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Infrastructure urbanism: Roadmaps for servicing unplanned urbanisation in emerging cities

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ABSTRACT

The extension of electricity, water and sanitation networks in developing cities seems to be *a priori* complicated by the deficiencies of urban planning. Nevertheless, on a daily basis, utility firms do install pipes and poles in unplanned settlements. The mechanisms they resort to in Delhi and Lima are here analysed as catalysts and revelators of an actually existing urbanism. Social, commercial and technical innovations help extend the coverage; institutional creativity and bricolage compensate for the inadequacy of the planning framework. The lack of planning of the built-up environment is actually not an obstacle to service extension; nonetheless, this process is suboptimal due to coordination deficits within the larger urban fabric. Two tools hence appear as key for servicing unplanned settlements: map generation and road preservation to spatially and institutionally articulate the actors' interventions. These instruments are promising to develop and consolidate unplanned urbanisation, and to pilot future growth. Therefore, they offer new perspectives for public action and urban planning in developing cities that deserve to be considered both scientifically and politically as a fruitful infrastructure urbanism.

Introduction

Since the 1990s, the inadequacy of urban planning in the Global South has led to political and scientific calls for its renewal (UN-Habitat, 2009; Watson, 2009). The 'stubborn realities' of developing cities lead to a plea for a practice movement (Watson, 2002) and postcolonial knowledge to inform planning thought (Watson, 2013). In contrast with Western models of planned cities and infrastructures, the lack of planning generates sociospatial deficiencies in developing cities. First, space and the built environment – infringing on norms and zoning – are haphazard and unsuited for conventional infrastructure laying; second, low capacity- and willingness-to-pay and alternative access practices influence consumption patterns and limit the scope for regulating socio-political relations with the State and its utilities; last, informality destabilises and blurs the public policy framework and interventions (Roy, 2009). These three kinds of spatial, social and institutional irregularities *a priori* complicate the extension of basic services and it is often assumed utilities are reluctant or unable to intervene in unplanned settlements.

Service delivery in developing cities has been mainly addressed from a political economy perspective, and tackled with neoliberal reforms of utilities. Nevertheless, the success of these reforms is debated (Hall & Lobina, 2007), and related research fails to account for on-the-ground challenges of service delivery (Zérah & Jaglin, 2011). Indeed, planning deficiencies do not entail actors' paralysis; quite the contrary, the realities of unplanned urbanisation are highly dynamic. Every day, utilities' engineers install new pipes, poles and wires to extend electricity, water and sanitation networks as observed in Istanbul (Baharoğlu & Leitmann, 1998), Bangalore (Connors, 2005), Buenos Aires (Botton, 2007) and Dhaka (Hossain, 2011). Although in some cities more than half of the population lives in unplanned settlements, basic service coverage rates outpace these figures (United Cities and Local Governments, 2014).[1] These accounts mean that as unplanned as urbanisation may be, utilities constantly try to catch up and to find adapted solutions. The instruments they resort to, as mechanisms that shape city's

[1] Inequalities and deficiencies remain in service delivery, but the focus here – like in similar case studies (Baharoğlu & Leitmann, 1998; Connors, 2005) – is on infrastructure extension as a precondition for access and as an urban production process.

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functioning and work out of the realm of official planning, thus deserve to be analysed.

This research approaches infrastructure extension in a sociotechnical perspective, in which cities' service networks are revelators and catalysts of the urban fabric (Marvin & Guy, 1997), and offer opportunities to renew urban planning thoughts and practices (Graham, 2000). Sociotechnical analyses consider the material, social and politico-institutional components of infrastructure networks (Coutard, 1999; McFarlane & Rutherford, 2008). Likewise, their extension can be deconstructed into a sociotechnical process, entailing technical, commercial, social and political actions. These phenomena are embedded in urban development processes and serve as political instruments within urban governance (Lorrain, 2011). This sociotechnical lens echoes and complements the notion of 'actually existing urbanism' in developing cities: departing from orthodox theories, 'actually existing urbanism' accounts for local space appropriation mechanisms, that are embedded in and interact with social relations and policy interventions (Shatkin, 2011). Combining sociotechnical and politico-institutional perspectives, this paper explores the extent to which infrastructure extension by utilities in unplanned settlements has potential to be a form of urbanism adapted to developing cities, and evaluates its implications for urban planning.

To analyse the various dimensions of basic service networks requires above all to set the policy and urban context in which service extension is embedded. Then, network extension appears to be challenging for different reasons: first, utilities have to intervene in spatially unfit environments and towards an unregulated demand; this entails to adopt new technical and commercial intervention tools. Second, network extension depends on public policies and planning; informality there requires alternative institutions and political instruments. Last, infrastructure dynamics must be related with larger city development stakes, in order to identify the actual constraints and opportunities to muddle through, catch up with and forge ahead unplanned urbanisation.

Case studies: contexts and method

This research is based on two case studies of basic service utilities which are indeed catching up with unplanned urbanisation: the public water and sanitation utility in Lima, and the three private electricity distribution companies in Delhi.

Planning and urbanisation in two emerging cities

As emerging capitals, Lima and Delhi enjoy economic growth and institutional stability while still facing issues of social inequalities and poverty (Lorrain, 2011). These features mean that public authorities and private utilities have the necessary investment capacity to extend the networks and that setting an appropriate policy framework for urban services is the real issue (World Bank, 2013).

Peru is a pioneering country as to the support of public authorities towards migrants invading and incrementally consolidating peripheries. In the absence of operational planning, the Peruvian State has promoted self-help housing (Turner, 1976), progressive servicing and land titling (De Soto, 1986) as solutions to urban issues (Bromley, 2003; Fernández-Maldonado & Bredenoord, 2010). Today, around 70% of the 9 million inhabitants in Lima live in these 'informal' settlements, and are engaged in social, economic, cultural and political integration (Matos Mar, 2012). Besides, large-scale restructuring of the urban service sectors in the 1990s have participated to increase service coverage and delivery efficiency. Lima is an 'illegal city' without a plan (Calderón, 2005) but national *ad hoc* policies have promoted network extension to exponentially catch up with urbanisation.

Delhi is by contrast shaped by a master planning tradition dating back from the 1950s (Datta & Jha, 1983; Nath, 1993), based on controlling urban growth through strict land-use, and characterised by political conflicts and sociospatial exclusion (Baviskar, 2003; Bhan, 2013). From less than 1 million people in 1941, the city has grown up to 22 million in 2011, whose 75% live in unplanned settlements, i.e. in infraction with the master plan. Within these, around 5 million people live in unauthorised colonies and villages: legally acquired from rural land, they are illegally built by low-income residents, but are considered for regularisation and development through extension of public services by the government since the 1990s (Zimmer, 2012). Servicing is there caught in between the rigid logics of planning and the pressure from irregular urbanisation (Kundu, 2004).

Utilities and urban development in Lima and Delhi

Neither slums nor bourgeois, the bulk of ordinary urbanisation in emerging cities is made of unplanned self-help settlements (Gilbert, 2009; Watson, 2013), where the population enjoys *de facto* tenure security and has a willingness- and ability-to-pay for formal services (World Bank, 2004). Rising lower-classes aspire to improve their living conditions, and their integration to the city through its networks has an important symbolic, political and material meaning: for them, access to the 'modern infrastructure ideal' of individualised, uniform and centralised service delivery is a right, means and objective. Therefore, unplanned settlements constitute a massive and growing market for utilities; that is where services are daily extended to satisfy popular demands.

The utilities of electricity, water and sanitation, drainage and solid waste guarantee proper city functioning. Both in Lima and Delhi, solid waste depends from municipalities and is erratic (Agarwal, Singhmar, Kulshrestha, & Mittal, 2005; Durand, 2010). Moreover, collection relies on a network of collecting points rather than infrastructure lines, it is a collective and not an individualized home service, and it follows the existing road network without shaping it. As to drainage, the specific climate of Lima, where it never rains, does not make it necessary. In Delhi, drainage depends from seven road-owning agencies, and is built in parallel with road laying works. Therefore, both these sectors do not directly impact the city space and follow rather than guide other network extension processes.

Wide-scale electrification in Lima has taken place in the 1990s following privatisation. Electricity utilities in Lima now offer complete coverage and high-quality service, and are forging ahead rather than catching up with unplanned urbanisation, thus facing other challenges than muddling through irregular settlements (Criqui, 2015a, 2015b). By contrast, the water and sanitation sector in Delhi is largely deficient: water scarcity is a burning issue, the public authority in-charge fails to deliver enough quantity and quality water and needs profound reform (Koonan & Sampat, 2012). Officially, 75% of the population is connected but receives unreliable water (Zérah, 2001). Extension had been silently put on hold, under pending approval of the master plan in 2013.

In Lima where electricity coverage is completed, demands focus on water and sanitation; in Delhi, people resort to alternative water supplies and mobilise for better electricity access. It is therefore in these two sectors that network extension without planning can be observed.

Confronting actual ordinary practices

The case studies are based on the observation of daily practices in ordinary cities (Robinson, 2006). Beyond normative and political