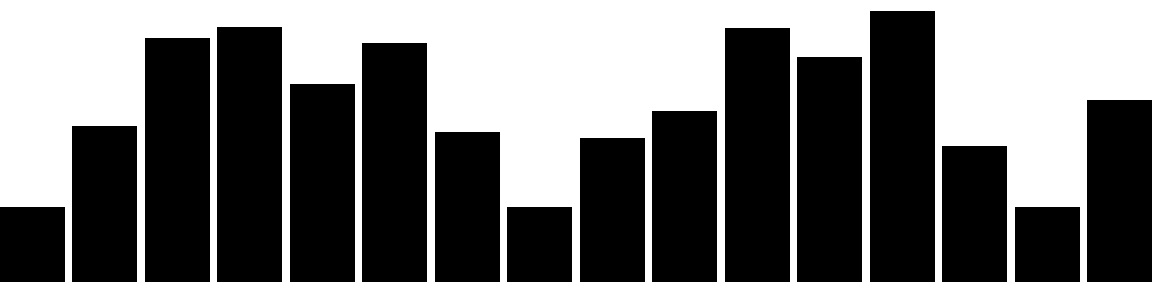

INNOVATION IN URBAN DEVELOPMENT: Incremental Housing, Big Data, and Gender

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A NEW GENERATION OF IDEAS

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Contents

Introduction

AN UNPRECEDENTED URBAN AGE

Within the last ve years, the global population reached a critical turning

new principles that address challenges such as slum growth and urban environmental degradation, in order to prepare for cities of the future.

A NEW GENERATION OF IDEAS

To encourage a new generation of urban policymakers and promote early career research, the Wilson Center's Comparative Urban Studies Project,

policy instruments that create effective rights and in incremental housing policies that are anchored in the local social and political context.

In Chapter 4, Shohei Nakamura asks the critical question, “what kinds of land rights are really beneficial for protecting slum households and thereby encouraging their housing investment?” Nakamura reexamines the relevance of a self-help housing strategy in India, where government notification policies officially recognize slum settlements and ensure the

threaten long-term environmental sustainability, Campbell concludes that all city residents gain from transportation policies that emphasize universal accessibility, connectivity and equitability.

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Incremental Expansion: Examining User-Initiated Transformations in Government Housing in Manaus[1]

Caleb Harper, Vasco Portugal, and Layla Shaikley
Massachusetts Institute of Technology

ABSTRACT

is paper examines user-initiated transformations of high-density government housing in the rapidly urbanizing context of Manaus, Brazil. e research, con ducted in the summer of 2012, o ers evidence-based analysis of twe existing multi story urban housing typologies, one traditional and one experimental, and the e ects of these typologies on the process of incremental expansion. By critically examining two distinct contemporary typologies in identical social and geographical contexts, this paper seeks to provide nuanced strategies for future urban housing policy and development at the interface of informal and formal construction.

Results revealed that the rst phase of development o ered an experimental three-story housing typology that inadvertently encouraged owners to signi cantly expand their units. Users of these units expressed satisfaction with the ability to personalize their space as well as their demonstrated ability to expand with high quality and craftsmanship. However, as the expansions were not predetermined, the government expressed concern with the high number of resident disputes ove

1 We are grateful to Professor Reinhard Goethert for being such a resourceful and rigorous researcher. e completion of this research would not be possible without his guidance and support. Acknowledgments and thanks are due to the PROSAMIM team, Concremat, Construtora Andrade Gutierrez, IDB, UBRA, and SUHAB. We also would like to thank Abrahim Frank Lima, the architect Luiz Fernando Almeida Freitas, Dr. Fernanda Magalhães, Professor Jaime Kuck, and Lúcio Rabelo for their general support.

had an insu cient urban infrastructure that had not been built to receive swollen population growth. In addition, business and industry could not absorb the quantity of unemployed constituents, causing haphazard and often illegal occupation of urban areas. Low-income immigrant-popula tions occupied areas on the banks of the igarapés (the small streams that once traversed the Amazon when it covered the area before it was replaced by the metropolitan capital. e end result has been a proliferation of precariously situated housing in the downtown area, creating what has historically been de ned as the oating city.

Every year in the rainy season (January to June), the igarapés are raised by the Negro River, whose volume increases signi cantly, leading to raised water levels. e settlements (pala tas) along the igarapés are ooded nearly every year, with the accompanying human, nancial, environmental, and social damage (Rojas and Magalhaes 2007).

THE GOVERNMENT'S STRATEGY

e current administration of the government of the State of Amazonas has adopted a strategy of working with the município on a broad range of actions and interventions to address these problems of the palafitas (Government of Manaus 2002). Total investments are $800 million over a twelve-year period, calling for systematic planning and e ective community participa tion. At the same time, the município is acting to minimize the risk of new squatting in the igarapés through preventive policies based on increasing the supply of low-cost housing and by controlling vulnerable areas (IDB 2005).

e government of Amazonas, seeking to resolve the local environ mental and social problems of the igarapés, founded PROSAMIM in 2003 to improve the quality of life for squatters. e methodology for intervention in PROSAMIM manifests itself in four ways, two corrective and two preventive:

1. e implementation of macro and micro drainage systems to regulate the impact of rainfall and ooding due to the Rio Negro;

2. e resettlement of the population occupying the igarapés to land that is suitable for housing and equipped with all the basic services;

3. Creation of boulevards and parks in the areas most vulnerable to illegal invasions;

4. Establishment of a general master plan and increase of the supply of land for housing, by means of a greater control and surveillance;

In order to achieve these goals, it was necessary to eradicate the locally established favelas by implementing a method of resettlement for the squatters. The options to relocate the families set out in the Operational Guidelines of PROSAMIM (UGPI 2012) are:

1.

the city center. For this exploration, we delimited our search scope to the palafitas deployed along the margins of the Igarapé Quarenta. These specific palafitas stood alongside new residential parks, which facilitated access to the existing squatter settlements. In addition, the palafitas had already been subjected to an extensive assessment from the government, which simplified our work in terms of socioeconomic characterization. Fundamentally, we sought to understand the original context of this population. This would allow us to appreciate the social and household characteristics established, and we were able to comprehend the relevance of the palafitas in the context of Amazonian culture. Through an understanding of the palafita, we looked for indications of the local culture to understand how the architecture of the palafitas would affect their integration into the new housing typologies of the resettlement program.

It is challenging to categorize the physical characteristics of the palafitas, but there are patterns of uniformity in certain formal characteristics and usage. We observed that the palafitas are used mainly for residential purposes, which eventually also often function as the basis for home-based enterprises (HBEs) and a subsequent source of income. Structurally, the palafitas are supported by stakes at approximately 1.5 meters above the ground, so they are protected from water during the flood season. During the period when the water level is lower, some of the locals use the space underneath their houses as either living or commercial space. In terms of construction, there are explicit differences, such as diversity of shapes, sizes, material, and quality of construction.

The material used in the construction ranges from unit to unit, although there is a predominance of wood as a natural consequence of the proximity to the forest and a common pattern within the traditional architecture of the Amazon River region. Less commonly but still prevalent were concrete slabs, ceramic brick, and metallic plates. The roof, in most cases, had been made of wood frames and roofing cement or zinc.

and cleanness. However, paradoxically, the exteriors were consistently

irregularity, and illegitimacy but also by its exibility and resilience. e occupants in the pala tad apt their households to personal needs; as the family grows or needs to create an informal business, the unit responds and adapts by reappropriating adjacent spaces.

METHODOLOGY

e methodology was established from a combined application of subjec tive methods (qualitative assessment) and objective methods (quantitative assessment), based on our eld research. e objective methods were fo cused on the physical constructions, population surveying, and collected data. e subjective methods were based on ethnographic research, which was derived from the visits to the site and empirical observation.

We started by gathering data from the combination of the analysis of documents and material available on the di erent phases of PROSAMIM. We furthered our understanding of the information obtained throu gh in terviews of the various stakeholders, from the coordination of the program to the users of the housing units. is allowed us to have a basis for com parison with the data collected during our eld study. In the eld study, detailed information had been gathered through observation and survey of the interiors and exteriors of the housing units.

e combined use of methods had the main objective of extracti ng con clusions about the housing units and their socioeconomic impact. We were interested in understanding the impact on the immediate surroundings and the city of Manaus as a whole, with particular interest in the units that had been informally extended in the new PROSAMIM housing projects. We were also interested in the lati is ab at

allocated habitation units (HUs), we applied a total of 125 questionnaires semistructured to the local community, based on the model proposed by Gattoni, Goethert, and Chavez (2011).

We used the sampling method de ned as a nonprobabilistic accidental sample, where those who responded to the survey were the people present at the time when the survey was conducted and who agreed to be surveyed. is is to say that the study interviewed one person for each dwelling

that social housing programs face seem to be particularly related to the indi vidual nature of residents. us, the breakdown of this study focuses on the user-initiated transformations made to the housing units, which ultimately turn out to be descriptive vectors of the residents' own needs. Outcomes allow us to a rm that the design of the building and houses directly in u ences the behavior of residents and has a direct impact on the web of social

Figure 1.

With regard to the layout (gure 1) of the interior spaces, both phases are well designed with a good functional con guration. All HUs have a kitchen, a bathroom, a living room, and two bedrooms. Entrance to the interior of the dwellings is gained through the balconies or patios.

ere are some aspects that have been improved from the rst to the sec ond typology, particularly in the roof of the HB1, which was relatively weak and responded poorly to the unforgiving heat and rain of Manaus. ere were also some improvements in the services and bathroom organization. However, the main reason for the change was essentially linked to govern mental requirements rather than resident desires.

It is interesting to perceive that the prime reason that led the government to opt for a di erent typology in the second phase is directly linked with the appropriation of the adjacent spaces in the initial project. In the opinion of those responsible for the program, the building design urged residents to expand their homes and occupy spaces that were appointed to be open spaces for communal leisure and circulation. e government has chosen to create a more rigid model, where the housing units are stacked on each other, and with less communal circulation space. While the HB1 has some

extra communal circulation space, in the HB2 the vertical and horizontal communal space was reduced to its minimum. is amendment, in addition to being highly inexible with respect to extending the apartments, directly a ects the sociability among neighbors. e extra communal area that we can nd in HB1 generates spaces that also serve to encourage residents to eat, talk, relax, and increase their sociability in the neighborhood as a whole. Something felt instantly upon initial contact with either neighborhood is a tremendous di erence between how the two neighborhoods

Table 2. Survey Results for the Question “What Is the Best Feature of the New House?” (percent)

simplistic. is is not necessarily awed, but produces a repetitive urban landscape, which di ers from the expected assortment of a city and high lights visual prejudice and segregation against this new context (Magalhães and Villarosa 2012) (table 2).

With the aim of developing a more consistent pro le of both typologies, we developed two forms (table 3; also see table 4 below), where residents identify the best and worst qualities of both, so that we could shape a di agnosis of the connection between the built environment and its residents.

ere is a general dissatisfaction about how the HUs are arranged, which is di erent from the preceding arrangement in the squatters and unlike the traditional practice of Amazonian culture, which is the vertical stacking of the units. ere is also some disappointment concerning the areas of the HB2 typologies. e HB1 typologies have additional 8 square meters

of area per unit. But if we consider just what useful space is, this does not have great relevance, particularly in the duplex units, whose interior stairs ultimately subtract that portion of extra space.

Residents were unhappy with the in exibility of the HB2 plans. e HB1 had two extra balconies per HU and additional communal space, these additional spaces allowed its residents to do ampli cations and make improvements to the houses. Conversely, in the HB2, despite the fact that there were also communal spaces, they were reduced to a bare minimum, which make it di cult to extend and transform the households without directly interfering with the neighbors from the same block.

e lack of space to dry clothes is also a common protest in both typologies. In general, residents were happy with the quality of construction materials, but it is interesting that most of the people who identi ed materials as the worst feature lived on the third oor, due to the heat retention on the roof. Although not signi cant in percentage, some residents mentioned natural light as the best feature of the house. e units have proper glazed areas as fenestration, particularly in the HB1, which have large glazed walls next to the entrance, adding to the two balconies for each duplex unit. is generates pleasant natural interior lighting and provides opportunities for natural ventilation in all HUs. Ventilation seems to have little signi cance for the tenants. However, there is a curious fact that we should highlight: e 2 percent who speci ed ventilation as the most positive aspect resided on the ground oor.

e most signi cant feature for both typologies was sanitation. Residents of both units reported that the greatest improvement from being resettled from the pala tas was access to basic sanitation, such as clean water and a sewage system. Adversely, there were also many complaints concerning services by both typologies. is particularly happened as residents were commenting on di erent aspects of the services. e criticisms had more to do with the quality of services than with the service itself—even though the houses were new, they posed several problems of in ltration and a degradation of materials. e percentage that identi ed electricity as the most positive feature referred particularly to the capacity to purchase appliances, air conditioning, and multimedia devices.

A gap between buildings in the HB2 was identi ed by 13 percent as a negative feature. e way in which buildings had been organized in the residential areas created a dark alley between the rear of one building and the next one, leading residents to complain that these hidden alleys commonly

Table 4. User-Initiated Transformations in the Habitation Blocks (HBs) and Habitation Units (HUs), Total and Percentage

User-Initiated Transformations	Parque Igarapé Manaus		Parque G. Mestrinho	
	Total	Percent	Total	Percent
Total HBs	273	100	62	100
Total HUs	819	100	372	100
Total extensions, HBs	174	64	24	38
Total extensions, HUs	193	24	76	20

attract illicit activities. Residents disliked the insecurity manifest by this spatial adjacency. Despite the fact that this was more of an urban problem than a housing concern, residents reported that the issue is emphasized by the fact that the HUs do not have a back door in the ground floor, which is found in the original typologies of HU1. This makes it impossible to monitor what goes on in that space, since access to it is limited. In addition, it obstructs the appropriation of that space by the residents, an area that could be used to dry clothes, as recreational space, or for the expansion of the units.

Characterization: User-Initiated Transformations

The residential area Igarapé Manaus has a total of 277 HBs, and each of these blocks holds 3 Hus, with one ground floor unit and 2 duplex HUs. From the 273 existing HBs, 174 had already been changed by their residents, which amounts to 64 percent of present HB. In the residential area Gilberto Mestrinho, there are 372 HUs, with 76 (20 percent) having undergone some sort of transformation resulting in 38 percent of HUs transformed (table 4).

As mentioned above, the HB1 offers more “opportunities” for extensions of units; the verandas, balconies, communal space, and courtyards have been extended in a wide variety of designs (see figure 2 above), and have proportions ranging from the simple extension of a veranda to the expansion of about 25 square meters of the house. Yet it is clear that there is a desire to expand and transform in both typologies. Where space allows, there is an obvious tendency to create additional rooms, particularly on the ground floor and especially for commercial purposes. In some cases, this is simply achieved by erecting a boundary fence with an entrance to the street.

An initial analysis of the objectives of PROSAMIM to improve the quality of life for squatters of the palafitas through the establishment of residential areas was clearly achieved successfully. However, the program did not anticipate the settlement of 127 micro and small businesses (PEPAC 2007), which were previously sources of income for some of the residents. Moreover, it is interesting to understand the benefit of mobility in relation to the contractual clause that prevents homeowners from selling the new property during a period of ten years.

We have identified three main triggers for the propagation of user-initiated transformations in the new households. Most transformations are related to informal trade purposes, followed by the creation of additional living space and, last, storage requirements (table 5).

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Table 7. Roof Materials Used in Extension Construction, in Percentage

Material	Parque Igarapé Manaus	Parque G. Mestrinho
Corrugated metal	71	15
Plastic	4	2
Fabric	0	24
Roof tiles	8	0
None	12	59

Table 8. Floor Materials Used in Extension Construction, in Percentage

Material	Parque Igarapé Manaus	Parque G. Mestrinho
Fabric	3	1
Concrete	68	86
Ceramic	29	13

Table 9. Size of Extension, Range, and Average

Measure	Parque Manaus	Parque G. Mestrinho
HBE range	3–25	0–6
HBE average	14 square meters	3 square meters
Living space range	5–25	3–15
Living space average	15 square meters	9 square meters
Storage range	3–16	0–4
Storage average	9.5 square meters	2 square meters

HB2 also has balconies and communal space, but it would be impossible to close that space since it would interfere with the access to personal space and also access to the neighbors' houses. In the HB2, most of the storage spaces were highly informal, where the owners would make a fence of card board boxes or fabric in order to close that space. Similarly, in most HBEs in the HB2, it was impossible to increment the ground floors as in the HB1, where users could go up to 25 square meters closed with bricks, metal bars, and fiber cement roofing. In the HB2, users had to give up their living rooms to have microbusinesses. Users also appropriated the exterior spaces by covering the space with a textile roofs.

DISCUSSION

Typically, resettlement and social housing projects are conceived based on cost/benefit studies, often excluding the assessment of indirect social costs. These costs are frequently neglected, but they have a substantial relevance, particularly if the house is intended for more than merely providing shelter. Assuming that there is also an urgent need to improve the social condition of the inhabitants, such a study may be far more significant than a simple cost/benefit analysis. Our investigation has shown that a better understanding of the value given to design elements and a detailed study of the inhabitant's desires can point out opportunities for the introduction of policy improvements while reducing the cost per dwelling unit. Therefore, we recommend a constructive approach to encouraging and supporting transformations in the built environment. A division of responsibility for the construction and development of the dwellings between the government and residents, and an approach that allows for gradual investments in improvements to the house, are important steps that include the occupants in the conception of their own spaces and avoid unjustified investment from the government. A structured and transparent decisionmaking process is needed in social housing programs to provide a link between design criteria and user desires, giving voice to end-users and avoid inadequate solutions (Kowaltowski and Granja 2011).

Based on the research work presented in the preceding chapters, we conclude with a set of strategies that should be taken into account when drafting the already approved third phase of the PROSAMIM resettlement

e ort. We o er strategies with application in two major sectors: policy, and the built environment.

POLICY FOR INCREMENTS

Along the various interviews we undertook with o cials of PROSAMIM, we realized that there is no policy to address the changes that have occurred in the buildings delivered, nor take into account future changes. It is clear that the program and the local government do not support the practice of

what is allowed and what is not, the residents will never be encouraged to report their upgrades to the built environment. Especially if residents feel that the changes made are at permanent risk of being demolished or are not legally recognized, this makes it harder to expect them to invest in good-quality and lasting transformations. Consequently, extensions may result in informal structures, as seen in the HB2 example.

Financial Sustenance

e units from PROSAMIM were o ered for free, and this ends up in uencing the behavior of the occupants toward their houses. ey are not only highly unsustainable as investments but also result in permanent dependence on the government, since residents never really feel like home owners. ey revealed that they are unable to take initiative and carry out maintenance to their houses because they feel it should be a program duty. is can be avoided with an approach in which residents become legally responsible for the completion and expansion of their homes, stimulating a sense of identity and ownership among them while sharing the cost per unit built. is additional cost can be further supported through various types of public-private solutions. Our study clearly indicates that families are perfectly able to increase the value of their residences through personal investment; nevertheless, in situations of a lack of personal currency, alternatives can be generated. Solutions like housing subsidy programs and microloans have been used successfully for similar projects (Ferguson and Smets 2009). e poorer population normally has di culty getting formal housing nance support, but through a coalition between the government, banks, resident associations, and tenants an agreement can be established to support incremental house improvement. By means of microloans for house extensions, the upgrading of the houses can be done in a faster and more permanent way than through residents' own investment.

Also, the integration of HBEs is an additional aspect that should be taken into consideration as a solution. e HBEs were excluded from the

a diverse microeconomy and encourage economic activities. Local entrepre neurship should have more economic viability and operate formally.

Sense of Ownership

but also they allowed setting subliminal limits to the transformations. An important aspect is then the integration of such voids in the design of an HB—a space that is suggestive of how it may be changed and tailored to multiple uses. Per unit and with the areas equally dispersed, the design should intentionally provide spaces for appropriation, without determining their exact use or con guration. us, this would create visual clues in the building form of how expansion over time can be accomplished. Both HB1 and HB2 have load-bearing walls, which leaves little room for exibility beyond the annexed areas. Also, the use of non-load-bearing exterior and internal partitions might facilitate the alteration of the original design to other possible layouts from which future tenants could choose. Last, the foundations should also anticipate an increased load from the expansions.

THE SUPPORT SYSTEM FOR TRANSFORMATIONS

A housing support system should be created in order to assist with the trans-

readapt the granted houses, especially if we take into account that Manaus is a city with a large and rapidly growing low-income population and with an accelerated birthrate. ese could be considered the main triggers for the house expansions: the absolute need to improve the nancial situation of its inhabitants and family planning, in which the house and its exibility have the important role of encouraging entrepreneurship—plus, in a city like Manaus it is critical to project the number of houses needed, anticipating that the number of inhabitants per household will necessarily be changing, especially when they cannot a ord to seek other alternatives. And so it does not seem surprising that in such a short time of existence, there are already so many clandestine expansions being made to the houses. Neither it is surprising to see houses overcrowded with people, either because the family has grown or they rennt3y

Pathways for Progressive Planning through Extending Water and Electricity Networks in the Irregular Settlements of Lima

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ABSTRACT

e spatial and physical dimensions of extending water and electricity networks in irregular settlements are rarely analyzed. Conducting works in unplanned area however, appears to be a technical and political challenge. is research looks the practices and tools actors use to build Lima's infrastructures. Utility rms create mechanisms to overcome planning de ciencies, which o ers new persp tives to rethink planning aims and methods. Sociotechnical, informational, and institutional innovations are revealed that actually could be considered as strat gic options for developing cities. eir spatial impact argues in favor of preserving rights-of-way for progressive servicing in order to face unpredictable growth.

INTRODUCTION: PLANNING AND CITY BUILDING IN THE SOUTH

e reversed urbanization process in the South—occupation, building, ser vicing, and planning (Baross 1990)—challenges the capacity of conventional planning to deal with irregular settlements. Planning inadequacy-in devel oping cities and the reasons why it has failed to keep pace with-urbaniza tion have already been extensively analyzed (Watson 2009). is consensual

account has led to a call for urban planning renewal, both theoretically and practically (Blanco et al. 2009). Irregular urbanization, however, has until now been mainly addressed through the poverty or illegality prisms, entailing socioeconomic, political, and managerial analyses (Devas and Rakodi 1993). ese approaches do not allow the spatial dimension of urban growth in the Global South to be considered; besides governance, people, or land issues, urbanization is also a process of material city making. Planning alternatives have largely overlooked the physical processes of building the urban environ ment, while they are de nitive and tangible manifestations of growth and sprawl (Mattingly 2001).

To look at irregular urbanization in that physical perspective allows some speci c challenges of the material fabric of Southern cities to be grasped. Indeed, irregularity is twofold; obviously it does not abide by the planning rules and building norms set by o cial plans (Roy 2011). But these settlements are also morphologically irregular: the layout and built-up environment are haphazard and do not a priori respect techni cal and physical conditions for proper consolidation and upgrading with infrastructures. e existing built-up framework and the demand from a settled population thus challenge the conventional planning methods and service provision processes (Baharoglu and Leitmann 1998). Nevertheless, irregular urbanization constitutes the bulk of urban growth, which is progressively taken into account by planners and service providers. Operationally, irregular urbanization forces them into a catching-up and demand-driven logic of intervention.

Water and Electricity Sociotechnical Networks

Indeed, on the ground, the de ciencies of planning do not paralyze the urban fabric. Utility rms in particular do extend their networks in irregu lar settlements, whether to ful ll their universal service objectives, to in crease their customer base, to reduce theft, or to obey political demands. Considering the structuring physical impact of laying down infrastructure networks, it is an interesting phenomenon to consider issues of territorial functioning and management. In the absence of an operational planning framework, basic services utilities have to muddle through the built-up

planning. e purpose of this research is to identify some of the devices and tools that utility rms actually use to work in irregular settlements, and thereby to uncover some of the processes at stake in actually producing urban space. Our hypothesis is that these could serve as an opportunity to renew the thoughts and practices of urban planning (Marvin and Guy 1997).

Infrastructure extension is undeniably a material, social, and politi cal process that is decisive for reducing urban poverty, enhancing cit ies' competitiveness, improving the living environment, and, last but not least, shaping future spatial sprawl. In the last decade, the insu cient access to basic services in cities of the South has been mainly explained by insu cient investments and ine cient management of public utility rms (World Bank 2003). Liberal reforms and privatization have thus been favored, and the academic literature has largely focused on the issue of nancing basic services (Gassner 2003; Batley 1996). But this bias has largely omitted the physical dimension of service infrastructures, while they have a key role in consolidating the city, integrating irregular settlements, and mobilizing a large array of stakeholders (Jaglin 2008). Ful lling these functions is very close to planning; however, the articu lation between urban planning and electricity and water infrastructure networks is weak (UN-Habitat 2009). We argue that they often are a starting point for urban development and consolidation. But the modus operandi of utility rms and the impact of their interventions on the urban space is still poorly documented (Dupuy 1991).

Analyzing water and electricity network extension is a means to look at city building. In that perspective, we will not here consider the politi cal econ omy or the governance system of extending services. Rather, our purpose is to look at the implementation on the ground of the decisions and the physical embeddedness of service extension. Despite some ine ciencies and di cul ties, managers and engineers do work every day at installing new pipes and poles. Focused on the inability of utility rms to provide services, policies and research have ignored their positive attempts to extend service coverage and the techniques they use to make their way through irregular settlements (Connors 2005). To assess the daily, pragmatic, and e ective strategies of utility rms working in irregular settlement, we consider service networks as sociotechnical systems (Graham 2000). eir development is thus here ana lyzed as a threefold locus for planning innovation: rst, institutionally, by cre ating knowledge and coordinating actors; second, physically, by modifying

and consolidating the urban layout; and third, strategically, to nd new ways of dealing with unplanned urban growth.

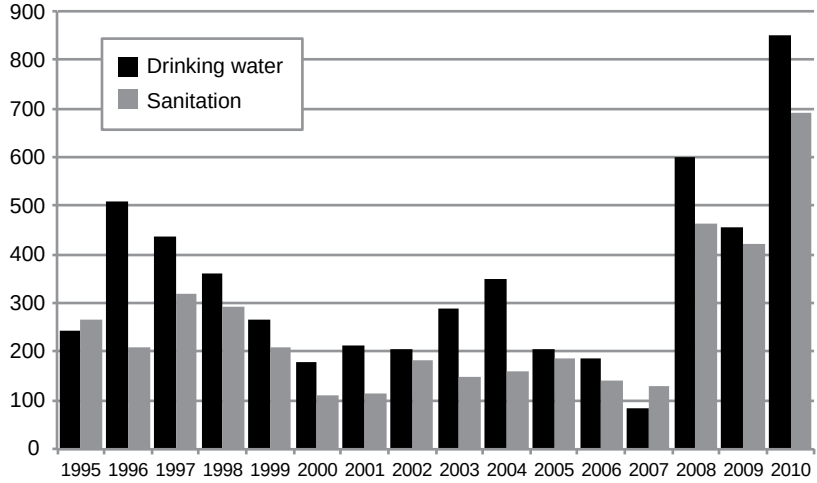
Utilities in the Irregular Settlements of Lima

Due to rural-urban migration, Lima grew at an average of 5 percent a year in the 1950s and 1960s; in the last two decades, annual growth rates have stabilized at about 2 percent. Incapable of providing su cient housing and in the absence of an urban plan, the Peruvian government accepted state land invasions by the urban poor (Calderón 2005). In 1961, an innovative law was passed that promoted the integrated physico-legal development of marginal settlements through the extension of public amenities combined with tenure regularization.[1] Since then, the sequence “progressive occupation, housing, upgrading, titling” has become the major pattern of urbanization in Lima (Matos Mar 2012). is unusual approach has inspireen(mern7h rsic

regulator SUNASS. In 2011, the regulators' official connection rates for Lima's population were 85.6 percent for water, 85.3 percent for sanitation, and 95.3 percent for electricity.[56]

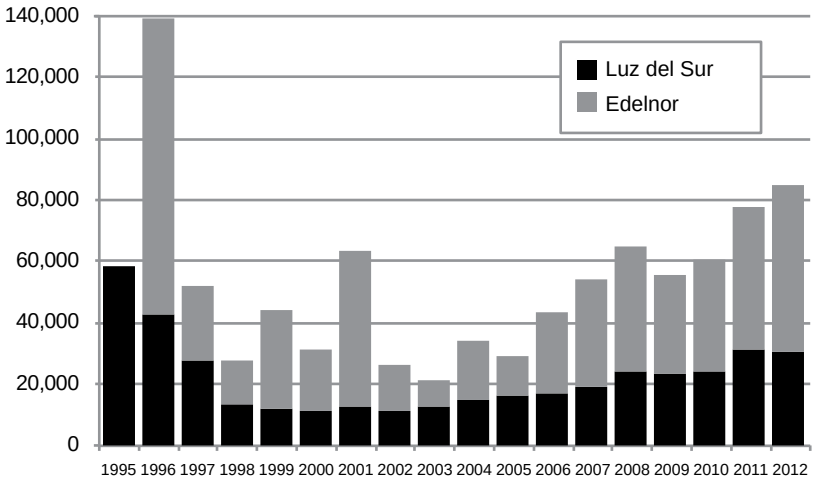
In the early 1990s, as per the progressive development approach then favored, service provision and land-titling were independent processes; there was no need to have a formal title to demand infrastructure extension (Calderón 2005). But in 1996, with nancing from the World Bank and on the basis of H. De Soto's theories, a central agency for the regularization

Figure 1. Additional Kilometers of Pipes in Sedapal's Network



Sources: SUNASS; Sedapal.

Figure 2. The Number of New Residential Electrical Connections



Sources: OSINERGMIN; Luz del Sur and Edelnor.
Note: e 2001 increase for Edelnor is due to the extension of its concession zone.

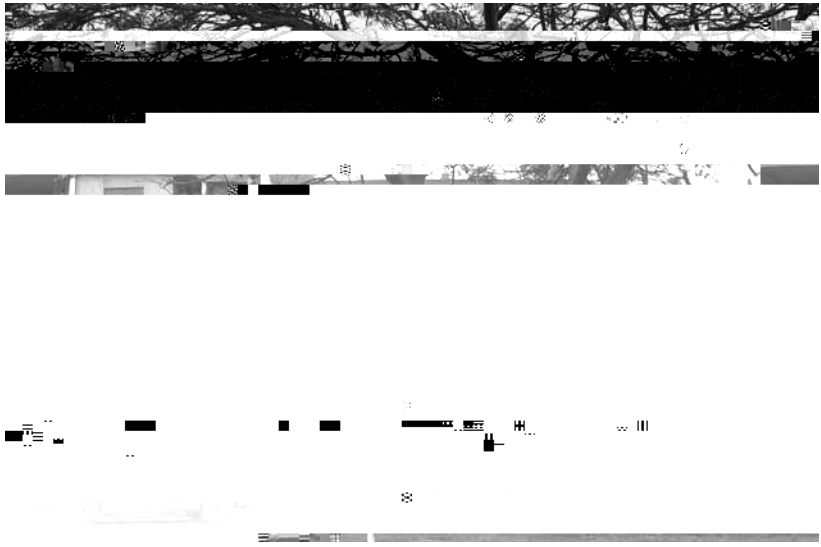
the installation of aerial lines and a system of provisional bulk connection for irregular settlements. Within the rst two years, electricity companies conducted massive electri cation, connecting more than 200,000 house holds. But in 1996, the policy of land-titling as a precondition for servic ing hampered the impetus. Constrained by the law, electricity companies shifted their strategy to improving their primary network instead of the distribution segment (interview in Edelnor). e 2006 law opened a new period when the rms could catch up with the accumulated backlog of demands (gure 2). Moreover, a 2009 emergency decree aimed at promot ing electri cation in marginal urban areas. is decree clari ed the rules for using the certi cate of possession, canceled the previous criteria of being 40 percent inhabited for an area to be electri ed8.823 0 Td (-)T((e)-14(a)-7)-8 (e)-14

land registry. e 2006 law does not explicitly mention this layout plan as a prerequisite for service extension, but a simple location plan of the area, which does not necessarily detail the internal mapping. However, in practice, the layout plan is required in the application procedures for the certi cate of possession and for service connection. is plan is stamped by the district municipality. Urban departments mainly verify that the streets are coherent with the transportation plan of the metropolitan mu nicipality, and thus that there is no risk of road relocation. Hence, utility rms can trustfully use these plans to draw their infrastructure lines along the approved rights-of-way. On the basis of that map, utility rms can es timate the needed human, nancial, and material resources, and minimize the risk of ex-post relocation of the network. Asking for the layout plan, they get the knowledge they need on their work environment and stabi lize their previsions on future development. Cooperation can thus emerge from that bricolage

Besides, in the meantime or afterward, people and local governments reuse these plans for conducting other urban public works. Indeed, for Lima—being in a seismic zone, and with irregular settlements encroaching steep hillsides—the building of stairs, roads, and retaining walls are crucial for consolidating the city. With their layout plan, inhabitants explain that they can go to di erent NGOs, social institutions, international donors, and public nancing schemes to get additional works done. e providers will align their projects on the layout plan, which in practice becomes the base map through which the city is incrementally built up. Besides facilitating actors' cooperation, the layout plan thus serves as an institution to spatially coordinate independent sectoral interventions and actors. Moreover, its elabo ration is a participatory process of cartography that entails community mo bilization (Patel, Baptist, and D'Cruz 2012). Inhabitants themselves are in charge of presenting the layout plan to municipalities; the leaders gather the residents, contract out an engineer or architect, levy the money, and follow up the topographical survey (gures 3 and 4). e exercise of mapping is a strategic moment, when people also decide where to locate streets and reserve public spaces for yet-to-come collective amenities, a process that several local NGOs accompany. e layout plan helps draw the environment in which people ultimately will live, foresee future equipment and infrastructures, and, consequently, participate in modeling the urban fabric.

Figure 3. Settlement's Information Board Announcing the Delivery of the Certificate of Possession

Figure 4. Private Topography Services Right in Front of the Entrance of the Municipality of Carabayllo



The Spillover Effect and Its Limits

e ultimate aim of the inhabitants is actually to get basic services because of the obvious threshold it constitutes for environmental improvement and integration with the rest of the city (Fernández-Maldonado 2008). Rather than expecting a title that would not bring any change, people favor demanding and pressuring the state for services (Matos Mar 2012). ey consequently prioritize getting a certi cate of possession and a layout plan, a process that generates its own political and spatial e ects: First, the community mapping is a form of coproduction that creates political mobilization and con dence among the population in interacting with public authorities (Mitlin 2008). Second, it is an institutional tool on which all stakeholders rely and that compensates for the planning de ciencies in irregular settlements. ird, it is a starting point, which has some irreversible e ects on the urban morphology and consolidation. In all these dimensions, the layout plan in Lima emerges as a strategic tool for urban development that proves to be e ective and e cient (Davidson 1996). Layout planning for basic services can thus be considered unconscious strategic planning; it is indeed "selective, relational annex inclusive, integrative, visioning and action orientated" (Albrechts 2006). Moreover, it has some spillover e ects on the general urban physical fabric and governance arrangements.

Nevertheless, being used by the actors outside the o cial realm of urban planning, its scaling up, registration, and formalization are limited. Because the layout plan is cheap, geo-referenced, and adequate to the actual built-

WORKING IN UNPLANNED SETTLEMENTS: SOCIOTECHNICAL INNOVATIONS

every time they go home, or the utility rm has to relocate them at its own cost when required by the municipality. With the progressive consolidation of Lima's settlements, these queries for post-relocation are more and more frequent. is is one of the technical reasons why utility rms now elaborate all their projects on the basis of the con rmed layout plans.

Finally, the search for technical and technological e ciency has spurred innovations that facilitate the extension of electrical network in the most remote and haphazard settlements (Pérez-Reyes and Tovar 2010). e topographical constraints of Lima's irregular settlements on rocky hillsides make it di cult to work with machines. Additionally, because of the frequent earthquakes, respecting safety distances is particularly important. But according to the engineers themselves, there is no technical constraint they cannot overcome! For instance, in the last few years, Edelnor has started using berglass electrical posts instead of conventional concrete ones. Weighing only 50 kilograms, they can be carried up to the hills by only four men, where trucks cannot go (gure 5). e additional cost entailed by this new material is compensated for by the reduced costs of the security, labor, and machinery necessary to install them. Edelnor also expects the market for berglass materials to expand, thus lowering the price. Less innovative but as useful are the single-post elevated transformers that require less security space around them in dense areas, or an electric switch for streetlights with solar cells to reduce the collective energy charges for residents.

A Short History of the Water and Sanitation Network Options

Since the 1990s, Sedapal has implemented a series of large-scale programs to expand water coverage, with nancial support involving international cooperation. More or less successfully, all these policies have tried to depart from the conventional network approach, and have generated intense debates within the water and sanitation sector on the appropriate use and acceptation of technological changes.

e rst program was Agua Para los Pueblos Jóvenes, which was nanced by the European Union from 1994 to 2001. Conceived as an emergency measure to cope with the cholera epidemic of 1991, it was rapidly converted into a strategic solution of progressive autonomous networks. In order to bring safe drinking water to settlements that would not be connected in the short term, Sedapal built for each settlement a reservoir, public standpipes,

Figure 5. Installing Fiberglass Electrical Posts in Hilly, Remote Settlements without Machines

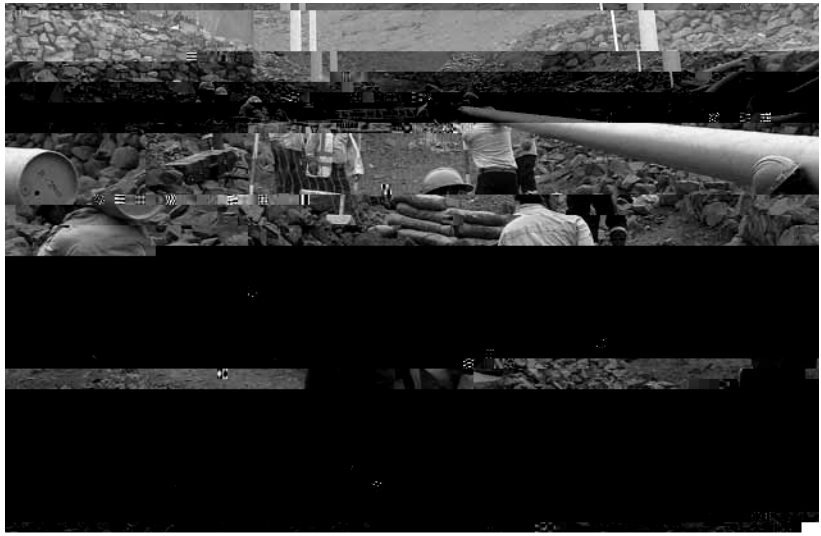
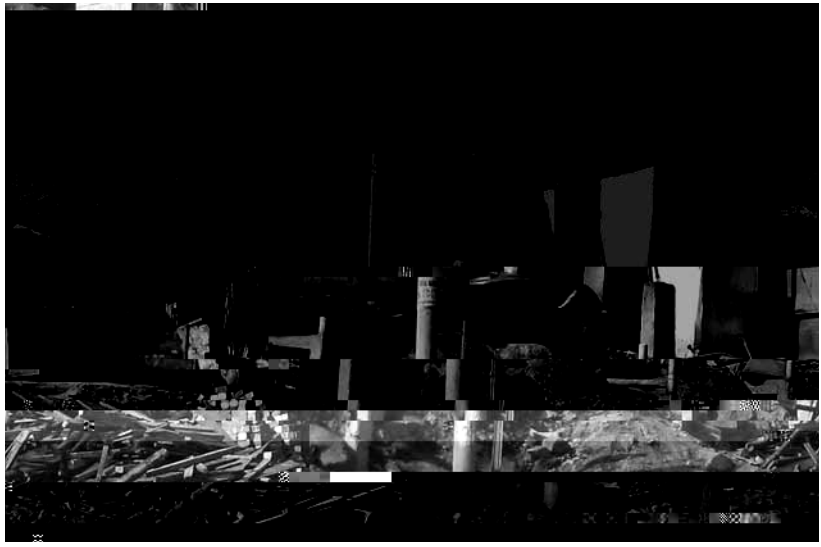


Figure 6. Public Standpipe, Proximity Tanker for Cooking, Overhead Tanker and Hosepipes for Bathing



and the main distribution pipes in between. A standpipe delegate distrib uted the water through safe and clean hosepipes to individual polyethylene tankers above houses (gure 6). e innovations in that system were both social and technical: On the one hand, the population organized itself in committees for the construction, distribution, management, and payment for proper functioning of the mini-network. e appropriation of the sys tem by the people has then been identi ed as the key factor in successful and sustainable implementation (Bon glio 2002). On the other hand, the

nationalinvestments." is policy was a return to a more conventional and technical way of approaching water issues; it followed the interna tionalized trend for subcontracting, it focused on the augmentation of supply and pipeline infrastructure instead of demand management (Ioris 2012), and it relapsed to the conventional centralized network. Several interviewees gave diverging accounts of this shift; but anyway, the politi cal discourse of progress and equality permeated the engineering culture and discredited the condominial systems as an ine cient and discrimi nating technology. Abandoning the sociotechnical innovations of the previous programs, this policy instead took advantage of the regulatory facilitating adjustments related to land status and nancing (Garrido-Lecca 2010). e failure of this innovative transition sheds light on the social and political issues at stake in extending networks; the socio technical regime of the water and sanitation sector in Lima proved to be change-adverse and highly resilient (Tru er et al. 2010).

The Sociocultural Conditions for Successful Technological Change

e physical techniques for network extension works are not neutral instru ments; for their new devices to be used and e cient, utility rms have to secure their social acceptance internally and by the users (Ostrom 1996). In the last decades, Sedapal has increasingly promoted inhabitants' par ticipation and involvement. Some extensive maintenance and hygiene edu cation workshops took place; hygiene promoters, standpipe delegates, and nancial managers were trained to ensure sustainability. e acceptability of new technologies was enhanced when the inhabitants knew and partici pated in their design, construction, and maintenance (Sedapal and World Bank 2006). According to the NGOs and sociologists involved, this form of coproduction was also crucial in building people's political, technical, and social capacities. e di usion of participatory planning methods also entailed some organizational changes; Sedapal relied on NGOs as social facilitators. e importance of NGOs was actually exponential—from "annex" partners in the rst years, they became the unique operator for both the social and technical works in irregular settlements from 1998 (Bon glio 2002). While launching the condominial program, Sedapal set a condition in its call for tenders; to be eligible, construction rms had to be in a consortium with an NGO. Technical and social professionals now acknowledge both the di culties but also the success of such collaboration.

and pressure from a strong civil society (Matos Mar 2012). Furthermore, it appears that utility rms have managed to take advantage of the institu tional and urban context to innovate and make their way through the irreg ularity of the settlements. Institutional, informational, technical, and social innovations have succeeded in overcoming urban planning de ciencies.

In order to extend services in unplanned settlements (i.e., to improve liv ing conditions in forthcoming settlements), three principles emerge from the Lima case, which help renew thinking about planning methods and aims in the context of uncontrolled urban growth. As to the procedural dimension, the key words are adaptation and progressivity. As to the content of urban action, the urban layout, for its role in both structuring space and reducing uncertainty, de nitely appears as the crucial element of the urban fabric.

Adaptive and Incremental Methods

In Lima, interesting perspectives are opened by the continuous adaptation of the legal framework, of the institutions used for coordinIt(-)Tj -13(iv)]TJ 0(a)93

incremental development, to respect people's wishes and needs, and to minimize the disturbance of works, the phasing of utility firms' interventions is here important. This intersectoral coordination cannot be done by utility firms, which follow their own strategies and capacities. It is therefore up to the local government to take care of the progressivity of infrastructure extensions. The layout plan is here a promising base in building mechanisms that are useful for all stakeholders. It provides the necessary information to reduce uncertainty, and it offers a platform for aligning public works.

The Layout, the Grid, the Street

The counterexample of the still-unconnected areas of Lima illustrates the importance of roads as the key element to deal with urban growth (Angel 2012). Regardless of the land status and investment capacities of utility

Figure 7. Land Invasion Respecting a Standard Layout

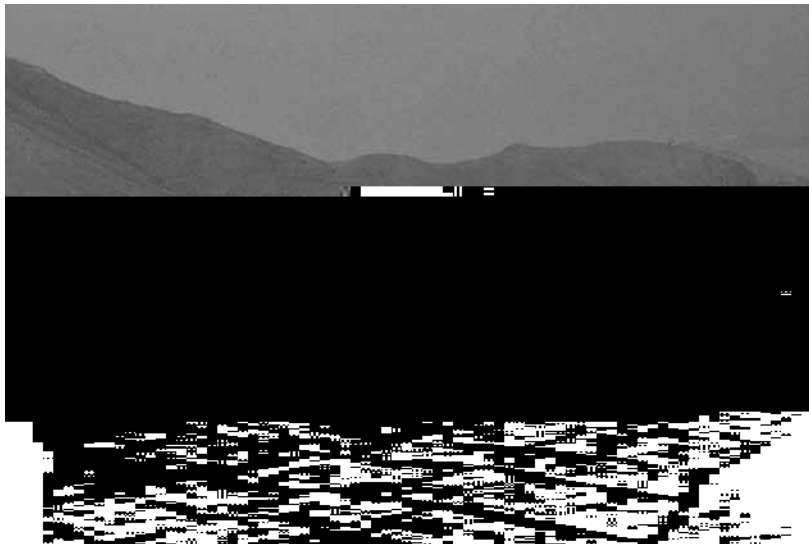


Figure 8. Piecemeal Encroachments on Hillsides

e innovations in rules and techniques developed by utilities help to

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Rethinking Informal Housing and Land Ownership Debates from Local Actors' Perceptions: A Sociological Understanding of the Failed Eviction of Thapathali Informal Settlement, Kathmandu

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ABSTRACT

is paper explores the sociological understanding of the meaning of land ownership and its consequences for incremental housing policies using discourse analysis as a method of investigation of local actors' perceptions following the eviction of Kathmandu's apathali slum area in May 2012. Establishing what is meant by forms of tenure arrangements—legal and customary—demonstrates the bene ts of studying a situation in which incremental housing failed as an alternative to eviction, informs traditional planning approaches through innovative recommendations related to legal instruments that create e ective rights, and emphasizes the need to anchor housing policies and incremental housing approaches in the social and political context with which local authorities are dealing.

versus (2) neighborhoods where formal titles do not guarantee protection from eviction. Ownership and occupancy legitimacy therefore take di erent meanings, with property rights ranging from de facto to de jure rights along a spectrum. Slum areas for which inhabitants possess formal titles; adverse pos session of buildings on land not recognized by the authorities; or low-income rental housing rules excluding certain age or ethnic groups—all help explain the production of informal housing.

Forms of informal housing therefore tend to in uence land ownership debates in various ways as ownership is increasingly shaped by both formal and informal rules. Social meanings related to housing and ownership are being embedded in social roots, which are di cult to disentangle from in formal housing production. e notion of the “choices” that city dwellers exercise in opting for one form or residence over another has been ques tioned by Gilbert and Varley (1991), acknowledging the idea that forms of informal housing conveyed crucial information related to life-cycle-related decisions, migration trends and drivers, and local representations related to informality, the right to the city space, and the in uence of social status on perceptions of illegal occupation.

The Social Construction of the Land Ownership Debate

e study of the social construction of ownership meanings bene ts from a sociological approach, in the sense that the legitimacy of land occupation is not systematically coupled with the existence of formal property rights, especially in the developing world. e debate therefore lies in the identi cation of who, among a broad range of social actors and their respective social representations, de nes the 5(y)

con icting views o er an alternative approach to the formal and informal occupation of city spaces, and goes beyond the substitutability of the for mal/informal housing debates.

In most of the economic literature related to land ownership, the focus has been highly directed toward rural areas and agricultural income; while informal housing tends to have a separate body of literature dealing mostly with urban dynamics, leaving aside the rural-urban nexus. Establishing a link between rural land ownership and the production of informal housing in cities can be achieved through a sociological approach, using social actors' perceptions of both rural and urban meanings attached to occupancy. To a large extent, land ownership in rural areas has been seen as a productive asset, a safety net ("safety net or insurance function which is made more valuable through retaining ownership rights than through sale"; De Janvry et al. 2001, 26), guaranteeing agricultural income and a wide range of risk-coping strategies, and acting as a major determinant of temporary migration decisions (VanWey 2003). In the context of developing cities, rapid urban ization patterns have been increasingly linked to low agricultural returns or unequal land distribution in rural areas, resulting in migration waves to urban areas where housing markets a ected by the rising cost of urban land over the past decades (Jones and Ward 1994) could not capture and respond to the increasing low-income housing needs of the migrant popula tions, which started to establish illegal settlements on available informal city spaces. Observing this phenomenon from a sociologist's angle, the right to informal city spaces has no established meaning and does not respond to any written rule or law system; perceptions about informal spaces and informal housing are built through local actors' representation of illegality, and the extent to which illegality and informality are considered legitimate is intrin sically linked to how migrant populations are perceived as having no other choice than occupying land illegally. e legitimacy of illegality therefore draws upon various social views—those of political leaders, local authori ties, urban middle-class and elites, the media, and so on—and the processes attached to arbitrating who is entitled to informal city spaces has become increasingly linked to perceptions of rural life, agriculture, and rural liveli hoods and, to a wider extent, to land ownership in rural areas. In societies where unequal land distribution has been a central issue, being a landowner in rural areas has had a considerable impact on social representations regard ing urban informal land occupancy by rural migrants.

Land ownership meaning therefore calls for an in-depth study of its social construction and an identi cation of the social factors in uencing these meanings. In order to broaden the understanding of informal housing dynamics in developing cities, the role of leaders, political parties, commu nity groups, and government o cials in authenticating and registering land rights, in arbitrating land disputes, and in regulating land-use development requires a new focus on socially controlled—formal and informal—regula tory mechanisms and on the social representations related to urban infor mal housing, land ownership, and the legitimacy of illegality.

Definitions of Eviction and Its Social Meanings

In a context of uncontrolled urbanization and sprawling informal settle ments, governments and local authorities in developing cities have been faced with increasing pressure on urban infrastructures, resulting in highly contested city nitc-uly enkf infriehons r8(l a)2(u)al a2(t)-2> BDG aty nieh ie(e)-
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as the meanings and values assigned to informal housing within a specific social context. The meaning of squatting for households grows out of the ways in which local actors act toward them and their identity as squatters with theories of Symbolic Interactionism (Blumer 1969) being at the core of a sociological understanding of what informal housing means to migrant populations. Meanings are therefore social products formed through social representations of informality and the social interactions of slum dwellers with the rest of the urban population—which are to shape the mechanisms leading to successful incremental housing approaches, or, in the case study presented here, to unclear urban planning policies resulting in eviction processes.

Informal Land Regularization and Incremental Housing: Land Ownership Meanings as an Entry Point

Incremental housing policies draw upon a wide range of options, either by upgrading and regularizing the informal settlements where they were first established (referred to as “in situ upgrading”) or by relocating informal settlers to places where they are offered tenure security and access to basic infrastructure (known as “relocation”), with the common aim of providing improved access to housing. Various pros and cons have been found regarding both approaches, notably the benefits of maintaining the community structure versus difficulties in providing basic services in encroached inner city spaces (in situ upgrading); distance from the city and its employment opportunities, difficulties linked to living on the edge of the city economy (Choguill 1993), and disrupted social and economic networks (“relocation”).

Land ownership meanings take a significant importance in conceptualizing incremental housing approaches as understanding that households’ motivations behind the production of informal housing is essential for the success of such urban planning policies. Values, norms, and procedures

Advocating for regularization entails a shift in perceptions toward con sidering informal tenure as a social change approach, as making legitimacy

THAPATHALI SLUM

the construction sector, although this booming sector has failed to provide cheap housing for all. Consequently, the problem of illegal settlements is

pressure on low-income segments of the urban housing market, as migrants from the rural areas tend to settle in rented rooms rst, before acquiring in formal knowledge about squatting areas through relatives or friends. Because living conditions in rented rooms are almost equivalent to living conditions in slum settlements, rural migrants choose to move to squatting areas where they can increase their consumption levels as they save on rent.

Thapathali Slum Settlement and the Eviction Rationale

land only seven years ago, which makes it a new and heterogeneous com

classi cation, the point of which is to highlight the hidden meanings and motivations of actors. As postmodern theories give a conceptualization of the world that allows a meaningful interpretation of belief systems, recent social science research has drawn closer to deconstructing concepts, social values, and various assumptions embedded in socially constructed actors' discourses. According to MacLure (2003, 43), "Analyzing texts involves much more than attending to whatever is in those texts.... e point is not to get the text to lay bare its meanings (or its prejudices), but to trace some of the threads that connect that text to others." e result aims at expanding the researcher's knowledge of unacknowledged agendas and mo tivations of individuals.

Discourse analysis for social research therefore is composed of di er ent stages in order to unpack agendas and unconscious assumptions of the discourse (table 1). Discourse codes expressed in spoken words encompass argumentative strategies, gurative meanings, presuppositions, and expec tations, along with individual and group identities, social structures, and power relations. Discovering patterns can be achieved using word frequen cies and semantic prosody, as well as themes quanti cation though text an notation. Beyond recurrent themes and content words, the structure of the

FINDINGS

Using the analysis described above, this section aims at disentangling the di erent themes associated with slum eviction, informal housing, and land ownership, and informing the debate around the role of social actors' perceptions and failed incremental housing approaches. ese points are distilled in the following ve ndings.

e rst nding is that the multiplicity of actors and the resulting diversity of standpoints related to squatter settlements can be identi ed as a mechanism leading to the failure of informal neighborhoods to be incorporated into a fast-growing city. Discourse analysis operates as a revelator for embedded mean ings. As shown in tables 2 and 3, evidence of di erentiated understandings of informality, housing, land, and ownership outlines the multiplicity of actors and their shape of thoughts regarding squatter settlements as a spatial component of a fast-growing city.

Academia

patchwork of individuals, from diverse origins, geographically or ethnically,

Figure 1. Academia's Discourse

Figure 2. Local NGOs' Discourse

Figure 3. International Organizations' Discourse

Figure 4. Journalists' Discourse

Table 2. Image Schemas and References by Type of Actor

Image schemas and references	Analogies, stories, salient examples	Sentiment words and adjectives	Quotations, sourcing, references, concepts
Academia	Descriptors of informality and housing involve 'dual policy', 'protests', 'displaced', 'land status', 'legal', 'processes'— revealing academic preference for interpretive focus and categorization of facts.	Low occurrence of sentiment words. Academia uses 'distance' as a position towards events.	Conceptualized signi ers such as 'employment', 'displaced', 'migration dynamics', 'con ict', 'poverty' showing the extent to which academia has a pre-structured and ideologico-political (unconscious) interpretation of reality.
Local NGOs	Local NGOs' discourse privileges collaborative ways of engaging with subjects, with frequent reference to pronouns. The NGOs standpoint is overly expressed as an 'active' vs. descriptive approach to the situation, with the enunciation		

Image schemas and references	Analogies, stories, salient examples	Sentiment words and adjectives	Quotations, sourcing, references, concepts
International NGOs / International organizations	International NGOs portray themselves through discourse as lling a governance gap, with an emphasis on ‘modes of engagement’ as an approach to slum settlements and related situations. The ‘bargaining model’ is expressed as a step forward to the implementation of policies that would satisfy all actors.	Tend to be more neutral and descriptive with a policy-making focus.	Global-view interventions and recurrent references to similar international contexts.
Journalists	Strong power aspects of journalists’ speech in the eld of discursivity.	Journalists’ discourse tends to privilege adverse subject positions, under the vocabulary set of ‘threat’, ‘power’, ‘social function’ of agents and their relation to ‘politics’.	Salient concepts involve ‘struggle’, ‘power’ and ‘political sphere’—all encompass dimensions of journalistic style, with the aim of striking the audience.

Table 3. Metaphorical Mapping by Type of Actor

Metaphorical mapping	Markers and intensifiers (metaphorically speaking, literally, actually, almost, in fact, regular)	Hedges (in a way, technically), metalanguage (in one sense)	Causal similies (as if, though, like, as), perceptual, cognitive and other processes (seemed, sounded, looked)
Academia	Medium occurrence—which shows the multifunctional aspects of discourse markers, less used for their communicative function in academic speech (informs, warns, suggest, disagrees); but mostly used to create the conditions of a linear explanation for facts.	Medium occurrence	High occurrence—meaning-making among academics shows preference for the logical connectives of addition and consequence, preference for ideas that escalate to a level where all arguments previously listed add up to a tangible explanation.
Local NGOs	Medium occurrence—relates to how local NGOs use markers as a way to emphasize logical connections between two ideas which do not easily connect or articulate. NGOs often try to link their discourse with the wider context (urbanization, world economy) using markers and intensi ers.	High occurrence—hedge discourse markers act as linkages between one idea to another, although coherence of meaning is not always achieved. Tendency to over-use logical markers to emphasize salient examples and create aspiration for engagement.	Medium occurrence—causal similies are supporting the signi er set of ‘engagement’, with markers functioning as signi ers of NGOs‘ will. NGOs tend to use and identify (as if, like) with salient images and a social justice discourse to describe and engage with a situation.

Metaphorical mapping	Markers and intensifiers (metaphorically speaking, literally, actually, almost, in fact, regular)	Hedges (in a way, technically), metalanguage (in one sense)	Causal similies (as if, though, like, as), perceptual, cognitive and other processes (seemed, sounded, looked)
International NGOs / International organizations	Medium occurrence— wider discourse on international contexts. Use of markers and intensi ers shows ability to directly and indirectly participate in policy making.	Medium occurrence	Medium occurrence— highlights the normative function of International Organizations in using cognitive processes to describe an eviction event.
Journalists	Low occurrence	Low occurrence— journalistic stance tends to make use of stylistic markers in order to assert the veracity of facts. These are linguistic devices that support both apparent discourse neutrality (stating the facts as they 'happened') and biased-assertiveness (facts presented in relation with 'power struggles').	Medium occurrence— eld of persuasion.

dwellers and politics as a whole (happened, eviction, government, politi cal, parties, struggle, power, di erent), granting the slum area an existence through external representations.

e multiplicity of actors engaged in shaping slum representations there fore resulted in a diversity of standpoints related to squatter settlements. It can be found that the regularization and incorporation of these settlements in Kathmandu, a city with contested spaces, could have bene ted from a more homogenous approach regarding (1) what constitutes a slum area and how slum dwellers organize their living; (2) the social function of the slum in a complex urban fabric; and (3) the extent to which political parties, the government, and power struggles gave rise to a speci c understanding of the slum area as shaped by events and external representations expressed b the rest of the population.

local actors' discourses as being highly and almost exclusively related to housing, housing conditions, and rural landlessness as a reason for migration, which highlight the linkages between rural and urban populations. While being landless in the rural areas is associated with low social status and poverty, being landless in urban areas is marked by a similar social stigma, because reasons for migration generally implied rural landlessness ("people in villages have a certain amount of land, assets, but it is not enough. So they migrate to the city—except that there, they have nothing" (local NGOs). Landlessness in rural areas is associated with forced migration dynamics, referred to as "internal displacement" ("Sukumbasi [the landless] represent a large part of the slum population. We call them sukumbasi, the landless people. ey are from di erent parts of Nepal. ey nd a better living in city areas, they squat on riverbanks and public land. ey move here for jobs; life in rural areas is di cult, there are droughts, oods, erosion, landslides" (academia).

As a result, spatial dynamics in the Kathmandu Valley appear to be shaped not only by the socioeconomic structure of the urban population—low-income populations (p)10(t t)-2e 2(t)-17(i)7(o)12(n)-16(—)-195(i)7ere ai1 -17

its function in a fast-developing city.

forced migration due to civil con ict: “With the insurgency, many people have had the feeling that rural areas were less safe than the urban areas. Even those who were better o in the villages migrated to Kathmandu, but most of them could not sell their lands before migrating, so they came to Kathmandu and were as poor as the ones migrating for economic reasons. ey settled in slum areas as well” (local NGOs).

e power struggle between slum dwellers and local authorities is there fore central in de ning who has the “right” to occupy informal city sptia3(Tw 0 -1.28 8o5(8(o))7(s t)-24(h)gvenens

dwellers should be relocated are usually unhappy with having newcomers. A couple of months ago, these people organized a protest and they managed to stop a relocation program initiated by the local authorities"—local NGOs), although the lack of a clear urban planning strategy and the absence of official documents outlining the rationale for eviction created confusion among the slum population and various actors involved in designing relocation alternatives.

Reasons for eviction become more evident as one regards the Sapathali slum area as a space where the political stakes are considerable: "The Sapathali case has multifolded interests. The government wants to have infrastructures along the riverbanks, but the riverbanks are encroached by the squatter settlements. Sapathali is a recent settlement, dated back to 2007 or 2008. But it is not solely about infrastructures, government is also concerned with the visual pollution, since people can see the squatting area from the Bagmati bridge. Other settlements in Kathmandu are behind the main roads, most of them are concealed" (international organizations). Another key component of the eviction rationale lies in the government trying to settle its legitimacy as a planning authority and the extent to which local authorities have a say in defining the legitimacy of illegality: "The government does not want to provide health facilities or any type of facilities to slum dwellers, as it would make the slum look almost like a legal place, a formal place of residence for the families living there" (academia); "they [government officials] established the fact they can evict anytime anyplace" (international organizations). Political stakes encompass even wider concerns, mainly due to the fact that the slum area was populated following a political demonstration in 2005, during which small shacks where built in a couple of days on government-owned land. Sapathali's recent status as a squatting area made it an attractive space for political parties and political strands opposed to the government to enroll slum populations: "They [slum dwellers] always try to find political protection from political parties, and political parties need them as well. It is a convenient situation" (international organizations). A consequence of the politicization of slum dwellers and their involvement in meso-level politics has been the confusion around what slum populations' interests were and to what extent they could negotiate with local authorities: "There was no proper relocation program organized for them. The government offered a three-month rent allowance but that is not sufficient, this was not a permanent solution.… The government

which is worsened by the uncertain political situation of the government. Di erent government o ces are involved in urban planning, and ministries are constantly reorganized, which makes the designation of responsible bodies di cult and contributes to the immobilism strategy.

CONCLUSION

As shown through an in-depth study of local context, the diverse social representations associated with apathali slum settlement and meso-level dynamics of eviction in a fast-growing city, limitations to incremental housing approaches in developing city contexts remain largely influenced by land ownership meanings and patterns of informal space, such as illegal occupation. Interestingly, the legitimacy of illegality draws upon various social views—those of political leaders, local authorities, the urban middle class and elites, the media—and the processes attached to arbitrating who is entitled to informal city spaces have crucial consequences for incremental housing policies.

Innovative ideas related to housing therefore lie in the establishment of new tenure policy instruments, which should reflect the need for legal instruments that create effective rights, are part of socially oriented urban planning laws. As a result, the future agenda for research on regulating land uses and occupation should encompass a new focus on (1) socially controlled—formal and informal—regulatory mechanisms, and (2) social representations related to urban informal housing, land ownership and the legitimacy of illegality.

Annex: Typology of Actors

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Tenure Formalization, Tenure Security, and Housing Investment: The Relevance of Self-Help Housing in India Reexamined

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ABSTRACT

is paper reexamines the relevance of self-help housing strategies in India, where government agencies implement slum noti cation policies, by which they o cially recognize slum settlements and ensure the occupancy rights of residents. Taking advantage of a nationally representative data set, it nds that a signi cant portion of households in slum settlements invest in their houses. However, housing conditions and households' investment behaviors are found to di er between noti ed and other slums, a situation that must be attributed to the di erence in the level of tenure security a orded by slum noti cation. e paper considers several policy implications.

INTRODUCTION

Since John F. C. Turner's research advocating for the so-called self-help housing approach four decades ago (Turner 1967, 1968, 1976; Turner and Fichter 1972), various types of in situ slum-upgrading programs have been implemented in the developing world. e key assumption of the strategy is that the urban poor are willing to improve, and capable of improving,

their living conditions, and that they thus strategically invest in housing by weighing changing priorities throughout the course of their lives. With a supportive regulatory environment and the assurance of tenure security, self-help housing construction by slum residents is expected to gradually bring physical improvement to their communities in the long term.

Academics and professionals have been paying growing attention to tenure security—that is, the protection of residents from forcible eviction without due legal process and compensation—as a driver of investment by slum households. Formalizing slum residents' informal land tenure by providing them with legal property rights is commonly referred to as implementing a "titling" policy. Although this legalization approach is touted to stimulate physical improvement in slums by ensuring tenure security and thereby spurring ;eir 6DnplaE7(g)1(t)-249(e p)11(r)3(o)10(t)

so doing to suggest a policy direction for improving housing conditions in slum settlements. To achieve this objective, the paper investigates the following five hypotheses derived from the theory of self-help housing, tenure security, and tenure formalization: First, younger and/or poorer households prefer to live in rental housing in slum settlements because they prioritize job opportunities and affordable rent over housing quality. Second, the quality of slum households' dwellings gradually improves as their financial capacity expands. Third, households in notified slums and/or with larger financial capacity are more inclined to invest in their houses. Fourth, they would also invest larger amounts of money in their houses. And fifth, slum households rely on their own resources, rather than borrowing from formal or informal lenders, in order to invest in their houses. By exploring these five hypotheses, this paper seeks to clarify the context in which slum policies should be developed. And to examine these hypotheses, the paper takes advantage of a valuable nationally representative data set collected by an Indian government agency.

This paper is structured as follows. The second section introduces the five hypotheses based on the review of key literature on the theory of self-help housing, tenure security, and tenure formalization. The third section discusses the data and methods used in this study. The fourth section empirically examines the five hypotheses. And the fifth section concludes with a brief summary and policy implications.

THEORY AND HYPOTHESES

Self-Help Housing Construction

Prescribing a policy to support self-help housing construction by the poor requires a solid understanding of how they decide to invest in their dwellings. Turner's classic model illuminates the changes in the priorities of the urban poor as they move up the economic ladder throughout their lifetimes (Turner 1976; Turner and Fichter 1972). Based on his observation of slum dwellers in Peru, Turner conceptualizes how households' vital needs (e.g., identity, opportunity, and security) and housing needs (e.g., proximity to unskilled jobs, freehold ownership, and modern standard shelter) change, corresponding to the rise of their income levels. According to Turner's conceptualization, the priority of tenure security is low for the members of the

households' residential dissatisfaction and economic motivation are closely related and change throughout their life span.

The Link between Tenure Security and Housing Investment

The nexus between tenure security and housing investment has been one of the primary topics in the literature on informal settlements, given that this link rationalizes the approach of enhancing the tenure security of the urban poor as a means of upgrading their living conditions in the long term. As mentioned above, economic theory generally presupposes that people invest in their properties as long as their expected future benefits exceed the costs. Higher-tenure security would encourage their investment by reducing the uncertainty about whether they will be able to fully retrieve the expected benefits in the future (Besley 1995; Demsetz 1967; Sjaastad and Bromley 2000; Arnot, Luckert, and Boxall 2011). Economists often associate such tenure security with individual freehold property rights. By contrast, an increasing number of researchers in other fields suggest that improving the de facto and perceived tenure security of the urban poor is more effective in stimulating their investment than providing full legal titles (Gilbert 2002; Kiddle 2010; Payne, Durand-Lasserve, and Rakodi 2009; Reerink and van Gelder 2010; Sjaastad and Bromley 2000; Van Gelder 2009). According to their observations and reasoning, slum households invest in their houses, regardless of their legal status, as long as social or political situations mitigate the risk of eviction, or they feel secure.

Tenure Formalization

One of the objectives of formalizing informal land tenure is to enhance the tenure security of slum dwellers.[2] Tenure formalization, by integrating informal tenure into a system recognized by public authorities, is a common practice used to improve the tenure security of slum dwellers in various parts of the developing world (Durand-Lasserve and Selod 2009). In practice, a set of property rights is provided to slum households, ranging from the provision of occupancy rights to freehold land tenure. Even granting a minimum level of legal tenure, such as occupancy rights or mere recognition by public authorities, might greatly enhance the perceived tenure security of

2 For some politicians, tenure formalization is a cheap way to gain votes from slum dwellers, the number of which accounts for a significant portion of the population in many cities.

frequently invest in their houses than do other households. Fourth, not only the propensity to invest but also the amount of resources invested by

members into the average monthly expenditures of the household, excluding housing rents. The average MPCE is slightly higher in notified slums (Rs. 2,723) than in nonnotified slums (Rs. 2,521). Roughly two-thirds of households own their houses in Indian slums. In this study, the types of housing structures are used as an indicator of housing quality. In India, pucca refers to permanent materials, such as brick, stone, and cement-related materials; kutcha refers to temporary materials, such as mud, bamboo, and wood-based materials. Pucca housing is housing with both a roof and walls built with pucca materials; semi-pucca housing is housing with either a roof or walls built with pucca materials; and kutcha housing is housing with both roof and walls built with kutcha materials. Whereas more than 80 percent of houses in notified slums are pucca housing, the proportion remains at 65 percent in nonnotified slums.

In examining hypotheses one, two, and three, I present figures with two lines representing the proportion of housing owners, housing, or investment for housing improvement in nonnotified and notified slums.[4] For the statistical test of the fourth hypothesis, I apply ordinary least squares (OLS) regression to the sample households in nonnotified slums and notified slums separately, and then apply another model with interaction terms with notification status and some covariates to the total sample.

EMPIRICAL EVIDENCE IN INDIA

Hypothesis 1

As discussed above, the underlying idea of the self-help housing strategy is that early settlers prioritize the proximity to employment opportunities and affordable rent over housing quality. I examine whether younger and/or poorer households tend to live in rental housing in slums in India by looking at how the proportion of households that live in rental accommodations changes as their duration of residence in slums (the proxy of household age) and MPCE increases, as shown in figure 1. The graph on the left in figure 1 clearly illustrates, as expected, that the proportion of owner households increases as their duration of residence in slums becomes longer. This pattern

4 I created the charts by using the twoway mspline command in Stata 11 (StataCorp 2009), which divides the x axis into equal-width intervals, calculates the medians of x and y values in each interval, and fits a cubic spline to the cross medians as knots.

Table 1. Descriptive Statistics

is similarly observed for nonnoti ed slums (dashed green line) and noti ed slums (solid orange line). e graph on the right shows that the proportion of housing owners becomes higher as their MPCE reaches Rs. 2,000 in noti ed slums. By contrast, no clear trend is observed in nonnoti ed slums. at a smaller proportion of low-income households lives in rental housing in nonnoti ed slums is an indication of a mismatch; rent is not a ordable enough for residents, whereas renting out rooms with such low rent is too risky and economically unfeasible for landlords.[5]

Hypothesis 2

e critical assumption of the self-help housing approach is that slum households gradually improve their houses. I examine this hypothesis by investigating whether the quality of housing improves as people stay longer and/or their income grows in Indian slums, as shown in gure 2. e graph on the left in gure 2 illustrates that the proportion of pucca housing rises as households' duration of residence becomes longer in nonnoti ed slums. On the other hand, no clear trend is observed in noti ed slums; most housing is structured with pucca materials in noti ed slums. Interestingly, even poor households live in pucca housing in noti ed slums, as illustrated in the graph on the right. Except for the poorest strata, the proportion of pucca housing and expenditure level is positively correlated in nonnoti ed slums.[6] By contrast, the proportion of pucca housing is high irrespective of households' expenditure levels in noti ed slums.

ere are three possible reasons for the observed di erence between nonnoti ed and noti ed slums. First, households in noti ed slums must have invested more enthusiastically in their houses than those in nonnoti ed slums. Enhanced tenure security due to noti cation could be the driving factor for the increased investment. I examine this perspective by exploring the third and fourth hypotheses. Second, housing conditions are better in noti ed slums because of government intervention. Government agencies

have installed infrastructure and services and implemented various social policies in noti ed slums. Households in nonnoti ed slums are usually not eligible for such public programs. Among the sample households, 14.7 per cent have received the allotment of tenements or land from the government in noti ed slums, as opposed to 6.4 percent in nonnoti ed slums (table 1). ird, government agencies have noti ed slums in which a majority of houses were already occupied.

noti ed slums, as shown in gure 3. While 12.3 percent of owner- house holds in nonnoti ed slums invested in their houses between 1998 and 2003, 13.4 percent of households did so in noti ed slums. As the graph on the left in gure 3 exhibits, setting aside the types and amount of investment,

Table 2. Estimation Results

	New Building			Improvement		
	Model 1		Model 2	Model 1		Model 2
	Non-notified	Notified		Non-notified	Notified	
Notification × log (MPCE)						0.643 (0.370)
Notification × Benefit			–1.547*** (0.364)			
Notification × SC						0.845 (0.437)
Notification × ST						1.364* (0.556)
Notification × OB						0.914 (0.467)
Constant	7.983*** (0.539)	9.376*** (0.472)	8.283*** (0.310)	7.738*** (0.466)	7.324*** (0.335)	7.891*** (0.345)
N	158	205	363	240	327	567
adjusted R^2	0.639	0.609	0.641	0.335	0.264	0.299

Note:

households and thereby encouraging their housing investment. In India, although planning has moved from slum clearance to in situ upgrading and redevelopment, its dominant policies still take an ine ective top-down approach. In this context, this paper has reexamined the relevance of a self-help housing strategy for India in light of its interaction with formalized land tenure and tenure security.

e ndings from the examination of the ve hypotheses are summarized as follows. First, this paper con rms that new settlers tend to stay in rental housing and gradually move into ownership as they stay longer in the slums. Contrary to expectations, lower-income households in nonnoti ed slums preferred owned housing to rental housing. Second, only in noti ed slums did the quality of housing gradually improve as households' duration of residence and MPCEs increase. By contrast, the quality of housing was constantly high in noti ed slums. ird, this paper does not support the hypothesis that households in noti ed slums and/or with a larger amount of nancial resources are more inclined to invest in their houses. e data instead suggest that households in both nonnoti ed and noti ed slums invested throughout their life course. Setting the types and amounts of investment aside, even lower-income households enthusiastically invested in their houses in nonnoti ed slums. Fourth, the regression analysis reveals that MPCE is in uential on the cost of housing improvement only in no

prompting housing investment because the type of structure determines the available improvements.

In conclusion, this paper nds that the theory of self-help housing is still relevant in India, where signi cant numbers of households have invested in their houses in slum settlements. Housing conditions and households' invest ment behaviors are found to di er between nonnoti ed and noti ed slums. Since the analysis of this paper was cross-sectional, it did not fully capture either the complex social, political, and market conditions in each city or the causal impact of slum noti cation on housing outcomes. Having said that, this paper has o ered empirical evidence to imply that the recognition of slum settlements and the assurance of occupancy rights for slum residents could make a signi cant di erence in tenure security and housing outcomes.

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Slum Rehab Flats: A Happy Living? The Subjective Well-Being of Rehabilitated Residents and the Impact of the Slum Plan in Mumbai

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ABSTRACT

is research provides a balanced and thorough approach to assessing the Sl Rehabilitation Scheme (SRS) in Mumbai, by taking the subjective concept o well-being as a central parameter. It seeks to determine the pathways throu which the SRS makes an impact on the well-being of its participants, eithe positively or negatively. e work presents quantitative and qualitative data that were collected over a period of four month in two communities in Mumbai in early 2013. is paper found rehabilitated residents to have a higher satisfac tion with life, if they are rehabilitated correctly. Many slum residents face hard ships induced by irregularities in the plans, a ecting their well-being negatively

INTRODUCTION

Near the end of 2011, the earth's human population reached a staggering 7 billion. e population of urban areas has also grown signi cantly in comparison with rural areas (UNFPA 2011). Forecasts are that the global urban population will keep increasing until approximately 2050. - e in ability of governments to keep up with the rapid pace of urbanization and

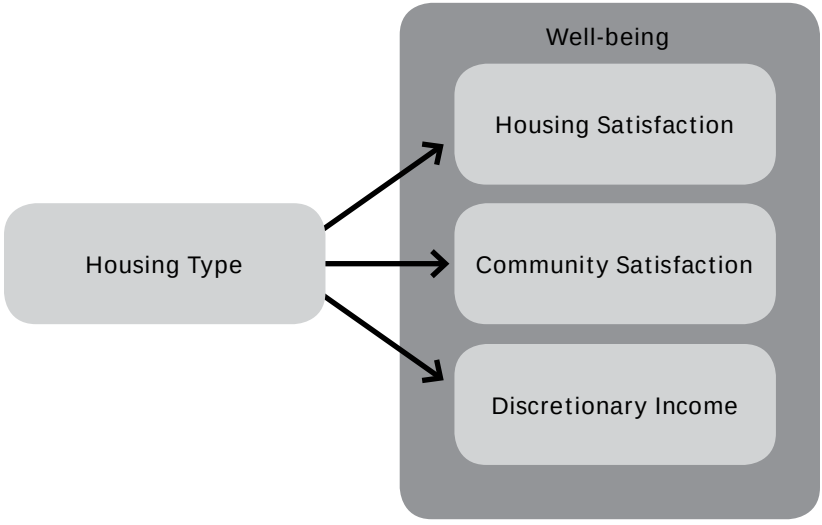
provide a ordable housing has led to an increase in the number of slums.

section describes the methods used to gather the data. e fourth section presents results and discusses the e ects of rehabilitation on the well-being of the participants in the plan. e fth section concludes.

THEORETICAL FRAMEWORK

is section lays down the framework on which this paper relies to analyze the impact of slum rehabilitation on the SWB of its participants. e framework is based on the well-being, housing, and slum upgrading literature. e framework (gure 1) starts with the grouping variable of this study: “housing type.” A study by Campbell (1981) found the following domain satisfactions to be correlated with life satisfaction: the self, standards of living, family, work, income, health, and community. Can eld, Choudhury, and Devine (2009) studied the well-being of poor people in Bangladesh and found that material needs and social relationships are both important contributors to well-being. Because the Mumbai rehabilitation

Figure 1. Theoretical Framework



plan is meant to change housing conditions, I decided to focus on the material domains of housing satisfaction and discretionary income. Income is found to be essential for survival in an urban setting (Rakoldi and Jones 2012, 11). In the social domain, the rehabilitation plan affects community; therefore, this was chosen as a domain satisfaction indicator as well.

This study compares the well-being of slum residents and rehabilitated residents to understand the impact of slum rehabilitation on the life of the residents. In this study, two housing types are distinguished: (1) slum and chawl houses, and (2) SRA flats (i.e., multistory buildings).

To assess the change of quality of life of SRS participants, SWB is taken as a parameter. SWB has been defined by Shin and Johnson (1978, 478) as "the global assessment of a person's quality of life according to his own chosen criteria." In this paper, SWB is denoted for short as simply "well-being." By using objective measurement, we can gain insight into housing attributes, but this does not allow us to understand the lived experience of individuals, households, and neighborhoods. Assessing overall well-being broadens the evaluations' scope and enhances the insights into the overall performance of the SRS (Veenhoven 2002).

Housing satisfaction has been positively associated with well-being (Cox 2012; Biwas-Diener and Diener 2001). A study by Bookwalter and Dalenberg (2002) on SWB and household factors in South Africa found that housing and transportation are the strongest determinants of the well-

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(Cox 20

to well-being, as human beings are essentially social. Along these lines, Bradburn (1969) found that changes in the frequency of social contacts

Hypothesis 2: Rehabilitated residents have a lower community satisfaction compared with slum residents.

Public-private partnerships, on which the SRS relies, provoke the rise of multi story buildings and gated communities (Doshi 2013). is is fundamentally di erent from the community structures in Mumbai's slums and, and,

DATA AND METHODS

To measure the changes in well-being due to slum rehabilitation and minimize memory bias, I compared the well-being of rehabilitated residents with the well-being of slum residents. I selected a treatment group consisting of residents who had already participated in the in situ rehabilitation plan of the SRA. They have already been relocated to the newly

on family name or house numbers is not viable in these areas. As women and elderly people are more often at home, in an attempt to avoid overrep resentation of women, I speci cally targeted men and younger households. e data were also collected so as to obtain generational representation. I approached people within the age group twenty to thirty- ve years, as they were at rst underrepresented in my sample. For the data collection in the SRA buildings, permission from the housing committee was needed, as those communities were gated. Two buildings, one on each research site,

were heavily based on the existing Living Standard Measurement Surveys of the World Bank.

of internal consistency. As shown in table 1, the mean score of SWL for slum residents (M = 3.97) and rehabilitated residents (M = 5.44) was shown

Table 2. Housing Attributes

Attribute	Slum Residents	Rehabilitated Residents	t-value	x^2 value
Average size of the dwelling	171 sq. ft.	238 sq. ft.	–6.328*	
More than one room	50%	16%		10.527*
Private water pipeline connection	78%	100%		11.958*
Reliable and suf cient water supply	81%	78%		0.125
Private toilet	44%	100%		11.402*
Average hours of electricity available	24	24		

Note: SD = standard deviation; * signi cant at = 0.01.

included questions regarding size, number of rooms, water pipe- line con nection, toilet, and electricity. e ndings are presented in table 2. Slum residents lived in pucca and chawl structures, which are bricked houses with concrete structures. Most households did not have private bathrooms and would use the community toilets, where one has to bring one's own buckets of water. ese living conditions are very di erent from what I found in the SRA ats. Objective improvements in housing quality once rehabilitated are private toilets and private water pipeline connections. Rehabilitation therefore leads to a big improvement in hygienic conditions for most slum residents. Notably, both slum residents and rehabilitated residents had 24/7 electricity in the last month. e slum residents have electricity through Reliance, one of India's main power suppliers. is is remarkable, as many slums in Mumbai or elsewhere do not have access to this facility. e reha bilitated residents were found to have bigger houses on average. Evaluating the quality of housing, one should also look at the quality of construction. During the eldwork, various cracks were observed in the construction of new SRA buildings in Siddarth Colony. Furthermore, one of the buildings

that was already occupied did not have su cient emergency exits. An extra staircase was under construction, but seemingly it was not built on a strong foundation; it was merely attached to the existing structure. e weakness of the construction of the SRA buildings is cause for concern, and better monitoring is highly desirable.

Rehabilitated residents say they are happy about the improvements in their housing conditions. One resident commented: “It was very congested in the chawlHere there is more personal space, which I am happy about.” Another resident also feels they should not complain as it is an improvement compared with their previous living conditions: “Earlier life was di cult

plan. is is con rmed by the rehabilitated residents, of whom 31 percent said they nd no di erence in the ability to continue work. e remaining 69 percent felt they had better opportunities to continue their work. On the topic of work opportunities, the vast majority of rehabilitated residents said they were positive; only 4 percent said they now have fewer job opportunities than they used to. It is important to stress that the results might be di erent in the case of ex situ rehabilitation or the rehabilitation of Dharavi, where working and living are strongly intertwined.

Rehabilitated residents faced signi cantly lower utility costs compared with slum residents. e average spending on gas, water, and electricity in the slums was INR 1,990 (SD = 637). Rehabilitated residents on average paid INR 1,657 (=852). e lower utility costs might be induced by saving strategies of the rehabilitated residents. In interviews, rehabilitated residents said that the price of living had increased since rehabilitation: " e cost of living went up. Some people have a di cult time to pay their bills. e maintenance costs, costs of water, it all keeps going up." e extra costs of living in a at, raised in the form of maintenance cost, are on average INR 619 (SD = 231). is would make the average housing cost for rehabilitated residents INR 2,230 (SD = 841). Hagelund (2009, 87) performed a study on the welfare e ects of slum rehabilitation in Mumbai; 40 percent of respondents stated that they had a tighter economy after rehabilitation due to maintenance costs.

CONCLUSION

Given the ndings described above, rehabilitated residents were, on average, more satis ed with their lives than slum residents. Objective housing quality has improved in terms of hygiene. Rehabilitated residents all have private bathrooms and private water connections. ough they have bigger houses, they miss the comfort of the multiple rooms they enjoyed in the slums. Surprisingly, no signi cant di erence was found in the levels of housing satisfaction between both groups, while one would expect major di erences based on di erences in objective quality. Contrary to the view that income has a large impact on the well-being of the lowest economic levels, discretionary income was not found to be signi cantly correlated with well-being. One of the reasons might be that the respondents in this

study are not among the poorest and make up a diverse income group. is leads to a paradox: If no relation has been found in the domains of housing satisfaction and community satisfaction, while community satisfaction has been found to be negatively correlated with well-being, what makes reha bilitated residents happier than slum residents?

is study suggests that if one is among those who get rehabilitated, im

Understanding the Evolution of Slums in Ahmedabad through the Integration of Survey Data Sets[1]

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ABSTRACT

is paper seeks to explain the evolution of slums in Ahmedabad City through the integration of various publicly available surveys that were carried out be tween 1990 and 2012 to observe the trends and growth patterns. e paper also highlights the challenges in comparing the slum surveys done by various agencies and establishes the need for a standardized database of all slum surveys. is is one of the rst attempts to integrate survey data from multiple sources into a sin gle database. e paper concludes with how such a database could be very useful for evidence-based planning and policymaking for e ective slum redevelopment.

INTRODUCTION

Slums are a manifestation of the two main challenges facing the development of human settlements globally: rapid urbanization, and the urbanization of

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poverty. Over 900 million people all over the world live in either slums or

segment of the urban poor, there is a vital need to have a reliable estimate of the number of people living in slums. e development of correct and accurate estimates of the country's slum population would help in better targeting government funds allocated for programs such as JNNURM.

AHMEDABAD CITY: A CASE STUDY

Ahmedabad is the nancial and industrial capital of Gujarat State. With a city population of more than 5.5 million and an extended metropolitan population of 6.3 million, it is the fth-largest city and seventh-largest met ropolitan area in India (Census of India 2011). e increase in population from 3.52 million in 2001 to 5.58 million in 2011 was fueled by natural growth as well as an increase in the jurisdiction from 190 square kilometers to 466 square kilometers during the period 2001–11. e slum population has also witnessed tremendous growth in Ahmedabad. According to the Census of India data, the city's slum population increased from 439,843 in 2001 to about 800,000 in 2011, accounting for 14.3 percent of the city's population, as shown in table 1.

city (including both slums and chawls), with a total slum population of

organizations, institutions, and NGOs have carried out slum surveys across various slum pockets in Ahmedabad during this period. ese detailed data sets exist in isolation, but the integration of such data done for this study will provide additional insights into the evolution of slums and changes that have taken place due to the implementation of various slum policies in the past. is study attempts to undertake such integration and to our knowledge, it is the rst attempt to integrate these isolated data sets. e study provides an accurate understanding of growth of the slums in Ahmedabad City and the change in its dynamics can be better understood by analyzing the integrated data that these survey sets provide.

e various data sets that have been used for the analysis in this paper are:

- 1990 ASAG AMC Slum Survey
- 2001 Census of India Slum Survey
- 2001 AMC-MHT Slum Survey for 1668 slums and chawls
- 2007 SEWA Slum Survey for 75 slums and chawls
- 2012 SEWA Slum Survey for 120 slums and chawls
- 2012 SAATH Slum Survey for 98 slums and chawls.

e slum surveys done by AMC and MHT-SEWA in 2011 for implementation of Rajiv Awas Yojana in Ahmedabad could provide the most recent information that covers all the slums and chawls of Ahmedabad. However, two years after the co-27(n)9(d M)-1463(7 S)8(0 Tc 0.07M.071 Tw(d3

limited in its coverage since it is only available for slums where these NGOs have ongoing programs.

e data sets have been analyzed and compared at the zonal, ward, and slum levels to explain the evolution of slums in Ahmedabad at various levels.

ZONAL- AND WARD-LEVEL COMPARISONS

When surveys conducted by di erent agencies are compared, di erences in slum population estimates was observed between two data sets in the same ward for a given year, as shown in table 2.

With such huge di erences in the number of households for some wards, as shown in example wards in table 2, it is really di cult to ascertain which survey set is to be believed and used for analysis, given that both the survey sets have been done by well-established agencies and are widely used for research and administrative slum improvement purposes. For example, the Census of India reports that there were 2,004 slum households in Shahpur ward in 2001, whereas AMC-MHT reports 17,525 slum households in the same ward in the same year. Similarly, Bapunagar ward had 4,638 house holds according to the census data, whereas AMC-MHT listed only 115 households. It is di cult to determine whether the census has underesti mated the slum population or AMC-MHT has overestimated it.

Comparing the 1990 ASAG data with the 2001 census data, the zone

Table 2. Differences in Household Data estimates between the .1(0t)-

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Looking at the overall picture, the number of households in the 67 slums has increased at a rate of 3 percent from 1990 to 2012.

However, the 1990 ASAG covered only the noti ed slums recognized by the 1956 Slum Act, primarily in the walled city, the South Zone, and the West zone, while the slums in the East and the North zones were not covered because they were outside the Ahmedabad City boundary limits in 1990. us, this survey does not reveal the complete growth trend. After discussing this issue with the experts, it was concluded that the AMC-MHT survey is more appropriate to consider as the baseline.

Analyzing the change for 93 slums that could be compared from 2001 to 2012, the number of households decreased from 41,541 to 29,107, show ing a negative growth rate of 2.92 percent. While the South Zone and the East Zone showed the maximum decrease in the number of households, with a decrease of over 40 percent, the North Zone and the Central Zone do not show any considerable change in household numbers. e maxi mum decrease in the number of households in the South and the East zones can be justi ed with the fact that most of the slum relocating and-upgrad ing plans have been implemented in those zones.

If we use the growth rate of –2.92 percent, the number of slum house holds for the year 2012 is projected to be around 180,791, which is much lower than the gures that have been quoted by the Census of India or by the AMC. At the current rate of decline in slum population of –2.92 percent, one can estimate that the city will not be slum-free before 2036. However, it should be noted that this analysis is based on estimates from the 93 slums that could be compared across surveys done in 2001 and 2012. ere may be many slums whose residents have been completely evicted or new slums that have emerged at new locations, but these are not considered in this analysis due to the lack of availability of such data.

With respect to trends in the availability of infrastructure services for these slums and improvements oveperch do t e sf decline in slum pop.50 Tdcc

leads to the variation in values shown in the survey data. is explains the occurrence of various cases where certain slums showed the presence of infra structure services in the 2001 AMC-MHT list but have been shown as lack ing these services in surveys done at a later date (i.e., in 2007 and 2012). It is not plausible that a slum had infrastructure services in the past (i.e., in 2001) but does not have them currently (i.e., in 2012).

In order to explain the trends in the growth of slum households all across the city, slums showing the greatest changes were assigned to one o three categories: slums showing the greatest increase; slums with the great est decrease; and exceptional cases, where slums have observed a revers of growth trends after a certain period. e possible reasons behind such trends have been studied in detail.

While some slums showed a distinct trend of increase or decrease in the number of households over the period, some exceptional cases were

households in some other location, also putting pressure on the minimal level of infrastructure services that might exist at that location.

e method of the lottery system that was adopted by AMC to allocate economically weaker section (EWS) housing has often resulted in slum fami lies from di erent areas of the city that belong to various communities com ing together to live in an area that is far away from their individual areas of

developed in 2001, Kankaria Lake in Ahmedabad, and GIDC Industrial estates—have led to massive evictions and resettlements of slum dwellers. Krishna-nagar in Stadium and Maganram Jagliram ni chali near Kankaria are examples of slums where many households have been evicted for imple mentation of projects such as BRTS and Kankaria Lake.

ere were several challenges for integrating these isolated data sets into one for comparison; some of the major challenges are discussed below.

1. Variation with respect to slum de nition. One of the challenges in combining the various data sets for comparison pertains to the varying de nitions of slums use. As UN-Habitat (2003b) suggests, there are multiple reasons for-the nonex istence of a universally accepted and quanti able de nition of a slum:

- Slums are too complex to de ne according to one single parameter.
- Slums are a relative concept, and what is considered a slum in one city will be regarded as adequate housing in another city—even in the same country.
- Slums change too fast to render any criterion valid for a reasonably long period of time.

Di erent organizations use their own de nitions to identify a slum based on several parameters. As shown in table 4, the UN-Habitat de ni tion is the only one that covers the maximum number of parameters that have been listed. All other de nitions use subsets of theses parameters. is variation in de ning slums leads to huge di erences in how agencies deter mine the number of households in a particular slum.

e Census of India (1991) followed the slum de nition given by the Government of India (1956). Until then, only noti ed slums were included in the slum census. It should be also noted that in the 1991 census, only those slums with a population of 50,000 or more according to the 1991 Census were covered for slum demography. is led to an underestimate of the total slum population, since smaller slums were not counted. e Census of India in 2001 used a new de nition for slums, whereby, in ad dition to the noti ed slums, all areas recognized as a “slum” by the state or local government and the Union Territories (UT) administration that have not been formally noti ed as slums under any act and constitute a compact

Table 4. Comparison of Slum Definitions

2. Variation in values for the same year in di erent data sets. With the avail ability of survey data sets for a particular slum for a particular year from two di erent organizations, for several slums there was a huge variation in the number of households between the two data sets. While any variation having a 10 percent di erence could be considered tolerable for analysis, there were many slums where a di erence of over 100 percent in values was observed for the same slum in a particular locality in surveys taken by di erent agencies.

One possible reason for this variation could be the lack of o cial slum boundaries. Given that slums are entities that cannot be de ned in a xed area, it might be possible for a particular agency to use its own parameters to de ne the boundaries of a slum for their surveys that might be-very dif ferent for another agency. e absence of a slum boundary makes it di cult to con rm the number the households in the particular area. e other reason for variation would be di erences in the de nition of slums used by agencies, as was explained in the previous point.

3. Mismatch in the naming of slums / changing the names of slums. ere were several slums with the same address and ward but with di erent names. When this was discussed with Ms. Verma of MHT SEWA, she explained that slums are often named after the headman or the elected representative for the locality. After few years, when the representative is replaced by an other, the slum is renamed for a new data set according to the convenience of the new headman, who prefers to name the slum after himself. ese changes could result in a slum recorded under two or more di erent slum names in di erent time periods. Such discrepancies make it really di cult to identify slums while comparing two data sets from two di erent time periods.

4. Lack of a common slum code for veri cation. Surveys done for slums by various agencies use their own sets of slum codes in order to identify a par ticular slum. With each slum in a survey set having its indigenous survey codes, and in addition to the factors described above, much manual work is necessary to individually search a single slum from a data set to compare with another set with all the limiting factors constraining the parameters for identi cation. It is essential that the city government create a central da tabase for slums with a unique code for each slum, which can then be used for future slum surveys. at way, all the data sets could be linked with each other to study trends.

5. Absence of common procedure for rating infrastructure services. All individua extensive survey sets have their own way of rating the infrastructure services in the slums. While some survey sets measure the percentage of households that have access to infrastructure services in a particular slum, some survey sets only indicate the presence or absence of infrastructure services. Such a dichotomous measure cannot provide the micro-level details of whether all the households are deprived of infrastructure services. For example, a slum having only 10 percent of households covered by infrastructure services is considered as having infrastructure, and so is a slum having 90 percent of households covered by infrastructure services—which is misleading.

6. Rede ning and reshaping ward boundaries. Various development plans prepared for Ahmedabad City over the last three decades from 1986 to 2011 have brought many changes in the ward boundaries. Due to these boundary changes, several slums are categorized under one ward in one survey data set, but are then assigned to another ward in the later surveys. In the absence of clear demarcations of changes in ward boundaries, it be comes a challenge to combine multiple data sets for ward-level analysis.

CONCLUSION

Slums are an integral part of a city in most developing countries. Unless e orts are made to understand the growth patterns of slums, it is very dif cult to discern how to suggest a developmental approach to improve the livelihood of people living in the slums. In order to understand the growth of the slums, the foremost requirement is to have comprehensive infor mation and data essential for devising e ective and coordinated policies. An authentic database is essential to assess the magnitude of the problems existing in the area in order to formulate planning and policies that ef fectively target potential bene ciaries. To implement plans and policies for slum development, it is critical to develop a detailed database on slums and to gain a de nitive understanding of the size of the problems and their distribution across cities and areas in a city. e vision of a slum-free India can be achieved only on the foundations of sound plans of sound data.

ere should be a central database for all slum-related information col lected by di erent agencies. is database should hold information about

each and every slum, its structure, the availability of services, and the growth trends from all credible sources that have worked on the site, on the basis of which policy formulations are to be made on the type of action necessary for a particular ward or a zone. All the slum details should also be kept in the public domain under the “Open Data Movement” initiated by the Ministry of Statistics and Programme Implementation (MOSPI), so that researchers interested in working on the growth of slums and un derstanding the change in the dynamics of a city’s slum development can have access to all available data collected. A committee set up under the chairmanship of the secretary of MOSPI in 2009 talked about evolving a sustainable and viable methodology for conducting slum and other surveys between successive census surveys and at the same time suggested measures to build an Urban Information Management System on Slums and Urban Poverty, Housing, and Construction, duly taking into account the data

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Optimizing Property Rate Returns for Urban Development in Ghana, Using Geographic Information Systems

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ABSTRACT

Ghana, in an attempt to promote the use of geographic information systems (GIS) in urban planning, initiated the Land Use Planning and

continue to remain a daunting challenge, one would think that with advancements in technology, the urban planning process will yield to the potential of these support systems. Unfortunately, the advent of new urban planning support systems such as GIS that facilitate the tracking and documentation of urban activities continue to elude developing countries. One potential reason is that the approaches to developing such support systems have been excessively mega in nature. With weak institutional systems, implementation capacity and sustenance have continually remained a challenge.

In Ghana, the formulation of the National Land Policy in 1999 and the Land Administration Project (LAP) with World Bank support in 2003 set in motion the development of a nation-wide GIS. e LAP through the Land Use Planning and Management Project (LUPMP) established a Land Use Planning and Management Information Systems (LUPMIS) in 2008. e aim was to provide a comprehensive direction to build the capacity of urban planning departments and planners in the use of GIS to track urban growth and land development patterns. ough some successes have been achieved, the use of GIS in urban planning practices in Ghana still remains underdeveloped.

is paper argues that the challenges exist because of failures in the design and implementation approach which does not utilize several national potentials and programs to comprehensively develop an incremental approach to developing a community, district, regional and national area GIS. is paper therefore suggests a new design and a bottom-up approach that incorporates academia and youth programs that will develop technical and vocation skills on an incremental basis with greater prospects for e ciency, cost e ectiveness, time-relevance and sustainability. e paper argues for a strong synergy between academia and practice to develop this capacity on an incremental basis. Using property rates as a case in point, the paper demonstrates how the new design can enhance the LUPMP to provide the needed urban and land development planning information to inform the relevant policies and programs for urban development in Ghana.

URBAN PLANNING AND PROPERTY RATES IN GHANA

The State of Urban Development

According to the 2010 Census Summary Report, the majority of Ghana's population was rural until 2009–10. In 1931, the proportion of urban population was only 9.4 percent. By 2000, the proportion was 43.9 per cent (Ghana Statistical Service 2002; Songsore 2009). Currently, the proportion of urban population is estimated at 50.9 percent (Ghana Statistical Service 2012). is rapid rate of urbanization is similar to trends found in other developing countries. Indeed, urbanization at the beginning of the twenty- rst century has been a major development challenge for Ghana due to high national population growth rates (2.7 percent) and urban growth rates (4.2 percent). Rural-urban migration, natural increases in towns and cities and reclassi cation of villages and towns as urban areas have contributed to these urbanization trends[1]. Unfortunately, national and local responses to urbanization in Ghana have been inadequate and sometimes, mostly absent (Ministry of Local Government and Rural Development 2010). It was not until April 2013 that the rst-ever National Urban Policy was launched in Ghana[2]. Today, this challenge still persists and the absence of a de nite response has resulted in tra c congestion, uncontrolled growth and sprawl, ooding, slum development, and poor accessibility to social services such as water, sanitation and health (Owusu and Afutu-Kotey 2010; UN-Habitat 2009).

Currently urban planning in Ghana takes place within the new local governance system of decentralization which came into being in 1993. Chapter 20 of the 1992 Constitution of Ghana, Local Government Act, 462, 1993, National Development Planning (Systems) Act, 480, 1994, and the National Development Planning Commission Act, 479, 1994, support decentralized planning processes that allow for grass roots participation, accountability and transparency. District assemblies

1 In Ghana, any settlement with population of 5,000 and above is classi ed as urban according the Ghana Statistical Service in the 2000 Population and Housing Census.

2 Cities Alliance reported on their website the launch of Ghana's rst-ever National Urban Policy that provides a national governance framework for urban development. See http://www.citiesalliance.org/node/3748.

(DAs) subsequently became the “planning authority” at the local level (Republic of Ghana/Local Government Act, Part 1, Section 12[3] 1993).

Two planning entities are currently part of this existing local governance structure. e rst is the District Planning Coordinating Unit (DPCU) and the second, Physical Planning Department. ese are present in all districts. In Section 7 (1a-e) of the National Development Planning (System) Act, Act 480 (1994), the DPCU serves as the secretariat that advises the DA on planning issues, coordinates all “the planning activities of sectoral depart ments,” provides a “comprehensive and cohesive development framework,” updates “the district development plan,” and provides data to the National Development Planning Commission (NDPC). e activities of the Physical Planning Department are consolidated by the Town and Country Planning Act, Cap. 84 (1945), and are mainly responsible for the spatial planning of

Urban Development F

charge on the premises until it is paid, and that charge shall have priority over other claims against the premises except claims of the Government." Yet this potential has not been utilized in many districts to its full potential. Per Act 462, it can be inferred that land registers, cadastres, master plans, divisional

For instance, in the Sissala East-Tumu District, the DA has compiled a property list for the Tumu Township. “ is was compiled together with the lands Valuation O cer. Unique codes are given to all the property within the catchment area of the township. With the list, rate collectors collect property rates and return with ticks of properties visited.”[5] Currently, there is an emerging trend. With limited capacities, property rate collections are now being privatized with DAs outsourcing the valuation and collection processes. In the Builsa District, the key respondent at the Town and Country Department indicated that “the assembly sublet property rate collection to a private consultant to do the rate assessment and collection. But basically, the property rate being covered and collected is for telecommunication mast.”

Unfortunately, the absence of a reliable database leaves room for undervaluation and reporting by the collection agencies which may deprive DAs of huge sums of revenue. Koney and Akwensivie (1995) for instance identi ed high levels of corruption associated with property rate collection and allude to the issue of subjectivity in the assessment and collection of the rates as well as embezzlements of rates collected. Although the Local Government Act, 462, 1993, delineates clearly the administrative framework for property rate implementation, Adem and Kwateng (2007, 53) argues there are deviations “with regards to timing, quantum and in some cases apathy to the application.” In addition, DAs do not have rolls of all properties and the rates paid to date. e absence of such a database makes collection and retrieval of unpaid rates di cult and at times impossible. In addition to poor permit regimes for land development, many DAs are also not even aware of the number of new properties that have emerged to be rated.

GIS can o er such potential. e software will o er DAs the opportunity to capture, document, and map the various properties and o er opportunities for updates as the location can easily be determined. e areas where property rates bring in the most revenue can easily be identi ed and prioritized to inform strategic local economic development. Nonetheless, all these depend on the capacity to utilize and manage the potential of the software. In urban planning and management, the need for GIS skills has

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become imperative for numerous reasons. As part of planning intelligence and support systems, GIS technology facilitates the collection, organization, analysis and dissemination of information in urban planning processes (Brown and Brudney 1993; Budi 1994; Nedovi -Budi and Godschalk 1996; Huxhold and Levinsohn 1995; Nedovi -Budi et al. 1999). ese are the reasons why the LAP was introduced to facilitate the development of a Land Use Planning and Management Information System (LUPMIS). is project is the focus of the subsequent section.

THE LAND ADMINISTRATION PROJECT

Overview of the Project

e LAP is part of an ongoing land reform process to streamline land registration, administration and management in Ghana. e reform began with the formulation of the National Land Policy in 1999. e long-term goal of the "land policy is to stimulate economic development, reduce poverty and promote social stability by improving security of land tenure, simplifying the process for accessing land and making it fair, transparent and e cient, developing the land market and fostering prudent land management" (Yankson, Asiedu, and Yaro 2009, 2). In 2001, the Government of Ghana initiated processes to prepare and implement LAP and in 2003, the World Bank provided nancial support for the implementation of the rst phase of the project. ere have been several implementation challenges. e complex structure of the project led to a restructuring in 2008. is led to an extension of the project deadline by two years (Ministry of Lands and Natural Resources 2011). LAP-1 ended in 2011 and in the same year, LAP-2 commenced with four main components (World Bank 2011). ere is not much di erence[6] aside from the reduction in project components of LAP-2 because it builds on the foundations laid in LAP-1. LAP-2 subsequently aims to "to consolidate and strengthen urban and rural land

6 LAP-1 had ve components: (1) harmonizing land policy and regulatory framework for sustainable land administration; (2) institutional reform and development; (3); improving land titling, registration, valuation, and information systems; (4) the land titling program; and (5) project management, monitoring, and evaluation. In LAP-2, component 4 of LAP-1 was dropped as part of the restructuring of the program; and probably because it was part of component 3 of LAP-1.

administration and management systems for e cient and transparent land service delivery" (World Bank 2011, 6).

Land Use Planning and Management Information System (LUPMIS)

In component three of LAP-1 and LAP-2, the emphasis is on integrating information systems into land registration and titling because "both land administration and management involve land registration and it has been recognized that improvements to land registration systems and the establish ment of land information systems (LIS) or geographic information systems (GIS) are important catalysts for development in less developed countries" (Karikari, Stillwell, and Carver 2002, 1). In the National Land Policy and LAP, LIS are to facilitate a move from paper based ling systems to auto mated land administration database systems. e LUPMIS is an outcome of LUPMP. is was initiated and implemented between 2007 and 2011 to provide the foundation for a comprehensive GIS for land administration and planning. LUPMP was funded by the government of Ghana and the Nordic Development Fund aimed at developing "a coherent, streamlined and sus tainable land use planning and management system which is decentralized and based on consultative and participatory approaches in order to manage e ectively human settlements development."[7] e project components are:

1. Development and testing of pilot decentralized land use models in se lected high priority areas;

2. Policy studies and the reform of the legal and institutional framework for land use planning and management;

3. Implementation of an information system for land use planning and management; and

4. Pilot plan making and the implementation of plans at regional, district and local levels.

7 e discussions were based on a Town and Country Department document that provides an overview of the LUPMP; see http://www.tcpghana.gov.gh/index.php?option=com_content&view=article&id=70:the-land-use-planning-and-management-project-ghana-&catid=23:news-a-events&Itemid=157.

Town and Country Planning Department (TCPD). ere will be a national headquarters, ten regional headquarters and district o ces of the TCPD which will collect and document spatial data for land administration and urban planning. As indicated in the concept paper,[9] training of personnel to manage these centers is done in ve ways: outsourced formal training courses, in specialized trainings institutes; in-house, formal training; in-house, infor mal training; on-the-job-training and supervision; and, manuals and guide lines, both in hardcopy and online.

ere is a strong disconnect in this approach with how urban planners are trained in Ghana. Most of the personnel that perform planning tasks are graduates from the various universities in Ghana, most especially the Kwame Nkrumah University of Science and Technology (KNUST). ough the LUPMIS approach o ers critical on-the-job training and in-service train ing for current local planners, it has signi cant implications for sustainabil ity and continuous development of national and local GIS capacity build ing in Ghana. GIS education at the main universities in Ghana—namely University of Ghana, KNUST, University of Cape Coast, and University of Development Studies—o er inadequate and mostly no GIS courses for ma jority of students. e Department of Geography and Resource Development and the Centre for Remote Sensing and Geographic Information Services at the University of Ghana o er short courses in GIS. ere is also a GIS Center at KNUST's College of Engineering. ese avenues do not o er a compre hensive path to a GIS professional career. is thus limits the ability of gradu ates to use and apply this skill to a real life work environment. For planning education in Ghana, GIS use is inadequate. ough respondents are aware of GIS and its relevance for planners, they explained that they would not be able to use GIS in their planning tasks. Table 2 summarizes the state of GIS capacity in the various districts studied.

e use of GIS in planning activities is almost absent at the local level and this is due to low human resource and organization capacity. As such there is no link between GIS and property rate collection in these dis tricts, even in districts with GIS databases. e guide that GIS provides in terms of e ciency in collection rates and the tracking of new develop ments in local areas to inform the collection of property rates from new

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Table 2. GIS Capacity and Usage at the Local Level

Aspect of Capacity or Usage	Number (N)	Percent
Ability to use GIS	N = 15	
Yes	5	33.3
No	10	66.7
Existence of GIS database	N = 15	
Yes	1	6.7
No	14	93.3
Rank in department GIS expertise	N = 15	
One	7	46.7
Two	2	13.3
Three	2	13.3
Four	1	6.7
Five	2	13.3
Seven	1	6.7
Rank in department GIS use	N = 15	
One	11	73.3
Three	1	6.7
Four	2	13.3
Six	1	6.7

developments subsequently eludes many DAs. e TCPD where LUMPIS focuses is not the only agency that needs GIS integration at the local level. e nationally oriented nature of the project makes it di cult for incre mental integration and di usion of GIS to other departments as districts wait on national and regional projects to be completed. Karikari (2006, 7) asserts that “there is need for organizational reform, the ‘big-bang’ ap proach cannot be a viable option, technically.”

GIS units can take shape at the various DAs without the complex na tional implementation structures. e rationale for this nationally oriented approach has been informed mainly by harmonization and data sharing principles. Nonetheless, these principles can still prevail if GIS integration and di usion are approached from bottom-up, in uenced by local actions

and partnerships between the various decentralized departments at the local level and national agencies. For instance, for property rate collection, GIS integration and di usion will be feasible as DAs are the planning and rating authority. is is one exciting local potential that needs to be tapped e ec tively to harness property rate collections. In the next section, the suggested framework for such a bottom-up approach and recommendations for how other existing national systems can support this framework are articulated.

SUGGESTED APPROACH

Incremental Design for Integrating GIS into Local Planning and Property Rate Collection

In this framework, GIS di usion should begin from the various loeal gov ernment agencies in an incremental fashion with the development of local level GIS units or departments. Currently, emphasis of GIS development is captured at Customary Land Secretariats (CLS) that concentrates mainly on land deeds and title registration in pilot areas. National and regional o ces and regulatory frameworks have been the main focus with the aim of reduc ing land con icts and stress in land registration. Indicators achieved in LAP-1 relate to policy and legislative reviews, policy on land compensation, assess ment of land rights and vulnerability, and establishing of CLS (World Bank 2011). As critical as these indicators are for (f(d)-20(i)7)-10(shnvelopment ioue

a sustainable stream of skilled GIS personnel. It would also allow more direct use of GIS for urban planning and development tasks rather than the current systems wijl-15(si)7()-11(uhp)9(l)-8(a)-26()-11(e)-67(rs g-15(s)3(e)-14(a)-2t)1(e)-(r t

Available National Systems

e Role of Academia: Public Universities and Polytechnics. ere are eight public universities, ten polytechnics, thirty-eight colleges of education and fty- ve accredited private tertiary institutions in Ghana (NDPC 2012). Wikle and Finchum (2003) and Wikle (1998) note that tertiary institutions play critical roles in GIS trainings and development-by pro viding certi cate and academic degrees in GIS. Yet for Ghana, such mo tivation is minimal and the potential of tertiary institutions is not real ized. All fteen respondents are aware of the use and relevance of GIS in urban planning. irteen respondents have attained a bachelor's degree in a program related to urban and development planning and two have a master's degree. All received their rst degree in Ghana. For those with a master's degree, one earned the degree outside of Ghana and the other within the country. All respondents (66.7 percent) who could not use GIS have had some experience with GIS during their undergraduate degree education. ose who could use the software gained the skill through self-teaching (20.0 percent), in-service and on-the-job training through LAP (20.0 percent)[10] and NGO programs (20.0 percent).[11] e rest (40.0 percent) emphasized their undergraduate education. e respondents who could use the software however intimate that there was a strong diver gence in GIS education and its planning application; thus the experience only performed the role of awareness creation and was not su cient for practical skill training. Typically, Development Planning and Human Settlement Planning students who graduate from the Department of

In our proposal, we see public universities and polytechnic institutions as critical avenues for establishing GIS resource centers that will provide regional training and capacity building in GIS for students and professionals. The initial cost of establishing these centers can be daunting but this offers a cogent and sustainable national effort toward developing GIS skills for local level planning and other application of the skills in public discourse. Certificate and degree programs will offer vocational and technical know-how for both public and private institutions.

This will eliminate the proposed crash courses that deprive DAs of planning time as well as the high costs associated with contracting out such services. It will also take away the vacuum that will be created when planners migrate from DAs to other agencies as their replacements will not need to have to go through crash courses in order to be able to use GIS in planning activities at the local level. University of Ghana, KNUST, University of Cape Coast, University of Development Studies and the ten polytechnic institutions can serve as these regional resource centers. The universities can serve as national and subcontinental resource centers in GIS capacity building while the polytechnics will provide regional services.

This training would provide the needed skills in land registration, cadaster, master plan, divisional plans, block plans, property record and valuation list preparation that are critical for enhancing effectiveness and efficiency in property rate collections. Aside from using this for property rate collection, these skills can be applied to enhance other planning tasks at the local level. Universities and polytechnics can also develop studio-like courses to facilitate the community based GIS systems. Such systems can form the basis for integration into district-wide GIS systems. These tertiary institutions can also develop internship opportunities and partnerships

school level of 728,076 students in the 2010–11 academic year. ough not all these students graduate, this gives a sense of the number of individuals who wait to attain tertiary education—a huge untapped resource that can help in tracking changes in the urban space on an annual basis.

National Youth Programs

National Service Scheme.

e information and communications technology module can be har nessed to develop youth skills in GIS that can form the basis for the de velopment of GIS professions in Ghana. GIS is a technical skill set that is relevant for nation building. Since most of these modules are implemented at the local level, bene ciaries can be identi ed and career paths developed in line with GIS to support local level GIS capacity building through short courses in the summer at the proposed GIS Centers. ese individuals will be trained in geodata collection and property mapping within districts. After the courses, they will attain basic GIS skills in database collection and management to support planning tasks. In the long term, through recur rent courses they would receive a certi cate in GIS and can use these skills to support planning tasks at the district level.

CONCLUSION

e proposed idea holds great potential. Further studies are needed to con solidate the proposed strategy and integrate the challenges and lessons in the implementation of LUPMIS into the suggested strategy. Nonetheless, academia o ers great untapped potential for promoting national, regional and local GIS capacity in Ghana. For the current LUPMIS to have any sus tainable relevance for urban planning and inform property rate collection, there is a need to develop resource centers that can provide various local planning agencies with human resource to promote development. Without this, the program faces high costs for training and maintaining skilled planning personnel at the local level.

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Navigating the Global City: Gender, Mobility and the Case of Bangalore's IT Economy

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ABSTRACT

is paper situates research on gender and mobility within the context of the infor mation technology economy in Bangalore in order to investigate how this econo in uences both urban space and the literal mobility of female workers. Are thes women more likely to choose personal transportation over public transportati in order to better access socio-economic opportunities spread far and wide ac the city? Transportation policies that favor personal mobility often increase soc economic inequalities and threaten the long-term environmental sustainability o our cities. As more women enter Bangalore's formal labor force, it is important address gender-based barriers to accessing public transportation and develop cies that mitigate these barriers in order to achieve inclusive and equitable mob ity. It is this author's argument that everyone stands to gain from transportatio policies that emphasize universal accessibility, connectivity, and equitability.

INTRODUCTION

As incomes rise, it is predicted that individuals will choose personal over public transportation because the e ciency of personal transportation becomes more valued than the higher monetary cost to use it (Sabapathy 2012). Higher incomes are also correlated with longer commuting distances

2. In a detour to a larger, more general body of literature on gender and mobility, I home in on safety, cost, and time as three major barriers women face when accessing transportation.

3. We take a shift to the rise of two-wheeler ownership in developing countries around the world, highlighting why this mode of transportation appeals to a diverse range of socioeconomic groups and, more specically, to the residents of Bangalore.

4. I o er a discussion of Bangalore's road-related infrastructure nancing, the increase in two-wheeler sales, and the connection between private mobility and global city ideologies.

5. I arrive at my destination: the question of how women's mobility issues can further in uence the tendency to use private modes of transportation the incjl-5(si)71007 Tw oro(c)-14()-24at, mo-14(o56(r)-9(a)2(ts ()4)-7(g)-15(y

early IT sector development (i.e., in the 1980s and early 1990s); first, it was too expensive for the nascent industry; and second, the land was already "imagined" and connected to Bangalore's past as a textile- and manufacturing city (Nair 2005). The new economy needed new space, one in which the "self image…is far removed from any concept of a laboring

(quoted by Ditrich 2010, 244).[11] Returning to Reddy's finding, we might conclude that improved road conditions came at the favor of those with access to private, motorized transit at the expense of lesser mobile groups such as women, the poor, and the elderly.

Motivated by the observations of Sassen (2001) regarding the "social polarization" of a global city due to economic factors, Sabapathy et al. (2012) collected data from a total 436 Bangalore employees and used a weighted multinomial regression analysis to measure and compare the commuting patterns between the employees of a large IT employer located on the city's southern periphery and a manufacturing-oriented public-sector unit in a more centrally located part of the city. The authors had two major hypotheses: that increases in income would correspond with an increased expenditure on transportation and that employees of the IT economy would have broader differences of commuting patterns than those in the traditional public-sector unit. As they explain:

> It was expected that higher income employees would be more likely to afford better quality homes at more distant locations leading to greater commute distances…with the limited supply of good-quality housing in central areas and newer residential development taking place at the edges of the city, it would be more likely that higher

employees sampled were women, while 19.5 percent of the IT employees were female. Furthermore, among married employees, 97 percent of spouses in the public-sector unit were not employed, while 41.3 percent of those in the IT sector were.

ere is empirical evidence that the number of women entering India's formal labor economy is increasing, particularly in the IT and BPO in dustries. As of 2011, women constituted 36 percent of the IT sector (Crest 2011). A 2008 NASSCOM study found that among Indians, the IT and BPO industries are perceived as "safe" and "acceptable" careers for women

where a million people enter and leave the city every day. We see it in the IT rms, which are mobile enough to expand the boundary of the city by lo cating on its periphery. And we see this is in the employees of the IT sector, who, due to higher incomes, are more economically and spatially mobile than their public-sector counterparts. Finally, we see it in the comparison between men and women IT workers, where women seem to have longer, and more complicated, commuting patterns.

Contemporary gender and mobility research argues that women have greater mobility but less accessibility than men. is is largely attributed to (1) gendered experiences of safety and security and (2) gendered experi ences of labor—namely, women's attachment to formal and informal eco nomic responsibility (also known as the double burden). While the former restricts access to certain modes of transportation, the latter translates into an increased number of trips per day. Indeed, many research and policy institutions nd that safety, cost, and time are the most common barriers women face to accessibility (see, e.g., GTZ 2007; "World Bank Gender and Resource Guide").[2]

Safety and Security

It is generally accepted that women's perception of safety and security dif fers from men (e.g., Vasconcellos 2001, 2003; Peters 2001; Tanzarn 2008). e literature consistently shows that women tend to value security over all other factors when choosing their mode of transportation. Security in this case does not refer to road conditions but rather to the perceived safety of the space—be it inside a train or waiting at the bus stop. Safety and security have an enormous impact on women's ability to access transporta tion, which, in turn, a ects women's mobility. In their research on women's experience of sexual harassment while commuting in Chennai, Mitra-Sarkar and Partheeban (2011) found that 66 percent of respondents (from a sample of 274) had experienced sexual harassment. e most common places of sexual harassment were in buses and trains without separate cars or sections for women, and also at bus stops. When asked to rank the best mode of transportation from a safety and security perspective, those sur vef sexual (n)-12(so)10(f)603co-o

knowing other characteristics of these women—such as income, education, and family composition—this finding suggests that women might not inherently prefer personal over public transportation modes. From a road security perspective, this is intuitive; most vehicle accidents in Indian cities involve two-wheelers (Mohan 2000). Personal safety has many dimensions;

Oxfam's survey also found that 26 percent of participants were the sole economic earners within their family, making them even less likely to re port harassment. As Mitra-Sarkar and Partheeban explain: "Single working women are primary targets for such attacks because they most visibly signal their independence from male control. Women who resist the de nition of them as private sexual property by going out to work su er the risk of being public sexual property" (Mitra-Sarkar and Partheeban 2011, 75). How do women cope with these experiences? To what extent does sexual harassmen become an everyday experience for women moving throughout the city? While fear of job loss is indeed a barrier to addressing workplace sexual harassment, using transportation is something all people do, regardless of being fort ha TD [(h)-10(-101-p)-6(o)1(s)-(cg f)-1-8(eb)g all ph24(h)9(e)-9(e

think deeply about the implications of this not just for individuals but also for the entire city. If women who can a ord personal modes of transportation are at an even greater risk of sexual harassment in public, it seems likely they will choose personal over public transportation. Fewer people using public transportation makes nancing it less feasible. When bus services operate at a loss, routes are likely to be cut; this has dire consequences for the urban poor, the disabled, and the elderly.

Mitra-Sarkar and Partheeban's research in Chennai found that women rely on a multitude of coping strategies to avoid being sexually harassed while traveling. A total of 18 percent said that they paid more for "safer" transportation, 58 percent said they traveled in groups, and 28 percent carried a personal weapon such as a safety pin. Most women did not nd transit operators or law enforcement such as police o cers helpful or sympathetic to their complaints (Mitra-Sarkar and Partheeban 2011, 78). Bangalore ranks number four in terms of number of reported rape cases. A recent article in the Times of India highlights a university student's dissatisfaction with the police response when she reported an incident of sexual harassment that occurred on a public BMTC bus (Times of India 2012):

> When journalism student Ankita Sen Gupta walked into a police station to complain against alleged molestation on a BMTC bus, cops asked her questions she will not forget in a hurry.... Ankita asked joint commissioner of police (crime) Pranob Mohanty: "Where do girls like us go and complain if your policemen are so insensitive? Why are victims treated like culprits? What is the safety for women in this city?"

Similar conclusions were found in Mitra-Sarkar and Partheeban's research in Chennai. If transit operators and law (s a)T(n)-8((e)n M4 -0.00 -1.2)-1
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In 1997, the average door-to-door travel time for one trip in São Paulo was 28 minutes by car and 56 minutes by bus (Vasconcellos 2001, 21). is means that a simple commute to and from work by bus would easily take two hours each day—more or less depending on time of day traveled. Additional trips would require additional time. In other words, these gures do not take into account women's common experience of multitasking by trip chaining. In an urban context, this could be anything from dropping children o to school before going to work; in a rural context, it could be fetching wood and water, returning home, and then traveling to a eld for agricultural-produc tion. Each woman will experience time poverty according to her own con text; however, the experience of being time poor is shared by many women throughout the world, so that even a woman with access to a car is more likely to be more time poor than her male counterpart.

THE CASE OF THE TWO-WHEELERS

A number of factors explain the rise of two-wheelers. e general ł ord ability of these vehicles allows personal mobility—a characteristic usually associated with higher incomes—to transcend class boundaries. e two-wheeler also allows an individual to navigate the congested urban streets with relative ease. Both characteristics prioritize individual e ciency and interest at the expense of the greater good of the city.

In the early 2000s, the typical cost of a two-wheeler in Cameroon was around $1,600; by 2008, the price had dropped to $500 (Sietchiping et al. 2012, 186). Although this gure is still quite high fd ur.5(j(i)7(o)11(r)-10(i)18(t T* [(2

A two-wheeler has other bene ts. One two-wheeler might be shared among one's immediate and extended family. In developing countries, it is not uncommon to see entire families on one vehicle. ese vehicles are not only utilitarian but also status symbols for lower- to middle-income families.

> Scooters are important status symbols for middle-income families. So rather than criticize women's newly found independence and mo bility, husbands in Bamako are actually supportive of their wives' motorcycling.… Women on a motorcycle are not only much more e cient shoppers and caretakers, but they are also moving advertise ments of their families' social status and wealth. (Peters 2001, 14)

Sietchiping et al. attribute Cameroon's proximity to Nigeria—a coun try with manufacturing and assembly facilities, a good spare parts market, and access to cheap fuel—as factors that keep the cost of two-wheelers down (Sietchiping et al. 2012, 186). Bangalore's proximity to Chennai, India's au tomotive manufacturing city, suggests that parts, fuel, and assembly facilities could also reduce the cost of two-wheelers for those living in the region. In fact, the similarities between Bangalore and Chennai warrant some compari

rickshaw), 4.5. In Bangalore, we see a much di erent pattern: walk and bike, 17; public bus, 41; private bus, 3; cars and two-wheelers, 38; and others, 4 (the source for these data is World Bank 2005, 14; percentages do not necessarily total 100). Although Bangalore has a light rail track left over from the days of the British, it has never been used for transporting people.[4] e second observation I would like to o er is that Chennai is not imagined in the same way as Bangalore. While Chennai might wish itself to be a global city, it fails to reproduce the image. e historical conditions of Bangalore's land use—for example, favoring of low density—helped convince IT development rms to locate on the city's periphery. Locating on less developed land allowed architects and planners the freedom to reimagine and recreate the sprawling campus designs found in California's Silicon Valley. is in turn helped further distinguish Bangalore IT economy as well as its workers from the actual space where it was physically located. As described by one Infosys employee:

> Whenever clients come here, they walk in, they walk through this chaos; [and] they are confused because they see…cattle on the road. You see people crossing the road; you see the buses going helter-skelter, you see the road is crowded, you see the dirt on the road, and you are confused.… And they come here, and suddenly they see order, they see beauty and they see aesthetics, they see a lot of well-dressed people moving about. (quoted by Stallmeyer 2011, 60)

e myth of Silicon Valley is the myth of the individual eking out his or her own fortune. Although there are multiple ideas at play here, I would like to highlight two. First

its contemporary inhabitants" (Stallmeyer 2011, 24–25). Bangalore is imag ined and experienced as a world-class city; it is a city that is based largely on the interests of private, often global, investors. It seems logical that in dividual travel behavior would mimic the mobility and circulation of the global economy.

ROAD DEVELOPMENT IN BANGALORE

e introduction of two-wheelers in India coincided with the 1985 New Economic Policy, which reduced restrictions on production capacity and opened the country up to foreign investment. Demand for two-wheelers spiked again in the early 1990s, when the country experienced a signi cant increase in its gross domestic product (George et al. 2002). In November 2012, the world's largest two-wheeler manufacturer, Hero MotoCorp Ltd.,

In his work on road safety, transportation expert Dinesh Mohan argues that the issue of safety is far more complex in lesser motorized countries (LMCs) where, unlike highly motorized countries (HMCs) (e.g., the United States), roads are occupied not only by cars but also by pedestrians, bicyclists, animals, and two- and three-wheelers:

> Indian cities are characterized by heterogeneous tra c and land use patterns.... e road network is used by at least seven categories of motorized and nonmotorised modes.... In the mind of the formally trained planner, it is chaos moving towards total gridlock." (Mohan 2001, 54).

"Formally trained planners," regardless of being in a HMC or LMC,

35 percent of all two-wheeler users are women, such an accessory will find a success in a growing market of consumers (Prasher 2012). In India today, 45 percent of modern retail is purchased by women; this is expected to increase to 60 percent, representing close to $360 billion per year (Crest 2011)

As a group that has been traditionally underrepresented, women in India are used to going at it alone; this includes figuring out how best to access social and economic opportunities spread far and wide across the urban space. When thinking about future transportation policies for growing cities in India, it is crucial that policymakers consider the unique experiences women face while using transportation. I have highlighted the way in which the image of the global city inherently lends itself to an ideology of self-interest, an ideology that is reflected in the economic organization of the city, transportation policies, and the sociocultural values of the middle class. Although I did not touch on it at length, this

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