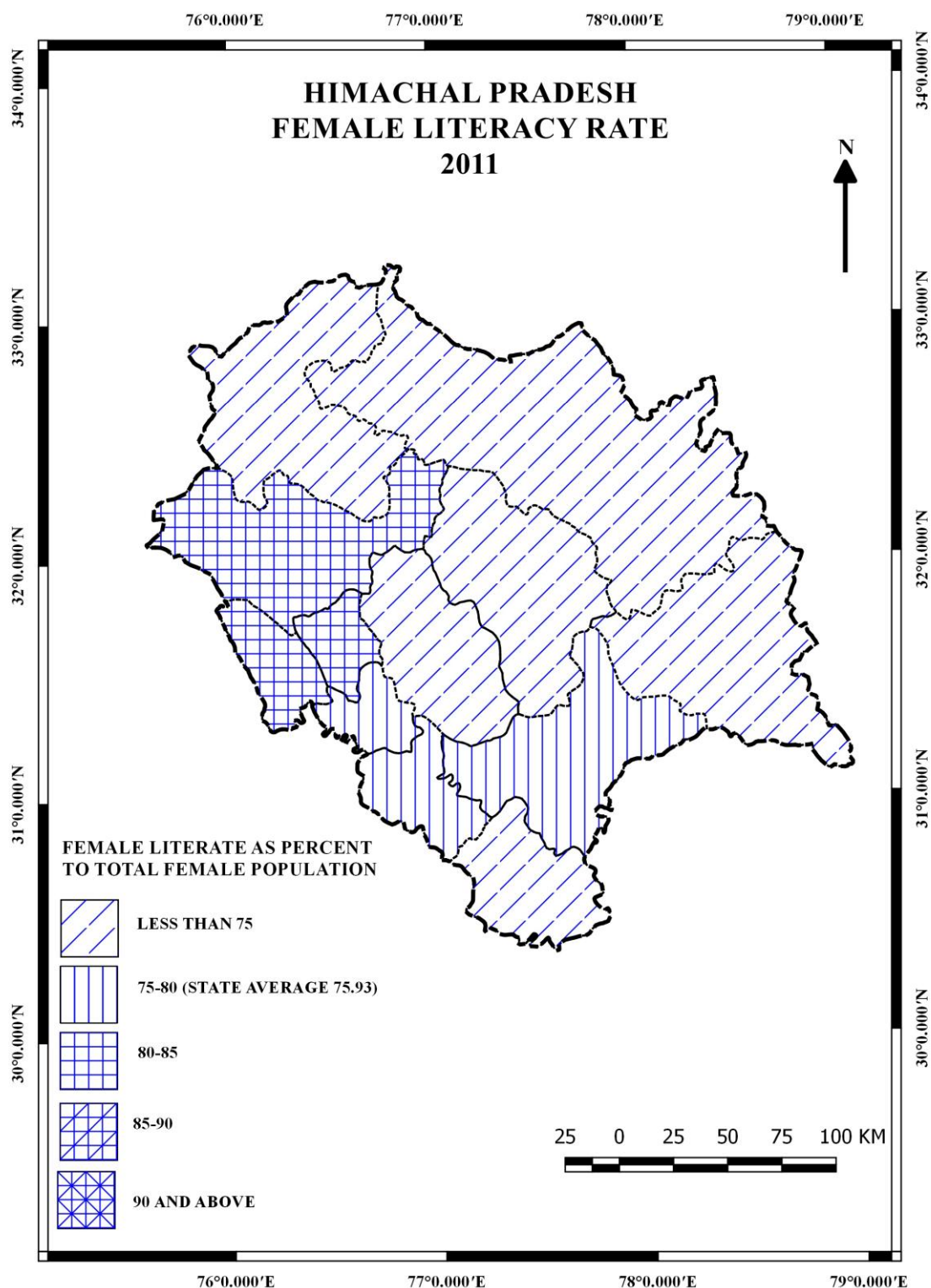


Figure 5

Table 2 and Figure 3 show that there are perceptible regional variations in literacy level of total population in the state of Himachal Pradesh in 2011. 82.18 per cent of total population is literate in the state. The gap in the literacy rate between the most (Hamirpur) and least (Chamba) literate districts is 15 percentage points. Hamirpur, Una and Kangra are the districts where more than 85 per cent of total population is literate. Bilaspur, Solan and Shimla are other districts having literacy rate more than the state average. It is evident from Figure 4 that male literacy is as high as 89.53 per cent with regional variations. Hamirpur, Una, Kangra and Bilaspur are the districts where more than 90 per cent of male population is literate. Lowest rate of male literacy

is recorded in Chamba district. Figure 5 shows that only 75.93 per cent females are literate in the state with considerable regional variations. The higher percentage of female literacy rate is found in Hamirpur district followed by Kangra and Una and lower percentage of female literacy rate is found in Chamba district followed by Kinnaur and Kullu district.

Conclusion:

There are 123 persons per square kilometer in the state of Himachal Pradesh in 2011 being highest in Hamirpur district and lowest in Lahaul-Spiti district. There is a considerable regional variation in level of literacy also. 89.53 percent males are literate while this figure is 75.93 for females.

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