

# Sustainable Development and Role of Urban Centers in Kachchh District

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## ABSTRACT

The world Commission of Environment and development (Brundtland) –WCED, 1987, leads to the environmental problems, and development countries issues, discussing about sustainable development urbanization has changed the scenario of living standard, here this paper presents how urban center emphasis on overall of sustainable development. This paper illustrates performance of urban centers in wide areas like, housing, water supply, sewerage and sanitation, waste management etc. In Kachchh district urban centers are challenging increasing demand of urban population and not only performing in development but conserves our resources and having good correlation between population and development. This paper investigates the sustainable development through urban centers recital in Kachchh district.

**Keywords:** Overview of urbanization in kachchh district, statistics of urbanization, performance of urban centers, relation between urban centers and kachchh district by primacy index

**JEL Classification:** P25, Q01,

<sup>1</sup>Sustainable development is such a pragmatic attempt to resolve the conflict between capitalism and environmentalism, or a between development and

preservation, or between man and nature. <sup>2</sup>Sustainable development is a process in which development can be sustained for generation. It is a development which affords to the future generation the same if not more capacity to prosper as the present generation has. Thus sustainable development focuses on inter-generational fairness in the explanation of the development opportunities. <sup>3</sup>From another set of dictionary definition of “Sustain”: “To support life in; to furnish with necessities of life; to supply a person’s need.” <sup>4</sup>It is claimed that sustainable development is compatible

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with a high standard of living, based on extensive consumption of goods and services.

<sup>5</sup>The most common definition of sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”, which comes from the United Nations study which first brought this issue to the world’s attention (Our Common Future, The World Commission on Environment and Development – Brundtland Commission, 1987). It is an approach to growth that considers the impacts of policies, programs and operations on economic prosperity, environmental quality and social well-being. <sup>6</sup>Sustainable development means attaining a balance between environmental protection and human economic development and between the present and future needs. It means equity in development and sectoral actions across space and time. <sup>7</sup>To be noted that some of the Millennium Development Goals<sup>3</sup> (see UNDP) have urged for ensuring environmental sustainability and reduction of the percentage of the population under extreme poverty. <sup>8</sup>Similarly, explaining implications of climate change for sustainable development the Intergovernmental Panel on Climate Change notes (IPCC)<sup>4</sup> the importance of social and environmental equity in development.

Due to urbanization development in Kachchh district populace relocate to cities; steady increase in the ratio of urban population to the total population; Labor transfer from main to secondary and regional industries.

Changed in life technique and expenditure formation, Industrial clustering toward urban areas, Urbanization is a process of continuous development of both a city area and its interconnected rural surroundings. The process of urbanization enhanced people’s quality and living standard.

### ***Review of Literature***

<sup>9</sup>Sustainable urban development specifically means achieving a balance between the development of the urban areas and protection of the environment with an eye to equity in employment, shelter, basic services, social infrastructure and transportation in the urban areas. With rapid expansion of urban population around the world there has arisen a wide awareness about

minimizing the environmental costs of urbanization. Concerns are raised at environmental damages and depletion of nonrenewable resources and rising levels of pollution in urban areas. He discussed on the deficiency in urban basic services in India and its management for sustainable urban development. He explained explains the pros and cons of the compact city form and applicability in different countries with different densities. <sup>10</sup>His study is applied and the method of its investigation is descriptive analytical. Findings indicate that the model of urban growth is sprawl and this leads to ecological, social and economical and urban form unsustainable. The Urmia case is interesting for several reasons: first, it is a case of very fast urban growth even for a developing country; second, it portrays a land substitution process in which agricultural land is not the primary provider of urban land which is relatively rare in urban contexts. <sup>11</sup>By ‘economic characterization’ of urbanization we mean that the economic structure and the process operating in a country are associated with its on-going urbanization process (McGee 1971) <sup>12</sup>Paper illustrates that Kamataka and its region in terms of: a) “top-heavy” character; b) city-region disparities; c) regional disparities; d) transport corridor-based urbanization; e) distorted urban hierarchy and its associated problems; and finally, f) evolving a model for sustainable urbanization by combining the processes that promote integrated development of higher order urban centers through the top-down approach along with the growth of small and medium towns via the bottom-up approach.

### ***Overview of Urbanization in Kachchh (1961-2011)***

Urbanization is one of the significant aspects of social as well as economic transformation. Development of any region is closely related to the degree of urbanization and industrialization. The process of urbanization is dynamic and it changes through time and space. Though the process of urbanization is very rapid but it is not uniform. Kachchh district is not exception for this.

Therefore it is necessary to study the Urbanization in Kachchh district. The district urban population according to Census of 1971 was 849769 and in 2011 it was reached up to 2090313 persons. The district has 11 and 8

towns in respectively 1971 and 2001 as per the Census of 1971 and 2001, where district has 14 towns according to Provisional Census of 2011. <sup>13</sup>With the desire to achieve urban development that “meets the needs of the present without compromising the ability of future generations to meet their needs”, urban development are required to minimize threats from wasteful use of non-renewable resources, to avoid the uncompensated geographical or spatial displacement of environmental costs onto other places, and not to draw on the resource base and waste absorption capacities to the levels which disrupt dynamic equilibrium of the ecosystem (chen and et al, 2008).

The term ‘urban’ is usually applied to a spatial or aerial unit having certain specific characteristics which differentiate it from a rural unit. It refers to towns or cities having marked secondary and tertiary functions along with a municipality or notified area committee. It concerns with the geography of town, their situations, patterns, layout, housing and hierarchical organization of population concentration and service areas. While the growth of population in urban area is known as ‘Urbanization’ in other words, the shift of population from village to city or town and the process of transformation of villages into city or town are called ‘Urbanization’ (G.Trewartha). Hauser and Duncan characterize urbanization as a change in the pattern of population distribution and growth in number and size of urban places with increasing concentration of population of such places. An attempt has been made to

analyze the regional pattern of urbanization in Kachchh district. The study may help in understanding various aspects of the process and pattern of urbanization in the district. The data has been collected from Census of India, 2001 and other official record from ULBs. On the basis of the selected indicators, it is concluded that in this district. Gandhidham, Bhachau and Mundra towns have higher level and Bhuj, Anjar and Rapar towns have medium level, and Kandla (estimated, 2011) and Mandvi towns have negative growth in 2011.

In this study the trend of urbanization of Kachchh District is assessed and is compared with the level of Urbanization of the State so as to ascertain the position of the Kachchh in the State scenario.

#### *Trend of urbanization in Kachchh district*

In the 2001, Gujarat had a 50.67 million population and 31.74 million were in its rural areas and 18.22 million in the urban areas as per Census 2001. In the 2011, the total population in Gujarat has 60.38 million and the urban population is 25.71 million, with the growth rate 41.07% in the 2001-2011. The Gujarat had a 28.08% urbanization level in 1971 and it is increased 42.58% in 2011.

At same time period, urbanization level is increased from 22.51% to 34.72% in Kachchh district, which is lower than average of Gujarat state. Increased 42.58% in 2011. At same time period, urbanization level is increased from 22.51% to 34.72% in Kachchh district, which is lower than average of Gujarat state.

**Table 1:** Trends in urbanization of Kachchh and Gujarat from 1971-2011

Year	Kachchh			Gujarat		
	Total	Rural	Urban	Total	Rural	Urban
1971	849769	658445	191324	26697475	19200975	7496500
1981	1050161	794153	256008	34085799	23484146	10601653
1991	1262507	899461	363046	41309582	27063521	14246061
2001	1583225	1108333	474892	50596992	32369941	18227051
2011	2090313	1364472	725841	60383628	34670817	25712811

**Source:** Past censuses and provisional census 2011

The total population in Kachchh district is 849769 people in 1971 and it is increased 2090313 in the 2011, with the growth rate 52.84% of urban population in the

2001-2011 which is highest amongst all the district in the Gujarat state (table 1).

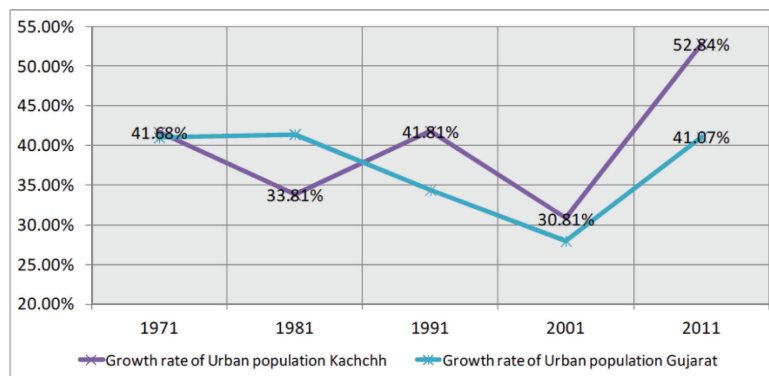
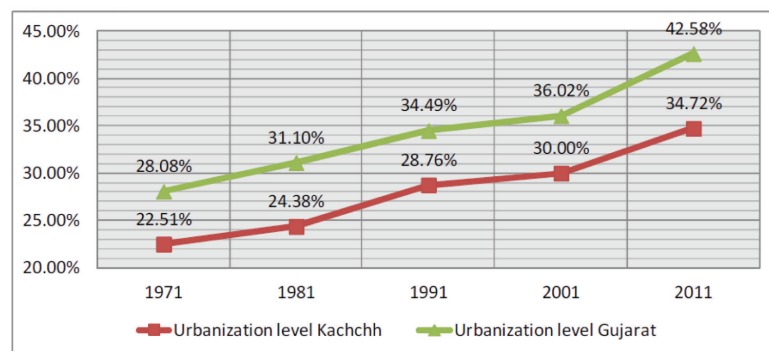
**Table 2:** Trend of Urbanization level and Growth rate of urban population

Year	Urbanization level		Growth rate of Urban Population	
	Kachchh	Gujarat	Kachchh	Gujarat
1971	22.51%	28.08%	41.68%	41.00%
1981	24.38%	31.10%	33.81%	41.42%
1991	28.76%	34.49%	41.81%	34.38%
2001	30.00%	36.02%	30.81%	27.94%
2011	34.72%	42.58%	52.84%	41.07%

**Source:** Past censuses and provisional census 2011

Table 2 shows the trend of urbanization level and growth rate of urban population from 1971 to 2011. The overall growth of Kachchh district is 32.03% and the urban population growth is 52.84%, it means there is spread effect of population into the urban area. This is an indication to subsequently address the reasons for the spread effect of population to urban areas. The figures 4.18 and 4.19 shows the urbanization level of

the Gujarat and Kachchh district is steadily inclining till 1971 to 2011. The urbanization level of the Kachchh district is low than the Gujarat state and the growth rate of the Kachchh district is higher than the average in the Gujarat state. The Kachchh has a highest 52.84% growth rate in the urban area compared with the overall growth is 32.03%.

**Fig. 1:** Temporal variation of the growth rate of urban population from 1971 to 2011**Fig. 2:** Temporal variation of the urbanization level from 1971 to 2011

The table 3 is representing the urbanization scenario in the Gujarat state in 2011. The Ahmedabad district has a highest urban population and urbanization level amongst the all district in the Gujarat state. The Kachchh

district is placed from 9th to 7th rank in context of urban population. Other details of various districts are given in the table 3.

**Table 3:** Urbanization scenario in the Gujarat state in 2011

State /Districts	Total	Rural	Urban	Share of districts in total urban population of state (%)	Urbanization Level %	Urban context rank 2011
Ahmadabad	7208200	1149436	6058764	23.56	84.05	1
Surat	6079231	1235509	4843722	18.84	79.68	2
Rajkot	3799770	1591188	2208582	8.59	58.12	3
Vadodara	4157568	2097791	2059777	8.01	49.54	4
Jamnagar	2159130	1188485	970645	3.77	44.96	5
Junagadh	2742291	1836049	906242	3.52	33.05	6
Kachchh	2090313	1364472	725841	2.82	34.72	7
Valsad	1703068	1068993	634075	2.47	37.23	8
Anand	2090276	1456483	633793	2.46	30.32	9
Gandhinagar	1387478	787949	599529	2.33	43.21	10
Bharuch	1550822	1022413	528409	2.06	34.07	11
Kheda	2298934	1775716	523218	2.03	22.76	12
Mahesana	2027727	1513656	514071	2.00	25.35	13
Surendranagar	1755873	1258880	496993	1.93	28.30	14
Banas Kantha	3116045	2702668	413377	1.61	13.27	15
Navsari	1330711	921599	409112	1.59	30.74	16
Amreli	1513614	1127808	385806	1.50	25.49	17
Sabar Kantha	2427346	2064318	363028	1.41	14.96	18
Panch Mahals	2388267	2053832	334435	1.30	14.00	19
Porbandar	586062	300736	285326	1.11	48.69	20
Patan	1342746	1061713	281033	1.09	20.93	21
Dohad	2126558	1935463	191095	0.74	8.99	22
Tapi	806489	727513	78976	0.31	9.79	23
Narmada	590379	528765	61614	0.24	10.44	24
The Dangs	226769	202074	24695	0.10	10.89	25
Bhavnagar	2877961	2859908	18053	0.07	0.63	26
Gujarat State	60383628	34670817	25712811		42.58	

**Source:** provisional census 2011

Figure 3 represents the Sex ratio in the urban areas in Gujarat and Kachchh district from 1991 to 2011. The sex ratio is low in Kachchh than the average in the Gujarat

state. The sex ratio has been declining since 1941, till 2011.

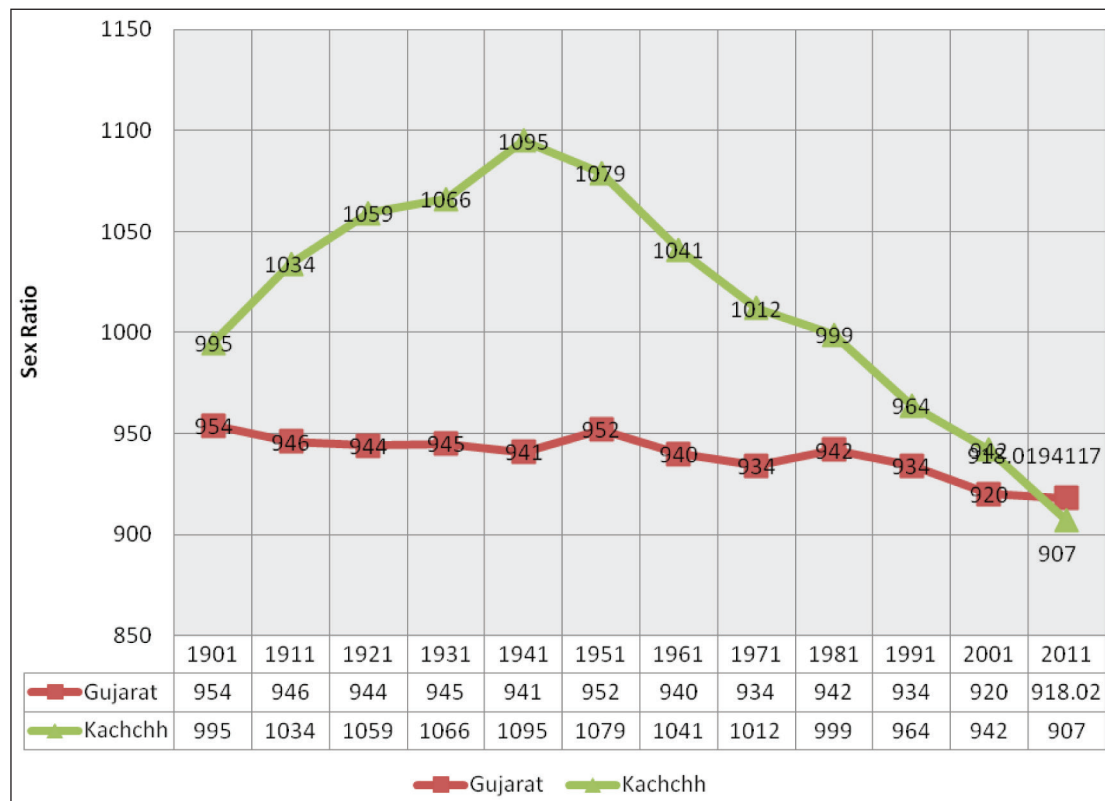


Fig. 3: Sex ratio in the urban area in Kachchh district and Gujarat state from 1991 to 2001

#### Urbanization pattern in Kachchh district, Taluka wise 2001 and 2011 (Estimated)

Table 4: Trend of urbanization in Kachchh district in 2001 and 2011 (estimate)

Talukas	2001		2011	
	Total	Urban	Total	urban
Abdasa	97508	0	108259	0
Anjar	160292	68343	202699	88611
Bhachau	147891	25389	173852	39516
Bhuj	345013	136429	445832	0
Gandhidham	201569	166388	296377	0
Lakhpatri	50120	0	64465	0
Mandvi	170573	42355	194233	42160

Mundra	83010	12931	92378	20329
Nakhatrana	129249	0	151092	0
Rapar	198000	23057	242917	28360
Kachchh district	1583225	474892	1972104	218976

Source: census 2001 and Provisional census 2011

In the 2001, the Gandhidham had a 201569 population which consisted by the 166388 urban population with the highest rank in the Kachchh district. And after ward it is followed the Bhuj taluka with the 136429 urban population. In the Lakhpatri, Nakhatrana did not have any town in 2001 and 2011. Abdasa taluka had a one town Naliya in 1991 but it declassified in the based on census criteria in 2001. The other detail are given in the table 4.



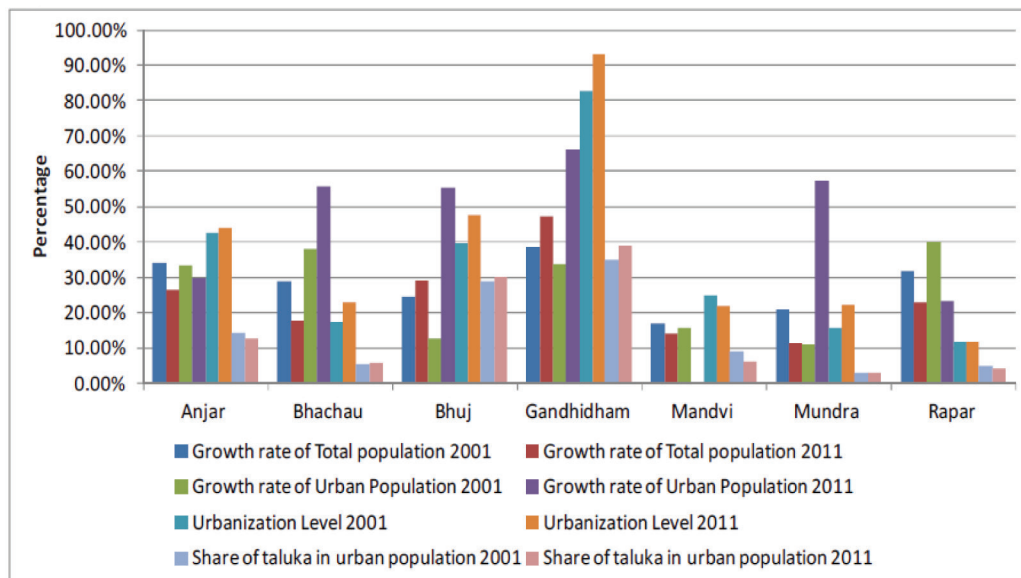
The table 5 is representing the Growth rate of total population and urban, Urbanization level and share of talukas in urban population in the Kachchh district in 2001 and 2011. The growth rate of total population is

increased in the Gandhidham, Bhuj and Nakhatrana Talukas and it decreased in the remaining talukas in 2001-2011.

**Table 5:** Urbanization scenarios in the Kachchh district, Taluka wise in 2001 and 2011(estimated)

Talukas	Growth rate of Total population		Growth rate of Urban Population		Urbanization Level		Share of taluka in urban population	
	2001	2011	2001	2011	2001	2011	2001	2011
Abdasa	12.85%	11.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Anjar	33.88%	26.46%	33.46%	29.66%	42.64%	43.72%	14.39%	12.53%
Bhachau	28.87%	17.55%	37.92%	55.64%	17.17%	22.73%	5.35%	5.59%
Bhuj	24.46%	29.22%	12.74%	55.38%	39.54%	47.55%	28.73%	29.97%
Gandhidham	38.54%	47.03%	33.78%	66.06%	82.55%	93.23%	35.04%	39.07%
Lakhpata	36.35%	28.62%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Mandvi	16.80%	13.87%	15.61%	0.00%	24.83%	21.71%	8.92%	5.96%
Mundra	20.91%	11.29%	10.98%	57.21%	15.58%	22.01%	2.72%	2.87%
Nakhatrana	10.52%	16.90%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Rapar	31.55%	22.69%	40.03%	23.00%	11.64%	11.67%	4.86%	4.01%
Kachchh district	25.40%	22.47%			30.00%	35.86%		

**Source:** census 2001 and Provisional census 2011



**Fig. 4:** Urbanization scenarios in the Kachchh district, Taluka wise from 2001 to 2011

The figure 4 shows a growth rate of urban population is increased in the Gandhidham, Mundra, Bhachau and Bhuj. The growth rate of the urban population is rapidly increased in the Mundra taluka from 10.98% to 57.61% in 2001 to 2011. The urbanization level is increased in Bhachau, Bhuj, Gandhidham and Mundra. It is slightly increased in the Anjar taluka. The Highest level of the urbanization is in the Gandhidham taluka with 93.23%. The Gandhidham taluka is first with 35.04% share of the urban population in 2001 and it is increased to 39.07% in the 2011. after that Bhuj taluka have more population in the urban area with the 29.97% share of the total urban population of Kachchh.

Figure 5 depicts the population growth rate of various village and towns of Kachchh district in the decade 1991-2001. It is clear from the picture that the growth rate of population of the urban area of Kachchh district is less (in range 30-50) than that of the surrounding Panchayats because of out migration of people from the urban area to the rural areas or settling of in migrants to the urban area in the peripheral Gram panchayats due to various social and economic reasons.

### *The spatial variation of the population Growth rate 2001*

Taluka wise urban population is shown in table 4 the table shows that 39.07% of the total urban population of the Kachchh District is concentrated in Gandhidham Taluka. The Gandhidham Taluka has 94.56% of its total population as urban population. The urban area in Gandhidham Taluka constitutes about 31.96% of the total urban area of Kachchh District making this Taluka the most urbanized Taluka of Kachchh District. Lakhpat, Abdasa and Nakhatrana are the non-urbanized Talukas in the District. The share of the Gandhidham town is 35.16% of the total urban population in the Kachchh district. The Bhuj urban agglomeration has a 26.48% urban population of the Kachchh district. So, the 61.64% urban population of total urban population of Kachchh district is concentrated in these two urban areas. In the vicinity of the Bhuj town the Madhapar is new identified town, it may be shows a higher growth with above 32158 population. The Other details are given in the Table 6.

**Table 6:** Details of urban population, Taluka wise in 2011

No	Name of Taluka	Name of Municipality/Census Town and Urban Agglomeration	Urban population in 2011	Share Urban centre of total Urban Population	Total Population in Taluka 2011*	Urban population in Taluka 2011	Urbanization level of Taluka (%)	Share of taluka in total urban Population (%)
1	Abadasa	-	0		106731			0.00%
2	Anjar	Anjar, B Grade M	88611^	12.53%	199840	88611	44.34%	12.53%
3	Bhachau	Bhachau, C- Grade M	39516^	5.59%	171400	39516	23.05%	5.59%
4	Bhuj	Bhuj, B - Grade	187279#	26.48%	439544	211979	48.23%	29.97%
		Madhapar CT						
		Mirzapar CT						
		Haripar OG						
		Sukhpur CT	12489*	1.77%				
		Manukuva	12211*	1.73%				
5	Gandhidham	Gandhidham, A - Grade	248705#	35.16%	292196	276299	94.56%	39.07%
		Kandla CT	11474*	1.62%				
		Antrajal CT	8921*	1.26%				
		Galpadal CT	7199*	1.02%				
6	Lakhapat	-	0		63556	0	0.00%	
7	Mandavi	Mandavi, C - Grade M	42160^	5.96%	191494	42160	22.02%	5.96%
8	Mundra	Mundra CT	20329@	2.87%	91075	20329	22.32%	2.87%
9	Nakhatra	-	0		148960	0	0.00%	0.00%
10	Rapar	Rapar, D - Grade M	28360^	4.01%	239491	28360	11.84%	4.01%
	Desert		0			0		
	Kachchh district		707254.00		1944286	707254	36.38%	





**Table 7: Census Towns, Statutory towns and Out growths in Kachchh District – 2001**

No.	Name of Census Town	Census Classification	Village, No. of Ward and OG
1	Anjar	(M)	12 wards
2	Antarjal	(CT)	Antarjal
3	Bhachau	(M)	9 wards
4	Bhuj	(M+OG)	14 wards and Haripar (OG)
5	Galpadar	(CT)	Galpadar
6	Gandhidham	(M)	14 wards
7	Kandla	(CT)	Kandla
8	Madhapar	(CT)	Madhapr
9	Mandvi	(M)	9 wards
10	Mankuva	(CT)	Manukava
11	Mirjhapar	(CT)	Mirjapar
12	Mundra	(CT)	Mundra
13	Rapar	(M)	7 wards
14	Sukhpar	(CT)	Sukhpar

**Source:** District census hand book of the Kachchh and census 2001 and Provisional census 2011

The table 7 is representing the existing detailed structure of the urban area in Kachchh district in 2011. The 6

Municipalities and 9 Gram panchayats are cover the whole urban population of the Kachchh district.

**Table 8: Class wise distribution of the 14 urban centers in Kachchh district**

Urban centers	Status and Class	Census 2011	AACGR
GANDHIDHAM	M, Class-I	248705	5.07
BHUJ	M, Class-I	147123	3.22
ANJAR	M, Class-II	88611	2.63
MANDVI	M, Class-III	42160	-0.05
BHACHAU	M, Class-III	39516	4.52
RAPAR	M, Class-III	28360	2.09
MUNDRA	CT, Class-III	20329	4.63
KANDLA	CT, Class-IV	11475	-2.44
Madhapar	CT, class-III	32158	
Mirzapar	CT, class- V	7998	
Sukhpar	CT, Class - IV	12489	
Manukuva	CT, Class - IV	12211	
Antrajal	CT, Class - V	8921	
Galpadal	CT, Class - V	7200	

**Source:** Census handbook of Kachchh district, 2001

Table 8 shows the class wise distribution of the all 14 urban centers in 2011 and the average annual compound growth rate of the 8 urban centers which are identified in 2001 census. The highest AACGR is 5.07 of the Gandhidham city and then Mundra and Bhachau towns have a 4.63 and 4.52 respectively in 2001 to 2011. Mandvi and Kandla towns have a negative AACGR in the same time period. The other detailed of the urban centers are given in the table 9. Table 9 shows the past trends of

the urban centers in the district from 1961 to 2011. In the existing governance status of the urban centers, the Gandhidham municipality is a grade, Bhuj and Anjar municipalities are B grade, Bhachau and Mandavi are C grade and Rapar is D Grade municipalities. And others 9 are govern as a Gram panchayats. And the Hariapar village consider as outgrow of the Bhuj city in the census 2011.

**Table 9:** The past trends of urban centers in the Kachchh district

Name of the Towns	LSGs (2011)	Status (2011)	1961	1971	1981	1991	2001	2011
Anjar	Statuary town	B Grade M	III	III	III	II	II	II
Bhachau	Statuary town	C- Grade M		IV	IV	IV	III	III
Bhuj	Bhuj Urban Agglomeration	Statuary town	III	III	III	I	I	I
Madhapar		Census town		V	IV	IV	III	III
Mirzapar		Census town						V
Sukhpar		Out grow						IV
Manukuva		Census town						IV
Gandhidham	Statuary town	A - Grade M	III	III	III	I	I	I
Kandla	Census town	Kandla Port trust	V	IV	IV	IV	IV	IV
Antrajal	Census town	Gram Panchayat						V
Galpadal	Census town	Gram Panchayat						V
Mandavi	Statuary town	C - Grade M	III	III	III	III		III
Mundra	Census town	Gram Panchayat	V	V	IV	IV	IV	III
Naliya*	Census town	Gram Panchayat		V	V	V		
Rapar	Statuary town	D - Grade M		V	IV	IV	III	III
TOTAL		6 - M, & 7 - GP, & N M	6	10	10	10	8	14

Source: District census hand book of the Kachchh and census 2001 and Provintional census 2011,

The class wise distributions of the all towns are given in the table 9 from 1961 to 2011. The maximum numbers of urban centers are found out in the 2011 which is 14

urban centers. And minimum numbers of towns found out in the 1961 in between 1961 to 2011.

**Table 10:** Governance status wise distribution pattern of the urban Centers

Year	Total Number of Urban centres in Kachchh	Municipality	Non Municipal towns (Census town)
1961	6	2	4
1971	11	4	7
1981	10	4	6
1991	10	4	6
2001	8	6	2
2011	14	6	8

Table 10 and table 11 shows the Governance pattern and Class wise distribution pattern of the urban centers in the Kachchh district from 1961 to 2011. The Mandavi and Anjar are the oldest municipalities which are established in the 1951, The Gandhidham municipality established in the 1959. The Bhuj municipality established in 1962 and Bhachau and Rapar municipalities are established in the 1994 (Statistical abstract of municipalities and towns in Gujarat, Economic and Statistical Commissionerate, Gandhinagar)

**Table 11:** Classification of Towns on the basis of Population Size, 2011

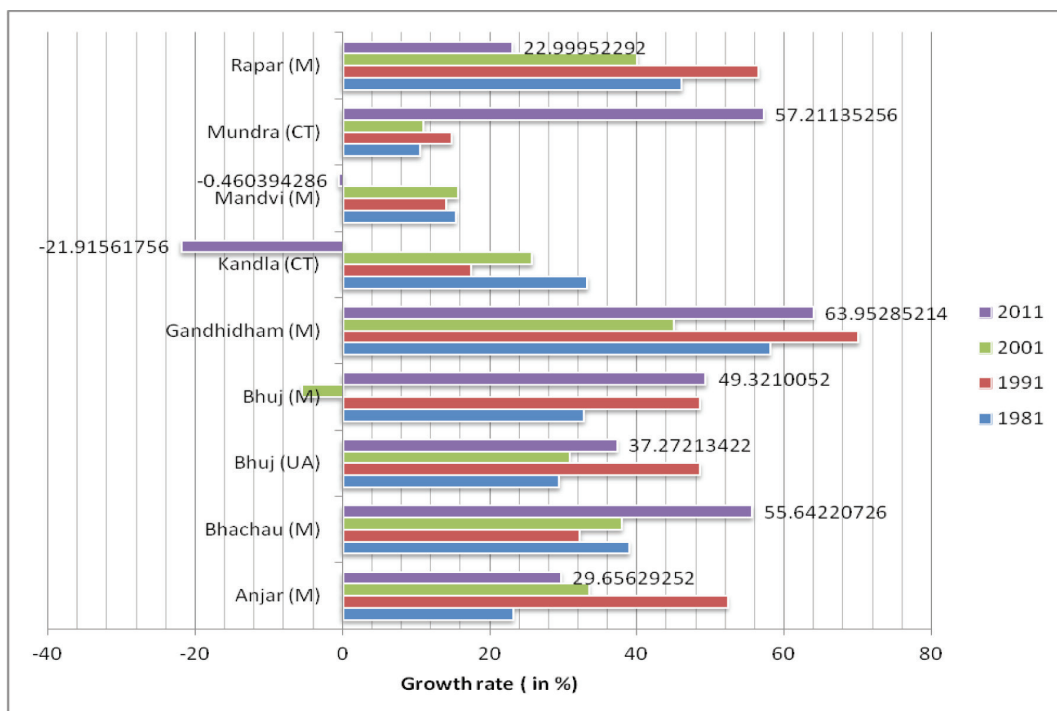
Class	Size of Population	Class-wise Number of Urban Centers	Class wise distribution of the Urban population	Percentage of total Urban population
I	> 1,00,000	2	395828	55.97%
II	50,000 – 99,999	1	88611	12.53%
III	20,000 – 49,999	5	162523	22.98%
IV	10,000 – 19,999	3	36175	5.11%

V	5,000 – 9,999	3	24119	3.41%
VI	< 5,000	0	0	0.00%
All Classes		14	707256	

**source:** Census handbook of Kachchh dsitric, 2001

The table 11 shows the Class wise distribution of the urban centers in the Kachchh. The Gandhidham and Bhuj towns are class I, Anjar town is class II, Mandvi, Mundra, Bhachau, Rapar and Madhapar are class III, Kandla, Sukhapar and Mankuva are the class IV and Mirjhapar, Galpadhar and Antarjal are the class V towns in the Kachchh district.

The figure 6 and 7 shows sex ratio and Growth rate in the particular urban centers. The Gandhidham city has a highest concentration of the population with the 63% decadal growth rate of population in the Kachchh district and after that followed by the Bhuj urban agglomeration which is consist by the Bhuj, Madhapar, Mirzapar towns. The figure 4.24 shows the decadal population growth rate from 2001-2011.



**Fig. 6:** Growth rate of the urban centers from 1981 to 2011

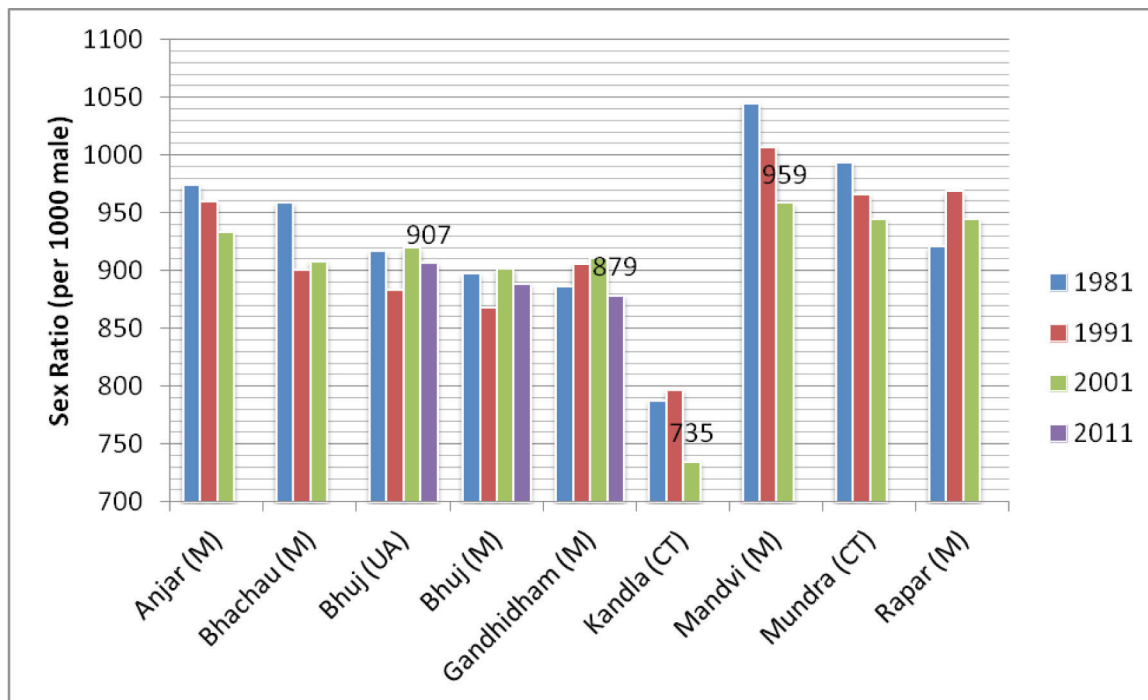


Fig. 7: the sex ratio in the Urban centers from 1981 to 2011

The sex ratios of the urban centers are decreased in the Gandhidham and Bhuj urban agglomeration. The sex ratio of Bhuj UA is low than the Bhuj municipality area, it may show the other villages have more sex ratio than the core area in the Bhuj UA in 2011. The sex ratio of the Kandla town is very low because of the male migrants who are working in the Mundra port as labour for loading and unloading of good and in the other industries which located in to the proximity of the Kandla port. The net density of the urban centers in

the Kachchh district in 2011, the net area of the census towns are taken through the Google earth and the population is estimated based on their past trend. The highest density is 18810 people per Sq.Km are in the Kandla census town. The lowest density is 2258 people per Sq.Km are in the Rapar Municipal town. Also the Mankuva and Sukhpar census towns are high dense which are new identified census towns in the vicinity of the Bhuj UA in census 2011. The taluka wise urban area and net area is given in the Fig. 8.

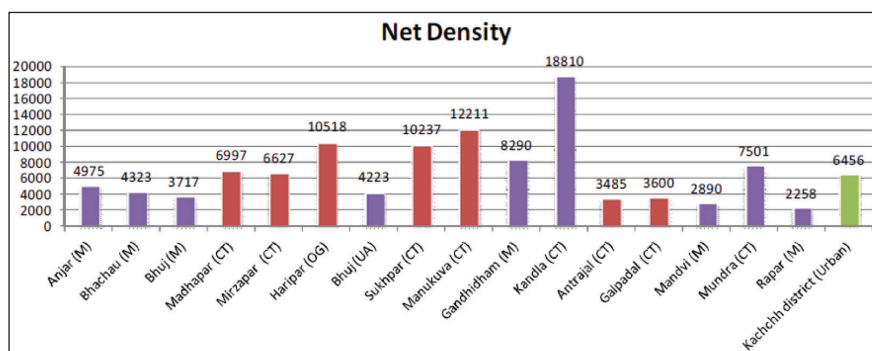


Fig. 8: Net density of urban centers in 2011

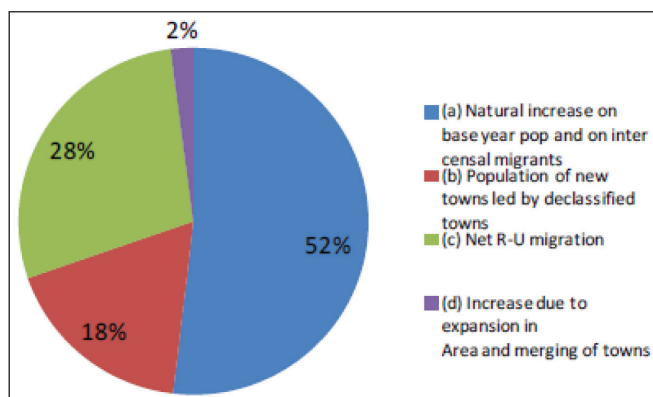


### Disaggregation of the Incremental Urban population

**Table 12:** Disaggregation of Total Incremental Urban Population into Components

Percentage distribution	2001-2011	
	Urban population	In Percentage
Total increase	228644	48.15%
(a) Natural increase on base year Population and on internal migrants	118649	51.89%
(b) Population of new towns led by declassified towns	40821	17.85%
(c) Net R-U migration	64446	28.19%
(d) Increase due to expansion in Area and merging of towns	4728	2.07%
Source: census 2001 and provisional census 2011, Statistical abstract of Kachchh District 2001 to 2010.		

The table 12 shows the disaggregation of total incremental urban population into various Components. The natural increase is estimated on the data given in the District statistical handbooks of Kachchh district. The values of the population of new towns are found out based on the past trends of those towns. The value of the Net R-U migration is calculated based on the past trends which are given in the census 1991 and 2001. The net increased population is given in the provisional census 2011.



**Fig. 9: The Disaggregation of total Incremental Urban Population**

Figure 9 the Disaggregation of total Incremental Urban Population So, the incremental urban population may be 232364 in urban areas which consists by the 51.06% of natural increased, 17.57% by new identified town in the district, the part of Net R-U migration is 27.73% and remaining part is due to the expansion and merging of the urban area which is just 3.64%. The increase of urban population due to the expansion and merging is because of the merging of the Bhuj municipality and some part of Madhapar (Junawas Gram Panchayat) town on their adjacent boundary.

### The relation between urban centers

The relation between the urban centers are analysed by the rank size rule and primate city concept. These both concepts are mainly used to identify the relation between urban centers.

### Rank size rule

The relationship between size and number of settlements are given by the G. K. Zipf (1949) which is known as a 'rank size rule'. It is used to explain the size cities in a country. He explained that the second and subsequently smaller cities should represent a proportion of the largest city. The rank-size rule (or rank-size distribution) of city populations, is a commonly observed statistical relationship between the population sizes and population ranks of a nation's cities.

This technique is used based on the lognormal of population size and lognormal of Rank of Urban centers (see annexure) to identify the relation between the urban centers in the Kachchh. The Bhuj urban centers was at top with highest population size during the 1961 to 1981 after that the population size of the Gandhidham urban centers became biggest in the Kachchh till 2011. The figure 4.28 shows the relation between urban centers in Kachchh. In the graphed, it may show the huge gap in the highest and lowest sized urban centers and the low sized urban centers are more nearer than the higher sized cities.

### Primate city concept

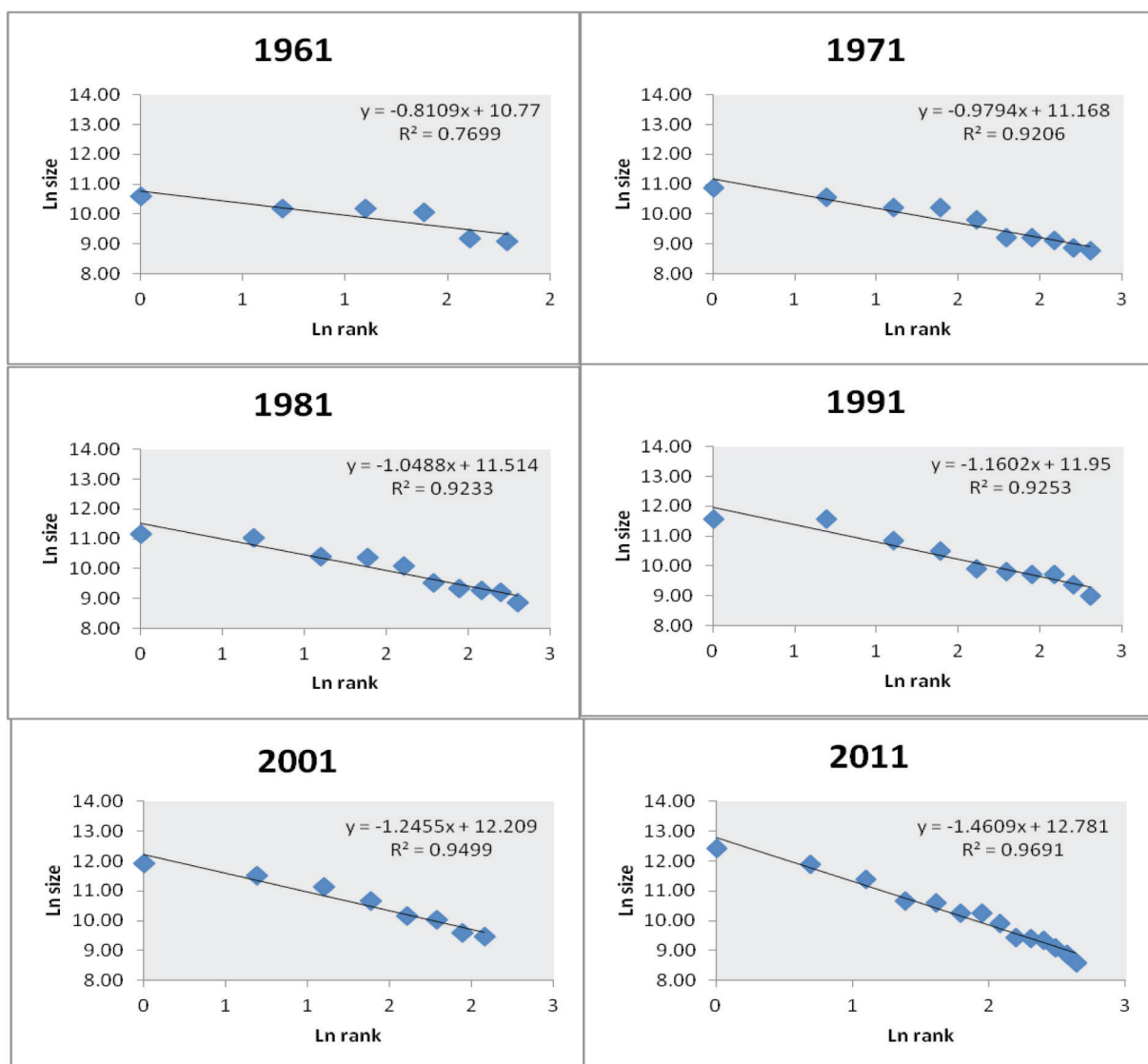
The primate city concept 'law of the primate city' was first proposed by the geographer Mark Jefferson (in



1939) which are empirical construct and their objective is to explain the real world structure of settlement system. He explains the phenomenon of huge cities that capture such a large proportion of a country's population as well as its economic activity. These primate cities are often, but not always, the capital cities of a country.

The calculations of three primacy indexes are: Primacy index I is the ratio of first and second ranking city. Primacy index II is the ratio between the population of the largest city and combined population of first four

cities. Primacy index III is the ratio of first largest city and total urban population. The states are divided into three categories of primacy viz., high moderate and low. Urban primacy does not exist at the national level. A variable pattern of primacy exists at the state level or district level. With few exceptions primacy is found to be high in industrialized, urbanized and mountainous states. Low primacy is found in physically large, densely populated and backward states. The classification of the primacy index,



According to the above classification the primacy index I is low, primacy index II is high and primacy index III

is also high (see annexure). According to the primacy index II and III the Gandhidham city is primate city but

as per the primacy index I, there is no any primate city available in the Kachchh. So, the Gandhidham and Bhuj are the main city of the Kachchh which are provided the major services in the Kachchh district.

### ***Service Towns***

The major Towns are situated in Southeast side and on the coastal belt in Kachchh and locate in a remote and sparsely manner so; they may not be providing easily services to villages, which are placed in the Northwest area of the district. The difference in the population size in between the urban areas is huge so, the major services like; big hospitals, good education facilities and, etc., are mostly available in the Gandhidham and Bhuj city in 45652 Sq.Km area of the district. The Industries and service sectors are depend on the Towns for the Basic needs like goods, facility of commerce and trade and etc. The figure shows the towns are provided the basic services to Industries and service sectors in Kachchh.

The largest region covered by the Bhuj city, and the Gandhidham city is the economic hub of Kachchh because of the industries and major port Kandla and KASEZ are located in the hinterland of the city.

### ***Performance Assessment of Urban Centres***

In this chapter, the assessment is done based on the various indicators related to the basic services, Housing stock, Road network etc. of Bhuj, Gandhidham, Anjar, Mandavi, Bhachau and Rapar municipal towns. The performance assessment of the Municipal towns is necessary to understand the existing situation of Basic services and to know the future scope of the development of the municipal towns and the data are used which is collected during the field visit from Local ULBs in Kachchh.

### ***Demographic Characteristics***

**Table 13:** Demographic characteristics of Urban centers

Name of Municipality	Population in 2001	Population in 2011	Decadal Growth Rate of the City 2011	Number of Election Wards in 2011	Town/City Area in 2001	Town/City Area in 2011	Population Density in 2011
Anjar (M)	68343	88611	29.66	12	17.81	17.81	4975.35
Bhachau (M)	25389	39516	55.64	9	9.14	9.14	4323.41
Bhuj (M)	98528	147123	49.32	14	9.49	38.00	3871.66
Gandhidham (M)	151693	248705	63.95	14	30.00	30.00	8290.17
Mandvi (M)	42355	42160	-0.46	9	15.00	15.00	2810.67
Rapar (M)	23057	28360	23.00	7	12.49	12.49	2270.62

**Source:** census 2001, Provisional census 2011 and Local ULBs

The table 13 is representing the Population size, decadal growth rate of population, number of election ward, and area of the municipalities and gross density of the six municipal towns.

### ***Housing***

Housing stock in the municipal towns in the Kachchh district, census 2011

**Table 14:** Housing and Slum in urban centers

Name of Municipality	Number of Households (Census 2001)	Number of Households in 2011	House hold Size in 2001	House hold Size in 2011	Number of Properties in 2011	Number of Commercial and Institutional Properties in 2011	Number of Slums in 2011	Number of Slum Households in 2011
Anjar (M)	14411	18855	4.74	4.70	22135	5826	36	3806
Bhachau (M)	5703	7776	4.45	5.08	14488	1903	7	2480
Bhuj (M)	27992	35000	3.52	4.20	47100	9100	74	11300
Gandhidham (M)	29872	54487	5.08	4.56	54054	14640	10	12000
Mandvi (M)	8045	12511	5.26	3.37	22880	4801	17	2500
Rapar (M)	4327	4552	5.33	6.23	10422	4504	5	250

**Source:** census 2001, Provisional census 2011 and Local ULBs

The Table 14 is representing the trend of the housing sector in the six municipalities in Kachchh district from 2001 and 2011. The decadal growth rate of the number of the houses is 82% in the Gandhidham municipality area which is highest amongst all municipalities in the Kachchh district after that subsequently followed by the Mandavi, Bhachau, Anjar, Bhuj and Rapar which are respectively 55%, 36%, 31%, 25% and 5%. The housing sector is highly influence the local economy. The house hold size is highly increased in the Rapar from 5.33 to 6.23 and it is increased in the all municipal towns except Gandhidham and Mandavi. The Kachchh district is falling in the Earthquake zone V so; there is a no permission to construct above the G+1 building so, there may be required to construct more houses to facilitate the people.

The highest, 74 numbers of slum are located in the Bhuj city but the maximum slum house hold are located in the Gandhidham city because of the high immigrants flow in the city, who are working in the Kandla port and other industries which are located in the surrounding region of the Gandhidham and Kanda. They are live in the very congested space, in some areas like, 3 to 4 families in the single tenement. The biggest slums in the Gandhidham are Sunderpuri and Gopalpuri and Cargo Slums. Also many immigrants are live in the periphery of the Gandhidham and Kandla which may not be consider in the particular municipal or town areas so, overall population of the immigrants is high in these regions.

### **Water Supply System**

**Table 15:** Situation of Water supply system in six Municipality in Kachchh district in 2011-12

Name of Municipality	Source (MLD)				Capacity (MLD)				LPCD	Continuity of Water supply
	Bore	Dam	Narmada	Total	No. of ESR	ESR MLD	No. of Sump	Sump MLD		
Gandhidham	7	18		25	10	10	13	25	80	Every 4 days
Bhuj	30		3	33	3	25	3	25	100	Alternate day
Anjar	4.69		2	6.69	4	4	4	7.2	115	Alternate day
Bhachau	2.3		1.6	3.9	0	0	6	6.7	100	Alternate day
Mandavi	3.5		2	5.5	3	1.8	3	6	110	Daily
Rapar	1.5		1	2.5	3	2.6	4	1.05	88	Every two days

**Source:** Local ULBs

The table 15 is representing the sources of water supply and Existing capacity of the storage in the six municipalities. From the table, the all municipalities have a their own bores and they are located from long distance like, the Gandhidham municipality's bores are located in the Viri and other nearer villages which are situated 18-20 Km from Gandhidham city. The Gandhidham also depend on the Tapar dam. The all municipalities also depend on the Narmada canal except Gandhidham. The Bhuj Municipalities have a highest storage capacity of

water because newly constructed sumps for the water storage of Narmada pipe line. of the Gandhidham municipality has a worst condition in the water supply with just 80 LPCD and the continuity of water supply is every 4 days and the same condition is followed by the Rapar municipalities. In the Gandhidham town, the people are set a big under water tank in their houses. The Anjar and Mandavi municipalities are provided highest LPCD among the all municipalities which is respectively 115 and 110 LPCD.

**Table 16:** Situation of Water supply system in six municipalities in Kachchh district, 2011-12

Name of Municipality	Coverage of water supply connections (%)	Extent of metering of water connections (%)	Extent of non-revenue water(%)	Continuity of water supply(hrs per day)	Efficiency in redressal of customer complaints (%)	Quality of water supplied (%)	Cost recovery in water supply services (%)	Efficiency in collection of water supply related charges (%)	Coverage of water supply connections in slums (%)
<i>Benchmarks</i>	100.00	100.00	20.00	24	100.00	100.00	100.00	90.00	100.00
Anjar	77	na	14	0.50	75	0	36	51	30.1
Bhachau	94	0	12	0.75	50	61	8	152	84.7
Bhuj	116	1	19	0.63	80	0	96	47	90.0
Gandhidham	65	0	44	0.23	86	0	68	60	0
Mandavi	86.90	0.00	4.20	0.50	79.6	99.9	55.5	93	42.5
Rapar	94	0	63	0.75	100	2	44	33	76.0

The Table 16 is representing the existing situation of the water supply system in the six municipalities in Kachchh district, 2011-12. The Bhuj municipality may be providing a water connection outside the municipality area like in the fringe area of the Bhuj-Madhapar towns or in the other relocation sites which are established after the Earthquake 2001. There is no metering system

is established in the any municipality in the Kachchh district. The quality of water is provided by the Mandavi municipality among the all municipalities. In the slum areas the highest connection is available in the Bhuj and Bhachau towns.

### Sewerage and Sanitation

**Table 17:** Situation of Sewerage and Sanitation in six municipalities in Kachchh district, 2011-12

Name of Municipality	Coverage of toilets (%)	Coverage of waste water network services (%)	Collection efficiency of waste water network (%)	Adequacy of waste water treatment capacity (%)	Extent of reuse and recycling of waste water (%)	Extent of cost recovery in waste water management (%)	Efficiency in redressed of customer complaints (%)	Efficiency in collection of sewerage related charges (%)	Coverage of toilets in slums (%)	Coverage of sewerage connections in slums (%)
<i>Benchmarks</i>	100.00	100.00	100.00	100.00	20.00	80.00	100.00	90.00	100.00	100.00
Mandavi	26.7	16.3	0	0	0	441.30	80	97	23.5	19.6
Bhuj	99	46	0	0	0	74	90	73	89.0	0

## Sustainable Development and Role of Urban Centers in Kachchh District

Anjar	64	56	na	na	0	262	80	57	54.7	44.2
Gandhidham	78	77	0	0	na	36	90	59	0	0
Bhachau	31	0	0	0	na	0	90	na	42.4	0.0
Rapar	38	0	0	0	na	na	na	na	17.0	0.0

**Source:** Local ULBs

The Table 17 is representing the existing situation of the sewerage and sanitation facility in the six municipalities in Kachchh district, 2011-12. The toilet facility in the Bhuj municipality area is high then the other municipalities. The coverage of the sewerage is high in the Gandhidham and Bhuj municipalities' area and in the Bhachau and Rapar municipalities' areas the sewerage may not be in the working condition. There is no treatment plant available in the any town in Kachchh district. In the cost of recovery the Mandavi municipality shows the 441% it may be sum of the existing and past collection of the revenue or some other taxes consider under this. In the slum area the toilet facility is high in the Bhuj

municipality area and the coverage of the sewerage network is high in the Anjar municipality area.

The table 18 is representing the existing situation of the solid waste management in the six municipalities in the Kachchh district in 2011-12. The HH level coverage of solid waste collection is highest in the Bhachau and Mandavi town which are respectively 80% and 73.4% areas of the municipalities. In the all municipalities, the solid waste disposal is mostly done by the land fill method, there is no municipalities used a scientific method.

### ***Solid Waste Management***

**Table 18:** Situation of Solid waste Management in six municipalities in Kachchh district, 2011-12

Name of Municipality	Household level coverage of SWM services (%)	Efficiency of collection of municipal solid waste (%)	Extent of segregation of municipal solid waste (%)	Extent of municipal solid waste recovered (%)	Extent of scientific disposal of municipal solid waste (%)	Extent of cost recovery in SWM services (%)	Efficiency in redressed of customer complaints (%)	Efficiency in collection of SWM related charges (%)	HH level coverage of SWM services in 'slum settlements' (%)
<i>Benchmarks</i>	100.00	100.00	100.00	80.00	100.00	80.00	100.00	90.00	100.00
Mandavi	73.4	90	0	0	0	57.7	90	93.3	0
Bhuj	59.9	82.14	0	0	0.0	9	95.0	18.2	0
Anjar	28.9	na	na	na	0.0	37	95.0	62.6	na
Gandhidham	30.0	80.00	0	0	0.0	25	90.0	53.6	0
Bhachau	80.0	85.71	0	50	0.0	27.38	50.0	45.2	0
Rapar	52.8	85.71	0	20	0.0	9	100.0	39.4	33.2

**Source:** Local ULBs

The all municipalities have a solid waste disposal site except the Gandhidham municipalities because of the governance system (SRC, KPT, Gandhidham Municipality and GDA) in the Gandhidham.

In the slum area the solid waste collection is poor in all municipalities, except Rapar municipality. In the Rapar

town, collection is 33.2% of total slum house hold it may be due to the Rapar municipality established a compost fertilizer plant and the waste may be used as a raw material in the plant. Other details information is given in table 18.

**Storm water drainage****Table 19:** Situation of Storm water Drainage in six municipalities in Kachchh district, 2011-12

Name of Municipality	Coverage of storm water drainage network (%)
Benchmarks	100.00
Anjar	2
Bhachau	1
Bhuj	2
Gandhidham	9
Mandavi	12.5
Rapar	2

**Source:** Local ULBs

The table 19 shows the existing situation of the Storm water rain in the six municipalities in Kachchh district, 2011-12. The highest area covered in the Mandavi town which is 9% of the total municipal area. And lowest in the Bhachau town with just 1% of the total municipal

area, but due to the physical setting of Bhachau town is benefited to decrease the water logging incidence.

**Road Network in the six municipalities in Kachchh district****Table 20:** Situation of the Road network in six municipality in Kachchh district, 2010-11

Name of Municipality	Type of Road	Length (in Km)	Total Length (in Km)	Density (Per 1000 Sq. Km Area)	Density (Per 1000 Pop)
Gandhidham (M)	Kachcha	0.00	345.00	11500.00	1.39
	Pacca	345.00			
Bhuj (M)	Kachcha	35.00	237.00	6236.84	1.61
	Pacca	202.00			
Anjar (M)	Kachcha	13.93	70.81	3975.86	0.80
	Pacca	56.88			
Bhachau (M)	Kachcha	25.02	78.62	8601.75	1.99
	Pacca	53.60			
Mandvi (M)	Kachcha	20.00	115.00	7666.67	2.73
	Pacca	95.00			
Rapar (M)	Kachcha	18.00	67.75	5424.34	2.39
	Pacca	49.75			

**Source:** Local ULBs

The table 20 is representing the existing situation of the Road network in the six municipalities in Kachchh district in 2011-12. The longest road network is available in the Gandhidham city with 345 Km pacca type road

and shortest in the Rapar but it may be depending upon the available area in the particular municipality so, there should be required see a density of the Road with both parameter like Population and Area. The highest



density per 1000 Sq.Km in a Gandhidham Municipality with 11500, and as per 1000 population, the Mandavi Municipality has a dense road network with 2.73. The average urban road density in India is 3893.48 per 1000 Sq.Km and 0.91 per 1000 Population. So, Anjar municipality has a low density than the average of

India in the context of the population. Otherwise all municipalities have more road density than the average urban road density of India.

### *Financial Aspects*

**Table 21:** The financial position of six Municipalities in Kachchh district in 2010-11 (Rs in '000)

Income Head	ANJAR	BHACHAU	BHUJ	GANDHIDHAM	MANDVI	RAPAR
Revenue Income	15468	4399	50470	39712	9910	3097
Capital Income	40449	4931	59647	51500	22816	5980
Total Income	55917	9330	110117	91212	32726	9077
Revenue Expenditure	4383	3521	0	11249	13137	2272
Capital Expenditure	23786	5399	84234	50209	13706	6624
Total Expenditure	28169	8920	84234	61458	26843	8896
Status of Surplus/Deficit						
Revenue Surplus / Deficit	11085	878	50470	28463	-3227	825
Capital Surplus / Deficit	16663	-468	-24587	1291	9110	-644
Total Surplus / Deficit	27748	410	25883	29754	5883	181

**Source:** Census of GoI, 2001

The table 21 shows the financial position of the six municipalities in Kachchh district in 2010-2011. All municipalities had a surplus revenue income except Mandavi municipalities. The Ajar, Bhachau and Rapar Municipalities had a Surplus capital income and remaining municipalities had a deficit. So, all municipalities had a surplus at end and maximum balance remaining with Anjar and Gandhidham municipalities where the Rapar and Bhachau municipalities had a lowest surplus at the end of financial year 2010-2011. So, Anjar and Gandhidham municipalities' condition was good in 2010-2011. In the comparison of the all six municipalities' financial condition in 2000-01 and 2010-11, the financial condition of Bhuj municipality was become low in 2010-11 than 2000-01 and Gandhidham and Anjar Municipalities had a strong financial condition among the all municipalities in Kachchh district.

So, after the spending a huge fund by GoG, the existing situation of the basic service should not be proper or

sufficient to provide the better quality of life to people who are living in those six towns in the Kachchh district. The Road network is good in the all municipalities because of the GERRP. If, the existing situation of basic services are not enough in the Municipalities area than there is the question of "what is the condition of the basic services and quality of life of people in the urban-Rural fringe areas where the maximum development is going on?" Because of the lacking in the water supply by ULBs is increased the private business of the water supply by the tankers in the Bhuj and Gandhidham town and also people are facilitate their own bore in the Societies and Institutes.

### **CONCLUSION**

Urban centers are playing pivotal role of the urbanization and sustainable development for regional/state enlargement. Urban centers are helping for regional planning and poverty reduction in Kachchh urban development. Above statistics illustrates good indication

for demographic consequence of urban centers. An urban center has provided many services to the towns. Here we found some concrete result like local governance also collaborating with sufficient resources and competence, requirements and precedence are responding by urban centers for sustainable development in Kachchh district.

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