Changing Pattern of Population Density in Ratanagiri District (1991-2011)

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Abstract: *Population density is that the average number of individuals per square kilometer. Its way of measuring population in district and shows where a geographic area is sparsely or densely populated. Density of population helps us an understanding nature of distribution of population. It's useful in several other ways. It also becomes easier to understand possibilities for development for a neighborhood. It indicates nature of balance between population of the region and its natural resources. This study is predicated on the secondary sources data mainly collected from District Census Handbooks and Socio- Economic Abstract. The period from 1991-2011 is chosen for the observation of variations in population density within the study area. Various statistical techniques are used for this study. Prepared maps by using ArcMAP GIS software (Version)*

Keywords: Population, Arithmetic density of population, ArcMAP GIS Software

1. Introduction

The term density of population was employed by Henry in 1837, while preparing railway map. One among the important indices of population concentration within the density of population. The density of population is often defined as a ratio between population and area. It's expressed in terms of persons per square miles. This is often used as an indicator to live of concentration of population while calculating density total population taken as numerator while total area is taken as denominator. Study of density of population helps in understanding the characteristics and extends of population over a specific area. It's helpful for implementation of development schemes associated with agriculture, health, education, trade and transport network etc. if density of population is quite caring capacity of the region; it's called as over population and such situation encourage migration. This view in mind density of population studied within the Ratnagiri district.

2. Study Area

Ratnagiri district is located in the Konkan region of Maharashtra. Ratnagiri district lies between 150 36' north to 180 5' north latitude and between 730 5' east to 740 36' east longitude. It is located in konkan region. The total area of Ratnagiri district is 8208 km2. To the west of the district is Arabian Sea to the east is Satara, Sangali and Kolhapur to the south lies Sindhudurg and to the north lies Raigad district. In the eastern part of Sahyadri Mountain ranges are present which about 180 km is and it possesses coastline of about 167 km. There are nine tehsils places in the distractive Ratnagiri, Chiplun, Khed, Sangmeshwar, Dapoli, Mandangad, Guhagar, Rajapur and Lanja.
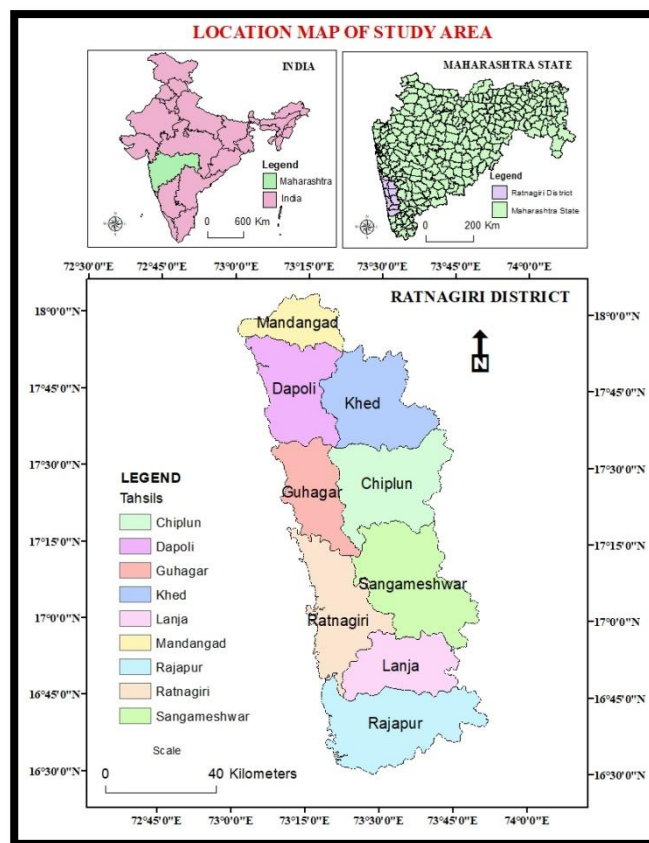

Figure 1

3. Objectives

The present study has been undertaken with the subsequent specific objectives.
1) To Study the population Density of Ratnagiri district comparatively from 1981 to 2001 census.
2) To review the arithmetic density of population within the district.
3) To seek out the decadal variation of population within the study area.

4. Database and Methodology

The present study is predicated on the secondary sources data mainly collected from District Census Handbooks and Socio- Economic Abstract. The amount from 1991-2011 is chosen for the observation of variations in population density within the study area. Population density may be a measurement of the amount of individuals in a neighborhood. It's a mean number population density is calculated by dividing the amount of individuals by area. Various statistical techniques are used for these calculations.

The info was tabulated analyzed and represented within the sort of cartographic, statistical diagrams and maps. Prepared maps by using ArcMAP GIS software (Version). Population density is calculated using the subsequent formula.

$$\text{Population density/ Arithmetic density} = \frac{\text{Total Population}}{\text{Total Geographic Area}} \times 100$$
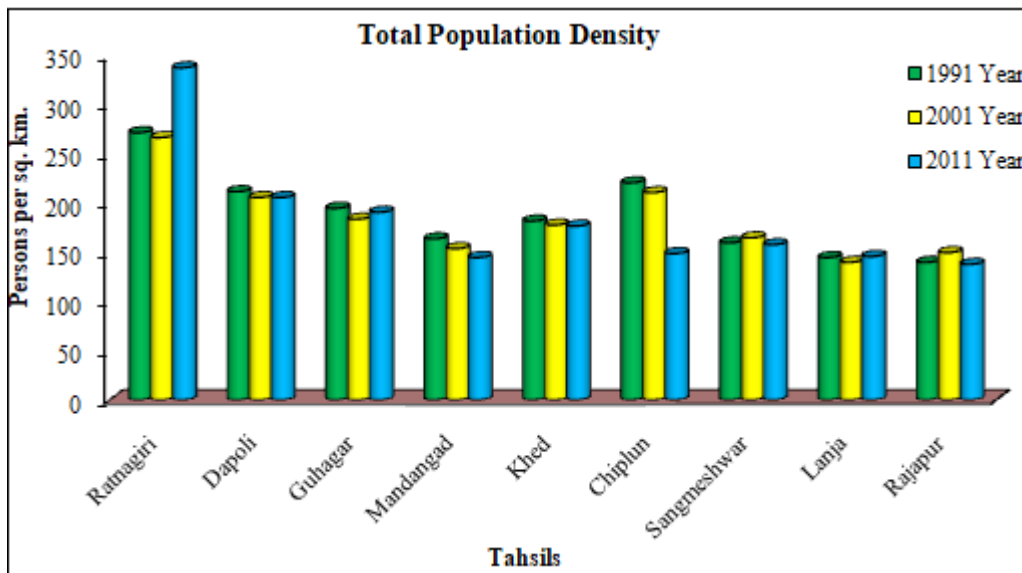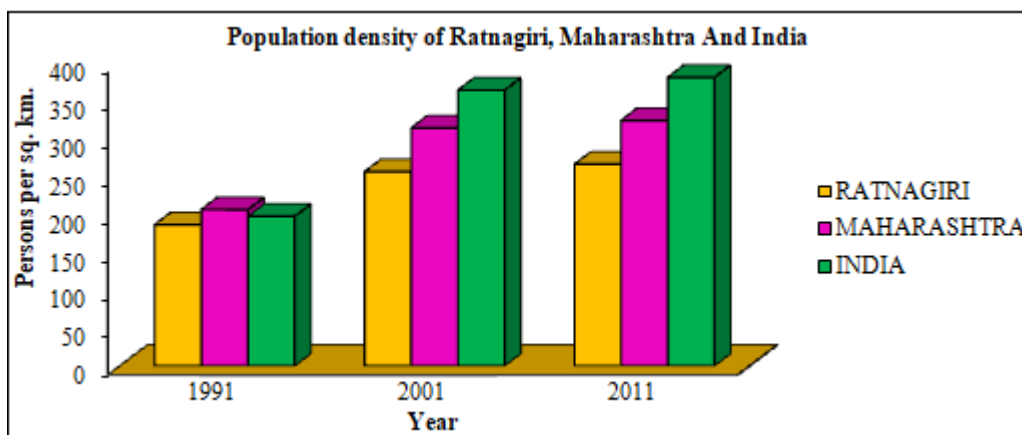
5. Discussion and Result

Figure 2

Figure 3

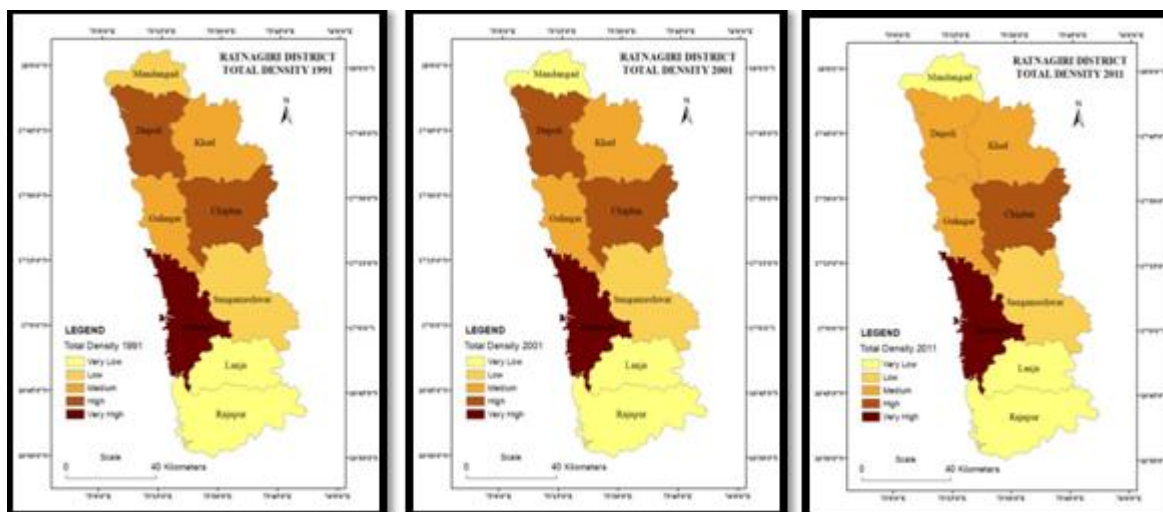**Table 1:** Arithmetic Population Density (Person Sq. Km.) in 1991, 2001 and 2011

Tahsil	Population			Area Sq. Km.	Population Density		
	1991	2001	2011		1991	2001	2011
Rural	195090	222641	212850	922.58	213	209	239
Urban	56529	79620	106599	13.28	5384	5389	4912
Ratnagiri	**251619**	**302261**	**319449**	**935.79**	**272**	**267**	**338**
Rural	157153	177567	144084	839.40	190	185	207
Urban	22131	15863	34256	21.57	1183	1182	2173
Dapoli	**179284**	**193430**	**178340**	**860.97**	**212**	**206**	**206**
Rural	122135	139052	121588	642.92	195	184	217
Urban	-	3207	1621	3.74	-	857	433
Guhagar	**122135**	**142259**	**123209**	**646.66**	**195**	**184**	**191**
Rural	68198	70593	62123	428.42	164	154	165
Mandangad	**68198**	**70593**	**62123**	**428.42**	**164**	**154**	**145**
Rural	170647	180702	164723	1022.43	171	167	176

Urban	11288	13813	16892	2.01	5644	3517	4303
Khed	**181935**	**194515**	**181615**	**1026.45**	**182**	**178**	**177**
Rural	210418	224150	211586	1098.64	194	182	204
Urban	38286	56931	67536	6.60	890	2036	2657
Chiplun	**248704**	**281081**	**279122**	**1105.24**	**221**	**211**	**249**
Rural	206530	214819	185654	1242.80	160	165	158
Urban	-	-	12689	16.59	-	-	765
Sangmeshwar	**206530**	**214819**	**198343**	**1259.39**	**160**	**165**	**158**
Rural	106211	100877	92609	715.97	145	140	141
Urban	-	12276	14377	17.10	-	718	841
Lanja	**106211**	**113153**	**106986**	**733.07**	**145**	**140**	**146**
Rural	169619	174167	156129	1192	134	143	146
Urban	9822	10499	9753	6.19	1584	1587	1693
Rajapur	**179441**	**184666**	**165882**	**1204.38**	**140**	**150**	**138**
District Rural	1406001	1504568	1351346	8089.83	174	170	185
District Urban	138056	192209	263723	118.17	1631	1523	1910
District Total	**1544057**	**1696777**	**1615069**	**8208.00**	**187**	**207**	**198**

Source: Density computed by Researcher. (Population and Area of Tahsil as per Census Record)

The present study reveals that in 1991, Population density of Ratnagiri district as a whole was 187 persons per sq.km. In rural areas, density was 174 whereas in urban centres the average population density was 1631 persons per sq.km. By the year 2011, the population density of district increased up to 198 persons per sq.km[2]. As per the census, population density of Ratnagiri and Chiplun tahsil was increased from 272 and 221 in 1991 to 338 and 249 persons per sq.km. in 2011. In Dapoli, Mandangad and Khed tehsils as a whole population density was 212, 164 and 182 persons per sq.km. in 1991. By the year 2011, it decreased up to 206, 145 and 177 respectively in 2011. And fluctuations of population density in remaining tahsils namely Guhagar, Sangameshwar and Rajapur tahsil. Rural population density of Ratnagiri tahsil increased up to 239 persons per sq.km. but decreased up to 4912 persons per sq.km. in urban areas.

In Dapoli, Guhagar, Mandangad, Khed, Chiplun and Rajapur tahsils population density was 190, 195, 164, 171, 194 and 134 persons per sq.km. in the year 1991. By the year 2011, it increased up to 207, 217, 165, 176, 204 and 146 respectively in 2011. And population density of Sangmeshwar and Lanja tahsils was 160 and 145 persons per sq.km. in 1991 but it decreased up to 158 and 141 persons per sq.km. respectively in 2011. During the year 1991, urban population density of Dapoli, Chiplun and Rajapur tahsails was 1183, 890 and 1584 persons per sq.km. it increased up to 2173, 2657 and 1693 persons per sq.km. respectively in 2011. Urban population density of Khed tahsil was 5644 persons per sq.km. in 1991. It decreased up to 4303 persons per sq.km. in 2011.
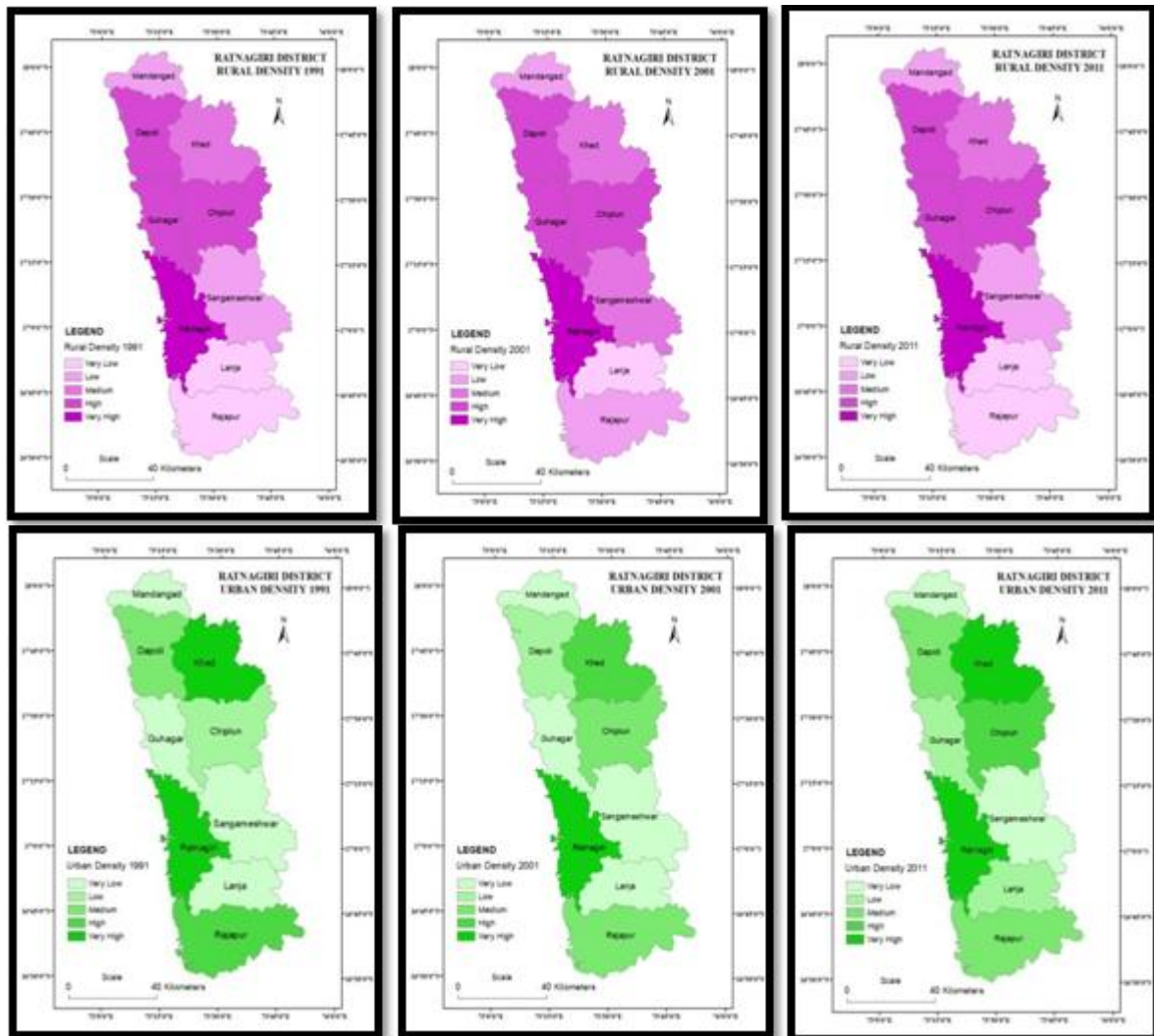
Figure 4

6. Conclusions

On the basis of above discussion and result it can be concluded that population density of Ratnagiri district is constantly changing. It is observed in Dapoli, Mandangad and Khed tahsils average population density is continuously decreasing from 1991 to 2011 except Ratnagiri and Chiplun tahsils, but fluctuations of population density in remaining tahsils namely Guhagar, Sangameshwar and Rajapur tahsil. As per the census, average population density of Ratnagiri and Chiplun tahsils was increased by 66 and 28 persons per sq.km. from 1991 to 2011. During 1991 to 2011, the density of population in urban regions of all tahsil was increased except Ratnagiri and Khed tahsil. Urban population density of Ratnagiri and Khed tahsils was decreased by 472 and 1341 persons per sq.km. respectively. It is noted that, the density of population most of the tahsil in rural areas is increasing from 1991 to 2011.

In overall, Ratnagiri tahsil is the most thickly populated because development of industries and other services while Rajapur tahsil is having least density. Dapoli and Chiplun are the tahsils which have density more than the average density of the district. As per comparative chart (Fig.3), the density of population in the Ratnagiri district is in decreased as compare to the state and country.

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