

Pivoting From Smart to Sustainable: What's Next for India's Urbanisation Beyond the Smart Cities Mission (SCM)?

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Abstract

India's rapid urbanisation has intensified socio-environmental challenges that increasingly undermine urban liveability and economic productivity. While initiatives such as the Smart Cities Mission (SCM) sought to enhance quality of life through technological integration, mounting evidence suggests that pollution, urban heat, water scarcity, biodiversity loss, and infrastructure deficits continue to shape everyday urban experiences. This perspective article examines the limitations of the SCM's dominant interpretation of "smartness," arguing that the initiative often equates technological adoption and infrastructure expansion with urban progress. As a result, economic growth priorities frequently overshadowed social inclusion, environmental sustainability, and citizen well-being. Drawing on emerging scholarship, the article highlights how top-down governance, privatisation, and digital-first solutions have produced uneven outcomes, marginalising vulnerable communities and failing to address structural urban inequalities. In response, the article advocates a conceptual shift from technology-centric smart city models towards sustainability-oriented, participatory approaches grounded in the "slow ideology" of context-sensitive development. Comparative insights from international practices, particularly Singapore's Liveability Framework, demonstrate how integrated planning, community engagement, and nature-based urban design can align economic competitiveness with environmental resilience and social equity. Ultimately, the article argues that India's next phase of urbanisation requires redefining smartness to prioritise liveability, inclusivity, and long-term sustainability alongside technological innovation.

Keywords: Smart Cities; Smart Cities Mission; Sustainability; Sustainable Urbanism; India

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Introduction

Pollution is a challenge in India, and if you look at the impact of pollution on the Indian economy, it is far more consequential than any impact of any tariffs that have been put on India so far.

At the 2026 World Economic Forum in Davos, former deputy managing director of the International Monetary Fund (IMF) Gita Gopinath made headlines for her comments on India's future economic challenges (Telegraph India, 2026). According to Gopinath, pollution was more than an environmental threat, a problem "deeply intertwined with economic growth, productivity, and the health of citizens" (Telegraph India, 2026). India's worsening urban pollution crisis is well documented; according to the 2024 World Air Quality Report, three of India's biggest cities—Kolkata, Delhi, and Mumbai—ranked among the top five cities with the worst air quality in the world (World Air Quality Report, 2024). According to estimates by the global consulting firm Dalberg, air pollution imposed an economic burden of approximately US \$95 billion on India in 2021, driven by declines in labour productivity, reduced consumer activity, and heightened mortality risk (Rao, 2021). The World Bank estimates that by 2050, India's urban population will reach nearly 951 million, making cities key drivers of economic growth in the country (World Bank, 2025). However, despite the rapid rate of India's urbanisation, Indian city dwellers' quality of life has not experienced the same rapid increase. Urbanisation has led to a plethora of environmental and social challenges, including affordable housing, access to clean water and sanitation, air pollution and waste management, urban heat islands, flooding and increased risks arising from anthropogenic climate change. Indian cities are warming nearly twice as fast as the rest of the country, with an average increase of 0.53 degrees Celsius per decade; this is largely attributed to the urban heat island effect and the rising concentration of greenhouse gas emissions within urban spaces (Sethi & Vinoj, 2024). In 2025, Indian cities such as New Delhi

experienced temperatures exceeding 45 degrees Celsius, with a heat index of 51.9 degrees (Sobhan, 2025). Prolonged heat exposure increases the risk of heat-related illnesses and mortality amongst outdoor workers, informal settlement dwellers, the elderly and young children, as well as economic losses from power outages and reduced labour productivity (Yadav, 2025). Urban water shortages are becoming increasingly prevalent in cities like Hyderabad, with some estimates suggesting that by 2030, 40 per cent of India's population may not have access to drinking water, primarily those living in rapidly urbanising smaller cities (Sharma et al., 2025). Regulatory oversight and poor infrastructure management in cities like Indore, where sewage-contaminated drinking water hospitalised over 270 citizens in January 2026, have led to concerns over the costs of rapid urbanisation in India, particularly relating to long-term management and responsiveness to urban citizens' own needs (MacRae, 2026). Recent reports have also highlighted the cost of urbanisation on biodiversity loss; in the Western Himalayas, for instance, urban expansion has led to a decline in 11 per cent of forest coverage and 8 per cent of water bodies, which could have significant implications for the region's groundwater table and biodiversity (Pandey, 2024).

These numbers paint a different picture of the sprawling Indian urban metropolis compared to those outlined in India's Smart Cities Mission (SCM), a decade-long flagship initiative that aimed to "improve the quality of life in 100 cities by providing efficient services, robust infrastructure, and sustainable solutions" (Press Information Bureau, 2025). The SCM was established in 2015 with two main objectives: fostering economic growth and improving the quality of life for urban residents (Das, 2025). At its conclusion in 2025, the national government had invested 1.64 trillion Indian rupees (US\$19.5 billion) into the initiative, deployed to areas including healthcare, infrastructure development, education, water sanitation and treatment, and notably the digitisation and

integration of data and Artificial Intelligence (AI) into urban governance through the establishment of Integrated Command and Control Centers (ICCCs) (Press Information Bureau, 2025). Despite the numerous achievements of the SCM, Indian cities still face significant socio-ecological challenges that threaten to undermine the quality of life for their newly urban inhabitants.

This article reflects on the limitations and challenges of the India Smart Cities Mission, particularly its interpretation of “smartness”. It argues that many of the projects initiated under the SCM conflated technological adoption and an economic-growth framework with “smartness”, leading to a decline in social and environmental urban planning and governance. Consequently, this has resulted in the SCM fostering economic growth at the cost of improving urban residents’ quality of life, as evidenced by emerging socio-environmental urban crises exacerbated by uneven development. Increasingly, scholars are calling for alternative approaches to “smartness” that capitalise on the benefits of data and technology to achieve more sustainable, socially inclusive outcomes via participatory, localised urban interventions that prioritise citizen wellbeing beyond economic growth (McFarlane & Söderström, 2017; Boni et al., 2019; Park & Yoo, 2023; Geoghegan & Cugurullo, 2025). Drawing on this call for a shift towards “slow ideology” (see Das, 2025)—which emphasises sustainability, context-specific, participatory urban development — the article proposes alternative approaches to Indian urban development, such as Singapore’s Liveability Framework (p.49).

Looking Ahead: From Smart to Sustainable Cities

The SCM was characterised by its emphasis on “smartness”, the integration of smart technologies and digital infrastructure into urban design and governance, operated by a smart urban citizenry (Datta, 2018; Das, 2019). Recent literature on SCM outcomes indicates that most projects focused on physical infrastructure and technology deployment, with

“less than one-tenth of overall investment” allocated to social, environmental, and housing development (Praharaj, 2025, p. 129; see also Kesar & Ache, 2024). These findings echo wider criticisms of the smart city concept worldwide, including a narrow focus on economic growth through privatisation and digitalisation of the urban space, marginalising local communities and prioritising broader public-private investment and corporatisation (Kitchin & Dodge, 2017; Marvin et al., 2015). In the Indian context, scholars have highlighted the top-down nature of the 100 SCM projects, including an increasing trend towards privatisation of previously state-provided resources, the creation of cities as for-profit sites of investment, and the centralisation of urban governance due to increased digitalisation (Datta, 2018; Das, 2019; Praharaj, 2025). Moreover, despite the Indian government’s claims to encourage local citizen participation in SCM projects, the literature suggests that in practice, initiatives focused on providing technological fixes to issues such as informality and gendered violence often fail to engage with the needs of those communities (Prasad et al., 2023; Datta, 2020).

A recurring issue in the literature is that most SCM projects have misguidedly equated “smartness” with the adoption of digital technologies and physical infrastructure, leading to gaps between the lived experience of urban residents and the city’s development, which ignores the socio-environmental costs of such urbanisation. In Pune, for instance, rapid urbanisation in the past decade has led to an 89.24 per cent increase in built-up areas and a decline of 991.4 sq.km in vegetation cover, exacerbating the urban heat island (UHI) effect in the city (Raj et al., 2025). Urbanisation has also resulted in urban water shortages in cities such as Bengaluru and Hyderabad, where overconsumption combined with non-absorbent built environments has altered hydrological cycles, increasing concerns for low-income and informal communities who do not have access to piped municipal supplies (V & Ramachandran, 2023; Das, 2015). Moreover, studies on Indian Smart Cities have raised concerns about projects

skewing towards the interests and needs of elites, bypassing the needs and social capital of marginalised citizens (Basu, 2019; Datta, 2018; Ghosh & Arora, 2022; Mullick & Patnaik, 2025). For example, efforts to increase social inclusion via public participation have met with mixed results. In their analysis of Pune's SCM initiative in public street design planning, Hambarde & Shinde (2025) note how tensions among multinational urban planning consultants, local government, and the public complicated the initiative's implementation, highlighting the complexities of Smart City interventions in urban planning. Conversely, urban planning projects that emphasise "social smartness", such as Bhubaneswar's Socially Smart Bhubaneswar (SSB) Program, have been more successful at engaging with and empowering marginalised citizens, particularly youth and women living in informal settlements. "Socially smart" programs emphasise people-centric, bottom-up initiatives that prioritise inclusive participation and social responsiveness over technological interventions (UNFPA, 2019). Bhubaneswar's SSB Program focused on empowering youth leaders within the city's urban slums by providing them with leadership training to identify and collaborate with local government institutions in resolving community concerns within their slum dwellings, leading to youth becoming more actively involved in local governance and problem-solving within their community (Mullick & Patnaik, 2025). Efforts have also been made by city planners to infuse digitisation with democratic initiatives to increase citizen participation and reduce digital divides. In cities like Barcelona, for instance, projects like the Smart City Barcelona have focused on democratising digitalisation through platforms like Decidim, which facilitates direct consultations with citizens (Tomàs, 2023). These initiatives, which prioritise social responsiveness over digital adoption alone, could be adapted to the Indian context to further encourage meaningful participation, particularly amongst marginalised groups.

While there have been some attempts at smart sustainable development under the SCM, these are largely technical in nature. Examples include

the use of surveillance and tracking data systems like GIS and Supervisory Control and Data Acquisition (SCADA) systems for mapping resource distribution, the expansion of public green spaces within cities, and the adoption of sustainable mobility platforms enabled by digital technologies, such as Chandigarh's public bike sharing system, enabled by the Smart Bike app (UN-Habitat, 2023). However, many of these urban renewal projects aimed at environmental or social regeneration have been criticised for their exclusionary approach, with Praharaj (2025) arguing that many of these initiatives operate as "quick fixes" that risk deepening or worsening existing urban inequalities (p.129). Reports on Chandigarh's public bike-sharing system, which was positioned as a sustainable method to reduce vehicular traffic and pollution, indicate a lack of maintenance and problems accessing bicycles due to glitches and difficulties using the Smart Bike app (Narula, 2025).

Such projects showcase the disparities between the conceptualisation and implementation of smart city projects thus far. They highlight the need for a more holistic approach to city planning, where environmental and social considerations are given equal weight to economic growth potential, centred around the everyday, embodied experiences of city dwellers.

Conclusion: Building Liveable Cities

Given these challenges, how can Indian urban planning and policy focus on improving the liveability of cities whilst balancing economic development objectives? Das (2025) proposes a shift towards "slow ideology", emphasising sustainability, deliberation and context-sensitive development to counterbalance profit-driven, neoliberal urbanisation (Das, 2025, p.49). As Evans et al. (2019) note, there are numerous benefits to smart-sustainability than cities can take advantage of, including "the potential to enhance social well-being, empower communities, reveal previously hidden urban environmental processes, enable resource and skills sharing, include citizens in co-creative governance processes, generate novel solutions to mundane urban problems, and underpin new

models for more efficient use of idle assets” (p.561). While technological adoption and integration can provide numerous benefits to city-dwellers, scholars caution against an overreliance on “smart city-in-the-box solutions that envisage a seamless urban experience”, which can lead to social exclusion and de-contextualisation of urban spaces, making it harder for everyday citizens to navigate comfortably (Aurigi & Odendaal, 2021, p.66). Importantly, consistent engagement with local urban communities, including those found within the margins, is necessary to achieve equitable urban development (Datta, 2020; Prasad et al., 2023).

More recent approaches to urban planning, like Singapore’s Liveability Framework, [A1.1] emphasise the synergistic and interdependent relationship among a high quality of life, a sustainable environment, and a competitive economy, especially amid rising urban complexity from environmental and climate change challenges and geopolitical turbulence (Centre for Liveable Cities Singapore, 2025). Singapore’s Green Plan 2030, for example, foregrounds a ‘City in Nature’ approach where “residents will be able to enjoy a liveable, sustainable and climate resilient Singapore” by integrating nature and environmental concerns into Singapore’s urban design (Singapore Green Plan, 2025). These interventions range from large-scale technological investments to “socially smart” programmes aimed at increasing environmental awareness amongst urban citizens. Projects such as the Active, Beautiful, Clean Waters (ABC Waters) program emphasise a holistic approach to sustainable development, integrating environmental and social benefits into urban design. Launched in April 2006, the ABC programme integrates Singapore’s waterbodies into residential community spaces; for example, Ang Mo Kio-Bishan Park functions as a floodplain for the Kallang River, and a public park for the local community, mitigating heat exposure from UHI through increased green cover and increasing inhabitants’ access to biodiversity within the city (Singapore Green Plan, 2025). Singapore’s model also focuses on integrating sustainability

outcomes into public-private sector developments; its vertical greening requirements and incentive program, Landscaping for Urban Spaces and High-Rises (LUSH), has resulted in more than 100,000 square metres of greenery within Central Area developments since its inception in 2009 (Urban Redevelopment Authority, 2025). Luxury developments such as the Parkroyal on Pickering, which features 161,459 square feet of sky gardens, waterfalls, and planter walls, and mixed-use public facility buildings like the Kampung Admiralty indicate Singapore’s success in incorporating green urban design. While frameworks like Singapore’s are not meant to be viewed as urban models to be replicated in Indian cities, the processes, ideas and techniques they employ can be scaled to and adapted to the local context. “Slow ideology” driven urban planning becomes increasingly important as the impacts of unsustainable urban development planning are exacerbated by external pressures such as climate change, highlighting the need for more holistic approaches.

Urban planning models like Singapore’s provide a blueprint for sustainability-focused urban development, advocating integrated, long-term master planning and development; responsive, dynamic, and adaptable governing institutions; and a collaborative ecosystem among the private and public sectors and citizens themselves (Centre for Liveable Cities Singapore, 2025). Adopting bottom-up approaches to smart city development can also enable citizen participation and provide valuable feedback on long-term urban management and maintenance of infrastructure and services (Prasad et al., 2023). As India enters its second phase of urbanisation, observing and extrapolating contextually sensitive elements and frameworks in urban planning and governance can pave the way for creating more sustainable, ultimately liveable urban spaces for its inhabitants.

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Ethical Approval

This manuscript was prepared in accordance with the ethical standards laid down in the Declaration of Helsinki or similar ethical statements.

Conflict of Interest

The authors declare no conflict of interest, whether financial or non-financial, related to this manuscript. We confirm that no portion of this manuscript was prepared using AI-generated text. The authors certify that the submission is original work based on secondary data and research.

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