Growing slums in Indian towns: Insights from Census data 2001-11

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Abstract: Urbanization is considered as a new source of prosperity for cities and towns, but it has also resulted in its fair share of 'by-products.' 'One of the most persistent is pockets of poverty, overcrowded residential areas, substandard housing, and inadequate basic services, which come in all shapes and sizes and have different names but all mean the same thing and are commonly referred to as "slums." The present paper tries to examine the trend and pattern of slum growth in towns, its correlation with urbanisation, and speculates on whether slum growth is inevitable with India's rapid urbanisation. Using data from the population Census of India 2001 and 2011, it discusses the spatial pattern of slums and the growth of slum populations in different size classes of towns and administrative categories. The study finding shows that over the decade 2001-11 slum population reduced by 0.8%. However, relationship between urbanisation and slum growth is still positive, strong and linear over the decade. Similarly, correlation coefficient (r) value is positive for both census period (Census 2001- r = 0.69, P-value = 0.001; and Census 2011- r = 0.71, P-value = 0.001). Additionally, it found that proportion of slum dwellers in urban areas is declining, although their number is increasing significantly. Over the decade 2001-11 number of town reporting about slums has increased 1725 to 2613 respectively. Among the states Tamil Nadu has added the highest number (266) of new slum town over the decade followed by Madhya Pradesh (161) and Chhattisgarh (60). The analysis shows that small and medium towns reported a higher proportion of slum population in both Census periods (2001-11) than larger towns/cities. Except for Municipalities and Notified Areas, all other administrative units have seen a significant increase in slum population growth over the decade particularly Cantonment board area. The findings of this study concludes that coordination requires within various authorities in charge of economic development and urban planning. To strengthen the affordable housing may be an important implication for India's efforts to eradicate slums.

Keywords: Administrative Unit, City, Informal Settlement, Population, Slum.

Introduction

The gradual and increasing concentration of population in the urban unit is referred to urbanisation (Davis, 1965). However, the rapid pace of urbanisation, combined with deteriorating infrastructure and inadequate facilities to accommodate the growing urban population, is leading to the formation of slums in many developing-world cities (UN-DESA, 2014). Today, the urban age is unfolding, with more than half (54.5 percent) of the world population lived in urban settlements. By 2030, it is projected that urban areas will house of 60 percent of the people globally, and we can say that every third person will live in cities having a population of at least half a million inhabitants. The world's cities are expanding in terms of both size and number. In 2016, there were approximately 512 cities in the world with a population of at least one million

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people. This figure is expected to rise by 662 cities by 2030 (UN-DESA, 2014). Despite this, India has one of the world's lowest rates of urbanisation. This country is in the grip of a severe urbanisation crisis. While cities are regarded as the engines of economic growth, the growing presence of slums paints a bleak picture of such growth in areas where socioeconomic inequality is so pervasive (UN-HABITAT et al., 2015).

The term *'slum'* was originated to define and characterise a settlement with distinct features like dilapidated, overcrowded, squalid slums inner-city dwellings during the Industrial Revolution in Europe in North America (Bhagat, 2004; Frankenhoff, 1967; Ward, 1976). The paradox of slums is that it persist despite the wealth and high level of economic development in urban areas (Stokes, 1962). Hence, no country in world history has ever been able to prevent the formation of slums through development. (UN-HABITAT et al., 2015). Hence, absolute number of slum dwellers is constantly increasing due to the fast tempo of urbanisation, currently one in eight people or around a billion (881 million) of people living in slum conditions around the globe previously, it was 760 million people in the year 2000, and 650 million people in the year 1990 (UN-HABITAT, 2015; UN-HABITAT and UNESCAP, 2015). In the context of India, the census 2011 reports that approximately 65 million (27 percent of the urban population) people live in 13.7 million slum houses, accounting for 17.4 percent of urban households. Additionally, it is important to note that over one-third of India's slum population lives across 46 million-plus cities (Formation and Identification of Slum Enumeration Blocks for Slum Demography, 2010).

The emergence and growth of slums can be thoroughly examined by addressing related questions such as why, how, and where slum development occurs (Roy et al., 2014). The primary cause of slum development is the imprudent scale of urban population growth, as well as the unsystematic expansion of urban areas and the depressing lack of infrastructure. Slums are typically located in and around (i.e., peri-urban) waste or unused land urban centres. It is also found near cemeteries and dumping grounds in some cases(Garr, 1996). This slum development phenomenon indicates that the locus of poverty is shifting from rural to urban areas, and this phenomenon is now referred to as the *'urbanisation of poverty'* (UN-HABITAT, 2007). Concerning the vulnerability of slums, governments/administrations all over the world are constantly developing new policies, upgrading older localities for slum reduction, and preventing the formation of new slums. However, the growth of slums is frequently portrayed as a governmental institutional failure of housing policy (Sietchiping, 2005). Slum reduction policies can be divided into two categories: slum redevelopment and slum upgradation. The slum redevelopment policy is linked to the processes of in-situ and ex-situ development. Previous research indicates that planners initially adopted an ex-situ redevelopment policy, but due to intense criticism of this policy, they later adopted an in-situ redevelopment policy. The in-situ policy is appreciated because it preserves their socially integrated fabric with the surrounding neighbourhood (Cronin, 2013; Saharan et al., 2018). Whereas, slum upgradation entails a number of interventions aimed at providing basic services to slum dwellers in order to help them cope with their difficult circumstances (Banes et al., 2000; Pugh, 2000; Turley et al., 2013). However, it is believed that in general, these policies have been found to be inefficient in providing holistic development and demonstrating either an incremental or experimental scenario (Kundu, 2013; Patel et al., 2012). Although, some developing countries (such as Rwanda, Guatemala, Peru, Uganda, Senegal, China, Ghana, Mexico, Turkey, Vietnam, and India) have showed substantial

reduction in the incidence of slums by 20 percent to 30 percent by significantly improving their prevailing living conditions (UN-HABITAT, 2012).

In India, with the announcement of the Sustainable Development Goals (SDGs) in 2015, the government stepped up its efforts and introduced programmes such as the Smart Cities Mission (SCM), the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), the Atal Mission for Rejuvenation and Urban Transformation (AMRUT), and the Pradhan Mantri Awas Yojana (PMAY), all of which are aligned with SDG 11 (UNDP, 2015) to address the challenge of improvement of urban spaces particularly up-gradation of slum. However, the growing slum population presents a challenge to policymakers since it is tough to design and implement a '*one size fits all*' solution to the problem. Additionally, with the emergence of new cities distracted migration stream from large cities to small cities increases the concentration of slums not only with the level of urbanisation but also with size class of the cities in India (Kumar, 2016; Laquian, 2005). Currently, in order to make cities more glamorous and appealing to foreign capital, slum residents are being forced to relocate to the city's outskirts from the core, resulting in a decrease in the proportion of slum population in the cores of large urban agglomerations(Kundu, 2013). Understanding the process of slum concentration and the spatial dispersion of slum population in cities has always been critical for demographers and geographers. Previous studies on the slum population attempted to track this process but failed to provide comprehensive picture due to insufficient data. The most recent study on slum dynamics only able to deals with the first phase of slum population data (covering 640 towns) from the Registrar General of India's Census 2001 (refer to material and method section for detail) (Rahaman & Nath Das, 2017). In this context, for the first time, this study computes slum population growth at the town level using consolidated first and second phase data from census 2001 and census 2011, covering 640+1085 = 1725 towns in 2001 and 2613 towns in 2011. This study also considers the common towns (1504) in both censuses. As a result, this paper will undoubtedly help policymakers better understand the current dynamics of slums. In addition, it will provide a stable base for understanding slums in towns in the upcoming Census 2021.

Objective

The present study has been carried out to estimate the urban and slum population growth in different size class towns in India based on their types and administrative units. It also sheds light on the growth of the non-slum areas.

Material & Methods

Data & Definition used

The present study used two rounds of Census of India data on slums for the period 2001 and 2011. For the first time in Census 2001, slum areas were earmarked across the country. The Census of India defined slums as: "A *residential area where housing is unfit for human habitation by reasons of dilapidation, overcrowding, faulty arrangements and design of such buildings, narrowness or faulty arrangement of the street, lack of ventilation, light, or sanitation facilities or any combination of these factors which are detrimental to the safety and health" (Census of India, 2001-2011).* The Census has defined slums in three types such as: 1) *Notified Slums:* All specified areas in a town or city notified as "slum" by the state, UT Administration or Local Government under any Act including a "Slum Act" 2. *Recognized Slums:* All areas recognized as "slum" by

State, UT Administration or Local Government, Housing and Slum Boards, which may have not been formally notified as slum under any act 3. *Identified slums:* A compact area of at least 300 population or 60-70 households of poorly built congested tenements, in an unhygienic environment usually with inadequate infrastructure and lacking proper sanitary and drinking water facilities These areas should be canvassed personally by the Charge Officer and also appraised by an officer assigned by Census authority (Formation and Identification of Slum Enumeration Blocks for Slum Demography, 2010).

In Census 2001, a total of 640 towns with a population of 50,000 or above were found to report slums using slum reporting norms of the 1991 Census (Phase-1). However, after careful consideration, it was decided to exclude slum data from towns with a population of less than 50,000 but more than 20,000 in 2001. It was anticipated that these medium and small population towns might have a sizable slum population, and that estimating the slum population within them would be critical for planning their development. As a result, 1321 towns were covered in the second phase, with 1103 reporting slums (958 towns with 20,000 to 50,000 population and 145 towns with more than 50,000 population).

In the first and second phases of slum enumeration, 1743 (640+1103) towns reported slums. However, of all the towns covered in the second phase, the Census eventually released data for only 1085 of them. In total, 1725 towns (640+1085) reported slums in Census 2001. The RGI's slum data covered only towns with a population of more than 20,000 out of a total of 3799 statutory towns, and it only covered notified slums. The problem of underestimation occurs mainly due to the non-coverage of the non-notified slums. *However, in census 2011, slums have been earmarked in all statutory towns irrespective of their population size based on the same definition as in 2001.* Out of the 4041 statutory towns, 2613 reported slums. *While Census 2011 showed an increase in the number of towns with slums, it is not comparable to Census 2001 because it only covered statutory towns with a population of more than 20,000* (Formation and Identification of Slum Enumeration Blocks for Slum Demography, 2010).

Definitional issues related to slums in India

The global conception and definition of slum varies from country to country (UN-DESA, 2014), depending on urban settings (Dorélien et al., 2013). Similarly, in India slum definition are not uniform and varies by state and even by city (Agarwal & Taneja, 2005; Chandrasekhar & Montgomery, 2010; Goli et al., 2011; MoHUPA, 2011; O'Hare & Barke, 2002). While, definitions and classification criteria for what constitutes a slum vary (Richter et al., 2011), the reality for residents is often insufficient shelter, insufficient access to essential services such as inadequate water and sanitation, insufficient access to health care, and in general, a low quality of life. In India, The Registrar General of India (RGI) and the National Sample Survey Office (NSSO) are the nodal agencies for collecting, collating, and disseminating slum population statistics. Other sources include the Town and Country Planning Organization (TCPO), as well as state government and urban local bodies that conduct slum surveys on a regular basis. It is documented that the name of the slum varies by region in different parts of the country. Slums in Delhi are commonly referred to as 'Jhuggi-Jhopdi,' whereas they are referred to as 'Jhopadpatti' in Mumbai, 'Bustees' in Kolkata, and 'Cheris' in Chennai. However, the physical characteristics of all such slum areas are similar. While examining the various sources of information on slums, it is clear that, while they all define a slum in exactly the same manner, their definitions of subjective concepts such as narrowness,

dilapidation, overcrowding, lack of ventilation, or lack of sanitation vary. As a result of these differences, the slum population varies greatly.

The UN-Habitat defines a slum as *"a contiguous settlement where the inhabitants are characterised as having inadequate housing and lacking basic services such as access to safe water, improved sanitation, sufficient living area, durable housing, and secure tenure."* The absence of any of these components is referred to as shelter deprivation. However, it is worth noting that if we apply the UN-Habitat definition of a slum to India, the country's slum population will rise dramatically. According to some estimates, India's slum population in 2011 was around 158 million of the urban population, which is 50% more than what the Census and NSSO estimates revealed. The reason for this is that UN-includes Habitat's five shelter deprivation criteria that apply to both rural and urban areas, whereas slums are considered a phenomenon of urban areas only. There are many villages where people are deprived of basic amenities of life, but we do not consider those rural settlements to be slums. While we comparing two primary government sources of slum population, the RGI and the NSSO, we find two completely different estimates. According to Census 2011, there were approximately 6.5 crore slum dwellers, whereas the NSSO released a report indicating only 4.4 crore slum dwellers in 2012. The difference is enormous, at 2.1 crore people, and could be attributed to the well-known fact that the Census conducts a comprehensive enumeration of the slum population while the NSSO limits itself to only a few samples. (Chatterjee, Singh, Naidu, 2015).

Methodology

Concerning the benefit of knowing the slum population at the town level, an attempt was made to capture the difference in slum growth patterns between 2001 and 2011 period. The Growth rate of slum is calculated by subtracting the current value from the previous value. The growth rate is then expressed as a percentage by dividing the change by the previous value and multiplying by 100.

$$\frac{Current\ year\ slum\ Population\ (2011) - Previous\ year\ Slum\ Population\ (2001)}{Previous\ year\ slum\ Population\ (2001)} * 100$$

However, determining growth rates for both periods is difficult due to the emergence of multiple new towns with slums between these two points in time. The adjustment of new towns has solved this problem. For calculating growth rate, there are two methods: i) Instantaneous approach and ii) Continuous approach (refer to Bhagat, 2004).

The instantaneous approach evaluates just population changes within the size class category between two points in time, during which time multiple new towns with slums emerge. This is not taken into account in the instantaneous approach. As a result, the instantaneous approach's estimates for urban growth by size class of towns are often misleading. The continuous approach, on the other hand, calculates the growth rate using just the population changes of towns and cities that are shared between two points in time. As a result, it is an adjusted rate for new slum settlements during the study period. Between two censuses, the size class classification of some municipalities is likely to change. In this study, the size class in the later census is used to calculate urban growth rates. This controls the size-class shifts of towns during the two censuses, which affects their growth rates. As a result, the present study used a continuous technique to

calculate the growing rate of slums in towns. The concentration of common slum towns by different class size cities is also shown in this paper for the period 2001 to 2011.

Specific methods used

To begin with, we used bivariate analysis to show the percentage growth of urban and slum populations. In addition, to better understand the relationship between the urban and slum populations in India over a decade, using STAT 14.2 software scatter graph of common slum towns fitted with a linear regression line and the R^2 value was plotted. In this regard, the correlation coefficient (r) was also calculated. The coefficient of correlation measures how much a factor's relationship with another factor explains its variability. Furthermore, a choropleth map at the state level in India is created using the ARC-GIS 10.7 software to better illustrate the changes in slum population over a decade (2001-11).

Results
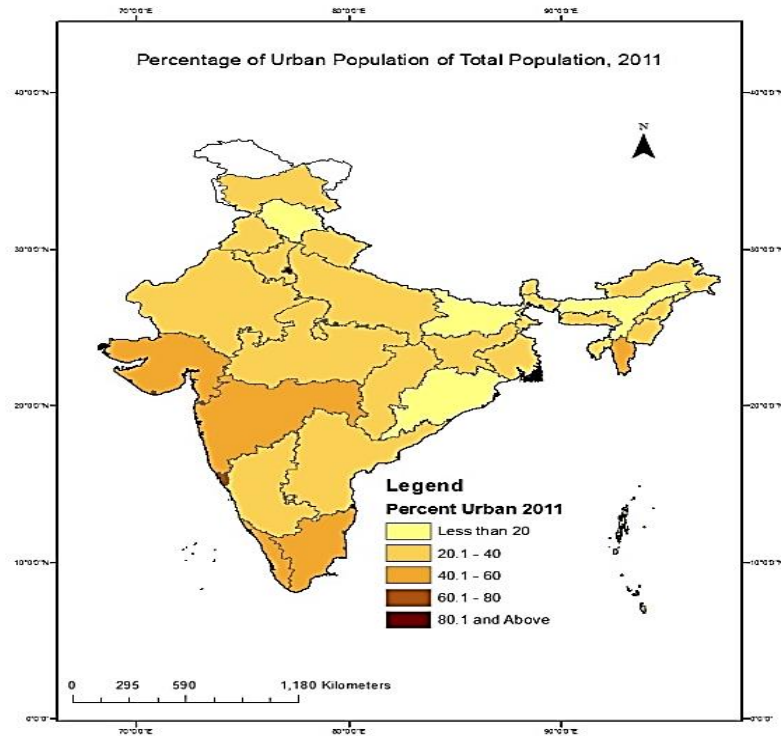
The pattern of urban growth

According to the Census of India 2011, the rural population is growing slower than the urban population. Interestingly, urban growth is being experienced not only by large major cities, but also by medium and small-sized towns. The pattern of urbanisation at the state level is very dissimilar (refer to figures 1 and 2). From 2001 to 2011, the percentage of urban areas increased substantially in some places, while it increased slowly in others. As a result, while 18 states/union territories have higher urbanisation levels than the rest of India (31.16), the remaining 17 states/union territories have lower levels. It should be noted that the pattern of urbanisation follows the economic growth of the states and is influenced by the presence of one or more large and rapidly growing cities.

Figure 1: Percent urban population to total state population, 2001
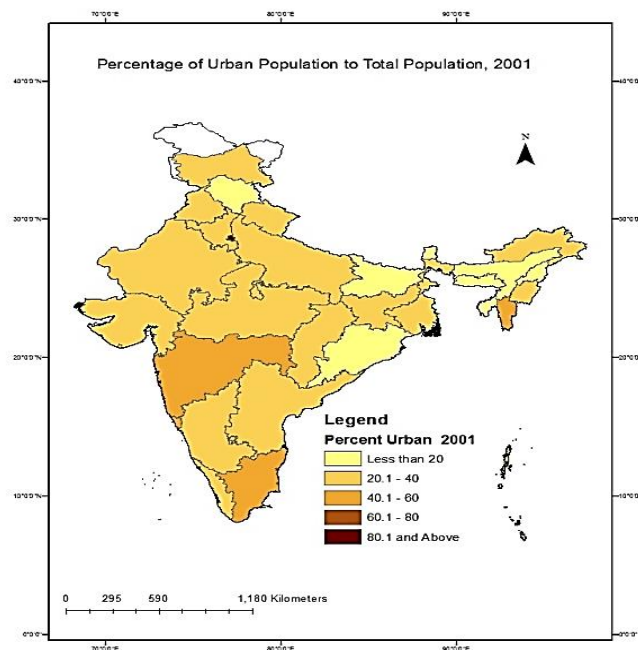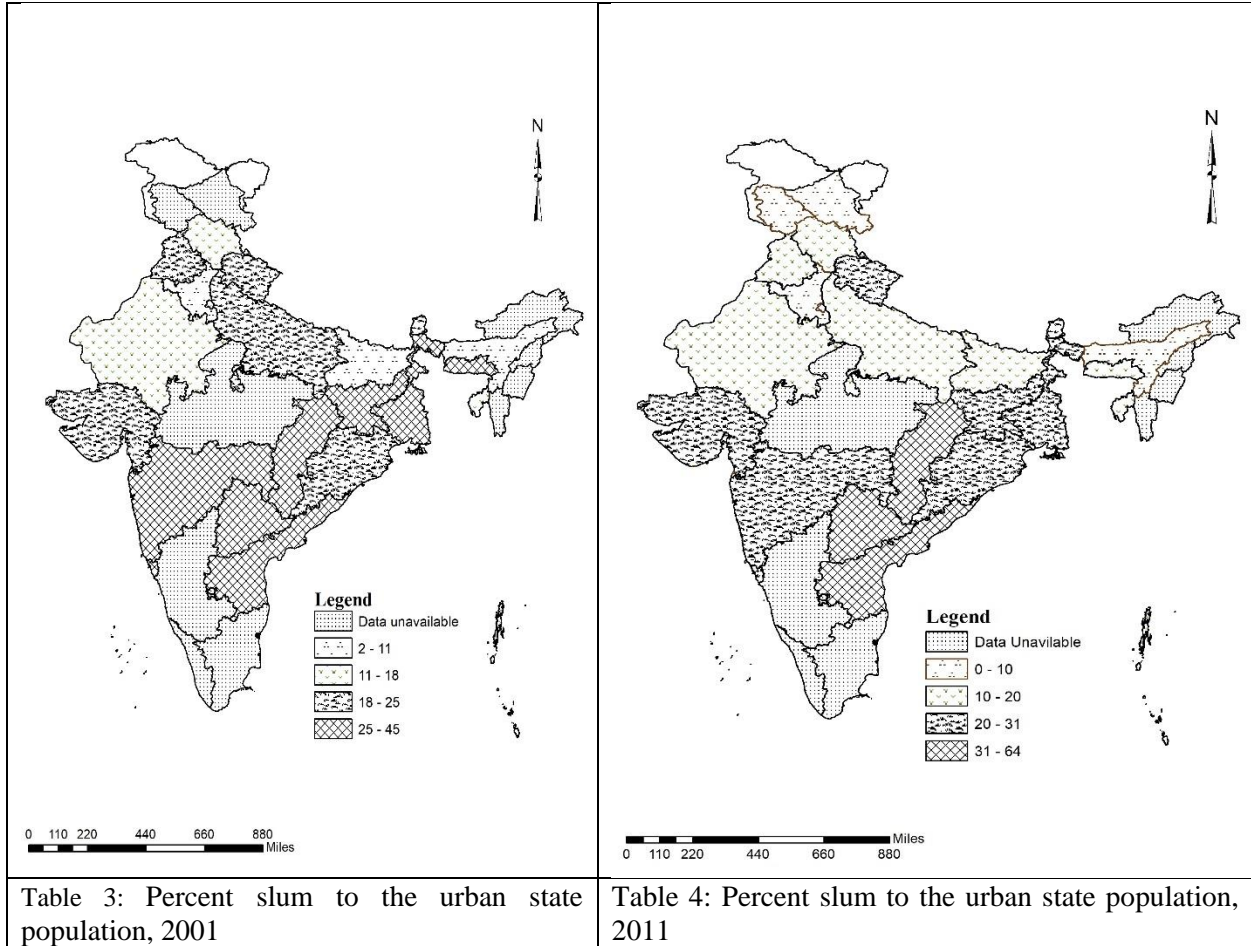

Source: Prepared by Author

Figure 2: Percent urban population to total state population, 2011

Slum situation in India

In India, according to Census 2001, 52 million people lived in slums in 26 states, and by Census 2011, the figure had risen to 65 million, spread across 29 states and two union territories. According to the census, Maharashtra has the highest slum population among the states, with approximately 11.8 million people, followed by Andhra Pradesh, West Bengal, Uttar Pradesh, Tamil Nadu, and Madhya Pradesh (refer to figure 3 and 4). It should also be noted that in India, the majority of villages have similar inadequate basic facilities. Hence, there is a low quality of deprived civic life in both cities and villages.

| Table 3: Percent slum to the urban state population, 2001 | Table 4: Percent slum to the urban state population, 2011 |

Relationship between urbanisation and slums

The argument "*parallel progression of the slum should not be existent with the expansion of urbanisation*" to test this preposition scatter graph fitted with trend line has plotted to observe the relationship between urban and slum population for both census period 2001 and 2011. The scatter plot of both the rounds of census data showing strong, positive, and linear relationship over a decade refer figure 5 and 6. The R^2 value of both the scatter plot Figure 5 (R2 = 47.2 percent, P-value = 0.001) and Figure 6 (R2 = 50.4 percent, P-value = 0.001) significantly explaining the strength of relationship. The correlation coefficient (r) values for 2001 (r = 0.69, P-value = 0.001) and 2011 (r = 0.71, P-value = 0.001) also showing positive relationship between urban and slum populations.
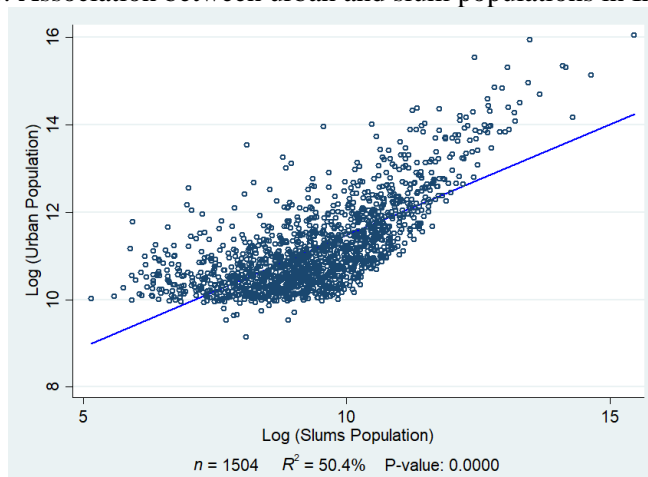
Figure 5: Association between urban and slum populations in India, 2001

$n = 1504$ $R^2 = 47.2\%$ P- Value: 0.0000
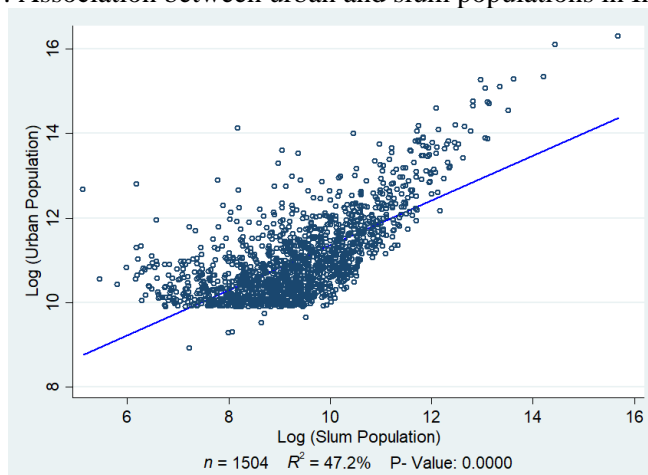
Source: Census of India, 2001

Figure 6: Association between urban and slum populations in India, 2011

$n = 1504$ $R^2 = 50.4\%$ P-value: 0.0000

Source: Census of India, 2011

Differential pattern of slum growth in India

The number of towns reporting slums substantially increased between the 2001 and 2011 Censuses. This increase could be attributed to a change in the definition of a slum in 2011, when the RGI collected data from all statutory and Census towns, regardless of population size. In the 2001 and 2011 censuses, approximately 1725 and 2613 towns reported slums, respectively (refer to Table1). In both Census periods, the 1504 towns were discovered to be common. Within a decade, major states such as Jammu and Kashmir, Uttaranchal, Bihar, Tripura, Assam, Chhattisgarh, Andhra Pradesh, and Kerala have seen a dramatic increase (more than 35 percent) in embodied slum population growth. On the other hand, the absolute increase in the concentration of slum towns from 2001 to 2011 revealed that slums increased dramatically across the major states during this time period. Tamil Nadu has added the newest slum towns within the decade, with 266 towns, followed by Madhya Pradesh with 161 towns, Chhattisgarh with 60 new slum towns, and Uttar Pradesh and Karnataka with 50 new slum towns each. Most notably, in both census periods, states/union territories with large slum populations are common. The slum population has decreased in only a few states/union territories. Five and two towns in Bihar and

Kerala, respectively, show a decrease in the slum population. Kerala, on the other hand, has experienced a threefold increase in the growth rate of its slum population. This unusual increase is due to a rapid increase in the state's urban population[4] within a decade 2001-11.

Table 1: Number of towns reporting slums in each state with the number of common towns of India, 2001 and 2011

Sl. No	States/Union Territories	Number of towns reporting slums in 2001	Number of towns reporting slums in 2011	Number of common towns in 2001-11	Slum population of common towns		Relative change % (2001-11)
					2001	2011	
1	Manipur	NSR	NSR	NSR	NSR	NSR	NSR
2	Daman & Diu†	NSR	NSR	NSR	NSR	NSR	NSR
3	Dadra &Nagar Haveli †	NSR	NSR	NSR	NSR	NSR	NSR
4	Lakshadweep†	NSR	NSR	NSR	NSR	NSR	NSR
5	Meghalaya	4	6	4	109271	45274	-58.57
6	Gujarat	79	103	67	1933136	1570166	-13.09
7	NCT of Delhi†	16	22	13	2018793	1763982	-12.97
8	Andaman &Nicobar Islands †	1	1	1	16244	14172	-12.76
9	Chandigarh†	1	1	1	107125	95135	-11.19
10	Punjab	59	73	50	1412309	1357684	-3.87
11	Haryana	49	75	49	1681117	1549365	-1.12
12	Maharashtra	176	189	161	11882965	11752652	-1.10
13	Jharkhand	23	31	17	292388	290465	-0.66
14	Himachal Pradesh	NSR	22	-	-	61312	0
15	Sikkim	NSR	7	-	-	31378	0
16	Arunachal Pradesh	NSR	5	-	-	15562	0
17	Nagaland	NSR	11	-	-	82324	0
18	Mizoram	NSR	1	-	-	78561	0
19	Uttar Pradesh	238	293	164	4966635	5647738	13.71
20	West Bengal	89	122	85	4580244	5239976	14.40
21	Tamil Nadu	241	507	224	4122951	5053083	22.56
22	Rajasthan	93	107	73	1481323	1924754	29.93
23	Madhya Pradesh	142	303	133	3697997	4867291	31.62
24	Puducherry†	3	6	3	73169	97123	32.74
25	Karnataka	154	206	147	2284928	3055020	33.70
26	Odisha	57	76	55	1074230	1438504	33.91
27	Jammu & Kashmir	12	40	11	360360	492177	36.58
28	Bihar	93	88	74	728407	1045875	43.58
29	Assam	12	31	11	87956	130530	48.40
30	Chhattisgarh	34	94	34	1097211	1639165	49.39
31	Tripura	1	15	1	29949	47002	56.94
32	Andhra Pradesh	118	125	105	5436145	8807365	62.01
33	Uttaranchal	6	31	6	195470	340909	74.40
34	Goa	3	3	2	14482	25266	74.46
35	Kerala	21	19	13	46966	189557	303. 60
	India	**1725**	**2613**	**1504**	**49731771**	**58749367**	**18.13**

Source: Census of India, 2001-11
Note: Common towns excludes declassified and new towns; NSR: Denotes 'No slums reported'; †: Union Territory; States and Union Territories are arranged in ascending order on the basis of percent change in growth rate of slums during 2001-11.

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[4] Kerala's urban population was 8266925 and 15934926 respectively in Censuses 2001 and 2011.

It is important to note that over one-third of India's slum population lives without any basic facilities provided by the states because the slums are not recognised. State governments in Rajasthan, Gujarat, and Bihar continue to ignore a slum population of several lakhs. Several states, including Jammu and Kashmir, Haryana, Delhi, Rajasthan, Assam, Jharkhand, and Gujarat, have identified more slum dwellers using the Census of India's new method for identifying slums than notified or recognised categories of slums. As a result, India has a larger number of identified slums than recognised or notified slums (refer to Table 1.1 in the appendix).

Comparison between the actual and adjusted growth rate of the urban and slum populations during 2001-11

Despite rural-to-urban migration, the percentage of slum dwellers appears to have decreased significantly over the last decade. Thus, while Census 2001 found 18.24 percent of the urban population living in slums, Census 2011 found only 17.4 percent (refer to Table 2 for actual estimates). This could be due to two important factors: Firstly, recent infrastructure development may have forced slum dwellers to vacate the space they occupied. Second, slum rehabilitation programmes in various cities may have enabled many slum dwellers to relocate to non-slum areas. In absolute terms, however, the slum population appears to have increased by around one million during this time. However, when interpreting the slum population growth rate, one must take caution because the actual estimates of the slum population during 2001-11 do not include the adjustment of newly formed slum towns.

During the decade 2001-11, growth rates in cities and slums were compared (refer to Table 2). The actual and adjusted figures have been calculated. According to the findings, the actual slum growth rate over the decade was 25.5 percent, while the adjusted rate was 17.5 percent. It's worth noting that the adjusted estimate implies that slum growth is roughly equivalent to urban growth. It clearly shows that there is a positive relationship between the increase in slums and the increase in urbanisation. When people migrate to major cities for work, they frequently look for low-cost housing in order to avoid the burden of high urban living costs. Usually, low-income families who cannot afford transportation or who lack any form of affordable public transportation end up in squat/slum settlements within walking distance of or close enough to their formal or informal workplace. It's also worth noting that non-slum areas are growing at a rate similar to urban areas.

Table 2: Comparison between actual and adjusted urban and slum growth rates, 2001 and 2011

Census year	Actual estimates					Adjusted estimates				
	Urban Population	Slum population	% slum population to Urban population	Urban growth rate	Slum growth rate	Urban Population	Slum population	% slum population to Urban population	Urban growth rate	Slum growth rate
2001	286119689	52180399	18.24	31.80	25.51	209328413	49669638	23.73	17.40	17.52
2011	377106125	65494604	17.37			245748289	58370506	23.75		

Note: Adjusted estimates are based on values of common urban towns reporting slums

% slum population to urban population=$\frac{Slum\ population}{Urban\ population}*100$

Urban growth rate=$\frac{Urban\ Population\ 2011-Urban\ population\ 2001}{Urban\ population\ 2001}*100$

Slum Growth rate=$\frac{Slum\ population\ 2011-Slum\ population\ 2001}{Slum\ population\ 2001}*100$

Source: Census of India 2001-11

The size-class analysis of slums reveals that the concentration of slums is not only limited to large cities, but that a higher percentage of slums are located in small and medium towns as well in both Census periods (refer to Tables 3 and 4). This indicates that slums are spreading not only in major cities but also in smaller towns. Over the period 2001-11, slums mushroomed everywhere.

Table 3: Percentage of slums by city size/ class of towns, 2001

City size/ class	Urban population	Slum Population	Number of towns	Percent of slum population to urban population
Above 1 million	74349692	17926553	28	24.11
100000 to 999999	86246004	18525086	329	21.48
50000 to 99999	24263735	6456777	351	26.61
20000 to 49999	24393226	6728156	790	27.58
<20000	75756	33066	6	43.65
Total	**209328413**	**49669638**	**1504**	23.73

Note: Based on only common towns of Census 2001
Source: Census of India, 2001

Table 4: Percentage of slums by city size/ class of towns, 2011

City size/ class	Urban population	Slum Population	Number of towns	Percent of slum population to urban population
Above 1 million	101786451	24423740	46	24.00
100000 to 999999	93229221	20843983	371	22.36
50000 to 99999	27736642	7381878	398	26.61
20000 to 49999	22857498	5682886	680	24.86
<20000	138477	38019	9	27.46
Total	**245748289**	**58370506**	**1504**	**23.75**

Note: Based on only common towns of Census 2011
Source: Census of India, 2011

Table 5: Distribution of urban and slum populations by administrative status of the towns, 2001 and 2011

Administrative Status city	2001			2011		
	Urban population	Slum population	Percent slum	Urban population	Slum population	Percent slum
Municipal Corporation	112423	25305	22.51	124077	29780	24.00
Municipality	88724	22685	25.57	52744	15115	28.66
Notified Area	3016	616	20.41	2619	375	14.33
Cantonment Board	455	56	12.22	445	106	23.90
Census Towns	1211	148	12.19	1332	205	15.37
Others	3499	861	24.6	61446	12789	20.81
Total	**209328**	**49670**	**23.73**	**242663**	**58371**	**24.05**

Note: Population in thousands; *Others category* includes: Notified Area Committee (NAC), Municipal Council (MCI), Municipal Committee (MC), Municipal Board (MB), Town Panchayat (TP), Nagar Panchayat (NP), Town Municipal Council (TMC), City

The distribution of urban and slum populations across administrative status has also been made in order to determine the magnitude of the slum population in the specific administrative units. Table 5 shows that slum population is highly concentrated in Municipalities, Municipal Corporations, and Cantonment Boards over the decade, with an increasing trend. Within the last

decade, cantonment boards and municipalities have seen a significant increase in slum population when compared to municipal corporations. One of the reasons for this increase could be the expansion of municipal areas through the merger of neighbouring municipalities and gram panchayats. The reasons for the declining slum population in the Notified Areas must be investigated.

In continuation to the previous table, adjusted slum population growth based on administrative status has been calculated (refer to Table 6) to determine the increase in decadal slum population growth within specific administrative units. The results show that, except Municipalities and Notified Areas, all other administrative units have seen a significant increase in slum population growth over the decade. The decline in Municipalities and Notified Areas could be attributed to a decrease in the number of urban centres within those categories between 2001 and 2011. During 2001-11, the number of towns within the other administrative units increased or remained constant. Notably, the Cantonment Board area has increased 9.1 times per year. These are civic administrative zones with relatively high living standards that provide opportunities for the poor to make a living. Within cantonment areas, there may be notified slums. Migration to these slums reflects the availability of work in these areas, and the natural increase in slum population in these areas reflects the phenomenal growth within this category of administrative units. The other category has also seen a 138-fold increase in annual slum population growth. This category combines all of the remaining small administrative units, and the sudden increase in the number of urban centres from 87 to 777, as well as the changing population size within the other category during 2001-11, may be one of the likely causes of the increase.

Table 6: Adjusted growth rate of slum population by administrative status of towns, 2001 and 2011

Administrative status of city	2001		2011		Adjusted Growth Rate 2001-11
	Number of towns	Slum Population	Number of towns	Slum Population	
Municipal Corporation	100	25305	101	29780	17.68
Municipality	1232	22685	566	15115	-33.37
Notified Area	69	616	44	375	-39.12
Cantonment Board	4	56	4	106	89.29
Census Towns	12	148	12	205	38.51
Others	87	861	777	12789	1385.37
Total	**1504**	**49670**	**1504**	**58371**	**17.52**

Note: Population in thousands; *Others category* includes: Notified Area Committee (NAC), Municipal Council (MCI), Municipal Committee (MC), Municipal Board (MB), Town Panchayat (TP), Nagar Panchayat (NP), Town Municipal Council (TMC), City

Discussion

The salient findings from the study are as follows: First of all, a new census definition of a slum in 2011 identified more slum dwellers than in 2001. While the proportion of slum dwellers in urban areas is decreasing, their numbers are increasing, according to the 2011 Census. Slums were reported in approximately 1725 towns in the 2001 Census, and this number increased to approximately 2613 towns in the 2011 Census. In both census periods, approximately 1504 towns were discovered to be common in reporting slums. Furthermore, a scatter graph of common slum towns fitted with a linear regression line was plotted alongside the adjusted R^2 value, demonstrating the strong positive relationship between urban and slum population growth. This

finding is in line with previous research findings, which show that there is a strong, positive, and linear relationship between urbanisation and slum growth in developing countries, particularly in Asian countries (Ooi and Phua, 2007).

Moreover, finding highlights the concentration of slums across various size class towns. Surprisingly, Small and medium towns reported a higher proportion of slum population in both Census periods (2001-11) than larger cities. It demonstrates that the *size of urban centres has no bearing on the growth of slums; slums expand wherever they can*. Later, both slum and non-slum areas of urban centres were discovered to be growing at the same rate. Consequently, we can say that if the rate of urban absorption rises due to improved infrastructure and better job opportunities, migration to cities may rise. However, in the context of the slum population, this may not be necessary. Furthermore, it is possible that efforts to slow or redirect migration flows from larger cities to small urban areas have resulted in the further expansion of slums in those medium and small towns. The findings are consistent with the previous work that shows an increase in the slum population in smaller towns in developing countries (Laquian, 2005).

Finally, Municipal Corporations, Municipalities, and Cantonment Board areas have a higher percentage of slums than other administrative units. Because these areas have larger demographic units than the others. Even the percentage of slum dwellers is higher in these settlements due to higher densities than in other administrative units with more rural characteristics. If the current rate of growth continues, a large portion of the population will face developmental deprivation. At the same time, these areas have more redevelopment programmes and, as a result, more funds. As a result, slums in these areas have a better chance of being redeveloped than those in small and medium urban centres. Findings on Cantonment Board areas show that it is very unusual for the normal urban population to increase in these slum areas. Because these are under defence occupation, they are not easily encroached upon, and it is well known that lands administered by cantonment boards are privately owned. According to previous study, Cantonment board authorities are very strict and vigilant towards newcomers to the city. However, people with low incomes are permitted to live in old buildings and outhouses in cantonment board areas. Such dwelling units are known as "roaming slums," and they may be responsible for the concentration of slums in those areas (Agnihotri, 1994). Nonetheless, the presence of slums in a cantonment area is a problem that can be explained by noncompliance with land-use restrictions, which is common in India. During 2001-11, the slum population increased dramatically in the Nagar Panchayat and other categories. These are the areas that are transitioning from rural to urban areas. As cities grow in size, slums may emerge. To learn about the ground reality, research and field investigation are required.

Conclusion

In a nutshell, the study found that, while the overall slum population is declining, slums are growing faster, particularly in small and medium-sized towns. This phenomenon demonstrates the redirection of migration flow from larger cities to small urban areas, as well as the development of small and medium towns in terms of employment and other facilities in recent years rather than large cities. Furthermore, evidence suggests that slum populations in major cities are declining over the decade (for e.g., Greater Mumbai City). The unexpected growth of slums in the cantonment board zone would be a source of concern for the various authorities in charge of

economic development and urban planning. A similar coordination gap may exist between the city and the national government, which requires immediate attention. Here it is noteworthy, that to afford the increasing cost of housing by the low segments of urban population in the rapidly growing cities is doubtful; Unless there is a provision for any affordable housing by the city government. So, strengthening the affordable housing may be an important implication for India's efforts to eradicate slums.

Policy Implication

The study's findings serve as the foundation for a number of policy recommendations. In a broader context, the findings of this study clearly suggest evidence-based and targeted interventions that, at the current rate of urbanisation in India, could prevent slums from growing in town/cities. To begin, there is a need to create a microeconomic and social database of all existing slums that is linked to census data and strongly reflects the underlying factors of slum growth. In addition, the findings highlight the unusual occurrence of slums in Cantonment Board areas, indicating the need for additional research and field investigation to determine the exact causes of the slum population's rapid growth. Lastly, there should be a participatory approach for an exercise to legitimise, reduce, or remove slums by all stakeholders, i.e., the central, state, and local governments, as well as the people who live in slums, because slums cannot be cleaned out of cities until they become a formal part of urbanisation and urban development policy.

Limitation of the study

Census data does not provide a microeconomic and social database of slums; the study cannot identify underlying factors of slum growth.

Acknowledgement

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Appendix

Table 1.1: State wise distribution of statutory towns and reported type of slum with population, 2011

Sl. No.	Name of State/Union Territory	Statutory Towns	Slum reported towns	Total Population	Notified Slums	Recognized Slums	Identified Slums
1	Lakshadweep†	0	0	0	0	0	0
2	Chandigarh†	1	1	95135	95135	0	0
3	Dadra & Nagar Haveli†	1	0	0	0	0	0
4	Andaman & Nicobar†	1	1	14172	0	0	14172
5	Daman & Diu†	2	0	0	0	0	0
6	NCT Delhi†	3	22	1785390	738915	0	1046475
7	Puducherry†	6	6	144573	70092	73928	553
8	Sikkim	8	7	31378	31378	0	0
9	Meghalaya	10	6	57418	34699	8006	14713
10	Goa	14	3	26247	6107	0	20140
11	Tripura	16	15	139780	0	124036	15744
12	Nagaland	19	11	82324	0	48249	34075
13	Mizoram	23	1	78561	0	78561	0
14	Arunachal Pradesh	26	5	15562	0	0	15562
15	Manipur	28	0	0	0	0	0
16	Jharkhand	40	31	372999	64399	59432	249168
17	Himachal Pradesh	56	22	61312	60201	0	1111
18	Kerala	59	19	202048	186835	8215	6998
19	Uttarakhand	74	31	487741	185832	52278	249631
20	Haryana	80	75	1662305	14912	0	1647393
21	Jammu & Kashmir	86	40	662062	162909	136649	362504
22	Assam	88	31	197266	9163	70979	117124
23	Odisha	107	76	1560303	0	812737	747566
24	Andhra Pradesh	125	125	10186934	8338154	877172	971608
25	West Bengal	129	122	6418594	48918	3703852	2665824
26	Bihar	139	88	1237682	0	0	1237682
27	Punjab	143	73	1460518	787696	193305	479517
28	Chhattisgarh	168	94	1898931	713654	764851	420426
29	Rajasthan	185	107	2068000	0	0	2068000
30	Gujarat	195	103	1680095	0	0	1680095
31	Karnataka	220	206	3291434	2271990	445899	573545
32	Maharashtra	256	189	11848423	3709309	3485783	4653331
33	Madhya Pradesh	364	303	5688993	1900942	2530637	1257414
34	Uttar Pradesh	648	293	6239965	562548	4678326	999091
35	Tamil Nadu	721	507	5798459	2541345	1978441	1278673
	India	**4041**	**2613**	**65494604**	**22535133**	**20131336**	**22828135**

Note: '0' refers to no population; † : Union Territory; States and Union Territories are arranged in ascending order on the basis of number of statutory towns in each state.
Source: Primary Census Abstract for slum 2011