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MEASUREMENT BRIEF 2024

NDIC FELLOWS PROGRAMME

Making Sense of Slum Statistics in the National Sample Survey (NSS)

DIBYENDU BISWAS

Overview and Measurement Challenge

In the National Sample Survey (NSS) 76th Round data on basic services (2018), 7 per cent of urban households were reported as 'slum' dwellers[1], which increased to 17 per cent in the NSS 78th Round on the Multiple Indicator Survey (2020). One wonders how the share of slum dwellers more than doubled in just two years! Any attempt to assess the inclusivity of urbanisation in India is frustrated by a lack of adequate data or consistency across datasets. In fact, estimates from different NSS Rounds are not strictly comparable. For instance, 17 per cent of urban households were categorised as slum households in Census 2011, whereas in the 69th NSS Round of 2012, 12 per cent were designated as slum households in India[2]. Given that slum dwellers are generally underrepresented in official statistics, attempts should be made to use innovative methods on the available data to produce more reasonable estimates. Earlier studies employing household-level and neighbourhood-centric measurements of slums using different data sources such as National Family Health Survey (NFHS) and micro-census data to identify slum households document inconsistencies in slum statistics in India (Mahabir et al., 2018; Nolan, 2015; Patel, 2014; Patel et al., 2020). This present study attempts to reclassify urban households by applying alternative definitions of 'slums' using six NSS Rounds from 1993 to 2020 and tries to rectify slum figures reported in NSS.

Existing studies have chosen either household-level or neighbourhood-centric deprivations in basic amenities to identify slums (Lilford et al., 2019; Thomson et al., 2020). Following the household-level approach to accommodate Millennium Development Goals (MDGs) and their successor Sustainable Development Goals (SDGs), UN-Habitat (2002, 2003) defines a slum household as one that lacks access to any (or more) of five specified elements: access to adequate drinking water, sanitation, living space, poor structural quality of housing structure, and secured tenure of a dwelling unit. Such a household-based identification

KEY RESULTS

- **Underrepresentation of slums in NSS**
  Our results reveal the underrepresentation of slum households in the NSS datasets using both household-centric and neighbourhood-centric measurements of slums. Over time, the share of slum households decreased gradually in India, unlike the fluctuating pattern in NSS reports.
- **India has a similar level of slum household share as Sub-Saharan countries**
  Following the UN-Habitat household-level measurement of slums, our results reveal that in 2018 India had a similar proportion of slum households (56%) as Sub-Saharan African countries.
- **Poorer states report higher slum household share**
  Official statistics indicate that poorer states report a lower share of slum households than relatively better-off states (Census, 2011; Planning Commission, 2013). Our study, using alternative definitions, shows the reverse: poorer states have a higher share of slum households than better-off states.
- **Intersection of household and neighbourhood-centric slum measurements**
  Making an intersection between household-level and neighbourhood-centric slum measurements, we find that 9% of 'slum' households are located in deprived neighbourhoods, whereas 7% of 'slum' households are located in non-deprived neighbourhoods.

1 For a general discussion of the etymological connotations of slums, refer to Mayne (2017).

2 These two government agencies do not follow the same definition of slums. As per the NSS categorisation, slums could of two types: 'notified' and 'non-notified'. Apart from government-recognised 'notified' slums, a deprived area with at least 20 households could be called a 'non-notified' slum (officially unrecognised slums). On the other hand, the Census of India identifies three types of slums: 'notified', 'recognized' and 'identified'. Apart from the first two categories with some legal recognition, the Census of India identifies a locality as an 'identified slum' (officially non-recognised) with at least 300 residents or about 60-70 households. Thus, these two government agencies vary in identifying officially non-recognised slums. Though the NSS definition of slum seems to be more inclusive (with a lower level of threshold than the Census adheres to), the share of slum households remained lower than in the Census.

strategy reminds us of the much-discussed Multidimensional Poverty Index. In a neighbourhood-centric classification of slums, a locality/area having deprived households in terms of several indicators (e.g., poor physical appearance and hygiene conditions, absence of basic amenities, or overcrowding) is considered a slum. In India, both the Census and NSS follow this neighbourhood approach to identify slums. In this study, we use both approaches to identify slums in India using NSS data and attempt to figure out inconsistencies, if any.

Data and Methods

Data Sources

We used six successive NSS Rounds on Basic Services, i.e., the 49th (1993), 58th (2002), 65th (2009), 69th (2012), and 76th Rounds (2018), and the 78th Multiple Indicator Survey Round (MIS) (2020), which carry information on slums covering the entire post-reform era. Within the stratified multi-stage survey framework of NSS, all urban households within a district are primarily accommodated into a basic 'urban stratum'. First Stage Units (FSUs), i.e., enumeration blocks, are then selected within each stratum. Usually, eight/ten households from each FSU are sampled as the ultimate stage units. Multiple FSUs from metropolitan cities are surveyed, whereas one FSU is chosen from each non-metropolitan town (with population not exceeding one million).

Selection of indicators

We used the UN-Habitation (2003) characterization of slum households discussed above. However, due to unavailability, land tenure related information could not be incorporated in this study. The motivation behind the selection of these indicators is shown in Table 1. In the 78th MIS Round, housing density and housing structure related information are not available. Further, following Patel et al., (2020), we incorporated two additional indicators, i.e., the availability of bathroom and kitchen, to make the modified slum index.

Table 1: Selection of Indicators

Rationale	Indicator	Source
Durable housing	Pucca House	UN-Habitat
Sufficient living space	Not more than three people sharing a room	UN-Habitat
Access to safe water	Tap water availability	UN-Habitat
Access to sanitation	Availability of latrine	UN-Habitat
Separate kitchen	Indoor pollution	Patel et al., 2020
Access to a bathroom	Living standard indicator	Patel et al., 2021

Slum Classification Methods

Neighbourhood Approach

Previous studies have used Primary Stage Unit (PSU) information in different Demographic Health Survey (DHS) datasets across the globe and in India to identify 'slums' adopting the neighbourhood approach (Fink et al., 2014; Nolan, 2015). Following a similar approach, an FSU in the NSS datasets could be reclassified as a 'slum' if at least half (or more) of the households in an FSU do not have access to one or more of the selected basic amenities[3], viz., drinking water, sanitation, housing structure, and household density (more than three members per room), as proposed by UN-Habitat[4]. In our case, the first five Rounds carry this information and we followed a similar method. Since the 78th MIS Round (2020) did not collect information on household density and housing structure, we developed a Modified Slum Index (MSI) to make this round comparable with the previous five rounds, including two additional indicators: a separate kitchen and access to a bathroom. We classified an FSU as a slum if half the surveyed households do

3 The UN-Habitat identification of slums uses deprivation in one indicator. However, in developing countries, where deprivation of basic amenities is rampant, a single indicator characterising slum households will lead to a whopping amount of the slum-residing population. Hence, along with a one indicator deprivation criterion, we also use deprivation in at least two indicators of the slum identification strategy (Nolan, 2015).

4 It excludes tenancy rights for which data is unavailable and hard to measure in developing countries.

not have access to one or more selected indicators or two-thirds do not have two or more selected indicators (Fink et al., 2014).

1. **Unplanned Settlement Index (USI)[5]:**
   a. USI - Two Indicators Deprivation
      i. One-half households deprived
      ii. Two-third households deprived
   b. USI - One Indicator Deprivation
      i. One-half households deprived
      ii. Two-third households deprived

2. **Modified Slum Index (MSI):**
   a. MSI - Two Indicators Deprivation
      i. One-half households deprived
      ii. Two-third households deprived
   b. MSI - One Indicator Deprivation
      i. One-half households deprived
      ii. Two-third households deprived

Household Approach

Following the USI approach, a household can be labelled a slum if it lacks one of the above basic services. In a less restrictive manner, we also used deprivation as a criterion in at least two indicators among four chosen indicators. Similarly, for the MSI household-level slum identification, we considered deprivation in one and two indicators in the four selected basic amenities discussed above.

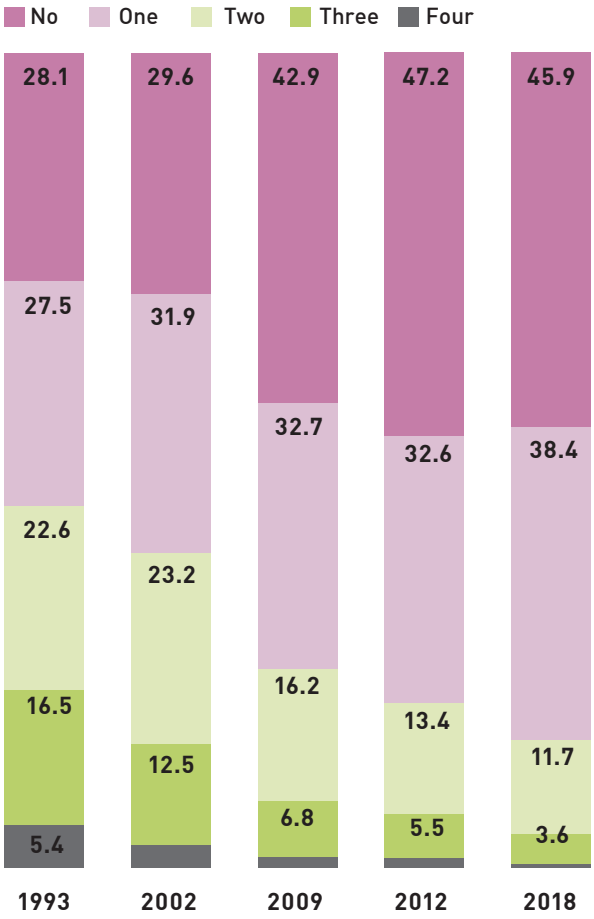
3. **USI at household level:**
   i. One Indicator Deprivation
   ii. Two Indicator Deprivation

4. **MSI at household level:**
   i. One Indicator Deprivation
   ii. Two Indicator Deprivation

Results

Figure 1 shows substantial expansions in the availability of basic services over time. The share of households with joint deprivations on four selected indicators has come down considerably in urban India. However, one in every seven households was deprived of two or more

Figure 1: Share of households as Per Number of Joint Deprivations (UN-Habitat Definition)



Source: NSS 49th, 58th, 65th, 69th, and 76th Rounds

(out of four) basic amenities in 2018. The availability of basic amenities expanded at a greater pace between 2002 and 2009 than between 2012 and 2018.

Neighbourhood-centric Approach

When considering deprivation on at least one indicator, both the USI and the MSI yield similar results. By these measures, four in five urban households in 1993 and three-fifths in 2018 could be classified as 'slums'. The MSI data further indicates a decline in the proportion of slum households to 54% in 2020 (USI estimates are not available for this year). A less restrictive definition of a slum, where at least two-third of households in an FSU lack more than one amenity,

5 Used by the UN-Habitat.

Table 2: Share of Slum Households by One Indicator Deprivation at Neighbourhood Level

		Share of Households in FSUs (%)					
		1993	2002	2009	2012	2018	2020
USI	Half of households deprived	77.0	79.6	66.8	59.1	56.5	
	2/3rd of households deprived	57.4	54.4	42.2	37.8	38.5	
MSI	Half of households deprived	79.3	75.9	67.0	59.8	58.1	54.4
	2/3rd of households deprived	60.8	53.0	45.1	42.1	42.0	39.5

Table 3: Share of Slum Households by Two Indicator Deprivation at Neighbourhood Level

		Share of Households in FSUs (%)					
		1993	2002	2009	2012	2018	2020
USI	Half of households deprived	42.7	38.2	25.0	21.0	12.4	
	2/3rd of households deprived	24.9	15.3	10.2	8.9	5.8	
MSI	Half of households deprived	52.8	49.1	32.6	27.7	18.8	20.1
	2/3rd of households deprived	34.7	24.0	16.0	11.7	10.0	10.8

Table 4: Share of Slum Households at the Household Level

	Share of Households (%)					
	1993	2002	2009	2012	2018	2020
One or More Deprivation						
USI	71.9	70.4	57.1	52.8	54.1	
MSI	73.2	68.2	59.1	54	55.7	54.8
Two or More Deprivations						
USI	44.4	38.5	24.4	20.2	15.8	
MSI	51	46.3	30.5	25.2	20.4	24.9

classified three-fifths of households as slums in 1993, decreasing to 40% in 2018 (Table 2).

As expected, at the aggregate level, deprivation on at least two amenities shows a lower share of slum households than the previous criterion of deprivation on one indicator (Table 3).

Considering deprivation in two or more indicators, the MSI produces a higher share of slum households than the USI measurement. Following USI, if half the households in an FSU do not have access to two or more selected basic amenities, 43% of urban households could be labelled a slum in 1993. Applying the same criterion, if we follow the MSI, a little over half of the urban households could be called slum households. In 2018, 12% and 19% of the households could be labelled as slum dwelling households using USI and MSI definitions, respectively. A slight increase can be noticed in slum households between 2018 and 2020 in the MSI measurement.

Household-centric Approach

Similar to our earlier findings, when we consider at least one deprivation in the household to define a slum, both MSI and USI show similar results (Table 4). More than

70% of the households could be categorised as slum households using both USI and MSI in 1993, which fell to around 60% in 2009. When we consider deprivation in at least two amenities, the USI definition shows a lower slum share than MSI throughout the study period. The MSI estimates show that the share of slum households fell to 30 per cent in 2009 from 46 per cent in 2002. However, following the same definition, we see that the share of slum households increased to 25 per cent in 2020 from 20 per cent in 2018.

No matter which definition we follow, our results reveal a lower representation of slum households in the NSS datasets over time. All these estimates show that the share of slum households decreased gradually over time, contrary to the fluctuating shares of slum households reported in the NSS surveys. Using all these alternative definitions of slums and following both the neighbourhood and household criteria in identifying slums, we observe that slum reduction was faster during the first decade of this century than in the second decade.

Multiple reasons could contribute to this slowdown in the growth of slums:

- First, Indian urbanisation in recent times has primarily been fuelled by the emergence of smaller towns, often called 'subaltern urbanisation' (Denis et al., 2012). These towns are primarily characterised by a lower level of basic amenities compared to bigger cities. If the underserved and deprived households of smaller towns are integrated into the urban areas, the share of slum households might go up. This could lead to stickiness in the share or number of slum population in the 2010s. However, further investigation is warranted.

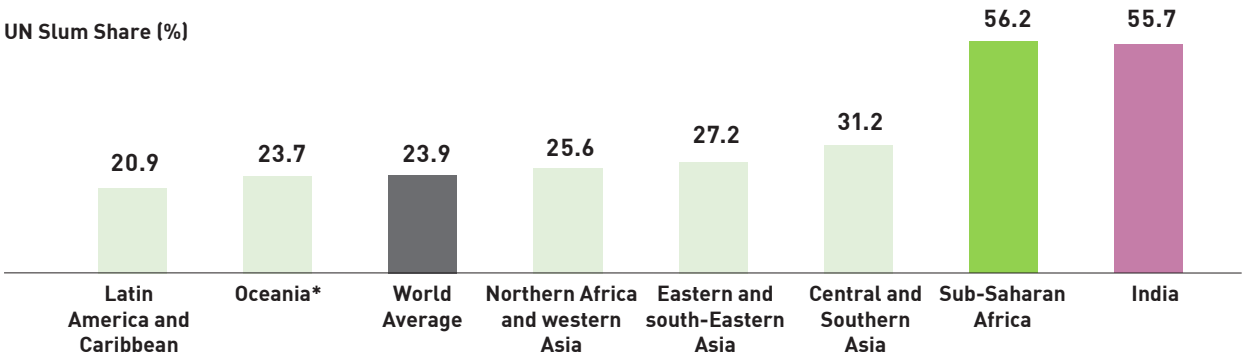
- Second, there is an upper limit to the coverage of all basic amenities. Availability of basic amenities cannot go beyond 100% when all households are covered. Following Sen (1987) and Kakwani (1993), it could be argued that at a higher level of coverage, it is more difficult to cover a new unserved area/ population as it takes much more effort to *improve* further than at a lower level of coverage. This might be another reason why slum share has not declined, especially in metropolitan cities where coverage of basic amenities is higher than in smaller towns.

- Third, an increase in the share of deprived households in one or more amenities might slow down the fall in the share/number of the slum population. For example, the availability of drinking water fell to 35 per cent in 2018 from 26 per cent in 2012[6]. As instance, if we follow the USI one indicator deprivation of slum household by only looking at the availability of drinking water, the share of slum households would have gone up by 9 per cent from 2012 to 2018.

Research Design Lessons

To put our results in perspective, we compare our results with the proportion of slum households in urban

Figure 2: Proportion of the Urban Population Living in Slums in Selected Regions and India, 2018 (UN Household Centric Approach#)



Source: https://unstats.un.org/sdgs/report/2021/goal-11/ and own calculation, #Apart from Land Right information in India.

6 The Economic Survey 2020-21 also reported this issue.

Figure 3: Official Urban Poverty Rate 2011-12 (Tendulkar Committee) vs. Slum Household Share in 69th NSS Round (2012), By States

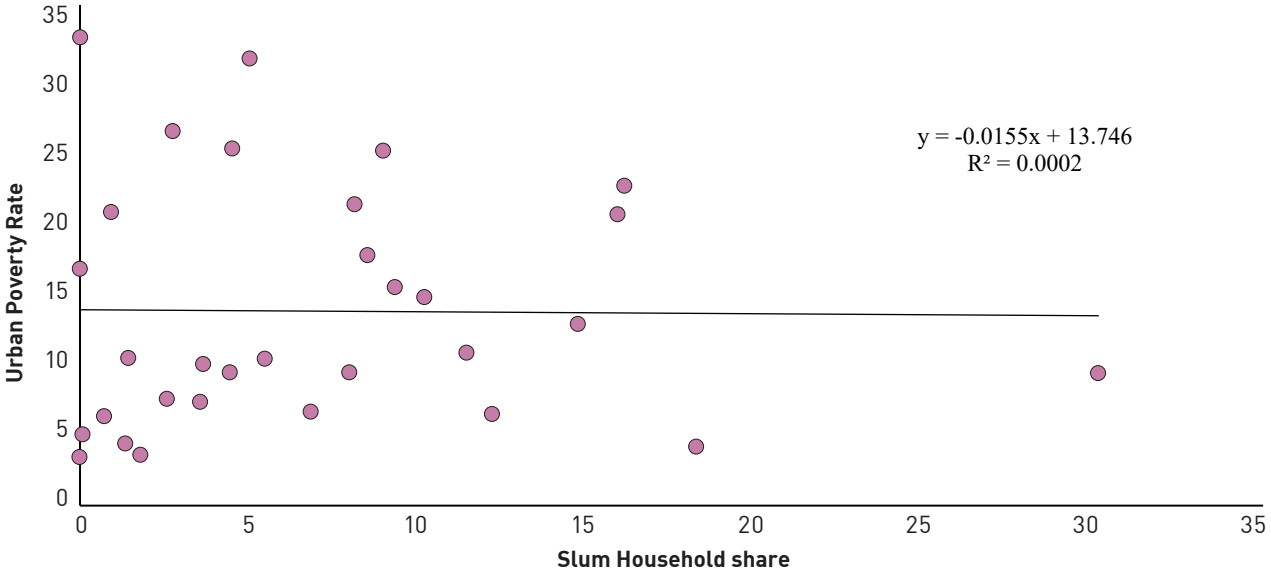
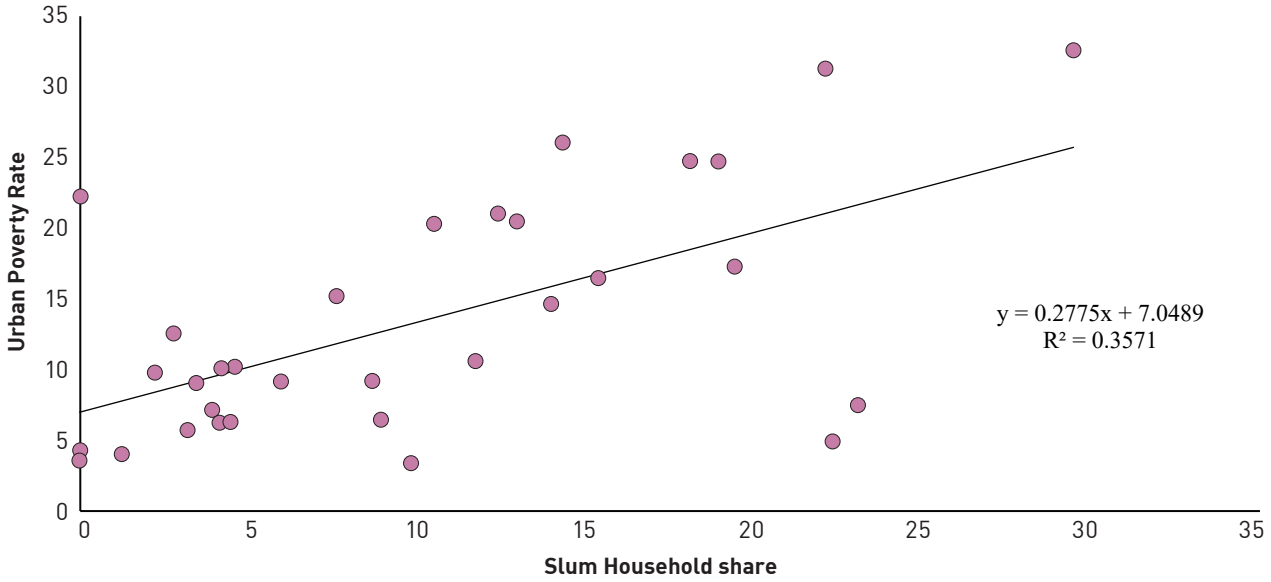


Figure 4: Official Urban Poverty Rate 2011-12 vs. UN Habitat Slum Definition of Half of the Households Deprived Two or More Indicators in a Neighborhood in 2012, Across States



areas across global mega regions using the original UN-Habitat definition. India and Sub-Saharan African countries had a similar share of slum households, more than half, in 2018, far more than other regions[7] (Figure 2 on Page 6).

In India, poorer states[8] report a lower share of the slum population than relatively better-off states, even though the poorer states also have much lower coverage of basic amenities. This is shown in Figure 3, which counter-intuitively shows a weak negative association between the share of the slum population reported in the 69th NSS Round (2012) and the official urban poverty rate in 2011-12 across states. However, once we use the USI definition of half the households in a neighbourhood being deprived in at least two indicators to assess the relationship between urban poverty rate and slum share (Figure 4), a stronger positive

7 Data on land rights in India are not available; otherwise, the share of slums would probably have been higher than in Sub-Saharan countries.

8 In Bihar, the poorest state of India, the share of slum households to the total urban household was only 1.6%, whereas the national average was ten times higher in 2011 (Census, 2011).

association is portrayed, clarifying the underrepresentation problem in NSS data sets; a similar exercise for Census slum figures draws the same conclusions. This method of slum identification shows a higher share of slum households in poorer states than reported in NSS or Census datasets.

Concluding Remarks

This study uses both household and neighbourhood-centric alternative classifications of slums that are dominant in the research literature to unearth the underrepresentation of slum households reported by the NSS. The normative standpoints behind these two types of slum characterisation contradict or supplement each other depending on the methodology used. Instead of this competitive characterisation that relies on constitutive plurality[9], we make an intersection of these two strands of slum identifications (at household and neighbourhood level) to identify and prioritise deprived households that could be pragmatically helpful in geographical targeting of urban poverty. Making this intersection of neighbourhood and household-centric classifications of slums, we get four types of households:

i. Non-"slum" households in non-deprived neighbourhoods

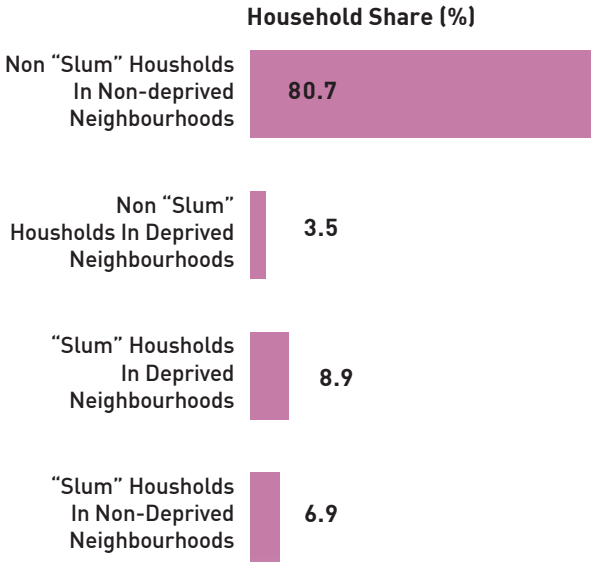
ii. Non-"slum" households in deprived neighbourhoods

iii. "Slum" households in deprived neighbourhoods

iv. "Slum" households in non-deprived neighbourhoods

In 2018, Figure 5 shows that 9% of the total urban households fell into the worst category of "slum" households in deprived neighbourhoods (deprived in both categorisations) and should be prioritised on the basis of the (vertical) equity principle. On the other hand, 7% of the households could be categorised as "slum" households in non-deprived neighbourhoods.

Figure 5: Intersection of Neighbourhood and Household-Centric Approaches Identifying Slum households in 2018



Based on the logic of geographical targeting of poverty, slum redevelopment policies from an equity-sensitive standpoint consider deprived neighbourhoods (in India, slum is defined only at the neighbourhood level). Thus, deprived households in non-deprived or less deprived neighbourhoods always remain at the risk of exclusion from slum redevelopment policies because their neighbourhoods are not considered deprived.

Policy Relevance

Identification of slums is fraught with methodological problems and lack of adequate data has made it even worse. There is good reason to believe that slum households are underrepresented in NSS datasets throughout the post-reform period in India. We have shown how certain adjustments could help us understand the extent of slum households and changes therein. From the policy point of view, viewing slums as the concentration of deprivation within urban areas is a fruitful way of thinking about anti-poverty policies. Our study shows that there is a need to go beyond the percentages of slum households in urban households as provided by the NSS datasets.

9 Constitutive plurality supplements different normative standpoints instead of supplanting each other, as in the case of competitive plurality.

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