The Smart City Paradigm in India: Issues and Challenges of Sustainability and Inclusiveness

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Introduction

Immediately after assuming power in May 2014, the National Democratic Alliance (NDA) government led by the Bharatiya Janata Party (BJP) decided to set up '100 Smart Cities' throughout the country. With the contribution of urban India to the national GDP estimated at 75 per cent during 2030, the Smart Cities are expected to be engines of economic growth. The budget speech of the Finance Minister in July 2014 mentioned that the aspirations of the neo-middle class towards better living standards are to be achieved by developing Smart Cities as satellite towns for larger cities and by modernising existing mid-size cities. According to the draft concept-note prepared by the Ministry of Urban Development (MoUD), Government of India, they will comprise 9 satellite cities with a population of 4 million or more, 44 cities in the population range of 1–4 million, 17 state/Union Territory (UT) capitals, 10 cities of tourist and religious importance, and 20 cities in the population range of 0.5 to 1 million (MoUD 2014: 21–22). The focus will be on the development of high-end infrastructure and technology-enabled governance, with the objectives of accomplishing competitive, investor-friendly and world-class entities. The concept-note indicates the three cardinal principles for Smart Cities as: competitiveness, quality of life and sustainability.

The concept of a 'Smart City' has become popular in the policy arena of the European Union (EU) and other developed countries. The *Smart Cities Readiness Guide* of the Smart Cities Council, an advocacy group of industry houses, defines a Smart City as one that uses 'information and communications technology (ICT), to enhance its livability, workability and sustainability' (Smart Cities Council 2013: 5). It identifies the seven drivers of Smart City development as: (a) increasing urbanisation with the addition of 700 million to the urban population over the next decade; (b) growing stress due to unemployment, crowding, inadequate housing; (c) demand and supply gap in infrastructure; (d) economic competition among cities to secure investments; (e) rising expectation of citizens towards world-class education, health care, recreation and a responsive government; (f) growing environmental challenges related to carbon emission and global warming; and (g) expanding technology options in the areas of ICT, electronics and telecommunication, energy, water and waste management. The 'Internet of Things' (IOT) has become a major building block of the

Smart Cities. The *Guide* highlights a reported increase in IOT devices by technology provider Cisco, from 200 million in 2010 to 10 billion in the year 2012. Based on evidence from the literature (Amin *et al.* 2000; Brenner and Theodore 2002; Florida 2005; Graham and Marvin 2001; Harvey 1989; Komninos 2002), Holland (2008) identifies five prime characteristics of a Smart City as: embedding of ICT into the city fabric, emphasis on business-led development and domination of neo-liberal urban spaces, shift in urban governance from managerial to entrepreneurial forms, significance of social learning and education, social capital for innovation, the nurturing of a creative class, and focus on social and environmental sustainability. Citing the examples of Ottawa, Singapore, San Diego and Sao Paolo, Holland argues that the characteristics of smart urbanism have led to conflicts between promoting global, mobile IT businesses and serving stationary, ordinary citizens; patronising the elite creative class and sustaining the unskilled IT illiterate urban poor; top–down corporate-driven governance and bottom–up decentralised urban management. He further opines that the urban form of Smart Cities, led by business-driven technology and gentrification, has been unconcerned about the issues of class inequality, polarisation, social justice and inclusion.

In India, a section of industry and civil society welcomed the idea as they rightly consider the Indian urban scene as anything but smart, with obsolete and inconsistent data, crumbling infrastructure, unaccountable city governance and lack of financial resources. A city with a mission of quality living, characterised by state-of-the-art infrastructure, a high-speed mass transit system, a pollution-free environment, energy efficiency and transparent governance through the application of ICT, is expected to uplift livability to the level of world-class cities in the West. Moreover, the private sector investment in ICT and other infrastructure, real estate, energy, health care and education will bring in efficiency, intelligence and quality in the socio-economic, physical and institutional environment in the cities. On the contrary, critics raise the issue of diversity of the country, in terms of its people, economies and geographies. They argue that ICT applications and the cost recovery of service delivery would increase the cost of living of the urban poor, who may then be pushed further to the peripheries of cities and endure a renewed onslaught on their lives and livelihoods.

The Purpose and Content of the Smart City Initiative and Challenges for Sustainability and Inclusiveness

Soderstrom *et al.* (2014) pointed out the theoretical underpinning of the concept of the Smart City, particularly the New Urbanism movement in the USA during the 1980s and the concept of a technology-based intelligent city. Between 1994 and 1997, the city of Multifunction Polis near Adelaide in Australia and two cities in Malayasia – Cyberjaya and Putrajaya – were planned as Smart Cities using ICT to attract investments and automa-

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tise the service delivery arrangements. In early 2000, the other issue that became instrumental in the popularisation of the idea of the Smart City was the proactive role of private sector companies, namely IBM, in developing software and consultancy services for urban instrumentation, to monitor real-time information of the cities in order to improve their operational efficiencies. The 'Intelligent Operations Centre' in Rio de Janeiro – a partnership between the Municipality and IBM – has developed a city-level instrumentation system through sensors and camera networks, drawing data from thirty line agencies engaged in the provision of urban services, weather monitoring, gathering information from citizens through mobile phones and the internet into a state-of-the-art analytic centre. It analyses high volume, diverse and real-time data to investigate the state of affairs in the city and predict scenarios of development and management, e.g. traffic bottleneck, flooding, rubbish bins sending an alarm as they are close to being full, impending health risks and so on.

Encouraged by the success of Rio and subsequently Singapore, IBM has developed the following two-pronged strategy to dominate the rising market of the Smart City: full-scale contracting for the city government (McNeill 2013) and consultations to 100 Municipalities across different countries as part of its Smarter Cities Challenge Programme. With the declared objectives of operational efficiency in governance and the development of a knowledge economy, currently the major players such as IBM, CISCO, Microsoft, Intel, AT&T and Master Card are pushing for the adoption of new urban technologies and services by cities, and are simultaneously advocating for deregulation and privatisation to ensure capital accumulation. The validity of the technocratic mode of governance, and the limitations of ICT and an automation-based knowledge economy in generating jobs for millions flocking to the cities, have been questioned in the available literature. Kitchin (2013) observed that a large number of self-designated Smart Cities fail to incorporate the attributes of culture, politics, policy and governance, and that a technological solution alone is not capable of addressing the deep-rooted structural malaise inextricably linked to their social dynamics. Marvin and Luque (2013) highlighted that selected proprietary technologies developed by the world's largest software services and hardware companies would focus on ensuring monopoly in the potential market, as opposed to larger societal or environmental priorities, either in the greenfield ventures (e.g. Songdo in South Korea or Masdar in UAE) or the retrofitting of existing cities. IBM is presently selling its product called 'Intelligent Operations Centre' that combines the features originally designed for Rio into a single product, applicable to any city.

The Indian version of Smart Cities started with the announcement of the building of seven such cities in six states, each with a population of two million, along the proposed Delhi–Mumbai Industrial Corridor (DMIC), by the erstwhile United Progressive Alliance (UPA) govern-

ment in 2007. The city clusters include Dadri–Noida–Ghaziabad in Uttar Pradesh, Khuskehra–Bhiwadi–Neemrana in Rajasthan, Maneswar–Bawal in Haryana, Ahmedabad–Dholera in Gujarat, Pithampur–Dhar–Mhow in Madhya Pradesh, and Dighi in Maharasthra (D'Monte 2014). These were envisaged primarily as greenfield industrial cities with world-class infra-structure and ICT. Similar to the concept of the developed world, high-end infrastructure, sensors, smart grids, big data and analytics have been con-sidered as the elementary instruments for urban governance. The former Chief Minister of Gujarat, Mr Narendra Modi, had declared two Smart Cities: Dholera Special Investment Region (SIR) and Gujarat International Finance Tec (GIFT) City, as the building blocks of a global Gujarat (Datta 2014). On assuming power in Delhi, the Modi government launched the ambitious initiative of 'Make in India' to facilitate the entry of private investment and innovation in order to build international-quality manufac-turing infrastructure. The Smart City has been conceived as an instrument to invite global funding agencies, technology firms and private (domestic and international) real estate, to help realise the dream of 'Make in India'.

The number of cities on the DMIC corridor is proposed to be increased to twenty-four, in addition to several new cities along the Chennai–Bangalore Industrial Corridor (CBIC) and the Bangalore– Mumbai Economic Corridor (BMEC). These corridors and Smart Cities are expected to be developed with the help of funding and expertise of the Japan International Cooperation Agency (JAICA), the UK, France and Singapore. IBM has pre-pared the ICT Master Plan for Dighi Port Industrial Area in the DMIC, with a proposal for setting up a Rio-like Intelligent Operations Centre patented by IBM. CISCO prepared the ICT Master Plan for four Smart Cities in the DMIC project and entered into a collaboration with the Electronic City Industrial Association (ELCIA) to set up an IOT hub to house companies for developing software to be used in 100 Smart Cities (Idiculla 2014). The US–India Business Council expressed the willingness of US companies to contribute capital and global expertise in developing solutions for such cit-ies, and possible financing instruments including debt markets, public–pri-vate partnerships (PPP), equity investments and other innovative business models (US India Business Council 2014: 2). The PPP opportunities for US companies may be explored in the areas of transportation infrastructure, power, slum development, sanitation, sewage and water. In conformity with the envisaged business model, most of these proposed Smart Cities are being, or are likely to be, designated as Special Economic Zones (SEZs) or SIRs, to attract foreign and private capital by offering exemptions from taxes, duties, labour laws and by bending rules to ensure easy access to cheap land. Efforts have already been initiated through the recent Land Acquisition Ordinance 2015, to dilute the provisions of the present Act in order to ensure state expropriation of agricultural land for the industrial corridor, infrastructure and real estate development under the holy tag

of 'public purpose'. The blueprint for the displacement of people from 5,000 villages for the DMIC alignment and construction of Smart Cities has already been prepared (Hasan 2015: 4). Recently, the government has announced the setting up of twelve Smart Cities in port lands with designated SEZs, which will be implemented through the PPP model (*The Hindu* 2015). The government has reduced the cap on foreign direct investment (FDI) in real estate from 50,000 sq. m to 20,000 sq. m, and the investment limit from $10 million to $5 million, to further relax the regulatory barrier.

Several issues regarding sustainability and inclusiveness have been raised in academic and policy advocacy circles, on the objectives, content and possible outcome of such cities in India (Burte 2014; Chatterjee 2014; Bhatia 2014; Ghosh 2015; Puri 2014). First, the proposed alignments of DMIC, CBIC and BMEC, and the development of Smart Cities along these corridors will further reinforce the uneven and polarised urbanisation in the country. Presently, the states of Delhi, Gujarat, Maharashtra and Karnataka have a higher rate of urbanisation and per-capita income than the majority of the eastern and central states. The proposed industrial corridors and the Smart Cities will worsen the existing west–east divide in this regard. Second, cities in the Western countries, Singapore and China have been adopted as the role models for smart urbanisation in India, disregarding the contrast in socio-political contexts and institutional capabilities. Third, questions have been raised about the relevance of computer and mobile-aided living, working, banking and utility provision in a so-called Smart City, where large sections of dispossessed and homeless communities coexist without formal employment. There is a large possibility that the technocentric governance of Smart Cities may further push the urban poor to the margins of cities. Fourth, the centralised data system might be able to forecast urban flooding or anticipate disease outbreaks and other emergencies, but the decision to mobilise resources and prioritisation of localities for intervention will be decided by politics dominated by the ruling elite. Fifth, the initiative has an ambitious objective of creating transit-oriented, walkable, cyclist-inclusive, livable cities, but in reality, the rising number of personal car ownership and private enclave urbanisation during the last two decades have created a marked polarisation based on class, caste, social hierarchy and professional position. Cities have significantly lost their shared character and with the phenomenal participation of the private sector, as envisaged in the Smart City initiative, they are likely to be converted into a breeding ground of crony capitalism. Sixth, Smart Cities make a lofty claim of environmental sustainability in their siting and operation. Contrary to this objective, Dholera SIR in Gujarat, the city proposed on the DMIC alignment, located in a flood-prone zone, appears to be an expensive venture in terms of site development. There may be several such locations selected in other states through a top–down and bureaucratic process.

In India's Smart Cities, emerging technology features, namely, sensors, cameras, wireless devices, data centres and analytical engines, are expected to ensure efficient urban services, a low ecological footprint, reduced carbon emission and maximised entrepreneurial opportunities for the citizens. However, looking at cities purely through the lens of technology, in terms of investment destination and knowledge economy, implies a failure to interpret the aspirations and socio-political relations of multiple stakeholders with competing interests that are engaged in the shaping of Indian cities.

The primary aim of the Smart City, as envisaged in the draft concept-note, is to achieve competitiveness in order to attract investment and operational efficiency in service delivery, through the pillars of institutional, physical, social and economic infrastructure. Institutional infrastructure seeks to address the fragmented nature of service delivery across multiple institutions, achieve e-governance and citizen participation through social media and other mechanisms. Physical infrastructure emphasises a high level of urban mobility, intelligent and ubiquitous availability of urban services, including ICT services and digital technologies mentioned in previous sections. Social infrastructure encompasses quality education, health care and entertainment facilities to attract entrepreneurs and professionals. Economic infrastructure will comprise industrial parks, export processing zones, IT/BT parks, trade centres and financial and logistic hubs.

Essential Attributes

The following will be the distinguishing features of Indian Smart Cities.

ICT Enablement and Technological Intervention

High-speed internet connectivity and an online payment platform for various urban services such as electricity, water, property tax, gas, etc., smart metering for the efficient measurement of water consumption, the use of techniques like SCADA (Supervisory Control and Data Acquisition) to reduce transmission loss, sensors to estimate water flow rates on a real-time basis and leak detection, and smart grids to manage the distribution of electricity generated by various sources including renewable energy. The use of clean technologies has been prescribed to harness renewable materials and energy sources, so as to reduce the environmental impact of urban development, and the Geographical Information System (GIS) based spatial mapping has been recommended for the formulation of Smart City Development Plans (SCDPs).

Service-level Benchmarking (Comparable to Cities in European Countries and the Developed World)

Smart Cities should strive to attain the world-class benchmark for urban services, such as high frequency mass transit, with a residential density of

175 persons per hectare (pph), 100 per cent household access to 24×7 and 135 lpcd water supply with metered connections, sewerage, storm water drainage and 24×7 supply of electricity. Hundred per cent efficiency in cost recovery for water supply and sewerage has also been specified.

Private Sector-led Development

Considerable involvement of the private sector is contemplated, to facilitate innovation and make the delivery of urban services more efficient. Dialogues have been initiated with global management consultancy firms such as Mackenzie, KPMG, PWC, ILFS and leading IT companies such as IBM, CISCO and Microsoft, to involve them in the design, implementation and real-time monitoring of Smart Cities.

Consultant-driven Planned Development

The document recommends the formulation of SCDPs and project DPRs by urban local bodies/parastatal agencies in different states through centrally empanelled consultancy firms. The central engagement of agencies is suggested to expedite the process of planning and to ensure uniform and high quality outputs.

Greater Institutional Coordination

As the city is conceived as a 'system of systems' where multiple agencies have been involved in planning and management, it is important that there is a synergy among them for coordinated action. The document underscores the need to overcome the current practice of working in silos with greater institutional coordination (MoUD 2014: 7).

Transit-oriented Mixed-Use Development

Inadequate access to affordable housing is conceived as a problem created by prohibitive land prices and low floor area rations (FARs) being unable to promote high intensity development. To address the problem, transit-oriented, mixed-use development with higher FAR is proposed to reduce the commuting time, to integrate work with living and affordable housing for people near the work centres.

Governance by Incentives rather than Governance by Enforcement

People would be encouraged to adopt right practices proactively rather than by fear of penal action. Flexible FAR norms should be treated as an incentive, contrary to regulatory compliance of low and fixed FAR. All decisions should be based on rationality and non-discrimination with the infusion of technology and compliance to service-level agreement, with human intervention restricted to a bare minimum level.

Conditions for the Selection of Smart Cities

The selection of Smart Cities will be decided by compliance to several conditions set by the state and the urban local body (ULB), such as the existence of a notified Master Plan, a digitised and GIS-enabled base map, online seeking and delivery of all public services, transparent and time-bound procedure (not more than seven days) for the approval of various utility projects, and availability of all information and decisions in the public domain. All projects are to be offered first to the private sector for implementation and maintenance; the tariff structure should be affordable to the poor, but cost recovery of capital and operational expenditure should be assured; and there will be a single regulatory body for all utility services to ensure quality of service delivery and financial sustainability. Credit rating by agencies empanelled by GoI, flexible land-use and FAR are considered mandatory commitments. Recently, the government announced that cities will be selected through a 'City Challenge Competition'. The evaluation will give special emphasis, in the selection process, to the ratio between revenue and population, and the ratio between revenue and the number of government employees.

Financial Architecture

The High Power Expert Committee (HPEC) of the government estimated the investment requirement as Rs. 7 lakh crore for a period of twenty years, and an annual requirement of Rs 35,000 crore each for 100 Smart Cities with an average population of 10 lakhs. With a major share of the investment expected from the private sector, the contributions from the central government shall be limited to Viability Gap Funding. The GoI recently announced an investment of Rs 48,000 crore for this initiative (*The Economic Times* 2015). The financing mechanism will primarily be based on land value-based taxation, user charges, PPP, market borrowing and debt financing of infrastructure. The instruments likely to be explored include leveraging of land available with ULBs and parastatals, betterment levy, Pooled Municipal Debt Obligation, Real Estate Investment Trusts, Infrastructure Debt Funds and tax-free Municipal bonds.

Operational Procedures

The procedure for the development of Smart Cities should commence with the formulation of a Citizen Reference Framework (CRF) to reflect the aspirations and expectations of the residents, prepared by the empanelled agency in consultation with the citizens and other stakeholders. This will be followed by the formulation of SCDP, based on the Master Plan of the city, gap analysis and CRF. SCDPs should assess the investment requirements to bridge the gap in different aspects of infrastructure and urban livability and indicate possible sources of funding. The initiative will be implemented by a Special Purpose Vehicle (SPV) that is to be created for each city.

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Indian Urbanisation Challenges and Smart City Utopia

Indian cities are grappling with multiple challenges which do not appear to have any bearing on the Smart City agenda outlined by the government. The following section discusses the emerging challenges of the Indian urban scenario and the initiative's ignorance about them.

Oblivious to the JnNURM Experience

The Smart City programme was launched subsequent to the Jawaharlal Nehru Urban Renewal Mission (JnNURM), the most ambitious post-Independence urban renewal initiative to rejuvenate 65 mission cities (including the megacities of Mumbai, Delhi, Kolkata, Chennai, Hyderabad, Bengaluru, Ahmedabad and seventeen state capitals) and 640 non-mission towns across the country during the period 2005 to 2012. The Mission aimed to fast-track urban development and promote reforms to ensure efficiency in infrastructure and basic service delivery, including affordable housing for the poor and community participation, and accountability of the ULBs or parastatal agencies towards citizens. Several assessments by GoI (HPEC, Grant Thornton, Arun Moira Committee, CAG) indicated limited success of the Mission's activities in metropolitan and large cities of more urbanised and high-growth states such as Tamil Nadu, Maharashtra, Gujarat and Karnataka. Out of the total 1,093 DPRs submitted till August 2012, only 552 (51 per cent) could be sanctioned (CPR 2014). CAG indicates poor completion rates of infrastructure and housing, inefficiencies of consultant-driven project management and implementation process, diversion of funds, irregular payments to contractors, and delay in the release of funds leading to cost escalation and further burdens for the ULBs (CAG 2012).

The problem of land acquisition is one of the major constraints on infrastructure development. The mid-term appraisal of Urban Development in the Eleventh Plan (Planning Commission 2010) reported a delay in the utilisation of funds, with twenty-five states and Union Territories using less than 80 per cent of the allocated budget for infrastructure projects due to the lack of ULB capacities in planning and execution of projects. The key constraints of the Mission were: absence of participatory planning leading to lack of ownership of the projects; absence of coordination between urban planning, project selection and citizen's needs, resulting in the weakening of citizen–government interface; and the absence of a need–benefit analysis, social audit and monitoring mechanism to assess the impacts of the reforms and projects.

The CAG (2012) reported that out of thirty-nine cities audited, only seven could implement user charge collection for water supply and five for solid waste management, while no state implemented rent control reform and stamp duty rationalisation. This indicates a lack of political will and an adverse ground reality in executing the reforms. The same solutions and reforms prescribed for towns of all sizes did not seem to

work for smaller towns. Available literature and citizen consultations reveal evidences of non-inclusiveness in the process of implementation of the Mission projects (Kundu and Samanta 2011; Mahadevia 2011; Banerjee-Guha 2009; National Consultation on JnNURM 2012). These include a major disconnect between the vision of creating world-class infrastructure and the livelihood of the urban poor in the CDPs, leading to their eviction or relocation to the city peripheries in the process of implementation of infrastructure projects like the Bus Rapid Transit System, road widening, flyovers and river-front beautification in Ahmedabad, Hyderabad, Bhopal and Surat. The repeal of the Urban Land Ceiling and Regulation Act 1976 (ULCRA) (one of the mandatory reforms) led to the current situation of the accumulation of 95–98 per cent of urban land with the top 20 per cent of people, while less than 1 per cent lies with the urban poor in the ten most populous cities. The draft concept-note does not refer to the experiences gained through the JnNURM, and the reasons for the disconnect between the original intentions and the actual outcome after a decade of its implementation. The Smart City initiative assumed a clean slate to implement a techno-managerial spectacle for the neo-rich, which in reality is an intensely contested space with conflicting interests of diverse stakeholders, dysfunctional institutions, unequal power relations and diverse development trajectories adopted by different cities, based on their socio-political dynamics, resource disposition and urban geography.

Big City Bias

India's urban scenario is lopsided, with the distribution of urban population skewed in favour of class I towns (population more than 1 lakh). The share of the urban population in class I towns increased from 26 per cent in 1901 to 63.3 per cent in 2011, while the share of class IV, V and VI towns decreased from 47 to 6.3 per cent during the same period. The number of metropolitan cities increased from 1 in 1901 to 53 in 2011 (Roy 2013: 409). Class I towns and metropolitan cities have better resource disposition and higher efficiency of governance in comparison to smaller towns. In the proposal for 100 Smart Cities, 44 will be in the population range of 1 to 4 million. With large-scale investment envisaged in these cities, the existing polarisation between bigger cities and smaller towns with respect to infrastructure, governance and capital accumulation is likely to intensify further.

Exclusion of Census Towns

According to the Census of 2011, out of 7,935 towns, 3,894 (49 per cent) are census towns (CTs) that do not have ULBs, continue to be governed by a rural administrative structure and desperately need access to rudimentary urban amenities. In spite of some of the CTs achieving an economy of scale and emerging as possible locations for future investments, they still do not satisfy the criteria for selection as Smart Cities.

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Silence on Urban Poverty and the Informal Sector

Urban poverty in the country is quite evident with 26.4 per cent earning less than 1 dollar a day (Singh 2014). IIHS (2011) indicates that a million plus cities are home to 40 per cent of the slum population, while 80 per cent of the urban poor live in cities with a population of less than 1 million. The extent of informality observed in urban employment is quite high (around 70 per cent), with a considerably low wage structure, adverse service conditions and location outside the purview of the social safety net. The largest category of urban employment is non-trade services, which includes large-scale informal employment comprised primarily of domestic workers and rag-pickers. The concept-note ignores the overwhelming presence of the urban informal sector and the linkage between the formal and informal sectors.

Density Norm and Impracticable Land Acquisition

Indian cities are among the most densely populated in the world. The current population density of Mumbai is ten times that of New York. The poverty-stricken northeastern part of Delhi has the highest population density in the country, which is sixteen times the average stipulated in the Master Plan of Delhi (D'Monte 2014). Contrary to this reality, the concept-note proposes a very low residential density of 175 pph for the Smart Cities. The prescribed residential density of 175 pph for an average population size of about 1 million (as indicated in the concept-note) will entail a residential land area of 57 sq. km and a total town area of about 100 sq. km. Bulk acquisition of land being a politically contentious issue, the prescription of such a low density raises doubts about the implementation of such an ambitious initiative. Adoption of the density norm without considering the specific context may lead to encroachment into fertile agricultural land.

Disconnect of Infrastructure Deficit and Service-level Benchmarking

There is a considerable deficit in access to infrastructure in Indian cities. The Planning Commission (2012) reported that no Indian city can boast of 24×7 water supply and the duration of supply ranges from 1 to 6 hours. About 94 per cent of Indian cities do not have access to even a partial sewerage network, only 21 per cent of waste water is treated, and the collection of solid waste in smaller cities is limited to 50 per cent. Public transport accounts for only 22 per cent of the modal share. According to HPEC (2011) estimates, 24 per cent of the urban population lives in slums. The Smart City initiative proposes to achieve world-class benchmarking without assessing the feasibility or the incremental milestones to be achieved in the process of transformation.

Myth of New Towns and Smart Cities

The development of satellite towns of large cities along industrial corridors has been advocated as the prime strategy of the Smart City initiative. Since

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Independence, India has built about 225 new towns or greenfield cities as industrial centres, new capitals or counter-magnets to decongest existing megacities (Roy 2013: 410). Many of these new towns, although exhibited as good practices in spatial planning, have failed to establish themselves as inclusive and sustainable models. They accommodate less than 5 per cent of the incremental urban growth (Sivaramakrishnan 2011: 190). Roy (2013) observed that the satellite towns of the National Capital Region (NCR), such as Gurgaon, Noida, Ghaziabad and Faridabad, are glaring illustrations of non-inclusiveness for not achieving housing mix of various income strata, exclusion of informal sector, lack of public transport, absence of women's safety and indiscriminate encroachment of natural resources. The prime causes of failure include lack of understanding about mutual dependence of metropolis and satellite towns, inadequacies of work centres and social infrastructure, and ineffective land management. The Smart City initiative places unrestrained faith in satellite towns to address urban disorder without probing the reasons for their success or failure.

Accountability Deficit for Private Cities
The private sector is considered the driving force for the development of Smart Cities, recent examples being Lavasa and Amanora in Maharashtra. The *Economic and Political Weekly* (2010) reported the dubious land acquisition process and controversial environmental clearance of the Lavasa project. Despite its lofty claim to accommodate the lower segment of the migrant population, corporate-led development set the minimum price of a flat at Rs 16 lakhs, which is beyond the budget of the intended lower-income group. The plans of Lavasa and other private cities are not open to public scrutiny. In all likelihood, SCDPs, to be formulated by consultants, would evade civic scrutiny, and the outcome would be resource depletion and exclusive enclaves of the neo-rich.

TOD Instrument and Operational Deficiency
The concept-note has identified TOD as a tool to integrate transport with land-use and create impetus for growth with high-density, compact development, to challenge the ill-effects of urban sprawl. Despite the good intentions of the TOD, it is spoiled due to unplanned growth as the authorities in control of land-use do not have a realistic plan for the zones and lands are put into incompatible use by more proactive market forces. Very little has been done to provide parking facilities in transit stations, even in peri-urban locations.

Governance by Incentives in Planning Vacuum
Some of the notable incentives proposed are flexible and higher FAR norms close to the transit corridor, and the Transfer of Development Rights (TDR) in heritage conservation areas and slum redevelopment zones. Judicious

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implementation of these incentives and their monitoring depends on the existence of detailed Master Plans. Ironically, 76 per cent of 7,935 towns do not have Master Plans and hardly 25 per cent of the plan proposals have actually been implemented (Roy 2015: 217). Therefore, governance by incentive remains a fanciful promise and may result in indiscriminate granting of higher FAR, driven by vigorous market forces without any cognisance of the carrying capacity of local infrastructure.

The PPP Myth in Augmentation of Infrastructure

The Smart City initiative depends enormously on the PPP mode for the augmentation of infrastructure. However, it does not take into account the experience of existing PPP projects. Seddon and Mahalingam (2013) observe that projects with smaller time horizons, technologically simple, specific output and risks shared primarily by public sector, such as bus shelters and solid waste management, appear to be largely successful. On the other hand, projects with uncertain revenue streams, an embedded objective of equitable access and higher transaction cost could not achieve success. 24×7 water supply schemes in Hubli–Dharwad, Belgaum and Gulabarga cover only 10 pe cent of the population, while the Nagpur scheme reported a cost over-run of 46 per cent due to delay in execution. PPP in urban roads such as the Karur Toll Bridge and Coimbatore Bypass ran into problems due to an incorrect estimate of demand and a controversy regarding land acquisition, whereas in the case of the Chennai Ring Road, risk-sharing between public and private sector became questionable. Hyderabad and Mumbai Metro Projects were delayed due to problems in land acquisition; the Bangalore Metro began as PPP but moved to an Engineering, Procurement and Construction (EPC) contract which was also the model for the Delhi Metro. The Chennai Metro has been built as a joint venture of the central and state governments as it could operate at a lower cost, as compared to a PPP contract. The concept-note sweepingly indicates PPP or complete private investment for the augmentation of infrastructure without looking into the ground reality of existing initiatives.

Uncertainty of Market Borrowing and Debt Financing

The initiative places considerable faith in market borrowing and debt financing of infrastructure. The experience on this front reveals that only financially strong and large Municipal Corporations can access capital markets. Notable among them are Ahmedabad, Hyderabad, Bengaluru, Chennai, Nagpur and Visakhapatnam, which raised Rs 12,884 million through taxable bond, tax-free bond and pooled financing (Chakraborty 2014: 83). The bond proceeds were used to fund water supply, sewerage projects and road projects. Poor balance-sheet and high transaction costs restrict the access of most small and medium ULBs to the market, which has been effectively dead in India since 2010. The concept-note is oblivious

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of the limitations of the bond market, such as hurdles of low rating, reluctant investors, ambiguous regulations, and limited capacity and understanding of ULBs regarding market access.

Technological Fix and Urban Reality

The initiative underscores the use of sensors and digital technology to make urban systems efficient, cost-effective and environmentally sustainable. Sensor networks and digital cameras are expected to monitor the condition of drainage networks and anticipate flooding. However, since only 20 per cent of the road network is served by stormwater drains, flood monitoring remains in the realm of wishful thinking. RFID chips attached to rubbish bins are supposed to send alarms when they are close to being full, but there is an obvious doubt about their application, considering that there is only 50 per cent waste collection coverage in small and medium towns. While Auto DCR (development control regulation) is being touted as a tool to ensure an online and transparent building plan approval process, it is unlikely to have a perceptible impact on the quality of life of ordinary citizens in 76 per cent of our cities and towns that have grown organically in the absence of Master Plans. The other implausibility of a technological fix in Indian cities is that in a resource-scarce situation, allocation decisions are predominantly influenced by patronage-based politics. Thus, despite leaks in water lines or pressure drops perfectly located through digital systems, the decision to prioritise intervention would be decided by local power relations.

Overarching Issues Confronting Sustainability and Inclusiveness

The Indian urban scenario is a conglomerate of divergent development patterns, wide-ranging norms and conflicting priorities of multiple stakeholders, inherited from an indigenous, colonial, post-independent and liberalised socio-political order. These layers interacted with the diversity of physical and cultural landscape, inducing a complex heterogeneity in cities. This is reflected in the differential access to infrastructure and opportunities in various parts of megacities, the contrasting urban form and activity patterns of cities in deserts and hills, the divergent management priorities in historic and industrial towns and variations in resource disposition in economically vibrant and stagnant towns. The Smart City initiative, in its urge to replicate the developed economy model, became a carrier of neo-liberal urbanism, overlooking the range of diversity in Indian cities. The following issues are challenging the sustainability and inclusiveness of the initiative.

Technocratic Approach to Governance

The obsession with monitoring and managing cities through ubiquitous computing and digital devices disregards the city as a socio-political phe-

nomenon. It presumes that all its attributes and problems can be measured and monitored in real time, as technical problems having technical solutions. This form of governance is extremely limited in scope and fails to capture the heterogeneity of culture, politics, policy and physical landscape that shapes Indian cities. The deep-rooted problems of cities, manifested in unequal access to opportunities linked to skewed power relations balanced in favour of the elites, lead to inefficiency in resource allocation. Hence, technological solutions determined through real-time analytics are unlikely to address deep-rooted structural problems.

Entrepreneurial Urbanism

The explicit focus on cities as destinations of skilled professionals serving the knowledge economy, seen as high-security enclaves of the neo-rich, with a PPP mode of service delivery, and adopting technologies and services developed by big corporates, will lead to capital accumulation by a few through the dispossession of others. The urge to promote entrepreneurial urbanism is revealed in the unusual haste of the GoI in promulgating the new Land Acquisition Ordinance (2015), stripping the farmers of the safeguards against compulsory acquisition enshrined in the present Act and withdrawing the regulatory barrier for FDI in real estate. Neo-liberal ethos with market-driven solutions eludes urban poverty and occupational informality, and will accelerate the social cleavage prevailing across cities.

Ambiguous Selection Criteria

The selection criteria do not recognise the imbalance existing in the urban geography across different states. In tune with neo-liberal ideology and entrepreneurial agenda, it emphasises performance in the City Challenge Competition, the presence of a Master Plan, mandatory involvement of the private sector, commitment to cost recovery in infrastructure projects and per-capita revenue earning. Mostly, large cities in developed states will satisfy these criteria. Surprisingly, the list of Smart Cities indicated by the Finance Minister in the first budget speech includes a large number of cities that are already funded under the JnNURM. The government has not drawn lessons from the weakness of JnNURM, and it is imprudent to infuse a second phase of ambitious investment in urban rejuvenation without first conducting a regional planning exercise. This faux pas will lead to the snowballing of regional imbalance and exclusionary urbanisation in the country.

Leapfrog Approach to Development

The urban reality in India is characterised by gradual improvement contributed through investment by people in shelter and household-level infrastructure, complemented by augmentation of trunk infrastructure by ULBs and state governments. All that the JnNURM could achieve that was positive was a gradual transformation through implementation of

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infrastructure and housing projects in some of the better governed cities. The Smart City initiative intends to reverse this trend and adopt a leap-frog approach to development. The vision of overhauling existing cities to achieve an unattainable level of service and the development of greenfield cities through large-scale land acquisition are unlikely to be sustained in the context of the prevailing socio-economic structure in the country. The one-size-fits-all approach, and the manufacturing of cities in an identical mould by ignoring the diversity of physical landscape, culture, history and politics, are doomed to fail.

Downgrading the Role of ULBs
The ULBs will be silent spectators as SCDPs, to be formulated by exter-nally hired consultants and SPVs, will be created for managing the cities. The initiative belied the provisions of the 74th Constitution Amendment, and charted a course of action that is undemocratic and unaccountable to the citizens. The situation is analogous to the formulation of recent CDPs under the JnNURM and previous IDSMT (Integrated Development of Small and Medium Towns) Programme, which ignored the participation of citizens and could not yield expected results because of the downgraded role of elected ULBs.

Concluding Remarks and the Way Forward
Overarching issues and underlying shortcomings are the corollaries of neo-liberal urbanism and mission-mode interventions being practised in India since the 1990s.

The ambiguous selection criteria are resulting in arbitrary choices of cities for investment. Any such initiative needs to be taken up as an integral component of a comprehensive urban policy. The report of the National Commission on Urbanisation formulated during the late 1980s needs to be re-examined and amended under the changed circumstances. The chal-lenge presently is to develop cities in conjunction with the development of the regions. Small and medium towns, especially growing census towns, should be treated as priority locations for investment and augmentation of infrastructure and governance.

The obsession with the technocratic mode of governance is oblivious to the legacy of cultural, political and ecological dimensions of wisely man-aged cities. For example, the traditional built-form and street orientation in the old cities of Jaipur and Jaisalmer contain clues for addressing climatic discomfort, while the colonial hill settlements of Dalhousie and Darjeeling negotiated the difficult topography with remarkable sophistication and finesse. The megacity of Kolkata boasts of its wetlands as sites for sew-age-fed fisheries, contributing to the natural process of waste recycling and generation of local employment.

The leapfrog approach to development, in terms of unattainable ser-

vice-level benchmarking for existing cities and bulk acquisition of land for new towns, is a confirmed recipe for failure. The argument is further valid for slums and informal settlements. Contrary to this, the country has had a successful experience of community-driven projects leading to incremental improvements in shelter and infrastructure, such as the Slum Networking Project in Indore and Ahmedabad. The Ban Mankong (Secure Housing) Programme in Thailand is also a model that needs to be examined.

The top–down, consultant-driven and big player-oriented initiative would serve the political agenda of the new government, as against the basic spirit of devolution and autonomy in urban planning by the ULBs as envisaged in the 74th Constitution Amendment. In contrast, it is worthwhile to mention the Kollam Development Plan in Kerala as an example of participatory spatial planning undertaken by the District Planning Committee and involving diverse stakeholders, including the urban poor.

The Smart City initiative and the digital technologies for management and monitoring of urban systems are being promoted by the world's largest hardware and software companies to ensure a world-class living and working experience for the emerging rich and neo-middle class. To be inclusive, it is necessary to adopt a democratic approach to city development and to explore the potential of connecting information technology with the marginalised sections of society, to enhance their access to employment, market, education, health, and help in building resilience against natural disasters. Some of the established examples available across the globe are the *Digital Stewards Project* in Redhook, Brooklyn (providing job listings and support for recovery from hurricane Sandy); the *Community Telecentre* in Africa (providing job opportunities for women); and the *Random Hacks of Kindness* (RHoK) that produces open source software for disaster response. RHoK products were used effectively during the 2010 Haiti earthquake. Bengaluru-based *Babajob*, a digital social network, provides information about jobs to millions working in the informal sector. About a decade ago, a collaboration of NGOs and women's networks prepared a slum atlas of Pune by mapping them on a GIS platform, to bring slum communities into the ambit of planning so that they could have a fair share of resources. The *Map Kibera Project* used participatory GPS and Open Street Map to empower communities of Kenya's largest slum to monitor and record their experiences with state initiatives. Townsend (2013) explains the potential of mobile phones in bringing economic and social opportunities to slum communities in the developing world. In the *Kosovo Science for Change Project*, people measure air quality, temperature, humidity and noise levels in their communities with the help of Arduino-based smart citizen sensors, and share the data through the internet. The communities use the information for advocacy so as to improve their circumstances by adhering to environmental principles and ensuring the enforcement of standards.

Growing evidence suggests the possibilities of grassroots action and the

vision of local governments across the globe for an inclusive future, to create just and humane cities based on demand-driven, community-empowering, incremental and participatory principles of development. The notion of prosperity and competitiveness in cities should expand beyond the confines of economic growth, and should strive for equitable distribution of benefits and opportunities, securing economic well-being, social cohesion and environmental sustainability. In the words of Jane Jacobs, 'Cities have the capability of providing something for everybody only because and only when they are created by everybody.'

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