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SPATIO-TEMPORAL VARIATION IN URBAN PROCESSES OF RAJASTHAN

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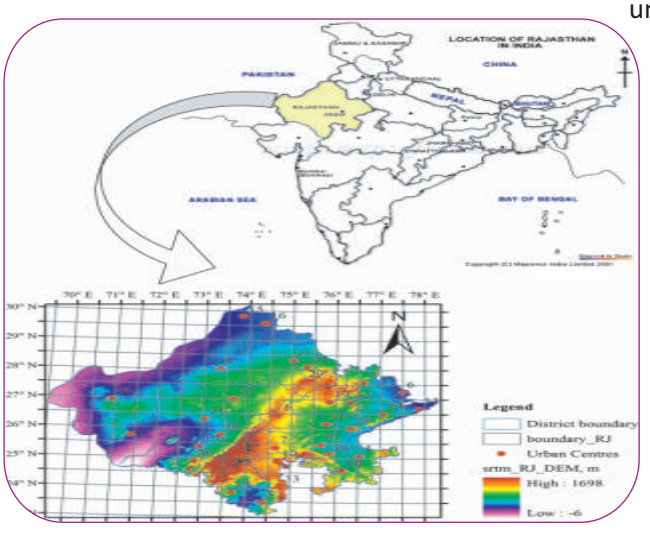
ABSTRACT: -

This article documents the temporal and spatial variation in the urban processes in Rajasthan. It is the largest state in India area wise. Urban process includes the study of level of urbanization, urban growth pattern, size classes of towns and the spatial variation in the level of urbanization in Rajasthan. Census of India data on the urban population has been used to study urban process. In Rajasthan since 1961 the level of urbanization has seen a continuous upward trend. It was 16.28% during 1961 which now has increased to 24.87% in 2011.Urban growth pattern in Rajasthan has declined since 1981 to 21.3% in 2011 and the urban growth is higher than in India as in 2011 urban growth in India is 17.64% while in Rajasthan it is 21.3%. Numbers of towns in the state have increased drastically from 222 in 2001 to 297 in 2011. It has been observed that a number of urban centers in the upper three categories, i.e. Class I, II and Class III have been increasing, while those in the lower three categories are declining. From the district level urban scenario study it is concluded that there is the regional variation in the level of urbanization and urban growth across the districts. Districts with well connected transportation pattern, infrastructural facilities, trade opportunities, mineral occurrence, etc. have marked the high level of urbanization like districts of Jaipur, Kota, Ajmer, Sikar, Jodhpur etc. While districts like Barmer, Dungarpur, Jalore and Jaisalmer have observed the low level of urbanization mainly due to their nearness to the large cities and extreme border location.

KEYWORDS: *Rajasthan, Census of India, urbanization, urban growth, census towns.*

INTRODUCTION :

Scholars have posited an urban explosion in Asia and argued that the fulcrum of urban growth has shifted dramatically away from Africa and Latin America, and towards Asia. Rapid growth of the urban population is undoubtedly one of the key processes affecting Asian development in the 21st century (Kundu, 2011).Today more than half of the world's population resides in urban areas and demographers project that between 2000 and 2025 the population growth of urban areas will constitute about 90 percent of all world population growth (Orum, 2011).



Peng et al. (2009) defined the urbanization as the process by which rural areas converted into urban areas as a resulted due to economic growth and industrial development. He said that the central difference between urban and rural areas is that urban populations live in bigger, denser and more heterogeneous cities as opposed to small, more sparse and less differentiated rural places. The process of

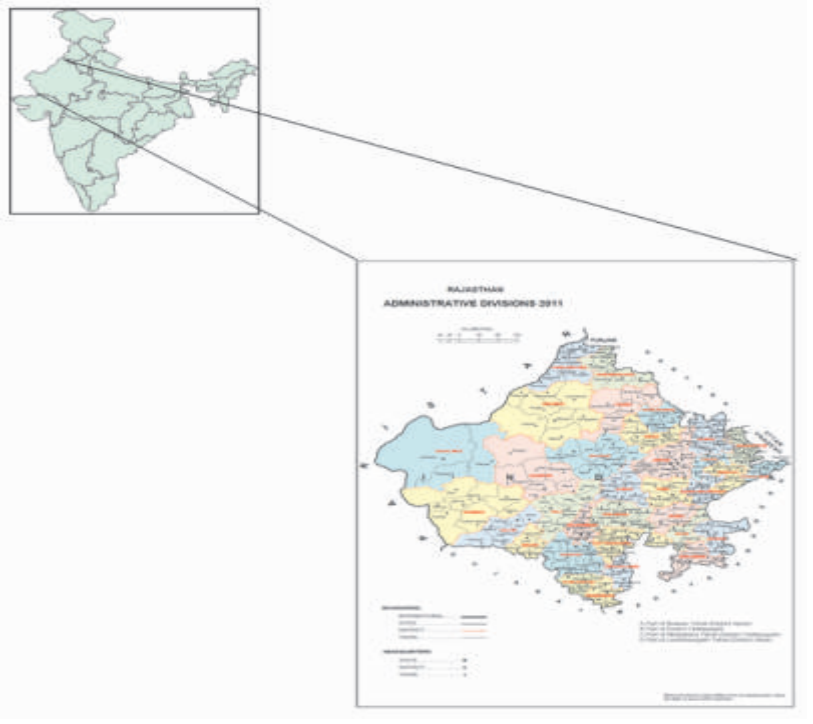
urbanization is the structural shift in occupation structure i.e. from agriculture to non-agricultural activities (Sharma, 2011). 'Urban area' is the term used in two senses first one is demographically, which focuses in the size and density of population and nature of the majority of the adult males and another is in a sociological sense, whose focus is on heterogeneity, impersonality, interdependence and the quality of life. Urbanization like a structural process is normally connected to the industrialization, but it has not been always the result of the same. Rather, it is the results of the concentration of many commercial, industrial, technological and financial activities at the big and small level. Kundu (1993) found that the rapid urban growth in many of the less developed states of India can be attributed to the push factors operating in the rural economy and not due to the economic development.

Urbanization is measured in several ways by different scholars according to their approaches. Tripathi (2013) observed that there are two ways of measuring urbanization. First is the study of the factors responsible for the level and growth of urban population and its distribution by size classes of towns take population as a base is known as the 'demographic approach' to study urbanization. Other is the changes in number and growth of towns and an expansion of geographical areas of these towns, which he named as the 'geographical approach'. Gory (1979) used the ecological approach to study the modern time urban growth pattern and distribution. The study suggested an ecological perspective to study the process of urbanization and its related parameters as growth appears to be more a function of a community's organizational capacity (managerial activity) than its production capacity. The Globalization has great impact on the country like India, which increases the economic growth of the country, and because of this we are seeing a growing urbanized India. Historically, India's population has been predominantly rural, but since the year 1991 the urban population was increasing, and today it stands about more than 30% of the total population of the country (Sadashivam, 2016). Demographic dividend and the huge market potential attract the investment in the country, which in turn pull the population towards urban areas.

STUDY AREA:

For the present article Rajasthan, a state located in the western part of India and also the part of Thar Desert which has diversity in its physical landscape is chosen. The geographic features of Rajasthan are the Thar Desert and the Aravalli Range, which runs through the state from southwest to northeast, almost from one end to the other, for more than 850 kilometers (530 miles). In the west, it is relatively dry and infertile; this area includes some of the Thar Desert, also known as the Great Indian Desert. In the south-western part of the state, the land is wetter, hilly, and more fertile. The climate varies throughout Rajasthan. On average winter temperatures range from 8° to 28° C (46° to 82° F) and summer temperatures range from 25° to 46° C (77° to 115° F). Average rainfall also varies; the western deserts accumulate about 100 mm (about 4 in) annually, while the south eastern part of the state receives 650 mm (26 in) annually, most of which falls from July through September during the monsoon season. It lies between 23°30' and 30°11'North latitude and 69°29' and 78°17' East longitude. According to 2011 Census of India, Rajasthan has a total population of 68,548,437. In recent decades, the literacy rate of Rajasthan has increased significantly. In 2001, it was 60.41% (75.70% male and 43.85% female). At the Census 2011, Rajasthan had a literacy rate of 67.06% (80.51% male and 52.66% female).

Map 1: Study area Rajasthan



Source: http://www.censusindia.gov.in/2011census/maps/administrative_maps/RAJASTHAN.pdf

RATIONALE AND SCOPE OF THE STUDY

Though the Rajasthan state occupies a bottom position among the states of India in terms of percentage share of the country's urban population, temporally the urban population of Rajasthan has registered quite a rapid growth and with potentialities of mineral occurrence, availability of power resources, irrigation development and development of transport and communication, providing scope for further expansion of secondary and tertiary sectors, and consequent growth of urban settlements. Prospects of urban growth are higher in Rajasthan due to the passing of western dedicated freight corridor through it. But along with the potentialities comes various problems of haphazard urban planning. Baker et al. (2004) mentioned that the population in arid regions have issues related to water distribution, like saline water and laos other biophysical problems. Portnov et al. (2008) looked into the interaction between the climate change and urbanization in arid regions. Hence it is imperative to study the trends and patterns of urbanization and urban growth in arid state of Rajasthan for the sustainable urban planning.

DATA AND METHODOLOGY

For the trends and patterns of urbanization in Rajasthan the data used are as follows:

- Census of India, 1961 to 2011 for trends and pattern of urbanization in India and Rajasthan.
- Census of India, Rajasthan, District handbook, 1991, 2001 and 2011.
- All India Town Directory, 2001 is used for a number of towns in different size classes of towns (size-class I-VI).

The spatio-temporal maps of level of urbanization and urban growth in Rajasthan have been prepared. Level of urbanization is calculated by the simple percentages and decadal urban growth for the given period is taken out by using the following formula:

$$(P2-P1)/P1*100$$

Where, P1 = Urban population of the previous census

P2 = Urban population of recent census.

- With the help of GIS maps are prepared to study the regional disparity in the level of urbanization and the urban growth across Rajasthan.

RESULTS AND DISCUSSIONS

1. Trends of Urbanization and Urban growth in Rajasthan: 1941-2011

During the last ten decades the growth of population in rural areas has been fivefold whereas in urban areas it has been eight fold. From this it became obvious that the rural population is showing its migrating trend towards urban areas with its increased pressure on rural areas. Table1 shows the level of urbanization and the decadal urban growth in Rajasthan, which presents an increasing trend since 1941 (15.27%) except the year 1951 when it marked the highest urbanization of 18.5% and in the following decade, i.e. in 1961 it is decreased to 16.28% and after that the level of urbanization increases in every coming decade. In 1971(17.63%), 1981(21.05%), 1991(22.88%), 2001(23.39%) and it increased to 24.87% in the year 2011. The increase in every year from the previous year is not much. When comparing the level of urbanization of Rajasthan with India it is found that in two years i.e. 1941 & 1951, it is greater in Rajasthan than in India. 1961 onwards the level of urbanization is greater in India than Rajasthan. In India it is 31.16% in 2011 which is higher than 27.78% in 2001.

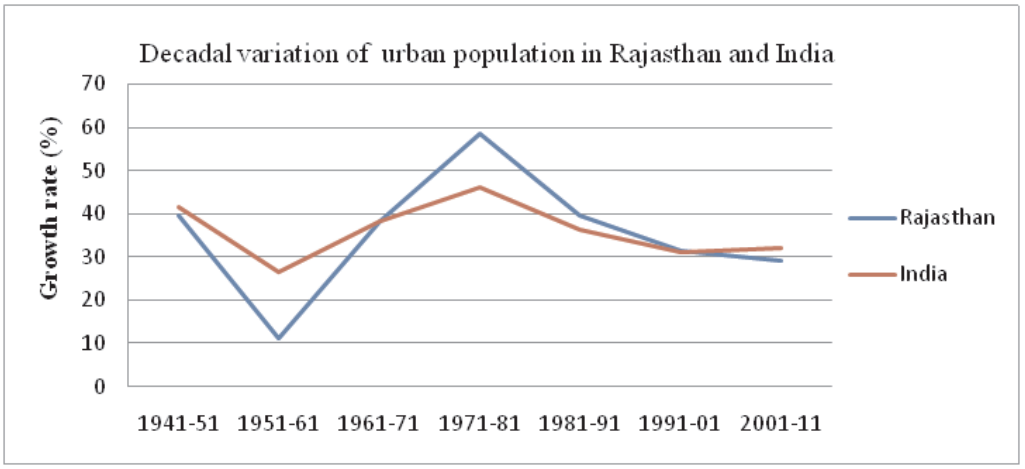
It was only in the post independence period that the phase of industrialization, urbanization and socioeconomic transformation got the real start in Rajasthan (Bhalla, 2016). Expansion in administrative, industrial and commercial activities and development in communication gave new impetus to the growth of new towns. The spectacular increase in urban population of Rajasthan took place between 1941 and 1951 with the urban growth rate of 39.59%. In the studying decades the highest decade percentage variation in urban population was observed during the year between 1971 & 1981 i.e. 58.69%. Thereafter, in the following decades the urban growth rate has been falling continuously that is 39.62%, 31.26% and 29.01% in 1981-1991, 1991-2001 and 2001-2011 respectively in Rajasthan. Regarding the comparison of the decadal variation of urban population of Rajasthan with the country, it is shown that, except in the two decades that is 1941-1951 and 2001-2011, in all other decades it is higher than the country. The high growth rate of urban population during 1941-1951 both in the state as well as the country was mainly due to loses application of the census definition of town by which a large number of overgrown villages were classified as towns. A rigorous definition of “town” and its stricter application in 1961 census resulted in the declassification of a large number of towns and a sharp fall in the growth rate of urban population in the country as well as the state. The decline in the urban growth rate from 39.59% to 11.04% during 1941-1951 to 1951-61 in the state is much steeper than the corresponding decline of all- India from 47.33 to 15.76%. In the following four decades the decadal variation in urban population is higher than the country as a whole. The data from population census 2011 marked a little departure from previous trends. In 2001-11 the decadal variation of urban population in the state is lower than the country.

Table1: Decadal urban growth rate and the percentage of urban population in India and Rajasthan: 1941-2011

Year	RAJASTHAN		INDIA	
	Decadal urban growth (%)	Level of urbanization (%)	Decadal urban growth (%)	Level of urbanization (%)
1941	----	15.27	-----	13.86
1951	39.59	18.5	41.42	17.29
1961	11.04	16.28	26.41	17.79
1971	38.47	17.63	38.23	19.9
1981	58.69	21.05	46.14	23.73
1991	39.62	22.88	36.37	25.71
2001	31.26	23.39	31.15	27.78
2011	29.01	24.87	32.13	31.16

Source: Calculated from Census of India, 1941- 2011.

Figure1: Decadal urban growth rate in India and Rajasthan: 1941-2011



Source: Calculated from census of India

Below table 2 represents the number of towns in each size class and their percentage to total towns in Rajasthan between 1941 and 2011. The numbers of urban centers in the upper three categories, i.e. class I, II, III have been increasing in the state. While those in the lower three categories, i.e. Class IV, V, VI have been declining. The number of Class I towns has increased to nineteen in 2001 from four in 1941. The number increased in the Class II, III towns are from 2 and 13 respectively in 1941 to 27 and 90 in 2001 respectively. The different picture has presented in the lower three categories where the proportion of the number of towns to the total number of towns have decreased. The number of towns in Class IV towns earlier increased to 101 in 1981 from28 in 1941 but in the following two decades it decreased to 61 in 2001. Number in the class V and VI towns have decreased continuously since 1941 to 2001. In 2011 the number of Class I towns have increased to 29 from 19 while the number of Class II towns has declined from 27 in 2001 to 26 in 2011. Numbers of Class III towns have observed the marked increase, i.e. 15 new towns have added and the number increased to 105. In the lower three size classes the number has increased in every category. The increase in the share of towns in the upper size categories and decline in the lower size categories indicates that the towns in these size classes might be growing very quickly and getting promoted into the higher size class category.

Table2: Number of towns in each size class and their percentage to total towns in Rajasthan: 1941-2011

Years	Class I	% to total	Class II	% to total	Class III	% to total	Class IV	% to total	Class V	% to total	Class VI	% to total	Total towns
1941	4	2.55	2	1.27	13	8.28	28	17.83	74	47.13	36	22.93	157
1951	4	1.76	4	1.76	20	8.81	36	15.86	96	42.29	67	29.52	227
1961	6	4.14	4	2.76	23	15.86	52	35.86	51	35.17	9	6.21	145
1971	7	4.46	7	4.46	31	19.75	67	42.68	41	26.11	4	2.55	157
1981	11	5.47	10	4.98	55	27.36	101	50.25	23	11.44	1	0.5	201
1991	14	6.31	20	9.01	74	33.33	87	39.19	25	11.26	2	0.9	222
2001	19	8.56	27	12.16	90	40.54	61	27.48	20	9.01	5	2.25	222
2011	29	9.76	26	8.75	105	35.35	80	26.94	47	15.82	10	3.37	297

Source: All India Town Directory, 1991-2011.

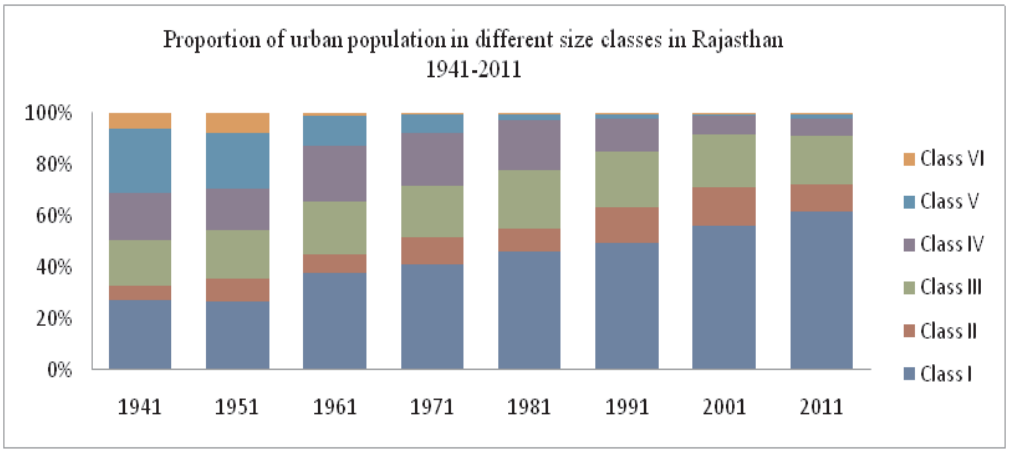
Looking at the composition of urban population of the different size classes shows in table 3, the share of the cities in the Class I towns have gone up from 27.26% in 1941 to 56.31% in 2001. The proportion of the urban population in the Class II towns has increased continuously from 1941 to 2001 except in the year 1981 when it decreased from the previous decade from 10.75% in 1971 to 9.18% in 1981. In the coming two decades the urban population has increased to 14.66% in 2001. While in the rest of the size classes the urban proportion is declining. The structure of the urban growth is reflected by distribution of urban population in different size classes. In Rajasthan 8.56% of urban centers (class I) accounted for about 56.31% of the urban population in 2001. The class II and III together constitute around 35% of the urban population. In 2011 the percentage urban population of class I towns has increased to 61.48%. While in the Class II and Class III towns percentages of urban population has decreased to 10.49% and 18.96% respectively. The proportion of urban population in Class IV, V and Class VI is less as compared to the upper three categories. Hence it revealed the "top heavy" nature of the urban structure with a few large urban centers claiming a large share of urban population at the apex with a weak base below.

Table3: Number of towns in each size class and their percentage of urban population: 1941-2011

Years	Class I	% pop	Class II	% pop	Class III	% pop	Class IV	% pop	Class V	% pop	Class VI	% pop	total towns
1941	4	27.26	2	5.38	13	17.69	28	18.3	74	25.01	36	6.36	157
1951	4	26.58	4	8.92	20	19.11	36	15.93	96	21.74	67	7.72	227
1961	6	37.84	4	7.35	23	20.34	52	21.56	51	11.87	9	1.04	145
1971	7	40.94	7	10.75	31	20.03	67	20.62	41	7.3	4	0.36	157
1981	11	45.85	10	9.18	55	23	101	19.21	23	2.7	1	0.06	201
1991	14	49.54	20	13.64	74	21.72	87	13	25	2.03	2	0.07	222
2001	19	56.31	27	14.66	90	20.52	61	7.15	20	1.17	5	0.15	222
2011	29	61.48	26	10.49	105	18.96	80	6.75	47	2.07	10	0.25	297

Source: All India Town Directory, 1991-2011.

Figure2: Proportion of urban population in different size classes in Rajasthan, 1941-2011

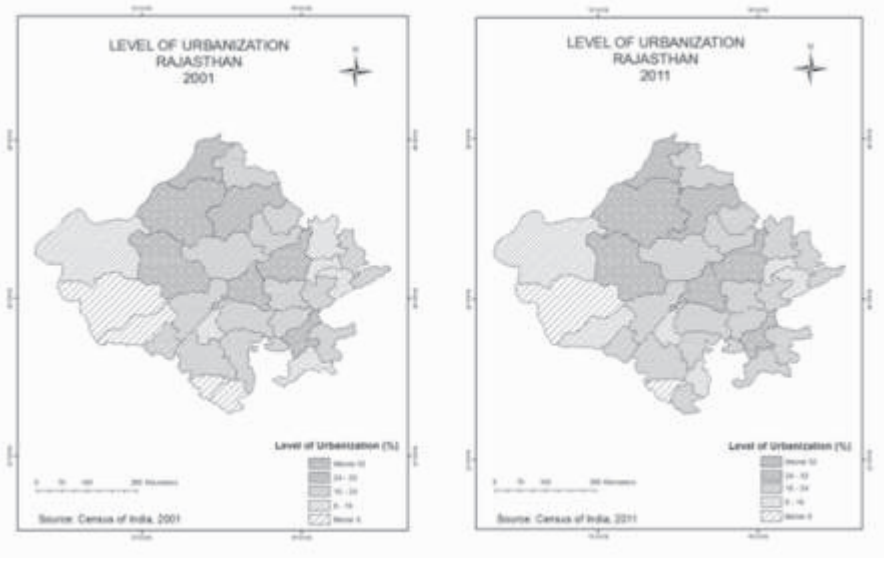


Source: Census of India, All India Town Directory, Rajasthan 1991, 2001, 2011

2. District Level Urban Scenario in Rajasthan: 2001- 2011

Spatial variation in the level of urbanization across the districts is shown in Map 2. In 2001 the number of districts in the Rajasthan increased to twenty seven. New districts were Karauli, Dausa, Rajsamand, Baran, and Hanumangarh. The level of urbanization in the Rajasthan had raised to 23.39%.With the exception of the few districts the level of urbanization in every district had increased. Kota (53.46%) has recorded the highest level of urbanization followed by the Jaipur (49.36%) and Ajmer (40.09%). Lower level of urbanization was in the Banswara (7.15%) district. Ganganagar (25.34%) has achieved the high urbanization along with the Churu (27.87%) district. Barmer had faced the decrease in the level of urbanization from 10.04% in 1991 to 7.40% in 2001. There are thirty three districts in the Rajasthan in 2011 and Pratapgarh is the new district created from the Chittaurgarh district. The level of urbanization in the state has increased to the 24.87% from 23.39%. The highest level of the urbanization is observed in the district of the Kota (60.31%) and the lowest in the district of Dungarpur (6.39%). In the Pratapgarh (8.27%), Dungarpur (6.39%), Banswara (7.10%), Barmer (6.98%), Jaisalmer (13.29%), Bikaner (33.86%) the level of the urbanization has decreased from the previous year. In Jalore and Jhalawar level of urbanization has increased and hence their category also increased to low urbanized from the very low urbanized districts for Jalore and Jhalawar from the low urbanized districts to the moderate urbanized districts.

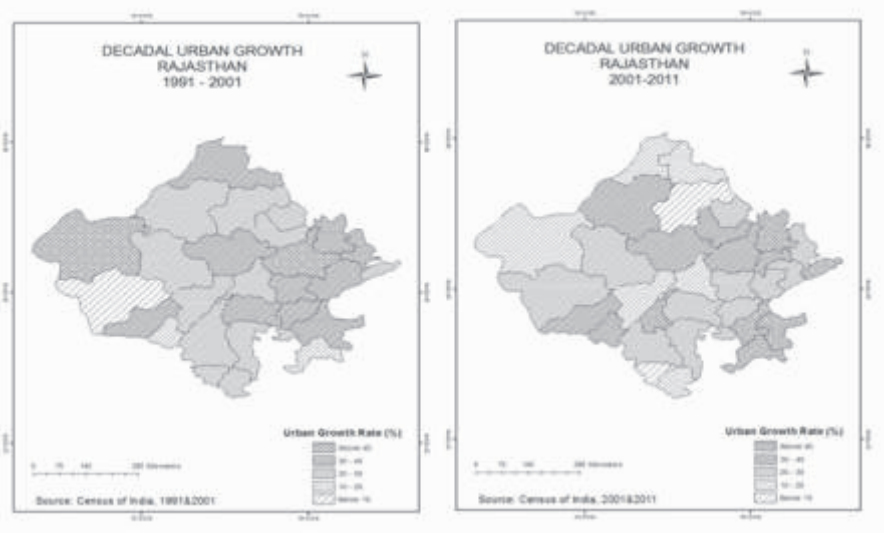
Map2: Level of Urbanization in Rajasthan: 2001 & 2011



The spatial variation in the urban growth pattern in the districts of Rajasthan is shown in Map 3.In the decade 1991-2001 the highest growth rate was recorded by the state's capital Jaipur (46.14%) followed by the desert district Jaisalmer (42.53%). The lowest decadal variation in the urban population was of Barmer (0.86%). In the decade 2001- 2011 an urban growth rate of many districts had decreased as compared to the previous decade. The minimum urban growth rate in 2001-11 was 7.47% registered in Churu district followed by Dungarpur (9.75), Hanumangarh (15.46%) and Jaisalmer (16.53%). Alwar recorded 50.47%, followed by the Dausa (48.48%) and Baran (47.79%) was at the maximum. In the state the urban growth had decreased from the previous decade to 29.01% from 31.26%. The steep increase in the urban growth rate was registered by the Barmer district from 0.86% in 1991-01 to 25.06% in 2001-11. In half of the districts, urban growth rate had declined while in the rest it had increased. Jaipur, the state capital and Kota are the industrial capital of the state. Both are the class I size towns very well connected with the transportation network from the rest of the world. Consequently, due to the location and infrastructural facilities these two districts have attained the highest level of urbanization. Other districts observed the high level of urbanizations are the Ganganagar, Bharatpur and Udaipur as they fall on the borders of different states. Ajmer, Jhunjhunu, Sikar, Jodhpur, Churu are enjoying the central locations so here the urbanization level is high. The reasons for the high level of urbanization are trade opportunities, wide hinterlands, nearness to the other state markets, mineral occurrence, etc. Besides, there are

some individual factors which accounted for the growth of town viz. Udaipur due to Tourism, Ganganagar for agricultural development, Ajmer for religious and educational purposes, Jodhpur due to the air base and centrality, Pali and Bharatpur have the growing industries. Barmer and Dungarpur, Jalore and Jaisalmer have observed the low level of urbanization due to their nearness to the large cities and extreme border location. Dungarpur has rough and hilly terrain and vast communication gap. Barmer is physiographic and climatically handicapped (Bhalla, 2016).

Map3: Decadal Urban Growth Rate in Rajasthan: 1991-01 & 2001-11



CONCLUSIONS

The main focus of this article is to analyze the urban processes in the state of Rajasthan. As Rajasthan is one of the states of India Union, which is lowly urbanized, the process of urbanization has been accelerated in the state after independence. Before independence the growth of the urban population was more due to the addition of the new towns and less due to already existing urban centers. The level of urbanization in Rajasthan in 2011 census is the 24.87% and it is lower than the corresponding urbanization at all India level (31.16% in 2011). The distribution of the urban population in the different classes revealed the "top heavy" nature of the urban structure with a few large urban centers claiming a large share of urban population at the apex with a weak base below. In Rajasthan 10.49% of urban centers (class I) accounted for about 61.48% of the urban population in 2011. Rajasthan is a land of diversity which finds expression in her physical as well as a cultural landscape. District wise analysis of the level of urbanization shows the inter regional variation of the urban population, which is mainly controlled by the factors like annual rainfall, temperature conditions, availability of cultivable fertile land, general relief structure and means of transport and communication, etc. Districts in the north and the southern and southwestern part of the state are highly urbanized as compared to other regions.

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