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RESEARCH ARTICLE

Relationship between availability of basic amenities and proportion of Slum population in Maharashtra

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Abstract

The urban centers offering diverse employment opportunities and means of livelihood are the main centers of attraction for migration. But the availability of infrastructure is low to accommodate the invariably growing population. The access to basic amenities like electricity, drinking water, toilet facility, wastewater outlet and clean fuel are critical determinants of quality of urbanization. And if it lacks, then it would facilitates the growth of slum. In this paper it being tried to capture the interdependent relationship between basic amenities and slum population residing in the class I towns in Maharashtra; largest slum populated state of India. As the slum is all about the situation or condition in which the people of medium and lower strata are living.

A detailed analysis of proportion of slum population and availability of amenities which includes good housing condition, treated tap water as the source of drinking water, electricity as the source of lightning, households having latrine and bathing facility within the premises, waste water outlet connected to closed drainage, and households availing the banking facilities. This may be a limitation of the study that only these indicators have been taken to assess the availability of amenities and to calculate the amenity index of class I towns of the state of Maharashtra.

To achieve the sustainable development goal (Sustainable cities and communities), we have to control the growth of slum population and to combat the formation of slum; we have to analyze the situation of basic infrastructure provided in urban centers. Amenities and slum population has policy implications as to reduce the slum population, provide basic amenities to the households which will improve their standard of living and ultimately lead to reduction in growth of slum and check the future slum formation.

Keywords: Slum Population, Maharashtra, Amenities, Urban agglomerations

1 | INTRODUCTION

Urbanization is a population shift from rural to urban areas, "the gradual increase in the proportion of people living in urban areas", and the ways in which each society adapts to the change. According to United Nation's estimates, in 2010 about 55.1 percent of the world population is urban while there is great gap between developed and less developed nations. About 77.1 percentage point urban population lives in developed countries and in less developed countries the proportion of urban population is approximately 44 percent.[1] Although India is one of the less urbanized countries of the world with only 31 per cent of her population living in urban agglomerations/towns, this country is facing a serious crisis of urban growth at the present time. The sheer magnitude of the urban population, haphazard and unplanned growth of urban areas, and a desperate lack of infrastructure are the main causes of such a situation. The rapid growth of urban population (decadal growth of total population in India is about 17.7 percentage points during 2001-2011 while urban population growth is about 31.8 percentage points)[2] both natural and through migration, has put heavy pressure on public utilities like housing, sanitation, transport, water, electricity, health, education and so on.

The urban centers offering diverse employment opportunities and means of livelihood are the main centers of attraction for migration; growth of migrants was about 21.5% (1999-2001). But the availability of infrastructure is low; as per the Census of India, 2011, about 68.4 % of households living in good housing condition in the country, 70.6 % of households having the access of tap treated water as the main source of drinking water, 92.7% having main source of electricity as main source of lightning, 81.4% households having latrine facility, 77.5 % houses have bathrooms while only 44.5% households having closed drainage connectivity for waste water outlet and 67.8 % of households availing banking facilities. The accesses to basic amenities are critical determinants of quality of urbanization and if it lacks then it leads to the poor living conditions and ultimately become the breeding ground for the growth of slum.

The slums in Indian cities predominantly created when large numbers of individuals or families move to the urban centers of their dreams, usually in search of better economic opportunities. However poor the quality of life of the urban areas may seem, from migrant slum-dwellers' perspective, living there is an entirely rational decision based on three basic factors; (1.) The productive employment opportunity in the urban center will likely generate a higher and more consistent personal disposable income (2.) Cities offer a wider choice of education and employment opportunities, and (3.) While no parent wishes their child to grow up in a slum, the chances that the child could raise to a middle class life provides a strong incentive to migrate to one from the countryside. Unfortunately, slums are the only available way to inhabit the city for the vast majority of migrants. As of total migrants in the country about 71 percent are rural migrants who move from one area to another within the country.[3] The coalescing of these processes over decades, with successive waves of migrants and no exodus of the previous waves leads to slums growing in scale and scope.

As per the definition of slum, given by UN Habitat, 2013; a slum is characterized by lack of durable housing, insufficient living area, lack of access to clean water, inadequate sanitation and insecure tenure indicates that as the urban population grows without the proper growth of infrastructure provided by the government led to the increase in slum population. Here, we can say that there is interdependent relationship between basic amenities[4] or physical

[1] World urbanization prospects: The 2014 revision, Department of Economic and social Affairs, United Nations.

[2] Census of India, 2011

[3] Census of India,2001

[4] Things considered to be necessary to live comfortably- Cambridge Dictionary

Supplementary information The online version of this article (https://doi.org/10.15520/jassh.v6i11.551) contains supplementary material, which is available to authorized users.

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infrastructure[5] and slum population.

Slum is all about the living conditions (including housing conditions, access of amenities, social security, institutions, etc.) of the urban population that is dynamic and ever changing. Slums are characterized by high concentrations of population, heterogeneous and ethnically multiracial population, largely inhabited by poor and socially weaker.[6] People move from one condition to other, when people move from low income to high income, they also shifts from poor condition to better conditions. Not all slums are homogeneous and not all slum dwellers suffer from the same degree of deprivation. The degree of deprivation depends on how many of the five conditions that define slums are prevalent within a slum household. Slum population in India is increasing day by day, as per Census of India, 2011; decadal growth of slum population is about 31.8% (2001-2011). Slums have become an integral part of urbanization as the pace of urbanization is increasing in developing countries in the absence of affordable housing and are in a way manifestation of overall socioeconomic policies and planning. Slum Population simply refers to people living in slum areas with low income.[7] As India is still on the path of development, there is large number of people living below the poverty line. These people usually live in slum areas connected to the city. Increase in Indian Population over a period of time has also resulted in slum population growth. Slums sprout and continue to grow for a combination of demographic, social, economic, and political reasons.

Study Area:

Maharashtra is a state in the western region of India and is the nations and also the world's second most populous sub-national entity with over 110 million inhabitants and its capital, Mumbai, has a population of approximately 18 million. Maharashtra is one of the wealthiest states in India, contributing 25% of the country's industrial output and 23.2% of its GDP (2010-11).[8]

According to the census of India, 2011, Maharashtra is the second most populous state in India with 9.28 percent population of India. The total population growth in 2011 was 15.99 percent while in the previous decade it was 22.57 percent. For the first time, in the year 2011, it was found to be lower than the national average. 55 percent of the state's population to be rural with 45 percent is being urban with 10.36 percent rural population growth while urban population growth is much higher that is about 24 percent. This indicates that the rural populations of the state will soon over ruled by the urban population. And of this urban population 77 percent urban population have shelters in class I towns of the state which is the home of about 35 percent of total population of the state.

Maharashtra is the home of one of the largest slum population of the world. Dharavi in Mumbai is quoted as the Asia's largest slum.[9] About 18 percent of India's slum populate have shelter in Maharashtra. So this state has been chosen to see the causes of the slum formation and what could be the policy implications to reduce the slum in the state.

Here in this analysis, the relationship between availability of basic amenities and proportion of slum population residing in class I towns of the states of Maharashtra is being depicted (with the help of correlation coefficient method, scattered plot and regression analysis). As the slum is all about the situation or condition in which the people of medium and lower strata are living. To control the growth of slum population and to combat the formation of slum, we have to analyze the situation of basic infrastructure provided in these towns.

Location of the state of Maharashtra in India is being depicted in red colour in map 1 and location of class I towns of Maharashtra is shown in map 2. In Maharashtra growth of slum population increased at the

[5]**Physical infrastructure refers to the basic physical structures required for an economy to function and survive, such as transportation networks, a power grid and sewerage and waste disposal systems**

[6]Mundu, G. B., & Bhagat, R. B. (2009). *Slum Conditions in Mumbai with Reference to the Access of Civic Amenities*-working paper, *IIPS* Mumbai, ENVIS center, 1–18

[7]Stokes, C. J. (1962). A Theory of Slums. *Land Economics*, Vol.*38*(3), 187–197

[8]Reserve bank of India

[9]Marx, B., Stoker, T., and Suri, T. (2013). The Economics of Slums in the Developing World The Economics of Slums in the Developing World +. *Journal of Economic Perspectives*,Vol. *27*(4), 187–210.

rate of 5 percent during 2001-2011. The distribution of urban and slum population of class I towns of the state is being depicted in map 3 and 4 respectively.

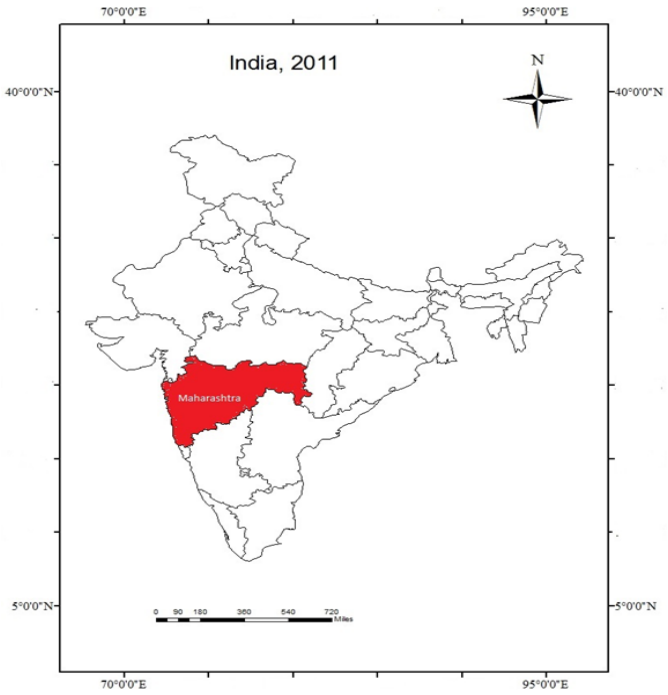


FIGURE 1: Map 1.Location of Maharashtra in India

Source; Census of India, 2011

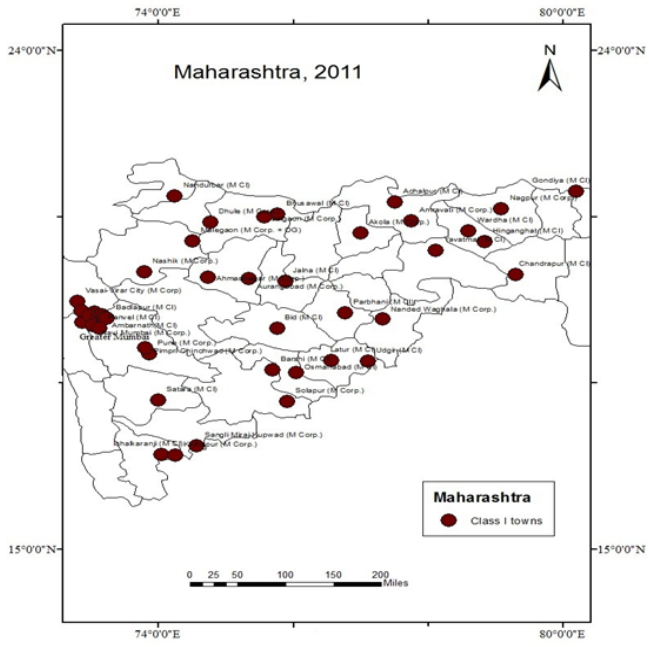


FIGURE 2: Map 2. Location of class I towns of Maharashtra

Source: Census of India, 2011

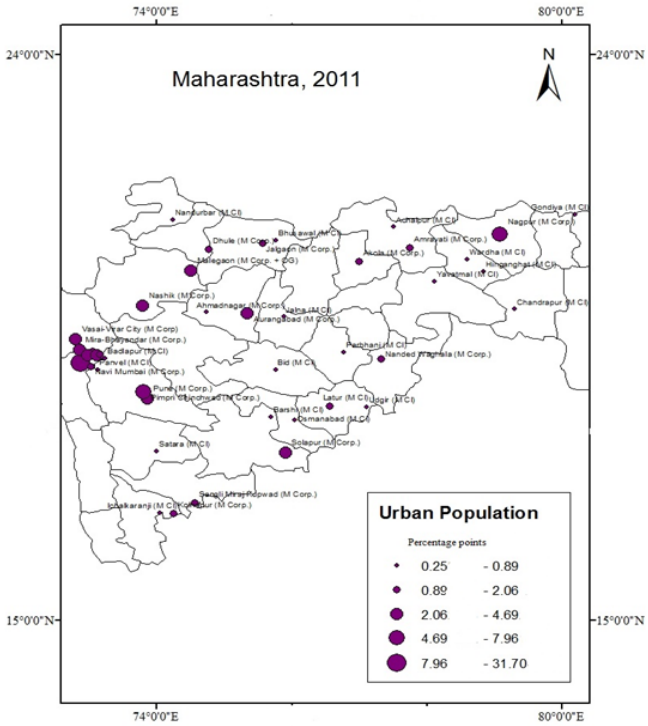


FIGURE 3: Map 3 Urban Population of Class I towns in Maharashtra

Source: Census of India, 2011

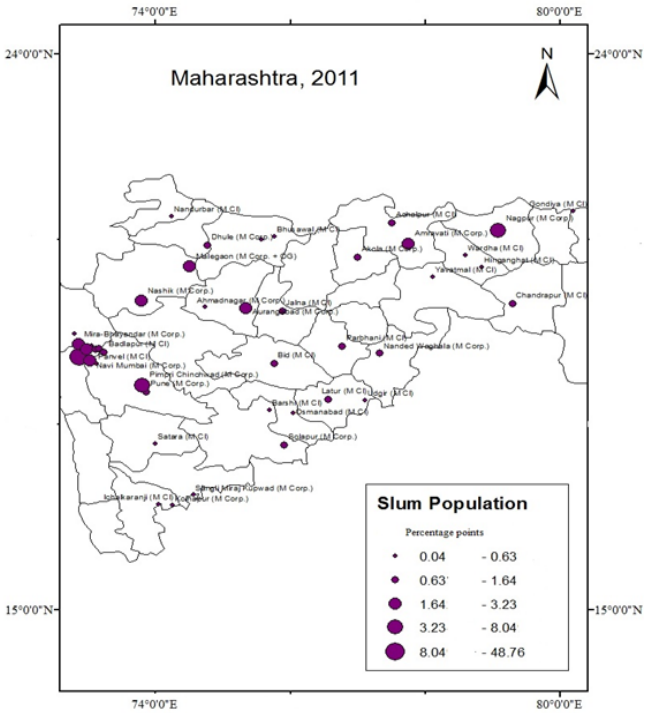


FIGURE 4: Map 4 Slum Population of Class I towns in Maharashtra

Source; Census of India, 2011

Basic amenities and proportion of Slum in Maharashtra

The higher economic vitality of cities and the possi-bilities of employment compared with the country-side pull the people to come and stay resulting into mushrooming of slums in urban centers.[10] But it has been observed that the slum may be a poverty trap and neither temporary nor a short stop on the way to greater economic opportunities.[11] As cities continue to attract excess rural populations and people looking for economic opportunities, slums' share of the urban environment will surely continue to grow, particu-larly in fast developing and low income countries where the rate of urbanization exceeds urban sys-tems' ability to assimilate the rapid growing popula-tion. Below-subsistence levels of incomes accruing to workers in this sector inflate the percentage of population below the poverty line, and compel them to reside in slums.[12] In this way slum start to flourish and continue to grow as this is the living condition as poor standard of life with the lack of basic amenities.

This study is related to the availability of basic amenities/physical infrastructure and slum popula-tion in class I towns of the state of Maharashtra in India. The state of Maharashtra has the highest share of slum population to the total slum population of India (as per the Census of India, 2011, 18.1% of total slum population of India lives in Maharashtra). And of the state's urban population 23.31 percentage point population residing in slum. Full coverage of the urban population in terms of access to safe wa-ter supply, toilet facilities, sewerage and electricity remains a major challenge in India.

[10]Firdaus G. (2012). Urbanisation, emerging slums and in-creasing health problems: a challenge before the nation: an empirical study with reference to state of uttar Pradesh in Nigeria. *Environmental Research and Management*, Vol.*3*(9), 0146–0152.

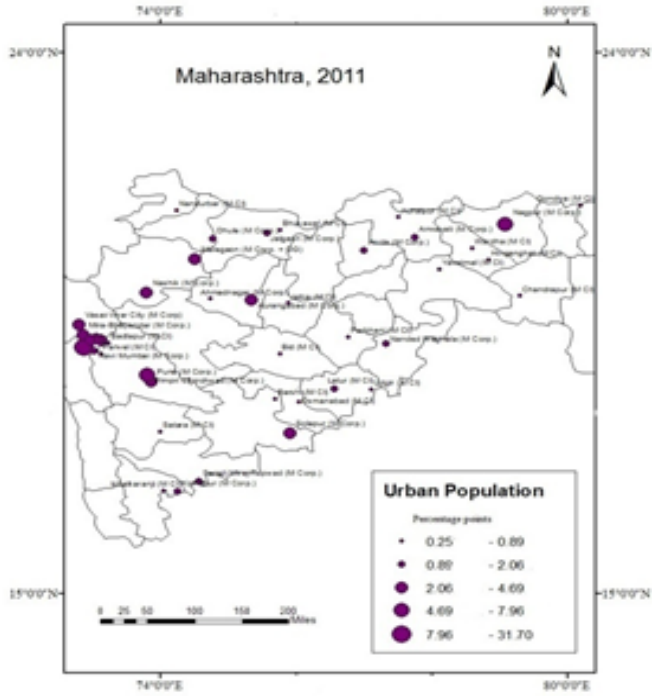
[11]Marx, B., Stoker, T., & Suri, T. (2013). The Economics of Slums in the Developing World The Economics of Slums in the Developing World +. *Journal of Economic Perspectives*,Vol. *27*(4), 187–210

[12]Andavarapu, D., & Edelman, D. J. (2013). Evolution of Slum Redevelopment Policy. *Current Urban Studies*, Vol.1(4), 185–192

There is lack of basic amenities available in this state as it is revealed by the Census data. As per the Census, 2011, at the National level, 43.5% of households uses treated tap water as a source of drinking water, 67.3% having electricity connection, 46.9% having the latrine facility, 42% having bathing facility while only 18.1% of households having closed drainage connectivity and 58.7% availing banking facility while in Maharashtra, 60.9% of households uses treated tap water as a source of drinking water, 83.9% having electricity connection, 53.1% having the la-trine facility, 64.3% having bathing facility while only 33.2% of households having closed drainage connectivity and 68.9% availing banking facility.

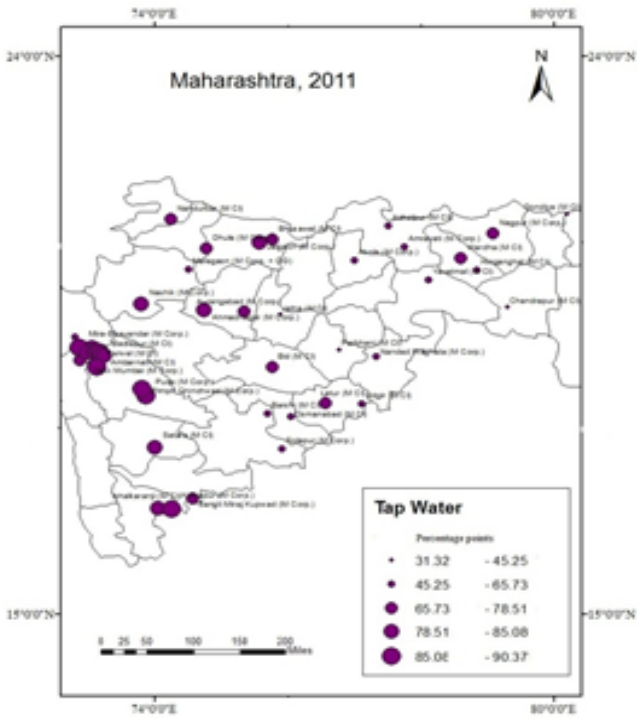
According to the NFHS-3 Report (2005), 81.3% population having tap water as their main source of drinking, 97% having electricity connectivity and only 48 % population of Maharashtra having sani-tation facility within their premises while the coun-try's 71% population having tap water as their main source of drinking, 93% having electricity connec-tivity and only 52.8% population of Maharashtra having sanitation facility within their premises. As in the second chapter it has been discussed that in Maharashtra about 45.2 percent population lives in urban areas and of this urban population 77 percent of population lives in class I towns of Maharashtra. So for the present study, class I towns of Maharashtra is being taken.

A detailed analysis of proportion of slum population and availability of amenities which includes good housing condition, treated tap water as the source of drinking water, electricity as the source of light-ning, households having latrine and bathing facility within the premises, waste water outlet connected to closed drainage, and households availing the banking facilities. This may be a limitation of the study that only these indicators have been taken to assess the availability of amenities and to calculate the amenity index of class I towns of the state of Maharashtra.



Map 5 Urban Population ofClass I towns in Maharashtra

Source: Census of India, 2011



Map 7 Householdshaving access to tap treated water

Source: Census of India, 2011

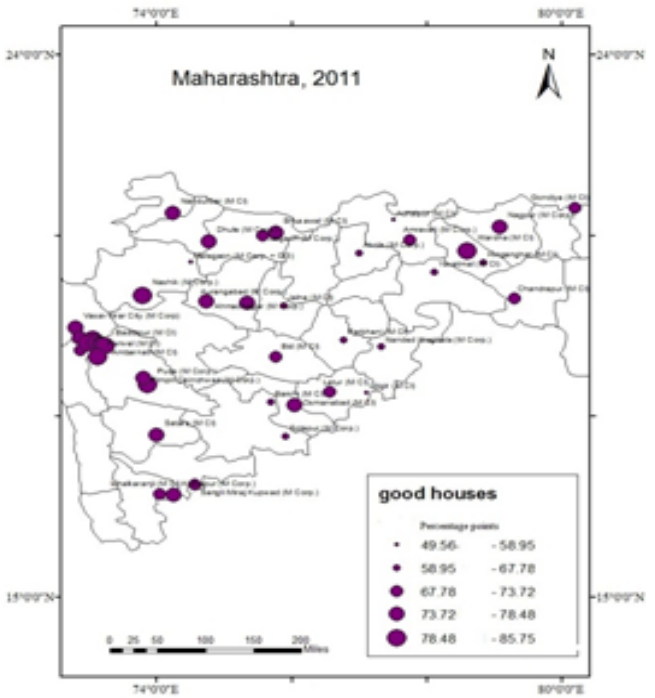
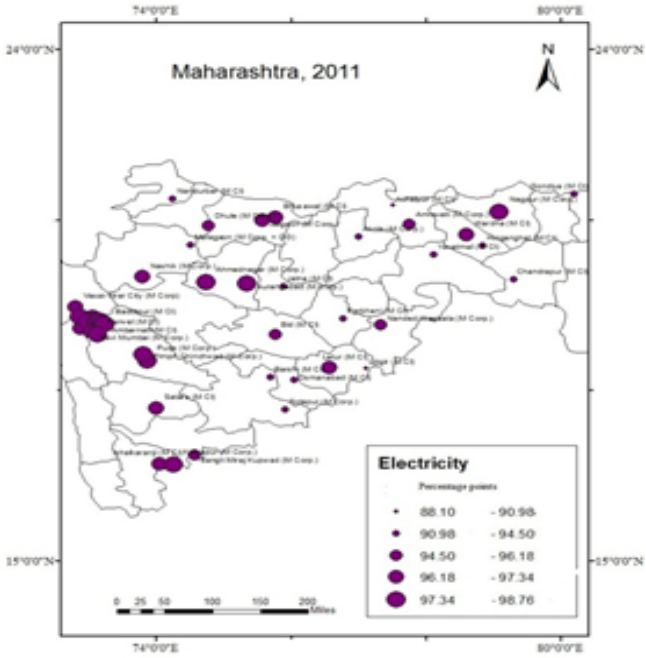


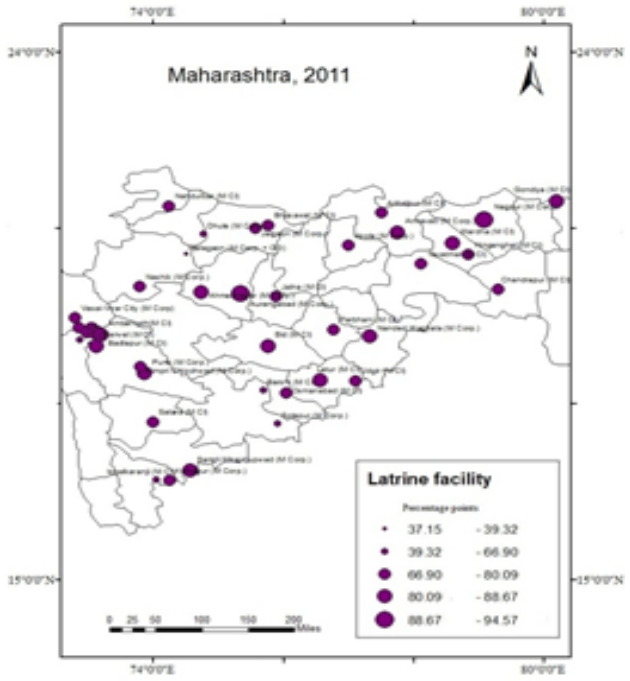
FIGURE 6: Map 6 Householdshaving good houses in Maharashtra, most of the towns are clustered aroundMumbai

Source: Census of India, 2011



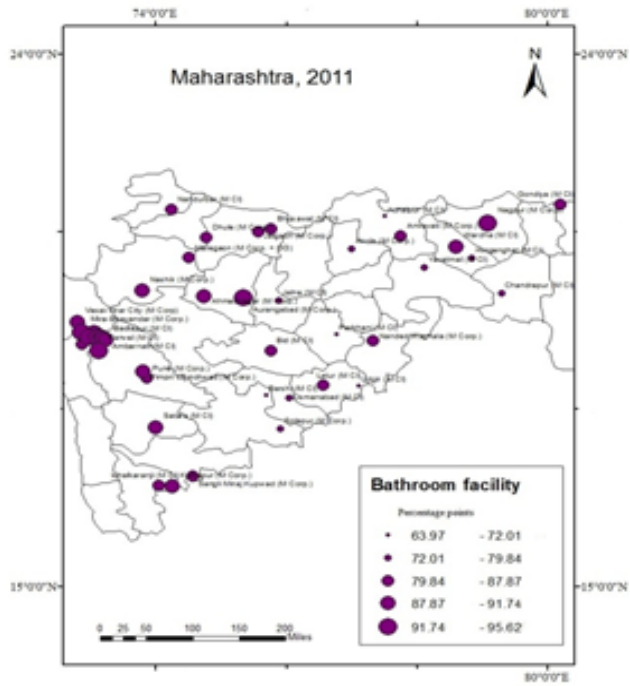
Map 8 Householdshaving electricity connection

Source: Census of India, 2011



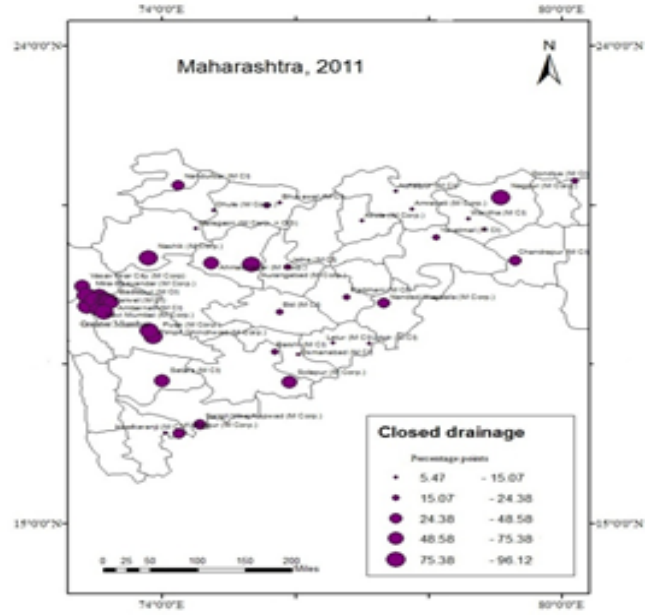
Map 9 Householdshaving latrine Facility within the Premises

Source: Census of India, 2011



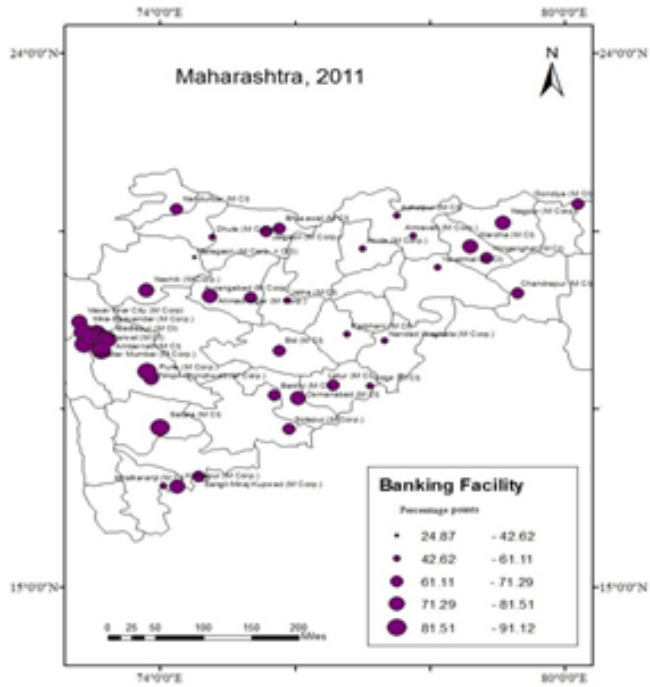
Map 10 Householdshaving bathroom Facility within the Premises

Source: Census of India, 2011



Map 11 Householdsconnected to closed drainage outlet

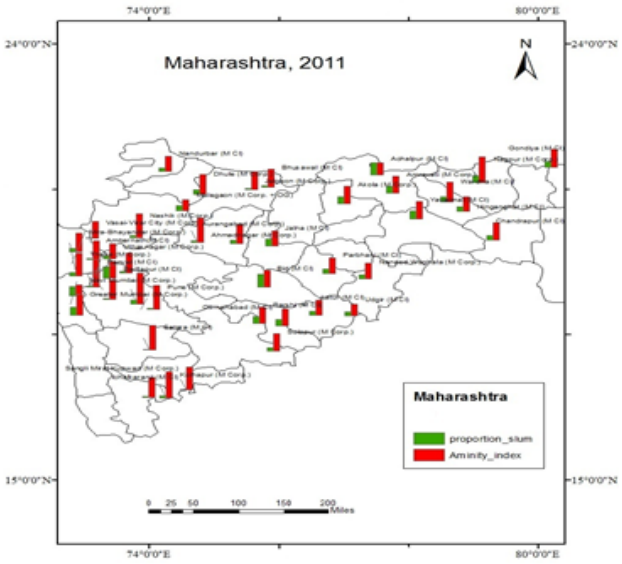
Source: Census of India, 2011



Map 12 Householdsavailing Banking services

Source: Census of India, 2011

As the class I towns are clustered around Greater Mumbai is shown in the map 1, the basic facilities also conglomerates around the Greater Mumbai area (map 2 to 8). As we move interior to the state, away from Mumbai the amenity availability declining. It emphasizes the growth of certain big towns which provides basic amenities to the households of the towns. This attracts the population of the hinter-lands to lead a life in better living condition with a better standard of life. All the amenities available to the class I towns is above 50 percent. It has been observed that in big cities, share of amenity is more. The distribution of amenity is more distorted. Somewhere it is as high as above 80 percent while in some region it is yet below 50 percent. Basic amenity like sanitary facility, tap treated water, waste water outlet connected to closed drainage are the basic need of public life. When these are provided, the environment conditions become difficult to live in filthy condition. But the low income group people have no choice as to settle down in these areas. This ultimately led to the slum formation. The proportion of slum population of class I towns of Maharashtra and Amenity index (calculated with the help of se-lected amenity) is shown in the map 9.



Map 9 Amenity Index andproportion of slum population in class I towns of Maharashtra
Sour ce: Cens us of I ndi a, 2011

The map 9 shows that where ever amenity index has the higher value, the proportion of slum population is less over there, except in Greater Mumbai and nearby areas of Mumbai. As the nearby or neighbouring regions shows more or less similar characteristics. So the class I towns of the state is being clubbed into the following urban agglomerations which gives the information about the amenity index and proportion of slum of urban agglomeration of the state.

Availability of basic amenities in urban agglom-eration and proportion of Slum population residing in these urban agglomerations in the state of Maharashtra

The table 1 tells us about the amenity indices and proportion of slum living in these urban agglomerations.[13]

Table 1: Amenity index and proportion of slum population in urban agglomeration of Maharashtra

Name of UA#	2001		2011	
	Amenity index	prop_slum*	Amenity Index	prop_slum*
Ahmadnagar UA	1.11	7.10	1.16	10.62
Aurangabad UA	1.24	16.92	1.19	18.81
Bhiwandi Nizampur UA	0.84	19.37	0.87	28.67
Bhusawal UA	0.96	11.67	0.90	9.24
Greater Mumbai UA	0.94	43.74	0.97	33.46
Ichalkaranji UA	0.79	7.03	0.87	5.48
Kolhapur UA	1.09	12.55	1.06	12.32
Malegaon UA	0.63	50.86	0.64	27.81
Nagpur UA	1.25	35.93	1.22	32.73
Nashik UA	1.24	12.89	1.22	12.77
Pune UA	1.02	17.35	1.01	16.89
Sangli Miraj Kupwad UA	0.99	6.19	1.00	5.39
Satara UA	1.09	5.40	1.17	3.80
Yavatmal UA	0.86	35.83	0.83	43.00

Source: Census of India, 2001and 2011

Note: * proportion of slum, # Urban Agglomeration

In the table 1, this is being quite clear that in general, where amenity index is low, proportion of slum population is high; that means there is inverse relationship between availability of amenity and proportion of slum population. When amenity index is compared with 2001, Census data to 2011 Census data, it comes to in light that amenity

[13]These urban agglomerations includes class I towns of the state

index is com-pared with 2001, Census data to 2011 Census data, it comes to in light that amenity of most of the ur-ban agglomeration is improving. While somewhere amenity index reduced also. Proportion of slum pop-ulation increases as amenity index reduced in most of the agglomeration during 2001-2011. In this study, few towns are being clubbed to form the agglomera-tion to have a better understanding of the relationship between availability of amenity and slum population town level analysis is being done. And these towns are classified into some hypothetical metros as in some towns major chunk of the population lives only in some cities. According to census of India, 2011, there are about 32% of urban population and 49% of slum population of class I towns of the state lives in Greater Mumbai only. This can be explained in the following section of the paper.

Basic amenities and proportion of Slum popula-tion across Reclassified class I towns of the state of Maharashtra

There is wide variation within the class I towns of the state, whether in terms of availability of amenities or proportion of slum residing in these towns. It has been discussed in the second chapter that the major portion of urban as well as slum population lives in metros having population more than 10 lakhs (about 32% of urban population and 49% of slum popula-tion).[14] In all the metro cities the amenity index is above 1 except Greater Mumbai which have amenity index lesser than unit, this indicates that there is lack of basic amenities provided by the Greater Mumbai but proportion of slum population is high in this metro as compare to others in this state (Appendix- 1). As the value of amenity index increases pro-portion of slum population decreases in other metro cities while in metros it does not follow the suit. This indicates that there is positive relationship in met-ros between amenity index and proportion of slum population. And there is inverse correlation between the two in transitional metro, regional metro, juvenile and incipient cities.

[14]Census of India, 2011

Correlation between proportion of slum population and amenity index is calculated as 0.02, 0.57, -0.99, -0.80, -0.66 and -0.46 for metro cities including Greater Mumbai, metro cities ex-cluding Greater Mumbai, transitional metro, regional metro, juvenile and incipient cities respectively.[15] (Appendix-2)

To have a better idea about the situation of these metro, the average of amenity index and proportion of slum population of every classification is being done. The table 2 throws light on the major issues related to availability of amenities and proportion of slum in the reclassified towns of Maharashtra.

Table 2: Amenity index and proportion of slum population in reclassified class I towns of Maharashtra

	2001		2011	
Classification of Towns	Amenity Index	prop_slum^	Amenity Index	prop_slum^
Metro cities (Above 10 lakhs*)	0.957	0.395	0.981	0.287
Metro cities (Above 10 lakhs#)	1.004	0.205	1.006	0.180
Transitional metros (8 to 10 lakhs)	0.999	0.188	1.073	0.185
Regional metros (5 to 8 lakhs)	1.022	0.221	0.994	0.257
Juvenile metros (3 to 5 lakhs)	1.022	0.211	1.003	0.214
Incipient metros (1 to 3 lakhs)	0.976	0.251	1.023	0.287

Source: Census of India, 2001 and 2011

Note:* includes Greater Mumbai, # excludes Greater Mumbai, ^ proportion of slum

In the above table, it can be seen that in metro cities, there is highest proportion of slum but amenity index is low. While within the metro city category, when Greater Mumbai is included amenity index is lower and proportion slum is higher and when Greater Mumbai is excluded amenity index goes up and proportion of slum goes down, and the largest concentration of slum population in Greater Mumbai itself. Here, it could be said Mumbai attract more people but could not provide the basic amenities to absorb growing population in the metropolis.

[15]Census of India, 2011

In 2001 amenity index was lower than 2011 in-dex, while proportion of slum reduces from about 40% to 29% during 2001-2011. This is evident that as amenity index increases proportion of slum de-creases from 2001 to 2011. In 2011 census, the trend is not followed by incipient cities as amenity index is highest in incipient cities which are just entered into the class I category but it also have high proportion of slum.

Relationship between availability of amenities and proportion slum population living in class I towns of the state tried to be traced with the help of correlation matrix, scatter plot diagram and regression analysis between various assets and proportion of slum pop-ulation. Here we start with the correlation matrix.

Correlation matrix: Correlation refers to any of a broad class of statistical relationships involving dependence; Correlations are useful because they can indicate a predictive relationship (whether it is positive or negative relation). Correlation matrix is a matrix giving the correlations between all pairs of data sets. Relationship between various selected basic amenities available to the households which have been taken for the analysis (to calculate amenity index) as well as proportion of slum population liv-ing in the class I towns of the state of Maharashtra, is being depicted in the table no.3.

Table 3: Correlation matrix of amenities and proportion of slum population living class I towns of Maharashtra

Amenity	*P_G*	*P_T.W*	*P_E*	*P_L.f*	*P_B.f*	*P_C.d*	*P_B*	*P_S*
P_G	1							
P_T.W	0.710	1						
P_E	0.748	0.757	1					
P_L.f	0.576	0.234	0.325	1				
P_B.f	0.801	0.753	0.800	0.510	1			
P_C.d	0.553	0.563	0.683	0.217	0.609	1		
P_B	0.876	0.602	0.673	0.562	0.701	0.657	1	
P_S	-0.504	-0.464	-0.480	-0.309	-0.514	-0.319	-0.420	1

Source; Census of India, 2011

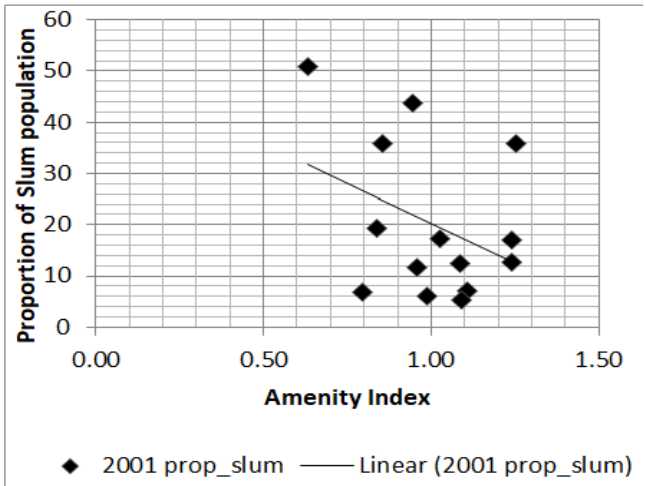
Note; P_G = Percentage of houses in good condition, P_T.W = Percentage of households using Tap water from treated source, P_E = Percentage of households having Electricity, P_L.f = Percentage of households having latrine facility within the premises, P_B.f = Percentage of households having bathing facility within the premises, P_C.d = Percentage of households having Closed drainage, P_B = Percentage of households availing banking services, P_S = Percentage of slum population

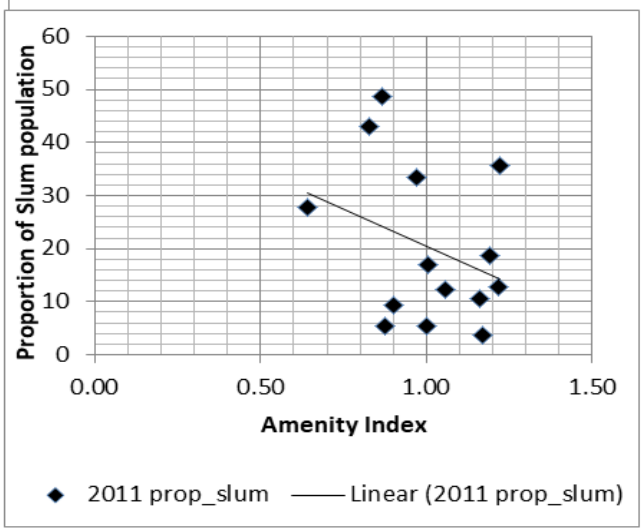
The correlation between various amenity and slum population has been explained it table 3. All the se-lected amenities show the positive relationship with each other as the availability of amenities is interre-lated. If people living in good housing condition then it will have electricity connection with latrine and bathroom facility within the premises. Where latrine and bathroom facility is within the premise, there would be more possibility that waste water outlet would be connected to closed drainage. As it can be seen in the table 3 closed drainage is positively correlated with the entire (selected) amenity but more with the bathroom facility within the premises. When banking facility is taken for the consideration, it is highly (positive) correlated with good housing condition. From the analysis it is being clear that availability of basic amenity is positively correlated as well as inter related with each other.

Proportion of slum population living in the class I towns of Maharashtra are negatively correlated with the availability of basic amenity availing the households. That means if amenity availability in-creases proportion of slum decreases. Therefore we can say to eradicate the problem of slum government have to provide the amenities or infrastructure to the households of the urban community. Slum is all about the condition of housing and environment where they are living. If conditions improve, slum automatically reduces.

Scatter diagram: A scatter diagram is a tool for analyzing relationships between two variables. One variable is plotted on the horizontal axis and the other is plotted on the vertical axis. The pattern of their intersecting points can graphically show relationship patterns. When line slope upward, then there is direct relationship or positive relationship

Scatter diagram: A scatter diagram is a tool for analyzing relationships between two variables. One variable is plotted on the horizontal axis and the other is plotted on the vertical axis. The pattern of their intersecting points can graphically show relationship patterns. When line slope upward, then there is direct relationship or positive relationship between two variables (when one variable increases on the 'x' axis, the other variable at the 'y' axis also increases) and vice versa. Generally on vertical axis (y-axis) variables taken are known as response variable which shows the relationship of the variable taken on the horizontal axis (x-axis). In other words it can be explained that a unit change in the variable of the 'x'-axis of the graph have the impact on the change in the variable plotted on the 'y'-axis. The figure 1 shows the relationship between asset index and proportion of slum population.





Source: Census of India, 2001 and 2011

In this graph, on 'x' axis, amenity index (dependent variable) is taken and on 'y' axis (response variable), proportion of slum population of the class I towns of the state of Maharashtra which shows that there is inverse relationship between proportion of slum and amenity index as the points of the plots which indi-cate the proportion of slum population are downward sloping. In both the Census year (2001 and 2011) some points are scattered while most of the points plotted on the graph more or less aligned along the line of fit and negatively sloped.

With both the methods discussed above describe the relationship between slum population and asset that there is inverse relationship between the two but how much increase or decrease in one variable could affect the other can be traced with the help of regression analysis as explained in the following section.

Regression analysis: Regression analysis is a statisti-cal tool for the investigation of relationships between variables. It is used when two or more variables are thought to be systematically connected by a linear relationship. Regressions are of various type; simple linear regression, multiple linear regression, logistic regression, etc. For this analysis simple linear regres-sion method is being used.

Simple linear regression is the most commonly used technique for determining how one variable; de-pendent variable (slum population) is affected by changes in another variable, independent variable (asset index). We suppose that they are related by an expression of the form; $\boldsymbol{y = b0 + b1x}$[16], is the equation of a straight line; b0 is the *intercept* (or *constant*) and b1 is the *x coefficient*, which represents the slope of the straight line the equation describes. The table 3.4 tells the relationship between proportion of slum population and asset index.

[16]y=proportion of slum population of Maharashtra, x=amenity index of Maharashtra

Table 4: Regression coefficients of the state of Maharashtra

	Coefficients	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.6742	5.1698	0.0000	0.4108	0.9376
Index	-0.4970	-3.3862	0.0015	-0.7934	-0.2006
R Square	0.22				
Adjusted R Square	0.20				

Source: Census of India, 2011

The Simple Linear Regression model explains for negative relationship among the dependent variable that is Slum Population and an independent variable Amenity Index. The p-values used for testing of null hypothesis against covariate explains for the possible rejection of the null hypothesis, accounted by the low p-value (< 0.01), that is 0.0000 for intercept term and 0.0015 for Amenity index. The negative coefficient of asset index very clearly indicates that there stands negative relationship between the two variables and if a unit change occurs in the amenity index the corresponding slum population will show a decline by 0.50 units. The value of R square indicates that around 22% of the variations in the dependent variable around the mean are explained by Amenity index, or one may explain it as 22% of the values fit the model. The model explains the causation between the slum population and amenity index. It could be explained that to address the issue of slum, to reduce to proportion of slum population and to improve the living condition of slum, the way is to provide better amenities to the urban households.

2 | CONCLUSION

From above analysis it can be concluded that pri-macy is seen in the distribution of urban population, especially slum population in large metros (have population above 1 million). A large chunk of slum population of Maharashtra lives in Greater Mumbai (49%).

It comes in light that there is tendency of people to live in large cities as there is general per-ception that big cities provide better infrastructure. But data shows that amenities in Greater Mumbai are lesser than other towns of the state. While in a whole, in Maharashtra, most of the cities/metros or urban agglomerations have inverse relationship between Amenity Index and proportion of slum population.

This relation between Amenities and slum popula-tion has policy implications as to reduce the slum population, provide basic amenities to the house-holds which will improve their standard of living and ultimately lead to reduction in growth of slum and check the future slum formation.

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