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Slums in India: making sense of place in urban planning

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Abstract Cities are the growth engine of national wealth and income production; however large number of city dwellers circumvents from the mainstream, are snubbed dwellers called slum population. Existence of slums in the urban units is a challenging issue in urban planning. India experiences a very sharp growth rate of slum population over the decades. Present work focuses on a conundrum of uninterrupted slum growth in spite of the implementation of many slum removal policies in India. The state-level household amenity status reflects a quite debatable agenda as to whether or not slum up-gradation policies are succeeded and works as a significant planning tool. The up-gradation of individual slum unit through the bottom-up approach of plan may act as effective action. This work finally directs a comprehensive planning tool for slum up-gradation as well as overall urban development, by placing the slum issues in urban planning practice.

Keywords Slum dweller · Policy gap · Slum up-gradation · Household amenity index · Urban planning

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Introduction

In a near future, majority of human population in developing countries is likely to live in urban area and it has been predicted that in India around 50% of its total population or 600 million people will live in the urban area in 2020 (Loughhead and Mittal 2000). With the rapid pace of urbanisation in developing countries, it is estimated that one-third of the urban population over the world lives in the dearth of even basic needs i.e., shelter, food, drinking water and so on, and they reside in overcrowded and congested environments (UN HABITAT 2003). Though cities are the growth engine of national wealth and income production and it is predicted that in India around 70% GDP will be generated by its cities (Sankhe et al. 2010) but a large number of dwellers in cities circumvent from the mainstream (National Building Organisation 2011), these snubbed dwellers are the slum population. Basically, slums are the informal settlements in an urban area characterised by improper housing stock and low standard of living (National Building Organisation 2013), socially vulnerable (Loughhead and

Mittal 2000) and belong to the lower segment of socio-cultural set up (D'souza 1979). Slums as an important element of present-day urbanisation (Bolay 2006) demonstrate the spatial appearance of urban poverty (Bhan and Jana 2013) and it pushes up urbanisation figure but pulls down overall urban development. Though in cities, slum and poverty are treated as synonymous it does not mean that all poor use to live in a slum or all people who live in the slum are poor (D'souza 1979). India has different poverty lines for rural and urban areas. Since 2007, India has set its official threshold income at Rs. 32 per day in urban areas to be considered as below poverty line called as urban poor (Planning Commission 2011). It is often uttered that the rate of urbanisation in India would happen in such a speed quite unlike India has seen before (Sankhe et al. 2010) and 2011 Census of India report witnessed 53 million-plus cities in India which can be apprehended with the prediction. It will be a big challenge for India to ensure the urban services for all the rising urban dwellers, for example, the demand trend of housing stocks in an urban area positively go on followed by an increasing pace of slum and squatters in India (GoI 2013c). Urban development is the prime task of urban governance. Both the World Bank and Asian Development Bank have considered the 'proportion of poverty' for determining the level of urban development (Mavric and Bebek 2015; Westfall and Villa 2001). Urban Planning is the main tool kit for the urban development. As slums are the implied features of urban habitat, slum up-gradation occupies an important place in urban development.

If we look at the world statistics, the urban population of the world has been estimated to reach soon half of the total population by 2020 and already the world housed more than 1 billion slum populations (UN HABITAT 2007). Such an alarming increase in the urban population will impact positively on the slum growth. Another source reveals a nearly 72% of Sub-Saharan Africa and 57% of Southern Asia's urban population reside in slums (United Nations 2012). But over the last 10 years, the slum settlements in the developing world surprisingly have declined from 39% in 2000 to 32% in 2010 (UN HABITAT 2008). The implementation of different plans and programs at global levels has resulted in the reduction of slum growth up to some extent. Though, West Asian countries recorded positive growth of slum population with 22.5% in 1990 to 24.6% in 2010 (UN HABITAT 2008) which demonstrate the problems of proper implementation of slum policies throughout the world.

Right from the independence the government has formulated and implemented different slum development policies at national as well as state level but the figure of slums remains same with little change. Land use problems, socio-economic problems in many slums of India are still evident. The existing literature and government reports prove a persistence of multiple problems in slums. Now, the pertinent question arises what are the real outcomes that are achieved from the lot of efforts and huge amount of resources invested for the same. Now is the time to think about the real problems of slum and searching remedy. The paper is a deliberate attempt to answer whether or not slum up-gradation policies are succeeded and works as a significant planning tool. The entire narrative in the study revolves around the question of equity of urban dwellers' right to the city. The discourse on this question mainly comes out from the conundrum of uninterrupted slum growth in spite of the implementation of many slum removal policies in India. The paper finally directs a comprehensive planning approach as an alternative to the existing model for slum up-gradation as well as overall urban development.

Literature review

Davis (2006) in his book "Planet of Slums" tried to correlate urbanisation with slum growth and discussed the living reality of slum dwellers over different megacities and focused on the colonial effectiveness over different cities and slum settlements. There is a retrospective relationship between slum outgrowth and urban governance (Ramachandra and Sudhira 2011), meaning thereby good governance can overshadow the problem of slum outgrowth. Cohen (2006) also observed a reciprocal relationship between urban growth and sustainable management of urban services. However, the eviction of slum may generate a new kind of poor group and can badly affect the interrelation between the formal and informal sectors of the economy (Arabindoo 2011). Sharma and Sita (2000) showed how the involvement of NGOs and Local Urban Bodies (ULBs) helps in achieving the goals of any national plan for slum development. Roy (2014) tried to trace the commencement of government

efforts in arresting the growth of slum after the colonial periods in developing countries in general and India in particular. Bolay (2006) studied to outline the causes of slum emergence and also suggested for the policy implementation for better living in slums. The Indian cities are very much familiar with the mass eviction of slum dwellers through the city improvement project or urban renewal project (Coelho et al. 2012). The eradication of poverty is now considered as an integral part of the development in India where poverty and employment are interlinked (Kumar and Aggarwal 2003). Satterthwaite (2010) discussed different dimensions of slum up-gradation over different parts of the world as well as India. Coelho and Maringanti (2012) criticized the traditional approaches towards urban poverty eradication and they called for the contentious engagement of urban poor with neo-liberal policy implementation. To sustain the slum environment, Chalana (2010) proposed a redevelopment plan. Though many scholars have focused on the theoretical approach on the dimension of slum related problems and advocated for ambiguous solutions, no study was found to be furnishing a straightforward direction of diagnostic planning for slum up-gradation in order to bring the slum dwellers into the urban mainstream.

Database and methodology

It is a secondary data based study having information from the Census of India, NSSO, TCPO, NBO etc. Compound Annual Growth Rate (CAGR) techniques have been adopted to analyse the compound decadal growth rate of slum reported towns of different selected states. The model of CAGR calculation is;

$$\text{CAGR} = ((\text{End Value}/\text{Start Value}) \wedge (\text{Periods} - 1)) - 1$$

$$\text{Predicted} = \text{Last Year} * (1 + \text{growth rate})$$

A matrix of relationship has been developed for examining an association between the state-wise urbanisation and share of slum population in India. In the matrix, the categories of high, medium and low levels of both urbanisation and slum concentration have been presented. To examine the household level status of basic amenities, Principle Component Analysis (PCA) technique has been adopted. The spatial information has been gathered through the mapping with Arc GIS and Map Info software in GIS environment.

Slum in India

The term slum generally recognized with three major characteristics of cities namely physical, social and economic (D'Souza 1979). In India, under "Database and methodology" section of the Slum Area Improvement and Clearance Act, 1956, slums have been identified as the residential areas where dwellings in any respect are unfit for human habitation by reasons of dilapidation, overcrowding, faulty arrangements and designs of such buildings, narrowness or faulty arrangement of streets, lack of ventilation, light, sanitation facilities or any combination of these factors which are detrimental to safety, health and morals (GoI 2013a). As per National Sample Survey Organisation (NSSO), slum is a compact settlement with a collection of poorly built tenements, mostly of temporary, crowded together usually with inadequate sanitary and drinking water facilities in unhygienic conditions (NSSO 2003). However, the UN-Habitat has extended the definition by two more components, i.e., living area and security tenure what other agencies didn't. The above definitions are furnished by the Government of India or national organization from time to time for slum identification, although these definitions lack a commonality. A lagging and lacking in these definitions can better be understood from the following table;

Registrar General of Census of India adopted following definition in 2011 similarly as 2001.

1. All specified areas in a town or city notified as 'Slum' by State/Local Government and UT Administration under any Act including a 'Slum Act'.
2. All areas recognized as 'Slum' by State/Local Government and UT Administration, Housing and Slum Boards, which may have not been formally notified as slum under any act;
3. A compact area of at least 300 populations or about 60–70 households of poorly built congested tenements, in the unhygienic environment usually with inadequate infrastructure and lacking in proper sanitary and drinking water facilities (Table 1).

Table 1 Components used by different agencies for defining a slum. *Source*: Risbud 2010

Definitions provided by	Lack of ventilation, light or sanitation	Access to safe drinking water	Structural quality	Over crowding	Living area	Security of tenure
Slum Area (Improvement and Clearance) Act 1956, Government of India	✔	✔	✔	✔	×	×
UN-Habitat	✔	✔	✔	✔	✔	✔
Census of India, Government of India	✔	✔	✔	✔	×	×
NSSO	✔	✔	✔	✔	×	×

A slum is a house or a neighbourhood that is in poor condition and that is generally considered unsafe and not nice to live or be in (Census of India 2001). The Government of India by adopting aforesaid criteria uniformly across all of its states has identified slums in all cities of the country and subsequently notified such settlements as slums. The slums declared by the government notification are more particularly called as notified slums, however, the settlements having similar characteristics though not notified are also slums rather called as recognized or identified slums (GoI 2011).

Slum in India is an inherent problem; it suffers the country since historical time, both in unplanned and planned urban area of the country slum is common feature (D'souza 1979), for example the first planned city of India Chandigarh also suffers from the problem of slum growth (Teotia 2015). Slum in the city is a consequence of rapid urbanisation (GoI 2013c; Sinha 1985), industrialisation (Kundu 2003; KMDA 2006), de-industrialisation (Davis 2006), influx of refugee (Guterres 2010; Albuja and Ceballos 2010), rural–urban migration (Roy 1994; Kundu 2007), better opportunity and so on. But the phenomena of slums are mainly considered as the outcomes of rapid industrialisation in India during mid-50 s of nineteenth century and early twentieth century in and around Kolkata (KMDA 2006). Mainly two events are the landmarks in respects of slum growth in India, first; the partition of the country and second the Industrial revolution (Bandyopadhyay and Agrawal 2013). Sometimes migration from rural to an urban area with the desire for better economic opportunities and finally their settling in the informal settlement results in the increase of slum and squatter settlements (Chandramouli 2010). At the same time presently unemployment and underemployment also contribute to the emergence and growth of slums in urban India. The current unemployment rate of India is 6.7 (CMIE 2018) and around 31 million Indians are searching for the job (Chaudhari 2018), a maximum of them are city dwellers. The Stagnant or negative growth of the industry in India directly restrict the generation of employment opportunity, presently India faced 7.2% negative growth of its industrial production (Trading Economics 2018). It is undesirable to the urban society that many such people settle in the slum to restrain on living costs. Unfortunately slum sometimes acts as a source of crime and social insecurity, associated with the unequal distribution of physical, economic as well as a social institution (UN HABITAT 2007).

India surprisingly figures a 40% of the urban population is poor (Loughhead and Mittal 2000). Though a dilemma exists about the exact figure of the slum population in India, because the Census of India didn't conduct a detailed survey on slum until 2001. Before 2001, the Census of India conducted a survey of notified slums only (Kumar 2010). Only sample survey report by NSSO (National Sample Survey Office) has been serving as a reliable data source of slums. Census of India shows a very sharp increase of slum population from 27.9 million in 1981 to more than 40 million in 2001 and 93.06 million in 2011 (GoI 2015). As per another source more or less 28 million people lived in slums in 1981, which rose to 45.7 million in 1991 (Chandrasekhar 2005). According to The Hindu report (a newspaper), about 13.1% of total urban children with age below six years use to stay in slums (Deshpande 2011). According to Rahman (2013), almost 64 million Indians live in a degrading environments as portrayed in Oscar-winning movie Slumdog Millionaire. Town and Country Planning Organisation (TCPO) estimated about 61.8 million

slum population in 2001 in India (GoI 2011). In 2001, the number of slum reported towns has increased from 507 in 1991 (Kumar 2010) to 1743 in 2001 (GoI 2010) and 2613 in 2011 (GoI 2013a). As per the NSSO report, 56,311 slums were estimated in India in 1993 (Chandrasekhar 2005). The 65th round sample survey report during 2008–2009 estimated around 49 thousand slums in urban India of which 24% slum people reported to reside along the *nallah* (Type of dirty, unhealthy drain of mainly stagnant domestic and industrial wastewater) and 12% along railway line and 57% on public land (NSSO 2010).

Slum reported towns in India

Some states of India have recorded a rapid pace of growth of slum reported town over the census years. Growth tempo of slum reported towns have been assessed state-wise and in this analysis only those states having information on slum reported towns of respective decades, have been considered (from 1991 to 2011).

Compound Annual Growth Rate (CAGR) of slum reported towns is reportedly very higher in some states like Tamil Nadu, Madhya Pradesh, Karnataka etc. (Table 2). However in other states like West Bengal, Gujarat, Bihar etc. it is having moderate level. The phenomena of slum reported towns can positively correlated with the rate of urbanisation and success of urban planning, for example Tamil Nadu have recorded positive growth of urban population from 43.86% in 2001 to 48.45% in 2011 which caused the growth of slum reported towns. During the same time Goa has reported zero percent compound annual growth rates.

If the present trend is maintained, Tamil Nadu is expected to report 1044 slum reported towns by 2021 followed by Madhya Pradesh (552), Uttar Pradesh (502). At the same time states like Goa, Kerala and Pondicherry will be reporting 03, 21 and 08 slums reported towns respectively (Table 2). A detailed study reveals a quite alarming increase of slum reported towns, which argues for taking planning initiative to arrest the pace. In this regards the government may take immediate action.

Urban population Vis-a-Vis slum population

It is observed from the slum statistics as provided by the Census of India, NSSO, NBO, and others reputed organizations of Govt. of India that there are unidirectional urbanisation and slum growth. Moreover, the Census of India 2011 has considered the urbanisation as a major factor of slums upcoming. It is clear that the way in which urbanisation going up either doesn't have or ineffective controlling tool for restricting the sharp growth slum population. The efforts in the urban development will be reasonable to upgrade the living condition, therefore a tag of slum can be taken aside.

Table 2 State having slum reported town/city, India (1991–2011). *Source*: Calculated by Authors based on census data

States	1991	2001	2011	CAGR	Predicted number in 2021
Andhra Pradesh	73	77	125	0.20	150
Bihar	38	34	88	0.32	116
Goa	3	2	3	0.00	3
Gujarat	45	41	103	0.32	136
Haryana	22	22	75	0.51	113
Karnataka	36	35	206	0.79	368
Kerala	14	13	19	0.11	21
Madhya Pradesh	50	55	303	0.82	552
Maharashtra	45	61	189	0.61	305
Rajasthan	21	26	107	0.72	184
Tamil Nadu	58	63	507	1.06	1044
Uttar Pradesh	58	75	293	0.72	503
West Bengal	40	59	122	0.45	177
Delhi	0	16	22	NA	NA
Pondicherry	3	3	6	0.26	8

N.B: CAGR, Compound Annual Growth Rate, NA, Not Applicable

Urbanization rate and share of slum population

This is an attempt to magnify the effective result of policies and programs implemented in past times for the up-gradation of slum livelihood in India. Going through the state-wise data records as provided by the Census of India, it is quite undoubtedly speaking that the planning toolkits used earlier could not lash upon the pace of slum population growth which is much higher than non-slum population growth in many states of the country.

India has recorded 31.16% urbanization rate in 2011, which is a little bit higher than 27.78% in 2001 (Table 3). As per 2001 census Goa had recorded the highest urbanisation rate (i.e. 49.77%) among all states of India national followed by Mizoram (49.5%), Maharashtra (42.40%) respectively whereas Himachal Pradesh found least urbanised state with urbanization rate 9.79% (Table 3). Both of the states of Goa and Mizoram retain same position in urbanization record in 2011 having 62.17 and 51.51% urbanization Among 28 states of India, 17 states have recorded urbanisation rate below the national average of 31.16% (Table 3). Among the Union Territories (UTs), both Delhi and Chandigarh have recorded more than 89% urbanization in 2001 and 97% in 2011; Lakshadweep and Daman and Diu with more than 35% in 2001 and 75% in 2011; Dadra and Nagar Haveli with 22.89% in 2001 and Andaman Nicobar Island with 35.67% in 2011 records least urbanisation among the UTs (Table 3). The variation of rate of urbanisation can be attributed with the scope of economic opportunity, availability of infrastructure facilities as well as government willingness to ensure the pace of urbanism over the different states of India.

Here is a unidirectional changing urbanization rate and the changing slum growth (Table 3), the share of the slum population to the total urban population as the national average figure has increased from 14.92% in 2001 to 17.37% in 2011 (Table 3).

Highest share of slum population has been recorded in Andhra Pradesh in 2011 (35.93%) followed by Chhattisgarh (31.99%), Madhya Pradesh (28.36%); some states are reportedly below the national average of 17.37%, i.e. Kerala (1.27%), Goa (2.90%), Assam (4.49%), Jharkhand (4.70%) etc. (Table 3).

Decadal change of urbanization and slum population

As far as the decadal change of urbanization is concerned, India is credited with a 24.33% growth rate between 2001 and 2011. During the same time period, among all states of India, Sikkim has recorded maximum decadal change of 60.45% followed by Kerala (48.11%) and Tripura (43.49%); however, Himachal Pradesh has recorded least decadal change of 13.62% followed by Maharashtra (19.30%), Madhya Pradesh (19.73%) and Punjab (20.62%) respectively (Table 3). Among all union territories, Daman and Diu documented maximum positive decadal change in urbanisation rate (i.e. 68.61%), and Andaman evidenced minimum (i.e. 14.11%). It is noteworthy that the share of slum population to urban population has increased by 78.57% being highest in Tripura during 2001–2011. Tripura is followed by Kerala (68.05%), Uttaranchal (59.92%), Bihar (57.06%) etc. During the same successive decades (2001–2011) some states and UTs like Meghalaya, Andaman and Nicobar Island and NCT of Delhi have recorded declining share of slum population to urban population by − 50.31, − 14.62, and − 13.69% respectively.

Here a decadal increase in slum population has been corroborated with the decadal increase in urbanisation. Declining slum population can be considered as the success of policy implementation by the concerned government and vice-versa. The study reveals that success or fail of slum removal policy has attributed much to the negative or positive changes in the slum population respectively. In case of a higher increment of slum population, urban planning toolkits either remain fails or these were not effectively implemented. A sharp increase of slum population in many states clearly manifests that the slum removal or up-gradation issues no more find a place of pride in modern urban planning practice.

Himachal Pradesh, Sikkim, Arunachal Pradesh, Nagaland, Mizoram and Manipur states; Daman and Diu, Dadra and Nagar Haveli and Lakshadweep Union Territories in 2001 and Manipur, Daman and Diu, Dadra and Nagar Haveli and Lakshadweep in 2011 did not have slum population. Overall, a unidirectional march of urbanisation rate and percentage share of the slum population is observed in India (Table 3).

Table 3 State-wise distribution of urban and slum population in 2001 and 2011. *Source*: Computed by authors from Census of India 2001 and 2011

Sl. No	India/State/ Union Territory #	% Of urban population to total population		% Of slum population to total urban population		% Changes of urban population (including slum)	% Changes of slum population	% Changes of urban population (excluding slum)
		2001	2011	2001	2011			
India		27.78	31.16	14.92	17.37	24.33	34.99	22.09
1	Jammu and Kashmir	24.88	27.21	10.72	36.27	26.62	59.44	18.72
2	Himachal Pradesh	9.79	10.04	0	15.77	13.62	NA	5.18
3	Punjab	33.95	37.49	14.06	25.98	20.62	20.61	20.62
4	Uttaranchal	25.59	30.55	9.01	15.78	29.79	59.92	24.15
5	Haryana	29.00	34.79	23.23	18.84	30.69	14.55	34.44
6	Rajasthan	23.38	24.89	9.80	12.11	22.69	37.42	20.66
7	Uttar Pradesh	20.78	22.28	12.74	14.03	22.39	29.56	21.22
8	Bihar	10.47	11.30	6.12	10.55	26.01	57.06	22.34
9	Sikkim	11.10	24.97	0	20.68	60.45	NA	50.14
10	Arunachal Pradesh	20.41	22.67	0	4.96	28.95	NA	25.24
11	Nagaland	17.74	28.97	0	14.35	38.51	NA	28.20
12	Manipur	23.88	30.21	0	0.00	30.62	NA	30.62
13	Mizoram	49.50	51.51	0	13.98	21.52	NA	8.77
14	Tripura	17.02	26.18	5.51	14.55	43.49	78.57	37.51
15	Meghalaya	19.63	20.08	19.07	9.65	23.94	− 50.31	31.86
16	Assam	12.72	14.08	2.43	4.49	22.77	58.29	21.10
17	West Bengal	28.03	31.89	18.30	22.03	22.82	35.87	19.13
18	Jharkhand	22.25	24.05	5.04	4.70	24.50	19.15	24.76
19	Orissa	14.97	16.68	11.46	22.30	21.44	59.62	10.48
20	Chhattisgarh	20.08	23.24	19.59	31.99	29.67	56.93	16.85
21	Madhya Pradesh	26.67	27.63	15.01	28.36	19.73	57.51	4.77
22	Gujarat	37.35	42.58	9.88	6.53	26.50	− 11.11	29.13
23	Maharashtra	42.40	45.23	27.31	23.31	19.30	5.45	23.51
24	Andhra Pradesh	27.08	33.49	25.36	35.93	27.69	48.96	15.76
25	Karnataka	33.98	38.57	7.76	13.96	24	57.74	18.52
26	Goa	49.77	62.17	2.17	2.90	26.20	44.82	25.64
27	Kerala	25.97	47.72	0.78	1.27	48.11	68.05	47.85
28	Tamil Nadu	43.86	48.45	10.52	16.59	22.06	50.56	16.39
29	Chandigarh #	89.78	97.25	13.24	9.28	21.15	− 12.60	24.60
30	NCT of Delhi #	93.01	97.50	15.83	10.93	21.51	− 13.69	25.83
31	Daman and Diu #	36.26	75.16	0	0.00	68.61	NA	68.61
32	Dadra and Nagar Haveli #	22.89	46.62	0	0.00	68.43	NA	68.43
33	Lakshadweep #	44.47	78.08	0	0.00	46.43	NA	46.43
34	Puducherry #	66.57	68.31	11.29	17.01	23.75	49.39	18.49
35	Andaman and Nicobar Islands #	32.67	35.67	13.95	10.46	14.11	− 14.62	17.47

Code: NF, Not Found; NA, Not Applicable; #, Union Territory

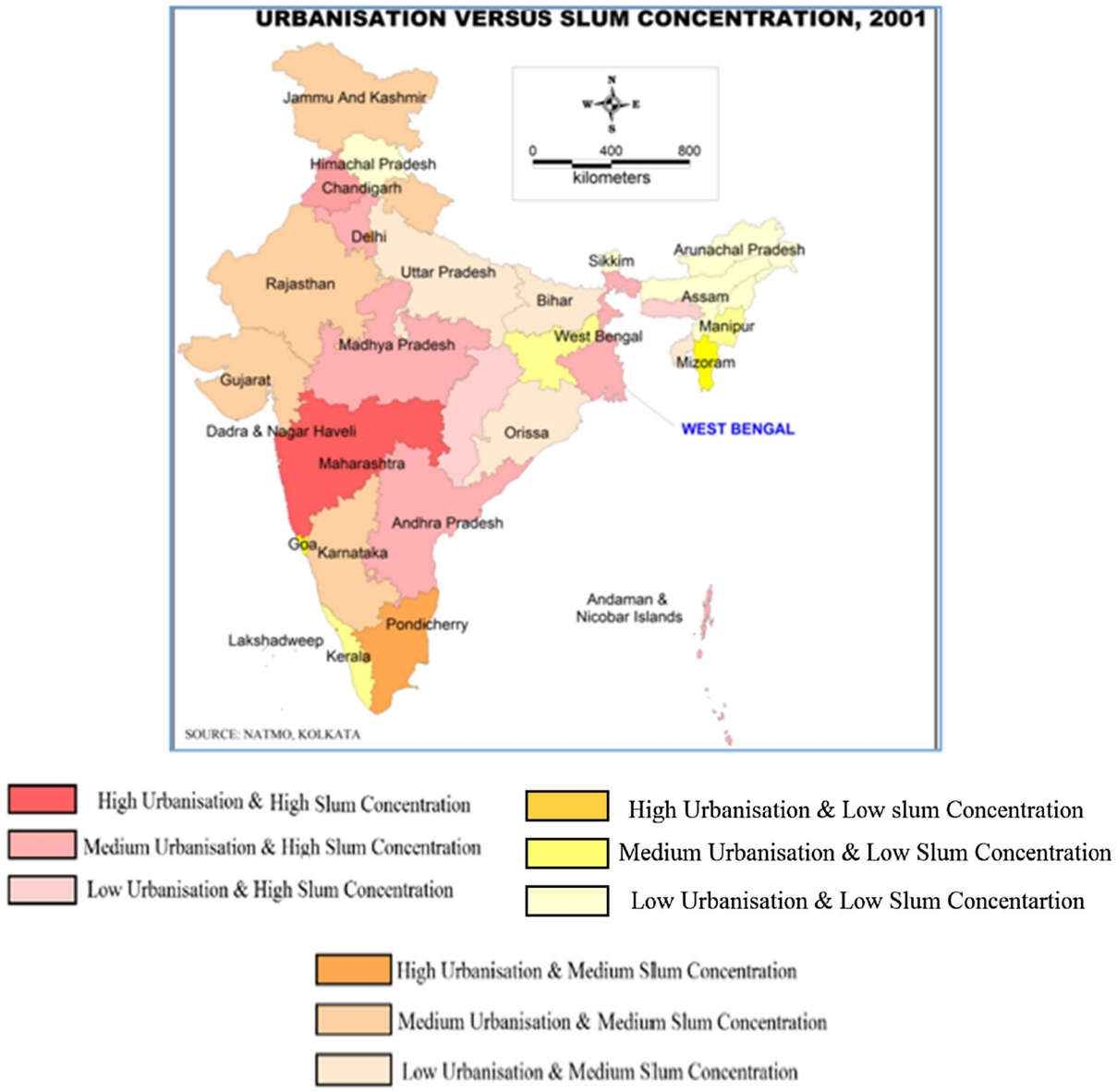

Fig. 1 Urbanisation versus slum concentration, 2001

Urbanisation Vs slum concentration

Here an attempt has been taken to assess the relationship between the urbanisation rate and slum concentration for the years 2001 and 2011. The relationship has been established through the pictorial presentation in Figs. 1 and 2. Nine categories of all the states/union territories have been prepared for extracting the relationships. Among these most surprising categories are '*high urbanisation and low slum concentration*' level and another one is the coincidence of '*low urbanisation and high slum concentration*' level. It is observed from Fig. 1 that Lakshadweep, Mizoram and Goa fall under the category of '*high urbanisation and low slum concentration*'', whereas Meghalaya and Chhattisgarh under '*low urbanisation and high slum concentration*' category in the year 2001. The first category prevalence the effective implementation of planning tool kits and witnessed the emergence of planned manner urbanisation which could arrest the

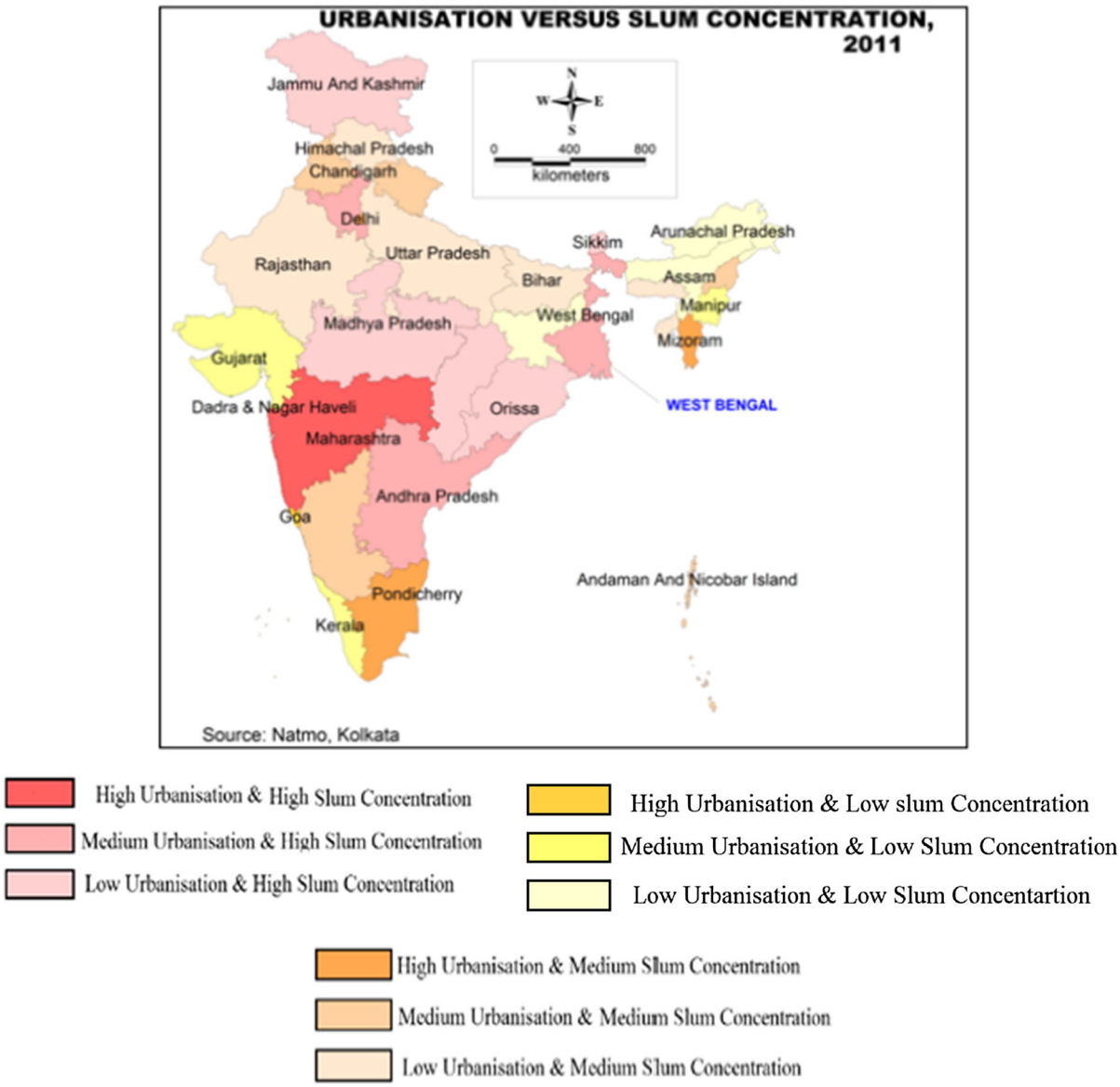

Fig. 2 Urbanisation versus slum concentration, 2011

growth and emergence of slum settlement through proper implementation slum improvement programme in the urban place. The second category is the most problematic because the low level of urbanisation did not happen in a planned manner which could not arrest an increasing pace of slum population nor slum improvement programs could function successfully. The figure is quite different in the year 2011 when only Mizoram failed to retain the same position in '*high urbanisation and low slum concentration*' category, whereas Daman and Diu comes under this category. In the same time, Sikkim, Orissa, Chhattisgarh, Jammu and Kashmir, Madhya Pradesh states have been identified in '*low urbanisation and high slum concentration*' category.

High urbanisation together with low slum concentration though manifests an availability of better job opportunities and other service facilities with proper access to the public facilities and considering of slum issues in the urban planning results in the low concentration of slum population. However low urbanisation together with a high concentration of

Table 4 Coefficient of variability of variables based on Principle Component Analysis for measuring Household Amenity Index. *Source*: Computed by authors based on Census of India (2011) data using SPSS 20.1

Broad category	Component matrix			
	Variable definition	Components		
		1	2	3
Family Information Index (FII)	Family size	− 0.201	− 0.080	0.819
	Household with 04 family members	0.371	0.219	− 0.767
Housing Infrastructural Index (HII)	House uses house premise for residence and other purpose	− 0.175	0.110	0.574
	Household with own house	− 0.349	0.494	0.021
	Good quality houses	0.849	− 0.290	0.004
	House with concrete roof	0.537	0.319	0.227
	House with brick and concrete wall	0.051	0.676	0.459
	House with concrete and mosaic floor	0.409	0.486	− 0.089
	Permanent house	0.640	0.593	0.290
	Household with at least two rooms	0.342	− 0.622	0.538
Basic Amenity Index (BAI)	Household with separate kitchen	0.717	− 0.563	− 0.259
	Household uses LPG and PNG	0.827	− 0.132	0.196
	Household with tap water within premises	0.795	0.354	− 0.001
	Household with latrine within premises	0.602	− 0.561	0.124
	Household with Electricity as source of lighting	0.497	0.246	− 0.556
	Household with bathroom facility within premises	0.903	− 0.106	0.238
	Household with waste water outlet connected to closed drainage	0.525	0.594	0.162
Variance in %		32.73	18.40	16.14

Extraction Method: Principal Component Analysis

slum population can't be corroborated with the same causes rather it can be argued that small as well as newly emerged urban centers when fails to provide socio-economic opportunities and other service provisions to it dwellers, their housing condition and livelihood status come to be dilapidated. Some other factors like migration of rural people to the small and nearly growing urban center in the emergency created by the natural calamities, and also the factors of deindustrialization and subsequent loss of employment results in the growth of slum population. Moreover, the small urban centers suffer the problem of ineligibility for receiving urban development grants. Sometimes such small urban units ineffectively practice the planning for slum up-gradation due to institutional or organisational negligence or lack of planning skill as well as lack of capacity among machinery. All such factors jointly result in the growth of the slum population in small urban centers much faster than the growth of non-slum population. For example, in Jammu and Kashmir increasing concentration of slum population is attributed to the refugee problem due to political instability, unplanned urbanisation and failure of slum eradication/improvement policies of the state as well as influx of labourer and other than indigenous for menial job also responsible for the growth of slum population in Jammu and Kashmir (Akmali 2017). However in Sikkim, slum concentration has increased as a consequence of immigration of rural people and people of hilly areas being victimised by natural disaster forcing them to settle down in nearby urban areas in search of job. It results into the haphazard housing structures which are identified later as slums (Table 4).

Table 5 Amenities Availability Index over different states/Union Territory in India (2011). *Source*: Computed by the author based on data of Census of India, 2011

Name of the state/Union Territory	FII	HII	BAI	HAI
Andaman and Nicobar Islands	0.73	1.86	2.65	5.24
Andhra Pradesh	1.00	0.79	2.86	4.66
Arunachal Pradesh	− 0.25	− 0.47	− 1.00	− 1.71
Assam	0.01	− 0.75	− 0.84	− 1.59
Bihar	− 0.78	− 1.92	− 4.33	− 7.02
Chandigarh	0.08	− 4.02	− 8.47	− 12.41
Chhattisgarh	0.14	− 0.43	− 3.00	− 3.30
Goa	− 0.01	0.93	3.05	3.96
Gujarat	− 0.10	− 0.56	− 0.19	− 0.85
Haryana	− 0.11	− 0.83	0.92	− 0.02
Himachal Pradesh	0.09	1.97	1.98	4.04
Jammu and Kashmir	− 1.15	0.82	− 0.72	− 1.05
Jharkhand	− 0.23	− 0.47	− 3.69	− 4.39
Karnataka	0.27	0.13	0.25	0.65
Kerala	0.48	1.49	1.33	3.30
Madhya Pradesh	− 0.20	− 0.47	− 1.45	− 2.13
Maharashtra	0.06	− 0.16	0.83	0.73
Meghalaya	− 0.76	1.32	0.67	1.23
Mizoram	− 0.18	1.94	5.49	7.25
Nagaland	− 0.52	1.03	− 0.94	− 0.43
NCT of Delhi	− 0.40	− 1.48	− 1.05	− 2.94
Odisha	0.23	− 0.75	− 3.56	− 4.09
Puducherry	1.03	1.13	2.18	4.34
Punjab	− 0.07	− 1.42	2.19	0.70
Rajasthan	− 0.37	− 0.47	0.48	− 0.36
Sikkim	0.05	2.42	3.80	6.28
Tamil Nadu	1.09	1.25	1.30	3.65
Tripura	0.73	− 1.53	− 0.86	− 1.65
Uttar Pradesh	− 0.87	− 1.20	− 0.90	− 2.96
Uttarakhand	− 0.37	0.27	1.89	1.80
West Bengal	0.18	− 0.34	− 1.18	− 1.34
India	0.20	− 0.07	0.27	0.40

Slum-household livelihood

Here an effort has been undertaken to measure the Household Amenity Index (HAI) of slum households of the states and union territories of India. This index may help to understand the livelihood condition of slum dwellers of different states and UTs. It is more imperative to have a deep insight into the real figure of the living conditions of slum dwellers. It is like a lens through which one can have a view into the living condition in slums and may clear its corroboration with the outcome of planning toolkits. This is further reason for comprehending the degree of circumventing, which can base the alternative plan formulation. This attempt may helpful in the formulation of a new plan to upgrade their level of living. HAI represents a composite of the indices of Family Information Index (FII), Housing Infrastructure Index (HII) and Basic Amenity Index (BAI) at the household level. These indices have been constructed on the basis of selected seventeen variables related to the slum household amenities. The indices manifest an aggregate state of livelihood of the slum population (Table 5).

HAI has been constructed using Principle Component Analysis (PCA) based factor extraction method. The index of each component is a composite figure of all variables under the same component. This can be represented with the following model;

$$HAI = FII + HII + BAI \quad (1)$$

Coefficient of variability or factor weight is standardized to obtain factor score of each variable. The method of computation of each index is as follows;

$$HAI = w_1(x_1) + w_1(x_2) + \cdots + w_{17}(x_{17}) \quad (2)$$

where HAI denotes Household Amenity Index, w denote component score or coefficient of variability, x denote Standardized value of variable.

For the analysis of HAI, relevant data of slum households have been obtained from each 35 States/ Union Territories.

As far as FII is concerned, India's national average score is 0.20. The states of Tamil Nadu and Andhra Pradesh have recorded more than 01 much higher than the national average reflecting a better living condition in terms of family size. Contrarily Jammu and Kashmir have recorded the least score i.e., − 1.15 (Table 5) in this regard. It is evident that Jammu and Kashmir characterises having an average bigger size of slum households. Sikkim records a highest HII score (i.e., 2.42) followed by Himachal Pradesh (i.e., 1.97) and Andaman and Nicobar Island (i.e., 1.86) proves to be better household infrastructure quality, contrarily slum households of Chandigarh score least HII, i.e. − 4.02 followed by Bihar (i.e., − 0.192). Table 5 further discloses that slum households of Mizoram record highest BAI (i.e., 5.49) followed by the states of Andhra Pradesh (i.e., 2.86) and Uttarakhand (i.e., 1.89).

A Higher index of HII marks better accessibility to the basic household amenities. From this observation, it can be argued that Chandigarh is far back and fails to promise standard housing infrastructure. In addition to it, Chandigarh found far back with least BAI (− 8.47) which further proves fail to promise standard household basic amenity. Chandigarh is followed by Bihar with the score in BAI − 0.4.33 (Table 5). Livelihood status of slum household in Chandigarh and Bihar in terms of both of the components is at the bottom in the country, which is a serious issue and requires implementation of a grass root level planning.

As far as the Household Amenity Index (HAI) which is the aggregate of all components of household livelihood, of slum household is concerned, Mizoram performed better in promising standard livelihood. This state stood at the top with scoring HAI 7.25, was also a slum-free state in 2001. Mizoram is followed by Andaman and Nicobar Island (i.e., 5.4) where the percentage of slum population is less than India national average (Tables 3 and 5). In the contrary Chandigarh has recorded the most dilapidated state of livelihood of slum households with the least scoring of HAI i.e., − 12.41. It can plead that this Union Territory (Chandigarh) fails in promising standard livelihood to the slum dwellers who share about 9.28% of the total urban population. This is mainly due to the ineffective implementation of planning, incapable planning tools, or/and issues of slum development that are ignorant in the urban planning domain. This seeks an urgent need of planning for immediate solution of the dearth and dire livelihood condition of the slum population. HAI of maximum states found to be positively corroborated with slum concentration. States with low HAI urgently require an emphasis for the provision of basic services which will minimize the problems in the slum, moreover, it may bring them to the mainstream of urban society. Chandigarh is followed by Bihar (− 7.02), Jharkhand (− 4.39), Odosha (− 4.09) and Chhattisgarh (− 3.30). It is worthy to mention that some states like Chhattisgarh, Odisha, Madhya Pradesh, Jammu and Kashmir etc. record a magnificent share of slum population simultaneously fall behind in aggregate living condition of slum dwellers. Such realities strive for an alternative planning approach which may seem to be appropriate for developing countries like India.

Discourse on the planning efforts and outcome

The study has identified a continuous increase of slum population and low access to basic facilities in the majority of states of India. After independence, India adopted the number of policies for slum development. On paper, India has many more plans for the urban area but very few of them practically implemented in the field (Sankhe et al. 2010). The most important slum development policies are National Slum Development programme of 1997 (Mathur 2009) which was started in 1997 as a part of the Special Central Assistance,

formulated for providing an additional fund to the state government for slum up-gradation. Swarna Jayanti Sahari Rojgar Yojana (SJSRY) of 1997 was introduced to provide gainful employment opportunity to the underemployed or unemployed (GoI 2007). Jawaharlal Nehru National Urban Renewal Mission (JNNURM) of 2005 focused on providing a holistic package of slum improvement and their interference (Hingorani 2011). Rajiv Awas Yojana of 2009 was introduced with an objective of making Indian cities slum-free (GoI 2013b). Atal Mission for Rejuvenation and Urban Transformation (GoI 2015) was introduced to provide the basic services (water supply, sewerage, transportation) and improving the quality of life of urban dwellers especially urban poor and other disadvantaged groups. Though the basic priorities of urban poor are revolving with survival, security and quality of life (Loughhead and Mittal 2000) but no policies considered these aspects in a common platform, there are no plans for the slum area where equity for the slum people have been considered. In spite of many efforts have been taken by the national, state and local government the pace of slum growth yet not in control neither the livelihood came up. The planning and policies could not arrest the pandemonium and dilapidated living and livelihood in slums. Such a failure may arise from faulty planning tool and also may come from traditional 'top-down' approach of planning, even in many city level planning in India this planning process has been followed, for example in Chandigarh city Chandigarh Administration through Chandigarh Housing (CHB) followed the same principle (Teotia 2015). Top-down planning approach result many shortcomings as follows;

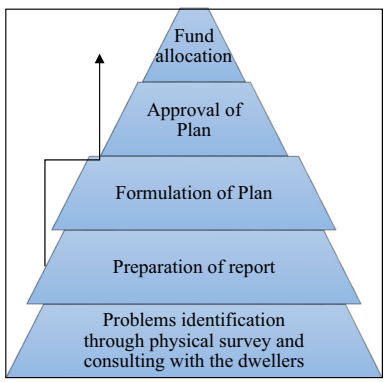

Fig. 3 Step 1 for planning formulation

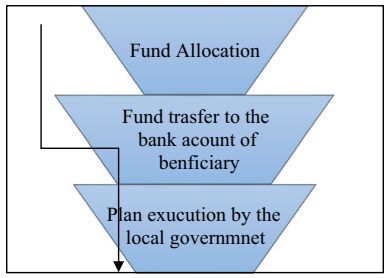

Fig. 4 Step 2 for planning formulation

1. In this planning approach, the different level of stakeholder involvement, where a chance of mismanagement is inherent.
2. Fund transfer through different level of governance results in delaying the execution time.
3. Lack of public awareness at grass root level regarding different policies implemented through a top-down approach.
4. This approach does not assure the people participation, therefore equity and transparency.
5. Political interfere is another negative aspect of this approach.

The failure of top-down planning approach can be accessed through the review of one slum policies. For example in case of Swarna Jayanti Sahari Rojgar Yojana (SJSRY), Ministry of Housing and Urban Poverty Alleviation (M/o HUPA) prepared two reports on the progress of SJSRY, the first one was on general evaluation of SJSRY across the country and the second one was on a simultaneous evaluation of SJSRY over different states. In these two report different shortcoming of this programme were focussed like lack of awareness about the scheme among people, lack of implementing official, Bank's reluctant to a sanctioned loan for micro-enterprise under this scheme. After that evaluation, the scheme revised for the first time in 2009. Besides, SJSRY deviated from its objective in providing unskilled training to urban poor for employment generation. Another main problem of the scheme is related to the insufficiency of the financial assistance for self-employment venture (Planning Commission 2011).

Right approach of planning the slums as alternative to early practice

In such a chaos circumstances the livelihood up-gradation in slums can be achieved through a diagnostic planning model with 'bottom-up' approach (as figures in following flow chart Figs. 3 and 4).

For the removal of slum problems, government should follow the mentioned steps (Step 1 and step 2) where problems of slums must be addressed first through physical survey and consultation with the dwellers followed by successive steps i.e. in the first steps, plan formulation for individual slum area, after considering different aspects approval of plan followed by the allocation of the fund by concern authority. In the second stage, after the allocation of the fund, the concerned authority should conscious to provide the allocated fund to the beneficiaries bank account followed by the implementation of the plan under the supervision of local authority. At the same, time government should ensure that there will be no seepage of the fund in the time of execution and the benefit should directly reach to the slum dwellers (as proposed in the second stage). For the overall up-gradation of slum livelihood a comprehensive planning approach must be introduced where all aspects for healthy living will be considered (e.g. Food, clothing, habitat as well as employment opportunity). At the same time, education and awareness among slum dwellers are foremost instruments that can scratch all sorts of complications in enjoying better livelihood the same as non-slum people. Government of all levels must take care of proper implementation, execution, monitoring and assessment of the effectiveness of existing plans, programs and policies. The issues of slum problems and development must be an integral part of the urban planning for the city development.

Conclusions

In India dynamics of the slum is quite unpredictable as few states are observed with a low percentage of slum population in 2001 but relatively higher shares in 2011. At the same time, few other states show declining of slum population because of the adoption of the slum development policies. The study reveals an affirmative corroboration of the pace of unplanned urbanization and slum growth. Slum management, as well as up-gradation is a precondition of achievement of overall urban development. Such can be done through the up-gradation of the livelihood status of slum households from the grass-root level. Though many slum development policies have been implemented in India the problems of slum yet not solved, nor touches the reality of slums. In nutshell, it can be argued that there is no single panacea to bleach the slum problem of cities. Indeed, the holistic approach of planning may serve as a rescue to the graveyard condition of slums. An integrated plan for each and every individual slum unit have to be formulated separately since problems of each slum is not identical neither treatment should be common. Until and unless the slum dwellers can be brought in the common platforms with others urban dwellers by ensuring their earning, good living habitat as well as social status, the problems of slum cannot be overcome.

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