



Changing pattern of population density in Tumkur district, Karnataka

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Abstract: The term density is related to population size and the land area with a view to assessing the pressure of population upon the resources of the area. Thus, it is a measure of the incidence of population concentration and is generally expressed in terms of persons/km² of land area. The population density of Tumkur district during the census periods of 1991, 2001, and 2011 was 218, 247 and 256 respectively an analysis has been done for the year 1991 - 2011. The concentration of population per unit area has increased over the three decades. The density of population is more near the city region. The present paper explained about population densities and its changes from 1991 to 2011 of Tumkur district.

Key Words: Census of India 2011, Density of Population. Changing pattern, & Tumkur district

Introduction

Population density is the concentration of individuals within a species in a specific geographic locale. Population density data can be used to quantify demographic information and to assess relationships among ecosystems, human health and infrastructure.

A population is a subgroup of individuals within the same species that are living and breeding within a geographic area. The number of individuals living within that specific location determines the population density, or the number of individuals divided by the size of the area. In the case of humans, population density is often described as the number of people per square kilometer (or per square mile) and is discussed in relation to urbanization, migration and demographics. Globally, statistics related to population density are tracked by the United Nations Statistics Division. Many countries also collect their own data on population density, often through the use of a census. In the United States, for example, the Constitution requires population data to be collected every 10 years, a task carried out by the U.S. Census Bureau. China also conducts a census once a decade and uses the information for economic and social planning. In recent years, some countries have employed new technologies to confirm population density and predict changes. China, for example, analyzes nighttime light data collected from sensors in space to confirm current population density calculations and to predict how density will change in coming years. Other countries use computer algorithms to interpret census data and forecast future growth.

Study Area

Tumkur district is situated between 12° 45' and 14° 20' North latitudes and 76° 20' and 77° 31' East longitudes. The district has irregular shapes with peculiar features. The North Eastern part of the district is totally detached from the remaining part of the district. This place named Pavagada taluk and surrounded by the Andrapradesh, western part of this taluk with very short stretch to touches the Chitradurga district. The district is bounded on the north by Annantpur district by Andrapradesh, on the south by Mandya district on the east by Chikkaballapur, Bangalore rural and Ramanagara district and west bounded by Hassan and Chitradurga district of Karnataka state. The Midwest part of the district too touches Chikkamagalur district. The district has an area of 10,597 km², accounts 5.5% of the total geographical area of the Karnataka state.

Objectives

The main objective of present paper is to comprehend the density of population in Tumkur district across various taluks.

Methodology

Density of population is an indicator of population concentration and it gives some indications about the extent of population pressure. A number of social and economic and spatial processes like industrialization, urbanization and regionalization are linked with the density of population in the study area. The Population density refers to the number of people that are living per unit of area. The density of population is calculated as, the total population that is divided by the total land area.

$$\text{Population Density} = \frac{\text{Number of people}}{\text{Land area (Sq}^2\text{ km)}}$$

Source of data

The Census 2011 is the primary and most reliable source of data for the present study. Acknowledging any limitations of the census data itself (Undercounting in certain regions or specific periods, changes in methodology over time, impact of historical events like famines or political unrest on data collection).

Discussion

Taluku Wise Density of Population in Tumkur District (1991-2011)

Sl. No	Taluk	Density (Persons/km ²)			Decadal change of Density	
		1991	2001	2011	1991-01	2001-11
1	Chikkanayaka nahalli	174	190	193	16	2
2	Gubbi	190	211	216	21	5
3	Koratagere	223	247	257	24	10
4	Kunigal	240	242	232	2	-11
5	Madhugiri	217	236	238	19	2
6	Pavagada	157	181	180	24	-1
7	Sira	165	196	204	31	8
8	Tiptur	249	280	288	31	7
9	Tumkur	415	538	617	123	79
10	Turuvekere	212	226	219	14	-7
	District	218	247	256	29	9

Source: Census of India 1991, 2001 and 2011

Population density of Tumkur district was 218 persons per km² in 1991, and it has increased to 256 persons per km² in 2011. Population density of Tumkur district varies at Spatio-temporal level also. Density of population varies significantly at taluk level. With the impact of better urbanization and having district head quarter, Tumkur taluk has highest density of population among the all the taluks of the district till the last census year. During 2001 amongst the taluks, Tumkur has the highest density of 538 persons per km², followed by Tiptur with 280 persons per km²; rest of the taluk had lower density than the district average density of population i.e. 256 persons per km². Least density was recorded with 181 persons in Pavagada taluk, which is located in the northern portion of the district where rain fall is scanty and dry farming is predominant. According to 2011 census, the average population density of Tumkur district is 256 persons per km². Among the taluks, as mentioned earlier, Tumkur taluk has highest density of population with 617 persons, followed by Tiptur taluk with 288 persons per km², which has strong agricultural base. The least density is 180 persons per km² exhibits by Pavagada taluk. Rest of the taluks have the population density below district average. Tumkur taluk has better of urbanization & industrialization and also a large number of educational institutions. In general, much of the district has dry land; utilization of underground water has led to the development of agriculture and dairying. Along with these general factors the nearness of Tumkur City to the fast growing Bangalore Metropolitan too has influenced the rise of population density.

Taluks Wise Density of Population in Rural & Urban area of Tumkur District 2001-2011

Sl No	Taluk	Rural Density (Persons/km ²)		Urban Density (Persons/km ²)		Decadal change 2001-2011	
		2001	2011	2001	2011	Rural	Urban
1	Chikkanayakanahalli	170	159	2292	3839	-11	1548
2	Gubbi	197	200	3837	4211	4	375
3	Koratagere	226	234	11379	12721	8	1342
4	Kunigal	211	197	5342	6013	-14	671
5	Madhugiri	213	212	3288	3645	-1	357
6	Pavagada	160	159	4272	4336	-1	64
7	Sira	163	167	3859	4434	3	575
8	Tiptur	212	211	5171	5798	-1	627
9	Tumkur	279	302	3873	4701	23	828
10	Turuvekere	203	197	3489	3350	-6	-139
District		198	199	3958	4675	1	717

Source: Census of India 2001 and 2011

The density of population in the rural area of Tumkur district is around 199 persons / km². At taluk level the density is varies considerably. With the influence of urban, Tumkur taluk has highest rural density with 302 persons / km², Pavagada and Chikkanayakanahalli both the taluks have least rural density with 159 persons / km², due to the dry land and comparatively larger area. Between the last two census years among the taluks, the rural density is increased at highest about 23 persons in the rural area of the Tumkur taluk followed by Koratagere, Gubbi and Sira taluk with 6, 4 & 3 persons respectively. Rest of the taluks reduces their rural density. Rural to urban migration may be the reason for the decline in rural density. Better infrastructural facilities and comparatively better employment opportunities of the urban areas attract the people from the surrounding rural areas. As a result population density of urban areas increases rapidly rather than the rural areas. The population density in the urban area of Tumkur district is about 4675 persons / km² as per 2011 census. At taluk level, the population density in urban areas of the district varies significantly. Due to the smaller urban area and nearness to the district head quarter urban area of Koratagere taluk has the highest population density with 12721 persons / km², with the strong agricultural base, urban area of Kunigal & Tiptur taluks have the second and third highest urban population density with 6013 and 5798 persons / km² respectively, followed by the urban area of district head quarter i.e. Tumkur taluk has the fourth highest urban population density with 4701 persons / km². Rest of the taluks in the district have below the district average urban population density, of Turuvekere taluk has least urban population density with 3350 persons / km². Between the 2001 and 2011 census years, among the taluks, the urban population density is increased about 717 persons in the district. Highest urban population density increased in Chikkanayakanahalli taluk about 1548 persons / km², due to the nearest big villages submerged into urban area and added one more municipal town, followed by Koratagere taluk (table 2.17). Turuvekere taluks reduces its urban population density, due to the decrease of overall population.

The table explains about the classification of villages based on the density of population during 2001. At the same time, the population density of Tumkur district was about 244 persons / km², population density of Karnataka state was about 276 persons/km², and India had the population density about 324 persons/ km². According to 2001 census, Tumkur district had 2574 villages. Out of 2574 villages about 1068 villages accounts 41.5 % have more than district average population density, 946 villages (36.8%) have the population density more than state average and about 828 villages accounts 32% have more than national average population density. Among the ten taluks, Tumkur taluk has more number of populous villages due to the influence of urbanization, followed by Madhugiri taluk. Development of infrastructure causes to increase the population density at village level.

Village wise Density of Population in Tumkur District-2001

Sl. No	Taluk	Total Villages	Number of Villages have the Density above the average					
			District Density 244 Persons/km ²		State Density 276 Persons/km ²		Density of India 324 Persons/km ²	
			Villages	%	Villages	%	Villages	%
1	Chikkanayakanahalli	221	73	33.0	60	27.1	43	19.5
2	Gubbi	328	141	43.0	123	37.5	113	34.5
3	Koratagere	236	95	40.3	84	35.6	77	32.6
4	Kunigal	294	125	42.5	111	37.8	99	33.7
5	Madhugiri	298	132	44.3	124	41.6	113	37.9
6	Pavagada	145	50	34.5	43	29.7	38	26.2
7	Sira	235	85	36.2	76	32.3	63	26.8
8	Tiptur	227	97	42.7	84	37.0	75	33.0
9	Tumkur	358	177	49.4	162	45.3	141	39.4
10	Turuvekere	232	93	40.1	79	34.1	66	28.4
District		2574	1068	41.5	946	36.8	828	32.2

Source: Census of India 2001

Village wise Density of Population in Tumkur District- 2011

Sl. No	Taluk	Total Villages	Number of Villages have the Density above the average					
			District average 253		State average 319		India average 382	
			Villages	%	Villages	%	Villages	%
1	Chikkanayakanahalli	222	49	22.1	24	10.8	14	6.3
2	Gubbi	331	130	39.3	94	28.4	67	20.2
3	Koratagere	235	93	39.6	62	26.4	38	16.2
4	Kunigal	294	89	30.3	59	20.1	40	13.6
5	Madhugiri	302	120	39.7	84	27.8	61	20.2
6	Pavagada	149	34	22.8	14	9.4	9	6.0
7	Sira	234	65	27.8	35	15.0	24	10.3
8	Tiptur	225	80	35.6	42	18.7	27	12.0
9	Tumkur	357	187	52.4	139	38.9	98	27.5
10	Turuvekere	233	69	29.6	35	15.0	25	10.7
District		2582	916	35.5	588	22.8	403	15.6

Source: Census of India 2011

According to 2011 census Tumkur district has 2582 villages; these villages were classified into 3 groups based on the population density viz. 1. Villages have more population density than the district average, 2. Villages have more population density than the state average, and 3. Villages have more population density than the National average. As per 2011 census Tumkur district has the population density about 253 persons / km², population density of Karnataka state is about 319 persons / km², and India has the population density about 382 persons / km². Out of 2582 villages of Tumkur district, about 916 villages accounts 35.5 % have more than district average population density, 588 villages (22.8%) have the population density more than state average and only 403 villages accounts 15.6 % have more than national average density of population. Among the ten taluks, more than 50 % villages of Tumkur taluk have high density of population than the district average, due to the influence of urbanization, followed by Madhugiri and Koratagere taluk with 39% villages each. Development of infrastructure causes to increase the population density at village level.

Conclusion

India is a populous country, making its demographic trends globally significant. Population size, growth, distribution, density and composition have profound implications for India's economic development, resource allocation, environmental sustainability and social well-being. Understanding these trends is crucial for effective

policymaking.

Implications of Density: Population density has significant implications for resource allocation, infrastructure development (housing, transport, and sanitation), environmental impact and strain on public services, while low density areas may face challenges related to connectivity and access to services.

Implications

* Demographic Transition: The India's ongoing demographic transition, where different states are at various stages of moving from high birth and death rates to low birth and death rates.

* Policy Challenges: The disparities in growth rates pose significant challenges for policy-making. States with high growth rates need to focus on education. Conversely, states with low growth might face challenges related to an aging population and labour force availability in the long run.

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