Assessment of Population Element and Land Use Pattern in Kachchh District, Gujarat

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Abstract

The present paper makes an effort to study the trend in population growth and the land use pattern across the talukas of the Kachchh region in the state of Gujarat. The paper observed a stable growth in the population during the last three decades. Asymmetrical distribution of population with reference to size and growth was observed among the all talukas of the region. The analysis indicated changes in population and land use pattern for the development of the Kachchh region.

Keywords: **population growth, land use pattern, demography, economic development**
JEL Classification: R0, R1, R10, R14, R 23

Demographic and land use dynamics have important implications for the natural environment within both developed and developing nations. The use of land is very wide and intense, and the demand for land has been increasing for its various uses over time. In fact, there are competing uses such as forests, agriculture, industry, housing, infrastructure, services, and recreation. As such, the land use pattern is highly influenced by the various deliberate interventions by the people, and has been undergoing changes significantly (World Bank, 1994). The issue of land use changes is very important in the context of increasing population pressure. When the pressure on land by man increases, it leads to both extensive and intensive use of land. But studies on the effect of population on the other uses of land are very limited. However, there are a few studies discussing the changes in land use pattern in general and with particular reference to population growth (Harrison & Fred, 2000; Kalipeni, 1994 ; Nandi & Rao, 1999 ; Ravichandran, 1997 ; World Bank, 1999). A review of the above studies provide a conceptual framework for our analysis of establishing the linkage between population pressure and land-use changes. Rapid population growth and economic development are increasing the demands on natural resources (Orimoogunje, 2011).

The demographic indicators serve as the base in all development endeavors. One of the objectives of all sorts of planning is to create a livelihood environment and provide maximum employment for the maximum number of people. Hence, it is imperative to analyze the population by studying the following parameters - size of the population, its growth rate, population density, population concentration pattern, migration pattern, population projection, age – sex distribution of the population, and the occupational structure of the area. The solutions of global environmental problems are centered on the nature of the relationship between developed and developing countries. There is a need for both developed and developing countries to make more eco - conscious policies capable of creating a sustainable balance between population, resources, and environment (Nandi, 1999).

Objectives of the Study

1) To ascertain the current scenario of population and land statistics of Kachchh district, Gujarat.
2) To conduct an assessment of population with land utilization in Kachchh district, Gujarat.

Data and Methodology

For the study, data was compiled from various secondary sources, like data were obtained from the State Govt. offices and regional offices of Kachchh region. We focus on the tendency and degree of difference for Gujarat and Kachchh populations. It includes information on population growth, density, and land use pattern. Most of the demographic

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data were taken from Census publications (Registrar General of India/State/Regional level) for different time periods (1991-2001) considered for the present study. The land use classification data were compiled from various reports like Statistical Abstracts of Kachchh district, 2010-2011 and Statistical Handbook of Kachchh district, 2010-2011. The population density is measured as the number of persons per square kilometer, which is used as an indication of population pressure.

Population in the Developing Region of Kachchh : Size, Density, Growth Rates

❖ **Population Size :** The total population of the Kachchh district, Gujarat state, and India were respectively 20.90 lakhs, 603.84 lakhs, and 12101 .93 lakhs as per the provisional population census of GoI, 2011.

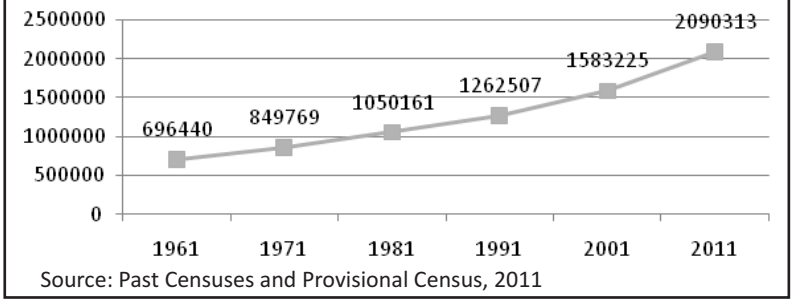
Table 1 : Population Size and Annual Average Compound Growth Rate (AACGR)

Years	Population (in Lakh)			AACGR (%) of Total Population			
	Kachchh	Gujarat	India	Decades	Kachchh	Gujarat	India
1901	4.88	91.00	2384.00				
1911	5.13	98.00	2521.00	1901-11	0.50%	0.74%	0.56%
1921	4.85	102.00	2513.00	1911-21	-0.56%	0.40%	0.03%
1931	5.20	115.00	2790.00	1921-31	0.70%	1.21%	1.05%
1941	5.08	137.00	3187.00	1931-41	-0.23%	1.77%	1.34%
1951	5.68	163.00	3611.00	1941-51	1.12%	1.75%	1.26%
1961	6.96	206.00	4392.00	1951-61	2.05%	2.37%	1.98%
1971	8.50	267.00	5482.00	1961-71	2.02%	2.63%	2.24%
1981	10.50	341.00	6833.00	1971-81	2.14%	2.48%	2.23%
1991	12.63	413.00	8434.00	1981-91	1.86%	1.93%	2.13%
2001	15.83	507.00	10270.00	1991-01	2.28%	2.07%	1.99%
2011	20.90	603.84	12101.93	2001-11	2.82%	1.76%	1.65%

Source: Census of India 2011, Provisional data, District Census Handbook, 2001

The Table 1 depicts the comparison of the temporal variation in the total population and AACGR (annual average compound growth rate) of Kachchh, Gujarat, and India. It can be observed from the Table that in the last decade (2001-2011), the AACGR of Gujarat and India has decreased, but the AACGR of Kachchh district has increased. The total population of Kachchh district as per the 2011 census was 2090313, with a growth rate of about 32.03%, which is about 3.46% of the total population of the State of Gujarat, and the district is placed at the 13th position as far as population size is considered. The AACGR of Kachchh district was 2.82 %, which is at an all time high. Also, it is greater than the AACGR of Gujarat (1.76%) and India (1.65%) respectively. The lowest AACGR for the district was recorded in the year 1911-1921 (0.56 %) and the Gujarat's highest AACGR was observed in the year 1961-71.

Figure 1: Population Size – Temporal Variation

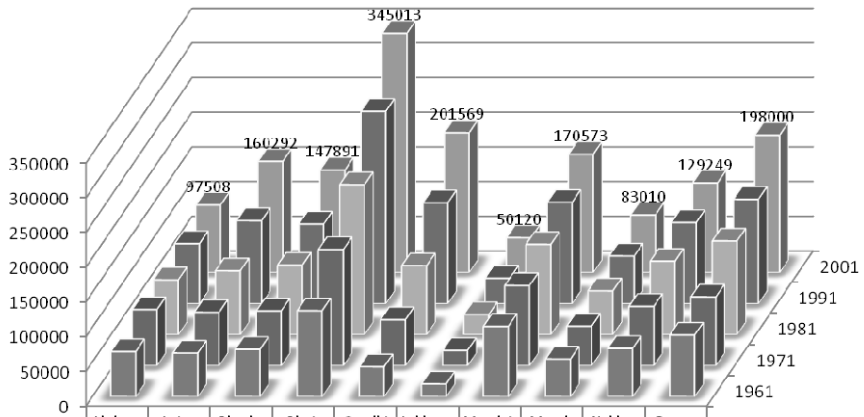


Source: Past Censuses and Provisional Census, 2011

The decadal variation in the size of population of the District over the last five decades is shown in the Figure 1; it is clear that though there was an increase in the population by about 13.93 lakhs from 1961 to 2011, the increase in population over the last two decades has been 8.27 lakhs, indicating an increase in the population growth of the District. The percentage share of these two decades in the total increase in population has been 59.3%. The Figure 2 represents the population growth of the talukas in the Kachchh district from 1961 to 2001. Bhuj taluka had the maximum population - with 3,45,013 persons in 2001 - among all the talukas in Kachchh district. Subsequently, the talukas with the largest population in Kachchh district in ascending order are : Gandhidham, Rapar, Mandvi, Anjar, Bhachau, Nakhatrana, Abdasa, Mundra, and Lakhpat, with Lakhpat taluka having the minimum population, with 50,120 persons.

The Table 2 depicts the population distribution in rural and urban areas, and the percentage share of the talukas in

Figure 2 : Temporal Variation of the Population in ten Talukas in Kachchh District



	Abdasa	Anjar	Bhachau	Bhuj	Gandhidham	Lakhpat	Mandvi	Mundra	Nakhatrana	Rapar
1961	65118	62942	68334	123949	43247	18401	101501	54425	69632	88891
1971	80864	76865	79016	167443	66268	21960	115546	57079	85555	99173
1981	78982	92052	100252	216318	99336	28902	130146	63224	105900	135049
1991	86402	119730	114759	277215	145495	36759	146034	68652	116944	150517
2001	97508	160292	147891	345013	201569	50120	170573	83010	129249	198000

Source: Past censuses and Provisional census, 2011

Table 2 : Population Distribution in Rural - Urban Areas, Taluka wise

Taluka	1991					2001				
	Total	Urban	Share of Taluka in Total Urban Population %	Rural	Share of Taluka in Total Rural Population %	Total	Share of Taluka in Total Urban Population %	Share of urban area %	Rural	Share of Taluka in Total Rural Population %
Abdasa	86402	8105	2.1%	78297	9.0%	97508	0	0.0%	97508	8.8%
Anjar	119730	51209	13.2%	68521	7.8%	160292	68343	14.4%	91949	8.3%
Bhachau	114759	18408	4.7%	96351	11.0%	147891	25389	5.3%	122502	11.1%
Bhuj	277215	121009	31.2%	156206	17.9%	345013	136429	28.7%	208584	18.8%
Gandhidham	145495	124372	32.1%	21123	2.4%	201569	166388	35.0%	35181	3.2%
Lakhpat	36759	0	0.0%	36759	4.2%	50120	0	0.0%	50120	4.5%
Mandvi	146034	36636	9.4%	109398	12.5%	170573	42355	8.9%	128218	11.6%
Mundra	68652	11652	3.0%	57000	6.5%	83010	12931	2.7%	70079	6.3%
Nakhatrana	116944	0	0.0%	116944	13.4%	129249	0	0.0%	129249	11.7%
Rapar	150517	16466	4.2%	134051	15.3%	198000	23057	4.9%	174943	15.8%
Kachchh	1262507	387857		874650		1583225	474892		1108333	

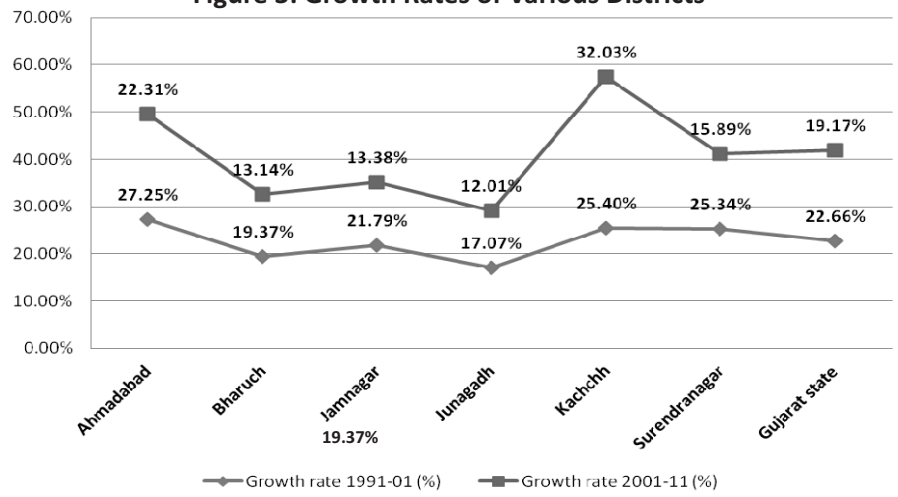
Source: District census handbook Kachchh, 2001

Table 3: Population Size, Growth Rate, and Percentage Share of Population of various Districts in Gujarat State

District	Population 2011	Growth Rate 2001-11 (%)	Share of Districts in State 2011 (%)	Rank in 2011	Population 2001	Growth Rate 1991-01 (%)	Share of Districts in State 2001 (%)
Ahmedabad	7208200	22.31%	12%	1	5893164	27.25%	11.63%
Bharuch	1550822	13.14%	3%	18	1370656	19.37%	2.71%
Jamnagar	2159130	13.38%	4%	11	1904278	21.79%	3.76%
Junagadh	2742291	12.01%	5%	7	2448173	17.07%	4.83%
Kachchh	**2090313**	**32.03%**	**3%**	**13**	**1583225**	**25.40%**	**3.12%**
Surendranagar	1755873	15.89%	3%	16	1515148	25.34%	2.99%
Gujarat State	60383628	19.17%			50671017	22.66%	

Source: Census 2001 and Kachchh district handbook, 2001 and 1991

Figure 3: Growth Rates of Various Districts

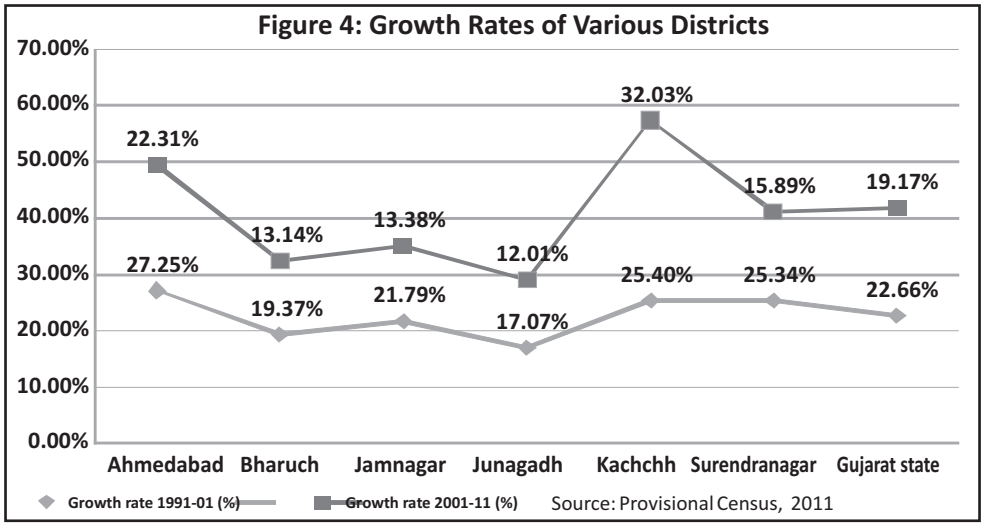


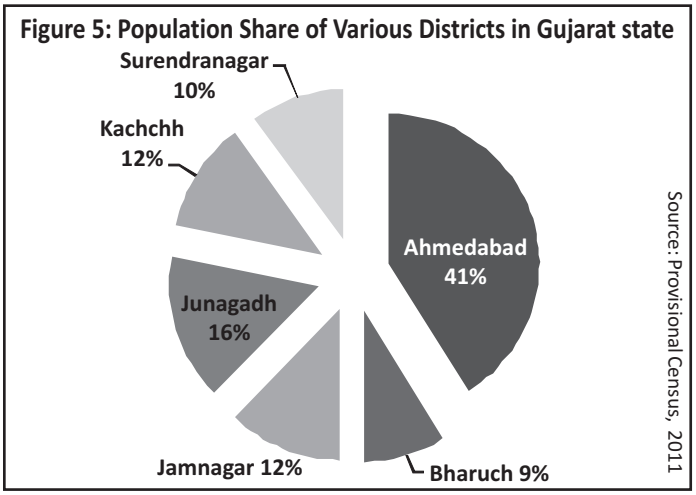
Source: Provisional Census , 2011

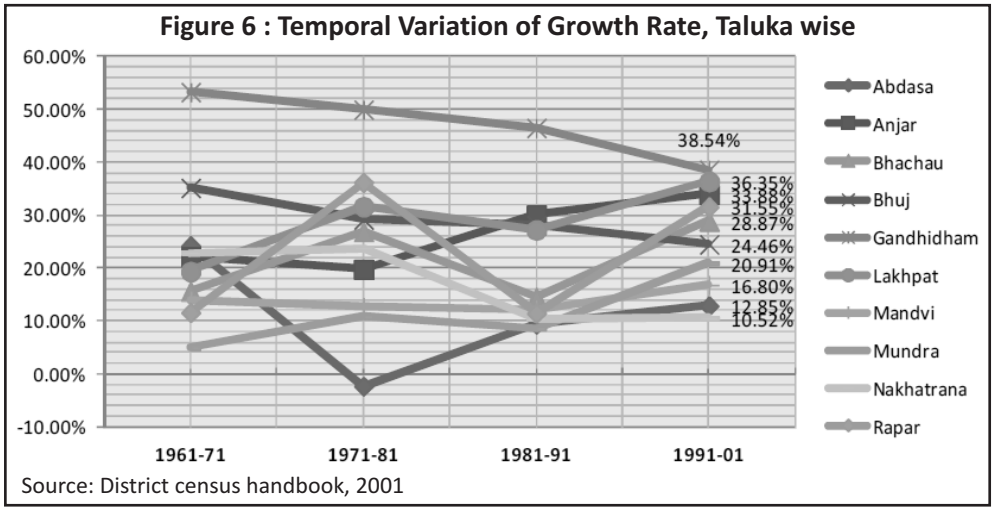
the total rural and urban population in the districts for 1991 and 2001. The share of urban population was high in Gandhidham than it was in other talukas in Kachchh district. Abdasa taluka had a town named Malaya as an urban centre in the year 1991, however, it was declassified in the year 2001, hence, at present, there is no urban population in the Abdasa taluka. Lakhpat and Nakhatrana talukas had no urban population in the years 1991 and 2001. The share of urban population increased in Gandhidham from 32% in 1991 to 35% in 2001.

❖ **Growth Rate of Population :** The distribution of the growth rate of the population among the districts of Gujarat in 2001 and 2011 is shown in the Table 3. It can be seen that in the present time, there has been a decrease in the population growth rate in the State when compared to the previous decade (2001) with the exception of Kachchh district. In 2011, Kachchh district stood first in population growth as compared to the population growth rate of the other districts. Decadal growth rate of population of Kachchh district was 32.03% as per the 2011 provisional census, which is greater than the average growth rate of 19.17 % for the State. Hence, this implies that while the overall growth rate has been decreasing in the State, the growth rate in Kachchh district has been increasing with a huge difference. The comparison of the population growth rate of Kachchh district with Gujarat state and other districts over the last two decades is shown in the Figure 3.

The Figure 4 depicts that the population growth rate of the district as well as that of the State inclined during the time period from 2001-2011. The District had a growth rate of 25.40% during 1991-2001, which inclined to 32.03% in the subsequent decade of 2001-2011. The Figure 5 depicts the share of the different districts in the total population







of Gujarat state. It can be seen that the population of Kachchh district comprised of 12% of the total population of Gujarat state, and Ahmedabad had the highest share in the total population, with a 41% share.

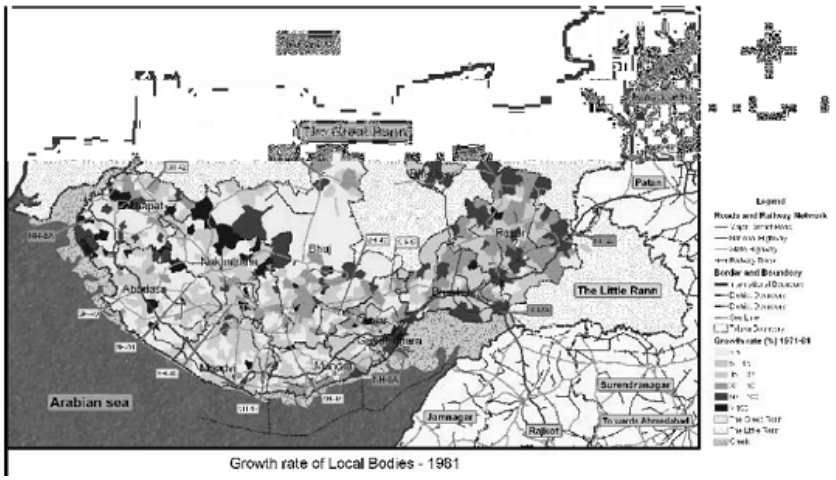
The Figure 6 shows that the population growth rate was declining in Gandhidham and Bhuj talukas, and other talukas registered an inclining trend from 1991-2001. In both these talukas, the population was concentrated in the Gandhidham and Bhuj towns ; from 1991-2001, the people migrated from these towns seeking better opportunities

for earning their livelihood. Abdasa Taluka registered a negative growth rate in the years from 1971-81. The Gandhidham taluka showed the highest growth rate in the years from 1961-71 due to the establishment of the Gandhidham town near Kandla port.

Spatial - Temporal Growth Rate in Kachchh District

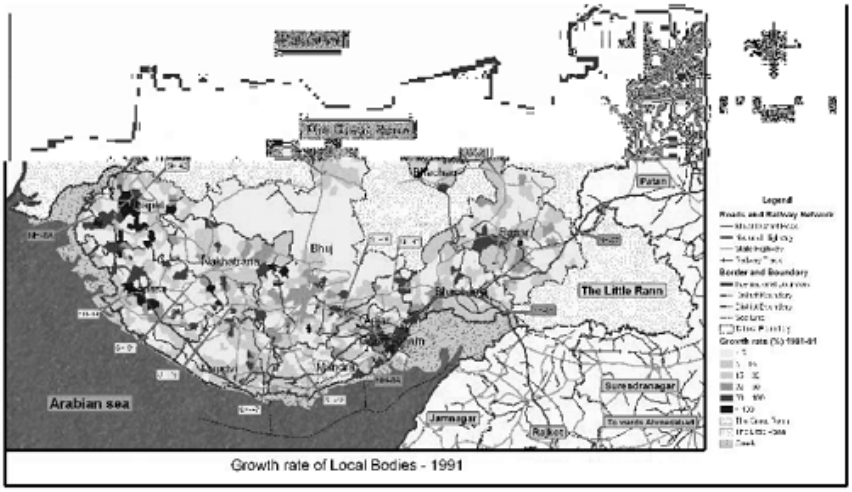
The Figure 6 depicts that in the rural areas of the District, the trend of growth rate of the population was similar to the general trend. The urban areas of the District depict a different trend with respect to the growth rate. The spatial distribution of the growth rate of the population during the last three decades is depicted in the Figures 7, 8, and 9. From the Figures 7, 8, and 9, it is clear that the growth rates of the population from 1981 - 2001 of most of the local governments of the district had inclined, including that of the six municipalities. But the population growth rate of Lakhpat and Naliya Gram panchayats also showed an increasing trend from 1981 to 1991. In the hinterlands of the Gandhidham and Kandla town, the growth rates of villages increased, and this may be due to the spatial location of these LSGs. The villages in Rapar taluka registered an increased rate of growth as compared to the other talukas from the years 1971-81. The growth rate of Bhuj, Bhachau, Rapar, and Anjar municipalities declined in the years 1991-2001. These areas are located nearby the urban areas. Moreover, most of these LSGs are well connected with higher

Figure 7: Population Growth Rate (1971-81) Local Govt. wise



Source: Data collected from census 1971 and 1981

Figure 8: Population Growth Rate (1981 -91) Local Govt. wise



Source: Census, 1981 and 1991

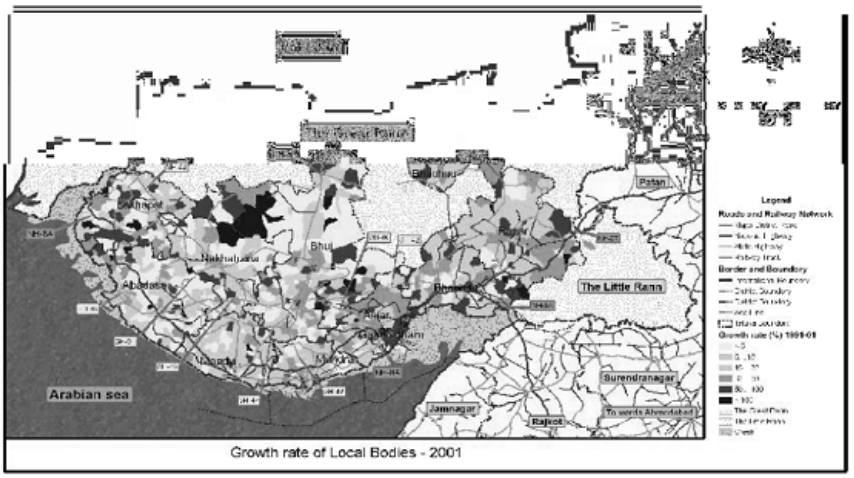
order road networks. During 1991-2001, the growth rates of the villages (that are in proximity to the coastal areas and are near the Great Rann) started increasing due to the port and industrial activity in these regions. During 1971-81, the spatial distribution of growth rate was widely concentrated in the Bhuj, Anjar, Mundra, Gandhidham, Bhachau, and Rapar talukas, and this scenario changed during the years from 1991-2001, when the growth rates of the local bodies were evenly spread in whole of the District.

The spatial distribution of the growth rates of the population during 1991-2001 depict a definite spatial pattern, and the same is depicted in the Figure 9. The growth rate of the population in the villages adjacent to the urban areas, industries, and port registered a higher growth rate, indicating the possibility of immigrants settling in the villages around the urban and industrial areas. The low growth rate of the villages in north of Bhuj taluka and in the central highlands remained the same from the years 1981 to 2001. In the district, a particular pattern of spatial distribution of the growth rate could not be identified in all the three decades.

Population Density

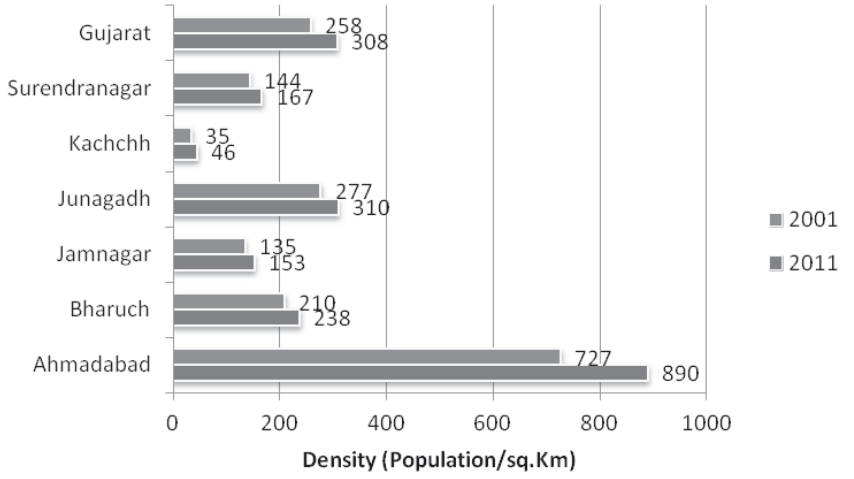
Gross population density and net population density of the district are analyzed in this section. The gross population

Figure 9: Growth Rate (1991-2001) Local Govt. wise



Source: Census, 1991-2001

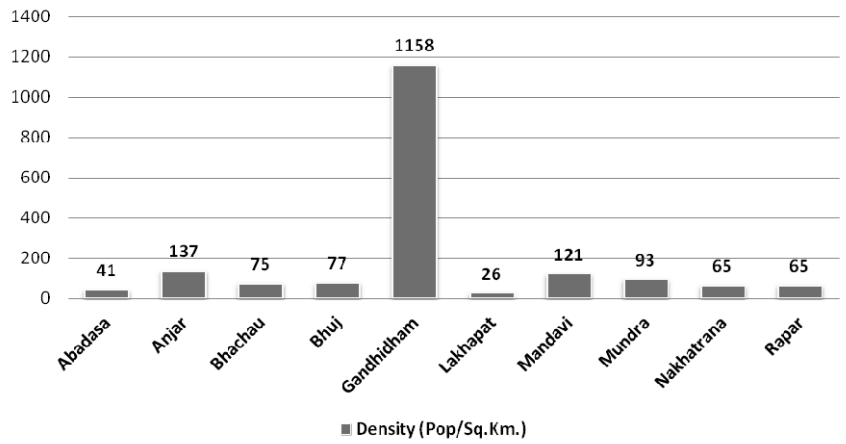
Figure 10: District wise Population Densities 2001, 2011



Source: Provisional census, 2011

density is calculated by dividing the total population with the geographical area; whereas, the net population density is calculated by taking the net area, which is calculated by subtracting the uninhabitable areas like water bodies, forest area, agricultural land, and area used under the irrigation system from the geographical area. The data was taken from the village directory for land use classification (for amenities) in the population census of GoI, 2001.

Figure 11 : Population Density (Taluka wise) , 2001

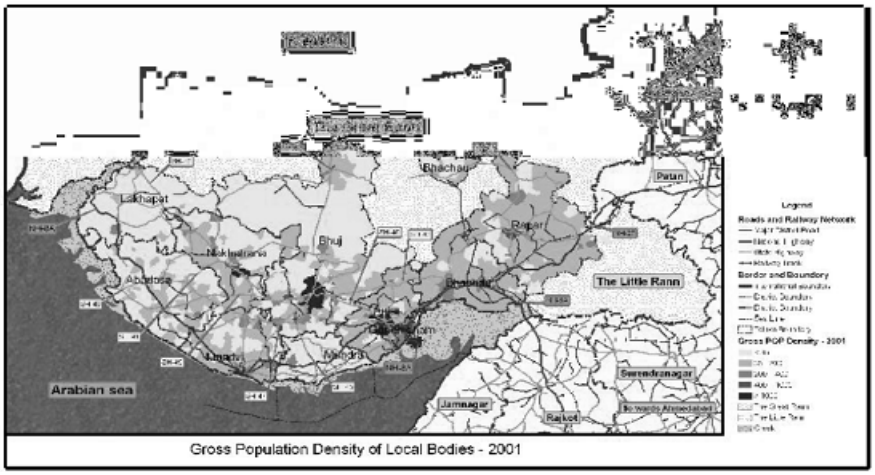


Source: Census, 2001

❖ **Gross Population Density :** A comparison of the gross population density among the districts in the State in 2001 and 2011 is shown in the Figure 10 and Table 3. It can be seen that, with the exception of the southern districts, population density increased during the time period from 2001-2011. The Figure 10 shows the gross population density, and a comparison with Gujarat state and other districts. The Kachchh district had the lowest gross population density in 2001 and 2011. The gross population density was the highest in Ahmedabad district because it is a big size urban agglomeration. The average gross population density of Kachchh was 46 persons/sq. km, which is quite low than the state average of 308 persons/sq. km in 2011.

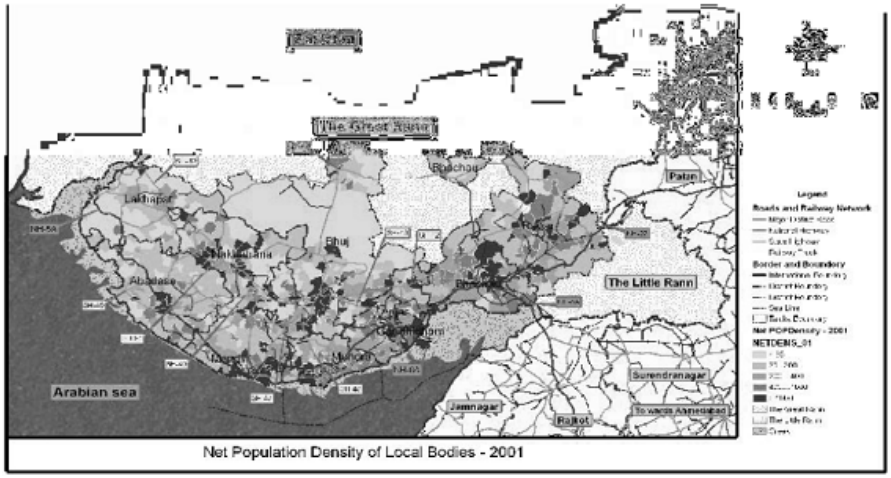
The taluka wise gross population density in Kachchh district for the year 2001 is presented in the Figure 11. The average gross density of ten talukas is 186 pop/sq. km. It can be seen from the Figure that the Gandhidham taluka had the highest gross density - 1158 pop/sq km, which is more than 6 times the average of ten talukas. The Lakhpat taluka had the lowest density of 26 pop/sq.km because the Narayan Sarovar Sanctuary is located in this area, and this region

Figure 12: Distribution of Gross Population Density (2001) – Village wise



Source: Census, 2001

Figure 13: Spatial Distribution of the Net Population Density, 2001



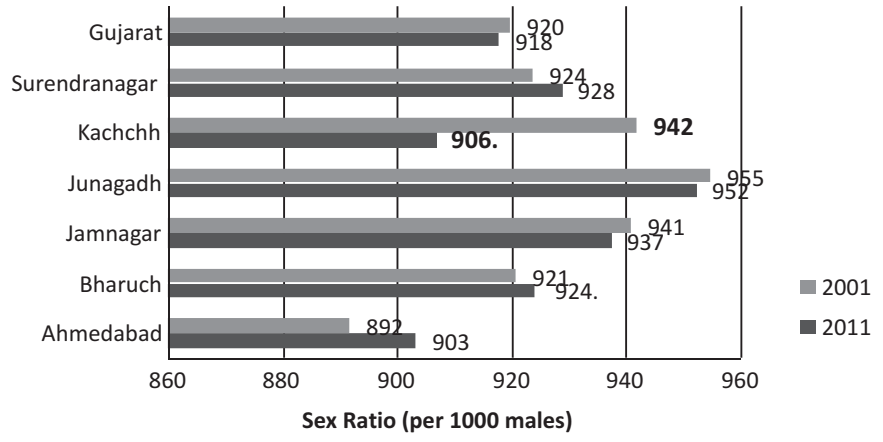
Source: Census, 2001

is in close proximity to the Pakistan border. Hence, people are not much interested to live in this area, as this area presented less opportunities of earning a livelihood. The Bhuj taluka also has a less density because of the Banni region and also because the barren desert land falls in this taluka. There is a huge difference between the District's gross density and ten talukas' average gross density because the Rann area, which is about 54% of the geographical area, falls in the Kachchh district.

The LSGs wise distribution of the gross population density in Kachchh District is shown in the Figure 12. The Figure depicts that the gross population density was high in the adjacent villages close to the urban centers like Bhuj, Anjar, Gandhidham, Mundra, Mandvi, Bhachau, and Rapar and the others are populated due to the accessibility of the road network. The highest gross population density was found in Bhuj, Gandhidham, Anjar, Kandla, and Nakhatrana towns, where the population density is above 1000 pop/sq. km. The Banni area had a very low density of population (below the district average of 35 pop/sq. km).

❖ **Net Population Density :** The net density was calculated on the basis of the available land for inhabitation, excluding the land used for agriculture, pasture, and land used under different irrigational infrastructures. The average net population density of the district was calculated to be 1007 pop/sq km. The spatial distribution of the net

Figure 14: Sex Ratio in 2001 and 2011



Source: Census, 2001 and Provisional census, 2011

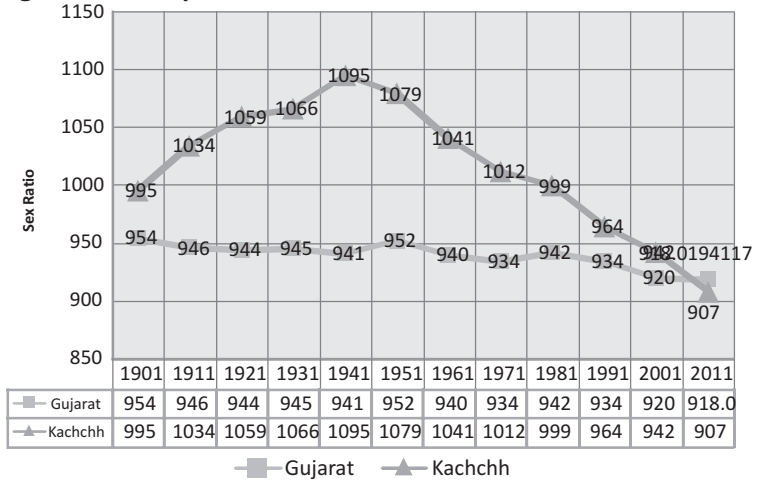
population density is shown in the Figure 13. The highest net population density range was found to be above 1000 pop/sq. km in the coastal plains and the central highlands. The lowest net population density was found in the Banni region and the Lakhpat talukas. In the coastal villages, where the net population density is high ; these areas may have less area for inhabitation due to forest and creek/mud flats. Hence, definite spatial distribution pattern of the net population density was concentrated in the hinterlands of the urban areas.

Sex Ratio

Gujarat had 918 females per 1000 males in 2011 as compared to 920 females per 1000 males in 2001, as per the provisional census (2011). Hence, the sex ratio is almost the same, as it was in the last decade in the State.

The Figure 14 shows the comparison of the sex ratio in Kachchh district with that of Gujarat and other districts in the State. Junagadh district had the highest sex ratio of 955 females per 1000 males. Ahmedabad fared worst in terms of sex ratio, with 903 females per 1000 males, and ranked 25th among all the 26 districts in the State in 2011. Kachchh district has had a poor sex ratio since the last 3 decades; the sex ratio decreased from 942 to 907 females per 1000 males, and the ranking of the district fell from 10th rank to 24th rank among all the 26 districts in the State, as depicted in the Figure 15. The sex ratio declined from 1095 in the year 1941 to 907 in the year 2011, so after the year 1941, the sex ratio decreased considerably, which may create many social problems in the future. The drastic decline in sex ratio may be attributed to the influx of immigrants, as male labour migrated to the district for pursuing better employment

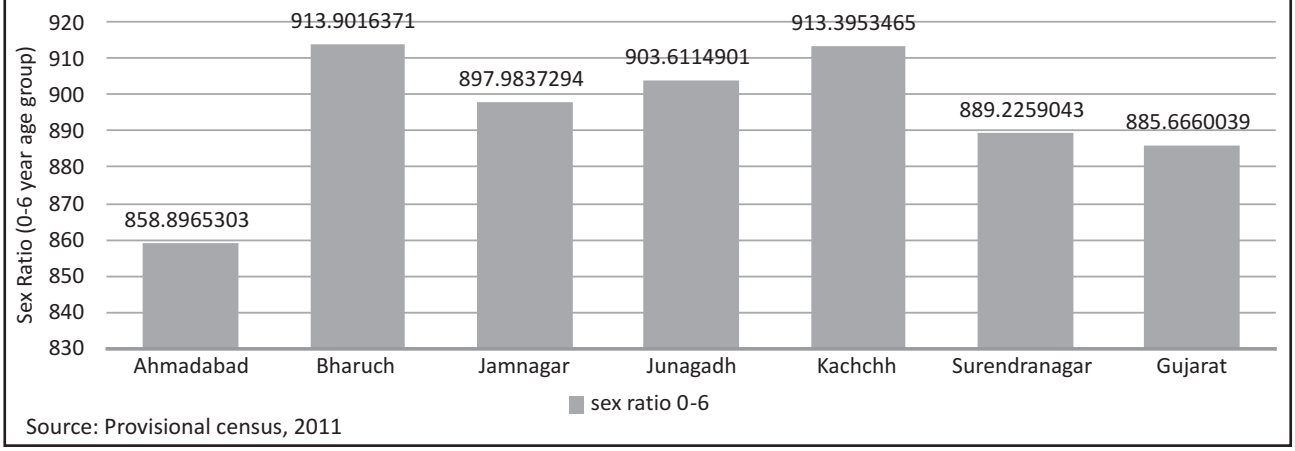
Figure 15 : Temporal Variations in the Sex ratio - 1901 to 2011



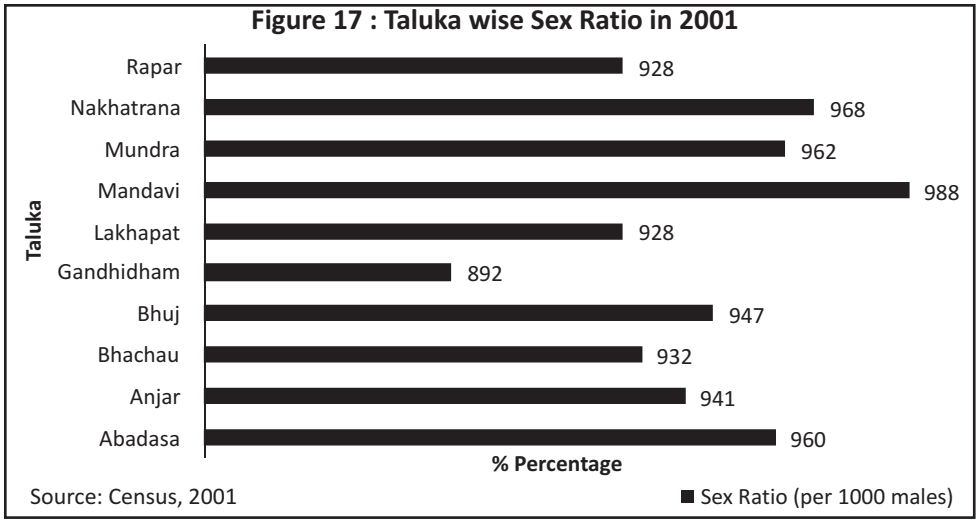
	1901	1911	1921	1931	1941	1951	1961	1971	1981	1991	2001	2011
Gujarat	954	946	944	945	941	952	940	934	942	934	920	918.0
Kachchh	995	1034	1059	1066	1095	1079	1041	1012	999	964	942	907

Source: Census, 2001 and Provisional census, 2011

Figure 16 : Sex Ratio (Age Group - 0-6 years) - Comparison with Gujarat and other Districts



Source: Provisional census, 2011



opportunities from outside the Kachchh district because of the rapid industrialization after 2001.

❖ **Sex Ratio in the Age Group of 0-6 years :** The sex ratio in the age group of 0-6 years of the District was 913, which is greater than that of the average value of the sex ratio of the State (886) in this age group. For this age too, the sex ratio is skewed, as is the case with all other age groups. However, the state of Gujarat, overall, presents a worst scenario in this age group of 0-6 years. The change in the sex ratio (age group of 0 -6 years) between the maximum and minimum value of the other districts (Figure 16) was less (914-859) than the general value of sex ratio (952-903), indicating that at birth, the sex ratio is more or less uniform irrespective of the districts, but it changes later due to the migration pattern.

The Figure 17 depicts the taluka wise sex ratio in the district. It can be observed that the Gandhidham taluka had the lowest sex ratio of 892 females per 1000 males among all the talukas in the district; it is due to the immigration of male labour that migrated to the Kandla port and the surrounding industrial area, and they settled in Gandhidham and adjacent villages. The maximum sex ratio was observed in Mandvi taluka, which had a ratio that was much above the district average sex ratio of 920 females per 1000 males. The Figure 17 represents that all the talukas had a high level of disparity in the sex ratio in Kachchh district. In Kachchh district, the spatial variation in the sex ratio is presented in the Figure 17. As discussed earlier, it can be observed from the figure that the Gandhidham taluka had a sex ratio of

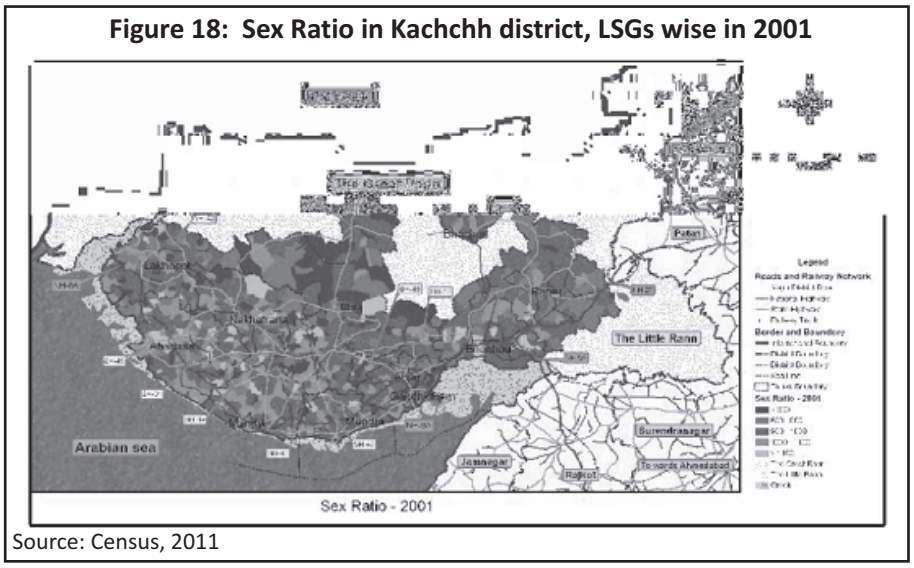
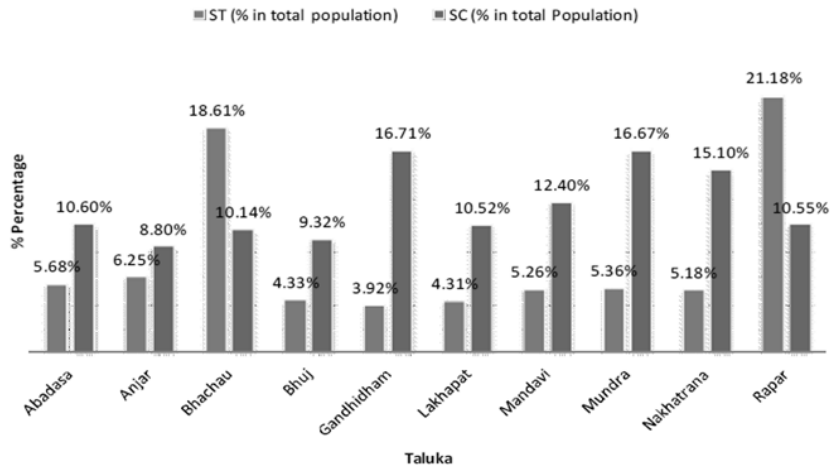
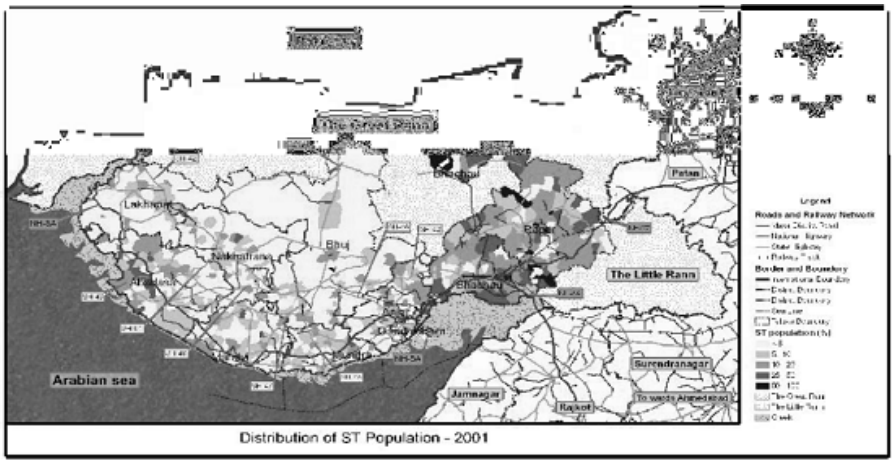


Figure 19: ST and SC population in 2001



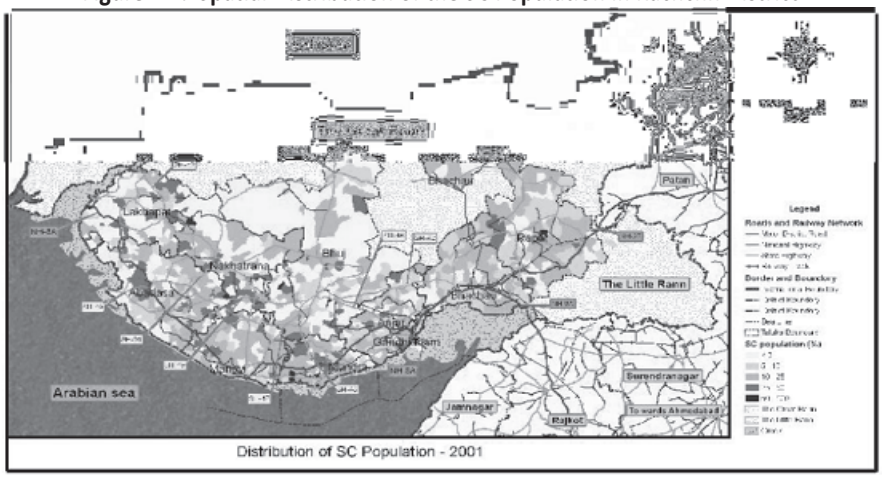
Source: District Census, 2001

Figure 20 : ST Population in Kachchh district, LSGs wise in 2001



Source: Census, 2001

Figure 21 : Spatial Distribution of the SC Population in Kachchh District



Source: Census 2001

892 females per 1000 males. The Figure 18 depicts that mainly the villages had a sex ratio in between 900 to 1000 females per 1000 males. The figure shows that no definite concentrated pattern of sex ratio could be identified in the district. The villages identified in the Bhuj taluka (Banni and surrounding region) had the lowest sex ratio - less than 600 females per 1000 males.

Population of Scheduled Castes and Scheduled Tribes

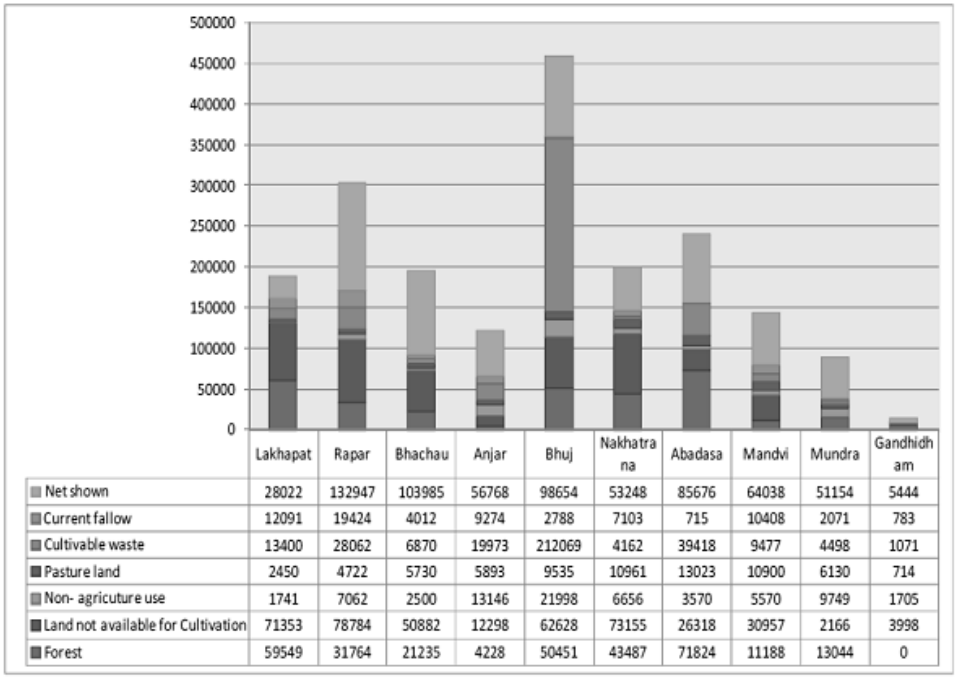
In the Kachchh district, the population of the scheduled tribes and scheduled castes was 8.01% and 12.08% respectively. The Figure 19 shows the percentage population of the scheduled tribes and scheduled castes in various talukas of Kachchh district in 2001. From the Figure 19, it can be ascertained that the ST population was highest in Rapar, and the SC population was the highest in the Gandhidham taluka, which were 21.18% and 18.61% respectively of the total population. The minimum and maximum ST population was 3.92 % and 21.81% of the total population respectively. The minimum and maximum SC population were 8.80% and 18.61% of the total population

Table 4: Land Utilization as in 2003-04

Land utilization	Area in Hector	Share in %
Available Land	1957629	100%
Forest	306770	16%
Land not available for Cultivation	412539	21%
Non- agriculture use	73697	4%
Pasture land	70058	4%
Culturable waste land	339000	17%
Current fallow	68669	4%
Net shown	679936	35%

Source: Statistical Abstracts of Kachchh district, 2010-2011

Figure 22 : Taluka Wise Land Utilization Pattern (as in 2003-04)



	Lakhapat	Rapar	Bhachau	Anjar	Bhuj	Nakhatrana	Abadasa	Mandvi	Mundra	Gandhidham
Net shown	28022	132947	103985	56768	98654	53248	85676	64038	51154	5444
Current fallow	12091	19424	4012	9274	2788	7103	715	10408	2071	783
Cultivable waste	13400	28062	6870	19973	212069	4162	39418	9477	4498	1071
Pasture land	2450	4722	5730	5893	9535	10961	13023	10900	6130	714
Non- agricuture use	1741	7062	2500	13146	21998	6656	3570	5570	9749	1705
Land not available for Cultivation	71353	78784	50882	12298	62628	73155	26318	30957	2166	3998
Forest	59549	31764	21235	4228	50451	43487	71824	11188	13044	0

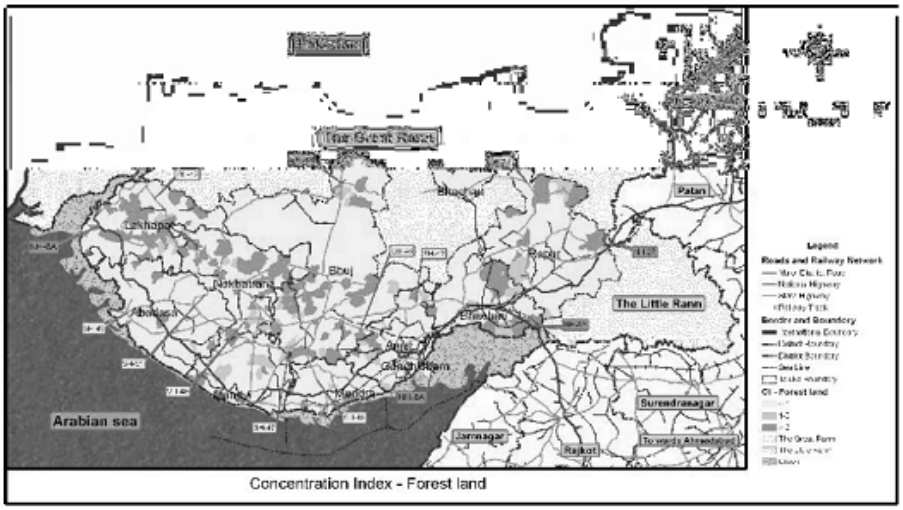
Source: Statistical handbook of Kachchh district, 2010-2011

respectively. The Figure 20 shows the spatial distribution of the ST population in the Kachchh district. It can be observed from the figure that the ST population is highly concentrated in the villages of Rapar and Bhachau Talukas. The Figure 21 shows the spatial distribution of the SC population in the Kachchh district. In the figure, it can be seen that the SC population is evenly spread out in the whole district, with the exception of the Banni region in Bhuj Taluka.

Land Use Pattern

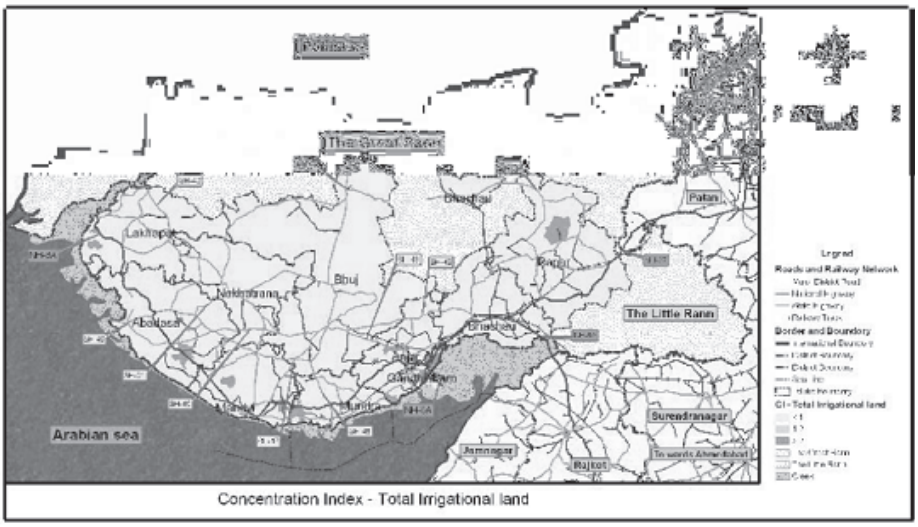
The land utilization pattern exhibits the characteristics of the district in terms of its growth, development, and activity pattern. It also indicates indirectly the amount of land available for future development. The Little Rann, the Great Rann, the Central highlands, and the remaining area (southern coastal belt, forest, and Creek/Mud flats etc.) cover 4954.00, 20000.00, 19576.29, and 1121.71 sq. km. area in the district respectively . The land utilization pattern of Kachchh district is broadly classified under the categories listed in the Table 4. As mentioned in the Table 4, the forest cover (in 2003 - 04) was 16% area of the available land or registered land, and the net shown area was 35%. The Figure 22 shows the taluka wise land utilization pattern and concentration of registered land. As per the Figure 22, among all

Figure 23: Spatial Variation in the Concentration Index of Forest Land at the Village level



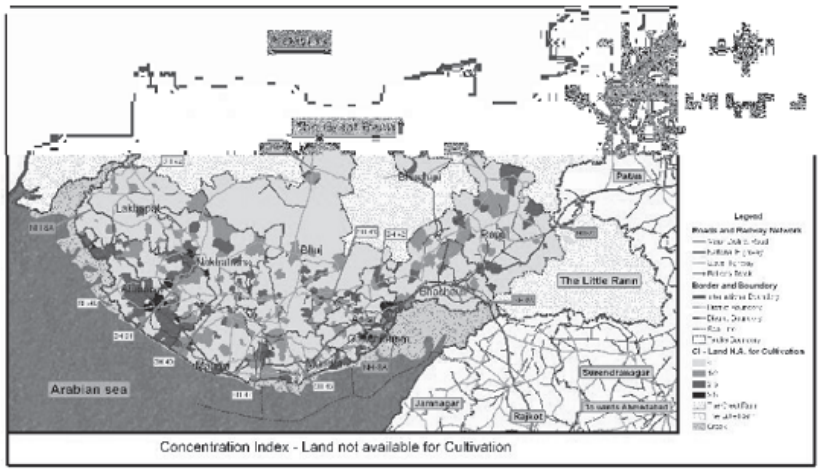
Source: Census, 2001

Figure 24: Spatial Variation of the Total Irrigational Land



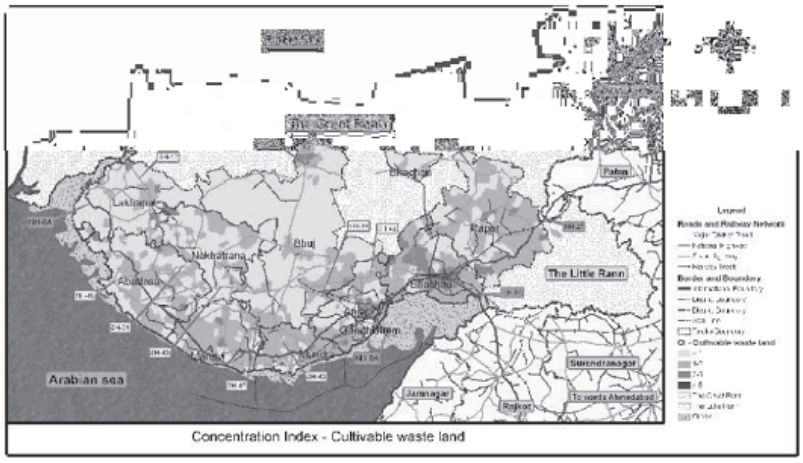
Source: Census 2001

Figure 25: Spatial Variation of the Land not available for Cultivation



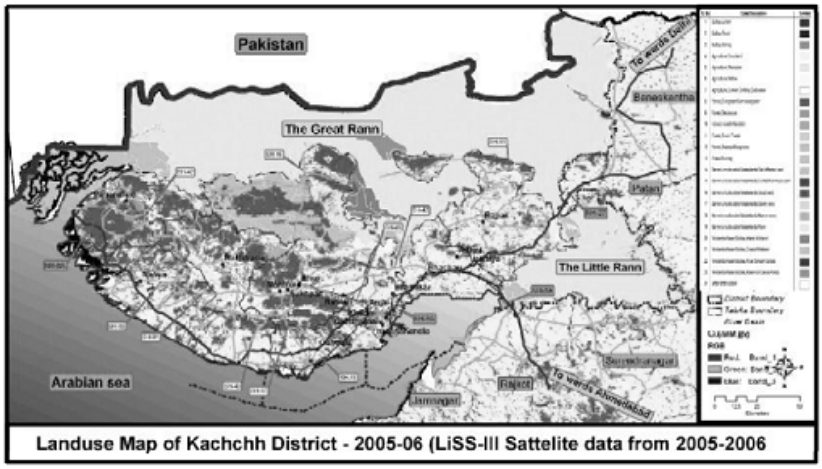
Source: Census, 2001

Figure 26: Spatial Variation of the Concentration Index of the Cultivable Wasteland



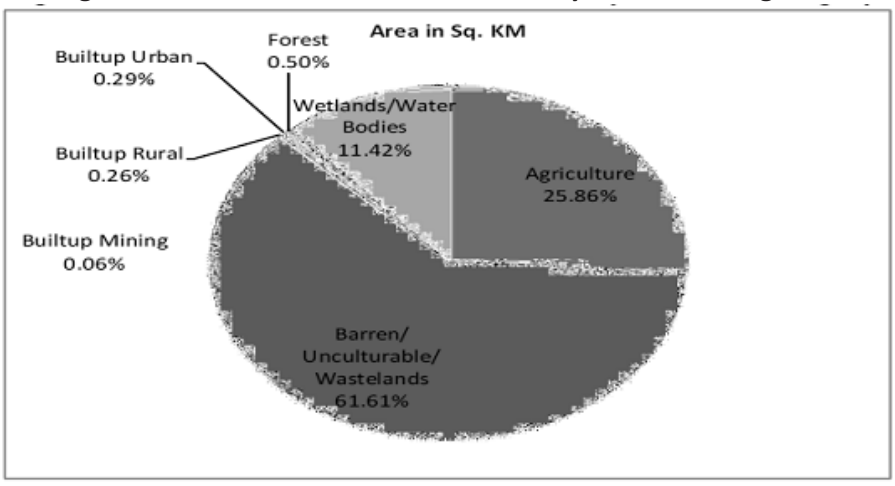
Source: Census, 2001

Figure 27: The Land Use Map of Kachchh District, 2005-06



Source: Census, 2001

Figure 28 : The Share of Land Utilization by Different Categories



Source: Bhuvan, thematic service, http://bhuvan- .nrsc.gov.in/theme/thematic/theme.php

the talukas - Bhuj and Gandhidham are geographically the largest and smallest talukas in the District. Rapar taluka has more net area and the Bhuj taluka has the highest cultivable waste land as compared to the other talukas of the district. The forest land area is maximum in Abdasa and Lakhpat talukas. Fallow land is available in Rapar, Lakhpat, and Mandavi to Anjar talukas; so, the opportunity of future development is high in these talukas.

The Concentration Index = [(Area of a particular land use in a local body / Total Geographical area of that local body) / (Area of same land use in the district / Total geographical area in the district)]

The four classes of the land use, **1)** forest land, **2)** total irrigation land, **3)** cultivable waste land, and **4)** land not available for cultivation and their spatial variation was analyzed. If the value of CI is above and below 1, it means the proportion of the particular land use to total geographical area is higher than the district proportion of the local bodies.

The Figure 23 shows the spatial variation of the forest land at the village level in Kachchh district. In the figure, the range wise concentration index is shown in the map. The forest land is mainly concentrated in the central highlands, the Banni region and around the Banni region, which is above the district average. The Figure 24 shows the spatial variation of the entire land available for irrigation. The Figure 25 shows the spatial variation of the land not available for cultivation. The concentration index was high in Abdasa, Nakhatrana, and Rapar Talukas. This type of land is not fit for agriculture, and can be used for other developmental activities. Hence, these villages have a good opportunity for future development (with the exception of development in the agricultural sector). The Figure 26 shows the spatial variation of concentration index of the cultivable waste land in the Kachchh district. It can be seen from the figure that the concentration was high in the coastal belt and the central highlands in Kachchh district. This type of land may be used for the further expansion and growth of the agriculture sector in the district.

The Figure 27 represents the total land distribution in twenty different categories. Among all the talukas, Lakhpat had the highest concentration of barren/ uncultivable and waste land. Agriculture is mainly practiced in Rapar, Bhachau, Mundra, Mandavi, Nakhatrana and Bhuj talukas. The N-E part of the district is the Rann area, which nearly covers 25,000 sq. km area. In the N-W corner, the Indus river delta has mangroves forest. The Kachchh district has the largest area under mangroves after the Sunderbans in West Bengal. The Figure 28 shows that the barren/ uncultivable land and wasteland covered 61.61% area of the District. Hence, this uncultivable land can be used for developmental activities.

Conclusion

The present study would prove to be helpful for policy makers to decide the future course of action for the land use pattern for Kachchh district. The study can be used for chalking out strategies which may lead to sustainable development of land arrangement for the district. Also, the study would be useful to conduct further research on land

utilization and sustainable development for Kachchh district. The present study provides reliable information about the provincial population growth and land development in Kachchh region of Gujarat. The findings of the study can be used by the State Government and policy makers to formulate policies for improving the land arrangement as per the population growth.

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