IIHS WORKING PAPERS IN HOUSING POLICY AND PRACTICE

Isn't there enough Land?
Spatial Assessments of 'Slums' in New Delhi

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INDIAN INSTITUTE FOR
HUMAN SETTLEMENTS

Introduction

In *Maloy Krishna Dhar,* one of the many public interest litigations in the 2000s that led to the eviction of a JJ Cluster[1] in New Delhi, the judgment paints a picture of the common sense around "slums" in Delhi.[2] The Court had ordered eviction, and said that authorities need not even wait until alternative resettlement had been arranged for residents. They argued that the land has 'uses that cannot be denied'; that the more settlements are removed, the 'more they come'; that 'their' numbers were 'growing and growing', and that steps must be taken to 'deal with the problem'. This narrative – large, growing numbers of the urban poor that have encroached upon swathes of well-located land in the city—has become a kind of common sense, reflected everywhere from public opinion to legal judgments and media reports. Is it, however, true? No data – public or otherwise – is cited or offered as the basis of this impression of large scale spatial footprint of JJ Clusters in Delhi.[3]

This paper directly addresses this gap. It measures the extent of land under JJ Clusters in New Delhi. As such, it can appear as a familiar exercise in urban practice: the use of geo-spatial techniques to estimate land area under a particular type of housing. Yet this exercise is anything but technical. The JJ cluster is a form of housing built in tension with formal logics of property, planning, and labour. It is, to use the Latin American term, *auto-constructed* (Caldeira 2017).

Auto-constructed settlements are often self-built, incrementally over years— one brick, one pipe, one wall at a time— as generations seek to actualize a right to the city. Their residents are workers that manage, run and build our cities, and do so usually without recognition. The built environment of these settlements generally reflects the income-poverty of the residents though it is equally a testament to the slow accretion of dignity, development and infrastructure promised but undelivered by the state. Legally, however, these settlements are often erased of this living history and reduced to questions of formal title and land ownership. Against a claim to land through its use, tags of "illegality" and "encroachment" reduce their citizenship to narrow considerations of property and the legal ownership of title, erasing the history of state failure to provide options for legal adequate and affordable housing.[4]

Historically, this was not always so in cities like Delhi that have been long used to the informal and people-led production of all urban space, including and beyond the space of the JJ Cluster. The claim of the informal settlement to the city has always oscillated between being both recognized and denied by the state. Recognition has meant different things at different times: regularization and giving different forms of tenure security, the delivery of formal public services, and the acknowledgment of years of residence as the right to at least use, if not own, land. Its denial has been harsher, leading to accusations of

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[1] The terms used to describe the homes of the workers tell us a lot about how we value them. In this paper, we confine ourselves to JJ Cluster, the term used by the Delhi Urban Shelter Improvement Board. We use the term "slum" only in quotations to indicate its difficult and complex history.

[2] Maloy Krishna Dhar vs Government of National Capital Territory of Delhi, CWP 6160 of 2003.

[3] If readers of this essay will be part of a thought experiment, then we ask you at this point to pause and

imagine: how much land do you think is occupied by the approximately 757 JJ Clusters marked and listed by the Delhi Urban Shelter Improvement Board (DUSIB)? You can then assess this perception gap for yourself.

[4] It is important, however, to note that informal production of space is not just a domain of the "poor" but equally of the elite, marked visibly in Delhi by the range of unauthorised colonies, peri-urban developments, as well as violations of the Master Plan through commercial use and exceeding building norms.

'encroachment' – even after decades of settlement –that have become the basis of systemic evictions that have scarred and transformed millennial Delhi. Cycles of recognition and denial have made the JJ Cluster as much a site for contestations of citizenship as a spatial form and planning category.

There is, in other words, a reason that we don't know how much land is under JJ Clusters in the city. Auto-constructed settlements constantly must calibrate how visible they are to the city, to each other and to the state. Too much visibility brings the risk of eviction, yet too little loses the possibility of much needed public investment in services, infrastructure and social security. The terms of this visibility matter equally: who decides on when, and to what extent, a JJ Cluster becomes visible to the state? Research on estimating land area under JJ Clusters at a city level must directly confront this question, remembering that the data itself is ethically unrooted. The same data can be used towards either end of the recognition-denial spectrum we described earlier. How then must researchers proceed with such analyses? Should they, at all?

Researchers have mostly erred on the side of caution, recognizing and respecting the need for tacitness for the survival of auto-construction. Yet the broader context of this question has changed significantly in the last ten years. Two shifts are critical to note. When the Rajiv Awaas Yojana (RAY) began as part of India's "urban turn" and the announcement of the Jawaharlal Nehru Urban Renewal Mission (JNNURM), one of its key techniques was the production of a Slum Free City Plan for Action. Under this

Plan, cities were to undertake a city wide survey that measured *all* slums in the city. This was to be produced as a geo-spatial map, showing location, boundaries, extent, and be the basis for household surveys. Since RAY, all metropolitan cities in India – Delhi included- have thus produced city wide geo-spatial maps as well as a tabular list of all JJ Clusters in the city. In Delhi, the map and this list sit with the Delhi Urban Shelter Improvement Board (DUSIB). National urban schemes following RAY, such as the Pradhan Mantri Awaas Yojana (PMAY), have consolidated and expanded these geo-spatial maps. The state, in other words, has produced this information, wielding this data for policy and practice. When this research started in Delhi, the list was available publicly but the map, crucially, was not.

The state's production of geo-spatial maps changes the context in which the question of visibility amidst auto-construction must be asked. Settlements are no longer as in control of how visible they wish to be to the state as they used to be. The tacit agreement that defined Delhi's urbanism where the state looked but not too closely, and the JJ Cluster made claims but not too deeply, has shifted. Now, the use of satellite imagery and ground surveys have made being visible to the state a pre-condition of politics, or at the very least its boundary condition that must be negotiated. With the advent of the new DUSIB policy in 2015 in Delhi, in particular, a new conjuncture is in place: settlements not on the list, and not on the map, risk erasure. They cannot make claims to in-situ redevelopment or upgradation programmes, they risk being ineligible for housing policies, and they lose the right to seek rehabilitation in case of eviction.[5] Visibility has become essential at a time of

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[5] Recent court judgments, especially Ajay Maken vs Union of India (W.P.(C) 11616/2015), have further reinforced the importance of the DUSIB 2015 policy by asking DDA to follow its mandates even if the JJ Cluster

is on DDA land. Presence in the DUSIB list therefore continues to gain importance as an entry into governance.

technological governance that seeks to create and reproduce universal knowledge about JJ Clusters in the city.

Within this new governance regime, many residents of informal settlements have begun insisting that they be put on the government's lists even while knowing its dangers. A newer question of control and accuracy of the information has emerged as a vital political and technical challenge to establish legitimacy. Inaccessible but existing spatial maps have created an imbalance in power specifically through the creation of a new kind of information asymmetry. Public data not available to the public evades accountability by denying transparency. New challenges arise: how does one contest the accuracy of this map, insist on the terms of its publicness, gain the ability to confirm and contest it, and, most importantly, exercise control over its interpretation and use to promote rather than deny the right to the city for residents? It was this shift that compelled us to create a map of auto-constructed settlements in the city, at least of the settlements that were already named in the DUSIB lists. If the government had this data but would not share it, then we believed it was necessary to create a publicly available map that would break such an information asymmetry.

Recently, DUSIB has released a geographical map of slum locations. The data is therefore now public from the state itself. The role of our own research has thus shifted through its own process. In what follows, we compare our own findings with those of DUSIB. We do so arguing that, within the new policy paradigm, the more public the data the more transparency and accountability can be created. We also write to position the

way in which this data must be read and interpreted, and the normative and constitutional roots that such interpretation must be located within. We return to these in the conclusion. For now, we describe our methods, and present a consolidated map, as well as comparative tables that helps us understand the spatial geography of JJ Clusters in Delhi.

Methods and Data

To both use and affirm the DUSIB list, we combined lists of JJ Clusters from the Food and Civil Supplies department, the Delhi Urban Shelter Improvement Board, and the Delhi Development Authority.[6] These lists were used to ascertain JJ Cluster locations and names and used to compare with the DUSIB list. In this paper, we limit our findings to settlements that were on the DUSIB list as well, noting here, however, that there are a number of existing settlements that the list does not include. DUSIB had 675 sites on its first list, and added a further 82, taking its total to 757. A team of three of the authors visited each site. Of the 757 sites, they found only 679 standing as of October 2019. The rest have been evicted and/or resettled since their name was put in the DUSIB list. This then is our first finding – the cycle of evictions in Delhi continues unabated, and arguably is deepening.

In each of the 657 existing sites, boundaries of the JJ Cluster were then verified using GPS co-ordinates, thus enabling a calculation of area under "slums" instead of just having a map that used point locations. Here, a second consideration emerged. What is the boundary of a JJ Cluster: is it the edge of the built environment? Does it include any open or unbuilt space beyond the last built structure, especially the open space

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[6] Details of the sources are available in Bhan (2013) and Dupont (2008).

found usually between the edge of built units and nearby features such as a drain, railway track, formal housing, or even just a wall? The estimation of boundaries by physical visits to the site that limit themselves to the built-up area may thus underestimate the area under slums marginally. We do not imagine this difference to be significant since most JJ Clusters are bounded by other built form that make their edges clear. Google Earth images have been used to demarcate areas and share the limitations to analysis based on such spatial resolution.

When the DUSIB geo-spatial map was made available, we were able to compare both the spatial datasets i.e. spatial mapping by DUSIB and IIHS. The DUSIB map was assessed through the longitude and latitude information of each node and accordingly, polygons were re-built to calculate the spatial extent of particular clusters. During this exercise, we must note that we found multiple errors in the DUSIB map. Polygons used to measure area often had little relation to the JJ Cluster built up area, some were simply on empty land at a different location, and boundaries often did not align with the JJ Cluster's built-up area. We were, however, able to compare the boundaries drawn by IIHS researchers and DUSIB surveyors for a set of JJ Clusters that did not have errors in them. This allowed us an imperfect but necessary measure of our challenge noted above: do the boundaries of the Cluster extend beyond the built-up area, and if so, by what measure? Comparing a random sample of sixteen settlements, we found a 9% net variation with DUSIB area measures being larger than IIHS measures by including unbuilt land area around the JJ Cluster within its boundaries. This is the basis of what we are describing as the Adjusted IIHS Survey Area, as reported in Table One.

Finally, in order to compare area under JJ Clusters under all area zoned residential under the Delhi Master Plan 2021, one of the authors geo-referenced the land use plan 2021 and vectorised the residential use to calculate the area, which came to 249.6 sq. km. The final map and the area calculations are presented below.

Figure 1 Area under JJ Clusters in New Delhi
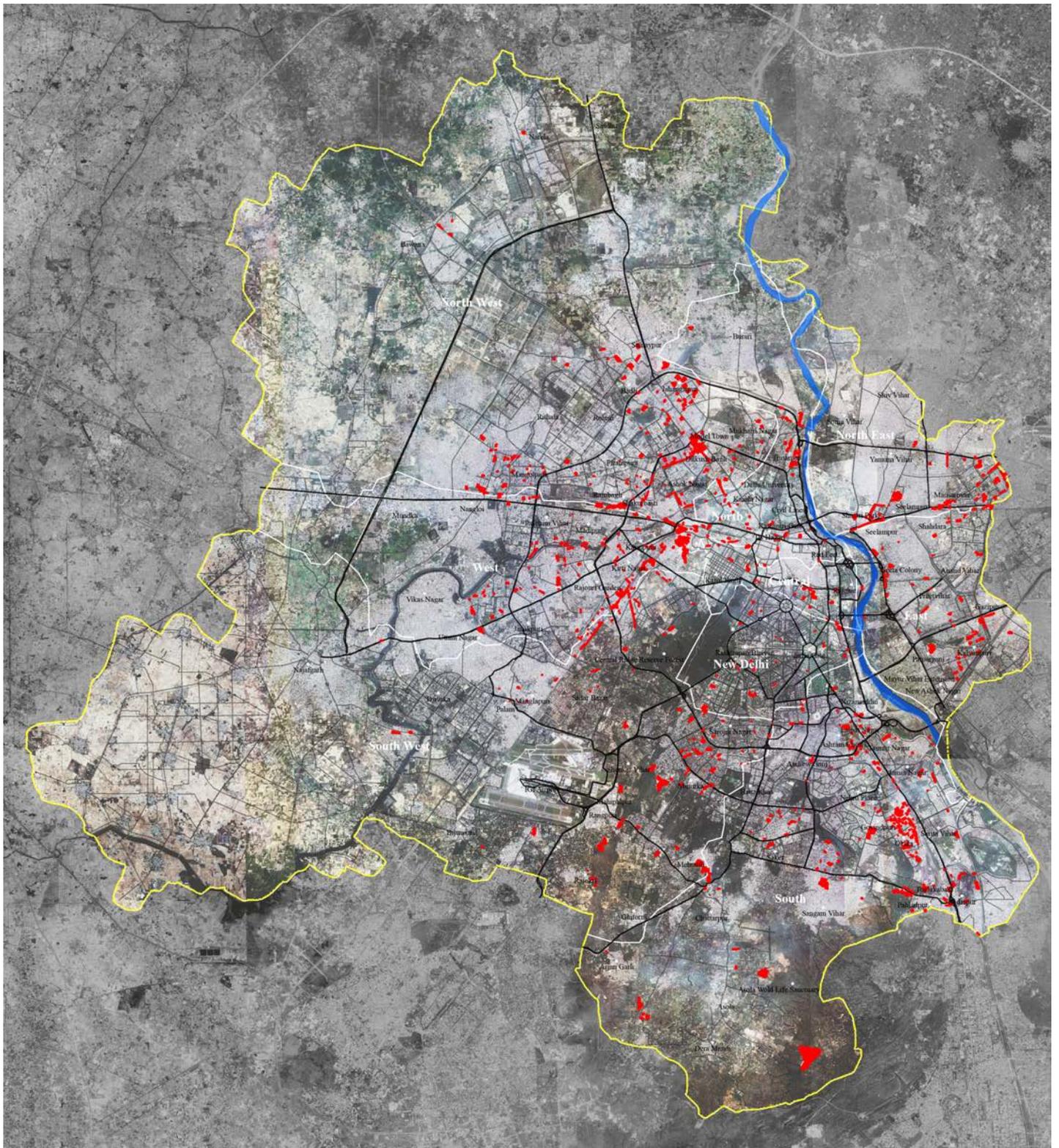
Legend

Area Under Slums

Districts of Delhi

National Capital Territory of Delhi

Major Roads

Yamuna River

0 1 2   4   6
Kilometers
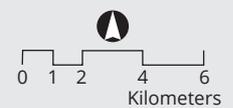
Table 1 Land Area under JJ Clusters in New Delhi

Key Figures	IIHS Survey (n=679)	IIHS Survey Adjusted (n=679)	DUSIB List (n= 757)	DUSIB Map (n= 752)
Total area of the National Capital Region of Delhi	1486 sq. km	1486 sq. km	1486 sq. km	1486 sq. km
Area zoned residential under Delhi Master Plan 2021	249.6 sq. km	249.6 sq. km	249.6 sq. km	249.6 sq. km
Area under JJ Clusters	6.93 sq. km	7.55 sq. km	8.44 sq. km	6.92 sq. km
Total JJ Cluster area relative to area zoned as residential	2.8%	3%	3.4%	2.7%
Total JJ Cluster area relative to total area of National Capital Territory of Delhi	0.5%	0.5%	0.6%	0.5%
Total JJ Cluster population as percentage of total households in NCT Delhi	11-15%[7]	11-15%	11-15%	11-15%

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[7] The numbers of existing slum populations are notoriously hard to measure. The Slum listing tables of the 2011 Census place population in JJ Clusters at 15% of Delhi's population, while the Delhi Economic Survey 2018-19 uses DUSIB data to estimate it at 11%. Yet Bhan and Jana (2013) have cautioned against these estimates that use a different definition of slum (60-100 households) as opposed to NSS surveys and others that use 20 households. Studies based on the NSS 69th Round (2012) thus place the estimates much higher, closer to 30%. See: Government of National Capital Territory of Delhi (2015).

On plain reading, some things are clear. Despite the language of "encroachment," and the sense of wide spread land grab, JJ clusters occupy a minute portion of land in the city – no more than 0.6% of total land area, and no more than 3.4% of land zoned residential in the 2021 Delhi Master Plan. The difference between IIHS and DUSIB data is minimal, and it is important to recognize that even if there were significant errors, the order of magnitude of the numbers is unlikely to change. A 30% under-estimation of the adjusted IIHS figures, for example, would increase the area under JJ Clusters to only 8.93 sq. km, or 0.6% of total area and 3.5% of residential area.

It is this very small percentage of land that supports no less than 11-15% but possibly up to 30% of the city's population.[8] Let us take one example to drive home how skewed this number is. In 2017, New Delhi had 31.72 lakh cars. Models made that year have an average size of 45 sq. ft. In other words, to park these cars, you need 13.25 sq. km of land, which is nearly 5% of all residential area. In the capital city of the world's largest democracy, cars have more space than the housing of workers, residents, families, and our fellow citizens.

We argued at the start of this paper that this figure is likely to be met with incredulity. Indeed, in every public presentation we have made of this data so far, it has. Estimates of those who have listened to us present this work in different fora guess no less than 5 and upto 20% of land to be under what they understand as "slums." Legal judgments, media reports, and opinion surveys echo this common sense that has grown without any data to affirm or contest it.[9] Our teams also found one other facet of low income housing in Delhi: the average

age of the settlements is several years, if not decades. There are no new large clusters being formed. If anything, these are long consolidated settlements that have grown with the city. The perception of "the more they come" that the judges feared is, empirically, not true.

This misrecognition matters deeply. The idea that the "poor" have invaded – and continue to invade— large amounts of city land creates the political foundation of their being considered illegitimate and allows a deep denial and disavowal of their rights. It is partly on the basis of such misrecognition that dozens of judgments like *Maloy Dhar* can argue that they are in the public's interest. What the final section of this paper focuses on is one key outcome of such misrecognition: its implications for housing policy and practice.

Policy Responses to Delhi's Housing Question

What should we read from this data? There are many conclusions to be drawn– on the paradigms of urban development that brought us here; on what the data says about a broken housing market both formal and informal; the human development consequences of such housing; or indeed on the changing nature of the urban social contract not just between the citizen and the state, but also among citizens in our responsibilities to each other. We will, however focus, on one particular question: what does this data tell us about housing policy and practice in Delhi? What policy paradigms have brought us here, and what must we take away in ways of moving forward? The fact that somewhere between 10-30% of citizens live in only 0.6% of the city's land represents a deep structural failure

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[8] See fn 7.

[9] See Bhan 2016, among others, for details on judgments that that betray this understanding.

of the intentions of our planners and the city's three Master Plans. It is important to understand this clearly: the failure is not that informal settlements exist, but that they are the only viable, affordable option for so many of the city's residents. Why is this so? At the root of it is a question of regulation: how should the land and housing market be structured to ensure the availability of affordable and adequate housing at different income levels? Elsewhere we have argued in detail[10] that housing in most Indian cities suffers what the Technical Group of the Ministry of Housing and Urban Poverty Alleviation described as the core dilemma: affordable housing is not adequate; adequate housing is not affordable.[11] In metropolitan Indian cities, housing stock under Rs 10 lacs that is affordable for urban poor households cannot exist in adequate supply unless regulation ensures that it does so through inclusionary zoning, planning and land regulation. The market left to itself, as repeated analyses have shown,[12] cannot create such supply. It is the absence of affirmative and equitable policy, regulation and planning that creates "slums," not illegality or encroachment or malafide intention.

Planners in Delhi have been aware of this challenge. The 1962 Delhi Master Plan had argued that it was of the "utmost importance that physical plans should avoid stratification on income or occupation basis."[13] To achieve this, they had advocated, repeatedly through the Plan, that it was necessary to "earmark reasonable areas in several zones for the low-income group people."[15] While no minimum figure existed for how much land should be earmarked, 5% reservation of land in each group housing category was listed. Clearly, nearly sixty years later, this imagined land footprint of even 5% does not exist even though the wage distributions that led to the need for them, in many ways, persist. This is the first clear message from the data: adequate land has never been made available for low income residents, making informal settlements the only solution to find housing in a city that wants their labour but not their claims o r entitlements to a dignified life.

Such misalignment in how much land should be made available for low income housing within any Master Plan in Delhi is likely to worsen. We argue this because of the shift in thinking about low income housing since the 1962 Plan where at least the need to allocate land explicitly for low income housing was acknowledged. In the 2021 Master Plan of Delhi, the approach has shifted from land to the housing unit. The Plan's language on low income housing is very different, arguing that the key approach is to mandate reservations for housing stock in group housing projects, and to redevelop existing slums using land as a resource. This echoes thinking in the current central scheme on housing – the PMAY. Indeed, housing policy in Delhi seems to have made the move to think about houses rather than housing – building units to work our way out of shortage, either through eviction and resettlement or through in-situ redevelopment.

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[10] See IIHS 2014.

[11] Government of India (2012). Technical Group (TG -12) to Estimate Housing Shortage In India. Ministry of Housing and Urban Poverty Alleviation: New Delhi.

[12] See, for example, Agarwal et al (2014), Bhan (2019), and McKinsey (2010).

[13] See Delhi Development Authority (1962): Introduction

[14] See Delhi Development Authority (1962): p 89, among others.

It is clear that new affordable housing has to be built. Yet, as we have argued in detail elsewhere, this approach has several difficulties. There are three key ways Delhi currently makes (or wishes to make) new units: (a) in-situ redevelopment using PPP partnerships; (b) resettlement through serviced land plots or into built new units; and (c) direct government construction and allotment such as the DDA's EWS housing lotteries.

Let us take the idea that the state can build enough new housing units to shift all residents of informal settlements to them. If this had been, or even could be, done, then the 0.6% number is, in fact, the success of the slum-free city. Yet we know that we are far from this reality.

The first option of in-situ redevelopment – building new units on the same site usually in a public-private partnership – is largely untested in Delhi except for a first project in Katputli colony, that has been met with strong and sustained resistance from communities and difficulties in implementation, as well as accusations of leaving out a large number of residents. Our own forthcoming work also suggests that the viability of most of Delhi's existing slums for such PPP arrangements is low - even if the model was to be fully rolled out, it would be economically viable only in a fraction of existing settlements (Harish et al, forthcoming). The DDA has announced two housing lotteries in EWS

space – yet the total number of units are of the order of 19,000 units in one, and 8000 units in another. This is fraction of Delhi's estimated housing shortage, even in 2012, of 5 lakh units.[15] Building enough, even with the best intentions of government, would take decades. We cannot, to put it bluntly, build our way out of our housing shortage.

This has meant that most of the plan to address informal settlements has been to evict and resettle them. Indeed, Delhi has seen an astonishing frequency of evictions and resettlement since the 1990s.[16] Leave alone the horrific human, economic and social costs of eviction of homes painstakingly built over decades of sacrifice and labour, has resettlement acted as a solution to low income housing? Few could make such a case. Researchers have shown the deeply detrimental impacts of economic and social impacts of peripheral resettlement;[17] argued that resettlement is usually offered to less than half of the residents of each settlement so it excludes as many as it houses;[18] shown that the quality of life in resettlement colonies post 1990 has been deeply inadequate and welfare-harming;[19] and, finally, that the number of new units build are severely inadequate to meet the housing shortage. The DDA, in fact, has, in the past two decades, demolished more housing units than it has built for low-income residents (Sheikh and Mandelkern

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[15] Government of India (2012). Technical Group (TG-12) to Es mate Housing Shortage In India. Ministry of Housing and Urban Poverty Alleviation: New Delhi.

[17] Bhan and Shivanand (2013), Bhan (2016), Dupont (2008), HLRN (2011). In fact, This documentation of widespread evictions is now affirmed by the Census 2011, which states in that "a major reason for the fall in the decadal growth rate [in Delhi] is the wide-ranging removal of slum (jhuggi jompri) clusters from various parts of the city". Preliminary data further

suggest "a significant fall in the slum population despite broadening the definition of slums for the 2011 Census". Particular districts bear the brunt of these evictions – "It has been established that removal of slum clusters within the NDMC [New Delhi Municipal Council] Area is the primary reason for a 25% fall i n population in the New Delhi district vis-à-vis 2001" (Government of India 2012b: 44).

[16] See Bhan and Menon-Sen (2008), Du a 2016, Ramakrishnan 2014, among others.

[18] See studies in fn 17

[19] See studies in fn 18

2014). To put it bluntly: resettlement seeks to create cities without slums, but not cities without the poor.

If resettlement has proven to be welfare reducing, government construction welcome but inadequate, and in-situ redevelopment unlikely to be able to be scaled even if it does work in particular projects, then where do we turn? The argument of many researchers has been to think about in-situ upgrading, i.e. working with existing informal settlements to formalise their tenure, provide infrastructure and services but make no changes to the housing units themselves. This is upgrading a settlement, not turning collectively built housing into finished, 30 sq. m units. Slowly, over time, it is expected that households will use their own investments to improve their units. Regularising the settlement's tenure is a move well within the legal and juridical competence of the central and state governments in Delhi in different ways. Upgradation has been shown globally to be the cheapest, most direct, quickest and most effective way to improve housing for residents in informal settlements, as it both acknowledges and builds upon what the settlements have already built. It may take time but its results are sustained and inter-generational improvement, and countries as diverse as Brazil, Venezuela and Thailand have shown that these programmes can work at scale.

Why then does in-situ upgradation not act as a preferred policy option? Two arguments are often made against regularization of informal settlements. The first argues that it takes away too much land. This argument has largely been made, however, without data. No percentage figure of how much land a city-wide upgrading programme would take has been cited. Our data shows that

this number is miniscule – using just 2-3% of city land would both regularize existing "slums" and provide additional areas for de-densification, and begin, as the MPD 1962 had intended, to reserve land for low income residents both here and those to come. One modality to do this is, in fact, already in national housing policies. Both RAY and PMAY had a mandatory reform that largely went unnoticed and implemented: the creation of an Affordable Housing Zone in city master plans. The extend of such an AHZ was not defined – but this data suggests that even a conservative estimation of such a zone at 5% of city land would make a huge impact on the city's low income housing market, increasing current area by over five times. As argued elsewhere, AHZs could both cover existing settlements as well as reserve currently vacant land for future migration.

The second argument against upgradation is that it represents a moral hazard. That regularizing "illegal occupation" encourages more of the same. There are many ways to refute this argument, ranging from pragmatic to constitutional ones. Yet, for now, the argument in Delhi's case is particularly odd to apply only to residents of informal settlements, when the homes of residents of unauthorized colonies are being regularized as we write. The question is not no longer if we can we post-facto regularize informal settlements. The question, in fact, is: if unauthorized colonies have been regularized, by what right can informal settlements be uniquely punished?

Regularisation of informal settlements is not only equitable and ethical – at this percentage of city land, it is also efficient. What will work technically, then, is known. Making it the primary policy response, however, requires something more – the elusive "political will" that all discussions

on public policy eventually circle back to. Policy does not work in an ethical vacuum. Often, they reflect the outcomes we collectively value. We write this paper in the hope that no resident of Delhi would argue that 11-15% of the city's workers deserve to be able to afford access to only 0.6% of the city's land. We write it in order to wield an argument that this data must serve as a wake-up call to the deep inequities of a broken housing market that requires regulatory responses that both recognize planning and market failures but also the rights and dignities of workers who have found a way to inhabit and build the city despite them. We may debate the ideal percentage of how much land in a city should be allocated for low income housing but we know what thresholds insult our constitutional promise to ourselves. We are below that threshold today. The challenge is whether we are prepared to hold ourselves to account and begin to move in the right direction.

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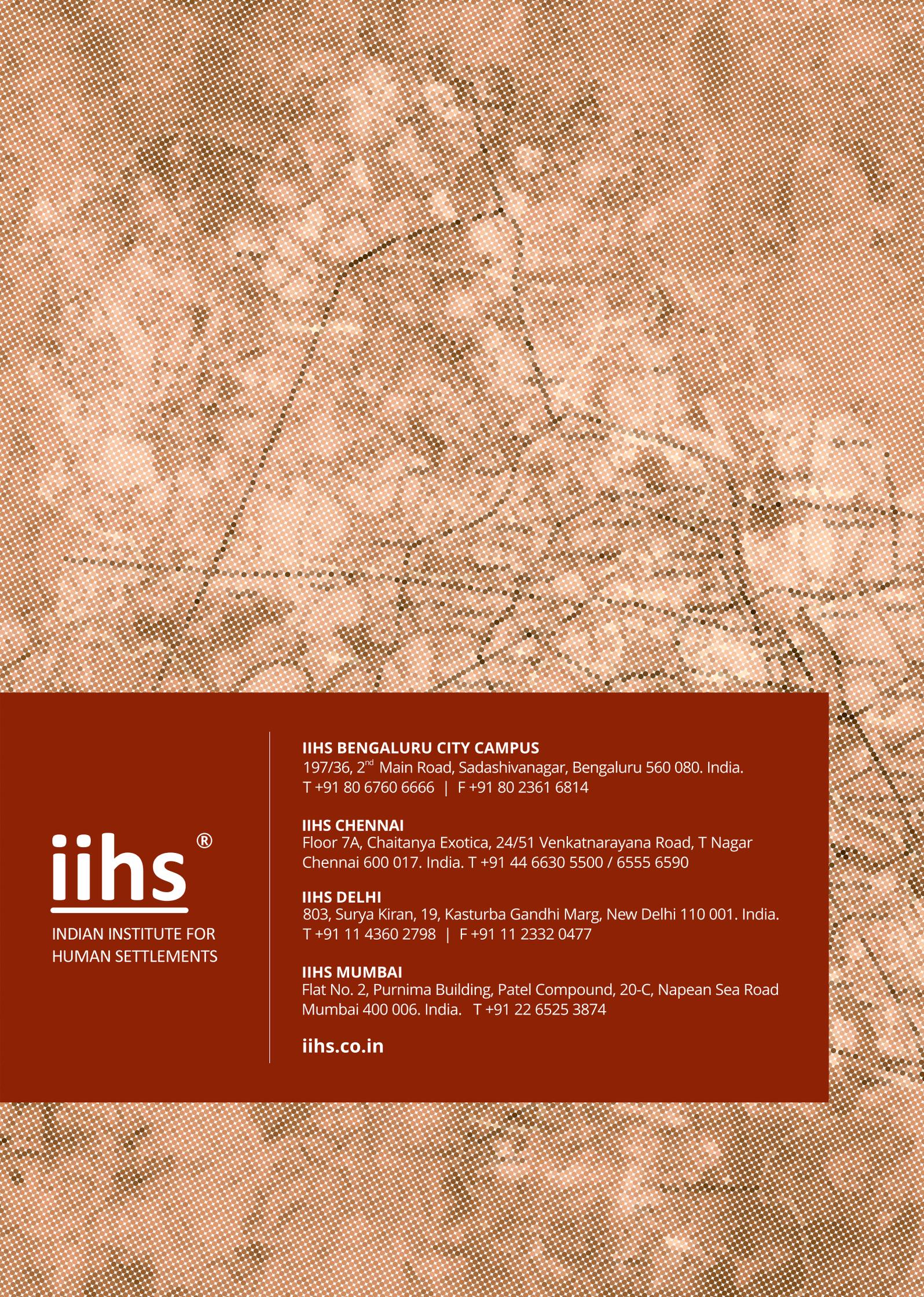
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