

Article

IT-Oriented Infrastructural Development, Urban Co-Dependencies, and the Reconfiguration of Everyday Politics in Pune, India

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Abstract

Existing scholarship on postcolonial urbanisms has judiciously analysed the role played by the state and private capital in the expansion of global information-technology clusters and exclusive high-tech knowledge enclaves that have emerged across different metropolitan fringes in India and in the wider global South. However, much of this scholarship has focused primarily on the antagonisms wrought by the ‘expulsion’ of local rural populations from their lands and livelihoods, at the hands of the neoliberal state and global capitalist elites. In contrast, there is not enough research on how diverse local communities and subaltern actors emerge in place, and help organise, support and sustain these modern infrastructural spaces well after the initial moment of their establishment. Citing this important gap in our knowledge, this article argues for the need to move beyond some of the adversarial accounts associated with the overarching logics of postcolonial capitalist accumulation and new suburban development in the global South, to focus instead on the complex ‘afterlives’ of these modern high-tech suburban spaces. Drawing on ethnographic data from Pune city in Western India, and an emerging IT and IT-enabled services (IT and ITeS) outsourcing hub, the article reveals that contrary to popular perceptions of high-tech clusters as sovereign spaces for transnational capital, these sites are, in fact, constitutive of their multiple ‘outsides’—which include diverse forms of informal and illegal economies and labour. To evidence these claims, the article highlights different examples of ‘urban co-dependencies’ which have in situ emerged in Pune’s new urban fringes, to meet the growing gaps in demand of essential public services in these areas. The article then proceeds to show how Pune’s local micro-political cultures, including the numerous instances of territorial conflict and collaboration between so-called elites and subaltern actors at the local level, continue to ‘co-shape’ the typologies and the temporalities of local land use, planning and development that takes place in India’s new urban fringes.

Keywords

critical urban theory; digital geography; global South; high-tech agglomerations; neoliberalism; postcolonial urbanism; urban co-dependence; urban informality

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1. Introduction

Recent scholarship on digital geographies addressing the growing pervasiveness of ‘the digital’ in everyday life has come to acknowledge the need to expand its focus from digital objects and subjects towards a broader understanding of its mediation by social power relationships and inequalities “along lines of race, gender, class, sexuality, age, etc.” (Elwood & Leszczynski, 2018, p. 630). Thus, apart from exploring material infrastructures that enable digital practices and specific kinds of

data and knowledge production, conversations on digital geographies increasingly include “the spacetimes and socio-spatial relations produced through increasing digital mediations of everyday life” (Leszczynski & Elwood, 2018, p. 631; Shelton, Poorthius, & Zook, 2015). These conversations have, in turn, led to new conceptualisations of the contemporary city through its ‘digital skin’ (Rabari & Storper, 2015), understood not just through cities’ physical infrastructures, but also through “their social and material forms, component resources, and as sites of creation and disposal” (Ash, Kitchin,

& Leszczynski, 2018, p. 28; also see Lepawsky, 2014; Zook, 2005).

This article attempts to further expand the discussion on contemporary digital geographies by exploring the interaction of modern digital infrastructures with uneven urban development and planning in cities of the global South. At the centre of its enquiry are the IT/IT-enabled services (ITeS) sector oriented high-tech clusters in Pune city, an emerging tier-two metropolis, near Mumbai in Western India. These high-tech clusters contain numerous large technology parks or knowledge enclaves, which have become hotspots for the IT and ITeS outsourcing in the region. Over time, these clusters have seen new commercial and residential developments around them, considerably altering the wider landscape of the city's suburban fringes.

The rise of high-tech urban clusters in India has been associated with post-economic liberalisation policies that permitted the state—and later private companies, as well as public–private partnership ventures—to punitively acquire large tracts of land from peri-urban and rural communities and facilitate the establishment of special economic zones and export processing zones with world-class, modern amenities, infrastructural facilities and substantial regulatory and tax concessions (Chatterji, 2013; Cowan, 2018, p. 1247). The primary aim behind the establishment of these large, fortified infrastructural spaces was to attract new foreign capital investment in the metropolitan fringes and satellite towns, “providing an internationally competitive and hassle free environment for exports of goods and services” (Topno, 2005, para. 1), insulating it from the quagmire of statutory regulations and interruptions to everyday life outside.

Ayona Datta (2015), writing on new smart-city developments in India, mentions that modern high-tech infrastructural urbanisation in India can be uniquely understood in two interlinked phenomena: First, as the continuation of an earlier project of postcolonial modernisation of the Indian state, aimed at creating self-contained or autonomous towns (Kalia, 1990) and, second, as the outcome of the “global phenomena of privatisation of urban spaces” (Hogan, Bunnell, Pow, Permanasari, & Sirat, 2012, p. 59), broadly associated with the advent of postcolonial urbanism and new models of neoliberal urban governance (Robinson, 2014; Roy & Ong, 2011) that idolise globally integrated but locally disarticulated ‘archipelago economies’ (Veltz, 2000), as key sites of new economic growth in developing nations such as India. Both explanations highlight the growing domination of postcolonial capital and transnational elites in urban planning and development and their role in producing hyper-exclusionary and unequal landscapes of new urban India through the violent displacement and dispossession of local landholding classes and of landless labour communities (Cowan, 2018; Sanyal, 2007).

Rather than tracing the genealogy of new high-tech urban clusters in suburban India and their evolution into private enclaves of globalisation, this article

instead conceptualises them as spaces that are constitutive of “a multiplicity of normative orders” (Mezzadra & Neilson, 2019, p. 152). In other words, instead of viewing high-tech urban clusters as sovereign economic enclaves, free from techno-bureaucratic interruptions and “‘annoyances’ of everyday urban life” (Datta, 2015, p. 4), this article identifies them as spaces of global production and exchange that are, nonetheless, mediated by local economies, infrastructural services and actors with varying degrees of formality, legality and permanence. In doing so, the article emphasises the need to emplace these new urban infrastructural spaces within notions of urban co-dependencies that emerge in place, and that get moulded by spatial contestations and collaborations between different elite and subaltern urban actors.

The structure of the article is as follows. The next section reviews the conceptual literature relating to IT-oriented urbanisation in India's megacity fringes, specifically focussing on the overarching class (capitalist vs. agrarian) and spatial (global vs. local) binaries that frame some of the key discussions in literature on postcolonial urbanisation in India and the wider global South. The section argues for the need to move beyond these binaries, to explore the vibrant afterlives of high-tech suburban clusters by understanding and exploring their continuous co-shaping by diverse, yet co-dependent local economies, infrastructures and civic and political actors. In the third section, the article introduces the reader to Pune city and its transforming suburban context in which this research is rooted. The fourth section, comprising of the first key discussion segment of this article, illustrates the various dimensions of Pune's IT/ITeS-oriented new suburban growth and its increasing dependence on the different forms of informal and illegal (shadow or grey) economies in the city, in the context of local access to various basic infrastructural-services such as transport, housing, water and food. This section finds that these diverse economies have become a huge and indispensable part of the city's fabric, establishing urban co-dependencies that are integral to the sustenance, growth and transformation of new infrastructural spaces in the city's fringes. The fifth section delves into the various urban actors and interest groups involved in the different territorial negotiations, contestations and collaborations in Pune's new urban fringes. Through different examples, this section highlights how the establishment of high-tech clusters has transformed the modes of everyday participation for these actors, with predictable intra-class and less predictable cross-class coalitions emerging locally in the context of these new spaces. The article then summarises the key conclusions based on the discussion.

2. IT-Oriented Urbanisation in India and Its Contradictions

Existing discussions on the rise of new IT-oriented urban development in India's metropolitan fringes encom-

pass two inter-connected antinomies that are hotly debated. One underscores the movement from public-focused to private-led urban planning in these ‘emergent’ spaces (Chatterji, 2015), while this highlights the relative sovereignty of these new infrastructural spaces fringes, from local social, bureaucratic and democratic constraints (McFarlane, 2010). Both sets of discussions emphasise the emergence of the overarching logics of mainstream global urbanism ‘from above’ in the global South, which “organise urban development around neoliberal norms” (Sheppard et al., 2015, p. 1947), and ultimately produce new socio-spatial divisions in the local context, layered over earlier ones.

2.1. Emergent ‘High-Tech Clusters’ and Bipolar Spatial Development: Of Gurgaon and Beyond

A common example from India, often cited in literature, that amalgamates both antinomies associated with neoliberal suburban development, is Gurgaon—the country’s foremost ‘millennium city’ and IT/ITeS exports hub, located just outside the national capital of Delhi. Gurgaon was primarily developed by large, private-sector investment companies with the help of the state; this was during the new “property development-led laissez-faire regime of urban development” (Chatterji, 2015, p. 165) in the economic liberalisation era that began in the early 1990s. This meant that while private planning was given a dominant role in urban development, public and participatory modes of planning in new suburban fringes were missing, or an afterthought at best. This stood in contrast to established cores of India’s metropolitan cities, where planning continued to be largely the prerogative of the state and its local, decentralised institutions of urban governance (Goldstein, 2016). Today, Gurgaon’s many IT-park clusters and associated commercial and luxury housing blocks are viewed as futuristic private islands, situated amidst the proverbial sea of vacant agricultural lands and rustic urban villages with poor public infrastructural access, and communities which have been left without proper compensation or decent jobs and livelihood opportunities. This ‘bipolarity’ in Gurgaon’s spatial development is further evidenced by the fact that while it has achieved global recognition as one of the top destinations for the internationally offshored IT/ITeS services in the world, it nevertheless continues to bear the reputation of being a dystopic ‘badland’—plagued by high levels of lawlessness and criminality outside the fortified and surveilled spaces of its private commercial and residential enclaves (Kuldova, 2017). This evident contrast in Gurgaon’s socio-spatial landscape tell the sordid narrative associated with the post-liberalisation development thrust of Indian state on the development of large export-oriented industrial zones and infrastructure corridors, specifically in the megacity fringes. This resulted in: (1) The changing role of the state from a key mediatory institution for land acquisition and development to an

extractive and regulatory one; (2) the transformation of private real-estate capital from an opportunistic actor in urban development to a predatory one, driven by speculative financial investment; and (3) the violent dispossession and displacement of local land-owning communities from their land, leaving them without fair compensation or long-term, sustainable livelihood opportunities.

Gurgaon’s lopsided development trajectory thus appears to be the outcome—an extreme case of what scholars have also referred to as the ‘postcolonial urbanisms’ in the global South (Roy & Ong, 2011), though one based in the peculiar expansion of the global transnational IT/ITeS sector, which significantly outpaces the sluggish industrial growth in the region. Unique as it may be, Gurgaon is certainly not an isolated case of the IT-oriented urbanisation in India. Indeed, the city serves as an important case example for wider IT-oriented suburban transformation in post-liberalisation India, whose growth trajectory can be both partially and extensively traced in contemporaneous development of other urban metropolitan fringes and satellite towns in India, albeit adjusted for subnational variations in their scope, scale and speed (Chatterji, 2015; Yardley, 2011).

Another somewhat skewed depiction of high-tech clusters or zones in urban India and the wider global South relates to those that depict them as self-contained and autonomous global knowledge enclaves. In different studies, the relative autonomy and independence of these sites is ascribed to processes including: the universal development of the global economy and urban capital (Brenner & Schmid, 2014); the manifestation of global ‘cookie-cutter neoliberal urbanism’ (Garrett, 2015) and/or the urban boosterist imagination borne out of ‘extrastatecraft’ (Easterling, 2014), which acknowledges multiple forces within and outside the state with “the considerable power and administrative authority necessary to undertake the building of infrastructure” (Easterling, 2012, p. 2). All the above emphasise the phenomenon of trans-local emulation of new urban development projects that aims to remove the (negative) externalities or interruptions associated with wider, uneven infrastructural provisioning, mundane regulatory and democratic pressures, as well as societal disruptions and unrest that afflict their deemed ‘outsides’ (see McFarlane, 2011; Odendaal, 2016; Roy, 2009). These narratives suggest that new high-tech agglomerations in suburban India are insulated from bottom-up constraints, local social relationships, and grassroots democracy. Together, such grand narratives of neoliberal urbanisation work to portray high-tech clusters as sites of sovereign exception (Gonzalez-Vicente, 2019) that operate exclusively in service of the networked global economy, but are disarticulated from their immediate environments, including from diverse local economies, forms of labour and micro-political cultures.

Though greatly informative, existing discussions about the development of new, large-scale, IT-oriented urban infrastructure—in the context of India’s postcolo-

nial modernisations project and/or its post-liberalisation pathways—provide a partial picture of the phenomena, in so far as they fail to move their focus beyond the initial and violent moment of the establishment of the spaces and the ensuing antagonisms between transnational capitalist elites and local agrarian land-owning classes—the classic conflict between the powerful urban elites and the excluded rural and peri-urban poor (Banerjee-Guha, 2013; Levien, 2013). The overt focus on the narratives of capitalist accumulation by dispossession and expulsion undermines the complex local histories of urban and agrarian transformations and how the different class interests align, fuse together or just fizzle away at different times. As Thomas Cowan (2018, p. 1245) finds in his ethnographic study of urban transformations in Gurgaon, the story of the millennium city is neither “one of wholesale agrarian transition, led by a unitary ‘carrier class’ of landowning capitalists...nor one of dispossession and the violent expropriation of land by the state and global capital.” Both Cowan (2018) and Goldstein (2016) stress that the large-scale urban and industrial developments in India’s new urban spaces such as Gurgaon have been mediated by multiple logics of uneven and differentiated agrarian change in postcolonial contexts and the corresponding (unequal) distribution of cultural and political capital between different local caste communities. This uneven process of local development has enriched some powerful actors (e.g., some of the traditional landholding caste communities of Jats and Yadavs, in case of Gurgaon), making them important players in the urban land markets, while forcing others into “petty rentiership and speculative investments in land and property in the city” (Cowan, 2018, p. 1247).

2.2. Beyond Expulsion: Framing the ‘Afterlives’ of High-Tech Agglomerations in India

Diverging from overt focus of existing literature on spatial and class-conflict produced by large-scale, private sector-led, IT-oriented infrastructural development in suburban India, this article takes a significantly different view of these spaces. While considering the exclusionary nature of the initial sovereign action involved in the establishment of these new spaces of capital, this article goes on to emphasise the need to move beyond, and understand the complex ‘afterlives’ of these ‘globalised’ infrastructural spaces—through the reconfigured materialities, changing power relationships and everyday micro-political cultures that scaffold them. Contrary to their fabled depiction in studies of global urbanisms, neither the state nor (global) capital are overarching, monolithic units “that can be seized ‘outside’ ordinary social life” (Buire, 2018, p. 2223).

Subsequently, by presenting a close, ethnographic account of IT-oriented urbanisation in India, and its local social and political dis-intermediation, this article attempts to redress the current gaps in urban scholarship. More specifically, following Mezzadra and Neilson

(2019), this article frames high-tech clusters and constitutive IT/ITes export zones in India, as containing multiple “divided and layered sovereignties” (Mezzadra & Neilson, 2019, p. 107) and governed by an assortment of normative orders. Thus, even when conceived as ‘elite’ and ‘exclusive’ nodes of global digital services production, circulation and trade, high-tech clusters are considered spaces of capital that are thoroughly dependent on their “multiple outsides” (Mezzadra & Neilson, 2019, p. 65), that is, “labour and activity of subjects that cannot be simply reduced to capital” (Mezzadra & Neilson, 2019, p. 70). These include “various forms of hustling, tapping into flows, or distributive labour that spring up, and in many cases, dominate, in situations where capital has done its work of dispossession” (Mezzadra & Neilson, 2019, p. 153). This approach, also further advances Brenner, Madden and Wachsmuth’s (2011) earlier criticism of the comparative framework of global (neoliberal) urbanism for its “over-reliance on trans-local learning to explain urban change” (as cited in Datta, 2015, p. 5), since it fails to shed sufficient light on the popular responses to such changes and the exercise of agency by ordinary economic and political actors in the local context (cf. Lund, 2006).

The analysis in this article is gleaned from ethnographic research conducted over 18 months (October 2015–April 2017) by the author in Pune city, an established hub of global IT and IT services exports in India, with a population of about 3.1 million people. The article draws on a combination of three different and overlapping modes of ethnographic data collection, including: (1) participant observations—“deep hanging out” (Geertz, 1998)—with young IT/ITes workers and job aspirants near Pune’s IT parks, office premises, homes, skilling centres and in the suburbs; (2) analysis of media and industry reports evidencing changing demography and patterns of urbanisation vis-à-vis new IT infrastructural developments in the city, as well as reports on popular territorial conflicts and associated local politics; and (3) 105 semi-structured interviews and unstructured interactions over the period of 18 months. The research was conducted with a range of participants, including: (1) IT/ITes professionals and mid—and high-level managerial staff in Pune’s tech parks; (2) low-paid allied service workers (housekeeping staff, IT park security guards) and other informal sector workers (taxi drivers, makeshift restaurant owners) serving the companies, various IT parks and knowledge parks and their workers; (3) NGO workers and government consultants working on issues related to urban service delivery; (4) local civic body representatives; and (5) local academics conducting research on urbanisation in Pune.

3. Pune’s IT/ITes-Led Transformation and Its Suburban Expansion

Pune city is the second largest city in the western state of Maharashtra, after Mumbai, which amalgamates iden-

tities from its past, present and the future: a British colonial barrack town, a Maharashtrian cultural hub, a thriving higher educational destination for young people, a key automotive and engineering centre, and now one of the leading outposts for India's 'global' IT and ITeS outsourcing operations. While each of these identities continue to shape Pune's geography even today, it is the IT/ITeS sector boom that has propelled the city's most recent urban demographic and infrastructural transformation.

Pune first saw the advent of high-tech urban clusters when work began in 1998 on the first large-scale 'special economic zone,' primarily meant for IT/ITeS exports. This was the creation of the Rajiv Gandhi Infotech Park, located in Hinjewadi, adjacent to Pune's western limits (Mahadevia & Parashar, 2008). The developer was the Maharashtra Industrial Development Corporation, a state-led enterprise of the Maharashtra government, which was originally tasked with identifying and establishing key industrial clusters and export promotion zones and corridors, including software technology parks—providing them with requisite physical infrastructures like land, roads, water supply, etc. The Rajiv Gandhi Infotech Park was established in collaboration with the central government body known as the Software Technology Parks of India, which regulates the software technology park scheme that provided various benefits to the registered units in tech parks or knowledge enclaves, including complete foreign equity, different tax incentives, duty-free import, duty-free indigenous procurement, central sales tax reimbursement, domestic tariff area entitlement, and deemed exporting. The Rajiv Gandhi Infotech Park was followed by the establishment of two larger IT park project developments in other parts of the city with greater private sector investments—one in Kharadi and the other in Talawade (Leducq, 2008). These tech parks provided companies with high-speed data communication, technology incubation and innovation centres, network monitoring and data hosting facilities, amongst other modern amenities and infrastructural services. Pune (today) has a high concentration of these large and mid-scale IT/Knowledge parks and enclaves, that co-exist alongside new hybrid commercial and residential townships. While official employment statistics for Pune's IT/ITeS sector are not available from either the National Association for Software and Services Companies or the national body that overlooks the development of new software technology parks of India, a recent industry study quoted in local newspaper reveals that direct employment in the IT/ITeS sector in Pune district to be significant, at about 425,000 people (Jadhav, 2020).

Ever since the advent of the Rajiv Gandhi Infotech Park over two decades ago, Pune city has followed a path of IT-infrastructure-led urban development that is recognisable in other Indian megacities (Chatterji, 2015). Today, it is not just Pune's high-tech IT/ITeS clusters that bear a changed look but, indeed, the areas surrounding

them. Where once stood urban villages, informal slum settlements and 'mandis' (small agricultural markets), there are now high-rise luxury apartment blocks, hybrid residential-commercial complexes, smart satellite townships, office towers and posh hotels. That said, unlike Gurgaon, which was designated as a so-called 'green-field development' and until recently lacked recourse to institutions of local urban governance (see Goldstein, 2016), Pune's suburban fringe areas are already integrated into the city's thriving local municipal domain—making its high-tech urban clusters more likely to be subject to participatory pressures from civic bodies other than Gurgaon's.

Figure 1 shows a map of Pune's land use change pattern from a 2014 study by Nitin Mundhe and Ravindra Jaybhaye. It depicts the growth of the total built-up area in the city over the past several decades. The study asserts that the bulk of this urban growth in the decade 2001–2011 has happened primarily along the city's fringe areas. They attribute this growth mainly to the swift expansion of IT industry and the service sector in the city (Mundhe & Jaybhaye, 2014, p. 55). Indeed, it is in these urban fringe areas that Pune starts to appear like other megacity fringes, not least, Gurgaon's—India's original 'technopolis.'

While Pune's rapid urbanisation trajectory underscores the city's enduring economic growth and its future potential, it also highlights the coterminous expansion of new forms of urban inequalities on the city. This is attested by Pune's informal slum population, whose growth has remained consistently higher than the rate of growth of Pune's total population over the years. According to Mundhe (2019), Pune has about 1.2 million people living in slums; about 40 percent of the city's population, up from 8 percent some 50 years ago. The growing disparities in urban resource distribution have thus also become starker in the last few decades. Today, this disparity stands out visually in the form of the distinct verticality of the glamorous office buildings in the IT parks and the high-rise, middle-class, residential apartment buildings surrounding them, which are contrasted against congested slum settlements of the urban poor, made from simple brick and mortar, sheet metal and cardboard.

4. Archipelago Economies? High-Tech Cluster and Urban Co-Dependencies

If one were to go beyond thinking about modern IT-industry agglomerations in Indian cities as exclusive archipelago economies (Veltz, 2000) of global digital outsourcing, then another visual economy emerges: One that makes these large IT/ITeS clusters and zones visible as intense assemblages of local economic and social activities and logistical labour, whether they be formal/informal, local/global, material/immaterial or legal/illegal. Such a view opens our eyes to the important and enduring relationship between life and operations within and outside these high-tech zones, beyond

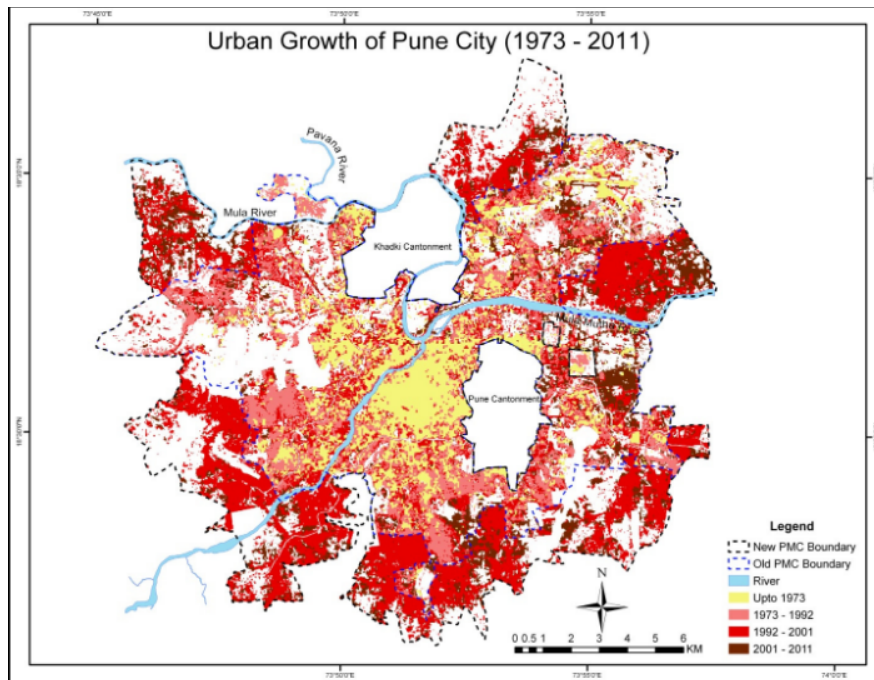


Figure 1. Map of urban growth in Pune city from Mundhe and Jaybhaye (2014).

the original moment of their initial separation. As Sassen (2011, para. 9) elucidates, underlying the growth of “homogenized landscapes and built environments of the glamour zone in global cities” of the global South is the sustenance provided by the primeval economies of ‘the global slums’—small businesses, family enterprises, informal services and infrastructures—which gives these spaces certain comparative advantages. Rather than disappearing, these informal urban economies rooted in place respond and adjust to the operations of these new global hubs, demonstrating an inherent plasticity to what are otherwise considered fragile or vulnerable urban economic sectors. This scenario becomes amply visible when one charts the rapid growth of Pune’s IT/ITeS economy, which, in less than two decades, has created and produced an uneven urban landscape, while also giving rise to a recombinant informal economy and workforce in the city. Different interview participants attested to this close and co-dependent relationship between the new formal and informal sector expansion in Pune. For instance, Kushal Sharma (name changed), the director of a transnational ITeS firm, and board member of an NGO that worked with the city’s municipal corporation on issues of urban planning and governance in Pune, explained:

Following the IT/ITeS boom in Pune in the 2000s, private sectors realtors started placing bets on land—buying large tracts in anticipation of future economic activity. They focussed largely on Pune’s fringe areas—Hinjewadi, Balewadi, Kharadi, etc. The software technology park development scheme of the Software Technology Parks of India, helped by the government, provided concessions and benefits to the registered

units in these parks at the time. This was the first phase of transformations of Pune and it was successful in attracting new IT and ITeS sector investment. Several concessions under the software technology park scheme were later discontinued. However, this did not deter real estate investors who had already got the taste of Pune’s great potential as a new property market. They continued expanding, placing bets on land, not just in low density areas but also higher density brownfield locations, incorporating established residential and commercial spaces in the city’s fringes. These were followed quickly by investments in high-rise residential complexes, shopping malls and other commercial spaces for middle-class professionals who came to work in IT-parks and wanted to settle down near them. Overall, the city [government] gave little incentive to private real estate players to develop public spaces and civic structures like bus stops, roads, streetlights, water supply systems, etc. The outsized expansion of IT-infrastructure development automatically created the spaces for self-organised urban communities, and the informal sector to come in, start operating and serving the needs of the companies and people here, whether legally or otherwise. (Kushal Sharma, April 2016)

Ever since its advent in Pune, private speculation-led, IT-oriented development has become an unlikely source of growth for informal economies and working classes in the city. One can commonly observe the constant movement of objects, services, bodies, practices and ideas between high-tech zones and their outsides, both of which appear to be tied up in complementary and opposing logics of everyday collaboration, exchange and juris-

dictional subversions. Thus, rather than being impenetrable fortresses of global services production and circulation, the different software technology/knowledge park clusters in Pune emerge as mutable spaces that have made possible “various forms of hustling, tapping into flows or distributive labour that spring up, and in many cases, dominate, in situations where capital has done its work of dispossession” (Mezzadra & Neilson, 2019, p. 153).

The intersecting spatialities and temporalities of formal and informal economies become instantly apparent when one visits the biggest tech parks or IT industrial zones in the city’s erstwhile fringes of Kharadi, Hinjwadi or Hadapsar. Here, for instance, one sees that the lack of dependable and affordable public and private transport options of last-mile connectivity for the bulk of the workforce in these spaces (including the mass of low-paid ‘allied service workers’ employed in housekeeping, hospitality and security in these zones) has given rise to a network of undocumented, private vehicles and six-seater rickshaw drivers who ferry workers back and forth from these relatively disconnected locations, operating above regular capacity. The indispensability of these alternative forms of transport is such that, even after the two civic authorities—the Pune Municipal Corporation and the adjoining Pimpri Chinchwad Municipal Corporation—have officially banned them on numerous occasions for public risk after several road mishaps and complaints of traffic congestion and environmental degradation (air pollution), they continue to ply their trade commonly in

the city. Indeed, while civil-society activists allege that the number of these vehicles is 12,000–15,000, for every legal auto rickshaw, there are four illegal ones (Puri, 2015). The city’s civic and transport authorities, quietly aware of their indispensability, puts their number at much lower. More recently, the proliferation of the ‘gig economy’ in the city, in digital-app-based ride-share services has taken some of the load off these ‘unauthorised’ and ‘undocumented’ modes of public transport; however, they remain important nevertheless because of their overall affordability to the lower-middle-class and working poor.

The two-tiered segmentation of the IT-oriented spaces and labour is further seen in the context of differentiated access to basic services for the different worker classes across most large tech parks in the city. Thus, for example, many workers do not have access to affordable, subsidised food inside corporate messes in these IT parks and come to depend on another more reasonable option—the makeshift roadside food and tea stalls known locally as *Tapri* (see Figure 2). These spring up organically outside the different office campuses and operate round the clock, just like the global operations that take place inside the IT parks. They, then, become spaces where workers gather during their cigarette breaks before, in between or after their daily work shifts. Here, they discuss workplace politics and share their routine lives with others. These adjoining stalls therefore become important spaces where workers can socialise and express themselves more comfort-



Figure 2. Makeshift food and tea stalls (*Tapri*) outside Eon IT Park in Kharadi. Source: Author.

ably and openly, without the same fear of constant techno-bureaucratic surveillance that prevails inside the IT parks.

In the same vein, the renewed influx of migrant populations in Pune looking to take advantage of opportunities in the booming IT/ITeS economy and the other digitally enabled new services sectors often raises the important challenge of affordable housing units for migrants near these hubs of new economic activities. Here, again, the demand for affordable housing is matched by the concomitant growth in 'unauthorised' slum settlements and low-cost neighbourhoods located near these IT/ITeS clusters. These offer different types of rented accommodation and housing arrangements—like shared flats and tenements for individuals, families and groups and paying guest accommodations for young workers, alongside other key amenities, such as food messes and lunch/dinner delivery services; cybercafes; small, private computer skills training centres; and English language learning centres.

Similarly, the lack of public water supply for new, high-rise residential projects in areas adjacent to the large IT parks in the urban fringes is met by another section of Pune's grey or shadow economy. This is known locally as the highly coordinated 'water tanker mafia,' which operates with political and administrative clout and closes the water resource gap for residential, industrial and construction sites in these areas, until these needs can be met legally (a process wrapped in bureaucratic red tape and corruption, which can take several months or years to resolve). Revealing the close nexus that exists between the city's grey economy and the local state, the water is purchased from municipal sources, private wells or bore wells and/or tapped illegally from civic water supply points. According to recent reports, the water tanker mafia in Pune does an annual business of approximately \$13.3 million (100 crore rupees; Bhaskar, 2019).

Resonant with Simone's (2004, p. 407) analysis in the context of African cities, the complex formal and informal spatial networks and assemblages around the various tech parks in Pune call into question the physical notions of infrastructure as "reticulated systems of highways, pipes, wires, or cables," in favour of the alternative conceptualisation of 'people as infrastructure.' These are defined as the "flexible, mobile, and provisional intersections of residents that operate without clearly delineated notions of how the city is to be inhabited and used, by engaging complex combinations of objects, spaces, persons, and practices" (Simone, 2004, pp. 407–408). This movement of people enables the constant osmosis of labour, technologies, practices and ideas between these global hubs and their 'ordinary' outsides. Diverging to the tropes of expulsion and dispossession associated with the growth of new infrastructural projects in private satellite cities such as Gurgaon (Kuldova, 2017), what one observes in Pune's urban fringes is the formation of intensive and intersecting network of actors, whose nodes are individuals and communities at the urban margins.

Rather than being net losers of the process of new urban infrastructural development in the fringe areas, many of these individuals and communities coalesce around, adapt to and (even) gain from these changes.

5. The Reconfiguration of Spatial Relations and Everyday Micro-Politics in Pune's New Urban Fringes

Recognising the presence of numerous co-dependencies between different IT industrial clusters and varied forms of urban formal and informal infrastructures, it becomes clear that these sites continue to have complex after-lives following the moment of their original and violent conception as some form of sovereign spatial entities. Having said this, it is equally important to keep in mind that the arbitrary and uneven process of land development and urban change, triggered by private investors hedging bets in different areas of the city, is not automatically geared towards creating collaborative urban spaces; rather, these become collaborative over time to meet the needs of diverse local communities and actors, whether they be elite or subaltern. These spaces harbour potential for coalitions, but also contestations and counter-claim-making between multiple actors in the transforming urban context. These new spaces and economies produce broad-based reconfiguration of social and spatial relations and politics in the city, inflected by classed and communitarian positionalities of its actors. This is to say that, contrary to the projected binaries between the 'powerful' capitalist classes and the 'powerless' agrarian classes, or between the neoliberal 'extractive' state and the 'compliant' subaltern, what emerges is a more diffused urban assemblage consisting of diverse social actors, social infrastructures and services, entwined in differing logics of spatial cooperation and contestation. While territorial conflicts between groups with different class and caste backgrounds is not the central focus of this article, to understand the changing everyday social relations and micro-politics that arise in the wake of large-scale IT infrastructure development projects, it becomes imperative to grasp the heterogeneity of urban actors and their interrelationships in the local context. Broadly, my research confirmed the important role of specific actors and interest groups that co-shape urban realities every day. These include: private real estate or public sector land developers; the elite and newly rich middle-classes; traditional land-owning communities; local political representatives, such as the Municipal Corporators and members of legislative assembly; lower-middle-classes; and urban, slum-dwelling communities, including settled and new migrants to the city.

State authorities like the Maharashtra Industrial Development and large private developers, such as the Pancshil Group, were some of the original investors in Pune's IT-oriented infrastructure developments. Today, new private-sector developers have together built large IT hubs and new business districts in the city's 'new'

urban fringes of Hinjewadi, Kharadi and Hadapsar. The initial developments have also triggered some essential infrastructural investment developments by smaller, private real estate developers in the new urban fringes. Land deals in these new areas are now increasingly negotiated by private developers directly with local land and property owners. Thus, rather than being completely state sponsored, much of the land around these large IT hubs has become a scattered collection of hundreds of large, small and mid-sized private commercial complexes and gated residential enclaves, with some tracts of undeveloped, vacant agricultural lands still visible in their midst. Certain land-owning communities in the city have become enriched from this process of private land development, even becoming real estate investors and developers themselves, using their local community and political clout.

The popular example of Magarpatta city in eastern Pune is often cited as a successful cooperative venture. It is a 450-acre, self-contained, eco-friendly, hybrid township with 30 percent green spaces, large, modern office buildings, residential blocks, hospitals, schools and shopping malls (see Chatterji, 2015; Kantakumar, Kumar, & Schneider, 2016). Here, farmers from the Magar community came together as politically influential agricultural landowners and subsequently became co-owners and developers of their own land, leasing it out to some of the biggest multinational corporations and earning huge profits (Chatterji, 2015; Sami, 2013). However, while Magarpatta city has come to be highlighted as a successful, more participatory and fair model of new urban infrastructural development for the country, this has not been replicated widely, even inside Pune, revealing the different configurations of local political cultures that continue to shape differential outcomes for different urban actors. Moreover, Magarpatta city's success also obscures from view the broader issues of planning that its eventual residents, its users and adjoining neighbourhoods continue to face every day. Thus, for instance, frequent traffic jams on the narrow public roads leading up to Magarpatta city are a significant source of frustration for the local populations, who travel to Magarpatta for work, reside in the area, or simply pass through it every day.

Another set of actors who have assumed great importance in the everyday politics of new spatial developments in suburban Pune, is the city's higher-earners and more affluent 'new middle-classes' (cf. Platz, 2012), that invest in the new residential and commercial projects that sprout around the different IT/ITeS clusters. It is common to see in Pune, numerous billboards with aspirational advertising, promising quick ownership of a high-end modern luxury apartment for upper-middle-class families through loans at low interest rates and easy instalments. Indeed, most IT professionals who I interviewed in Pune, either already owned (at least) one home in a multi-storey 'housing society' in these 'new' areas, rented there, or else aspired to own one in the future. The emergence of this new middle-class orient-

ed urban development projects in Pune's suburbs, further fuelled by the growing penetration of speculative real estate capital in the city, has subsequently given rise to new expressions of middle-class aspirational politics in the city. The usual vehicles of this politics are usually civil society groups and residential associations, which seek to address the numerous gaps in local infrastructure and planning in these 'up-and-coming' areas of the city—whether they be related to the environment, transport, water, lighting, traffic or road development (cf. Menon & Hartz-Karp, 2019). Many of these middle-class civil society groups are well-networked and media savvy, and use their visibility in the public sphere to intervene in and change the course of urban and area development plans, engaging with the state and civic authorities, as well as the private sector developers and companies.

However, Harriss (2005) and Lemanski and Tawa Lama-Rewal (2012) note new middle-class activism in India, in many cases, puts them on a collision course with those who operate the city's informal economy and provide crucial human infrastructural support, namely the lower-middle classes and urban poor communities. In Pune, a similar scenario can be observed. Several middle-class collectives here have regularly protested and advocated for implementing stricter bans on unauthorised, six-seater auto-rickshaws and unauthorised private vehicles on the roads near the different IT clusters, with the aim of reducing congestion and accidents, while also mitigating the rising air pollution in these 'new' areas (see Puri, 2015). In their claims for better roads and traffic management, however, it is the 'illegal' transport economy and its most common users—the informal working classes that often gets the most blame for causing traffic snarls and road accidents in these areas, even when they are the more likely to be at the receiving end of these problems. This, then, has major repercussions for the needs and legitimacy of the informal working classes, who depend on these alternative modes of transport to access and serve the same affluent spaces and middle-class communities. That said, it is important to remember that the relative power of urban elites and new middle-class groups does not indicate the permanency of (their) territorial antagonisms towards non-elite or subaltern groups in the city, since such a binary can easily hide from view the heterogeneity that exists within the middle-classes in new suburban spaces in India, and obscure the different instances of intra- and cross-class dependence and their alliances on provision of public services and infrastructures (see Lemanski & Tawa Lama-Rewal, 2012). Indeed, one could also argue that while poor road infrastructure and lack of proper transport planning in the new urban fringes of Pune underlines the large neglect by city authorities of these 'new' areas, the resolution of these problems often happens only after new spatial conflicts make these an issue.

The city's informal working classes and urban poor, while cut-off from the more prominent civil society networks, assert their importance by other means. They

rely on their indispensable role as organic lubricators of the city's new IT-oriented infrastructural spaces and their participation in the 'political society'—that is, new forms of urban governmentality which includes grassroots communitarian and civic associations, and the elections of urban, local bodies, such as for the municipal corporation (see Menon & Hartz-Karp, 2019). There is a visible heterogeneity among actors and interest groups within the informal economy and communities as well, which defines how and to what extent they engage in urban spatial politics. For instance, in unauthorised slum settlements adjoining new sites of private IT infrastructure investments in the city's urban fringes, there can be found two categories of migrant populations—recent migrants and settled migrants. While new migrants in these slums looking to access affordable accommodation and sustainable employment in the city do not commonly engage in municipal politics, settled and intergenerational migrant communities see the rise in land prices and private developments around them as an opportunity to collectively demand and push for regularisation and (re)development of their slum settlements from state authorities and municipal representatives in their respective *prabhag*, or municipal ward. Slum regularisation is an important demand of its residents, as it enables these communities to access better civic and infrastructural facilities and entitles them to become recognised property holders, landlords, rentiers and consumers of private services, such as new Internet and mobile communication infrastructures—services that are present in other regularised slums and in the city at large.

The 'municipal corporators,' representing the different wards in the city's new urban fringes with large growth in IT-oriented infrastructure, often come from powerful landowning and farming communities in the city. They can help accelerate, slow down or even block new private infrastructural developments in these areas, often based on their own political interests and/or associated economic motivations. The case of the proposed 17km Kharadi–Shiavane road on the eastern fringes of Pune is an example. The construction of this road has been 'pending' for over 11 years, following issues related to proper compensation to farmer communities who own the land by the state and the municipal corporation. The farmers have been supported in this by the municipal corporator in Kharadi, a local agricultural landowner himself (Kulkarni, 2020a). In a later instance, however, the same corporator supported a group of protesting middle-class IT workers against the inauguration of a vacant land space for a weekly farmers' market by the sitting member of legislative assembly from an opposing political party near their residential apartments (Kulkarni, 2020b). This contrasting posturing by the local municipal representative in different instances provides an insight into the ways in which class- and community-based antagonisms are suspended or superseded in favour of pluralist or pragmatic everyday territorial negotiations, engrained in the local political culture.

It is in such ways that everyday micropolitics continues to shape the typologies and the temporalities of local land use, urban planning and development that takes place in and around various IT/ITeS clusters and zones.

6. Conclusion

Recent digital transformations in the economies of countries in the global South have affected not just a physical change in the urban and infrastructural landscapes of cities and their peripheries, but also provoked a profound social reconfiguration within them. As everyday life in the global South is disrupted by these new socio-spatial transformations, there is scope to expand further the digital geographies agenda to include its engagement with uneven urban development and planning in different postcolonial contexts.

This article, rooted in extensive ethnographic research carried out in the city of Pune, has explored the progression of IT-oriented infrastructural developments that have come to define the most recent phase of urbanisation in many metropolitan cities across India. The article contributes in different ways to existing scholarship on urban digital geographies from the standpoint of contemporary southern urbanisms, excavating the complex relationship between contemporary digital transformations in the economy and nature of new suburban expansion in the global South. First, the article has interrogated the conceptual blind spots that exist within contemporary research on global urbanisms that overemphasise the rural–urban divide and related class binaries, in context of large-scale development of IT/ITeS-oriented infrastructures in India's megacity fringes. This article has, instead, emphasised the need to explore the complex 'afterlives' of these new infrastructural spaces in the global South, integrating the different intersecting experiences of heterogeneous economic actors, infrastructures and communities that surround these emergent spaces, and shape their futures.

Additionally, countering popular tropes that identify large IT/ITeS-oriented infrastructural spaces as closed and impenetrable archipelago economies, this article has argued for understanding these sites in the global South, as porous and co-constituted by their ordinary 'outsides.' The article evidences this argument by highlighting how the growth in speculative investments led by the private sector in Pune has also opened new avenues for the expansion of informal economies and infrastructures in the city, which include, amongst other things, provisional and illegal modes of public transport, informal and affordable means of housing, food and water. Over time, these informal and grey economies have become a huge and indispensable part of the city's fabric, revealing important urban co-dependencies that are integral to the sustenance, growth and transformation of these new infrastructural spaces.

Finally, this article has explored the ways in which high-tech development redefines the landscape of urban

micro-politics in India, but also how it gets re-configured (both) by the different territorial contestations and by pragmatic collaborations between different elite and subalterns groups at the local level. Identifying some of the key economic, civic and political actors involved in such spatial negotiations in Pune city, the article shows how the fluid nature of everyday micro-politics surrounding these high-tech global infrastructural spaces may create new forms of urban governmentality and public participation in cities of the global South.

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Conflict of Interests

The author declares no conflict of interests.

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