A Study of Population Growth and Density in Aurangabad City

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Introduction:

The population growth refers to the growth of human population in a particular area during a specific period of time. The growth may be positive or negative. It can be measured either in terms of percentage or in absolute numbers. Density of population refers to the average number of inhabitants living within a specified unit of area. In other words, population density can be defined as a ratio between population and area. Thus, it indicates man-land ratio. Generally, it is expressed in terms of persons per square kilometre or persons per square mile area. Study of population growth and densities helps in understanding the nature, characteristics and extent of population over a particular area. It is helpful for implementation of development schemes related to residence, health, education, trade, transportation network, agriculture, etc. Thus, the knowledge of population growth and density can play an important role in better urban planning.
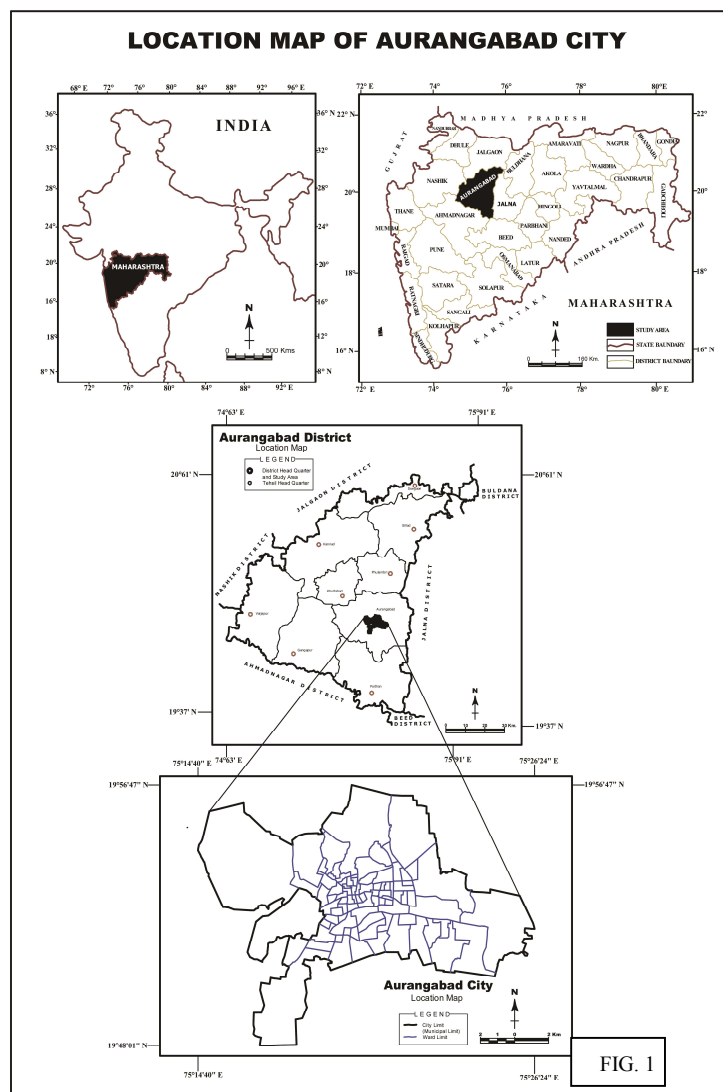
Study Area:

For the present study Aurangabad city has been selected as a study region. The selection of study region is not arbitrary. In recent decades, the city witnessed rapid growth of population. In the city, landuse is changing rapidly and land values also increasing at fast rate. It can be considered as a representative of million cities of the nation. Besides, researcher is familiar with the study region and also there is a close attachment with it. All these considerations motivated the researcher to undertake the present study.

Aurangabad is the largest urban centre of Marathwada region of Maharashtra state. It is headquarter of Aurangabad district and divisional headquarter of Marathwada region. It is an ancient and historical city of the Marathwada Region. Now days it is an important industrial centre and tourist place of the state. It is also recognised as million plus city. In population it ranks 38th in the country. According to 2011 Census, the population of the city is 11,75,116 persons with the density of about 8,485 persons per sq.km.

Aurangabad sits in a strategic position on the Maharashtra Plateau. The city is situated at the foot hills of Ajanta. It is surrounded by many hillocks. It is located on the bank of River Kham, a tributary of Dudhana which meet to Godavari. The average elevation of Aurangabad city is 555.04 metres above the mean sea level. Total area occupied by corporation limits of Aurangabad city is about 138.5 sq. km. The city area lies between 19° 48' 1"N to 19° 56' 47"N latitude and 75° 14' 40"E to 75° 26' 24"E longitude (Figure 1).

The Aurangabad Municipal Council was formed in 1936. In the year 1971 the geographical area of the town was 64.41 sq. km. On 3rd December 1982 the council was converted into a Municipal Corporation and 18 nearby villages were included in the city and area of the city extended up to 138.5 sq. km. Aurangabad was Asia's one of the fastest growing city during the decade of 80s and 90s due to development of industrial area.

FIG. 1

The city has many attractions such as Bibi Ka Makbara, The Panchakki, Soneri Mahal, etc. Aurangabad is also a centre of education in Marathwada region. Marathwada University was established in Aurangabad in 1958. Many educational institutions have come up in the neighbourhood of university. This has caused the development of the new housing societies.

Aurangabad is well connected with Mumbai, the state capital, Delhi, the national capital and other important places by air, rail and road. The city is located on Hyderabad – Manmad - Mumbai railway line. After to conversion of meter gauge into broad gauge railway line, the city is well linked with the major cities in India.

Aims and Objectives:

The main aim of the present study is to analyse the urban growth and population density. To achieve this aim, the following specific objectives are kept in mind:

i)   To know the population growth of the study region.

ii)   To study the population density of the city.

Database and Research Methodology:

A] Literature Survey:

The available literature on the topic of research has been scanned from various libraries, research institutes, journals and internet.

B] Data Collection:

For this study the secondary data are used for the present research work. Base map of the city and ward-wise maps were obtained from the Survey of India, Municipal Corporation and Town Planning office. Geographical, historical and socio-economic information about the city have been collected from government and non-government published literature.

The population data have been collected from District Census Handbook of India 1961, 1971, 1981, 1991, 2001 (CD-ROM) and 2011 (CD-ROM) and Provisional Population Totals, Census of India website and also from Municipal Corporation Office.

C] Data Analysis:

The data collected from secondary sources are processed by adopting appropriate methods and statistical techniques to investigate various aspects. The details regarding the various scientific methods and techniques have been discussed in the text at appropriate place.

The obtained results are given in the form of tables and maps. Appropriate cartographic techniques are employed to support the analysis.

A) POPULATION GROWTH IN AURANGABAD CITY:

The population growth of Aurangabad city since 1901 is given in the form of absolute numbers and also in terms of percent (Table 1). The decadal growth rates are depicted in Fig. 1. Actual rate of population growth for each decade is calculated with the help of following formula:

$$Ar = \frac{Pn - Po}{Po} \times 100$$

Where,

Ar = Actual rate of population growth
Pn= Current year population
Po= Base year population

Table No. 1: Population Growth of Aurangabad City

Census Year	Population	Absolute Change	Growth Rate
1901	36,837	--	--
1911	34,902	-1,935	-5.30%
1921	36,876	1,974	5.70%
1931	36,870	-6	0.00%
1941	41,644	4,774	42.19%
1951	57,949	16,305	39.15%
1961	87,579	29,630	51.13%
1971	150,483	62,904	71.83%
1981	298,937	148,454	98.65%
1991	573,272	274,335	91.71%
2001	873,311	300,039	57.33%
2011	1,171,116	298,019	34.12%

Study reveals that the population of Aurangabad is increasing rapidly since 1941. In 1901, the population of Aurangabad was only 36,837. By the year 2011 it increased up to 1,171,116 and recognized as a 'Million City'. It ranks 38th million city of the country and 5th in the state. Aurangabad was Asia's one of the fastest growing city during the decade 80s and 90s due to development of industrial area. The growth rate was highest in 1981 at 98.65%.
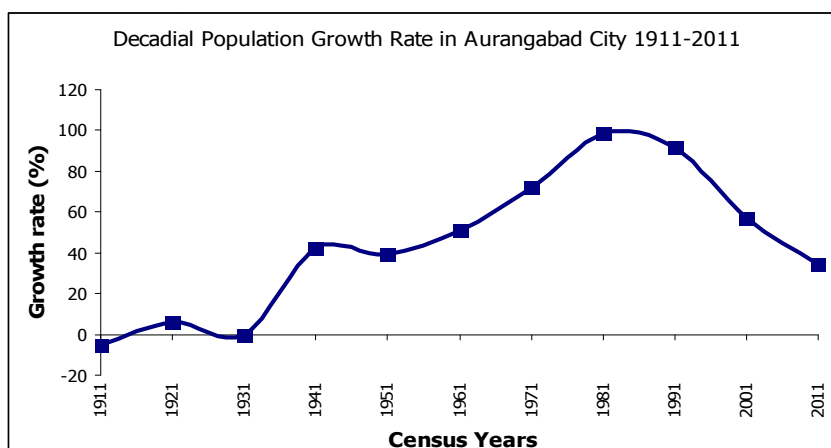
Fig. 2

       Table 1 indicates that, in 1901 the population of Aurangabad City was 36,837. It recorded negative change in the decade 1901 to 1911 and almost remained stable during the decade 1921 to 1931 mainly due to frequently occurring famines and epidemic diseases such as plague and influenza. Since 1941, the population of Aurangabad city is continuously increasing with fluctuating decadal growth rates **(Fig. 2).** The Aurangabad municipal came into existence in the year 1936. At that time, the nearby settlements were merged into the municipal limits. As a result, in the decade 1931 to 1941 population increased by 42.19 percent. In the succeeding decade, i.e. from 1941 to 1951, many people migrated to another area in search of job. Therefore, in this decade the population was increased only by 39.1 percent. After 1951, the population of Aurangabad city increased very rapidly up to 1991. The decade 1971 to 1981 witnessed highest growth rate of 98.65 percent followed by next decade with 91.71 percent. It is noteworthy to mention that Aurangabad was Asia's one of the fastest growing city during the decade of 80s and 90s due to development of industrial area. Now a day, it is an important industrial centre and tourist place of the state. After 1991 the population growth rate declined rapidly. During the decade 1991 to 2001, population of the study region increased by about 57.33 percent. In the last decade (2001 to 2011) growth rate further decreased upto 34.12 percent and as per 2011 census, population of the city is about 11,71,330.

Population growth of Aurangabad city occurred due to natural growth and migration from outside particularly in search of job. There appears to be a floating population of seasonal workers, skilled and unskilled construction and factory workers from the district as well as from outside the district.

  B) DENSITY OF POPULATION:

      The problem of urban population densities has long been a thorny one for city planners (Ludlow, 1966). Population density is one of the basic element of urban form as the size, structure or age of the cities are often expressed in urban growth has its influence on urban density. The population density greatly affect on the urban landuse and land values. Therefore, this section deals with the analysis of population density in Aurangabad city. The density is computed by using following formula.

        Total Population

        Population Density = ----------------------------------

                      Total Geographical Area

      Average population density of Aurangabad city for the census years 1961 to 2001 are computed and reported in **table 2.**

Table 2: Average Population Density of Aurangabad City.

Census Year	Total Population	Area in Hectares	Population Density (Persons per hectare)
1961	87579	4079	21
1971	150483	4079	37
1981	284607	5420	53
1991	573272	13850	41
2001	873311	13850	63
2011	1175116	13850	85

Source: Density Computed by Researcher.

It is clear from **table No. 2** that the average density of population in Aurangabad city was 21 souls per hectare of land in 1961. It increased up to 37 and 53 persons per hectare by the year 1971 and 1981 respectively. In 1982 the council was converted into a Municipal Corporation and 18 nearby villages were included in the city and area of the city extended up to 13850 hectares. Consequently, the population density decreased in succeeding census year 1991 as compared to population density in 1981. During the year 1991, the density was 41 persons per hectare. By the year 2001, the population density again increased up to 63. In 2011, population density further increased up to 85 persons per hectare due to development of service sector, educational facilities and industries.

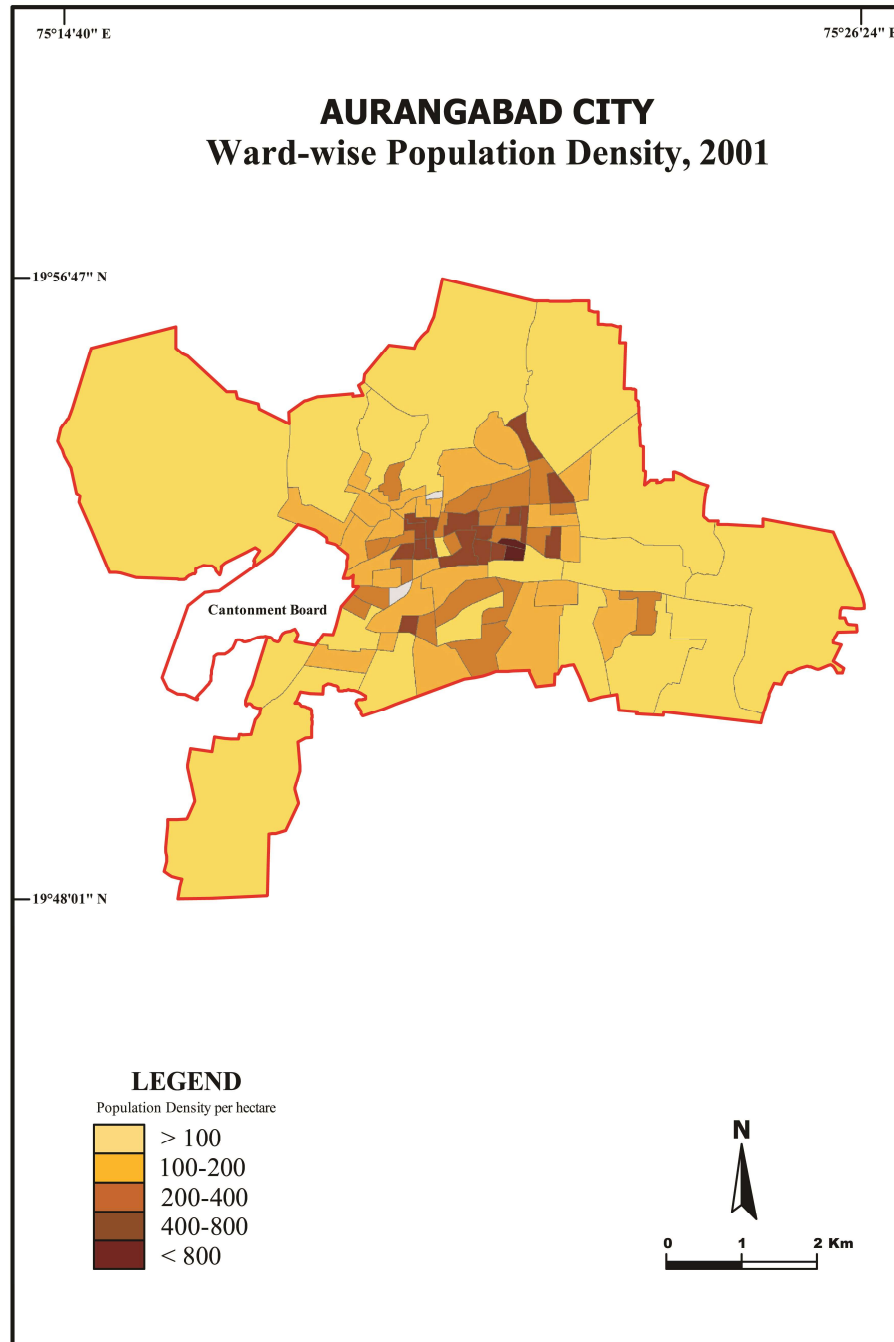**Ward-Wise Population Density in 2001:**

Population densities observed in different wards of Aurangabad city during the year 2001 are mentioned in **table No.3** and depicted in **figure 3.** The highest density of 1,472 persons per hectare was noticed in ward No. 74. On the other hand, very low density of population i.e. only 4 persons per hectare of land was found in ward No. 1. While studying the spatial variations in population densities within the Aurangabad city during the year 2001 **(Fig. 3)**, it is noticed that in two out of 83 wards the population density was very high i.e. above 800 persons per hectare of land. These are ward No. 55 and 74. The density between 400 to 800 persons per hectare found in seventeen wards, (Ward No. 25, 72, 79, 69, 77, 73, 57, 80, 76, 83, 81, 56, 45, 62, 52, 48 and 82) with highest of 689 in ward No. 79 and lowest of 411 in ward No. 82. The wards having high to very high population densities are mainly located in old city area. Total twenty one wards have recorded the density between 200 to 400 persons per hectare with highest of 388 in ward No. 49 and lowest of 201 in ward No. 47. Twenty five wards have reported the population density between 100 to 200 persons per hectare. Remaining eighteen wards have reported the density of below 100 persons per hectare. Among them, in six wards (Ward No. 1, 2, 5, 9, 10 and 28), the density was even less than 25 persons per hectare.
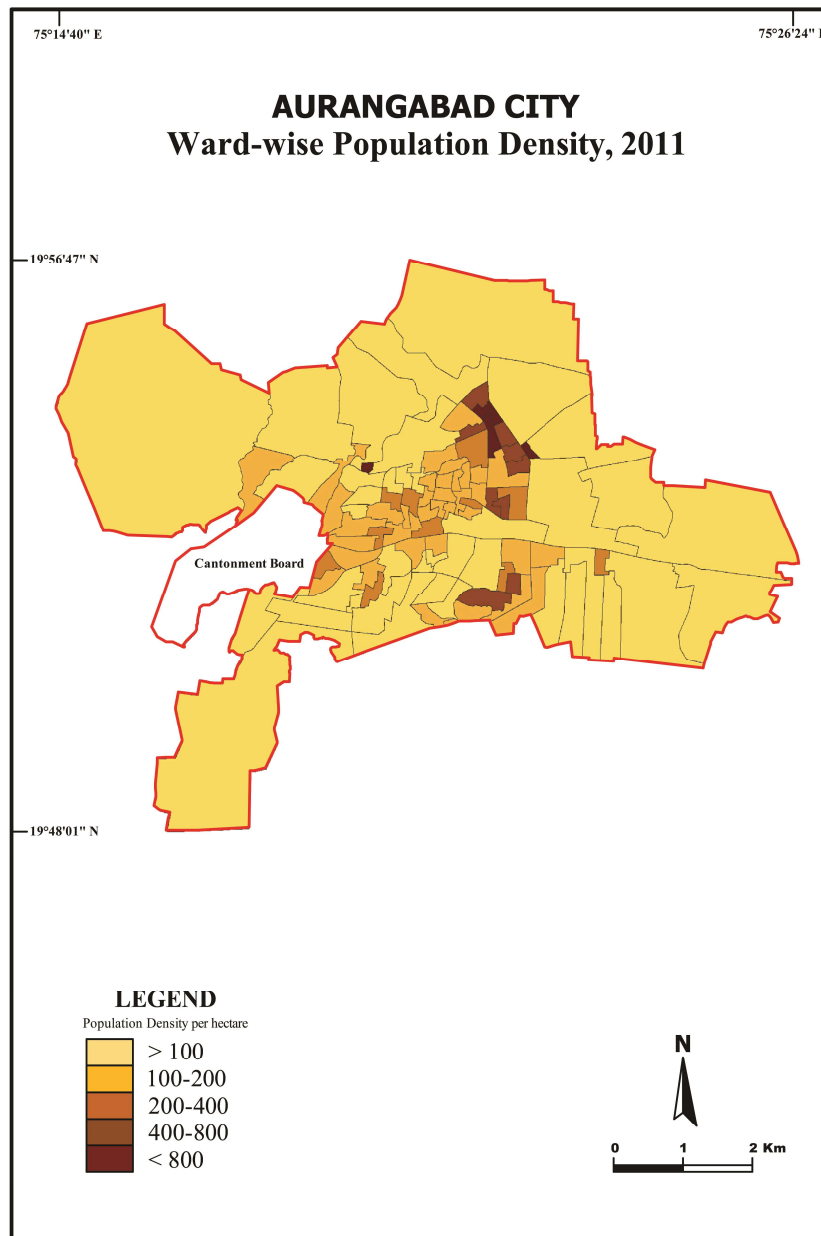
Ward-Wise Population Density in 2011

Population densities in different wards of Aurangabad city during the year 2011 are mentioned in table 4.5 and depicted in **Fig. 4.** It is observed that in 2011 population density of city increased (85 persons per hectare) as compared to density in 2001(63 persons per hectare), because of increase in population and area of the city remain unchanged. However, due to change in numbering and area of wards it became impossible to compare the ward-wise growth in population density. In 2011, the highest population density of 1184 persons per hectare density was noticed in ward No. 12. On the other hand, very low density of population i.e. only 15 persons per hectare of land was found in ward No. 8.

While studying the spatial variations in population densities within the Aurangabad city during the year 2011 **(Fig. 4)**, it is noticed that in 4 out of 99 wards the population density was very high, i.e., above 800 persons per hectare of land. These are ward 12, 16, 17 and 20. The density between 400 to 800 persons per hectare found in nine wards, (Ward No. 3, 15, 83, 19, 47, 18, 48, 25 and 84) with highest of 781 in ward No. 3 and lowest of

402 in ward No. 84. The wards having high to very high population densities are mainly located in old city area. Eleven wards have recorded the density between 200 to 400 persons per hectare with highest of 394 in ward No. 75 and lowest of 200 in ward No. 28. The population density in thirty five wards was between 100 to 200 persons per hectare. Remaining thirty nine wards have reported the density below 100 persons per hectare **(Fig. 4)**. Among them, in three wards, the density was even less than 25 persons per hectare. These are, ward No. 8, 6 and 24.

AURANGABAD CITY
Ward-wise Population Density, 2001

LEGEND

Population Density per hectare

> 100
100-200
200-400
400-800
< 800

AURANGABAD CITY
Ward-wise Population Density, 2011

LEGEND
Population Density per hectare
> 100
100-200
200-400
400-800
< 800

Conclusion:

i)   Study reveals that the population of Aurangabad is increasing rapidly since 1941. In 1901, the population of Aurangabad was only 36,837. By the year 2011 it increased up to 11,71,116 and recognized as a 'Million City'. It ranks 38th in million cities of the country and 5th in the state. Aurangabad was Asia's one of the fastest growing city during the decade 80s and 90s mainly due to the development of industrial area. The growth rate was highest in 1981 at 98.65%.

ii)   In 2011, the population of city was distributed in 99 wards. Among them, the ward No. 2 possessed maximum population whereas ward No. 84 have reported minimum population.

iii)   The average population density of Aurangabad city was 21 souls per hectares of land in 1961. It increased up to 53 by the year 1981. Thereafter, due to significant increase in geographical area of the city, the average density decreased up to 41 persons per hectare in 1991 and again increased up to 85 by the year 2011.

iv)   While studying ward-wise population density during 2011 it is found that the density was above 800 persons per hectare in four wards. On the other hand, in three wards the density was less than 25 persons per hectare.

Table 3: Ward-wise Population Density in Aurangabad City, 2001

Ward No.	Total Population	Area in Hectares	Population Density / Hectares	Ward No.	Total Population	Area in Hectares	Population Density / Hectares
1	11304	2894.80	4	43	6632	60.66	109
2	10506	597.88	18	44	11703	79.92	146
3	8067	295.12	27	45	15729	36.87	427
4	15938	458.70	35	46	26163	92.10	284
5	17159	1243.55	14	47	11847	58.91	201
6	9124	68.72	133	48	13747	33.21	414
7	19927	757.50	26	49	12875	33.22	388
8	12525	237.59	53	50	7793	49.89	156
9	12409	1059.26	12	51	7366	40.57	182
10	7713	478.13	16	52	11489	27.63	416
11	12136	335.98	36	53	8585	33.18	259
12	18887	92.13	205	54	7383	128.18	58
13	18390	147.17	125	55	14271	15.37	928
14	17340	201.84	86	56	6632	15.37	431
15	8353	63.85	131	57	15792	29.52	535
16	42791	222.50	192	58	9385	28.27	332
17	23995	66.43	361	59	5471	86.22	63
18	8762	34.39	255	60	4444	37.01	120
19	12471	36.92	338	61	7287	24.56	297
20	11276	177.70	63	62	6499	15.37	423
21	12171	67.76	180	63	7771	24.57	316
22	8726	36.94	236	64	7096	30.16	235
23	11017	61.33	180	65	9570	73.68	130
24	11020	61.35	180	66	7451	39.29	190
25	8501	15.36	553	67	6291	55.50	113
26	11206	67.52	166	68	7531	54.78	137
27	8682	247.04	35	69	7594	12.29	618
28	9717	1421.94	7	70	12590	44.32	284
29	9542	81.45	117	71	4869	15.28	319
30	12727	250.71	51	72	10595	15.37	689
31	9520	110.82	86	73	12559	22.14	567
32	7140	24.54	291	74	9050	6.15	1472
33	8212	33.78	243	75	8189	24.60	333
34	6822	43.14	158	76	8559	18.42	465
35	7596	60.79	125	77	8566	14.75	581
36	8740	55.26	158	78	4746	19.41	245
37	9843	61.48	160	79	6363	9.37	679
38	6896	58.87	117	80	7863	14.75	533
39	5971	34.36	174	81	4389	9.84	446
40	6813	55.39	123	82	7463	18.14	411
41	11267	36.87	306	83	3402	7.37	462
42	8509	36.93	230	City	873311	13850.00	63

Source: Census of India CD-Rom Volume 9 -2001

Table 4: Ward-wise Population density in Aurangabad City, 2011

Ward No.	Total Population	Area in Hectares	Population Density (Persons / Hectares)	Ward No.	Total Population	Area in Hectares	Population Density (Persons / Hectares)
1	24431	700.00	35	51	10524	60.00	175
2	31584	350.00	90	52	13139	58.00	227
3	10226	13.10	781	53	11231	65.00	173
4	21406	230.00	93	54	12270	70.00	175
5	15718	380.00	41	55	10019	54.00	186
6	7595	330.00	23	56	9696	68.00	143
7	17679	150.00	118	57	9973	72.00	139
8	22443	1500.00	15	58	10149	45.00	226
9	10928	150.00	73	59	8819	45.00	196

10	9408	50.00	188	60	8445	70.00	121
11	7866	88.00	89	61	9142	40.00	229
12	10656	9.00	1184	62	8448	75.00	113
13	10361	189.00	55	63	8559	50.00	171
14	10133	50.90	199	64	8521	120.00	71
15	8283	11.90	696	65	9226	80.00	115
16	9446	11.20	843	66	9975	125.00	80
17	9679	11.10	872	67	10660	125.00	85
18	9901	20.10	493	68	9677	80.00	121
19	9096	15.10	602	69	10258	108.00	95
20	9102	10.80	843	70	14816	163.00	91
21	23420	336.00	70	71	10308	43.00	240
22	12907	366.00	35	72	10667	100.00	107
23	14523	569.00	26	73	11012	100.00	110
24	9709	410.00	24	74	10892	160.00	68
25	9773	24.20	404	75	9848	25.00	394
26	10581	56.60	187	76	13305	175.00	76
27	11858	52.00	228	77	17934	310.00	58
28	11986	60.00	200	78	11117	440.00	25
29	13502	70.00	193	79	12766	158.00	81
30	8259	99.00	83	80	13357	145.00	92
31	10237	120.00	85	81	19930	120.00	166
32	11523	116.00	99	82	23641	210.00	113
33	10234	50.00	205	83	10347	17.00	609
34	10109	117.00	86	84	20089	50.00	402
35	9194	108.00	85	85	13310	170.00	78
36	10293	69.00	149	86	13639	110.00	124
37	8827	55.00	160	87	13378	150.00	89
38	7780	40.00	195	88	17921	220.00	81
39	10425	50.00	209	89	11038	215.00	51
40	8870	59.00	150	90	10426	60.00	174
41	9506	55.00	173	91	8078	30.00	269
42	11168	62.00	180	92	9297	110.00	85
43	8455	51.00	166	93	7307	189.00	39
44	12448	70.00	178	94	11326	70.00	162
45	11397	68.00	168	95	8809	40.00	220
46	10973	57.00	193	96	8822	150.00	59
47	10697	18.50	578	97	14313	160.00	89
48	8984	21.80	412	98	17694	715.00	25
49	11447	49.70	230	99	16272	108.00	151
50	9700	177.00	55	City	1175116	13850.00	85

Source: Census of India CD-Rom 2011

References:

Dubey, S.N. (2001), "Population of India", Authors Press, Delhi.

Estall R.C and Buchanan (1980): Industrial Activity and Economic Geography Hutchinson and Co. Ltd. London.

Firdos, Shaikh Sameena. "A Geographical Study of Tourist Centres in Aurangabad District." Online Available at www. cmrj.in

Hassan, M.I. (2005), "Population Geography", Rawat Publications, Jaipur.

Hoyt, H. (1939), "The Structure and Growth of Residential Neighbourhoods in American Cities". U.S. Govt. Planning Office, Washington D.C.

J. P. Singh (1976), "Pattern of Land-Use in Urban Area: A case study of Shillong", Indian Geographical Studies, R. B. No. 6, , pp. 25-32

Khan, G. A. (1941), "History of the City of Aurangabad." Transaction of IHC.

Konka, P.R. (2008), "Impact of Urbanization on Landuse and land Values in Jalna City of Maharashtra State" Unpublished M.Phil. Thesis, North Maharashtra University, Jalgaon.

Kulkarni, K.M. (1985), "Urban Structure and Interaction, A Study of Nasik City-Region", Concept Publishing Company, New Delhi.

Ludlow, W.H. (1966), "Measurement and Control of Population Densities", in Gibbs, J.P. (Ed) Urban Research Methods, D. Von Nostrand Co. Inc. Princeton, New Jersey, New York, p. 86.

Mandal, R.B. (2000), "Urban Geography- A Textbook" Concept Publishing Company, New Delhi.

Mayer, H.M. (1963), "Geography of Urbanism", Reading in Urban Geography, edited by Mayer, H.M. and Kohn, C.F. Chicago p. 7.

Mayhew, S. (2006), "Oxford Dictionary of Geography – Indian Edition", Oxford University Press, New Delhi.

Mishra, R.P. and Mishra, K. (ed.), "Million cities of India" Vol. I, II, New Delhi, 1988

Mohan, Rakesh, and Chandrashekhar Pant (1982), "Morphology of urbanisation in India: Some results from 1981 census." Economic and Political Weekly: 1579-1588.

Parodi, L. E. (1998), "The Bibi-ka Maqbara in Aurangabad." A Landmark of Mughal Power in the Deccan: 3-4.

Parodi, Laura E. (1998), "The Bibi-ka Maqbara in Aurangabad A Landmark of Mughal Power in the Deccan?." East and West 48.3/4: 349-383.

Pathy, T. V. (1978), "Ajanta, Ellora and Aurangabad Caves: An Appreciation", Marathwada Univiversity.

Premi, M.K., "Population of India-In the New Millennium: Census   2001",   National Book Trust, India (2006).

Sawant, S.B. (1978), "Poona: A Study in Urban Geography" Unpublished Ph.D. Thesis, University of Poona.

Sawant, S.B. and Athawale, A.S. (1994), "Population Geography" Mehta Publishing House.

Singh, U. (1966), "Allahabad: A Study in Urban Geography", Banaras Hindu University

Sinha, B.N. (1970), "Sirsi – An Urban Study in Application of Research Models", Karnataka University, Dharwar.

Sinha, V.N.P. (1976), "Chota Nagpur Plateau: A Study in Settlement Geography", K.B. Publication, Delhi p. 3.

Srivastava S.C. (2004), 'Studies in Demography', Anmol Publication, Delhi. Census of India : Census Centenary Publication No. 5, ORG Ministry of Home Affairs, New Delhi.

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