



Geographical Analysis of Road Densities in Aurangabad Division (Maharashtra State)

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Abstract

Road network is like blood veins of any country. Development of road network indicates the regional development. Roads are the medium to connect two different places with each other. Only availability of road network is not important but their dense networks are important for the development. In high dense road network the density of road network is always found high. Density of road network is found different in per sqkm region and per population. Present paper has reveals the analysis of road density according to the area and population distribution in Aurangabad division.

Keywords: Road density, Per Sqkm, per 1000 population, development

Introduction

Development of road network is the key of regional development and high density road region is found economically develop. Aurangabad division is the part of Maharashtra state and found uneven development of road network as well as regional development. Present paper is based on the district wise analysis of road density in Per Sqkm region and in per 1000 population in Aurangabad division

Objectives

The objectives of the present research paper as follows,

- i) To calculate and analysis the road density according to the geographical area
- ii) To analysis the road density according to the distribution of population in the region.
- iii) To compare the road density according to the area and population.

Data Source & Methodology

Present investigation is based on the secondary source of data and it is complied from Public Work Department Divisional Office, Aurangabad, also population data is complied from District Census Handbook of Aurangabad, Jalna, Osmanabad, Nanded, Latur, Parbhani, Hingoli, Beed District 2011. Road density in Per Sqkm and in per 1000 population is calculated with help of following formulas,



$$R D (\text{Per Sqkm}) = (T R \div G A)$$

$$R D (\text{Per 1000 Population}) = (T R \div T P) \times 1000$$

Where, R D – Road Density,

T R – Total Road Network Length,

T P – Total Population

The results are presented in the table and density regions are shown in the map of the study region. The comparison of the road density according to the area and population is shown in the graph.

Study Region

Aurangabad division is also known as Marathwada region. Aurangabad division is Administrative Division of Maharashtra State it consists eight districts like Aurangabad, Jalna, Osmanabad, Nanded, Latur, Parbhani, Hingoli, Beed respectively. Aurangabad is the divisional head quarter of the region. The geographical extent of the region is in between 17° 35' N to 20° 40' N latitudes and 70° 4' E to 78° 19' E longitude. Aurangabad division covered total 64464 sqkm area with total 18731872 population where 9698962 is male and female population is 9032910 as per the census year 2011.

Road Network in Aurangabad Division

Road network statistics of the present paper is based on the data March 2018. According to the end of March 2018 total road length of the Aurangabad division is 71339.2 km. Length of National Highway is 2689.57 km, State Highway is 7050.15 km, District Roads are 24193.67 km, and Rural Roads are 37405.81 km respectively. Beed and Aurangabad district found the highest distribution of road network and Hingoli district has recorded lowest road length in the region. Beed district and Aurangabad district has large area and compare to their area road length is not enough. Nanded and Aurangabad district has largest network of National Highway while Jalna district has State Highway in the region. The road network is not spread even all over the region.

Total Population of Aurangabad Division

According to the census year 2011 total population of the division is 18731872 and out of them 51.78% is male and 48.22% is female population. Aurangabad district covered highest distribution of total population in the division. More than 37 lakh population is concentrated in Aurangabad district. Nanded is second highest distribution of total population and more than 33 lakh population is situated in the entire Nanded district. Hingoli district found lowest distribution of total population compare to the other districts of the division. Near about 11 to 12 Lakh population is located in this district also Hingoli district covered low geographical area in the study region.

**Road Density (Per Sqkm)**

District wise road density in Per Sqkm is shown in the table no 1, table also shows the district wise area and total road length according to the year 2017-2018.

Table No 1

Road Density (Per Sqkm) in Aurangabad Division (2017-2018)

District	Total Road Length (Km)	Area (SqKm)	Road Density(PerSqkm)
Aurangabad	12339.44	10107	1.22
Jalana	8269.63	7726	1.07
Parbhani	5528.42	6214	0.89
Hingoli	4254.05	4758	0.89
Beed	13216.64	10686	1.24
Nanded	11323.8	10331	1.10
Osmanabad	7921.65	7485	1.06
Latur	8485.57	7157	1.19
Total Region	71339.2	64464	1.11

Source – Road length is complied from PWD Divisional Office Aurangabad
And Density is calculated by Author

The density of road network in Aurangabad division is calculated 1.11 km in per sqkm region. It means only 1 to 2 km roads are available in per sqkm area of the study region. Parbhani and Hingoli district recorded lowest density of road network and there are less than 1 km roads are available in per sqkm area of these districts. These two districts have also found lowest distribution of road network compare to the other districts of the division. Hingoli and Partbhani district have also the low regional development and low road density is one of the reasons for this. Other all districts has road density more than 1 km in every per sqkm region. Beed (1.24) and Aurangabad (1.24) district recorded maximum density of road network in per sqkm region. The road lengths in per sqkm area of these districts are more than 1.20 km. Aurangabad is comparatively more develop in the region and road density plays an crucial role of this development.

Road Density (Per 1000 Population)

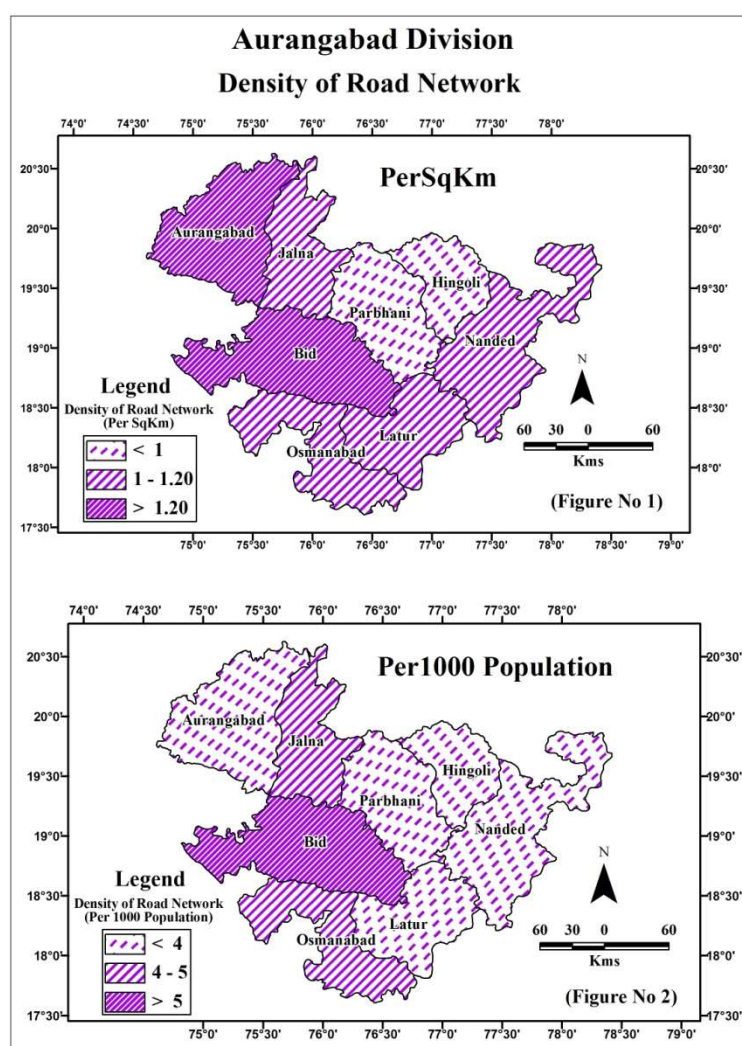
District wise distribution of total population, road length and density of road network in per 1000 population is shown on table no 2.

Table No 2

Road Density (Per 1000 Population) in Aurangabad Division (2017-2018)

District	Total Road Length (Km)	Total Population	Road Density (Per1000 Population)
Aurangabad	12339.44	3701282	3.33
Jalna	8269.63	1959046	4.22
Parbhani	5528.42	1836086	3.01
Hingoli	4254.05	1177345	3.61
Beed	13216.64	2585049	5.11
Nanded	11323.8	3361292	3.37
Osmanabad	7921.65	1657576	4.78
Latur	8485.57	2454196	3.46
Total Region	71339.2	18731872	3.81

Source – Total Population is Compliled from District Census Handbook of Respective Districts (2011) and Density is calculated by Author



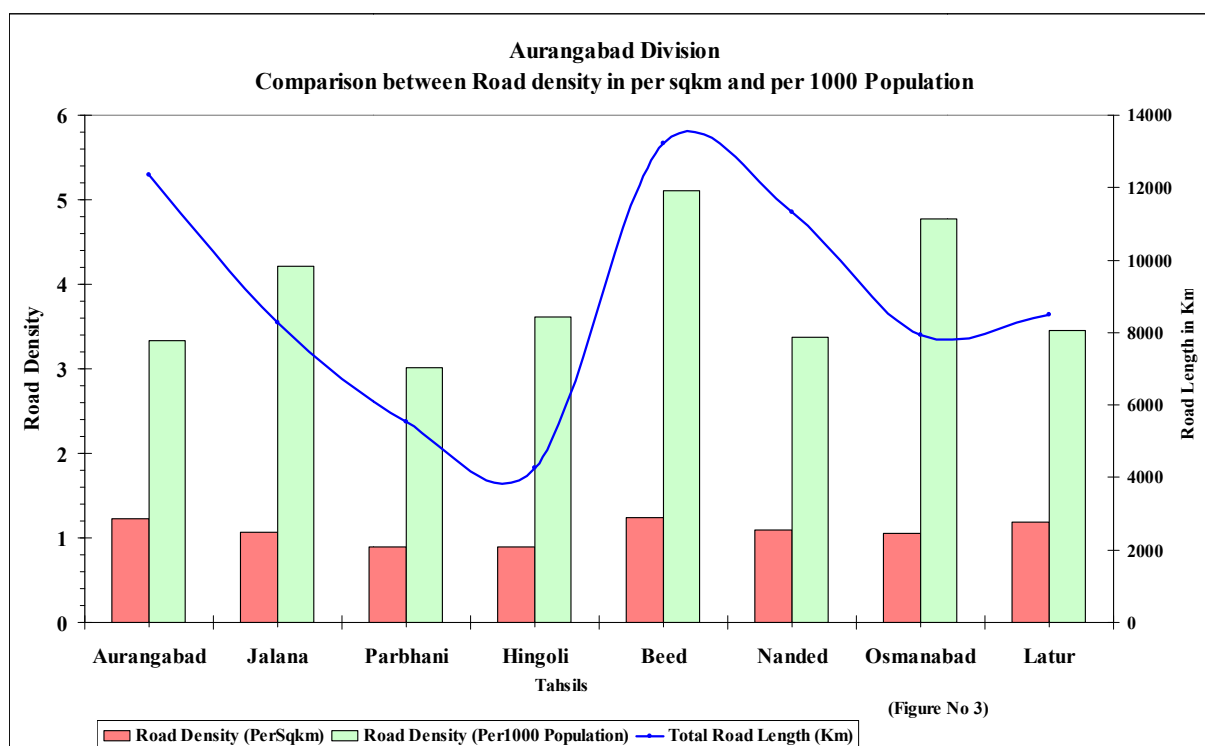
In the study region total 3.81 km roads are available in per 1000 population; it means very poor density of road network compare to the demand of increasing population. Beed district recorded maximum road density i.e. more than 5 km roads availability in per 1000 population in entire district. Osmanabad and Jalna has 4 to 5 km road network, and other remaining districts has 3 to 4 km road network behind per 1000 population. Osmanabad district has low population distribution after Hingoli and compare to their population ratio between road network and population is quite balance in the district.

Parbhani (3.01) district has found lowest road availability in per 1000 population; this district is also recorded low density in per sqkm. There are variations are found in the density of road network by area and population.

Comparison between Road density in per sqkm and per 1000 Population

Some variations are occurred in the both densities. Aurangabad district has found moderate road network compare to area but poor road development compare to the population. Hingoli district has low distribution of population and geographical area therefore the road network; it has very poor road network compare to the geographical area and quite satisfactory road network compare to the population distribution.

Parbhani district has found poor road development according to the both densities, while Beed district has found maximum in both densities. But the development of road network in Beed district is still low compare to the area of the district.





Conclusions and Suggestions

The density of roads explains the availability of roads in a particular area and behind the population. The distribution of roads in the study area is not the same everywhere as well as differences in geographical area and size of the region. Therefore, the availability of roads is also found to be uneven.

The density of roads is moderate compared to the area and very low compared to the population. Although it is not possible to increase the density of roads compared to population growth, it can be increased to some extent. Parbhani district has very few roads available in terms of both geographical area and population. Due to this, the development of Parbhani district is also hampered. Although the density of Beed district is highest in the study area in terms of area and population, it is less than the area of Beed district and the structure of the district. Because Beed district is not developed yet.

Aurangabad district has a satisfactory road distribution compared to its geographical area but very few roads are available behind the population. Aurangabad district has the highest concentration of population in the division and this district is slightly developed as compared to other districts. But compared to the growing population, the density of roads is less.

It is necessary to increase the road network in the study area as well as increase the density of roads by making flyovers, subways, four-laning of roads in areas where it is not possible to construct more roads according to the area. This will increase the density of roads in line with the population and accelerate the development of the study area.

Reference

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