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Practices of Legibility Making in Indian Cities: Property Mapping Through Geographic Information Systems and Slum Listing in Government Schemes

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Property mapping through use of geographic information systems (GIS) and slum listing are practices of official knowledge production in government improvement schemes in Indian cities. Our comparative analysis of these two practices is in concert with recent amplifications of Scott's analytical scheme around the notion of legibility making. In both cases knowledge production in practice encounters an "amorphous state." Government representatives and interests frequently intermingle with non-governmental representatives and interests. This influences knowledge production in practice with different implications for government scheme implementation and participation in urban governance. We find that slum listing supports scheme implementation better than GIS property mapping. The latter seeks to translate the notion of a clear delineation between state and non-state into organizational and technical design for legibility making. It stops short of reaching larger aims of the scheme and comes to focus on the problem of incomplete knowledge and mechanisms of self-referential monitoring. The more organic practice of slum listing involves dispersed paper and desktop technologies and relies on traditional sites of knowledge production in the city. It is adjusted to and enacted by an amorphous state. The official knowledge produced is temporary in nature, and as such allows for incremental and partially reversible scheme implementation. Slum listing retains channels of negotiation with city administration and politicians, which are vital for poorer sections of the urban populace. Our study is relevant to policy and future research, because as of 2012 the new national slum improvement scheme requires implementation of GIS also for slum data collection and management. The question is, whether the new scheme will run into similar problems as GIS property mapping or whether it puts at risk existing channels of negotiation.

Keywords: legibility; urban governance; India; GIS; listing

1. Introduction

Up-to-date information on the territory and people in a state is a core ingredient for the implementation and evaluation of government-driven improvement schemes. Standardized, unambiguous, and comprehensive information enhances the capacity of administrative cadres to "see" the territory and improve the welfare of the people (Scott, 1998). Information technology (IT) has promised to support these endeavors since the dawn of the information age (Tsoukas, 1997). Urban planners and urban studies scholars in particular have emphasized the potential of Geographic Information Systems (GIS) and remote sensing to better understand and manage the rapid changes that characterize urban areas (Abbott, 2003; Baud, Pfeffer, Sridharan, & Nainan, 2009; Joshi, Sen, & Hobson, 2002; Kohli, Sliuzas, Kerle, & Stein, 2012;

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Madon & Sahay, 2000; Madon, Sahay, & Sahay, 2004). In transitional economies, GIS and related technologies are being implemented especially for property and land administration (Harvey, 2006; Madon et al, 2004; Silva, 2007).

Nonetheless, students of Indian cities have shown that the government can also govern *without* comprehensive information, in the form of statistics and maps. For instance, Ghertner (2010) shows that aesthetic criteria override the evidence from statistics and numbers in slum resettlement in New Delhi with the “*appearance of filth or unruliness in and of itself . . . [as] a legitimate basis for demolishing slums*” (201, emphasis in original). Roy’s ethnographic studies in Calcutta (2003, 2009) show that urban governance often functions by “unmapping” cities. The absence of maps and statistics allows the state considerable flexibility to alter land use, deploy eminent domain to acquire land, and move the poor around (Roy, 2009).

Furthermore, the state/non-state dichotomy has come under closer scrutiny. Far from being a monolithic entity with one coherent interest, the state consists of a multiplicity of agencies with partially overlapping jurisdictions, with complex and emerging relations to private and research entities, and is increasingly tied into international bodies and regulations; the citizenry or “non-state” is just as incoherent (Fenster, 2006).

To unpack these complexities we need to engage with state improvement schemes encompassing a range of tactics and techniques (Li, 2005). The reason for such engagement is to explore, what effects these varied tactics and techniques have on scheme implementation (Li, 2005). Empirically, one often observes a variety of techniques of knowledge production that span across the state/non-state dichotomy, and employ various forms of technology, including individual desktop applications, paper and combinations thereof.

In this article, we amplify Scott’s (1998) analytical concept of legibility in order to analyze and compare two practices of official knowledge production in the context of two government improvement schemes: GIS property mapping in Nirmala Nagara in Karnataka and slum listing in Basic Services to the Urban Poor (BUSP), in Karnataka and Maharashtra. Although these schemes have different aims, they both share the basic requirement underlying legibility making as conceptualized by Scott, where the government is expected to produce unambiguous and standardized knowledge of society and the territory. Against this underlying commonality, our study explores how legibility making handles urban realities encountered in practice, and the implications this has on scheme implementation.

In the following section, we conceptualize official knowledge production by drawing on Scott’s (1998) work and recent amplifications in anthropological research as basis for the comparative analysis. Then we describe our research methodology and the background of the two government improvement schemes. After comparing the two practices, we discuss implications of our analysis for participation in urban governance beyond specific government schemes.

2. Amplifying Scott’s notion of legibility making

In “Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed,” Scott analyzes a range of state-driven improvement schemes in history across the globe through the lens of legibility. Legibility making refers to processes through which the state gradually gained a handle on its population and territory. These processes are manifold, but “[i]n each case, officials took exceptionally complex, illegible, and local social practices, such as land tenure customs or naming customs, and created a standard grid whereby it could be centrally recorded and monitored” (Scott, 1998, p. 2). Underlying efforts of legibility making is the notion of official knowledge, a permanent, unambiguous, standardized, and comprehensive knowledge, and as such a simplified version of reality (Carson, 2011; Scott, 1998).

Scott's example of land and cadastral maps illustrate the characteristics of legibility making. Local practices of land use and ownership are not only complex and often illegible to outsiders in terms of spatial arrangement, but also flexible through time. Land maps and particularly cadastral maps were designed to not only *standardize* the socio-spatial relations around land holdings across different localities, but also to trace land distribution and ownership through time promoting a *permanent* knowledge, for instance, through the creation of last names that allowed tax authorities to track owners across generations. In its aim of assigning one piece of land to one owner, the cadastral survey emphasizes *unambiguous* knowledge, as well as *comprehensiveness* in terms of coverage of territory and types of tenure and land holdings. Because of the multiplicity and complexities of local ownership regimes, such knowledge necessarily has to bracket out certain forms of land ownership and use practices. If backed up by state force, for instance, legal means, legibility making also has the power to alter the reality that it seeks to depict.

Within the framework of e-administration (Maddon, 2009) large-scale, integrated information systems and infrastructure, including cross-organizational GIS, are closely allied with the notion of legibility making as conceptualized by Scott. The integration of administrative agencies, their systems, applications, and databases require codified knowledge, and the standardization and classification of digital data (Homburg, 2008; Stalder, 2011). And conversely, increasing reliance on IT-based practices also fosters the notion that only standardized, codified knowledge counts as legitimate (Tsoukas, 1997). System and database integration in the government also contribute to an increasingly permanent knowledge base because the politics and histories that produce classifications sink into the routines of software applications, databases, and work processes (Bowker & Star, 2000). At the same time, deletions and errors once made are increasingly difficult to reverse (Prins, Broeders, & Griffioen, 2012). In this sense, e-government efforts are a historical continuation of older socio-technical assemblages that were deployed by the state to make its society and territory legible.

In Scott's scheme, the counterpart to standardized and permanent official knowledge produced by the state is local, vernacular knowledge. Vernacular knowledge draws on individual experiences, entails learning by inhabiting a specific place and tacit forms of knowledge embedded in local history. One of the many examples Scott gives is the knowledge of local farmers accumulated through ongoing experimentation, and an intimate understanding of environmental and social relations of a particular place. Scott (1998) thus makes a basic differentiation between official knowledge that is of the state and vernacular knowledge embedded in local practices:

Each undertaking . . . exemplified a *pattern of relations* between *local knowledge and practices on one hand* and *state administrative routines on the other* In each case, local practices of measurement and landholding were "illegible" to the state in their raw form. They exhibited a diversity and intricacy that reflected a great variety of *purely local, not state, interests*. (Scott, 1998, p. 24; emphasis added)

Recent anthropological research has amplified Scott's analytical scheme by zooming into the "pattern of relations" Scott refers to. Within this body of research, scholars have argued that the state cannot be conceptualized as a coherent entity with one interest and as the sole driver of improvement schemes hovering above a multitude of local complexities endowed with vernacular knowledge. According to Li (2005), multiple authorities are involved in improvement schemes, including scientists, political activists, and ethnographers creating different assemblages of interests, techniques, and discourses intertwined with the state. But in addition to this multiplicity, the idea of a state as a monolithic entity with one intent and as container of power is also contested (Li, 2005). Gupta's (2006) ethnographic research of relations between rural people and state officials in a north-Indian village demonstrates how decentralized and

dispersed the state is empirically, and how it is implicated in the texture of everyday life. Similarly, Ferguson and Gupta (2002) argue that the idea of a state hovering above grassroots organizations does not hold empirically. The state viewed as a set of practices is also very much local in its materiality and situatedness. So-called “grassroots” organizations may be global when they network across continents and countries, for instance, through international slum dweller associations. The idea of the state imagined in a vertical arrangement above the local and below the global, dissipates upon closer empirical observation. Rather, the game board is made up of multiple fields of power emerging from players’ various tactics and practices (Li, 2005). This means that resistance to an improvement scheme does not need to arise from “pristine spaces outside of power,” i.e. outside of the state, as Scott’s work may imply, but can arise from within the bureaucratic apparatus itself (Li, 2005).

Hull (2012) combines insights from science and technology studies (STS) and anthropology in a detailed ethnographic account of bureaucratic practices in the planning and governance in urban Pakistan. His study of graphic artifacts and their circulation through the city of Islamabad illuminates how bureaucratic writing is not only a mechanism of state control over people, places, processes, and things, but that official knowledge production engages places and urbanites in such a way that the political function of documents is highly ambiguous. The documents, lists, and maps take on an agency of their own mediating between the government and society. Although, a state plan may be designed to separate the work of government from the larger social world, individual documents and files work “not only as instruments of bureaucratic control but also as media of dissent and negotiation between the government and populace” (p. 66). According to Hull (2012), scholars need to explore the practices that enact bureaucratic objects, such as lists, petition letters, maps, and planning documents in order to discover how they have been turned into allies of individuals or groups of people that cut across the state/non-state dichotomy. This is necessary also to “explain the ordinary success of bureaucratic schemes” (p. 207).

Along similar lines, Li (2005) proposes to focus on three junctures in order to amplify Scott’s analytical scheme, namely (i) when local knowledge is adjusted for the purpose of the intervention, (ii) when local knowledge sustains bureaucratic and profit-making schemes, and (iii) when local knowledge and practice are embraced by experts (Li, 2005). Our comparative analysis takes the first two of these junctures as points of departure.

Scheme implementation requires “the state” to make its society and the city legible through official knowledge production. But how this takes place can vary in practice. Zooming into the “patterns of relations,” which Scott himself mentions, we conceptualize legibility making as practices of knowledge production within improvement schemes that *arise along a continuum* between state and non-state actors, and between official and vernacular knowledge. This amplification allows us to bring to the foreground legibility-making practices that create varying entities with authority and power, and position people as members of certain groups and to explore practices that fill the gaps between official plans and on-the-ground realities (Li, 2005).

3. Our study in the context of two government schemes

We draw on empirical material from qualitative research conducted between 2008 and 2012. The research sites were three cities in the Indian state of Karnataka: Bangalore (the state’s capital), Mugdali, and Dhabunagar, as well as in Kadovali,¹ in the state of Maharashtra, complemented by interviews in Mumbai for comparative purposes in a different state. In Mugdali, Dhabunagar, and Kadovali, we carried out a multi-site ethnography (Crang, 2005; Hine, 2007), with data based on semi-structured interviews, field observation, and collected scheme documents (Table 1, also Richter, 2011; Richter & Georgiadou, 2011). Data collected during several field-work rounds were inductively analyzed and played against literature and the explicit theory

Table 1. Summary of fieldwork by city and time.

City and government scheme	Mugdali, Karnataka BSUP, Nirmala Nagara	Dhabunagar, Karnataka Nirmala Nagara	Bangalore, Karnataka BUSP, Nirmala Nagara	Kadovali, Maharashtra, BSUP	Mumbai, Maharashtra, BSUP
Fieldwork Periods:	Aug 2008, Mar–Jun and Sep–Dec 2009, Oct–Nov 2010	Aug 2008, Oct–Nov 2010	Mainly Dec 2010–Feb 2011	Apr–May 2012	Apr–May 2012
Synthesis of main fieldwork activities (besides collection of active government records):	Survey shadowing, transect walks and observation in slums, observation and interactions at slum district and municipal offices, Attendance of weekly JNNURM review meetings	Interactions and observation at municipal office, district slum office, and “poverty cell” of municipality	Semi-structured interviews with key stakeholders in Nirmala Nagara at state-level and planning consultants, attendance at Municipalika Conference	Transect walks and interviews at slum re-construction sites, observation and interactions at BSUP engineering cell, interview with the head of poverty cell of municipality	Semi-structured interviews with MHADA and MMRDA officials

(Strauss & Corbin, 1994). The ethnographic methodology employed has been informed by STS insights with the aim of retaining interpretive symmetry between human and non-human actors influencing the practices under study (Czarniawska, 2007). This is reflected in the comparative analysis, where we discuss technical as well as organizational design aspects of both practices. Scott’s notion of legibility making emerged through inductive analysis as a common denominator for a comparison across two different government improvement schemes as both schemes require the government to produce knowledge of society for implementation.

Our study took place during the implementation of two major improvement schemes: the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and Nirmala Nagara.

JNNURM, a large-scale, seven-year long national investment scheme for cities across India, was launched in 2005 to conduct major urban infrastructure development based on the condition of reforming governance to receive funding. IT played a key role in supporting systematized accounting, benchmarking, and performance measurements in the scheme. JNNURM was being implemented in Mugdali and Bangalore in Karnataka, and Kadovali in Maharashtra during fieldwork. One of the sub-missions of JNNURM was Basic Services to the Urban Poor (BSUP), which sought to improve the lives of slum dwellers through housing and infrastructure provision. BSUP did not require a specific IT for data collection and management, but through the practice of “slum listing” it used diverse technologies already in place to list target areas and beneficiaries.

Nirmala Nagara was launched in 2005 by the Government of Karnataka in 57 cities, including Mugdali, Dhabunagar, and Bangalore, to take advantage of JNNURM’s reform agenda. This scheme’s main focus is the implementation of municipal e-governance systems (Ranganathan, 2012). It was initially funded by the Asian Development Bank as part of an urban infrastructure

project in northern Karnataka. In 2006, the World Bank took over most of the funding and expanded the scheme to include the computerization of the functions of all municipal corporations in Karnataka. One of the scheme's components is the "GIS-based property tax system" (in this paper: "GIS property mapping"). In Dhabunagar and Mugdali, the survey work for GIS property mapping started in 2006.

In both JNNURM (including BSUP) and Nirmala Nagara, a parastatal organization, the Karnataka Urban Infrastructure Development Finance Corporation, negotiates and brokers loans, oversees reforms, and acts as disciplinarian of municipal reforms (Ranganathan, 2012). In the case of Maharashtra, the Maharashtra Housing and Area Development Authority (MHADA) and Mumbai Metropolitan Region Development Authority play a similar role, with MHADA in charge of the BSUP sub-mission. The implementing agency for BSUP cities in Karnataka is the Karnataka Slum Clearance Board (KSCB), a parastatal organization, established in 1975. Monitoring work is guided by the state-level office in Bangalore. Scheme implementation and tax or installment collection from other, previous scheme beneficiaries are coordinated through the slum office at the district level. In Kadovali, Maharashtra, the scheme is implemented through a BSUP Engineering cell within the municipal corporation, not through a parastatal Slum Board.

Both Nirmala Nagara and BSUP require the city administration to map urban space and account for its population, i.e. to produce official knowledge of the status quo for subsequent scheme implementation and monitoring. *GIS property mapping* and *slum listing* are practices of legibility making in Nirmala Nagara and BSUP, respectively, to improve urban governance and residents' lives in the city.

4. Comparative analysis of GIS property mapping and slum listing

In the following sections, we identify the commonalities and differences between GIS property mapping and slum listing in terms of scheme goals and requirements, on-the-ground realities, the practices of legibility making in each case, and effects on the progress of each scheme.

4.1. Scheme goals and required legibility making

Under Nirmala Nagara, city administrators are expected to compile a GIS database of the properties within the municipal jurisdiction for all cities that are included in the scheme through GIS property mapping. The database is supposed to be stored on a central server in Bangalore, networked with municipalities in future, and updated at certain intervals. This is expected to provide a basis not only for tax revenue collection and monitoring, but also for strategic planning, and to provide online access to citizens with the option "to click on a polygon [one property outline] on the web and retrieve the relevant ownership information" (Department of Municipal Administration official).

Under BSUP, administrators are expected to delineate boundaries of slum areas and their respective residents along with their characteristics through slum listing. This information, in the form of paper and digital lists and tables, architectural drawings and sketch maps, is required for three main purposes in BSUP: phase-wise funding release through state nodal agencies, allocation of new housing units, and monitoring of progress, including land acquisition, phase-wise building construction, and subsequent housing allocation.

Despite differences in the official aims of each scheme, both share the basic tenets of legibility making as conceptualized by Scott: the government (city administration in our empirical cases) produces unambiguous, standardized knowledge of the city: properties and slums with respective owners and/or residents as well as their characteristics. As far as the schemes are

concerned, this knowledge would ideally be permanent providing a basis to take subsequent steps in scheme implementation and other strategic planning. Against this common requirement and assumption of legibility making by the state, the next step in our analysis takes a closer look at the urban realities encountered by both efforts in practice.

4.2. *On-the-ground realities: urban settlement processes and the amorphous state*

The ways of accessing, claiming, using, and owning urban land are highly flexible and locality-specific. They include a wide range of semi-formal and flexible arrangements, including temporary and informal rental agreements, flexible uses of spaces by street vendors, incremental construction of shops and additional rooms and houses (Figure 1), as well as multiple ownership agreements, all of which are linked to livelihood strategies of residents.

Different localities in the city grow from their specific histories, histories embedded in a multiplicity of land tenure regimes, driven by events and accidents, a complex web of power relations that underpin contestations over land claims by different groups of people, various means and modes of settlement, different forms of group leadership, and the interplay between the local and global economy (Benjamin, 2008a, 2008b; Benjamin, Raman, & Rajan, 2008). For our analysis, it is important to note that these settlements, land use, and ownership processes are the soil nourishing the growth of an amorphous state. The state does not hover above a fluid urban landscape. Members of the state, politicians and administrators, at different hierarchical levels, are entangled in various competing interest alliances and perform different roles and identities. This is evident in GIS property mapping and slum listing.

In GIS property mapping, it becomes manifest in conflicting interests between state-level officials and municipal administrators. While the Municipal Reforms Cell (MRC) and Directorate of Municipal Administration (DMA) have an interest in the completion of a permanent, cross-municipal urban property database, district and municipal administrators may be tied into processes of land claiming and related contestations that do not align with these interests. Municipal revenue officers and commissioners are associated with private developers, planning, and development agencies that in turn pursue varied interests regarding a specific locality. State versus non-state interests are simultaneously personified in municipal bill collectors (street-level bureaucrats).



Figure 1. Staking out space one roof at a time: incremental resident-constructed housing at Bandra Station, Mumbai.

Source: Author's own, 4 May 2012.

The amorphous state directly bears on practices of legibility making in the GIS mapping case. Often cited problems of on-the-ground surveys are “corruptive practices” by municipal bill collectors and surveyors (or both). But the term “corruption” does not always do justice to the relations between residents and street-level bureaucrats. Bill collectors have longstanding personal relations with residents and neighborhood leaders. They negotiate the multiple set-ups, rental agreements, and mixed uses of a locality. Livelihoods, directly related to claiming land are at stake and rely precisely on the very flexibilities, which the construction of permanent knowledge through GIS property mapping seeks to eliminate or simplify. In municipal bill collectors then, two opposing interests collide: what is informal from the perspective of GIS property mapping is a necessity to ensure continuation of various locality-specific micro-economies.

Similar contradictions arise in slum listing. A district office administrator acts according to scheme requirements when he reports in weekly monitoring meetings, but may pursue different interests when negotiating terms of scheme implementation with residents, or building contractors. A slum bill collector,² who lives in a slum, is simultaneously a resident and an administrator embodying potentially conflicting interests in one and the same person. In slum listing, the amorphous state personified in an individual is manifested in local politicians, especially ward councilors. They are representatives of the state. At the same time, they are members of families residing in neighborhood x, as well as representatives of constituencies, which may or may not coincide socio-spatially with neighborhood x.

This influences legibility-making practices for slum improvement in two ways. Firstly, administrators have to rely on local politicians (as well as informal leaders and associations) to gain access to neighborhoods for surveying, and for negotiating scheme implementation with residents. Municipal and district administrators often lamented the “influence of politicians.” One ward councilor in Kadovali stated that “they [the municipal administration] cannot do anything here [slum area that he is elected representative of] without going through me. Everything goes through me. When people who live here have a complaint, it also goes through me.” Secondly, slum lists themselves become tools in contestations over resources, including land and votes. “Tampering with lists” is a constant concern. For instance, a ward councilor may inform only family members and political allies about the location for signing up on housing beneficiary lists. Housing allocation lists may also be directly instrumentalized by politicians and other leaders in order to include family and socio-political affiliates, even if they do not live in the neighborhood under question.

In both cases then, the state becomes manifest as amorphous in terms of interests vis-à-vis a locality bearing influence on individual state members’ actions, including how, when, where, and what is included on a block survey map or a list. Far from being a surface underneath a state apparatus, the urban space to be mapped is the very soil from which a state grows that is amorphous in the roles and interests of its members. Both cases require the government to make society legible. In both cases, the amorphous state is manifest. It grows from and in correspondence with the flexibilities that characterize use and ownership of urban space. In the next analytical step, we explore how legibility making proceeds in practice in GIS property mapping and slum listing, respectively.

4.3. Differences in legibility making: designed versus organic practice

The two practices of legibility making, GIS property mapping and slum listing, differ in terms of the agencies and sites involved as well as survey techniques.

In GIS property mapping, the core tenets of Scott’s concept of legibility making are tightly inscribed into the organizational design and survey guidelines. Survey guidelines aim at comprehensiveness and disambiguation of property boundaries and owner assignment, as well as

standardization through a state-wide block numbering system. Surveying techniques are enforced through organizational design, for instance, by attempting to keep politicians at bay from the mapping effort. A hierarchical line is set up within the administration for the purpose of GIS property mapping. In Karnataka, it is coordinated and monitored by three state-level administrative agencies: the MRC, a semi-autonomous administrative body, the DMA, a state-level administrative agency, and the state-level office of the Survey of India (SoI), which provides base maps for the survey work, quality checks, and official approval of newly created GIS datasets. Work at the municipal level is supervised by GIS specialists deputed from the DMA. GIS property mapping is based on new guidelines for surveying and numbering of properties prepared by the e-government foundation.

The emphasis on spatial representation of properties is related to the need for comprehensiveness. The rationale behind GIS property mapping is to visualize the location of properties in relation to each other and in relation to every street as a means to ensure full geographical coverage of the municipal administrative area and to identify missing records. Spatial visualization here enables to identify “holes in coverage” by capturing so-called “revenue pockets.” Despite the existence of non-GIS-based digital tax systems in the two cities, GIS property mapping requires the re-surveying of all streets and properties based on new guidelines. Exact delineation of each property is important, accurate assignment of each owner to respective property, and ensuring that all properties in the city are thus captured unambiguously and comprehensively. Important to this process is a standardized approach to property numbering (Figure 2) in cities across the state.

To ensure standardized knowledge production, the protocol for legibility making from ground survey to digital dataset validation is the same for each city and is set out in detailed steps. Instructions include the order in which survey forms are to be filled out, the order in which blocks and properties are to be surveyed and numbered, assignment of staff members in charge of each step, as well as signatures that are required for approval according to the administrative hierarchy.

Slum listing proceeds differently both in organizational terms and survey techniques. Guidelines, delineation criteria, and actors involved are less clearly prescribed than in GIS property mapping. Legibility making in this case has a more organic and ad-hoc character. Although BSUP guidelines specify Urban Local Bodies (ULBs) as an implementing agency, the survey work in Mugdali is handled by the district office of the KSCB. In addition, the official definition of slum is ambiguous. In Karnataka, it is based on the 1973 Slum Clearance Act and pertains mostly to physical characteristics of a slum. But there are further stipulations in terms of resident eligibility for inclusion in the scheme. These criteria, especially regarding the length of stay in a place, change over time depending on different state policies. Furthermore, proof of length of stay depends on possession of other documents, for example, bill payment statements and below poverty line cards.

In Mugdali, we identified three main sites of legibility making: slums themselves, the district slum board office, and JNNURM review meetings at the main municipal office. The JNNURM review meetings have been specifically set up for the purpose of progress monitoring, including BSUP. The other two sites (slums themselves and the district slum board office) are “traditional” in the sense that they existed before the JNNURM scheme. However, even the weekly review meetings rely on information collected and compiled at these traditional sites. These three sites are not “set up” for legibility making, but are more organic and characterized by a convergence of urban actors and their interests, which in turn lead to an ongoing co-construction of information at these sites. The sites constitute meeting places between the scheme’s requirements for legibility making by administration, on one hand, and the interests and strategies of multiple actors at the backstage of official knowledge production.

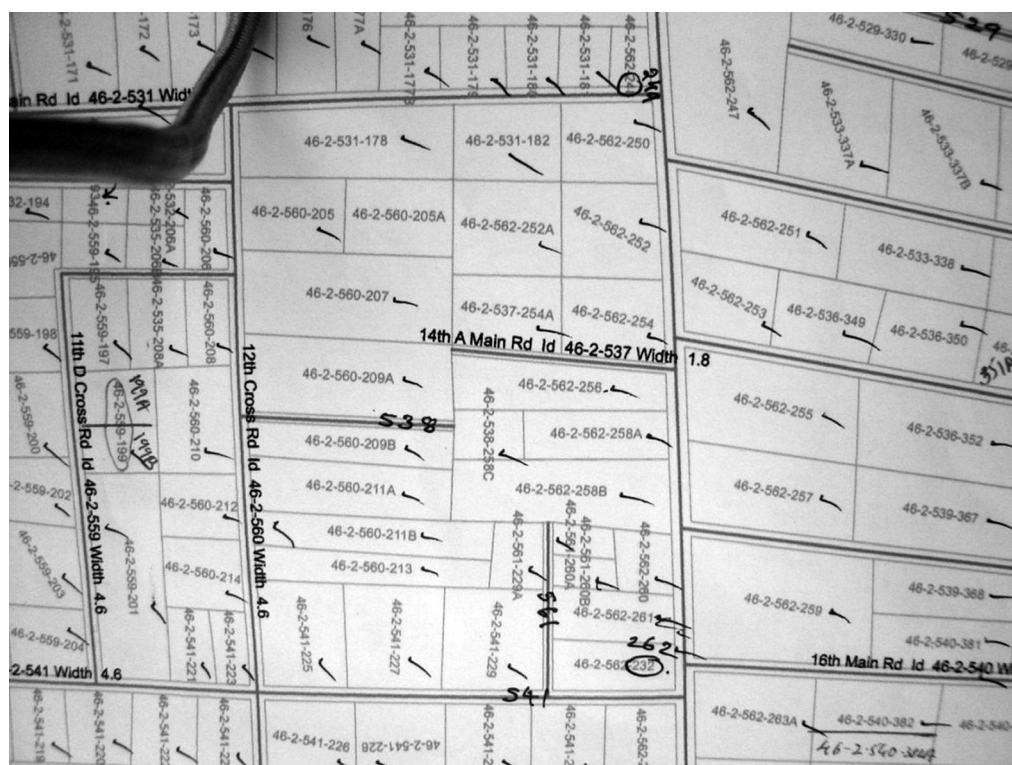


Figure 2. Block map of properties prepared by the GIS specialist in Mugdali, approved by SoI, and then sent back for additional validation by the GIS specialist. The numbers indicate: first two digits = ward number; third digit: block number (one map sheet per block); fourth to sixth digits: street identification number; and last three digits: property identification number. The latter are different from existing door and house numbers used by postal service, for instance. They are newly assigned according to the Nirmala Nagara GIS survey guidelines.

Source: Author's own, 21 May 2009.

The survey in slums themselves (first site) takes place for purposes of declaration or for other scheme implementation steps in already declared slums. These sites are not selected according to a standard set of criteria, but are mostly areas, which have become enrolled in past schemes through formation of politico-administrative alliances in the city (see also Richter & Georgiadou, Miscione, De', & Pfeffer, 2011). Survey work in these “already-known-to-be slums” is carried out by bill collectors of the district slum office together with residents and neighborhood leaders (Figure 3). While bill collectors record information in the official survey form, residents also keep track of the same information on their own list and check for consistency.

The survey process in slums is rather casual. Residents invite the bill collector for tea and share latest family and neighborhood news. Filling out the official survey form serves as a formal frame for informal communication and exchange of news about BSUP, but also about other state schemes, beyond the immediate survey task.

A second site is the district slum office, where the survey forms are digitized in Microsoft Excel® files. This information together with various engineering details and budget calculations is passed on to a private consultant, who combines the information with an architectural layout plan into a Detailed Project Report (DPR) for each slum, a necessary pre-requisite to acquire funding through the finance nodal agency. This formal line of information construction



Figure 3. Member of “the state” is surveying with a member of “the non-state” in Mugdali – District slum board bill collector/surveyor and resident of a declared slum are comparing lists of homes and family names to fill out BSUP socio-economic survey forms track of the same information on the resident’s list.
Source: Author’s own, 22 May 2009.

becomes intercepted by residents and their intermediaries. The slum district office is visited daily by residents, political leaders, nongovernmental organization, and slum dweller association members. These actors meet in and around the office, in small shops rented out to slum residents by the slum office, and in the office of the Assistant Executive Engineer (AEE). In these daily meetings and informal interactions, scheme details, problems, and reasons for delays are being discussed, people inquire about inclusion on beneficiary and slum lists, discuss bill payments, future housing options, the issuance of various identity and eligibility documents, or lobby against relocation of settlements. At this site too, we see a formal line of knowledge production in the compilation of DPRs and overview tables that are prepared for monitoring meetings, providing a frame for informal, non-procedural interactions. The AEE especially plays a crucial role in bridging eligibility and scheme requirements with individual families’ needs and situations, and at the same time negotiates the interests of labor unions, slum dweller association, and other organizations and leaders, in the midst of financial transactions with building contractors and private architectural consultants.

A third site of interaction between administrators of various departments, politicians, and citizens are review meetings at the main municipal office in Mugdali. During fieldwork they took place weekly and were open to the public once per month. In every meeting, a Microsoft PowerPoint® table of declared slums, that are part of BSUP, is displayed via a projector and updated during the meeting. While the slum list is presented as final and as comprehensive in the meetings, it changes weekly through updates in the slum district office, but also during the meeting depending on input from participants. The meetings are formally set up as a

means for citizens to participate and agencies to coordinate progress evaluation of JNNURM. As such they take place according to agendas, guidelines on how to present progress information (e.g. the PowerPoint® table format), and are marked by more formal interactions between participants.

In sum, slum listing is characterized by a greater diversity in actors, who construct information in a more ad-hoc manner depending on the circumstance and across traditional sites, “traditional” in the sense that they had been involved in previous schemes (both slums and slum district office). GIS property mapping is designed to retain legibility making in the hands of administration, and to enforce disambiguation and standardization as far as possible through a designed practice. What is the nature of the official knowledge produced in each case and, more importantly, the effect on scheme progress?

4.4. *The nature of official knowledge and scheme progress*

In GIS property mapping, resistance to legibility making arises from settlement and land use processes. There is a stark contrast between the need for a final and permanent database, and changes on the ground. Survey work and the detailed prescribed linear steps cannot keep up with new construction and settlement (Richter, 2011). Resistance may also stem from residents of a locality refusing entrance to surveyors, instances when police may be deployed to enforce measurements to take place. In GIS property mapping, a more tacit form of resistance arises from within the state itself, especially among municipal administrators. At the same time, survey work relies on municipal administrators’ (especially bill collectors’) support in navigating neighborhoods and in gaining the trust of residents. In Kadovali, Maharashtra, surveyors of a private company were allowed entrance by resident groups only after bill collectors accompanied surveyors and gave their approval. Putting in place a local DMA representative, the deputed GIS specialist, does not circumvent contradictory interests within the administration. In Mugdali, for instance, the GIS specialist was transferred and replaced by a new person during the time of our research due to a “lack of progress” according to municipal officials. The new deputed specialist was not only ill-informed of the status of work, but was also unfamiliar with the inner workings of the revenue department, and had difficulties in establishing day-to-day relationships with bill collectors and other officials in the municipality. The lack of support incapacitated the new GIS specialist for some time. The database is thus constantly under construction with varying reports regarding the progress achieved in terms of filling digital files and tables.

Set against the aim of producing a final, permanent database, the perception of incompleteness and partiality of the produced official knowledge takes center stage. This is where a more subtle effect spins off. Scheme proponents call into question the interest associations and relations between municipal administration and other actors. It is precisely the *relations between* the “citizen” and the “state” (street-level bureaucrats and local politicians) that impede the survey work. The amorphous state stands in its own way so to speak. One mayor expressed her concern to the DMA Director as follows:

... though we have the approval from the government of India to introduce the system, ... every now and then the manual people [surveyors/bill collectors] are doing some kind of hacking, something or another ... so, I cannot hire a third party company to check on the manual people, because ... if I have to stop the corruption I cannot tell that fellow [surveyor/bill collector] I will follow you [around] (at a session in Municipalika conference in Bangalore).

The mayor essentially suggested the need to hire supervisors in order to monitor the work of administrators. To some degree, GIS property mapping turns into a self-referential monitoring effort; self-referential, because it monitors progress of the survey work by itself and holding

“part of the state” accountable for progress of the survey work, namely municipal and district-level administration. The MRC monitors progress of GIS property mapping by using comparative maps that show the percentage of area in cities where survey work has been completed. If certain municipalities repeatedly display low levels of progress, the respective Commissioners are called for meetings to discuss causes of delays. The MRC also sends delegates to monitor progress in municipalities. Further uses of a final and complete database for planning and online access remain future visions. In neither city was the GIS database fully implemented for tax collection and monitoring purposes at the time of fieldwork.

BSUP, on the other hand, proceeded beyond listing slums and residents toward its broader aims. Land is acquired, people relocated, houses constructed, and new tenements allocated. In slum listing, too, the amorphous state is evident in contradictory roles and interests of members of the state. This may set off a series of ripple effects during implementation of the scheme. In one area in Kadovali, land ownership disputes, combined with list tampering, led to work delays, and cost escalations. While the building contractor did not agree to cover the extra costs, the state-level nodal agency had not yet decided to provide additional funds. Residents of the slum, who had been paid 18,000 rupees for renting homes elsewhere during the initially anticipated time of construction, were now severely impacted by delays as the already small amount of rent money was used up and their homes demolished. These problems in turn became known to residents of other areas, who now sought the opposite, namely to be removed from the “beneficiary” lists. The negative effects on certain groups of people, especially those displaced, led to a series of new reactions and counter-reactions with lists being accordingly adjusted.

The unpredictability in the course of events makes it sheerly impossible to keep a comprehensive, unambiguous, let alone permanent list of slums and beneficiaries even within one scheme like BSUP. Not only that, because information construction itself is a tool in contestations, a strategic means to claim land, housing, municipal services, and make money there are clearly interests in retaining multiplicity and ambiguity, but these interests cannot be assigned to any particular homogenous group of actors, nor are they stable through time.

Although the knowledge produced through slum listing is temporary and incomplete, it counts as official knowledge at certain points in time, for instance, during review meetings. As such it keeps the scheme moving incrementally: for stepwise funding release, for each review meeting, for every visit to the city by a monitoring team, for allocation of units in houses that have been constructed, and so forth. Final reports and official tables submitted for review and monitoring are already partially outdated once they are submitted. While a DPR is being approved by state-level review commissions, those included in the beneficiary list no longer see the scheme as beneficial and the lists are already being contested across the city. But the official reports presented and submitted at each step, in review meetings and commissions, evoke the appearance of a permanent representation of the city’s slums and residents. This temporary legibility is just-enough-legibility to keep moving incrementally or as one DC put it:

Actually there is no slum as such. The city is very diverse and the so called slums themselves are very heterogeneous. But *sometimes* you just have to put things *black and white* in order to keep moving.

Some of the multiple lists and maps come to represent a *temporarily* “official” knowledge, actually a snapshot of a given situation, the documentation of a temporary alignment, or a compromise of colliding interests. This temporarily official knowledge allows administrators to adjust to the volatility and fluidity of urban settlement and land use processes and thus accommodates the ground-reality of an amorphous state as expressed by two MHADA officials:

Planning, implementation and monitoring follow a strategy of situation-by-situation adjustments, every time matching information and action, to new ground realities.

Temporary legibility making in BSUP sustains the improvement scheme in so far as it allows the scheme to progress toward its broader aims. But the original points of reference in the form of permanent official knowledge are no longer valid, which also means that temporary nature of knowledge defies comprehensive and “objective” evaluation across time.

In Table 2, we have summarized the comparative analysis in Sections 4.1–4.4. In the next section, we discuss implications for urban governance in more detail before closing with notes on future research and policy.

5. Case interpretation within the broader frame of urban governance

In both schemes, the underlying requirements for official knowledge production are in line with Scott’s analytical concept of legibility making. When zooming into the patterns of relations between the two analytical poles (state/official knowledge and local/vernacular knowledge) as they play out in practice, we find that GIS property mapping and slum listing handle the amorphous state differently and with different effects on scheme implementation.

The scope of this paper does not allow us to discuss, in how far the provision of housing, infrastructure, and related relocations really mean an improvement in the lives of the urban poor. This remains highly questionable. However, within the framework of official scheme aims, slum listing supports scheme implementation in terms of construction, housing allocation, etc. in a more or less stop-and-go fashion. As such it goes beyond producing official knowledge as a basis for implementation and proceeds with the latter. In slum listing, administrators together with non-governmental actors deploy what Scott refers to as *metis*. *Metis* in practice is a means of comparing forms of knowledge embedded in local experience with the more general, abstract knowledge deployed by the state and its technical agencies. What is essential to *metis* is knowing, how and when to apply the rules of thumb or categories in a concrete situation. Practicing and experiencing *metis* is almost always local, but it draws on and feeds back into general rules and concepts as they are applied and adjusted to a given situation.

The three sites in our study constitute spaces, where the categories “slum” and “beneficiary,” that is a general, abstract knowledge required for scheme continuation, are compared to and “adapted to constantly shifting situation[s] to understand, and hence outwit, . . . adversaries” (Scott, 1998, p. 313). “Outwitting of adversaries” may apply as much to a local politician outwitting the local bureaucrat through list tampering as to a resident, who negotiates inclusion in beneficiary lists with an administrator at the slum district office. In other words, *metis* in the case of slum listing becomes enacted through and by an amorphous state, not only by “non-state local” actors. It is a means to produce temporarily official knowledge through negotiation and contestation among state and non-state interests, not necessarily only state representatives. In the process, official enumeration and survey techniques serve as front-stage activities around which more informal, ambiguous, and contested modes of interaction take place. This in turn allows municipal and district administrators and politicians to translate between the scheme’s requirements for unambiguous and permanent knowledge, on one hand, and the vernacular knowledge driving interest alliances and interactions. In so far as the scheme proceeds to housing construction and allocation, slum listing thus forms one of the junctures at which complexity and local knowledge sustain a bureaucratic scheme that would otherwise collapse (Li, 2005, p. 388).

On the other hand, GIS property mapping appears to run into much the same troubles, which British rulers and Indian administrators had run into when they attempted to number houses for tax collection and Census taking, efforts about which an “official gloomily commented [they] ‘will never go far’” (Harris & Lewis, 2012, p. 658). Li (2005) notes that Scott’s warnings of governing at a distance have long been recognized by agencies like the World Bank, who rely on

Table 2. Summary of comparative analysis between GIS property mapping in Nirmala Nagara scheme and slum listing in BSUP and theoretical and governance implications.

	GIS property mapping in Nirmala Nagara	Slum listing in BSUP
Scheme Goals	Increase and monitor municipal property tax revenue	Improve lives of slum residents through provision of physical infrastructure/housing
Core requirement for scheme implementation = legibility making as per Scott's conceptualization	<p><i>The state produces official knowledge of the city (residents and land):</i></p> <ul style="list-style-type: none"> • Standardized, unambiguous, and permanent knowledge is in the interest of the state and produced by the same • Residents and land form stable surface to be made legible <p>Administration delineates properties, characteristics, and each owner</p>	<p>Administration delineates slum, its residents, and characteristics</p>
Urban reality encountered during implementation	<p>Amorphous state manifests in both cases:</p> <ul style="list-style-type: none"> • entanglement of state actors in settlement processes, not hovering above still life of the city • incoherent intent • varying roles of individuals depending on interest alliance 	
Practices of legibility making	<p>Designed practice to retain core requirement and circumvent amorphous state:</p> <ul style="list-style-type: none"> • Sets up organizational line according to administrative hierarchy for purpose of legibility making • Follows strict protocol for information processing and validation according to administrative hierarchy • Deploys survey guidelines according to standard block and the numbering system 	<p>Organic practice carried out by an amorphous state:</p> <ul style="list-style-type: none"> • Legibility making at "traditional" sites with history of involvement in similar schemes • Without strict protocol for information processing across hierarchy and places • Draws on ambiguous and changing criteria over time to delineate slums and residents
Nature of official knowledge and effects on further scheme implementation	<i>Incomplete official knowledge</i> induces self-referential monitoring efforts and municipal/district administration held accountable for survey progress	<i>Temporary official knowledge</i> allows scheme to proceed to relocation, construction of houses, and allocation of new units
Relevance for theory	<ul style="list-style-type: none"> • Further supports Scott (1998) in terms of resistance to achieving full legibility • amplifies Scott, because resistance arises from within administration in its relation to other actors and land 	<ul style="list-style-type: none"> • illustrates a juncture where improvement scheme is sustained locally (Li, 2005), specifically through temporary legibility • metis enacted through an amorphous state
Implications for urban governance	Indicates tendency toward separation between administration and broader society: question of who can access official knowledge production	Objective evaluation, whether scheme improves lives of the urban poor or even in terms of eligibility criteria is questionable, but retains channels for negotiation important especially for poorer groups in the city

ethnographers to identify local social and power relations in order to ensure implementation of improvement schemes on the ground. Nevertheless, it is the notion of governing at a distance which becomes translated into practice through organizational and technical design in GIS property mapping. As such GIS property mapping is akin to previous documentary regimes instituted by administration, for instance, colonial powers, with the intent to constitute a more clear-cut separation between the workings of the government and the larger social world (Hull, 2012). And much like earlier efforts, GIS property mapping becomes undermined by the ambiguities and flexibilities that characterize the state/non-state boundary in urban governance.

In the case of Nirmala Nagara, the frustrations met in this endeavor led to a focus on the incompleteness of the knowledge produced. Because the database is supposed to be final and permanent, the lack of progress in survey work itself becomes a central concern besides or even more so than actual tax revenue and monitoring. But if completeness in official knowledge was attained with subsequent online access to the information for citizens as hoped for by scheme proponents, this would not necessarily mean greater transparency of the government toward citizens, a problem noted by other researchers like Raman (2012). Especially for poor and marginalized members of the urban populace, it is important to access the processes of spatial information production rather than the information itself (Raman, 2012), because current practices of claiming and securing one's land require human mediation and reliance on multiple forms of documentation.

The practice of slum listing affords this openness to knowledge production to some degree. Criteria to define slums are partially constituted through program, policy, and legal discourse, but they are constantly readjusted and filled with new meaning during implementation by various state and non-state interests and actors. This stop-and-go implementation and adjustment of official knowledge according to a given situation in turn afford what Scott suggested be built into improvement schemes, namely reversibility. Slum listing allows for incremental advancement, because it merely provides momentary snapshots of official knowledge required to proceed, but also possibly to contest later on. Incremental progress is not necessarily linear, but may go in the reverse direction depending on what interest alliances emerge and are influenced by sudden events. Were those included in the beneficiary list objectively eligible or were they members of a politician's family from a different area? Are those, who now receive new housing units still the same people, who were on the list submitted for funding approval? These questions clearly problematize the slum listing practice from the point of view of "objective evaluation" within one specific scheme. Slum listing then also provides ample opportunities to "move the poor around." However, this in-built reversibility also allows residents to resist being "beneficiaries" when negative impacts become apparent during scheme implementation. For this to be possible, access to channels of negotiation is pertinent. These are retained in slum listing as it adapts to the amorphous nature of the state, where actors involved cannot be assigned to one mode of operation or area of concern, but are often involved in different, and at times contradictory, networks of urbanization (van Dijk, 2011). Slum listing is part of practices more broadly, which allow different interest groups to lobby and exchange information, and to negotiate through what Benjamin calls "quiet strategies" or "stealth-like" politics (2008, 2008a). These stealth-like modes of participation are especially important for low-income groups, who have to rely on local politicians and other mediators to address administration with grievances, concerns, and for municipal service provision (Baud & Nainan, 2008). In our empirical case, slums, district slum office, and municipal office are "traditional sites" in the sense that they are nodal points of communication also for other improvement schemes, and to negotiate service provision in general. Besides slums, the "offices of the various government bureaucracies themselves [serve] as sites where important information about the state [is] exchanged and opinion about policies and officials forged" (Gupta, 2006, p. 214). Retaining

these nodal points of communication is important, because the practices enacted at these junctions allow urban governance actors to adjust to “governmental interventions [that] routinely produce effects that are contradictory, even perverse [and where] the messiness of the world, its intractability to government, is caused, in part at least, by the overlapping of various governmental programs in historical sequence or, concurrently, one program at cross-purposes with another” (Li, 2007, p. 19).

Who loses and who gains at a given point in time is highly situation-specific. However, the practice of slum listing allows different urban actors to enter the sphere of administrative work across various improvement schemes, agencies, and departments, and related knowledge production through time and as official program frames and guidelines change.

6. Final notes for future research and policy

In 2012, Rajiv Awas Yojana (RAY), a new slum improvement scheme was initiated by the central Indian government. The scheme requires that information about slums and residents be collected and maintained in a GIS database. Although the eventual goals of the schemes, in which GIS property mapping and slum listing are to produce official knowledge, differ, the amorphous state as explored in our study bears influence on both practices. Future research may address in how far RAY will run into similar problems and self-referential monitoring as indicated for the case of GIS property mapping. Alternatively, studies exploring GIS mapping in the case of slum improvement may find the eradication of some characteristics of the slum listing practice. These features include the kind of “[p]aper politics [that] may be relatively inclusive when compared to e-governance. The very cumbersome paper processes condemned by transparency advocates require much wider participation in bureaucratic affairs, though [not suggesting that] this participation is legal, just, or democratic” (Hull, 2012, p. 255).

Future research can inform policies for IT implementation by taking into account the context of institutionalization of IT not only in terms of the obstacles a context poses. Rather the difficult question to tackle is, how and which IT to deploy in order to support societal improvement without eradicating positive aspects embedded in the opaque and complex processes of paper work. A second longer term endeavor can entail the study of broader shifts in state-society relations that may arise from processes of digitalization and information centralization, shifts that may follow unanticipated and potentially unpredictable avenues.

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Notes

1. We opted for fictitious city names in three cases (Mugdali, Dhabunagar, and Kadovali) to retain anonymity, because of informal and intimate research encounters in these cities.
2. Municipal bill collectors collect property taxes from urban residents (not residing in slums). Slum office bill collectors work for the slum board at the district level and collect installments from slum residents,

for instance, installments for previous housing and infrastructure schemes, in which beneficiaries have to carry part of the cost.

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