POPULATION GROWTH TREND AND DENSITY OF GADAG - BETAGERI TWIN CITIES: A GEOGRAPHICAL ANALYSIS

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Abstract
The number of people that live in agiven geographic region depends on the locational advantages and fertility, mortality and mobility factors. Population growth is the increase in the number of individuals in a population of a region, and the trend refers to changes over time including changes in ranging behaviour.Gadag-Betageri is a twin city system in North Karnataka and characterized by dryland conditions.However the twin city-system has been emerged as one of the important commercial centre in this area and attracting the people of the surrounding areas for its diversed complex economic activities. The main objective of this paper is to analyse the ranging behaviour of the population of the Gadag-Betageri twin-cities over the time and its recent density.The researchers have made an attempt to analyse the population ranging behaviour by considering the decadal population ranging behaviour by considering the decadal population data.

Keywords: *Population, Density.*

Locational Aspects of the study area

The hinterland of the Gadag-Betageri has been charecterized by semi-arid conditions, and hence the economic base of the twin-cities depends upon dryland farming.The industrial activities are limited to only agricultural products such as cotton , groundnuts etc.However, the printing industry has been very well developed in the twin-cities.

Gadag-Betageri urban Region is geographically situated at the intersection of Northlatitude 15 degree 25 minutes and east longitude 75 degree 38 minutes at an altitude of 650 meters aboveMSL in the dry region of Deccan Plateau. The Gadag-Betageri urban area includes 10 revenue villages (including CMC area) measuring 2337.91 hectares of area.The total population as per the 2011census is 1,72,813 consisting 86,165 males and 86,648 females.Temperature in Gadag-Betageri varies from 15 degree celsiust to 36 degree celsius.The lowest temperature is found in December and the highest is found in April. The mean, maximum temperature is 31.34 degree Celsius and the mean minimum is 19.88 degree Celsius.

The average annual rainfall is 668.64mm.The heaviest rains being recorded during the mnths of June-September of October with an average of over 112.88mm during these months.

The twin city system has a railway junction connecting Gadag to Hubballi, Guntakal and Sholapur.Gadag connected by roads also.The Karwar-Bellary National Highway No.42 passes through the city connects Gadag to Poona-Bengalore National Highway and the District roads passing through the city connect the neighboring taluks of Navalgund, Nargund, Mundargi, Koppal, Ron and other important centers like Bijapur, Gulbarga, Raichur, Badami, Iholi, and Pattadakallu.These famous tourist centers are located in the close vicinity of Gadag-Betageri within a distance of about 80 kms.The nearest Airport is at Hubballi.Karwar port is located at 230 kms from Gadag.

Ranging Behaviour of population Growth

The variation of population growth in the city from 1911 to 2011 is as below.

Table 1. Growth of population - Gadag-Betageri.

Census year	Population	Growth (%)
1911	28, 902	37.25
1921	41, 060	11.73
1931	45, 852	22.75
1941	56, 283	16.39
1951	65, 509	16.95
1961	76, 614	24.55
1971	95, 426	22.18
1981	1, 16, 596	14.97
1991	1, 34, 051	15.51
2001	1, 54, 849	11.51
2011	1, 72, 813	11.60

Source: Census Records - 1911 to 2011

The population count in the city as per census 2001 reveals that, the city population is 154849. The growth rate during the previous decade i.e.1991-2001 is 15.51% and in the year 2011is 11.60% over the year 2001.

The highest growth rate has been registered during 1921 and then decreases during 1921-1931, and again rises in 1931-1941.The growth rate is almost constant between 1941-51 and 1951-61. Again during the period 1961-71 and 1971-81 there is a sudden increase in growth rate, which witnessed during 1981-1991 and 1991-2001 respectively . This may be due to the less migration to the city. This shows the growth rate in the city moderate.

Density of population

The average city population is 119.04 persons per hectare (pph).The distribution of population

is not even. Parts of old town i.e. old Gadag and Betageri areas are consisting higher population densities.

Whereas Masari extension, Vidyanagar extensions, HUDCO colony extensions contribute a lower density.The reasons that may be assigned are that these areas are newly and recently developed parts of the city and have still vacant plots, and the size of the plots are relatively higher with relatively lower floor space index. The table 2 depicts the ward-wise distribution/density of population in Gadag-Betageri twin cities.

The ward No.23 has the highest density of population i.e. 652.88 persons per hectare area. The lowest density i.e.27.17 pph is noticed in ward no.30 very high density is found in ward nos 4, 9, 10, 19 i.e,> 500pph.

As could be observed from the existing population distribution, the density of population is very high in ward no.4, 8, 9, 10 and 11 of Betageri town and ward no.17, 18, 19, 20, 23, 24, 25, 31 and 32 of Gadag town.

Table-2 Ward-wise distribution of population of Gadag-Betageri-2011

Ward No	Total population	Area in Hectares	Poulation Density (pph)
1	8743	28.45	307.31
2	5491	37.71	145.61
3	5873	54.18	108.40
4	8791	17.18	511.70
5	9508	33.50	283.82
6	4832	131.84	36.65
7	4282	48.76	87.82
8	2840	10.19	278.70
9	4453	8.54	521.43
10	3751	7.15	524.61
11	5919	19.96	296.54
12	3177	23.84	133.26
13	2460	31.06	79.20
14	3589	25.47	140.91
15	3663	23.24	157.61
16	5172	11.06	467.63
17	2960	6.18	478.96
18	3155	5.60	563.39
19	4024	7.22	557.34
20	4042	8.31	486.40
21	6607	83.08	79.52
22	8080	47.55	169.92
23	3395	5.20	652.88
24	2736	7.69	355.78
25	2609	7.84	335.78
26	3292	22.07	149.16
27	3454	94.82	36.42
28	4101	40.67	100.83
29	7750	172.50	44.93
30	3477	127.97	27.17
31	2696	8.13	331.61
32	3735	9.83	379.96
33	7302	131.55	55.51
34	6015	28.18	213.45
35	10638	121.39	87.63
Total	172612	1450.11	119.04

The density of population inward no. 4, 8, 9 and 10 of Betageri and ward no 16, 17, 18, 19, 20, 23, 24, 25, 31, 32 and 34 of Gadag is observed to be very high in relation to other wards.These wards constitute the old parts of Gadag-Betageri. Hence further development of these areas and to accomodate more population in the years to come is not desirable from planning standards.These areas have to be decongested to have a more reasonable density and better environmental conditions for safe and healthy living of people.

Scope for further development of the existing areas is observed to be possible in ward no.6, 7, 21, 22, 29, 30, 35 within the developed area boundary, as parts of these wards of the city have within them pockects of undeveloped land.

The conurbation area of Gadag-Betageri has been extended further beyond the existing limit to bring in to its fold, the developments that have come up on the fringes and contiguous to the existing developments to ease the congestion in the city and to have congenial atmosphere with lower density and to be in keeping with the norms.

Conclusion

The growth trend of population of Gadag-Betageri shows a high-degree of fluctuations from decade to decade.The population in 1991 was 28902 persons, which was doubled in 1941 increasing to 58283 persons i.e. during a span of 30 years. Again in the year 1981, there was a more than two fold increase in the population to the tune of 116596 persons in the twin cities, which took 40 years to double.Further, during a span of 100 years from 1911 to 2011, the twin cities have registered nearly six fold increase in the population size i.e. 28902 persons in 1911 to 172813 persons in 2011.Accordingly the density of the population has also been increased.

Similarly the total area of Gadag-Betageri twin-cities in the year 1925 was 450 hectares (4.5Sq.km) which has been increased to 1450.11 hectares (14.5sq.km).The increase in the total population in the twin-cities is mainly associated with the increased agro-based industries and increase in the basic amenities and infrastructural facilities, and printing/publishing industries.

Increase in the areal extent of the twin-cities due to the growth of population, has magnified the population pressure on the available land, and other essentia resources. The twin-cities are now facing an accute shortage of space, drinking water and scarcity of other civic amenities.Since the Gadag-Betageri urban region is situated in the semi-arid/dry region the resources are relatively limited, and hence there is a greater need for the exploration and development of new resources and methods for the further development of the twin-cities.

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