GEOGRAPHICAL ANALYSIS

Spatio-Temporal Distribution Urban Centres: A Case Study of Karnataka State

G Ramanna[1], Ashok D Hanjagi[2]

1 *Research Scholar, Department of Geography, Bangalore University, Bangalore*
2 *Professor & Chairman, Department of Geography, Bangalore University, Bangalore*

Abstract

Karnataka is the seventh largest urbanized state in India with 38.67% of urban population as of 2011. This paper is based on both primary and secondary data and the secondary data are collected from various government organizations Rural and Urban population composition is one of the important indicators of demographic composition. The trend in which the towns and cities of Karnataka expanded and the urban agglomeration in the last two decades are given emphasis in this paper.

Introduction

Rural and Urban population composition is one of the important indicators of demographic composition. In India urban-rural population in 2011 census was 31.16 percent and 68.84 percent respectively. At the national level slowing down of population growth was due to sharp decline in the growth rate in rural areas, while the growth rate of urban areas remains almost same. The total population of the state, 61.1 million is distributed among the rural and urban areas of the state almost in the ratio of 2:1. In other words 61.43 percent of the population is living in rural areas whereas, the remaining 38.57 percent lives in the urban areas. Thus, 37.5 million population is in rural areas whereas, the urban population is about 23.6 million. The percentage of urban population of the state 38.57 percent is much higher than the percentage of urban population of India which is about 31.16 percent of the total population of India.

Objectives

In this paper we are mainly focus on Karnataka State towns spatio-temporal distribution below the objectives. To study the urban scenario in Karnataka state, To examine the spatio-temporal distribution of towns of Karnataka state.

Data Sources

The research study will apply quantitative and statistical technique analyze the data collected relating to urban trends and regional analysis in Karnataka state. In this research, data will be collected from both primary and secondary level.

Methodology

The study attempted to analyze the urban trends in Karnataka. The data is collected during field visit by personal observation and discussion and the secondary data is collected by various institutions under Government of Karnataka and central government such as NRSC, ISRO, KNDMC, DES and its respective websites to facilitate the research. The present study in based on the application of modern technologies including GIS and remote sensing as well as the filed work with an integrated approach. The data has been obtained by both primary and secondary sources, remote sensing data and GIS softwares like ARCGIS and ERDAS Imagine has been used to enhance the research quality and GIS maps, Tabulation, histograms Lorenz curve etc., are used to analyze the data.

Research Problem

Towns and their spatial distributions play significant role in regional balance of any region. A main research question is how to re-distribute or reshuffle urban centers in Karnataka state? How to upgrade the existing small and medium towns so that activates them to provide vast service to their hinterlands. Also analyze rationally and streamline the existing urban centers and their connectivity to boost southern Karnataka more spatially defensible development.

Study Area

Karnataka is the seventh largest urbanized state in India with 38.67% of urban population as of 2011. With one out of every seven people in Karnataka live in Bangalore, it addresses pertinent questions as to how much of this growth is contributed by various regional pockets. This paper aims to identify regional imbalances in urban growth in Karnataka from 1961 to 2011 at the regional, divisional and district level and to examine the distribution of urban population across cities during the same period. It uses secondary data from the Census of India to compute measures of percent urban population, urban rural growth differential (URGD), Results show that Karnataka exhibits a fluctuating trend of urbanization with a high regional variation and a high urban primacy.

Results and Discussion

Karnataka has been divided into coastal, Malnad, southern Maidan and northern Maidan regions. As a result, the development policies have been encouraged according to the location characteristics and hence, the pattern of urbanization. In Karnataka, Southern Maidan region Is the highest urbanization region (50.6%) while, coastal region (7,4%) Is least urbanized. Both Malnad (21.4%) and northern maidan (20.6%), for obvious constraints, have revealed medium levels of urbanization. Southern Maiden (34.7%), for its location
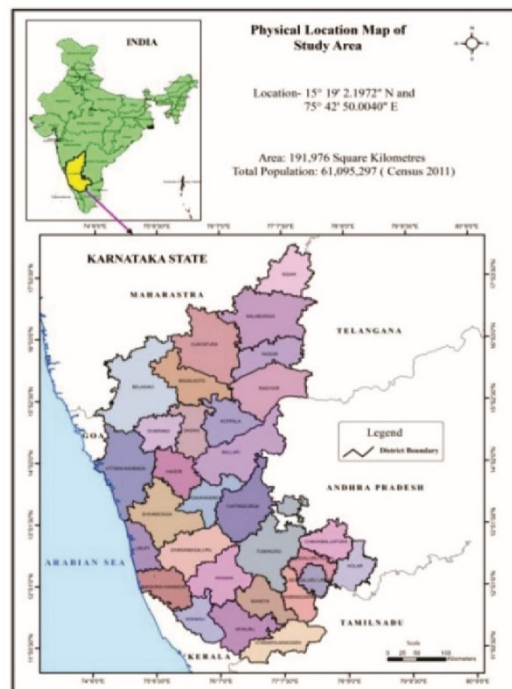

Fig. 1. Study Area

infrastructure facility, has also recorded the highest urban population growth in the state. Southern Maidan being the hard core region of the erstwhile princely state of Mysore has cornered all special privileges since the beginning for its well planned development in terms of the location of industrial and commercial activities and development of Infrastructure and services. Although Malnad (22.8%) has recorded the least increase, it is significant in terms of its magnitude which Is of very great concern as it Is an ecologically fragile forest resource region and hence, the region has been identified as one of the twelve biodiversity hot spots of the world (Sengupta, 2001). Malnad region has emerged as having very strong urban characteristics (Sastry, 2005 and Sastry and Rao 2002).

By regional concentration of towns, northern Maidan has the highest concentration followed by Malnad region. For obvious constraints, coastal region has the least concentration of towns. Surprisingly, Malnad, the ecologically fragile region, due to high concentration of various development activities (industrial, infrastructure, and irrigation projects) had the highest concentration of towns and particularly smaller size towns (town sizes IV, V and VI) in 1991 and have been reduced drastically due to declassification of towns in 2001. By size class while southern Maidan has the highest concentration of the most significant size class, the class 1 town and clan three III towns, the northern Madan has the highest connections of class II towns (Table 5). Malnad has

the second concentration of class I towns next to the southern Maidan. This is because the major towns like Hubli Dharwad, Mysore, Shimoga, Hassan are located in this region. Malnad is a resource rich region (forest, agriculture, industry and services). Hence, in addition to major cities, various town sizes are also concentrated (l, III, IV, V) to provide both and town level urban functions and services to the large rural hinterlands of the region. In another study by the author on the western ghats region of Karnataka, Mainad region has been identified as urban and industrially dominant region with higher level of development (Sastry and Rao, 2002), Interestingly, the number of towns under size class 20,000 - 50,000 have increased significantly during 1991-01 and this increase is again concentrated in southern Maidan region. It appears that both southern Maidan and Malnad regions have been experiencing greater urban population pressure on account of higher concentration of class I towns, thus, the demanding efficient urban development policy interventions for balanced urban development.

Urban population had increased almost eleven times with an annual growth of 9.91 per cent. As a result, the share of Karnataka's urban population was on the much higher side as compared to the national pattern during 1901-2001. As per the projected urban population, the same higher growth trend of urban population would continue in Karnataka till 2016 by reaching an urban-population share as high as 39.3 per cent while, at the national level it will be just 33.7 per cent (Govt. of India, 1991b). By per cent annual urban population growth, Karnataka is on the higher growth range along with the other prominent states. North —Eastern states, Tamil Nadu and Haryana have recorded the highest growth pattern. The national trend has also exhibited almost a similar bimodal pattern, but with moderate peaks. As per the projected urban population trends, by 2016, Karnataka's growth trend would be on the lower side as compared to the national pattern. The main implication of projected higher urban population share and lower growth is that there will be higher concentration of population in cities and towns in Karnataka as compared to the national pattern. This has obvious implications on the city and town management in terms of infrastructure and services. Subsequent urban development policies which encouraged higher size towns have led to redistribution in concentration of towns by eroding the pyramidal base. The main purpose of this study is to analyze the urbanization pattern of Karnataka, an economic analysis. Hence, this chapter covers the analysis in four different sections.

Karnataka is classified into coastal, southern maidan and northern maidan regions based on physiographical features. A clear economic divide of the regions could also be observed on the basis of the policies adopted. In this context, Karnataka's urbanization may be characterized with more of rural attributes than at the national level. As a result, urban - regional disparity in Karnataka has been much sharper than

at the national level. For instance, the rapid urbanization of the globally known primate city - Bangalore, has led to more pronounced city region disparity as revealed by various socio-economic and environmental characteristics like education level, income, type of occupation, piped water supply, toilet facility and solid waste disposal.

Bangalore: Ministry of Finance. The density of urban population for 20 districts is shown in Figure. (District wise share of states town and urban population 2001 per cent.). The concentration of urban population in Bangalore district is very high at more than 32 per cent of the state's population whereas Kodagu and Chamarajnagar do not even have 1 per cent of the urban population. The CV is very high at 158 per cent. Though the distribution of towns is more even, too much concentration of people in a few urban centers is leading to various problems.

Bangalore district itself has nearly 10000 people per sq.km of area compared to state level average of nearly 3500. Further, the southern cities have greater density than the northern cities.

The data reveals the increasing dominance of Bangalore district ,as a prime city with its rapid growth following the IT boom in the recent years the value of index for Bangalore is substantially higher than any other district and the state as a whole Further six more districts viz; Dharwad, Bijapur, Gulbarga, Bellary, Uttar Kannada and Chikkamangalur have recorded rise in their value index. Urbanization index value of Bellary is very significant. At the same time the cities of north Karnataka have shown greater dynamism with more number of migrants from rural areas preferring cities for their livelihood. Further inter regional disparity has widened in terms of CV and CIU.

The present section aims at analyzing the distribution of urban population by size class cities to further explore the nature of urbanization in the state. However, the analysis is restricted to census year 2001 for obvious reasons. Further, regionalization based on geographic features is also studied. The total population of Karnataka in 2001 was 52.7 million of which the urban population was 17.9 million accounting to 34 per cent. Karnataka state ranks fourth in the degree of urbanization among the major states in India after Tamil Nadu, Maharashtra and Gujarat. The decadal growth of urban population in Karnataka over the last 100 years. During the last five decades, urbanization in Karnataka registered rapid growth except during 1951-61 when the rate of growth was only 18.26 per cent. The highest growth was recorded during 1941-51 (61.7 per cent) and 1971-81 (50.6 per cent). However, during the following two decades, the eighties and nineties, the rate of growth of urban population declined to 29.09 and 28.85 per cent respectively The growth of urban areas has vastly outpaced the State's efforts to develop infrastructure to serve the growing needs of cities. There is now a substantial deficit of infrastructure in several key areas as roads and

transport (both within cities and between important cities in the State) housing. Drinking water supple. Domestic sanitation, sewage treatment systems., so id waste collection and management, storm water drains, lakes in urban areas, and domestic energy. In all these cases, the gap between demand and supply is very large, affecting millions of families, with negative consequences affecting the quality of life in urban areas across many measures. Bangalore Urban with 88 per cent of its population living in urban areas is the most urbanized district and accounts for 13 per cent of the urban population of the state. The second most highly urbanized district is Dharwad with an urban population of 55 per cent. All the other districts have less than 40 percent of the people living in urban centers. Urbanization is lower than 30 percent in ten districts and less than 20 per cent in nine districts.

Table 1. Number of towns senses wise in Karnataka.

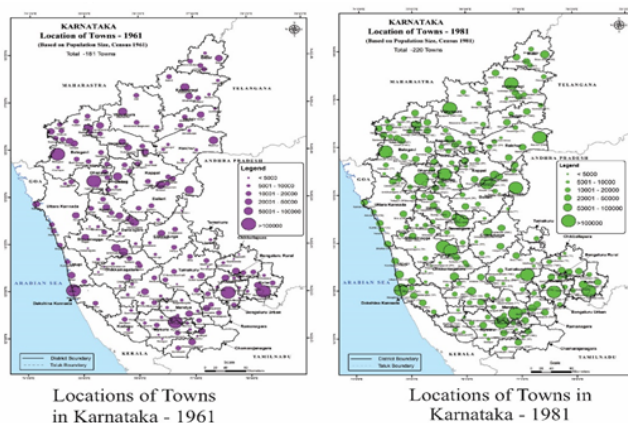| Yeas	Number				Percentage			
	Large	Medium	Small	All	Large	Medium	Small	All
1901	1	10	204	215	0.47	4.65	94.88	100.0
1911	1	10	169	180	0.56	5.56	93.89	100.0
1921	2	9	182	193	1.04	4.66	94.30	100.0
1931	3	11	197	211	1.42	5.21	93.36	100.0
1941	4	13	191	208	1.92	6.25	91.83	100.0
1951	6	28	251	285	2.11	9.82	88.07	100.0
1961	6	41	176	223	2.69	18.39	78.92	100.0
1971	10	53	179	242	4.13	21.90	73.97	100.0
1981	14	87	173	274	5.11	31.75	63.14	100.0
1991	18	125	163	306	5.88	40.85	53.27	100.0
2001	24	128	85	237	10.13	54.01	35.86	100.0

Fig. 2. Spatial Distribution of Towns- Division wise.

The map of Karnataka showing the distribution of cities with the population size of the 2001 census. The map shown
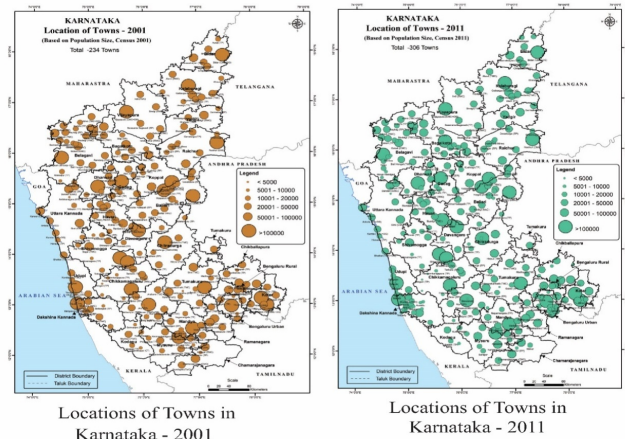

Fig. 3. Location of towns in Karnataka-2001 & 2011.

the village classification into small hamlets, hamlets, small village medium-sized village, large villages and very large villages in light yellow, yellow, dark yellow, pink and red color respectively. Small villages are more concentrated in southeastern and central districts of Karnataka and also most of the large and very large villages are seen in the central and southern Karnataka. There are no large villages in northeastern Karnataka.

The map shows total of 202 cities of which 5 cities are with population less than 5000, 77 cities with population 5000-20000, 82 cities with 50000 population 17 cities with population less than 100000 , 21 cities with population more than 100000 are shown in light yellow, yellow, orange, pink and red circles respectively. Bangalore, kolar, dakshinakannada, belagavi, mandya , mysore, shimogga, davangere, bellary , Hassan , koppal, raichur, vijyapura, kalburgi, dharwad district has cities with population more than 100000. Yadgiri, bagalkote, uttarkannada, kodagu, chamrajnagar, chikballapura, tumkur, chitradurga district has cities with population less than 100000, 50000, 20000 and 5000

Conclusion

The most urbanised Bangalore district with 90.94% urban population while on the other hand, Kodagu is the least urbanised district (14.61%) in 2011. Bangalore and Dharwad are the only districts where more than half of the district population lives in urban areas in all three censuses - 1991, 2001 and 2011. The trend across the two decades shows that the pace of urbanization in Karnataka was more during 2001-2011 (2.03) compared to the previous decade 1991-2001 (1.40). Coastal (3.07) is the fastest growing region, followed by South Karnataka (2.79) and North Karnataka (0.69). However, only 17 out of 30 districts, most of these from the South and Coastal regions, Urbanization by Urban Size Class Indian towns are classified into six-fold categories

ranging from less than 5000 population (Class VI) to more than 100000 (Class I) and its corresponding of urban populations for 1991, 2001 and 2011. The number of urban agglomerations and towns in Karnataka increased from 252 in 1991 to 314 in 2011. The number of Class I, Class II, Class III and Class V towns increased, while Class IV and Class VI towns decreased. 64 percent of class VI towns experienced negative growth while for another class size varied from 4 to 9 per cent. Nearly one fourth of Class IV towns with a high growth rate are census towns which are in close proximity to large cities and industrial areas. Overall, with increase in town size, proportion of towns with negative growth decreases and vice versa.

Karnataka experienced a higher pace of growth during 2001-2011 compared to the previous decade, while districts of Gulbarga division experienced a slower pace of growth. Only Dakshina Kannada had an Urban growth rate of more than 2.5 in both the decades. It is interesting to note that Haveri district in Belgaum Division which had less than 20% urban population in 1991, experienced 3.16 urban growth rate during 1991-2001, 2001-11 Udupi district in Coastal Division which had less than 20% urban population in 2001 experienced the highest urban growth rate of 5.53 in 2001-2011.

References

1) Brueckner J. Urban Sprawl: Diagnosis and Remedies. *International Regional Science Review*. 2000;23(2):160–171.
2) Government of India. Census of India, General Population tables, States and Union Territories. Government of India. 2001.
3) R BM. Urban Geography - A Text Book. New Delhi. 1967.
4) Benfield. National Resources Defnce Council. 1999.
5) Bhagat RB, Mohanty S. Emerging pattern of urbanization and the contribution of migration in urban growth in india. *Asian Population Studies*. 2009;5(1):5–20. Available from: https://dx.doi.org/10.1080/17441730902790024.
6) Government of Karnataka. Census of India, General Population tables. Mysore: Government of Karnataka. 1971.
7) GRAAM. Performance Evaluation Study of NRHM in Karnataka. Mysore: Grass Root Research Advocacy Movement. 2014.
8) Hirschhorn JS. Environment, Quality of Life, and Urban Growth in the New Economy. *Environmental Quality Management*. 2001;10(3):1–8. Available from: https://dx.doi.org/10.1002/tqem.1000.
9) Brody SD. Ecosystem Planning in Florida: Solving Regional Problems through Local Decision Making. UK. Ashgate Press. 2008.
10) A K. Trends and Patterns of Urbanisation and their economic implications. India Infrastrucuture. 2006.
11) Government of Karnataka. Human Development Report. Government of Karnataka. 2005.
12) Brody S. Measuring thr adoption of local sprawl reduction planning policies in Florida. *Journal of Planning and Education Research*. 2006;p. 294–310.
13) Burchell RW. The costs of sprawl revisited. Washington DC. National Academy Press. 1998.
14) Bhattacharya B. Urbanisation and Human Development in West Bengal: A District Level. 1998.
15) Garnier CB. Urban Geography. New York. John Wiley. 1967.