



# Assessment of Population Dynamics Using Geographical Information System in Faridabad District, India

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## Abstract

*Study of population distribution and its growth is very crucial for any developed or developing region because land use pattern changes drastically with the increasing population. The population data was symbolized for the entire Faridabad district based on the population values of 2001 and 2011 census using Geographical Information System. For the comparative population distribution analysis, the census data of 2001 and 2011 have been used at village level. The total urban population of Faridabad district in 1901 was 9816 which increased to 1,438,855 in 2011. Proportion of urban population in 1991 census was recorded as 48.6 per cent which has switched over to 55.7 per cent in 2001 and 79.51 per cent 2011 Census. As per the 2001 census data, the lowest values of population distribution were in the eastern side along the Yamuna river of Faridabad district whereas the highest percentage was in the Faridabad city. The lowest values of population distribution as per 2011 census were also found in the eastern side along the Yamuna river of Faridabad district whereas, the highest value is seen in the Faridabad city and its surroundings. Percentage map shows that pattern of population is expanding towards the North-Eastern and the Western parts of the Faridabad district. Based on the population dynamics map decision can be made regarding the areas that need to reduce from human population pressures on land and this can facilitate planners in appropriate land use planning.*

**Keywords:** Dynamics, Distribution, GIS, Population.

## Introduction

The word population can be used in several different ways a biologist, for example, might refer to a collection of animals or plants as a population, whereas a geographer would be more likely to confine his use of the word to collections of human beings<sup>1</sup>. Population studies concern with the size of the population and its characteristics. Along with this population studies also concern with the how population is distributed in various spatial divisions and the changes that occur in the patterns of population distribution of the decades. The importance of population distribution studies by its spatial pattern becomes evident when it is realized that small heavily populated areas exist near virtually uninhabited or sparsely inhabited areas<sup>2</sup>.

Population provides the focus to all studies. It is central to environmental and development, which drive their significance from 'man' or 'population' the 'inhabitor and developer'. The study of population and its various aspects, such as population fertility, growth, distribution etc., has often been made somewhat in isolation, as being something purely distinct from other studies<sup>3</sup>. Faridabad city is developing as an industrial centre for the all adjoining areas. So, in 1992 the Faridabad City Authority had announced an ambitious development plan for Faridabad city for the development of necessary infrastructure and social amenities to accommodate a population of 19.75 lakhs by 2011<sup>4</sup>.

The study of population distribution concerned with matters like, how the people are distributed, what is the nature of changes in population distribution, to find out the proportion of population living in advanced urban industrial areas, newly developing out growing urban industrial areas and rural areas and the ways in which changes are taking place in each category<sup>5</sup>. Present study deals with the population dynamic of Faridabad district provide the distribution pattern of population growth.

**Objectives:** The objectives of the study are mentioned below: i. to analyse the trends and patterns of population distribution. ii. to assess the area covered under various population classes; and iii. to analyse the population dynamics in Faridabad district.

## Materials and Methods

This study is based on both spatial and non spatial data which have been obtained from census of India, survey of India and ISRO Geoportal 2D Bhuvan. For the comparative population distribution analysis, the census data of 2001 and 2011 has been used at village level. The spatial and attribute data has been taken from Haryana administrative atlas and Haryana primary census abstracts of census of India 2001 and 2011. The village boundaries were vectorized based on the census 2011 Haryana administrative atlas while the clustering of the populated places has been identified through SOI toposheet and LISS III satellite imagery through GIS technique. Then, village polygon data was

joined with population attribute data for further analysis. Finally, the population data was symbolized for the entire Faridabad district based on the population values of 2001 and 2011 census using GIS.

**Study Area:** Faridabad district lies between 27° 51' 15" N and 28° 30' 52" N latitude to 77° 06' 49" E and 77° 32' 50" E longitude (Figure-1). It has a geographical area of 742.90 sq kms and situated in the south-eastern part of Haryana. The Faridabad district is a plain area with a perennial river Yamuna on its east, which has formed its flood plain area as a narrow belt along the Yamuna River. Physiographical we can sub divide the district into Faridabad undulating plain (Banger) and Yamuna Khadar regions<sup>6-7</sup>. The overall contour value varies between 200 meters to 300 meters. Highest contour values have been found in the western part (300 meters) while lowest (200 meters) in the eastern side.

## Results and Discussion

**Population Distribution:** Study of population distribution and its growth is very crucial for any developed or developing region because land use pattern change drastically with the increasing population. When we look towards study area it seems that the major landscape changes have taken place due to increase in human population. There has been big spurt in the level of urbanization in the Faridabad district. Proportion of urban population in 1991 census was recorded as 48.6 per cent which has switched over to 55.7 per cent in 2001 and 79.51 per cent 2011 Census. According to census of India, the total urban population of Faridabad district in 1901 was 9816 followed by 8540, 8058 and 9296 in 1911, 1921 and 1931

Which increased to 617717, 10, 55938 and 143,8855 in 1991, 2001 and 2011. Density of Faridabad district for the census year 2001 was 1744 people per sq. km. which increased to 2442 per sq. km. in 2011. It can be said that there was slow population growth before independence which grew very fast after 1971 due to medical and other social facilities provided by the government of India. To see the population distribution change of Faridabad district, the census data of 2001 and 2011 has been used at village level. The spatial and attribute data has been taken from Haryana administrative atlas and Haryana primary census abstracts of census of India, 2001 and 2011. The village boundaries were vectorized based on the census 2011 Haryana administrative atlas and was joined with population attribute data. Then the population data was symbolized for the entire Faridabad district based on the population values of 2001 and 2011 census.

**Population Dynamics:** Faridabad district had four tehsils (census 1991) namely Faridabad (69 villages and part of Faridabad complex town), Ballabgarh (88 villages and part of Faridabad complex town), Palwal tehsil (196 villages and three towns Palwal, Hassanpur and Hodal) and Hathin (86 villages and Hathin town) (Census of India, 2011). During 1991-2001,

the following jurisdictional changes were recorded. Tilpat village was declared census town and five villages were fully merged in Faridabad Municipal Corporation from Faridabad tehsil (Census of India, 2011).

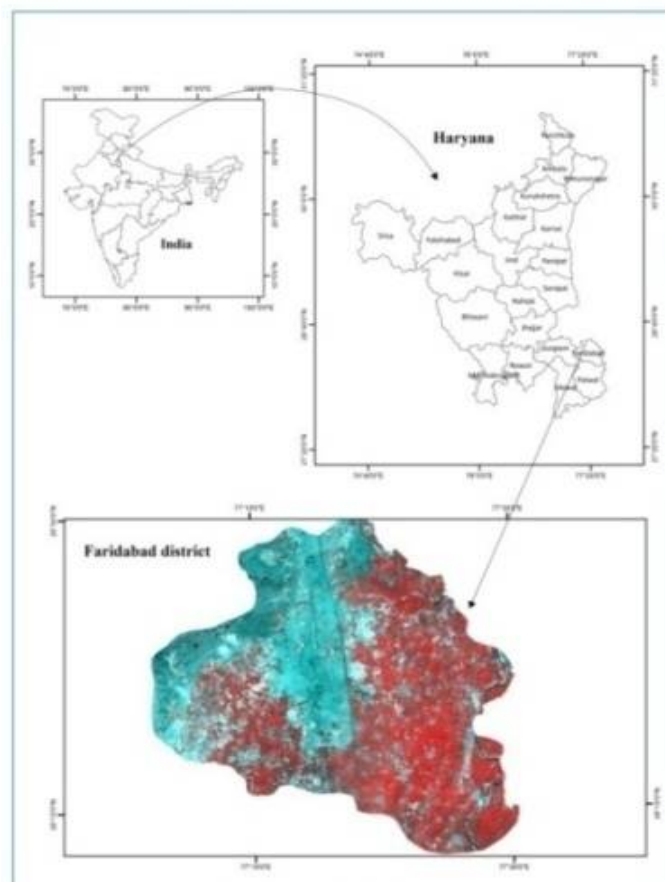


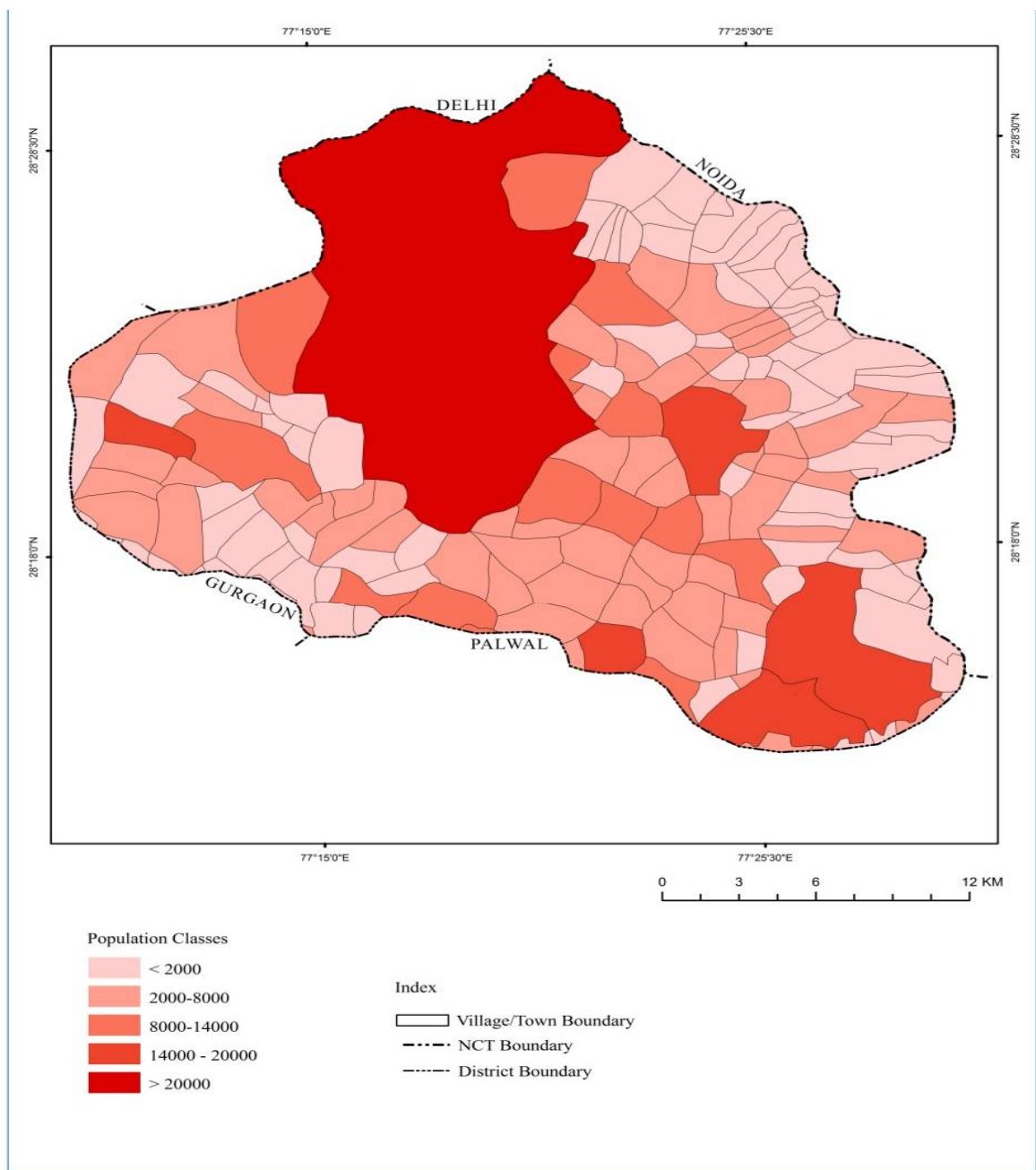
Figure 1  
Study area

Administrative position of the district in 2001 census, was that it contained five tehsil of Faridabad (63 villages and two towns of Tilpat census town and part of Faridabad municipal corporation), Ballabgarh tehsil (87 villages and part of Faridabad municipal corporation), Palwal tehsil (148 villages and Palwal town), Hathin tehsil (86 villages and Hathin town) and Hodal (48 villages and town of Hassanpur and Hodal). As per 2011 census, major jurisdiction changes took place and a large area of Faridabad district has transferred to district Palwal. In Faridabad district there are two tehsil of Faridabad (65 villages, Faridabad town and Tilpat census town) and Ballabgarh (84 villages with Pila census town) two villages transferred from tehsil Ballabgarh to tehsil Faridabad. The Population distribution for the year 2001 to 2011 has been classified into five classes. The distribution of population in Figure-2 shows that the population is mainly concentrated along national highway two, near to Delhi and around the Faridabad city and Ballabgarh town. Population distribution varied in the

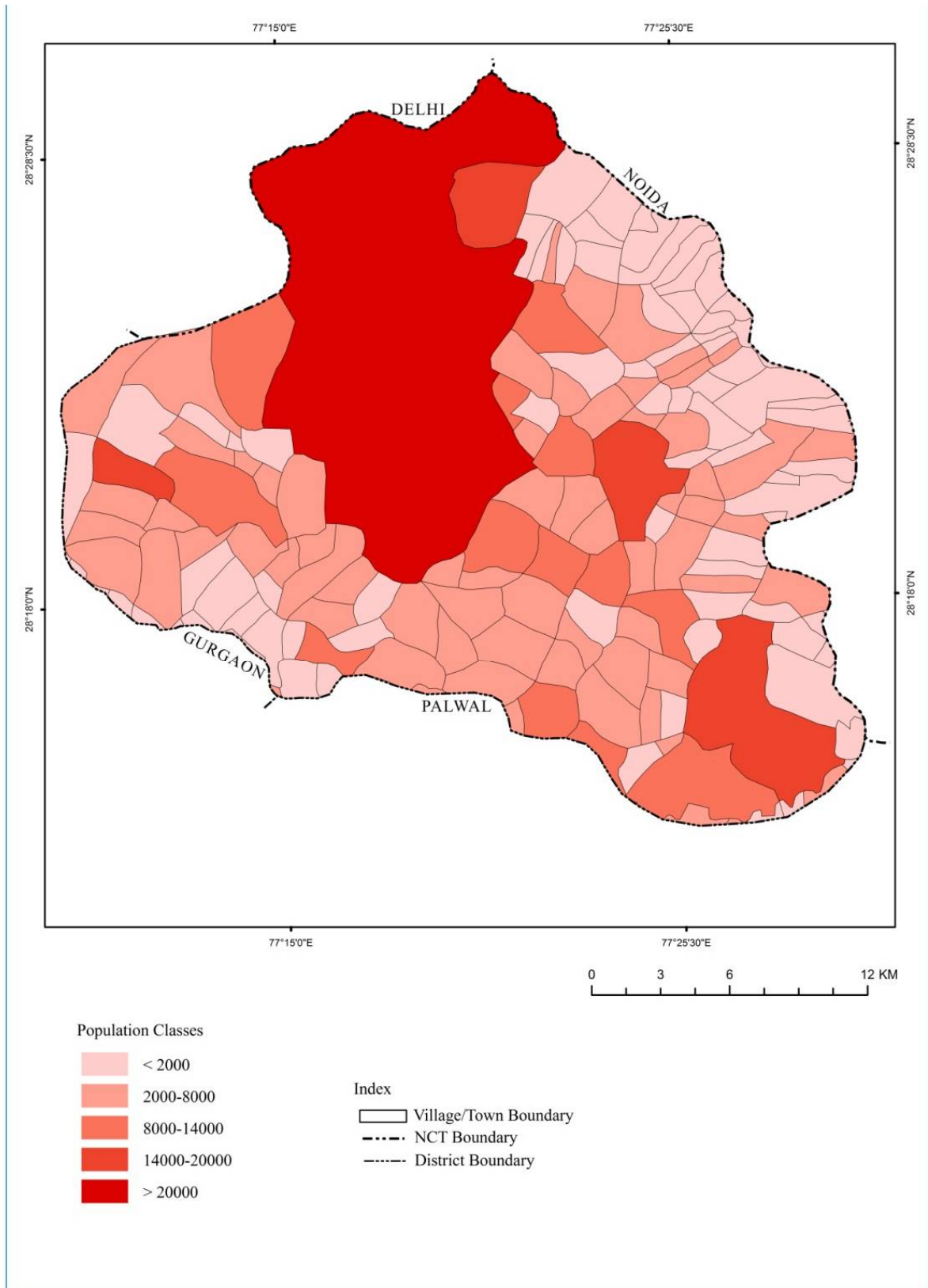
Faridabad district. The distribution pattern shows that the population of Faridabad district is expanding more towards east. As per 2001 census, the lowest value of population distribution was in the eastern side along the Yamuna river of Faridabad district whereas the highest value was in the Faridabad city. South - west part of the district shows low concentration of population due to Aravalli hills and distance from the city. The lowest values of population distribution as per 2011 census were also found in the eastern side along the Yamuna river of Faridabad district whereas, the highest values are seen in the

Faridabad city and its surrounding areas. South – west and south part of the district shows low concentration of population (Figure-3).

Figure-4 and 5 shows the area covered under various population classes from 2001 to 2011. Percentage map shows that pattern of population is expending toward the North-East and the Western part of the Faridabad district. The low expansion has been found towards eastern and south (Figure-6).

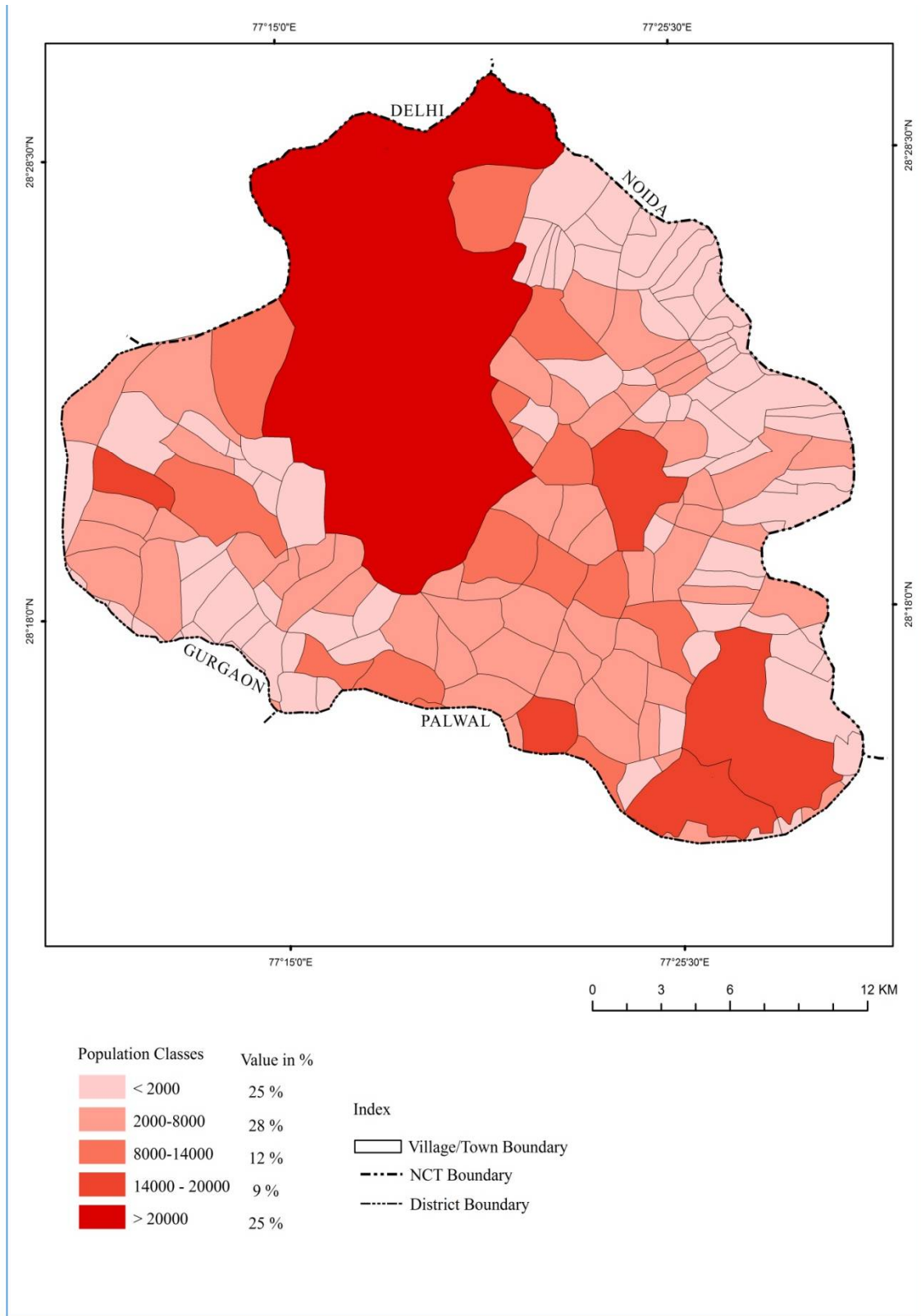


**Figure-2**  
**Population Distribution in Faridabad District, 2001**

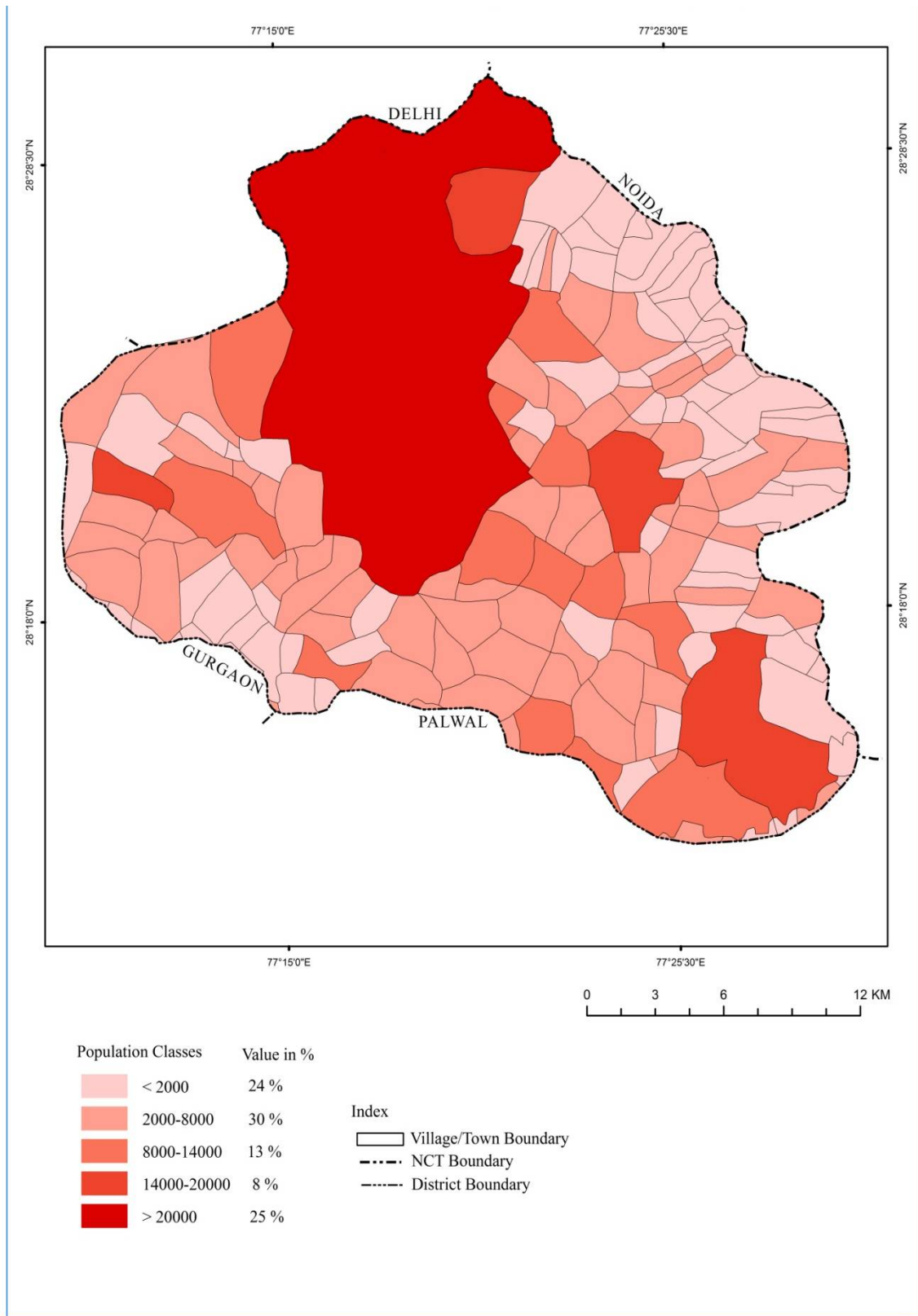


**Figure-3**  
**Population Distribution in Faridabad District, 2011**

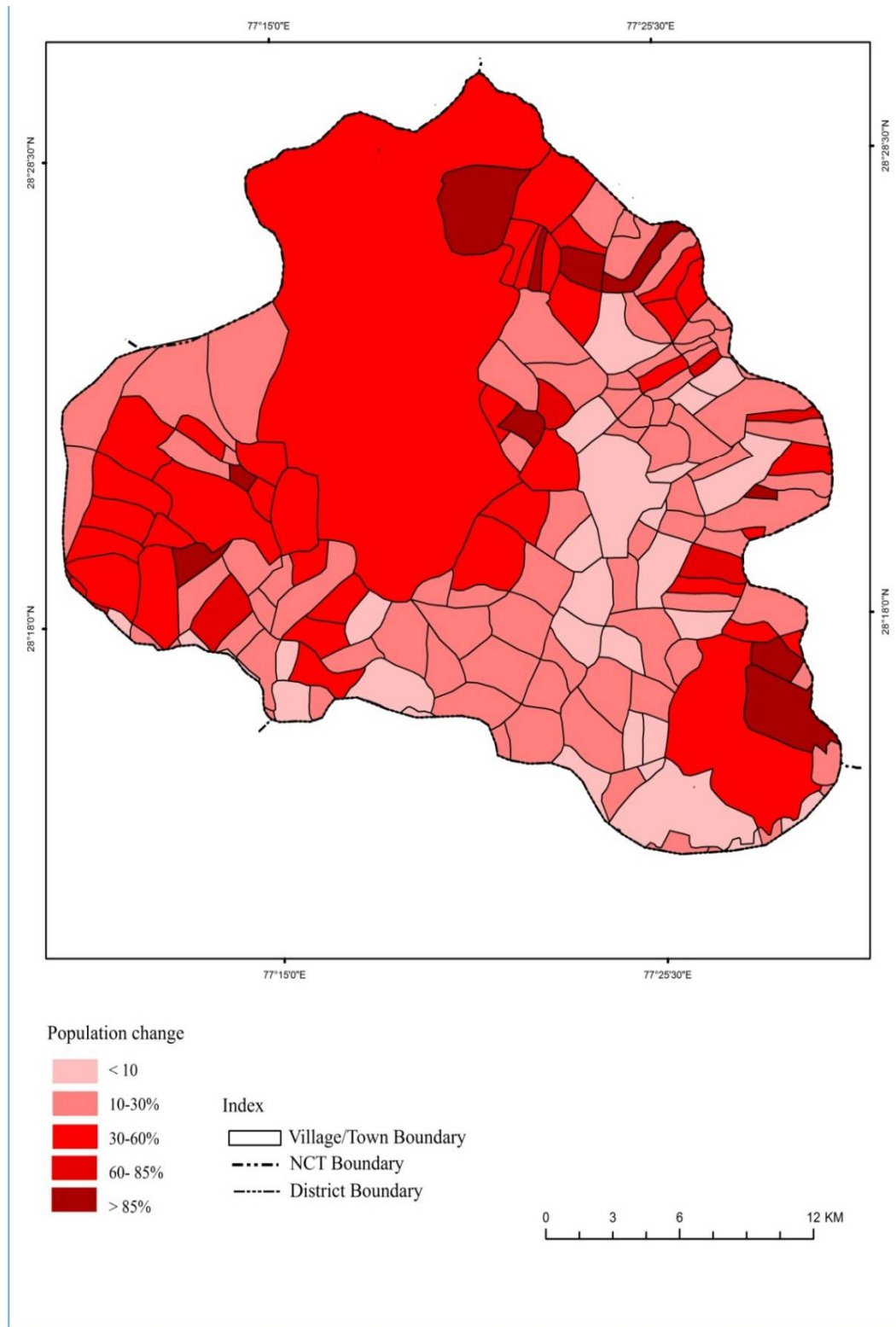




**Figure-4**  
**Area Covered Under Various Population Classes in Faridabad District, 2001**



**Figure-5**  
**Area Covered Under Various Population Classes in Faridabad District, 2011**



**Figure-6**  
**Population Change in Faridabad District 2001-2011**

## Conclusion

Population dynamics shows that as per 2001 census, the lowest values of population distribution are found in the eastern side along the Yamuna river of Faridabad district whereas, the highest values are found in the center part. On the other side the lowest values of population distribution as per 2011 census are also found in the eastern side whereas, the highest values are found in the Faridabad city and its surrounding areas. Percentage of population growth shows that pattern of population is expanding toward North-East and western part of the Faridabad district. The low expansion has been found towards eastern and south. Based on the population dynamics map decision can be made regarding the areas that need to reduce from human population pressures on land and this can facilitate planners in appropriate land use planning.

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