



SPATIAL PATTERN OF ACCESS TO BASIC SERVICES IN URBAN AREAS: A CASE STUDY OF AHMEDABAD CITY

Jolly J. Desai¹ and Dr. Shital H. Shukla²

¹Assit. Prof. Geography Dept. Govt .Arts college, Sector -15 Gandhinagar.

² (Head) Geography Dept. Guj. University, Ahmedabad, Gujarat.

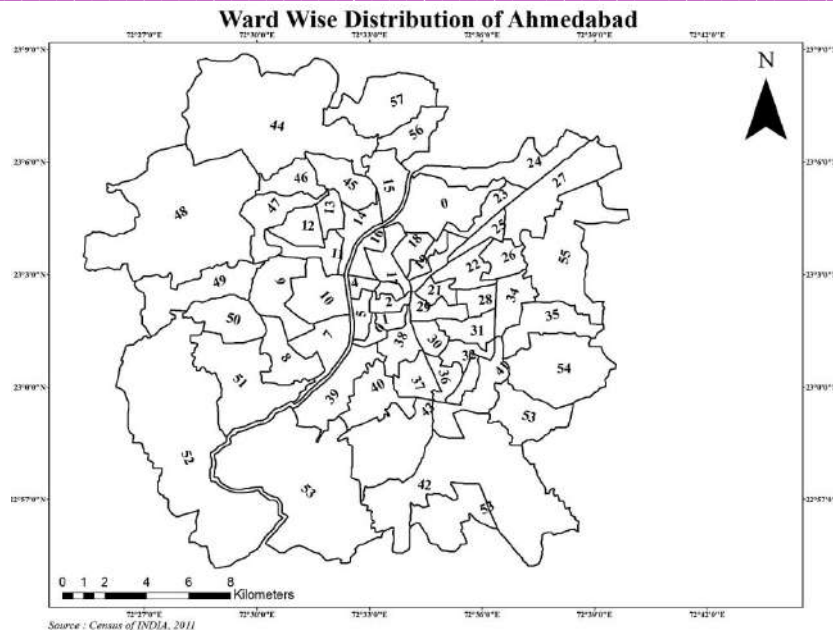


ABSTRACT

An easy and equal access to basic services for all is an important criterion towards human development. It is also considered important human rights. In order to have an easy and equal access to all, the basic services have to be provided spatially without discriminated. This is more imperative for urban areas because of densely populated areas. Unequal access to basic services can lead to segregated space over time which can lead to social unrest and violence in urban areas. Therefore, it is crucial to assess the status of basic services within the city area in order to make them more efficient and effective. This paper attempts to assess the status of basic services in Ahemdabad city. The paper finds that there are wide disparities existing within Ahmedabad city as far as basic services are concerned. Therefore, the city planners have to deal with these disparities for sustaining development in long run.

INTRODUCTION

The latest census data shows that the growth rate of population in urban India has shown 31.80 percentages from 2001 to 2011. This growth rate of urbanization remained higher than expected (Kundu, 2011)^[1]. Compared to Indian urban growth rate of population, Gujarat urban population has increased by 35.88 percentages in the decade of 2001-11. This shows that Gujarat urbanization rate is higher than the national average and therefore Gujarat is one of the highly-urbanized states in India. Nonetheless, there are variations in the growth of urban population within the state of Gujarat. The most populated town within Gujarat is Ahmedabad, which is located almost in the centre of the state. Ahmedabad is situated between 22 55''N and 23 09''N latitude and 72 25''E and 72 39''E longitude. It has developed as a historical town having developed through various industries; especially cotton textile. According to Gillone-1968^[2] "Unlike Bombay, Calcutta, Madras and Kanpur; Ahmedabad was not the creation of the British but a city which while remaining true to itself successfully adapted to the new industrial age carrying over commercial and industrial skills and patterns of traditional social organization. In no great city of India can continuity of past and present we seen as clearly as in Ahmedabad. This confirms the fact that Ahmedabad has remained as an attraction of an economic centre which attracts the migrants not only from rural areas of the state but also from other states. Ahmedabad has shown the demographically high jump in urban population. The population of Ahmedabad Municipal Corporation has increased from 3.52 million in 2001 to 5.57 million in 2011. This shows that the city population has increased by 36.80 percentages in the decade of 2001-11. This is mainly due to merging of several Gram Panchayat and Nagar Palikas into the Ahmedabad Municipal Corporation. Geographically, the area of the city has also expanded more than double, from 190.84 sq. km in 2001 to 464 sq.km in 2011. The census of India has included 14 new wards to the city in the year of 2011. Such a large demographic explosion and geographical expansion of the city area has to face lot of challenges in terms of basic services.



An easy and equal access to basic services for all is an important triumph for achieving human development. It is also considered as one of the important human rights. In order to have an easy and equal access to all, the basic services have to be provided spatially Non- discriminated. This is more imperative for urban areas because of densely populated areas. Unequal access to basic services can lead to segregated space over time which can lead to social unrest and violence in urban areas. Therefore, it is crucial to assess the status of basic services within the city area in order to make them more efficient and effective. This paper attempts to assess the current status of basic services in Ahemdabad city with help of Gorard Index.

In this Paper, data on basic amenities from the house listing and housing Census provided by the Census of India for the year 2011 are used. There are so many amenities listing data in the census report but in this research, some essential public goods, essential private goods, as well as aspirational goods has been selected. The following amenities have been considered:-

1. **Distribution of Tap Water from treated Source:-**
2. **Distribution of Safe Drinking water within premises:-**
3. **House hold with Flush/pour Flush latrine (piped sewer-system):-**
4. **House hold with Access to closed Drainage:-**
5. **House hold using LPG/PNG for cooking:-**
6. **Cooking Inside Home:-**
7. **House hold having television facility:-**
8. **House hold with computer /laptop with internet:-**
9. **House hold with mobile facility:-**
10. **House hold having two-wheelers:-**
11. **House hold Having Electronic Assets and Scooter /Car:-**

METHODOLOGY

Methodologically, this paper has used data on basic amenities from the House listing and housing Census provided by the Census of India for the year of 2011. This paper has used ward wise data on percentage of households having particular amenities for the year of 2011. The base map of Ahmedabad was prepared which included 57 wards as per census 2011. The shape file was created and geo referencing was

done in ARCGIS 10.2.2. The ward wise data on basic amenities were joined with the spatial data of wards in Ahmedabad. In order to assess the disparity in access to basic amenities, the wards were divided into five groups by equal division. Later on, Choropleth maps were prepared to show the spatial disparity within the Ahmedabad city.

In order to compare the disparity level among various basic amenities, the Gorard Index of segregation was used. The following formula was used to calculate Gorard Index (GI) for each and every amenity.

$$S = \frac{1}{2} \sum_{i=1}^n (A_{ik}/A - P_i/P)$$

where,

n denotes total number of wards,

A_{ik} denotes hh having *kth* basic amenity in the *ith* ward,

A denotes hh having basic amenity in the city

P_i denotes total population of the *ith* ward,

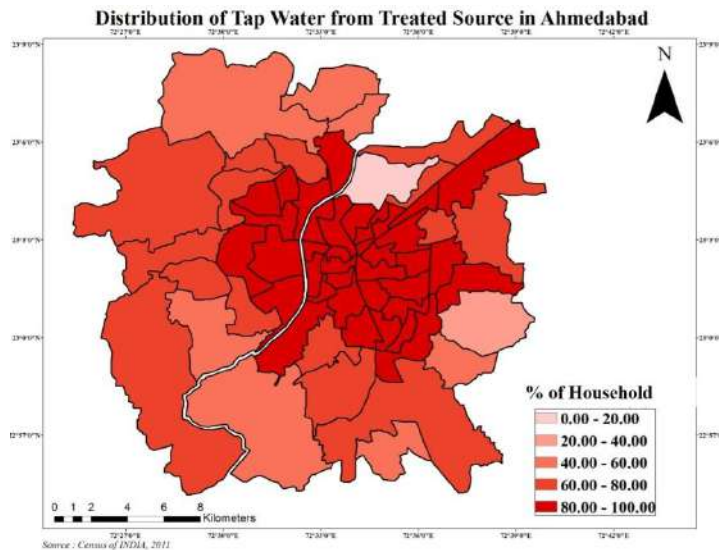
P denotes total population of the city, and

S denotes segregation index

RESULT AND DISCUSSION:

(1) Distribution of Tap Water from treated Source:-

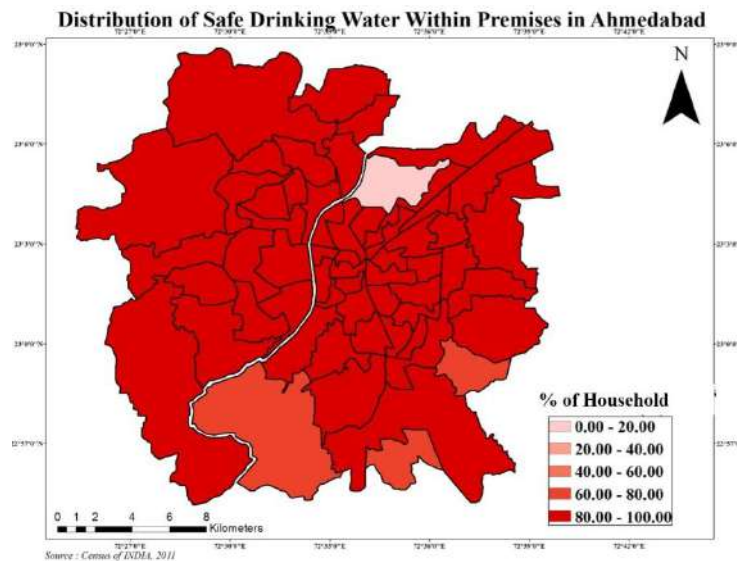
On studying the map, it has been found that 80% to 90% houses in the core area of Ahmedabad i.e. in the middle zone get treated water, while towards the western zone, 80% to 90% houses, and towards the northern zone 70% to 80% houses get treated water. In eastern zone 80% to 90% houses get treated water, this proportion decrease when as one move towards the southern zone, especially in Vatva where only 70% houses get treated water. Even in new western area only 70% to 80% houses get treated water. Thus moving from Middle area to outer area, the proportion of household getting clean water facility gradually decreases. Around the industrial area, as well as in the northern areas of Vastral and Ramol only 20% houses and in Lambha only 20% to 40% houses get treated water and this proportion can be considered very low. Because of this, it is obvious that the waterborne diseases would be seen more in these areas.



(2) Distribution of Safe Drinking water within premises:-

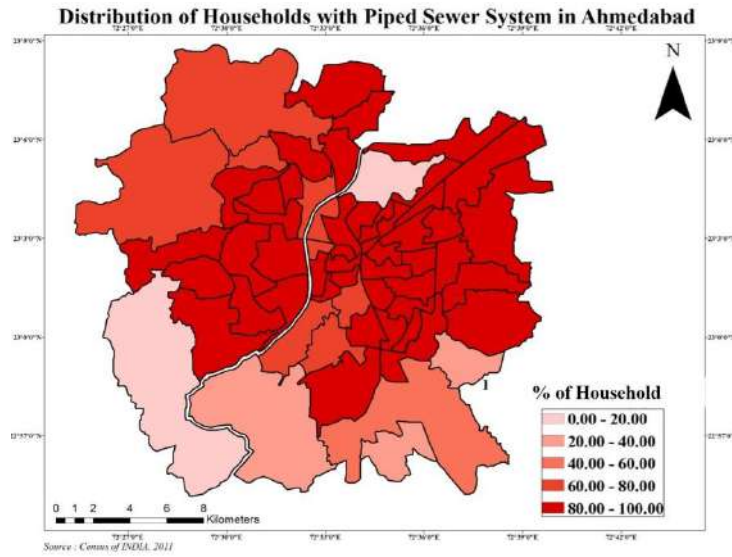
Looking at the map, it is evident that in most of the areas of Ahmedabad, pure drinking water is available close to the houses. This proportion is very low in the eastern areas of Ahmedabad such as Lambha, where only 70% houses get pure drinking water within their premises, while in Vatva, Isanpur, Baherampur and Danilimda 80% (people) houses get pure drinking water within their houses.

During a survey, it was seen that even in the LIG quarters which have been constructed by the government, people do not get pure drinking water within their premises and they have to fetch water from taps that are 500 m away, though these quarters are provided with water for house-hold purposes within their premises. Thus, it has been observed that there are more areas in the Western Part where the water provided within the premises is not drinkable and the drinking water has to be brought either by tankers or carried from far off places where Municipality water-taps are unapproachable.



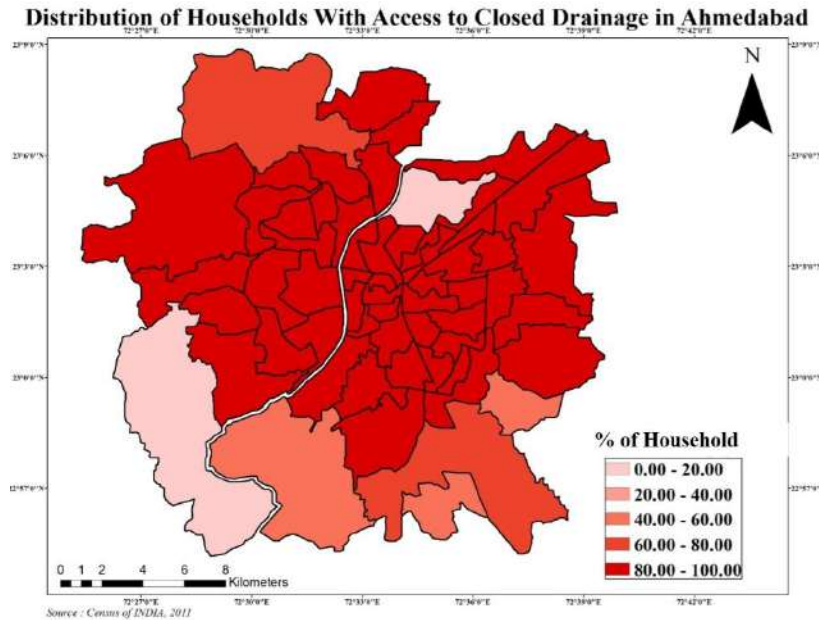
(3) House Hold with Flush/pour Flush latrine (piped sewer-system):-

In Ahmedabad, it has been found that the availability of flush system in toilets vary among different parts of the city. In the middle zone of Shahpur and Raikhad, 70% to 80% houses have flush system connected to the gutter-line. In Dudheshwar, Madhupura and Girdharnagar 70% to 80% houses have availability of flush system. In the western zone, the proportion is 80-90%. In northern zone, this proportion is around 90%. The situation in southern zone is the worst. In Maninagar, Baheramoura, Kankariya, Danilimda and Isanpure, this proportion of only 50-60%. The lowest proportion is in Vatva which is only 50%. It was noticed during personal visits that there is septic tank system only in Vatva and because of that in spite of the availability of flush latrine system, the proportion of their connection with the gutter line is somewhat nil. In Sarkhej and lambha, only 17.5% and 32.2% houses respectively have latrines with gutter line connection.



(4) House hold with Access to closed Drainage:-

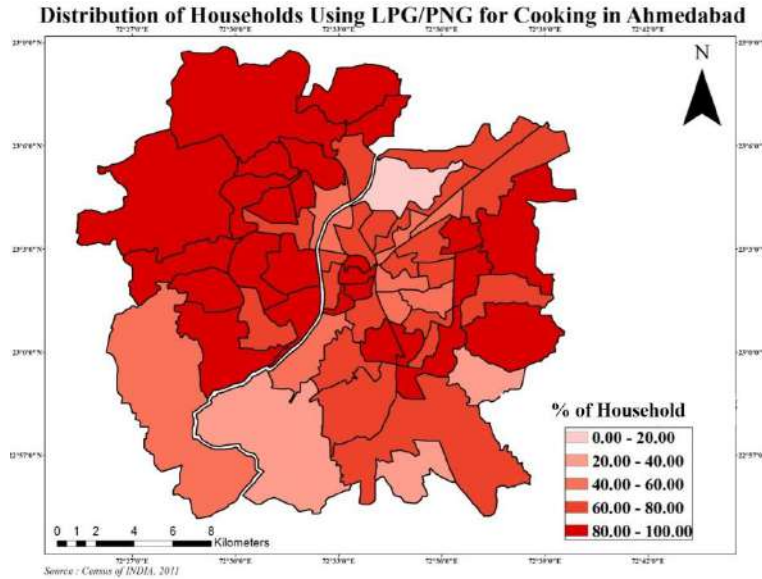
In Ahmedabad, except some areas of north and west, in most of the areas author see closed drainage system. In Vatva, its proportion is 60-80%,while the lowest proportion is in Sarkhej which is only 18.3% .In The absence of closed drainage system, There are changes of spreading the dirty water on roads in societies and during monsoon, this can lead to spread of diseases.



(5) House hold using LPG/PNG for cooking:-

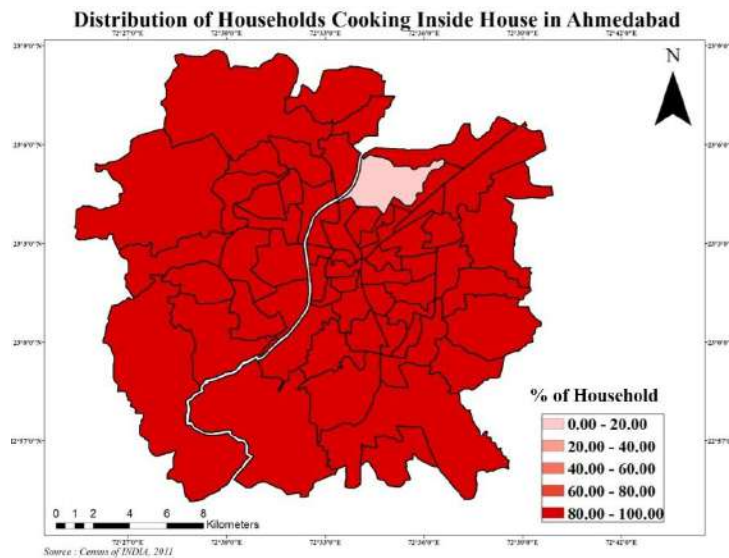
The western part of Ahmedabad is quite rich in this matter. Around 80-100% household use cooking gas. In vasna and Sardarnagar, the proportion is 60-80% while in Old vadaj Sarkhej, Thakkarbapanagar, Nikol, Bagefirdosh, Kokhara, maninagar, Dariyapur, Kalupur, Khadiya, Jamalpur, 80-100% houses use cooking gas, in Asharva, Girdharnagar madhupura, shahpur, raikhad, kankariya, danilimda,

isanpur, vatva, odhav, Naroda muthiya, sardarnagar, kubernagar 60-80% household use LPG/PNG as fuel for cooking. In northern zone in Bapunagar, Rakhiyal, Saijpur, Gomtipur, Naroda road, saiipur bogha 40-80% household use cooking gas. The lowest proportion is in lambha where only 20-40% households use cooking gas as fuel. During survey it was seen that in these areas people use other resources like wood, Kerosene, etc as fuel for cooking purpose.



(6) Cooking Inside Home:-

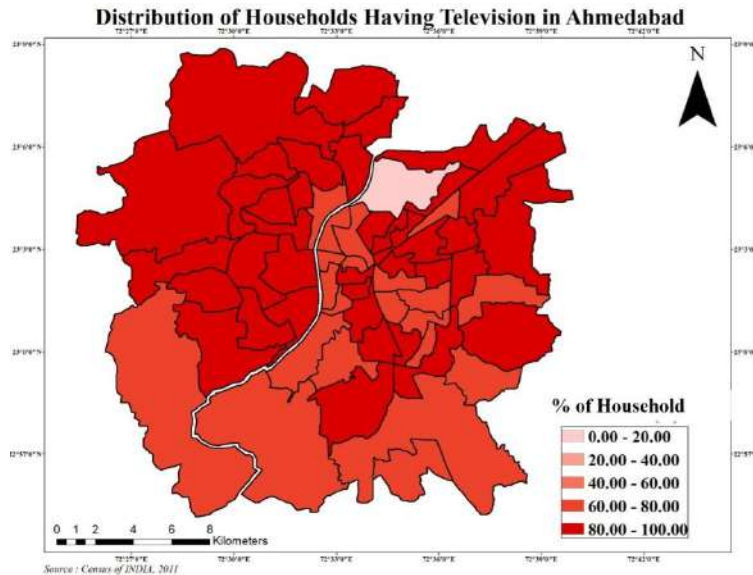
In almost all areas in Ahmedabad i.e in around 80-90% houses, it is seen that people cook inside their houses, which can be confirmed on the basis of the data. While people who are residing in poor and slum areas and poorly built shelters, cook outside their houses. This fact was noticed during personal visits.



(7) House hold having television facility:-

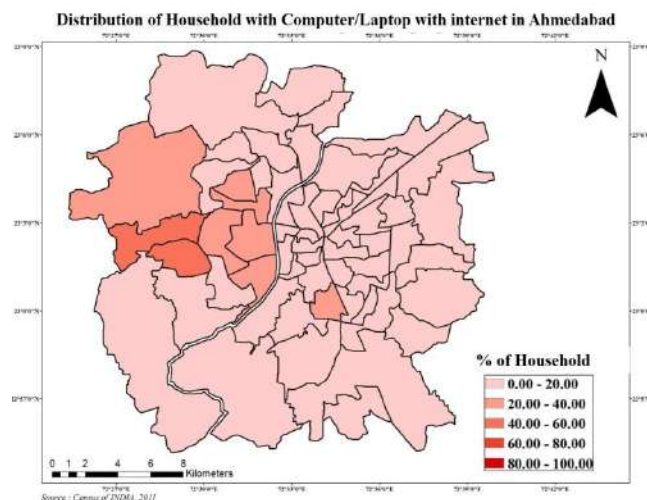
In modern times, television is seen in almost all houses, but its proportion is more in the western zone. Its proportion is 60-80% in east zone, particularly in Sarkhej and Vadaj area. The author finds variations. In core areas, the proportion is 60-80% while in outer areas the proportion is 80-100%.

The core areas of Ahmedabad are gradually being converted to residential to commercial. In last few years, the rich people have shifted towards the outer areas leaving lower middle class. This is one reason why the inner areas have low proportion of television facility.



(8) House hold with computer /laptop with internet:-

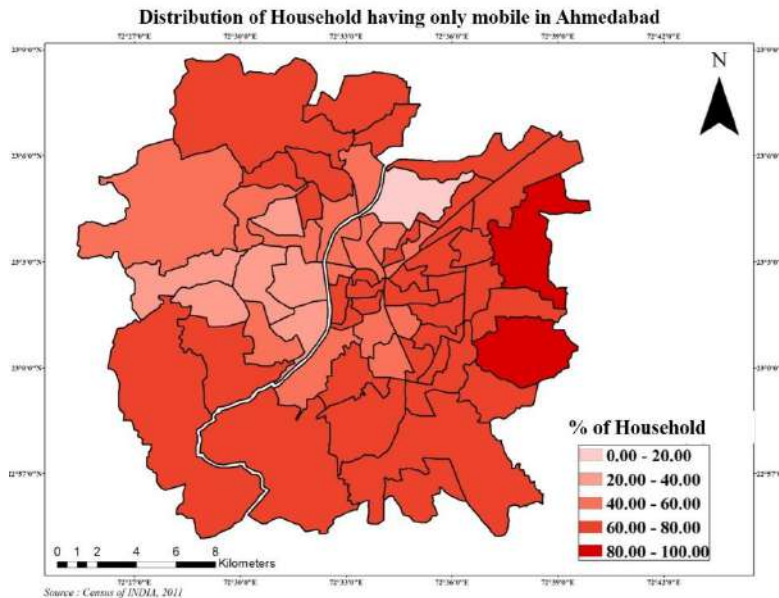
In the modern times, the use of electronics goods has increased but in eastern part of Ahmedabad, its proportion is low i.e. around 0-20 % and in Maninagar it is 20-40 % while towards the western zone in Paldi, Navrangpura, Gandhigram, Sardar, Thaltej, Naranpura, 40-60% household have computer or laptop. In Bodakdev, Jodhpur 60-80% household possess computer or laptop. Moving from east to west, the proportion increases in a pattern.



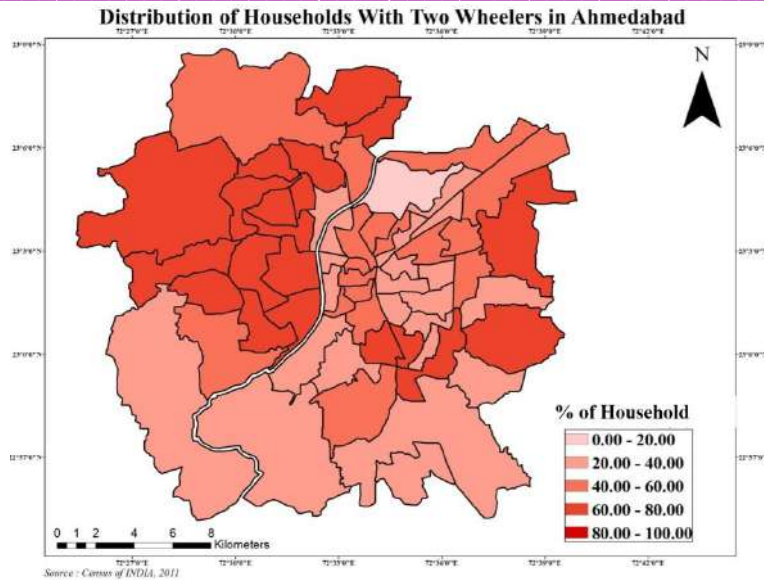
(9) House hold with mobile facility:-

Mobile has become an indispensable requirement in the modern age. In eastern (Vastral and New Naroda) Ahmedabad, its proportion is 80-100%. In western wards such as Kaligam, Chandkheda, Motera, Ranip, Chandlodiya and Nava Vadaj its proportion 80-100%. In Shapur, Dudheswer, Madupura, Girdharnagar, Naroda road, Kakeriya, Maninagar, Gomtipur and Behrapura there are 40-60% mobile users and 60-80 % proportion is seen towards the west in Paldi, Navrangpura, Gandhigram, Jodhpur, Bodakdev, Naranpura, Chadlodiya, Sardar, Junavadaj and Sabarmati. Sarkhej and Vejalpur account for 60-80% mobile users.

Thus it can be concluded that there are some areas in both east and west side where basic amenities might not be available but mobile facilities are seen in greater proportion. An important reason behind this can be the fact that the mobile companies provide the facility of recharging the mobile with small amounts like 10/- rupees etc. In this way in the eastern part the availability of mobile facility is seen more in proportion.

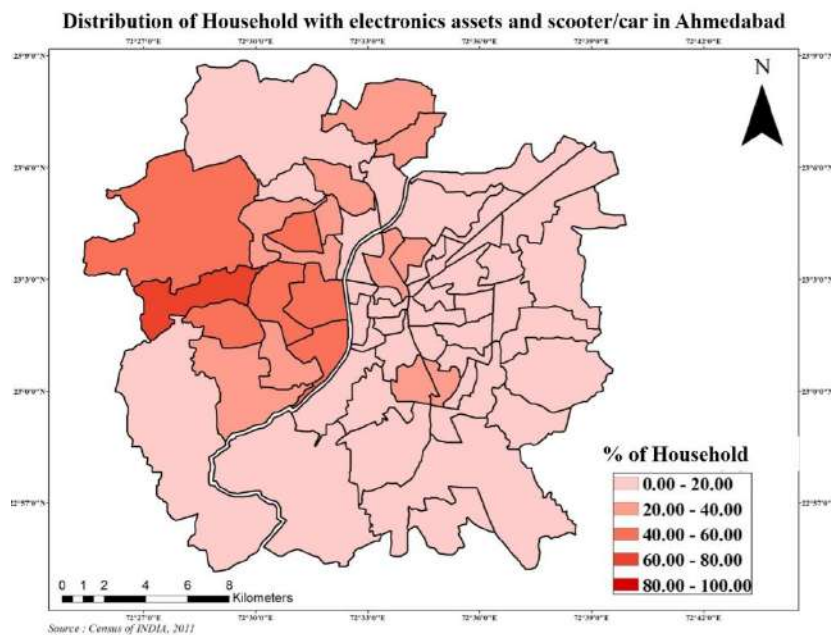
**(10) House hold having two-wheelers:-**

In this regard, only the eastern part of Ahmedabad differs from the other parts where the proportion of two-wheeler owners is around 20-40 %. Its proportion in Vastral, Ramol, Nava vadaj is 80-100 %. In the core areas, its proportion is 20-40 % this proportion is very low. And the proportion increases when we move towards the outer areas. The proportion is greter in western zone in comparison with the eastern zone. In Juna Vadaj and Sarkhej it is 20-40 % and in Kaligam, Sabarmati, Vejalpur it is 40-60 %. In all the other areas, its proportion is 80-100 %.



(11) House hold Having Electronic Assets and Scooter /Car:-

In the eastern part of Ahmedabad, very low proportion i.e. 0-20 % of total households is seen while in Maninagar, Khokhra, Madhupura, Girtharnagar its proportion is 40-60 %. In western part, the highest 80-100 % proportion is seen in Bodakdev. While in Kaligam, Chandlodiya, Juna Vadaj, Sabarmati and Sarkhej, the proportion is 20-40 %. In west, all the other areas have 40-80 % proportion.



CONCLUSION:-

Regarding the availability of various basic amenities covering the entire Ahmedabad, we can say that drinking water and Sewerage are the most important requirements for human beings. Especially when we are talking about the smart city concept, the proportion of these facilities is very low in peripheral region of

Ahmedabad. The lack of pure drinking water and closed drainage connection is the chief reason behind the spread of water-borne diseases. We even see frequent discussions in newspapers that the gutter-lines have been installed before many years but due to the lack of proper Maintenance the pipelines of drinking water and gutter-lines get mixed which leads to the increase in water born diseases.

Although the coverage of households having Tap as drinking water sources is better in core areas, it does not ensure the quality. During the personal visit to these areas, it was seen that in many areas; which are situated near the Industrial area (G.I.D.C), tap water was not drinkable and the T.D.S. proportion was higher than recommended. It is also observed that the facilities like cell phone and Television have less disparity compared to basic amenities like treated drinking water and cooking gas. Further, there is a wide disparity in having luxurious goods among the wards of Ahmedabad, Western part of Ahmedabad is enjoying the facility of luxurious goods and services, while the eastern part is still lacking. This shows that there is still disparity prevailing in accessing the basic facilities within the city areas. Now when Ahmedabad is looking forward to become a Smart city, provision of these facilities to all should be given at most priorities.

| Name of amenities | Gorard Index |
|--------------------------------|--------------|
| Treated Drinking Water | 7.36 |
| Drinking water within premises | 3.67 |
| Pipes sewer System | 6.88 |
| Closed Drainage | 5.23 |
| Cooking Gas | 9.39 |
| Cooking Inside home | 2.8 |
| Television | 5.4 |
| Computer with Internet | 40.76 |
| Cell Phone | 8.37 |
| Two Wheeler | 15.52 |
| Luxurious Goods | 33.63 |

The disparity index calculated for various amenities is shown in table. The amenities are divided in to three types (1) Basic amenities which are provided by Government, (2) Essential amenities which are owned privately and (3) Aspirational amenities owned privately.

Looking in to the Gorard index for basic amenities provided by government the highest disparity is prevailing in treated drinking water which is followed by piped sewer system. There is lot to achieve in millennium development goal as far as drinking water and pipe sewer system are concern. The next range of amenities is essential but privately owned. The disparity is less in the matter cooking inside the home. This is obvious for urban areas. However cooking gas disparity is the highest among all essential amenities its 'S' value 0.094. Cooking gas is available with most of the people concentrated in wards located in northwest Ahmedabad. The third range of amenities is privately owned aspirational and luxurious goods. These amenities include television, computer, cell phone, two wheelers and other luxurious goods. The disparity index is the highest for computer. It's 'S' values is 0.408. This is followed by luxurious goods such as car with 'S' value of 0.336. The disparity is also higher in two wheelers with 'S' value of 0.155. Looking in to an overall scenario the disparity is higher among aspirational goods compare to those of essential goods. In fact, ward wise disparity for government provided basic amenities is observed less in Ahmedabad. This may be due to the efforts of the A.M.C.

Regarding the availability of various basic amenities covering entire Ahmedabad, it can be said that drinking water and sewerage are the most important requirements for human beings especially when we are talking about the smart city concept. At present, the proportion of these facilities is very low in the

peripheral regions of Ahmedabad. The lack of pure drinking water and closed drainage connections is the chief reason behind the spread of water-borne diseases. Frequent discussions can be seen in newspapers that gutter-lines were installed many years ago and due to the lack of proper maintenance, the pipelines of drinking water and gutter-lines get mixed and lead to increase in water borne diseases.

REFERENCES:

- (1) Gillion, Kenneth L (1968) Ahmedabad : Astudy in Indian Urban History, University of California Press.
- (2) Gorard, S (2000): "Education and Social Justice: The Changing Composition of Schools and Its Implications," Cardiff: University of Wales Press.
- (3) Kundu, A., 2011. *Trends and processes of urbanisation in India*, London. Available at: [http://environmentportal.in/files/file/Trends and processes of urbanisation in India.pdf](http://environmentportal.in/files/file/Trends%20and%20processes%20of%20urbanisation%20in%20India.pdf) [Accessed January 14, 2016].
- (4) Mahadevia, D. (2014). *City Profile: Ahmedabad*. CUE Working Paper.

WARD-WISE DISTRIBUTION OF AHMEDABAD

| NAME | WARD No. | NAME | WARD No. | NAME | WARD No. |
|--------------|----------|-------------------|----------|---------------|----------|
| KHADIA | 1 | NARODA ROAD | 20 | BAHERAMPURA | 39 |
| KALUPUR | 2 | SARASPUR | 21 | DANI LIMDA | 40 |
| DARIYAPUR | 3 | POTALIYA | 22 | BAGE PHIRDOSE | 41 |
| SHAHPUR | 4 | KUBERNAGAR | 23 | VATVA | 42 |
| RAYKHAD | 5 | SARDARNAGAR | 24 | ISANPUR | 43 |
| JAMALPUR | 6 | SAIJPUR BOGHA | 25 | KALI | 44 |
| PALDI | 7 | THAKKERBAPA NAGAR | 26 | RANIP | 45 |
| VASANA | 8 | NARODA MUTHIYA | 27 | CHADLODIYA | 46 |
| GANDHIGRAM | 9 | BAPUNAGAR | 28 | GHATLODIYA | 47 |
| NAVRANGPURA | 10 | RAKHIYAL | 29 | THALTEJ | 48 |
| SARDAR.P.STD | 11 | GOMTIPUR | 30 | BODEKDEV | 49 |
| NARANPURA | 12 | RAJPUR | 31 | JODHPUR | 50 |
| NAVAVADAJ | 13 | AMRAIVADI | 32 | VEJALPUR | 51 |
| JUNAVADAJ | 14 | BHAIPURA HA. | 33 | SARKHEJ | 52 |
| SABARMATI | 15 | NIKOL ROAD | 34 | LAMBHA | 53 |
| DUDESHVAR | 16 | ODHAV | 35 | VASTRAL-RAMOL | 54 |
| MADUPUR | 17 | KOKHARA MEMDAVAD | 36 | NEW NARODA | 55 |
| GIRDHARNAGAR | 18 | MANINAGAR | 37 | MOTERA | 56 |
| ASARVA | 19 | KAKARIYA | 38 | CHADKHEDA | 57 |

Source: AMC Ahmedabad- 2011