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Analytical Study of Spatial Pattern of Rural and Urban Population Distribution in Hadouti Region

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ABSTRACT: In this research paper, an analytical study of the spatial distribution patterns of rural and urban population has been done in Hadouti region between the year 1971 to 2011. Under this, the nature of the process of urbanization in the area has also been highlighted. The study area is a geographical region located in the southern eastern part of Rajasthan state. In which at present there are 15 tehsils and in the research paper all these 15 tehsils have been considered as the unit of study. In the study the data of distribution of rural and urban population in Hadouti region from the year 1971 to 2011 was analysed and also the changes in the distribution of rural and urban population in all tehsils between 1971 and 2011 have been explained through the map. And finally, the reasons for the spatial changes in the population distribution were also clarified.

KEYWORDS: Hadouti region, Rural and Urban Population, Spatial Distribution Pattern, Urbanization.

I. INTRODUCTION

The economic development of any area depends on its human resource. Natural resources are used by humans only. In fact, natural resources are inactive. They only facilitate economic development, whereas the task of human beings is to maximize production from them. Therefore, it is important to study the population of any area.

The term population distribution is used in a broad sense in population geography. The population living in an area is basically classified as urban population and rural population. And both these types of population have their own specific role in the development of that area. Therefore, in order to understand the development of any area, it becomes very important to understand the distribution of rural and urban population existing in that area. Because whenever there is a process of urbanization in any area, then basically the rural population is converted into urban population. The existing rural and urban population in the area is recognized for its specific work, which later becomes the basis for the overall development of that area. Therefore, analytical study of the spatial distribution patterns of rural and urban population of the area is very necessary, so that plans for the development of the area can be made in future. In this study, the spatial distribution of rural and urban population in Hadouti region between the year 1971 to 2011 have been analysed, under which the nature of the process of urbanization in the area has also been highlighted.

II. OBJECTIVES

1. To analyse the spatial patterns of rural population distribution in the study area.
2. To understand the processes of urbanization in the study area.
3. To analyse the spatial patterns of urban population distribution.

III. METHODOLOGY

1. All the 15 tehsils included in the study area have been analysed as a unit of research.
2. For analysis of the spatial pattern of rural population distribution, according to the census of the year 2011 in all 15 tehsils, the number of villages inhabited and the population residing in them are arranged in the table between less than 200 persons and more than 2000 persons which are categorized into 5 classes.
3. To analyze the spatial patterns of urban population distribution, according to the Census year 2011, the data of urban population in all 15 tehsils has been arranged in a table and analysed.
4. In order to understand the process of urbanization, the developed cities have been classified and analyzed according to the population size between the year 1971 and 2011.

IV. REVIEW OF LITERATURE

First study on population analysis in the world was done in 1953 by G.T. Trewartha, after which many geographers and economists made their important contributions, in this Clark, Ward, J.I. Clark Garner, Jalensky, Stamp, Alfrid Peterson, G.J. Demko, Adams Landry, Brasley, P.E. James, Buchanan, P.George, W.E. Mori, D.J.Bogue, , Edelman, J.Brunsch, FedericDath, Kosnicke, Robin Prior etc. are prominent scholars.

Indian Scholars in Population Studies- Ashish Bose, B.L.Agarwal, Chandrashekhar, S.N.Agrawala, R.C.Chandana, G.S.Gosal, B.N.Ghosh, B.N.Puri, V.C. Misra, B.C.Mehta, Mansur Ahmed, S.J.Mehta, Suryakant, K.N. Dubey, Prem Sagar, Smita Sen Gupta, S.C.Julka, P.K. .Sharma, Keshav.C.Kayastha, Sodhiram, Dhaneshwari, , Meher Singh Gill, F.Z Jamali, N.L Gupta, Ismail Haque, Indel Singh, Kamalkant Dubey, Mahendra Bahadur, Juzar Singh, Pushpa Pathik, Gopal Krishna, Heather Joshi, Abdul Razak, NuralAlam, A.S. Panwar, Dharmaraj Joshi, LaluramBhagora,etc. have made their invaluable contribution.

In recent years, significant study is done in the population distribution by Akinbogun, T., and S. Ogunduyile. 2009, Bendi, S. K., and T. K. Pany. 2017, Bose, C. 2018, Chakrabarti, A. K. 2008, Chutia, L. J., and M. K. Sharma. 2016, Das, D., A. Kumar, and M. Sharma. 2020, Dash, M. 2016, Grobar, L. M. 2019, Huang, D., Lang, Y., & Liu, T. (2020), Ribeiro HV, Oehlers M, Moreno-Monroy AI, Kropp JP, RybskiD(2021), Yadav,S., Khan,Z. (2012), Zhang L, Lin X, Leng L, Zeng Y,(2021), Zhou Q, Xu Y, Zheng Y, Shao J, Lin Y, Wang H,(2020),N. Mangal and Z. Khan(2020).

V. STUDY AREA

Study area is located in the south-eastern part of Hadouti Plateau in Rajasthan, between $24^{\circ}25'$ to $25^{\circ}51'$ North latitudes and $75^{\circ}15'$ to $76^{\circ}45'$ East longitudes. The total geographical area of this region is 14481.6 square kilometres. This region includes the entire Bundi district, the entire Kota district except Ramganj Mandi tehsil, the entire Baran district except Chhabra Kishanganj and Shahbad tehsils and Khanpur tehsil of Jhalawar district. There are 15 tehsils in this region, in which there are 2278 inhabited villages and 19 towns. The main ever flowing river of this region is Chambal, whose tributaries are Kali Sindh, Parvan, Parvati and Mej. The climate here is semi-arid and sub-arid. Agriculture is the main occupation of the population here.

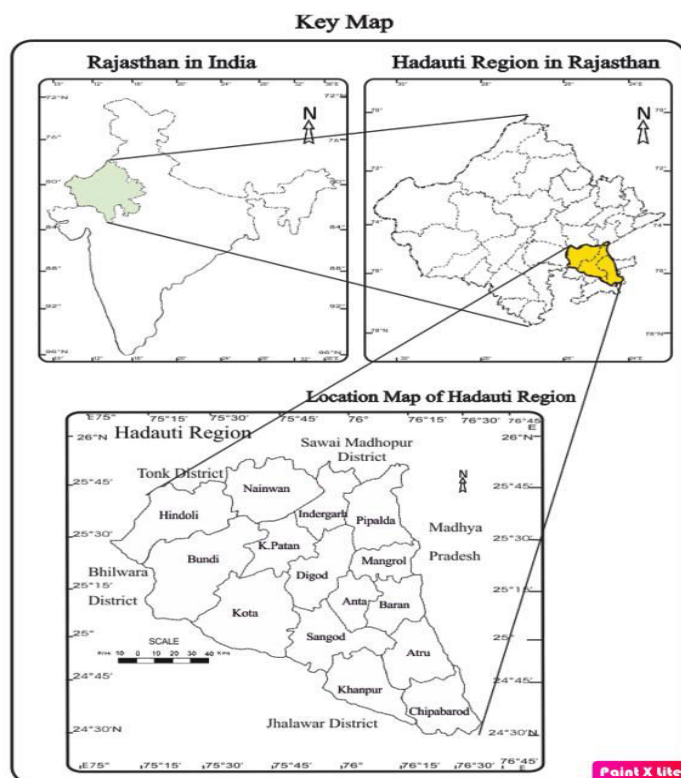


Figure 1:Map-1;Key Map

VI. ANALYSIS OF SPATIAL DISTRIBUTION OF RURAL AND URBAN POPULATION

To study the spatial distribution patterns of rural and urban population, for all the 15 tehsils of the region, the data of rural and urban population has been analyzed as follows.

VII. DISTRIBUTION OF RURAL POPULATION

Very interesting facts come out from Table 1. Hindoli tehsil has a maximum 1196 persons per village, second place is Mangrol tehsil where 1122 persons live per village. In Indergarh tehsil it is lowest as only 751 persons reside per village.

Table 1
Tehsil Wise Distribution of Rural Population per inhabited village 2011.

S.No.	Tehsil	No. of Inhabited Village	Percentage of Inhabited village	Rural Population 2011	Percentage of Rural Population	Avg. Rural Population per Inhabited village
1	Atru	141	6.3	122309	5.5	867
2	Anta	79	3.4	87661	4	1110
3	Baran	90	3.9	95563	4.3	1062
4	Bundi	265	11.6	295974	13.3	1117
5	Chhipabarod	176	7.7	152049	6.9	864
6	Digod	164	7.1	168734	7.6	1029
7	Hindoli	184	8.2	219968	9.9	1196
8	Indergarh	116	5	87066	3.9	751
9	K.Patan	112	4.9	108612	4.9	970
10	Khanpur	193	8.5	159345	7.2	826
11	Ladpura	117	5.1	117838	5.3	1007
12	Mangrol	73	3.2	81890	3.7	1122
13	Nainwan	190	8.4	176585	8	929
14	Pipalda	167	7.3	179800	8.1	1077
15	Sangod	211	9.4	164394	7.4	779
	Total	2278	100	2217788	100	

Figure 2: Table – 1

Per village population confuses us with the actual village sizes but many physical and social controls in substantial variation in the shape of villages have affected the size of the population of villages also. There are a total 2278 inhabited villages in the study area. Most of these villages are in Bundi tehsil which is 11.6 percent of the study area.

Mangrol tehsil has the lowest 3.2 percent populated villages. It is clear from Map-2 that Indergarh in the north and Sangod tehsil in the south where the rural population per inhabited village is less than 800 persons. Whereas 800 to 900 persons per inhabited village are found in three tehsils in the south-east of the study area. These are Atru, Chhipabarod and Khanpur.

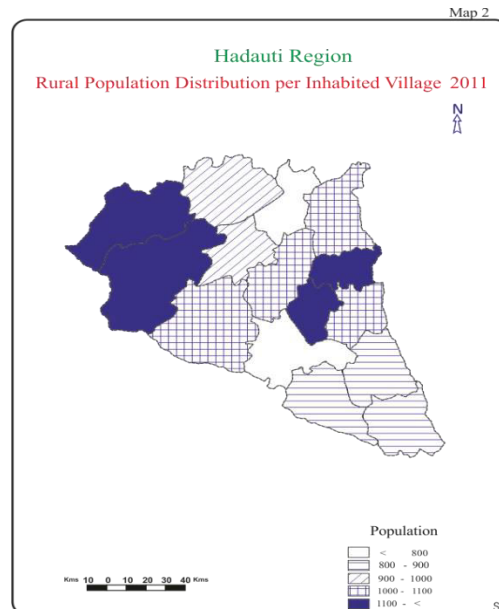


Figure 3: Map-2;Rural Population Distribution per Inhabited Village 2011.

Table - 2
Population size classification of villages (In Percentage)

Tehsil	2000-<	1000-1999	500-999	200-499	200->
Atru	6.38	22.7	39	24.82	7.1
Anta	12.66	25.32	40.51	15.18	6.33
Baran	10	24.44	42.22	18.89	4.45
Bundi	11.32	27.93	36.6	18.49	5.66
Chhipabarod	5.68	20.45	38.07	26.14	9.66
Digod	9.76	17.07	35.98	31.1	6.09
Hindoli	13.05	28.26	40.76	14.67	3.26
Indergarh	5.17	15.52	36.21	34.48	8.62
K.Patan	8.04	25.89	31.25	28.57	6.25
Khanpur	5.7	19.69	30.57	34.2	9.84
Ladpura	11.96	19.66	30.77	28.21	9.4
Mangrol	9.59	19.18	39.72	21.92	9.59
Nainwan	7.89	17.37	40.53	30.53	3.68
Pipalda	7.78	21.56	34.13	31.14	5.39
Sangod	4.74	16.59	35.55	31.75	11.37

Figure 4: Table – 2

900-1000 people are found in inhabited villages of Bundi district in Nainwan and KeshoraiPatan tehsil. 1000-1100 people reside in Ladpura, Digod, Pipalda and Baran tehsil in the east. More than 1100 people per inhabited village reside in Anta, Bundi, Hindoli and Mangrol tehsils. Most people per inhabited village are found in Hindoli of Bundi district, which is mainly a tehsil with rural population and agriculture is the main occupation of the population. It is clear from Table 2 that in Hindoli tehsil, villages with population more than 2000 had the highest 13.05 percent compared to other tehsils. Another thing became clear from the table that the highest percentage of villages are in the population size of 500-999. In almost all tehsils except Sangod tehsil, the percentage of villages with less than 200 population is less than 10 percent in size. Since the study area is mainly from an agriculture-based background. Therefore, the maximum percentage of population resides in small and medium sized villages. Smaller villages indicate that the pattern is scattered and the distance between villages is less whereas the distance between large sized villages is more.

VI.II. DISTRIBUTION OF URBAN POPULATION

The ratio of urban population to the total population of a region or the process of increasing this ratio is called urbanization. Urbanization is a process by which the proportion of rural population increases due to the following reasons-

- I. Rural population migration to cities.
- II. Due to the increase in the rural population, their increasing size, due to various economies, they attain the urban level, that is, when the rural settlement becomes urban.
- III. On the inclusion of adjoining rural areas in urban areas under the law.
- IV. Natural increase in the urban population.

In the 1981 census, the following settlements have been placed under the city:

1. All those places in which there is any unit of local administration of Municipality, Municipal Corporation, Cantonment Board or Notified Town Area Committee etc.
2. All other sites that satisfy the following criteria: -
 - I. Minimum population of 5000.
 - II. 75% or more of the male active population is engaged in non-agricultural activities.
 - III. The density of the population is at least 400 persons per square kilometre.

Urban sites have been divided into 6 classes in the Indian Census, which matches the suggestion of the United Nations.

Table-3
Tehsil Wise Urban population, 2011

Tehsil	Total Urban Population	Percentage of Urban Population to total Tehsil Population	Percentage of Urban Population to total Urban Population
Atru	27650	18.4	1.8
Anta	32377	26.9	2.1
Baran	117992	55.3	7.8
Bundi	115559	28.1	7.7
Chhipabarod	18837	11	1.3
Digod	Nil	Nil	Nil
Hindoli	1633	0.7	0.1
Indergarh	37016	29.8	2.7
K.Patan	45375	29.5	3
Khanpur	13848	7.9	0.9

Ladpura	1025954	89.7	68.1
Mangrol	25073	23.4	1.7
Nainwan	19485	9.9	1.3
Pipalda	Nil	Nil	Nil
Sangod	21846	11.7	1.5
Total	1502645		100

Figure 5: Table – 3

Classes	Population
I	100,000 more
II	50000 - 99999
III	20000-49999
IV	10000-19999
V	5000-9999
VI	5000 than

In the year 2011, 1,502,645 individuals had been living in cities, which was 40.4% of the population of the study area. The distribution of urban population is quite uneven in the study area. 68.1 percent of the total urban population resides in Ladpura tehsil alone, of which Kota is the main centre. Here initially industry and then educational institutions became the reason for the centralization of population in Kota.

It is clear from Table 3 that there is a lack of urban population in two tehsils, Digod and Pipalda respectively. Whereas even in Hindoli tehsil, the urban population is almost zero (0.1 percent), this population has been seen due to the inclusion of one village in Bundi city ward. In Baran and Bundi tehsils, due to the towns of Baran and Bundi, the urban population is 7.8 and 7.7 percent, while in other tehsils this percentage is less than 3 percent. The distribution of urban population 2011 is shown in Map 3. In 6 tehsils, Atru, Chhipabarod, Hindoli, Khanpur, Nainwan and Sangod, the urban percentage of the total population is less than 20. Out of this, 4 tehsils are in the south while 2 tehsils are in the east and middle. The urban percentage is between 20 to 40 in 5 tehsils, which are Anta, Bundi, Indragarh, KeshoraiPatan and Mangrol. This area is in the form of a belt from south to north in Bundi district and three tehsils are in the east of the study area. The urban percentage is more than 40 percent in 2 tehsils Baran and Ladpura respectively. Whereas there is a lack of urban population in 2 tehsils Digod and Pipalda.

VI.III. NUMBER OF CITIES AND INCREASE IN THEIR POPULATION

Table 4.
Number and population of cities according to category, 1971-2011

Year	Class I		Class II		Class III		Class IV		Class V		Class VI	
	No. of Cities	Pop.	No. of Cities	Pop.	No. of Cities	Pop.	No. of Cities	Pop.	No. of Cities	Pop.	No. of Cities	Pop.
1971	1	212991	....	....	2	64301	1	15908	3	23852	1	2655
1981	1	358241	....	....	3	110087	7	79995	1	9998	1	4157
1991	1	537371	2	122766	1	22891	9	132538	....	....	1	4540
2001	1	694316	2	167536	5	117079	4	67634	3	20000	1	4387
2011	3	1224605	....	....	7	178503	4	63311	5	36226	....	....

Abbreviation Pop. =Population

Figure 6: Table – 4

There were 8 towns in the study area in 1971 which increased to 19 in 2011. Similarly, in 1971 the urban population was 319707 which increased to 1502645 in 2011. Table 4 shows the category wise number and population of cities 1971-2011.

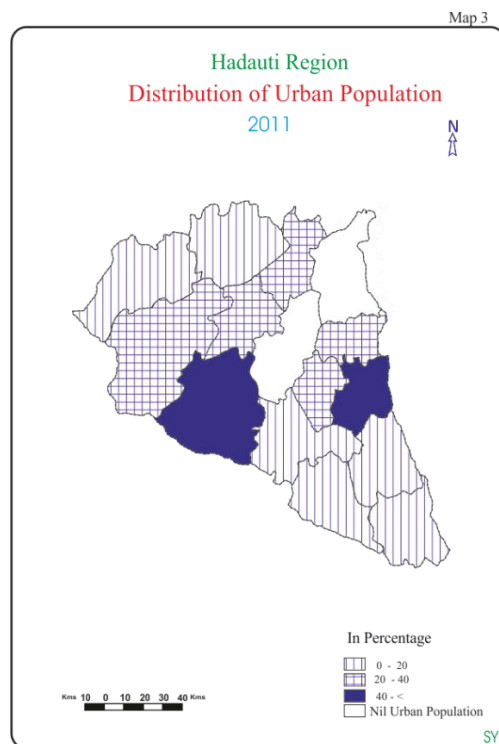


Figure 7: Map-3; Urban Population Distribution 2011.

Till 2001, only Kota was a first-class city. But in 2011 Baran and Bundi also came under this category. Both these cities were in the third tier till 1981 and joined the second tier only in 1991. There were two cities in the third category in 1971 which increased to 7 in 2011. There was only one town in the fourth category in 1971, whose number increased till 1991, but in 2001 they decreased from 9 to 4 as 4 cities were upgraded to the third category and 1 city Khanpur again became a rural area in 2001. The fifth category also saw an increase in the number of towns from 1971 to 2011. In the sixth category from 1971 to 1991, Indragarh got the place which was upgraded in 2001 and in its place Buddhapura of Bundi district again got the place. Buddhapura was also upgraded in 2011.

In the process of urbanization, the new cities did not have as much effect on the urban population growth as the class I to III cities had. The cities of the fourth and fifth grades were actually grown villages, which included urban features. Whereas in the sixth category, small villages that fulfill the definition of town in the census, such as more than 75 percent of the population, are engaged in non-agricultural activities.

VII. CONCLUSION

The rural population of the study area was 1095840 in 1971 which increased to 2217788 in the year 2011. That is, an increase of 102.38 percent in 40 years. The main reason for this was the availability of employment to the rural population due to the expansion of irrigation facilities and the reduction in the rural mortality rate due to the expansion of medical facilities. There was also a decline in the rate of rural population growth, which declined from 21.92 in 1971-81 to 8.65 percent in 2001-2011. The main reason for this is the promotion of family planning programs by the government.

The analysis of urban population data revealed that where the urban population was 319707 in the year 1971, which increased to 1502645 in 2011 i.e. the total population growth was 370 percent. In 2011, 40.4% of the population was urban. Only 68.1 percent of the total urban population is in Ladpura tehsil, due to which Kota city is in this tehsil.

There is a lack of urban population in Digod and Pipalda tehsils. Out of 15 tehsils of the region, 13 tehsils have a high rural population, while only two tehsils, Ladpura and Baran, have the concentration of urban population.

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