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Imagining smart cities in
India

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Growth in the majority of India's cities has been inherently unsustainable. Most lack core infrastructure: for instance, 18 percent of households in Delhi have no drinking water supply, 30 percent discharge wastewater into open drains or have no drainage at all, and 17 percent do not have toilets. Rapid urbanisation has led to haphazard management of resources such as land and water, with utter disregard for the environment. Uncontrolled expansion in the form of unauthorised constructions, without land-pooling policies to ensure coordinated development,¹ has left little space for urban commons. This creates densely built-up areas with little or no green space, intensifying the urban heat island effect.

There are now 53 cities in India with a population of over a million, and 468 with a population of over 100,000. Though only 31 percent of India's population is classified as urban, 70 percent of these urban-dwellers live in "hundred thousand-plus" cities, and 43 percent in "million-plus" cities.

In June 2015, Prime Minister Narendra Modi launched two programmes to direct urban growth: the Atal Mission for Rejuvenation and Urban Transformation (AMRUT), which covers 500 cities; and the Smart City Mission, which covers 100. This essay considers whether these schemes have the potential to create sustainable cities in India, and finds that they fall short on citizen participation and implementation mechanisms.

¹ Under land-pooling schemes, multiple landowners pool their land and allow the government or another body to install infrastructure and services on it. This allows planned rather than haphazard development of new urban areas.

“Smart” planning

The objective of the Smart City Mission is to harness technology and data to improve infrastructure and services in cities. It aims to create replicable models that can inspire other cities to become “smart”. The policies it promotes range from innovative ideas such as smart meters for energy and water, intelligent traffic-management systems, e-governance and citizen services, to more established solutions such as waste-to-compost or waste-to-energy, recycling, and reduction of waste.

Often, India’s cities fail to integrate environment and social sustainability into their planning and resource management. This is due in part to a lack of demand for environmentally friendly products and services, or a poor assessment of this demand on the part of the authorities. The Smart City Mission aims to bridge the gap by providing innovative (but as yet unspecified) means for increased interaction among citizens and local governments, among other groups. It calls for new greenfield projects around cities, for inclusive development, and for “area-based development”, which involves targeting specific areas of the city for transformation based on their specific needs, through redevelopment schemes or through retrofitting amenities that were not installed when the areas were first constructed.

Whereas the Smart City Mission seeks innovative means to enhance network efficiencies, the AMRUT mission is responsible for increasing penetration of city-wide services. Its focus is on water supply, sewage networks, storm-water drainage, transport, and green spaces. Previously, the Ministry of Urban Development (MoUD) had to give project-by-project approval to disburse funds, but now the MoUD approves State Annual Action Plans. This is intended to increase cooperation between the central government and the states. It remains to be seen whether bottom-up initiatives to enhance network efficiency will create conditions for better cooperation across departments and levels of government, or whether such cooperation is a prerequisite for enhancing these network efficiencies.

Poverty and participation

Slum areas are a focal point for redevelopment plans, and greenfield projects feature inclusionary zoning, with a requirement for 15 percent of housing to be affordable. But urban poverty is complex. Many of the urban poor have migrated from rural areas and lack skills, often finding their way into menial

jobs. Smart cities will be judged for their ability to train and impart skills to the urban poor, as well as to provide affordable housing.

Municipal governments are required to prepare planning proposals in line with citizens' aspirations, the local context, and resource availability. However, it is not clear how area-based planning and development will overcome tensions between conflicting objectives – for example, aspirations for improved standards of living versus limited financial resources.

The Smart Cities Mission overplays the role of technology and underplays that of participatory governance. One of its goals is to increase the use of mobile or internet-based ways of connecting citizens to local government offices, eliminating the need to physically visit these offices. For instance, it proposes cyber-tours of worksites, which might increase transparency to some degree. But it does not specify how citizens can actively participate in decision-making as a continuous process. Citizen participation is as much about integrating citizens into decision-making processes as it is about including transparency in urban planning and management, and these systemic changes cannot be achieved through technology alone.

The limits of localised development

Modi's urban development schemes fail to set out how the deep structural changes they call for would be introduced at city-level: who would be responsible, and through which institutions they would be implemented. Both AMRUT and the Smart City Mission focus on making cities more liveable by preserving open and green spaces, creating walkable communities, and encouraging non-motorised transport, as well as reducing average commuting times and recycling wastewater. These goals will require learning through experimentation and long-term research (with supporting data) – without this, localised, area-based development can only take cities so far. At best, this approach would expand the list of “islands of excellence” that sprout within India's otherwise unplanned urban spaces, rather than lifting cities as a whole.

Financial incentives

State and municipal governments are equal partners in the Smart City Mission. This comes with financial responsibilities, and the creation of distinct legal entities, known as “special purpose vehicles” (SPV). The states and municipalities have an equal stake in these entities, which have to be financially sustainable. A central government grant of at least INR 1 billion (roughly €14 million) per city

per year for the initial five years forms part of the municipalities' share of equity capital, with an equal share coming from states. These grants are supposed to be leveraged by the SPV to attract funding through the state/municipality's own sources,² public-private partnerships, other central grants, and borrowing from financial institutions, including domestic and external sources.

The AMRUT mission aims to improve governance through incentives. Its budget is INR 500 million (roughly €7 million) for 500 cities over five years, so the budget per city per year is one-fifth that of the Smart City Mission. However, under the previous system, the release of project funds for subsequent phases was linked to performance; if targets were not met, disbursements would stop, and many projects were delayed. AMRUT has flipped this mechanism from penalties to incentives. If projects are completed on time and on specification, an additional 10 percent of the budget can be awarded to the city.

System-wide thinking: A new model

Can India create cities that smartly manage their consumption without overburdening the environment? Cities are complex systems, which include ecosystems, physical infrastructure, and diverse social groups. Traditional approaches to planning and management of complex systems are based on reductionist methods of breaking down the system into smaller components using linear formulations of cause and effect. A system is considered as merely the sum of all individual elements.

This might be an appropriate way to model a simple system with low interconnectivity. But the patterns that emerge in a growing city over time are not just dependent on a central or top-down mechanism but are the result of interactions among different elements and sub-systems, which are highly interconnected, interdependent, and non-linear. For example, urban form,³ which helps determine energy consumption in a city, is also a result of energy consumption through a trade-off between housing and transport costs. Cities are complex adaptive systems. Elements of urban ecosystems are capable of adapting their behaviour and can self-organise through interactions among themselves, eliminating the need for a central or top-down mechanism.⁴

² These include the collection of user fees, beneficiary charges, impact fees, and land monetisation.

³ The physical characteristics of an urban area, including the configuration, size, and shape of buildings, and their relationship to outdoor space.

⁴ At the Council on Energy, Environment and Water (CEEW), we are studying how different agents of change may interact to induce shifting patterns of behaviour and participation, and transform cities. The CEEW (<http://ceew.in/>), based in New Delhi, is an independent, not-for-profit policy-research institution, and ranked as one of South Asia's leading think-tanks.

These new urban growth schemes are a step towards breaking this traditional paradigm through a more bottom-up approach (via area-based development and citizen participation). But more is needed in this direction, along with a better understanding of how local interactions could give rise to patterns that nudge a city to be more liveable and vibrant. We need to find the best mix of solutions for India's cities, where the competing goals of social and health benefits, economic growth, restoration of ecosystems, and minimisation of environmental degradation are met through a considered planning process.