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Spatio temporal analysis of changing population density in Nandurbar city

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Abstract
Population density is one of the important indices of the density of population. Demography is the study of population change over time and space and it studies the various determinants of population change and the impact of such changes on socio-economic development of region. The density is the ratio between land and population in a region. The geographers are generally use arithmetic density which is the total number of people divided by total area of the region. A density of population will imply greater economic activities and an obvious urge for an improved standard of living, a grater struggle for existence and continuous competition. All these are helpful for better economic life. Hence, it is necessary to the study distribution and density of population in the Nandurbar city.

Keywords: Demography, density, population, spatio- temporal, Nandurbar city

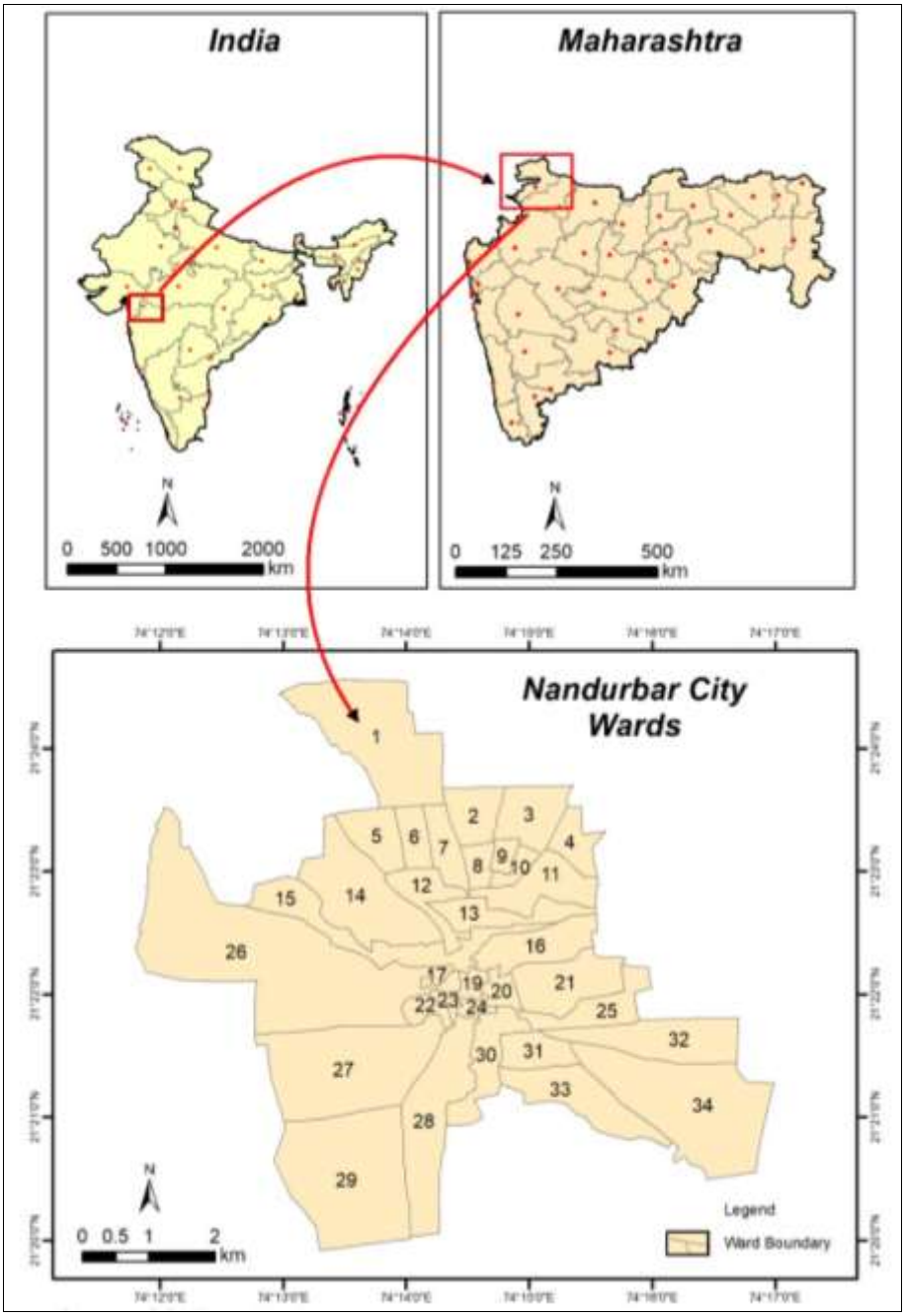
Introduction
In the demographic studies the population cannot be clarified without distribution Density. The population density is the most important tool of measuring the distribution of population in a particular area and it gives a clear-cut picture of the distribution of particular region.
Density of population in simple words refers to man-land ratio. Man and land are the ultimate elements in the life of human society, so that number of people in proportion to the area is a fundamental consideration to study population. It is therefore, becomes essential to analyses the distribution of inhabitants in terms of the total area which they occupy, and this helps in simplifying the complexities of population.
Density of population helps us to understanding nature of population distribution. It indicates natural resources; it also becomes easier to know possibilities for region. While introducing new transporting network it is essential to know density of population of a region. (Sawant, Athavale 1994) [5] Population density is the most fundamental demographic process with which all other demographic attributes are directly or indirectly associated. Population growth determines density, distribution pattern and composition of population. (Ghosh 1985) [2]

The composition of residential, industrial, commercial, transport and other services on the available land has been effected with the changes in population density over the period of time. The problem of housing, increasing congestion in the residential areas as well as on the public roads, expansion of slums, increasing pressure on natural resources, increasing land pollution with water and air as well as the social pollution are such problems, which are directly related with the increasing density of population in the area. Thus the impact of density can be seen not only on socio-economic environment but also on natural environment of the area.
Krishnan (1971) [3] analyze that the high density is related vary intensive agriculture, in upper Bari Doab, Punjab and close near to various urban centers and large proportion of population outside the agriculture.

Objective
- To study spatial pattern of tribal Population Density.
- To analyze the decadal changes in Population Density.
- To find out the factors affecting on Population Density.

Study area

Nandurbar city is headquarter and administrative district of northwest corner of (Khandesh region) Maharashtra. On 1 July 1998 Dhule was bifurcated as two separate districts now known as Dhule and Nandurbar. Nandurbar district is bounded to the south and south-east by Dhule district, to the west and north is the state of Gujarat, to the north and north-east is the state of Madhya Pradesh. The northern boundary of the district is defined by the great river. The district headquarters is located at Nandurbar city. The Nandurbar city is divided into 33 wards. It has an average elevation of 210 meters above sea level. Nandurbar is located on $21^{0}20'$ North to $21^{0}24'$ North latitudes and $74^{0}12'$East to $74^{0}17'$ East longitude. The city is spread over an area of 32.4 sq.kms, asper 2011 census. The Nandurbar Municipal Council has population of 111,037 of which 57,412 are males while 53, 625 are females as per report released by Census India 2011.



(Source: SOI Toposheet)

Fig 1: Location of study area

Data base and Methodology

This study is based on the reliable and accurate census data. It is not possible to conduct individual enumeration of the required data from door to door in study region. The required secondary data has been collected from the District census handbook (1991 & 2011) and Socio –Economic review.

Population density refers to the ratio between numbers of people to the size of land in a country. It is usually measured in persons per sq.km. That is

$$\text{Density of Population} = \frac{\text{Total Population}}{\text{Total Geographical Area}}$$

The geographical study of over 20 years i.e from 1991-2011 has been analyzed for concentration of tribal population Density. For detailed study of changes in population density a specific 40 wards in 1991 and 33 wards as per 2011 census. The collected data has been processed and analyzed by using different quantitative, statistical technique.

Discussion

Table no. 1. shows that density of population of 1951 to 2011 in the study region. The population Density is the most important tool of measuring the distribution of population in particular area. The man land ratio of Nandurbar city in the 1220 person per sq.km. in 1951 census year. Increased from 2189 person per sq.km. in 1971. After that density of population density has declined in 1981, because Nandurbar city expand the city area. After 1981 the population growth of Nandurbar is increasing rapidly. At present 2011 census year 3536 person per sq.km. density of population in Nandurbar city. The density increase in last ten year (2001-2011) nearby 530 persons per sq.km.

Table 1: Nandurbar city: Density of Population (1951 to 2011)

Census Year	Total Population	Area in sq.km.	Density of Population per sq.km.
1951	30140	24.7	1220
1961	41055	24.7	1662
1971	54070	24.7	2189
1981	65394	31.4	2083
1991	78378	31.4	2496
2001	94368	31.4	3005
2011	111037	31.4	3536

***Source*:** Nandurbar District census handbook (1951 to 2011)

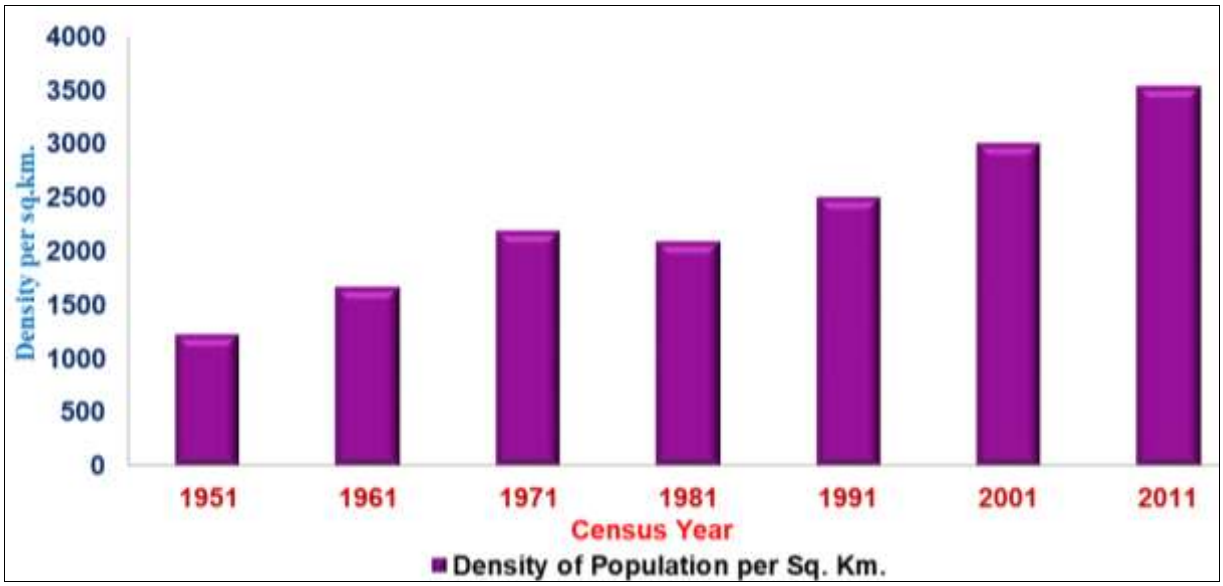


Fig 2: Nandurbar city: Density of Population (1951 to 2011)

Ward wise Density of Population in Nandurbar city

Table No. 2 clearly shows that ward wise density of population on 1991 & 2011 census year in Nandurbar city. On the basis ward wise density and they are detailed in three broad categories discussed.

1) High and very high density area (Above 5000 persons per sq.km.)

High and very high density of population is in the core area of the city where old settlement. According to census 1991 Ward No. 23 known is as seen. Manyar Mohallahas recorded highest density with 11037 persons per sq.km. followed by ward no. 31, 29, 14, 30, 28, 37, 20, 32, 22, 35, 21 and 12 with 10731, 9433, 9200, 8088, 7257, 6800, 5917, 5650, 5524, 5315, 5119 and 5087 persons per sq.km. respectively. These wards are located on Tilak road and Shivaji which are the main streets of the city of Nandurbar road and they are the centers of the commercial activities and as result the population density becomes high.

In the census 2011 ward no. 31recorded highest density with 40731 persons per sq.km. followed by ward no. 29, 23, 30, 32, 14, 22, 13, 28, 26, 21, 33, 24, 27, 19, 12, 15, and 04 with 16667, 14344, 14038, 13960, 13910, 13638, 12800, 12621, 10979, 10212, 8833, 7945, 7915, 6689, 6515, 6146 and 5521 persons per sq.km. respectively.

It is clearly seen that the average density of Nandurbar town has increased because of the growth of total population. This average density is not distributed uniformly. Areas the density is very high and density is below average.

2) Medium density area (2001 to 5000 persons per sq.km.)

According to 1991 census year the population density is medium in the eastern side of Nandurbar city. Ward nos. like 27, 13, 24, 03, 15, 02, 19, 33, 04, 38, 40, 18, 34, 39, 09, 26, 25, 11, and 19 with 4915, 4767, 4531, 4480l, 4392, 4280, 4198, 3662, 3344, 3335, 3286, 3184, 2922, 2844, 2798, 2526, 2177, 2142 and 2137 person per sq.km. This area residential area and near to the C.B.D. and core proximity of market and easy to access are area. The main cause of medium density distribution of population in area.

Table 2: Nandurbar City: Ward wise Density of Population (1991 & 2011)

Sr. No.	Ward No.	Geographical Area in sq.km.	Density of Population In per sq.km.		Spatio- Temporal Change in % (1991-2011)
			1991	2011	
1	Ward No. 1	02.08	1219	2169	77.93
2	Ward No. 2	02.72	4280	1248	-70.84
3	Ward No. 3	01.45	1034	4281	314.02
4	Ward No. 4	00.70	3344	5521	65.10
5	Ward No. 5	01.41	1578	2394	51.71
6	Ward No. 6	03.40	542	960	77.12
7	Ward No. 7	04.94	607	901	48.43
8	Ward No. 8	01.33	1660	2669	60.78
9	Ward No. 9	00.56	2798	4316	54.25
10	Ward No. 10	00.97	2137	4080	90.92
11	Ward No. 11	01.02	2142	2328	08.68
12	Ward No. 12	00.39	5087	6515	28.07
13	Ward No. 13	00.24	4767	12800	168.51
14	Ward No. 14	00.20	9200	13910	51.20
15	Ward No. 15	00.39	4392	6146	39.94
16	Ward No. 16	00.79	1490	4516	203.09
17	Ward No. 17	01.20	1347	3384	151.22
18	Ward No. 18	01.01	3184	2995	-05.94
19	Ward No. 19	00.45	4198	6689	59.34
20	Ward No. 20	00.24	5917	10979	85.55
21	Ward No. 21	00.26	5119	10212	99.49
22	Ward No. 22	00.21	5524	13638	146.89
23	Ward No. 23	00.16	11037	14344	29.96
24	Ward No. 24	00.49	4531	7945	75.35
25	Ward No. 25	00.98	2177	3809	74.97
26	Ward No. 26	00.97	2526	4251	68.29
27	Ward No. 27	00.33	4915	7915	61.04
28	Ward No. 28	00.28	7257	12621	73.91
29	Ward No. 29	00.18	9433	16667	76.69
30	Ward No. 30	00.16	8088	14038	73.57
31	Ward No. 31	00.13	10731	40731	279.56
32	Ward No. 32	00.20	5650	13960	147.08
33	Ward No. 33	00.40	3662	8833	141.21
34	Ward No. 34	00.92	2922	NA	NA
35	Ward No. 35	00.67	5315	NA	NA
36	Ward No. 36	00.40	4480	NA	NA
37	Ward No. 37	00.35	6800	NA	NA
38	Ward No. 38	00.65	3335	NA	NA
39	Ward No. 39	00.61	2844	NA	NA
40	Ward No. 40	00.56	3286	NA	NA
Total City		31.4	2496	3536	41.67

Source: Nandurbar District census handbook (1991 & 2011)

In the 2011 census year the population density is medium in the ward no. 16, 09, 03, 26, 10, 25, 17, 18, 08, 05, 11, and 01 with, 4516, 4316, 4281, 4251, 4080, 3809, 3384, 2995, 2669, 2394, 2328 and 2169 persons per sq.km. This is mainly due to the increase in irrigated area, expansion of infrastructural facilities, as well as the implementation of developmental activities.

iii) Low population density ARFA. (Below 2000 person per sq.km.)

According to 1991 census year the population density is low in the ward No. 08, 05, 16, 17, 01, 03, 07, and 06 with 1660, 1578, 1490, 1347, 1219, 1034, 607 and 542 person per sq.km. In 2011 census year low population density recorded was ward no 07, 06 and 02 with 901, 960 and 1248 person per sq.km. in the Nandurbarcity. The low population density is found around old settlements and peripheral zone city. This area is away from the city center, of the population density is decreased when the distance from the centre gets increased. Here the land use pattern changed. There are school, college, Government offices, ST. Stand, Railway station etc. in this area the density varies from ward to ward. The rest of the wards are included in this area.

The table no. 2 also shows that a spatio- temporal changes in percentage of 1991-2011 population density. In this decade the highest spatio-temporal changes inward no 3 with 314.02 percent followed by ward no 31, 16, 13, 17, 32, 22 and 33 with 279.56, 203.09, 168.51, 151.22, 147.08, 146.89 and 141.21 percent respectively. In the remaining 23 wards the spatio-temporal changes ranges between 08.68 to 99.49 percent.

There is a found a high variation in spatio temporal changes in the Nandurbar city population density. The researcher observed that due to modernization, Industrialization and Globalization the death rate in wards rapidly declined. Hence population increased in tremendous proportion, as well as the density of population in urban areas as affected. Not only the population density in ward wise has changed but the region's over density has also changed.

Conclusion

The concepts of population distribution and density are so closely related to each other that it would be appropriate to discuss them together though the two concepts are different. Population distribution is based on location while density is a ratio. Population distribution denotes the spatial pattern due to dispersal of population, formation of agglomeration, linear spread etc. Even in tribal areas density of population also increased. The distribution and density of population are very high in the centre and core while the distribution and density get decreased towards the peripherals zone. In the clearly observed that because of the growth of urbanization the average density of Nandurbar is constantly increasing year after year. There uniformity regarding distribution of population throughout the city. In general population is concentrated more in central part whereas scattered population is found in the area of periphery of the city.

References

1. Census of India, District Census Handbook Nandurbar District; c1951 to 2011.
2. Ghosh BN. 'Fundamentals of Population Geography', Sterling Publishers Pvt. Ltd, New Delhi; c1985. p. 28.
3. Sita K. 'Spatial Pattern of Scheduled Caste Tribes in Maharashtra', the Geographer. 1986;37(1):53-59.
4. Krishan G. Distribution and Density of Population in Upper Bari Doab, Punjab (India), National Geographer. 1971;6(1):31-36.
5. Sawant SB, Athawale AS. Population Geography, Metha Publishing House, Pune; c1994. p. 37-40.
6. Rai S. Pattern of Population Density in an Indian City, National Geographical Journal of India. 1996;42(3&4):237-247.