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Smart City Initiative in India: A Policy Review

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Abstract

In its effort to transform the cities as engines of economic growth, Government of India launched the Smart City Mission in 2014, which combines the features of a policy document as well as a financial package. The Mission has a target to develop 100 smart cities throughout the country. The focus is on development of high-end infrastructure and ICT enabled governance with the objective of accomplishing competitive, investor friendly and efficient cities. The article examines the intentions of the government in launching this initiative in the context of global and national perspective, track how the mission is unfolding in the contested urban landscape and analyze the possible implications of the initiative in future of urbanization in India.

Keywords

Smart Cities, ICT, PPP, SPV, Governance

Introduction

In its effort to transform the cities as engines of economic growth, Government of India launched the Smart City Mission in 2014, which combines the features of a policy document as well as a financial package. The Mission has a target to develop 100 smart cities throughout the country. With the estimated contribution of urban India as 75% to the national GDP during 2030, the smart cities are expected to be global investment destinations and offer world class living experience for the emerging neo-middle class in the country. The focus is on development of high-end infrastructure and ICT enabled governance with the objective of accomplishing competitive, investor friendly and efficient cities. ICT is perceived as the panacea for the

plethora of problems confronting the Indian cities by use of sensors, smart grids and data analytics to ensure infrastructure for meeting citizens demands on real time basis. The draft concept note outlines the 3 cardinal principles of the smart cities as competitiveness, quality of life and sustainability and identifies the four pillars of a smart city as institutional infrastructure (including governance), physical infrastructure, social infrastructure and economic infrastructure. The financing of most of the infrastructure in the smart cities is expected to be mobilized by private sector or through public private partnership. The contributions from the state will be primarily in the form of Viability Gap Funding. The concept note puts forward the conditions or benchmarks to be attained by the cities, operational procedures, financial architecture and implementation framework of the program.

Majority of the Indian cities have been growing in unplanned fashion with high degree of informality, large sections of urban population remain deprived of decent shelter, basic services, livelihoods, affordable means of mobility and voice in development. The process has resulted in inequities and sharp social divisions in a contested urban landscape of affluent gated communities and impoverished slums and informal settlements. Urban growth has been traditionally looked at from the perspective of public works missing the economic and social dimensions of the cities and could not factor in the issue of local history and place-specific development characteristics. There is mixed response to the smart city initiative with a section of the neo- rich middle class, professional elites and planners expect that it has the potential to rejuvenate the ailing urban system, while the other group dominated by experts of social sceince, NGOs and urban activists apprehend that the smart cities with its emphasis on area based development and ICT enabled infrastructure will exacerbate social polarization and inequality in selected cities. It is of scholarly significance and crucial from public policy viewpoint to

examine the intentions of the government in launching this initiative from global and national perspective, track how the mission is unfolding in the contested urban landscape and analyze the possible implications of the initiative in future of urbanization in India.

The article will address the following research questions:

What are the drivers of smart city initiative in India?

What are the challenges and concerns emerging in the process of its implementation?

What is the future agenda to adapt it better to the urban dynamics of the country?

Smart City Paradigm: Global and Indian Perspective

"Smart City" has emerged as a popular urban model in the policy arena of European Union and other developed countries during late 90s and early phase of this century. The Smart Cities Readiness Guide of the Smart Cities Council, an advocacy group of industry giants defines smart city as one that uses "information and communications technology (ICT), to enhance its livability, workability and sustainability" (Smart Cities Council 2013:5). It highlighted the motive forces of smart city development as : a) increasing urbanization with addition of 700 million urban population over 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, healthcare, recreation and 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. 'Internet of Things' (IOT) is becoming a prime building block of the smart cities. The Guide reported

increase of 10 billion IOT devices in the year 2012 from 200 million in 2010. Based on available literature (Amin et al.2000; Brenner and Theodore 2002; Florida 2005; Graham and Marvin 2001; Harvey 1989;Komninos 2002), Holland (2008) indicates five prime characteristics of 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, education, social capital for innovation and nurturing of creative class and focus on social and environmental sustainability. Citing experiences of Ottawa, San Diego, Sao Paolo and Singapore, Holland proclaims that characteristics of smart urbanism entail conflicts in promoting global, mobile IT business and serving stationery and ordinary citizens; patronizing the elite creative class and sustaining unskilled IT illiterate urban poor; top-down corporate driven governance and bottom-up decentralized urban management. He further argues that urban form of smart cities created through business driven technology and gentrification reluctant to address the issues of class inequality, polarization, social justice and inclusion.

In India a section of the industry and civil society greeted the initiative with much enthusiasm considering Indian urban scene as anything but smart with obsolete and inadequate data, appalling infrastructure, unresponsive city governance and paucity of resources. A city with a mission of quality living attributed with infrastructure of global standard, high speed mass transit system, clean environment, energy efficiency and above all transparent governance through application of ICT enabled citizen interface. The private sector investment in ICT and other infrastructure, real estate, energy, healthcare and education will bring in efficiency, intelligence and quality in the socio-economic, physical and institutional environment in the cities. Contrary to this, critics raise their concern about enormous diversity of the country across its populace,

economies and geographies. ICT applications and cost recovery of service delivery in large scale would escalate the cost of living of the urban poor who would be marginalized and pushed further to the peripheries of the cities with renewed onslaught on their lives and livelihoods.

Genesis of Smart Cities: The Drivers

Soderstrom et al. (2014) discussed the theoretical underpinning of smart city concept being linked with the New Urbanism movement in USA in 1980s and the idea of technology based intelligent city. During 1990s the city of Multifunction Polis near Adelaide in Australia and two cities in Malayasia- Cyberjaya and Putrajaya were planned as smart cities by using ICT to attract investments and ensure technology driven service delivery arrangements. In early 2000, proactive role of private sector ICT giants namely IBM became instrumental in popularizing the idea of smart city in developing software and consultancy services for urban instrumentation to monitor real time information of the cities to improve their operational efficiencies. Economic recession in late 90s compelled IBM to shift its focus from hardware design and production to more lucrative fields of consultancy and software development. It realized the emerging market potential of new generation urban technologies and launched the 'Smarter Planet' campaign advocating cities to be smarter to become sustainable and economically efficient. In Rio de Janeiro, the 'Intelligent Operations Centre' (state-of-the- art entity for data analytics) initiated by IBM in collaboration with the municipality is a city level instrumentation system with embedded sensors and camera networks drawing data from 30 line agencies engaged in provision of urban services, weather monitoring and information from citizens through mobile phones and internet. It analyses diverse, high volume and real time data to investigate the state of affairs and predict scenarios of city management e.g. traffic bottleneck, flooding, rubbish bins sending alarm as they are close to being full and impending health risks. Emboldened by the success of Rio and

Singapore subsequently, IBM developed a two pronged strategy to seize the opportunity of rising smart city market: 'full scale contracting for city government' (McNeill 2013) and consultations to 100 municipalities across different countries under its Smarter Cities Challenge Programme. With the declared objectives of achieving operational efficiency in governance and development of knowledge economy, currently the major players such as IBM, CISCO, Microsoft, Intel, AT and T are promoting new urban technologies and services by cities and advocating deregulation and privatization to ensure capital accumulation. The available research literature question the validity of technocratic mode of governance and limitations of ICT and automation based knowledge economy in addressing the complex and multidimensional problems confronting urban centres. Kitchin (2013) noted that large number of self-proclaimed smart cities fails to incorporate the attributes of culture, politics, policy and governance and technological solution alone is unable to address the deep rooted structural malaise inextricably linked to their social dynamics. Marvin and Luque (2013) observed that proprietary technologies developed by world's largest software services and hardware companies would focus on ensuring monopoly in potential market contrary to larger societal or environmental priorities either in the green-field ventures (e.g. Songdo in South Korea or Masdar in UAE) or retrofitting existing cities. IBM is aggressively marketing its 'Intelligent Operations Centre' combining the features originally designed for Rio, Singapore and other cities into a single product applicable to any city.

The genesis of smart cities in India is linked to the post economic liberalization and reform since 1991. Indian economy is going through a process of significant structural change between 1991 and 2011, with the declining share of agriculture in the GDP, stagnating manufacturing sector and leap-frog growth of service sector with its contribution to GDP rising from 44.1 percent to 56.4 percent (Roy 2013:18). The improved economic performance is powered by the growth of

urban based knowledge intensive services (e.g. IT-ITES-BPO, education and healthcare), automobiles, pharmaceuticals, biotechnology, garments, hotels and recreation sector activities. Chatterji reported that between 1998 to 2015 IT-BPO sector's contributions to GDP increased from 1.2 percent to 9.5 percent while the export contribution rose from 4 percent to 26 percent. The ICT sector has emerged as the prime foreign exchange earner and largest job creator in organized sector. After decades of economic stagnation, the sector became the agent of change and modernization and opened up global employment opportunities and increased aspirations for a large section of the middle class in the country. In post liberalization economic scenario, there is also a surge in the size of middle class population from 1 percent in 1985 to 5 percent (about 50 million) by 2005 and this is projected to reach 20 percent by 2015 (Mckiney Global Institute, 2007). The rise of the IT and service sector and growth of educated urban middle class created an unprecedented demand for office space, technology parks and high quality residential clusters to meet global corporate specifications and played a catalytic role for development of gated enclaves, premium residential townships, shopping malls, multiplexes, educational institutes and specialty hospitals contained in the trapping called smart cities. Initially these so called smart enclaves clustered in and around seven big urban agglomerations of Banagaluru, Hyderabad, Chennai, Mumbai, Pune, Kolkata and Delhi NCR. Subsequently, more grandiose vision of smart cities has become integral to the idea of industrial corridor being launched for economic turnaround of the nation through development of green-field industrial cities where high-end infrastructure, sensors, smart grids, big data and analytics considered as the elementary tools for urban governance. The United Progressive Alliance (UPA) Government in 2007 announced building seven such cities in six states each with a population of 2 million along the proposed Delhi- Mumbai Industrial Corridor (DMIC). The city clusters include Dadri-Noida-

Ghaziabad in Uttarpradesh, Khuskehra-Bhiwadi-Neemrana in Rajasthan, Maneswar- Bawal in Haryana, Ahmedabad- Dholera in Gujarat, Pithampur-Dhar-Mhow in Madhyapradesh and Dighi in Maharasthra (D'Monte 2014). The then 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 global Gujrat (Datta 2014). On assuming power in Delhi, Modi government has launched the ambitious initiative of "Make in India" to attract private investment and innovation for building international class manufacturing infrastructure. In the process, smart city has been advocated as the medium to invite global funding agencies, technology firms and private (domestic and international) real estate to realise the dream of 'Make in India'. The number of cities on DMIC corridor is proposed to be increased to 24 along with several new cities along the Chennai- Bangalore Industrial Corridor (CBIC) and the Bangalore- Mumbai Economic Corridor (BMEC) those are expected to be developed with the funding support and expertise of Japan International Cooperation Agency (JAICA), UK, France and Singapore. IBM formulated the ICT Master Plan for Dighi Port Industrial Area in the DMIC with a proposal for setting up a Rio like Intelligent Operations Centre. CISCO prepared the ICT Master Plan for four smart cities in DMIC project and initiated collaboration with Electronic City Industrial Association (ELCIA) to set up an IOT hub to house companies for developing software to be used in these smart cities (Idiculla 2014). The US India Business Council expresses willingness of the US companies to provide capital and expertise required for developing such cities and use of possible financing instruments namely debt markets, public private partnerships (PPP), equity investments and other innovative business models (US INDIA Business Council 2014:2). PPP opportunities have been considered to be explored for the US companies to develop transportation infrastructure, power, slum renewal,

sanitation, sewage and water supply sector. The other driver of smart cities in India is the emergence of new spatio-legal regimes transforming the nature of urban governance in the country. As globalization is unfolding, new modes of urban organizations with unique legal features been unleashed in the country through designation of certain spaces as Special Economic Zones (SEZs), SIRs, Industrial Townships and organizations as Special Purpose Vehicles (SPVs) bypassing the prevailing institutional architecture of democratically elected urban local bodies. This is done with the purpose of attracting foreign and private capital by offering exemptions from taxes, duties, labour laws and bending rules to ensure easy access to cheap land with private modes of urban governance and planning (Idiculla 2015). Electronic City Industrial Township Authority (ECLITA) in peri-urban Bangalore is one such example created to bypass the social and political realities of the urban locales and allow private capital to operate in spaces outside the ambit of regulatory functions of urban local bodies. Government has announced setting up of 12 smart cities in port lands with designated SEZs and will be implemented through model of PPP (The Hindu 2015). In its effort to relax further the regulatory barrier and facilitate the entry of international capital in housing sector, Government has reduced the cap on Foreign Direct Investment (FDI) in real estate from 50,000 sqm. to 20,000 sqm. and investment limit from $ 10 million to $ 5 million. Efforts are also initiated through the Land Acquisition Ordinance, 2015 to soften the provisions of present Act to ensure state expropriation of agricultural land for industrial corridor, infrastructure and real estate development under the tag of public purpose.

The proactive role of the state in emphasizing cities as engines of economic growth through development of knowledge intensive service sector and emergence of the neo-rich middle class as drivers of smart cities in the country and the institutional bypass used for their realization

created apprehensions among urban scholars and activists about their validity in Indian context. Following issues regarding the sustainability and inclusiveness of smart cities have been raised on the objectives, content and possible outcome of the initiative (Burte 2014; Chatterjee 2014; Bhatia 2014; Ghosh 2015; Puri 2014; Dutta,2014).

- Cities in western nations, Singapore and China have been projected as the role models for the initiative disregarding the contrast in socio-political context and institutional capabilities.
- Concerns are raised about the legitimacy of excessive emphasis on ICT enabled service delivery and governance of smart cities where large sections of dispossessed and homeless communities without formal employment coexist. Possibilities are looming large that techno-centric governance may further push the urban poor to the margins of the cities through sheer pricing or physical surveillance.
- As digital divide is sharply entrenched in the country due to poor network connectivity, low level of digital literacy and weak governance infrastructure, aggressive persuasion of technology intensive e-governance policies without addressing socio-economic disparities would further deepen the digital rift and aggravate further the rural-urban and rich-poor divide.
- Presently the states of Delhi, Gujarat, Maharashtra and Karnataka have higher rate of urbanization and per capita income than majority of the eastern and central states. Proposed alignments of DMIC, CBIC and BMEC and development of smart cities along these corridors will further exacerbate the uneven and polarized urbanization in the country and further intensify the existing West – East divide.
- The leapfrog approach to development or fast tracking urban rejuvenation through service-level bench marking as per global standard and one-size-fits-all approach is in conflict with

the current paradigm of incremental upgradation of cities through investment by people complemented with improvement of trunk infrastructure by ULBs and the state.

- PPP has been considered as a panacea for the resource crunch in developing urban infrastructure is delinked from Indian urban reality. Projects in large cities with smaller time horizon, technologically simple, specific output and risks shared by public sector, such as bus shelters and solid waste management succeed as PPP, while projects ridden with uncertain revenue stream and higher transaction costs namely 24*7 water supply, roads or Metro have failed or only partially successful
- ICT driven centralized data system might be able to forecast urban flooding or anticipate disease outbreaks and other emergencies, but the decision to mobilize resources and prioritization of localities for intervention will be decided by political considerations embedded in the asymmetry of power relations in the cities.

The Initiative and Its Current Status

Salient Features

Hundred modern cities endowed with world class technology and infrastructure was promised by the Bharatiya Janata party (BJP), the major political party, in its election manifesto in April, 2014. Subsequently, after winning the election, the National Democratic Alliance (NDA) under the leadership of BJP and Prime Minister Narendra Modi has expressed their commitment of building 100 smart cities in the Union Budget 2014-15. The pronouncement drew overwhelming response from the corporate giants, leaders and captains of industries of the countries Modi visited soon after, such as USA, Singapore and Japan and a section of the civil society who have been desperately looking for a solution to the endemic disorder plaguing

India’s urban centres. In June, 2015 the prime minister formally launched the Smart City Mission as a centrally sponsored scheme (CSS) covering 100 cities for a period of five years commencing from 2015-16. In the absence of universally accepted definition of smart city, Government of India in its Mission Statement and Guidelines refrained from giving a definition of smart city that varies for cities and countries relating to level of development, willingness to change and reform, resources and aspirations of the citizens. The document (Ministry of Urban Development Govt. of India, 2014) underscored the need to drive economic growth and improve people's quality of life in cities through local area development and harnessing technology that could lead to smart outcomes. The primary aim is to increase competitiveness of the cities to attract investment and operational efficiency in service delivery through institutional, physical, social and economic infrastructure, mediated by real time data monitoring and application of ICT/ digital technologies. The core infrastructure elements in a smart city would include: adequate water supply, assured electricity, sanitation and solid waste management, efficient mobility and public transport, affordable housing especially for the poor, robust IT connectivity and digitalization, good governance especially e-governance and ctizen participation, sustainable environment and safety and security of citizens especially women, children and the elderly and health and education.

The initiative adopted a combination of Pan-City approach with smart solutions (Box No 1) and Area-based Development. The aim of the Pan-City component is to overhaul, upgrade or install an infrastructure component embedded with smart elements that would benefit larger parts of the city, while the Area-based Development is planned urban development to be executed in a phased manner. The three models of Area-based Development are:

- Retrofitting- Development of an existing built up area of more than 500 acres to make it efficient and liveable.
- Redevelopment- Replacement of an existing built-up area of more than 50 acres and enable co-creation of a new layout with augmented infrastructure, mixed landuse and increased density.
- Greenfield Development- Develop a previously vacant area of more than 250 acres introducing most of the smart solutions using innovative planning, plan financing and plan implementation tools (land pooling, land reconstitution) with provisions for affordable housing especially for the poor.

Each city is expected to formulate the Smart City Proposal (SCP) containing the vision, plan for resource mobilization and intended outcomes in terms of infrastructure upgradation by including features indicated in Box 1 and 2.

Box 1: Smart Solutions

E- Governance and Citizen Services	Public Information, Grievance Redressal, Electronic Service Delivery, Citizen Engagement, Video Crime Monitoring
Waste Management	Waste to Energy and Fuel, Waste to Compost, Treatment of Waste Water, Recycling and Reduction of C and D Waste
Water Management	Smart Meters and Management, Leakage Identification, Preventive Maintenance, Water Quality Monitoring
Energy Management	Smart Meters and Management, Renewable Sources of Energy, Energy Efficient and Green Buildings
Urban Mobility	Smart Parking, Intelligent Traffic Management, Integrated Multi-

	Modal Transport
Others	Tele-Medicine and Tele Education, Incubation and Trade Facilitation Centres, Skill Development Centres

Source: Ministry of Urban Development Govt. of India, 2014

Box 2: Smart City Features

The mission identifies the following typical features of comprehensive development in Smart Cities:

- Promoting mixed land use in area-based developments–planning for 'unplanned areas containing a range of compatible activities and land uses close to one another in order to make land use more efficient. The states will enable some flexibility in land use and building by-laws to adapt to change;
- Housing and inclusiveness — expand housing opportunities for all;
- Creating walkable localities — reducing congestion, air pollution and resource depletion, boost local economy, promote interactions and ensure security. The road network is created or refurbished not only for vehicles and public transport, but also for pedestrians and cyclists, and necessary administrative services are offered within walking or cycling distance;
- Preserving and developing open spaces — parks, playgrounds, and recreational spaces in order to enhance the quality of life of citizens, reduce the urban heat effects in areas and generally promote eco-balance;
- Promoting a variety of transport options — Transit Oriented Development (TOD), public transport and last-mile para-transport connectivity;

- Making governance citizen-friendly and cost effective — increase reliance on online services to bring about accountability and transparency, especially using mobile phones to reduce cost of services and providing services without having to go to municipal offices. Form e-groups to listen to people and obtain feedback and use online monitoring of programs and activities with the aid of cyber tour of worksites;
- Giving an identity to the city based on its main economic activity, such as local cuisine, health, education, arts and craft, culture, sports goods, furniture, hosiery, textile, and dairy;
- Applying Smart Solutions to infrastructure and services in area-based development in order to make them better. For example, making areas less vulnerable to disasters, using fewer resources, and providing cheaper services.

Source: Ministry of Urban Development Govt. of India, 2014

Selection Process of Cities

Total number of 98 smart cities has been distributed among states and Union Territories (UT) based on the formula of equal weightage (50:50) to urban population of the state/UT and the number of statutory towns in the state/UT. Based on this formula each state/UT will have certain number (at least one) potential smart cities. The Mission has adopted an unprecedented 2 stage 'City Challenge' competition for short listing of cities by states (Stage I) and subsequently an intra-city competition to select the winning cities in different stages (Stage II). For Stage I , a 13 point criteria was proposed to be used by the state for short listing of cities for Stage II. Among the 13 criteria, higher weightage (60%) was assigned to attributes of institutional systems/capacities, abilities of self financing and past track records of Jawaharlal Nehru Urban

Renewal Mission (JnNURM). The parameters include: trend of revenue (taxes, fees, charges) collection, contribution of tax revenues, fees and user charges, rents to the city budget receipts, share of operation and maintenance cost of water supply met through user charges, contribution of internal revenue sources used for capital works, previous track record in completion of Jawaharlal Nehru Urban Renewal Mission (JnNURM) projects and achievement of envisaged reforms. The 97 short listed cities spread across the states in Stage I were given a grant of INR 200 million, to prepare the detailed SCPs for Stage II with the support of external empanelled consultants. This is crucial as each of the SCPs should contain the model chosen, emphasis on retrofitting, redevelopment or greenfield development along with Pan City element embedded with smart solutions. The evaluation criteria emphasizes on city vision and strategy, extent of consultation with citizens and other stakeholders including investors groups, use of social media and mobile communication technologies for consultation, whether citizen aspirations are matching with the vision, use of smart solutions in Area-based and Pan-city developments, implementation plan and financing proposal including the revenue model to attract private participation. In Stage I competition out of 98 cities shortlisted, 24 are state capital cities, 24 business and industrial centres, 18 cultural and tourism centres, 5 port cities and 3 educational and healthcare hubs. In terms of population size, the list is dominated by big cities. 21 cities having a population between .5 million to 1 million, 25 are between 1 to 2.5 million, 5 cities ranging between 2.5 million and 5.0 million, while 4 metropolitan cities with 5 million plus population are also included. Only 8 cities are having population below .1 million and 35 cities are between .1 million to .5 million.

Implementation and Financing

Govt. of India gives financial support of INR 480 billion over five years, i.e. average INR 1 billion per city per year. An equal amount, on matching basis will have to be contributed by the State/Urban Local Bodies (ULBs). The project cost for each smart city will vary based on the nature of development model and the execution capacity of the city. In view of the institutional deficiencies of the ULBs and fragmented jurisdictions of governance among different state agencies the Mission proposed creation of a Special Purpose Vehicle (SPV) for smooth and efficient implementation of Mission activities including planning, appraisal, approval, fund disbursement, implementation, management, operation, monitoring and evaluation of the projects in each selected cities. The SPV would be a limited company under the Companies Act,2013 and to be managed by the independent directors, nominees of the union and state governments as well as the concerned ULB. The state/UT and ULB are the promoters having 50:50 equity shareholdings. The private sector or financial institutions could be considered for equity stake provided the state/UT and ULB together have majority share holding and control of the SPV (State/UT:ULB: Private sector shareholding may be 40:40:20 or 30:30:40). The shareholders need to ensure substantial revenue stream for the SPV to make it self sustaining by raising additional resources from the market. The SPV would explore the possibilities of joint ventures, subsidiaries, PPP, turnkey contracts and others for the purpose. Several state governments have established financial intermediaries, such as Tamil Nadu, Gujrat, Punjab, Maharashtra, Karnataka, Madhya Pradesh and Bihar) that may be tapped for support and other states may also consider similar set up for the purpose. The rest of the fund may be mobilized from conventional and non-conventional sources: states/ULBs own resources (user charges, impact fees, land monetization, debt, loans), additional resources linked to acceptance of

recommendations of Fourteenth Finance Commission, municipal bonds, pooled finance, tax increment financing, convergence fund from Swachh Bharat Mission (SBM), Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Heritage City Development and Augmentation Yojana (HRIDAY) and Pradhan Mantri Awas Yojana (PMAY), borrowing from domestic and international financial institutions and National Investment and Infrastructure Fund (NIIF).

Current Status

From the nationwide pool of 98 short listed cities, 60 were selected in three rounds of Stage II competition. The first 20 cities in order of ranking are: Bhubaneswar, Pune, Jaipur, Surat, Kochi, Ahmedabad, Jabalpur, Visakhapatnam, Solapur, Davangere, Indore, New Delhi Municipal Council, Coimbatore, Kakinada, Belagavi, Udaipur, Guwahati, Chennai, Ludhiana and Bhopal. Majority of them are from regions with high economic and industrial potential. The 60 winning proposals will cover of about 7.2 crore urban population and total project cost of INR 133 billion. The Area- based Development has the prime share (80.2%) of the total project cost and covers only about 4% of the population in these cities. This is a point of concern for the critiques of smart cities. Some of the key success factors of first 20 winning proposals are:

- Business plan approach making a win-win situation for government, citizens and private sector
- Doing more with less by making existing infrastructure and services smart using technology
- Proposing a financially viable model using grants as returnable surplus
- Packaging various parts of the proposal into an integrated solution

- Prioritizing high impact and low cost solutions
- Developing a mechanism to continuously engage citizens in plan formulation and implementation
- Impactful consultations with stakeholders (strong partnership with local/state and central government), expert inputs from City Planners and Collaboration with private sectors

A Glance through the Pan City proposals of SCP reveals about 81 project components suggested in 20 cities. In this pool, centralized command and control centre (to streamline real-time interagency coordination and management of city-level data), intelligent traffic management system (including synchronized traffic signaling, real-time tracking of bus movements through mobile apps, smart parking, smart bus stops with public information system) and area based traffic control and public transit and traffic operations and management centre figured in majority of the 20 cities. Other prioritized projects in more than 4 cities are: common card (payment and operations) system, smart metering for water, CCTV surveillance, emergency response, wifi connectivity, NMT infrastructure, platform for citizen engagement and citizen services, city dashboard, grievance redressal through web, app and mobile phone, LED street lighting, GPS tracking and optimization of routes of garbage tracks, SWM operations and management centre, e-healthcare and water level sensors. In Area-based Development, the predominant projects are: Slum redevelopment and affordable housing, rejuvenation of parks and public spaces, lake and riverfront development, restructuring of CBD and market redevelopment, retrofitting of historic urban fabric, development of multimodal transit hub and transit oriented development (TOD). Incubation centres/start up centres are also proposed by 6 cities including the first two i.e. Bhubaneswar and Pune. Smart solutions proposed to be integrated with the retrofitting and redevelopment projects are: rain water harvesting, LED/solar street lights,

renewable energy initiatives, smart signaling, smart parking, seamless wifi connectivity, e-rickshaws, public bike sharing and barrier free walkways.

Challenges and Concerns

The Mission intends to fast track urban development by accomplishing the role of cities as engines of economic growth through provision of world class infrastructure, application of smart solutions, e-governance and land monetization in collaboration with investors, service providers and the private sector. The success of the Mission hinges on widespread application of ICT tools to improve the quality of data infrastructure, service delivery, citizen interface and smooth functioning of professionally managed SPVs in the selected cities bypassing the multi-institutional and fragmented urban governance. Since 2014, the Mission has become the major building block of the urban policy pursued by Government of India. However, in the process of unfolding of the initiative in last 3 years, following challenges are emerging that needs to be brought into the focus of discourse on the policy and its implementation.

Predilection for big cities

In the pool of 98 short listed cities, more than a half has a population greater than .5 million and more than a third has a population of greater than 1 million. Majority of the selected cities are state capitals, business-industrial-cultural and tourism hubs, cosmopolitan population profile, have significant presence of knowledge economy and international community and greater fiscal and management capacity compared to other cities in the country. Presently infrastructure in these cities are highly overstretched due to in-migration from neighbouring settlements and confronted with environmental pollution and encroachment of natural resources. The Mission would enhance their economic potential and augment infrastructure and governance capacities

which in turn invite further migration to these cities. With large scale investment proposed in the initiative, exacerbation of existing infrastructure and capital accumulation divide between bigger cities and smaller towns loom large in highly polarized Indian urban landscape.

Business plan approach

The SCP, though talks about the strategic focus of the city or strategic blue-print for development over next 5-10 years based on SWOT analysis but does not delve into the demographic transformation, socio-political dynamics, issues of migration and informality and institutional contestation. The scope of city profile is quite limited and merely documents what efforts have been initiated in last three years to improve infrastructure, housing, safety/security in the city and changes in administrative efficiency with the use of ICT. The entire SCP is a box-filling exercise in standard format with stress on measurable baseline, future targets, KPI (key performance indicators), hard metrics, cost estimation and revenue and pay back plan. SCP formulation was a fast track consultant driven process completed in 3-4 months by empanelled consultants of MoUD, Govt. of India with engagement of citizens, civil society and technology/smart solution supplier groups. The modes of citizen engagement involves face to face interactions, digital and online, competitions for crowd sourcing of ideas, social media and print media. The format of SCP provides a comprehensive checklist of the problems related to access to infrastructure in the cities but does not provide any clue about the socio-political root of the inequity in access to infrastructure or imbalance in resource allocation. Neither has it contributed to understand the growth trajectory or stagnation of the city, issues about the nature of urban economy and share of informal sector, land management and non-conformity of landuse, livelihood, infrastructure and housing problems of the urban poor. In Pune, the SCP proposes to create 500,000 jobs in next 15 years for the young entrants to the workforce by

making Pune the “Start Up” capital of the country. The SCP does not mention about the high presence of informal workforce in the city. In Bhubaneswar, the present employment rate is 54% and proposed to be enhanced to 95%. The course of action required for such transformation is missing. In, Bhubaneswar 36% and Pune 40% of the city population live in slums. The SCP documents propose affordable housing and slum free city. But it does not provide any clue about the possible impediments in achieving it, i.e. tenure profile, locational aspect, relocation vs in-situ upgradation. Experience of earlier Missions with similar mandate went unnoticed. The SCPs have adopted possible scenarios or KPIs for various sectors but most of them are silent about the operational aspect i.e. how, with what support and what kind of institutional changes required to reach the target.

Preference for Area Based Development

Scoring criteria for Stage II competition shows higher (55%) weightage assigned to Area- Based Development (ABD) compared to Pan- City interventions (15%). The reason for such skewed nature of scoring is to use land monetization as the prime instrument for financing of smart cities. The strategy is to be interpreted in conjunction with the reduced cap on foreign direct investment (FDI) in real estate from 50,000 sqm. to 20,000 sqm. and the investment limit down from $10 million to $5 million. In Pune, 75% of the money goes into smartification of 900 acres of Aundh-Baner-Balewadi area having a population of only 1% of the city. This is no exception as many other cities reveal similar imbalance in resource allocation. The areas are chosen based on their strategic advantages such as ease of land assembly, potential for high value real estate, adequacy of basic infrastructure and higher visibility. The critical point missing in the SCPs is consideration of the environmental and other externalities of these large investments and their dovetailing with the earlier plans (Master Plans and City Development Plans). Some of the SCPs

also envisaged that successful implementation of the ABD will act as bench mark for future transformation of the whole city. This approach seems untenable. Rarely Indian big cities are homogeneous in physical characteristics or socio-economic profile and replication of similar development models over the entire city fabric is not possible.

Replication of identical smart features and solutions

The Mission Statement and Guidelines highlighted the following elements should be integral part of the SCP for various cities. They comprise assured supply of electricity with at least 10% of the demand to be met by solar, adequate water supply including waste water recycling and storm water reuse, sanitation including solid waste management, rain water harvesting, smart metering, robust IT connectivity and digitization, pedestrian friendly pathways, encouragement of non-motorized transport, intelligent traffic management, non-vehicle streets/zones, smart parking, energy efficient street lighting, innovative use of open spaces, visible improvement in the area (replacement of overhead electric wiring with underground wiring, encroachment free public areas, ensuring citizens especially children, women and elderly). Despite being quite low in existing attainment of service delivery, most of the SCPs prescribed 24*7 electricity and water supply, 100% collection, separation and processing of solid waste, 100% wifi coverage and international bench mark of open spaces to display their competitive advantage over others.

Technocratic approach to governance

The obsession of monitoring and managing cities through ubiquitous computing and digital devices disregards city as a socio-political phenomenon. It presumes that all its attributes and problems can be measured and monitored in real time and considered 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 shaping Indian cities. The deep rooted problems of cities manifested in unequal access to opportunities linked to skewed power relation balanced in favour of the elites leading to inefficiency in resource allocation. Hence, technological solution determined through real time analytics is unlikely to address the deep rooted structural problems.

SPVs replacing elected urban local bodies

The initiative belies the provisions of 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 JnNURM and previous IDSMT (Integrated Development of Small and Medium Towns) Program which ignored the participation of citizens and could not yield expected result because of downgrading the role of elected ULBs.

Alternative paradigm and the future agenda

Indian urban scenario is a conglomerate of divergent development patterns, wide-ranging norms and conflicting priorities of multiple stakeholders inherited from indigenous, colonial, post independent and liberalized socio-political order. These layers interacted with the diversity of physical and cultural landscape inducing complex heterogeneity in cities. This is reflected in differential access to infrastructure and opportunities in various parts of megacities, contrasting urban form and activity patterns of cities in deserts and hills, divergent management priorities in historic and industrial towns and variation in resource disposition in economically vibrant and stagnant towns. The smart city initiative in its urge to replicate the developed economy model overlooks the range of diversity in Indian cities.

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

The smart city initiative and the digital technologies for management and monitoring of the urban systems are being promoted by the world's largest hardware and software companies to ensure 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 explore the potential to connect information technology with marginalized sections of the society to enhance their access to employment, market, education, health and building resilience against natural disasters. Some of the established examples available across the globe are Digital Stewards Project in Redhook, Brooklyn (job listings and support for recovery from hurricane Sandy), Community Telecentre in Africa (job opportunities for women) and Random Hacks of Kindness (RHoK) producing open source software for disaster response. The RHoK products were used effectively in Haiti earthquake in 2010. Bangaluru based Babajob, a digital social network provides information about jobs to millions working in informal sector. About a decade ago, a collaboration of NGOs and women's networks prepared the slum atlas of Pune by mapping them in GIS platform to bring slum communities into the ambit of planning so that they could have a fair share of resources. Map Kibera project used participatory GPS and Open Street Map to empower communities of Kenya's largest slum to monitor and record their experiences on state

initiatives. Townsend (2013) explains the potential of mobile phones in bringing economic and social opportunities to the slum communities in developing world. In Kosovo Science for Change Project people measure air quality, temperature, humidity, noise levels in their communities with the help of Arduino based smart citizen sensors and share the data through internet. The communities use the information for advocacy to improve their situations by environmental principles and enforcement of standards.

The growing evidences suggest the possibilities of grass-root action and 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 smart city development. The notion of prosperity and competitiveness in cities should look beyond the confines of economic growth and strive for equitable distribution of benefits and opportunities securing economic wellbeing, social cohesion and environmental sustainability.

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