



A Spatial Analysis of Population Growth and its Distribution: A Case Study of Eastern Uttar Pradesh

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Abstract

According to Karl Marx, man is the source of all wealth and that without him, all other resources remain idle. Man is therefore the main focus of all development endeavours. Consequently, a region's population has a significant impact on its development. However, beyond a certain point, the added population becomes a strain on the region's limited resources. As a result, studying population growth and distribution within a region is vital for analysing its development prospects and paving the way for optimal resource utilisation. This paper deals with the basic nature and characteristics of population distribution, its density, and growth in Eastern Uttar Pradesh. This region being endowed with fertile alluvial soil and abundant natural resources, has experienced substantial population growth in the last few decades. The purpose of the study includes highlighting the trend of population growth in last decade in study area, locating the densely populated regions and analysing the distribution of people in the area. The study demonstrates that the districts located in the north and south of the study area have very high (more than 21%) rates of population growth. In terms of population density, the central and north-eastern parts of the region fall into the very high to high density category, whereas the south-eastern, western, and north-western portions have low population density.

Keywords: population distribution, population density, optimal resource utilisation

Introduction

A country's real wealth is its people. They are the ones who decide policies, use the country's other resources, and eventually are the actual resources. A country is ultimately known by its people.

The availability of land, natural resources, and the environment play an essential role in the development of any nation or states. However, only humans can make the best possible use of these resources and contribute to economic progress. Population concerns are particularly relevant in today's world since the development of a region is inextricably linked to its population growth.

However, proving a cause-effect relationship between population increase and development may be difficult, despite the fact that the most widely held belief is that too much population expansion impedes a region's development. Furthermore, the current pattern of population concentration, which is closely tied to population growth trends, is highly inconsistent.

It is essential to first conceptualise both the place and the people in order to have a thorough knowledge of the relationship between them. According to Chandna (2008), the location of population distribution refers to the spatial pattern of population spread, such as linear, dispersed, nucleated, or agglomerated. The density, on the other hand, is more proportionate and focuses on the ratio of the population to the area. However, Clarke (1972) correctly noted that despite all these drawbacks, the idea of population density is generally informative and is a valuable instrument in the investigation of the diversity of man's dispersal in space.

The distribution of population in any region is closely influenced by the physical (terrain, topography, climate, natural, vegetation, and soils), socio-economic (religion,

customs, education, awareness, per capita income, and standard of living and political factor government policy (Husain, 2008). With 16.4% of the total population, Uttar Pradesh is the most populated state in the country. Additionally, it has a total area of around 240,928 sq. km, making it the fourth-largest state in terms of geographical area. Uttar Pradesh is divided into four economic regions: Western Uttar Pradesh, Central Uttar Pradesh, Eastern Uttar Pradesh, and Bundelkhand. Among the four economic regions of Uttar Pradesh, Eastern Uttar Pradesh ranks first in terms of population, area, and density. The physical landscape in Eastern Uttar Pradesh is diverse. According to the 2011 census, the region has 79.88 million people, accounting for 39.98 percent of the state's population. This region is endowed with fertile alluvial soil brought down by Ganga and its tributaries, favourable climate and topography and several other resources. The physio-cultural setting of the region favours the settlement of a large chunk of population, various economic activities and infrastructural development in the region. This region has a huge human resource-base but its expansion beyond a certain limit will definitely put an adverse impact on the existing limited natural-resource base of the region. Hence, the study of existing pattern of distribution of population, its growth rate and density in the region becomes important in analysing future prospects of development, without disturbing the optimum balance between existing resources and population.

Study Area

The Eastern Uttar Pradesh, which covers an area of 85961 km² and accounts for 27.6% of the state's total land area, is located between the latitudes 23° 45'N and 28° 30'N and the longitudes 80° 45'E and 84° 46'E. The region is bordered to

the north by Nepal, to the east by Bihar and Jharkhand, to the south and southwest by Chhattisgarh and Madhya Pradesh, respectively. Its western limit is frequently defined as a 100-meter contour line that separates the upper from the middle Gangetic Plain. There are 27 administrative districts in the area, according to the 2001 census. The region

experiences sufficient precipitation, and permeable alluvial soils often have ample capacity to store groundwater. The region has traditionally been dominated by agriculture, and human resources have been valued as an asset. This is demonstrated by the population's absolute size and its expansion through time.

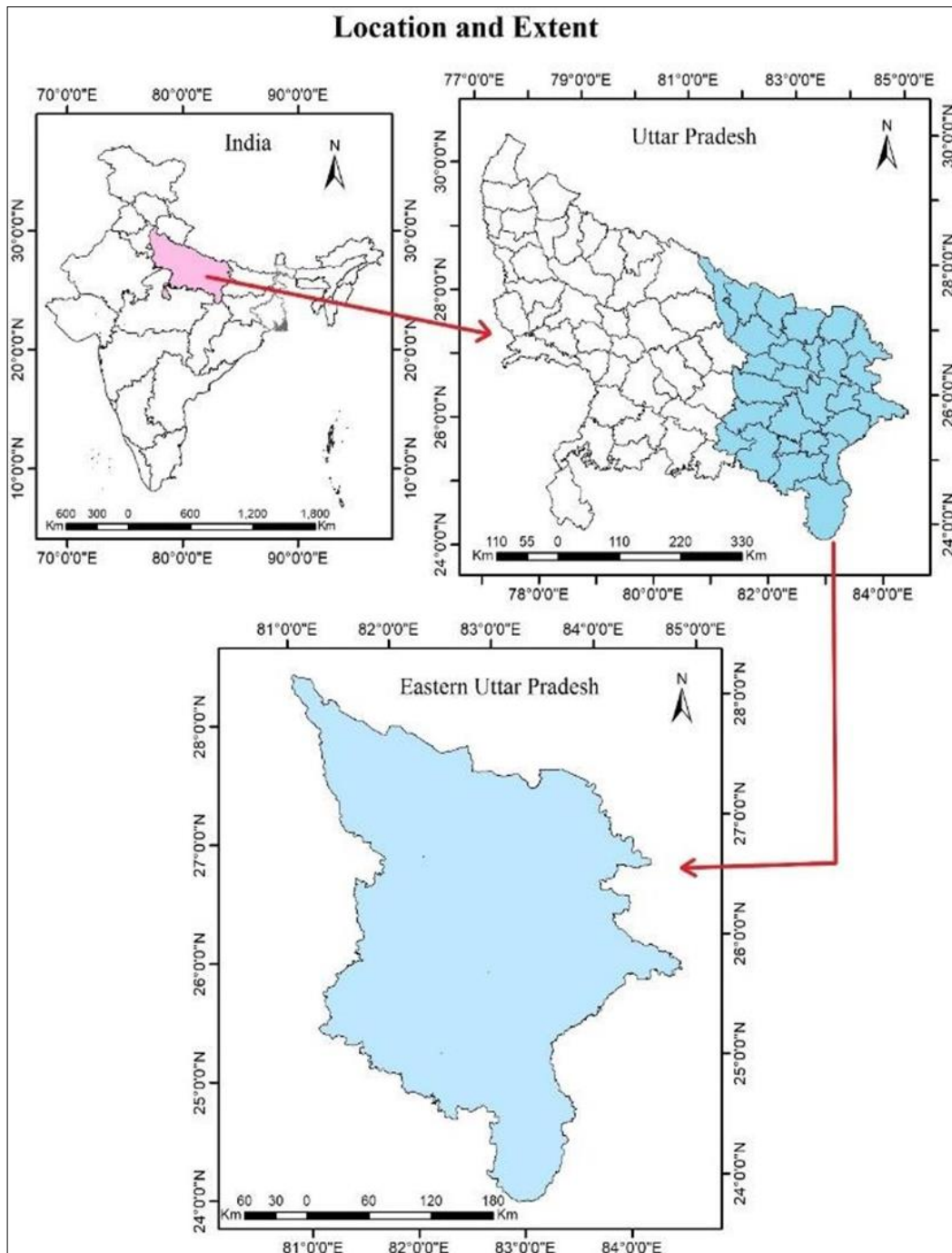


Fig 1: Location map of the study area

Data used and Methodology

In the present study, the data related to population growth and its distribution of Eastern Uttar Pradesh has been obtained from Census of India, Primary Census Abstract (2011) [2]. GIS and cartography techniques have been employed for the generation of maps.

Result

The Eastern Uttar Pradesh region presents a diverse physical landscape. The region reported a 79.88 million population,

which is 39.98 percent of the state's population according to the 2011 census.

▪ **Population Growth of Eastern Uttar Pradesh (2001-2011)**

The population growth rate is the rate at which the number of individuals in a population increases or decreases at a given time, often expressed as a percentage of the number of individuals in the population at the beginning of the period. The growth rate can be positive or negative. A positive

growth rate indicates that the population is increasing, while a negative growth rate means that the population is decreasing. A growth ratio of zero indicates the same number of individuals at the beginning and end of the period. A growth rate may be zero even when significant changes in the birth rate, death rates, immigration rates, and age distribution between the two times. The population growth rate in Eastern Uttar Pradesh during 2001-2011 is different spatially (Figure 1). The population growth rate is very high (more than 21%) in the districts situated in the north and southern part of the study area. The pattern is

observed in Bahraich, Shravasti, Gonda, Siddharth Nagar, Mahrajganj, Kushinagar, and Sant Kabir Nagar districts on the north and Sonbhadra, Mirzapur, Prayagraj, and Kaushambi district of the southern area. The study area's middle part is Chandauli, Varanasi, Sant Ravidas Nagar, Ghazipur, Ballia, Mau, Azamgarh, Gorakhpur, Basti Faizabad, Sultanpur, Pratapgarh, and Ambedkar Nagar; districts are located, the growth rate is between 16% to 20%. The low growth rate is less than 15% observed in two districts, viz. Jaunpur and Deoria.

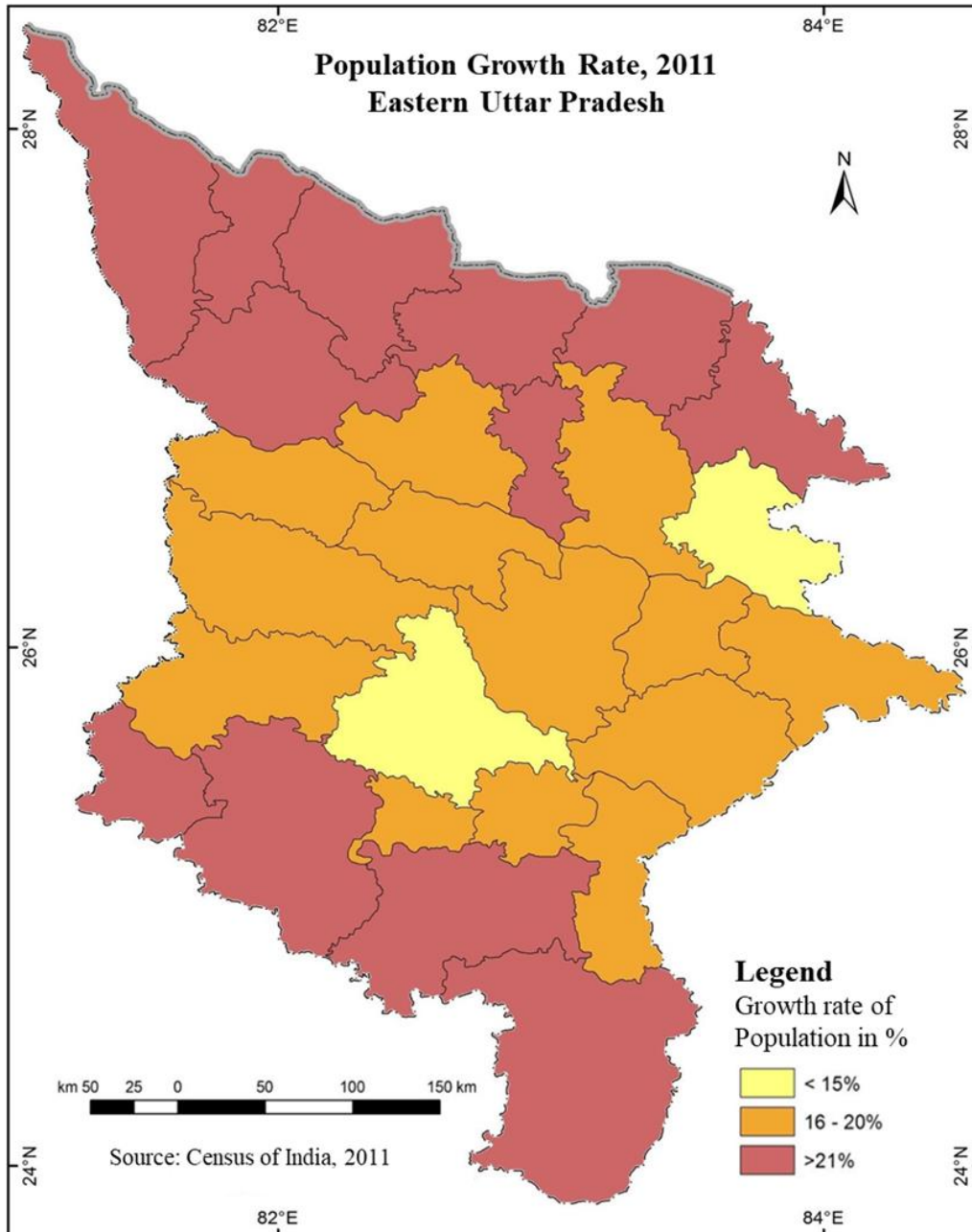


Fig 2: The population growth rate (2011) in Eastern Uttar Pradesh

▪ **Population Distribution in Eastern Uttar Pradesh**

A highly irregular pattern characterizes the spatial distribution of the population in Eastern Uttar Pradesh. The population of Eastern Uttar Pradesh ranges from 1.12 million in Shravasti to 5.95 million in Prayagraj (Figure 2). Sultanpur, Ghazipur and Varanasi have more than 3.5 million population, and Azamgarh, Gorakhpur, and Jaunpur

have a population of more than 4 million. In contrast, Bahraich, Ballia, Deoria, Gonda, Pratapgarh districts also have a population of more than 2.95 million, while Balrampur, Ambedkarnagar, Basti, Chandauli, Faizabad, Kaushambi, Mau, Mirzapur, Sant Kabir Nagar, Sant Ravidasnagar, Shravasti, Siddharthnagar, Sonbhadra have population less than the average population per district.

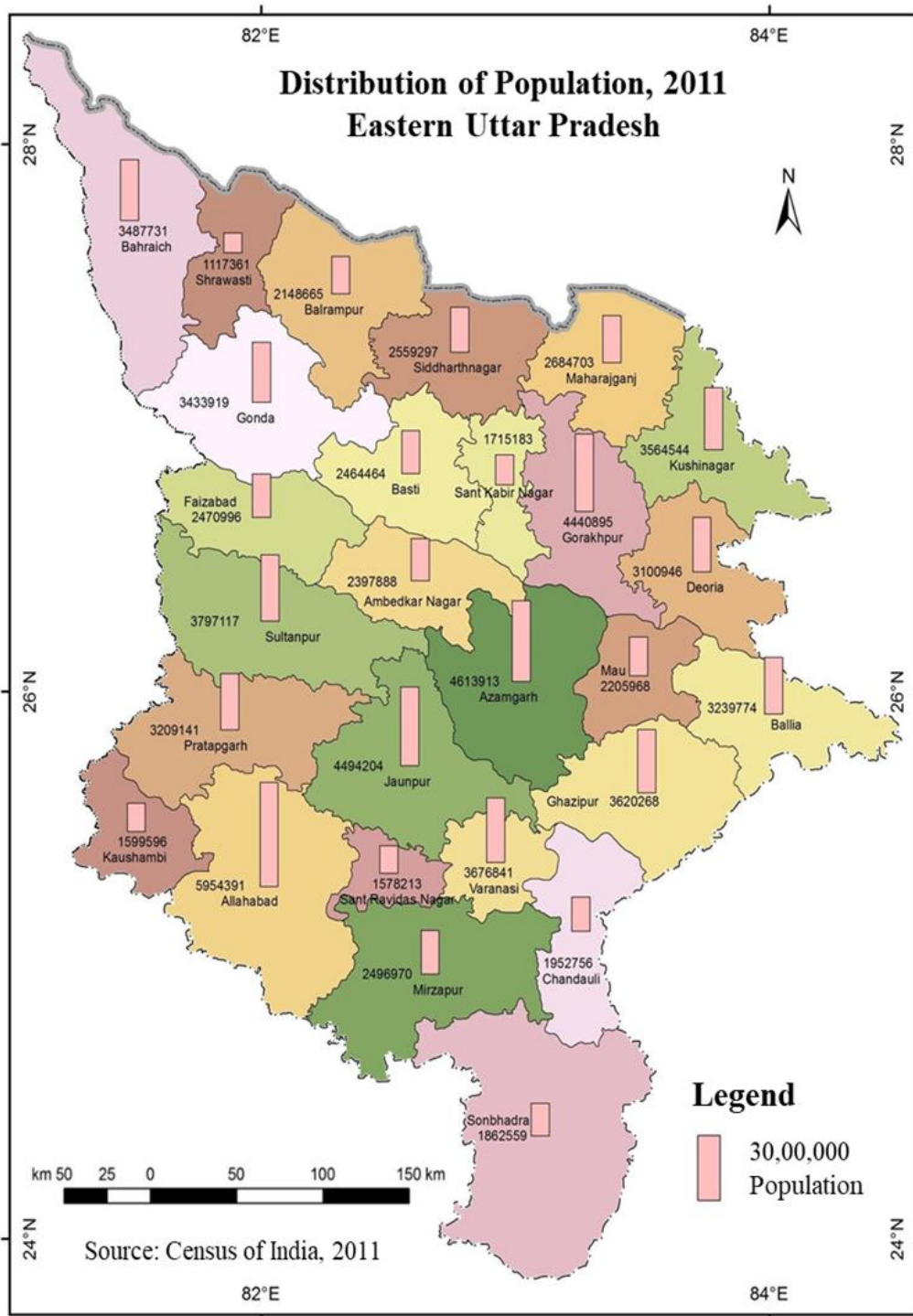


Fig 3: The population distribution (2011) in Eastern Uttar Pradesh

▪ **Density of Population in Eastern Uttar Pradesh**

Population density is a measurement of population per unit area. The average density of population in Eastern Uttar Pradesh for 2011 is 1015 persons per sq. km. which is more than the state average (829 persons per sq, km.) and much more than India (382 person/sq. km.) The overall density of population is evenly higher except in the northern Tarai and southern upland and other marshy and flood-prone patches, which have comparatively lower density. The distribution of density among the districts of Eastern Uttar Pradesh varies from 270 persons /sq. km. in Sonbhadra to 2395 persons / sq.km. in Varanasi. The wide variation in the spatial pattern of population density results from physical, social, and historical factors to understand the characteristics pattern

districts of the region. Population density has been divided into five categories-

Very high density (>1400- person / sq.km.): Exceptionally very high-density region of more than 1400 person's km. sq. is found in the district of Varanasi with 2395 person / sq. km. and Sant Ravidas Nagar with 1555 person /sq. Km. These districts do not have the highest population, but due to the small area compared to other districts, they have recorded a very high density of population; both districts are located in the south-eastern part of the region.

High density (1101-1400 person / sq.km.): Six districts of the region are included under this category of high density.

These districts are found in a compact zone in the central Eastern part of the region. The districts against their population density are Azamgarh (1138 person / sq. km.), Mau (1288 person / sq.km.), Kushinagar (1227 person / sq.km.), Deoria (1221 person / sq.km.), are the other districts of this category Gorakhpur has the highest population density under this category, while lowest in the Jaunpur (1113 person / sq. km.).

Medium density (901-1100 person / sq.km)- Eight districts of this region are under this category. These districts are scattered in the middle east, middle west, and southwest part of the region. The districts included in this category are Mahrajganj (910 person / sq.km.), Sant Kabirnagar (1042 person / sq.km.), Basti (917person / sq.km.), Faizabad (1056 person / sq.km.), Ambedkar Nagar, (1020person / sq.km.), Prayagraj (1086 person / sq.km.), Gazipur (1072 person / sq.km.), Ballia (1087 person / sq.km.), districts has the highest density and Mirzapur (567 person / sq.km.) and Sonbhadra (270 person / sq.km.), has the second-lowest and lowest density in respectively this category.

Low density (601-900 person / sq.km.) - Nine districts of the Eastern Uttar Pradesh region account for a low density of population. The districts comprises are Bahraich (666 person / sq.km.), Shravasti (681 person / sq.km.), Balrampur(642 person / sq.km.), Siddharthnagar (884 person / sq.km.), Gonda (858 person / sq.km.), Sultanpur (856 person / sq.km.), Pratapgarh (863 person / sq.km.), Kaushambi (899 person / sq.km.), Chandauli (769 persons per sq.km.). These districts are distributed in the northwestern and southwestern parts of the region. and have a density below the state average. Only Chandauli is located in the southeastern part of the region.

Very Low Density (< 600-person sq.km.) - There are only two districts of the region included under the category of very-low-density Mirzapur (567 person / sq.km.), and Sonbhadra is (270 person / sq.km.) are situated southern part of the region. Both these districts Sonbhadra is (270 person / sq.km.) are situated southern part of the region. Both these districts have tough physical conditions, and as a result, their population density to much below to the average density of the region.

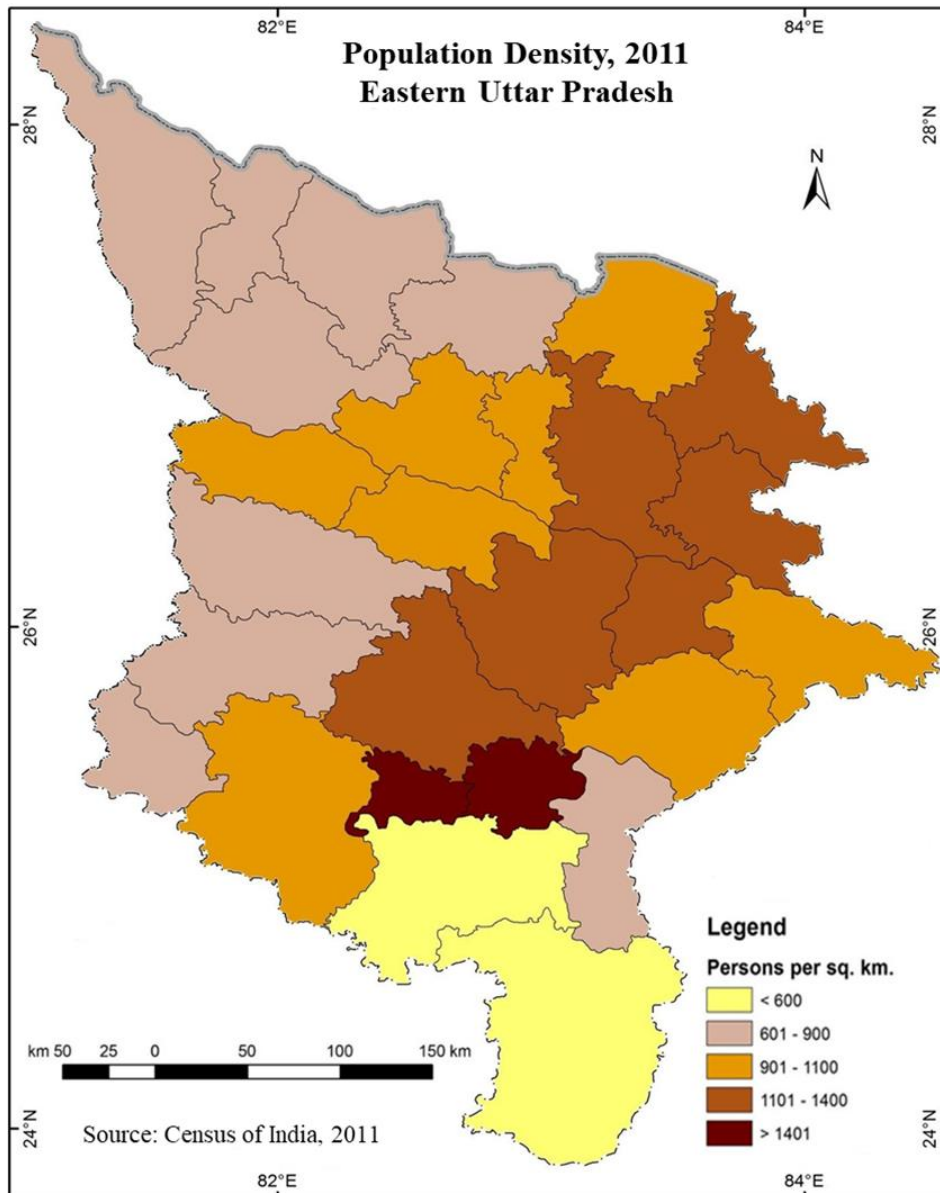


Fig 4: The population density (2011) in Eastern Uttar Pradesh

Table 1: Population density (2011) in Eastern Uttar Pradesh

S. No	Density	Person per sq. km	Districts	Percent
1	Very high density	>1400	Varanasi, Sant Ravi Das Nagar	7.41
2	High density	1101-1100	Azamgarh, Mau, Kushinagar, Deoria, Gorakhpur, Jaunpur	22.22
3	Medium density	901-1100	Prayagraj, Ghazipur, Ballia, Mahrajganj, Sant Kabir Nagar, Basti, Faizabad, Ambedkar Nagar	29.63
4	Low density	601-900	Bahraich, Shravasti, Balrampur, Siddharthnagar, Gonda, Sultanpur, Pratapgarah, Kaushambi, Chandauli	33.33
5	Very low density	<600	Sonbhadra, Mirzapur	7.41

Source: Census of India (2011) Primary Census Abstract

Conclusion

The study reveals that the population growth rate is very high (more than 21%) in the districts situated in the north and southern part of the study area while the central part has moderate growth rate. As far as density of population in the region is concerned, the central and north-eastern part of the region falls in the category of very high to high density of population; while the south-eastern, western and north-western part have low population density. Infact, from the general pattern of density distribution; it has been rightly observed that low densities are accounted for by forest area, mountainous and the swampy nature of the area, little cultivable land, and unhealthy climate. In contrast, high densities are found in places with good alluvial land, a healthy climate, and an excellent water supply for agriculture. In this way, Eastern Uttar Pradesh is in a high grip of population density. These population density changes represent people's opportunities of employment, educational facilities, industrial development, economic development, social environment health and recreation, political, social institutes of education and the exercise of residential preferences and at the same time indicate the onset of imbalance between population and existing natural resources in some parts of the region.

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