

PUBLIC SPACES UNDER THE SMART CITIES PARADIGM IN INDIA

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ABSTRACT:

Rapid urbanization in the emerging economies leads to immense pressure on existing amenities and urban services, and hence the congregation of smart technologies, with efficient data-driven solutions are a desirable requisite for a better quality of life, thus forming the basis of Smart cities. The concept of a smart city is multi-dimensional and is a mix of multiple factors and indicators that constitute the core concept of sustainability. One of the key indicators of a smart city is active public spaces and their consolidated wholesome implications on well-being. Hence, addressing the consequences of smart city initiatives, with respect to the access to the public realm to engage, interact, share, and recreate, through extensive literature review and case-based study seemed of prime importance. This paper attempts to unpack the smart city paradigm in India, in conjunction with aspects of social sustainability, technological interventions, and the on-ground reality while learning about their implications on the quality of life, specifically, in the case of the marginalized groups. The literature review and case-based study of three Indian smart cities, namely New Delhi, Indore, and Bhopal have opened possibilities for the identification of factors responsible for the smartness of public spaces and a realization of the extent to which theoretical concepts translate from paper to ground realities, and their immediate implications on the 'informal' aspects and groups of our society.

1. INTRODUCTION

The overarching idea of Smart cities as an all-encompassing umbrella for effective management of resources, assets, and better performance of urban services by virtue of the Internet of Things (IoT) and as a solution to the rising demands in urban spaces has garnered considerable significance in the context of urban development and policymaking. The major concentration of 'smart' initiatives are focused on adequately responding to the challenges of infrastructure and resources' requirements: their effective functioning and plausible outcomes, serving an ever-increasing population by utilizing information and communications technology advancements, and digital databases while ensuring social, economic, and environmental safeguards (Praharaj, 2019).

Comprehensive development of smart cities constitutes the development and upliftment of physical, institutional, social, economic, and environmental infrastructure, with an objective of smart initiatives to ensure sustainable and inclusive development, providing upgraded core infrastructure to optimize the functionality of the city in all sectors, by protecting the environment, stimulating economic growth, encouraging communication, and improving the quality of life of people. In this particular context, an integral dimension of every urban intervention has been identified as social sustainability, especially with regard to urban public spaces. This is to ensure objective recognition of user groups: their needs and concerns by addressing social and economic inequities. As indicated in UN's Sustainable Development Goals, factors such as social inclusion, eradication of poverty, addressing inequalities, and encouraging participation in decision-making is at the core of influencing greater consequences concerning society.

The presence of quality urban public spaces: a core key indicator of smart habitats, ascertains a good quality of life (both physical and psychological). They form a significant

component of urban fabric and structure, with the capability of influencing the development of an area sustainably. Urban public spaces play a very important role in our daily lives and most developed countries have been able to realize and actively capitalize on their importance, while valuing and appreciating them, whereas the developing and the less developed nations have not been able to do so, owing to other pertinent matters that need to be discussed and resolved (Woolley et al. 2003).

The paper aims to look into Smart city initiatives and features, with specific reference to urban public spaces in India, and the extent to which the initiatives have been able to address the social and economic division. The emphasis is laid on the importance and changing the narrative of public spaces for the marginalized groups and the emerging consequences of 'informality' in a city, which is often conveniently overlooked, in the context of the Smart City Mission in India.

2. LITERATURE REVIEW

The extensive study of literature accounts for an in-depth understanding of the Smart City Mission, Smart City concept in India, Smart Urban Public Spaces and their specific features, themes of Social Sustainability with regards to catering to the 'informalities' in Indian cities, the importance of urban public spaces for the marginalized groups, and the intertwined relationship between the tangible and intangible quality attributes of public spaces for the above-mentioned groups, in light of smart city initiatives.

2.1 Smart City Mission in India

India launched the Smart City Mission (SCM) on 25th June 2015, to transform Urban India, envisioning the improvement of living conditions in 100 existing cities across the country. The

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100 cities were selected in phases, with the last city being selected in June 2018. Broad guidelines based on four important pillars of development: institutional, physical, social, and economic have been formulated to assist in the process of urban transformation, which constitutes smart city features such as mixed land use, walkable localities, inclusive housing, open spaces, multiple transport options, citizen-friendly governance, and strong civic identity. The evaluation of a city's development is assessed in terms of nine dimensions: human capital, social cohesion, economy, environment, governance, urban planning, international outreach, technology, mobility, and transportation (IESE). In India, the Smart Cities Mission (SCM) was launched as a national plan with a place-based approach, formulated by a combination of two strategies: a. Area Based Development (ABD), and b. Pan-City Development.

It is imperative to mention that ever since the mission was launched, it has received a fair share of criticism for its disregard for the on-ground reality of Indian cities, local contextual references, for setting up very ambitious goals for a relatively shorter span of time and for being favourable to an elite group of users (Prasad, 2022).

2.2 Smart City Concept in India

With the ever-increasing population and rapid urbanization, there arises a need to manage the environmental, economic, and social sustainability of resources. Urban living is directly associated with better quality of life, but rapid developments and changing character of urbanization have rendered it harder for governance authorities to deliver their promise of better health, better education, better urban services, reduced wastage of resources, and overall better quality of life. Moreover, scholars have begun to consider the term "Smart Sustainable Cities" (Ibrahim et al., 2018), to incorporate the varying aspects of sustainability within the "smart cities" concept. Literature studies tend to consider a 'sustainable city' as a place with a strong environmental focus and balance within the city amongst infrastructure, Information and Communication Technologies (ICT), smart technologies, and urban services. The capability to systematically process the various aspects of a city, with the aid of ICT and digital networking of capital, enabling optimal functioning of urban services, with regards to the local context, economic growth, environmental concerns, well-being, and quality of life encapsulates the notion of 'Smart Sustainable city' (Martin et al. 2018; Yigitcanlar, 2015).

Smart City, by definition, refers to a city that seamlessly incorporates information and communication technologies (ICTs), and digitally enhanced initiatives to address issues of urbanization, thus resulting in improved quality and performance of urban services, such as energy, transportation, and public services/utilities, effective consumption of resources, reduced waste and overall costs (Praharaaj, 2021). The notion of 'smartness' is based on the networking of human capital, social capital and information, and communications technologies (Yigitcanlar, 2015). Ensuring liveable conditions in the context of rapid global urbanization demands a deeper understanding of the smart city concept.

As discussed earlier, in India, the Smart Cities Mission primarily adopts a place-based approach to achieving urban transformation (Praharaaj, 2021), which includes Area Based Development (ABD) strategies directed at city-scale and Pan-city development. The components of ABD strategy include (a) 'Retrofitting' or city improvement: improving the existing area of more than 500 acres, with a vision to 'replicate' these projects and implement them across other regions in the city, within a shorter frame of time, (b) 'Redevelopment' or city

renewal: replacing the existing area of more than 50 acres to generate a new layout and. (c) 'Greenfield Development' or city extension: applying smart solutions to a previously vacant area of more than 250 acres. Literature and case-based studies show that the challenge of ABD projects lies in the fact that most of these projects are vastly diverse in nature and the intention to 'replicate' seems impractical to execute, owing to local contexts of socio-economic considerations, cultural backgrounds, and on-ground reality. Additionally, in Indian cities, the ABD projects for SCM have predominantly been identified and executed in the already planned and well-established neighbourhoods, thus mostly catering to the elite classes. Moreover, the projects are located and developed in a fragmented manner, resulting in piecemeal development with no urban framework for connecting the ABD projects to the broader city network, resulting in no attempts to consolidate the disconnected smart projects into one whole functioning structure. (Prasad et al. 2022). The 'unstructured' and disconnected locations of ABD projects, along with the absence of appropriate urban planning and design framework, development/design controls, and guidelines for expansion indicate the 'bubble urbanism' scale of smart city development in India. (Murray, 2013), resulting in aggravated socio-spatial fragmentation.

The Mega Projects developed, as part of Smart City initiatives also tend to physically divide the region into 'IT bubbles' of elite infrastructure, with vast areas of impoverishment, 'informality', and disorderliness filling in the gaps. The process of acquiring the development lands for the projects also results in the displacement of low-income people and housing, slum evictions, privatization of municipal services, and environmental destruction (Datta, 2015; Watson, 2014), thus further marginalizing the communities that do not conform to the requirements of the projected development idea of the Mega Projects.

The Placemaking projects, as well are implemented in a fragmented manner, often at the cost of hidden social and economic costs, with minimum efforts to integrate the small-scaled placemaking projects with the broader city network. There have also been attempts to evict or displace informal economy from the selected regions or stretches of land to execute 'smart' features of Placemaking, that render no space for disorderliness or 'informality' to integrate within the smart city and thrive.

Additionally, riding on the concept of smart features, especially in the case of common open spaces and public utilities, implementation of technology, such as Wi-Fi sensors, solar-powered charging stations, dynamic data collection methods, shared e-vehicle opportunities and most other technology-led urban interventions have been identified to have found its implementation in well-off societies and neighbourhoods, that often comes with requisites of restricted entry or hidden cost of maintenance fees or prior knowledge and access to technology, that are not as inclusive and hence widens the socio-economic gap, in terms of accessibility and usage by the user groups. (Prasad et al. 2022). Case-based studies and literature studies have revealed fragmented and sporadic smart urban interventions that have disregarded the marginalized groups, with negligible solutions for inclusion of informal economy into the mainstream beneficiary ecosystem of smart cities.

Another component of Smart City Mission is the 'Lighthouse' projects that undertake social factors, such as health, education, skill development, participation, inclusivity, employment opportunities, safety, and security, especially in slums, and hence are more inclusive, positive interventions in light of smart city initiatives and sustainability goals. The challenge, however,

lies in the massive difference in the number of people benefitting from small-scale lighthouse projects, as opposed to the elite IT-related jobs in well-suited smart neighbourhoods targeting the educated smart citizens of the country.

2.3 Smart Urban Public Spaces

An important component contributing to good quality of life and ensuring a habitable living environment is the presence of quality urban public spaces. Urban public spaces are termed as breathing pockets amidst high-density living areas, especially in Indian cities, and are usually termed the heart and soul of a city. Traditionally, these spaces have rendered great services in advocating social cohesion, generating a sense of identity and community, enhancing cultural annotations within societies, driving local economic growth, adding to physical and mental health benefits, providing environmental benefits, and have largely contributed to the sustainability goal (Amin, 2008).

Smart Urban public spaces, in theory, take into consideration smart city initiatives to assist in better functioning and maintenance of these areas, with the use of ICTs and dynamic data (Filipponi, 2010) to understand user groups and assess user needs, ensure effective physical infrastructure, enhanced social cohesion, and also attempts to ensure equity of access to services, a better quality of life and greater economic and environmental benefits, as well. Owing to the involvement of technology, urban public spaces have undergone considerable change in meaning, function, and presence (Capdevila, 2015). The development and implementation of intelligent networking services have given rise to new opportunities for better understanding of user groups by continuous evaluation of dynamic data (pedestrians, activity mapping, mobility behaviour, environmental considerations) collected through digital networking, and hence using this information as a basis for developing further smarter networks of public spaces and increasing the aesthetic and functionality of these spaces. Smart public spaces are meant to exude resilience since secure, real-time information is actively utilised to improve the quality of services, user group experience, management of resources, and crisis management.

Improving the quality of public spaces, as a part of the Smart City initiative is the implementation of the principle: Placemaking. Certain aspects of the initiative include transforming automobile-heavy streets into more pedestrianized streets, with the incorporation of smart furniture with provision for charging facilities, dedicated bike lanes, and walkways, sensor-activated street lights, urban design intervention of opening up the streets to more active squares, and plazas, defined by multiple uses. Incorporation of Graffiti, digital advertisement boards at junctions, data-enabled mini centres for social activities, informal public markets to provide a structure to local produce and support the local economy, and smart public utilities such as e-toilets with data-enabled services. Incorporation of technical knowledge, design innovation, and stakeholders' needs, and necessities can generate successful examples of placemaking that initiate 'smartness' in public spaces.

As discussed in the earlier section of the Literature review, a lot of these smart initiatives are concentrated around already well-established neighbourhoods and often cater to educated user groups, which poses a serious question of inclusivity, with reference to the local context (Praharaaj, 2018). In India, it is important to understand the social and economic features of marginalized groups, that often form the 'informalities' in society, that a lot of the smart initiatives are not designed for, except barring a few. Lower-income group areas, in general, are

characterized by constrained resources, limited facilities, and high-density housing situations, which hardly meet basic human needs and are often deprived of amenities that directly affect their quality of life (both physical and mental), education, character development, and cognitive abilities. According to the Ministry of Housing and Urban Affairs (MOHUA), individuals with an annual household income of up to 3 lakh rupees are categorized under Economically Weaker Sections and those whose annual household income ranges between 3 and 6 lakhs rupees are categorized as Lower Income Groups (RBI, PM Awas Yojana). The prevalent area of their inhabitation also lacks considerable planning and is mostly organically developed, with dense built-up units, narrow streets, poor drainage systems, and often, a negligible amount of usable open spaces around them. The incidental spaces at the front or rear of their dwelling units are often utilized to house ancillary, spillover activities, or activities to generate additional income. Any form of technological intervention in such places, to address the quality of their life requires an in-depth understanding of social factors of sustainability that question the socio-economic and digital divide.

2.4 The Social Sustainability of Smart Cities

Sustainability, as a concept is ever-evolving and even though, it is more often perceived and equated based on environmentalism or green sustainability, any change in the physical world results in unprecedented consequences in the social dynamics of the ecosystem (Sugandha et al. 2022). Hence, social sustainability renders itself an important component of smart cities, as a significant factor determining the quality of life.

Urban social sustainability, as an integral part of the smart cities framework, attempts to serve as a long-term viable background for human interaction, communication, and cultural development, resulting in a viable urban social unit. Social Sustainability rests heavily on the basic values of equity and democracy (Sachs, 1999) In the case of smart cities, while the primary focus lies on technology and digital networking, it is equally critical to highlight the interconnections between people and place. As per literature studies, four critical targets of social sustainability include human well-being requiring protection of basic needs, equity guaranteeing sharing of society's benefits, democratic government ensuring citizen-friendly governance, and democratic society empowering people to build transparent government authorities.

By definition, social sustainability emphasizes both process and outcome by encompassing social capital, social equity and inclusion, social infrastructure, and effective governance, along with collaborative planning, paving a way forward for future generations (Partridge, 2005; WACOSS, 2022).

An integrated approach is desirable while amalgamating smart city initiatives, driven by ICT and infrastructural services but with a renewed understanding of social relationships between stakeholders: government, city managers, business, academia, the research community, and user groups. There is evidence and acceptance of participatory planning and involvement of citizens, with a major focus on governance as a key component of smart city frameworks (Albino et al. 2015). The problem lies in ineffective governance that fails to deliver the smart city vision, in conjunction with multiple stakeholders' participation from the design stage to the post-implementation stage (Washburn et al. 2010)

A more holistic approach is required to socially optimize the development and implementation of smart city initiatives that establish a healthy relationship with stakeholders, integration

with policy, smart initiatives, and implementation, along with consideration of urbanization challenges.

2.5 Need for the Study

Despite multiple discussions on the concept and objectives of Smart cities, it still lacks a universal definition in many cases, especially in the Indian subcontinent, where smart city initiatives lack contextual references and often overlook the disorderliness of informality (Prasad et al. 2022). The smart city model followed by the Global North is based on the idea of well-built, pre-existing high-quality technology and infrastructure services, whereas, for most cities in the Global South, basic infrastructure and related information remains absent, hence seamless integration of smart initiatives tends to be a considerable problem (Sugandha et al. 2022).

Addressing the significance of the concept of social sustainability within the smart city paradigm, the representation of requirements of the groups that constitute the 'informality' is very important. The well-being and quality of life of marginalized groups in our society are dependent on certain aspects, one of which is the availability of sufficient urban public spaces. As mentioned earlier, regarding the living conditions of these groups, it is best to assume the pattern and extent, along with the manner of usage of the available common open spaces varies distinctly from that of the higher income groups, owing to the variation in their lifestyle and the determinants that generate the particular necessities of usage. They are also conditioned to utilise these spaces, in a modified way, owing to the scarcity of space in their dwelling units, nature of spillover activities to be carried out, availability, or the lack of social amenities, accessibility, and linkages, adequacy or inadequacy of open spaces.

Bringing together the two distinct ideas of 'smartness' and 'public spaces' together, to ensure social and economic equality, understanding of quality attributes of public spaces, specific to the marginalized groups is of prime importance, especially in the context of Indian cities.

2.6 Quality Attributes of Urban Public Spaces catering to "Informalities"

It is significant to understand the nature of utilization of public open spaces by the marginalized groups in society, and the factors responsible for the use, non-use, and abuse of these spaces, which are often overlooked in the bigger picture of smart city initiatives.

The aspects of urban public spaces, especially the ones serving the lower-income groups that take precedence in inflicting major implications are accessibility and linkages, diversity of activities taking place within the premises, provision of infrastructure and facilities, elements of the natural environment, and maintenance (Project for Public Spaces, 2009).

Access and linkages count as a major attribute as far as urban public spaces for lower-income groups are concerned. The term encompasses distance from the dwelling units to the public open spaces; the location and positioning of these spaces, whether in the corners or along the streets, determining their accessibility and safety quotient. The attribute also refers to the condition of the access points and how easy or difficult it is to enter or exit an open space, for all age groups, hinting at the maintenance and regulation of these entrances and exits, as well, for example: dumping of garbage or presence of anti-social elements near the access points rendering the area inaccessible.

The diversity of activities ensures an inclusive and active open space, catering to a multitude of user groups engaging in both active and passive recreation activities, social interaction opportunities, spill-over chores, and additional economy generation activities' options for all age groups, communities, economic backgrounds, and gender.

Provision of infrastructure and facilities in the common open spaces such as public amenities to ensure comfortable utilization of the open spaces, play area for kids and young adults, an open ground to play around or hold social gatherings, community facilities such as an open gym, arrangements for seating or resting, opportunities for walking, running/jogging and exercise, allowing for street vending options, so on and so forth is desirable in conjunction with appropriate lighting, presence of litter bins, adequate pavement and walkways, well-maintained play equipment, benches, tables, water fountains and appropriate shade and shelter.

The intensity of usage of an urban public space, in such cases is majorly guided by the above-mentioned parameters. The more vibrant these open spaces are, the more they get utilized round the clock owing to an increased perception of a sense of safety, hence regulating the intensity and frequency of usage of the public open spaces.

The presence and appropriate placement of elements of the natural environment, such as trees, lines of shrubs, water bodies or garden space, and other components accentuating the beauty and significance of the natural elements are vital considerations in determining the quality of the open space. Extensive thoughtful landscaping helps in shaping the usage of the space, by providing shade and shelter during the summers, or ensuring the hierarchy of a single open space by physical segregation into various activity zones by means of lines of shrubs or the presence of water bodies. It is also important to take into account that wide foliated thick vegetation placed at the corners of the open space or along the peripheries renders those areas unusable and hence results in the creation of isolated spaces which might foster anti-social elements.

Abuse of public open spaces, in cases of utilization by lower-income groups, tends to be a bigger problem. It refers to the exploitation, misuse, and improper treatment of the available resource. It might include dumping of garbage, littering, water pilferage from water tanks, harbouring anti-social elements resulting in anti-social activities such as eve-teasing, drinking, and drug peddling, non-maintenance of the space and the facilities or amenities provided such as broken benches, street lamps, destroyed swing seats, etc. and vandalism of infrastructure.

Taking a cue from the issues related to or resulting as a consequence of abuse of open space, the maintenance of infrastructure and amenities is of utmost importance in order to ensure the usability of the space, assuring the users that their resources are taken care of, which helps in instilling faith in the hearts of the users. On the flip side, usually in the case of relocation or resettlement colonies, owing to weakened community ties or social disarticulation, resulting in little or no sense of ownership or community towards their living spaces and dependence on the authorities to take responsibility for the amenities, the open spaces are usually left unattended to and spoilt, with no maintenance.

An integrated approach addressing the complexities of urban public spaces for the marginalized groups is required to make it a seamless part of the whole structure and a more inclusive approach needs to be undertaken while taking into consideration the disorderliness of the informalities, for a more holistic smart city concept.

3. METHODS

3.1 Methodology

The paper is built on a case-study-based approach to research pertinent questions related to equality in public open spaces and their manifestation in the lives of marginalized groups, as an important construct of the Smart City Mission.

Case-study based approach to research is an established research methodology in the concerned field of understanding and studying various city-based initiatives. The research methodology enables intensive exploration and investigation into the topic, with emphasis on documenting on-ground realities, offering verifiable data from direct and indirect observations, which can further be encapsulated into information that concludes with relevant derivatives. The methodology though runs the risk of being considered ineffective in case of inadequate sample sizes used for conducting the study, thus affecting the analysis and rendering the study opinion-driven or observation-biased, with limited representation and objectivity. The methodology has earlier formed the basis of Deepti Prasad, Tooran Alizadeh & Robyn Dowling's Smart city place-based outcomes in India: bubble urbanism and socio-spatial fragmentation (2022); the Korea Research Institute for Human Settlements, in association with the Inter-American Development Bank (IDB)'s extensive work on ten cities documented in the International Case Studies of Smart Cities (2016) collection.

The paper concentrates on three smart cities in India, wherein the extent of progress, feasible implementation of smart city initiatives and functioning or operation of technology related to these initiatives is investigated in real-life context. The details of case studies of selected smart cities have been derived from publicly available documents, affiliated government websites and comprehensive reports on smart cities by research platforms and organizations that have carried out extensive fieldwork to present an overview of the vision for the mission initiatives in the cities and the achieved extent of implementation, as well as the points of failure, bottlenecks, the intervention of policy, governance, funding and related aspects.

The comprehensive reports formulating the basis of case studies (of the selected smart cities) are published works of non-profit research organizations, that engage and support efforts in advocating transparency and accountability of the Government in cases of such high-profile missions, especially concerning finances and policymaking. These reports that form the backbone of the paper are documented after an exhaustive investigation of the various aspects of smart city initiatives and the realities of the selected cities. The empirical work undertaken in these cases constitutes of series of site visits, along with semi-structured interviews with a pool of interviewees consisting of residents, state and local government officials, smart city officials, planners, designers, policymakers, private consultants and funding organizations.

The paper carries out an in-depth study of the available literature on smart cities, social sustainability, public spaces and marginalized groups, as well as the comprehensive reports on the selected cities documenting the progress of work and present-day situations to draw a parallel between the vision and the reality, using qualitative assessment of scenarios and parameters.

3.2 Selection of Cities for the Study

For case studies about understanding the narrative around public spaces within the Smart City concept in India, the paper

focuses on the Smart City Initiatives' implementation status and repercussions on the following three cities – New Delhi, Indore, and Bhopal. All these three cities were selected among the first 20 Smart cities under the Smart City Mission (SCM).

New Delhi has been selected for this study, owing to its status as the capital of the country, as well as for housing the country's highest levels of administration, best knowledge base, and technical institutions, making it the centre for creativity, 'smartness' and innovation.

Indore has been selected for this study owing to its status of being the cleanest city in India (Swachh Survekshan, 2021), hence a deeper study and understanding of the other facets of smart city initiatives in Indore required consideration.

Bhopal, also known as the City of Lakes, has been selected for this study because this particular smart city project is pretty distinct in the sense that immense public pressure had forced the state government to change the location of Area Based Development (ABD) component of the proposal to a different location than what was proposed initially by the Municipal corporation. The smart city proposal for the city also takes into account the evolution of the city from being a princely state to its current status as a smart city.

4. ANALYSIS OF CASE STUDIES

4.1 New Delhi

Under the Smart City Mission (SCM), around 2.2sq.km of the New Delhi Municipal Corporation (NDMC) area, designated as New Delhi City Centre (NDCC) has been selected for Area-Based development, over a period of ten years: 2015-2025.

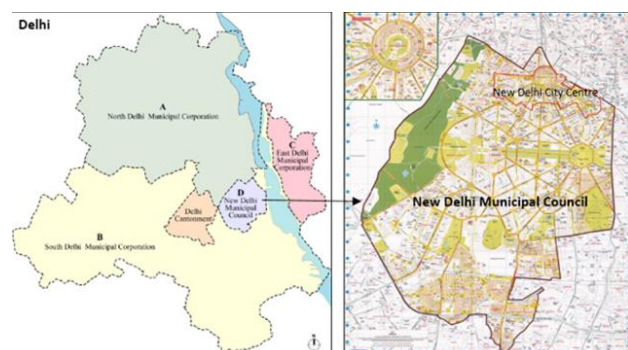


Figure 1: Map of Delhi and demarcation of NDCC (Source: ORF, 2020)

NDCC is preferred for ABD initiatives since it forms the hub of activities and thus holds social, cultural, and economic significance. Completed projects under SCM include outdoor gyms, solar rooftops, façade lighting at Palika Kendra, and the Charkha museum.

The Charkha museum, as the name suggests is part of an initiative to promote distinctive cultural identity in the city, while empowering local weavers associated with the Khadi industry. A training institute offering courses on spinning yarn has been developed alongside. Improper management of the project, such as irregular classes, and non-availability of forms online, arising as a result of the investment is a matter of concern and has eventually led to its underutilization (ORF, 2020).

One of the other Public amenities projects constituting digital clinics, providing a range of health care services, near Janpath and Mandi House has also started struggling due to frequent disruption of internet services, and other related difficulties with

the timely issue of test results. There are often concerns regarding execution and upkeep.

The understanding of the current status of the completed projects raises questions on the long-term effectiveness and appropriateness of the smart initiative, as part of the broader goals of SCM. There have been instances where public amenities centres providing useful, basic services have been constructed in improper locations, as is, in the case of Mandi House, where PACs built in the middle of a footpath cause inconvenience to the pedestrians, forcing them to walk on the busy roads (ORF,2020).

Smart initiatives, such as smart bike and electric bike facilities, tend to reduce pollution, yet NDCC is not prepared to host them, since dedicated bike lanes have not been constructed, yet, forcing bikers to risk their lives and commute along the busy roads, amidst heavy traffic. These technology-led developments are concentrated at a minuscule level with no planning of broader prospects of implementation or connectivity with the city, as a whole.

Digital information and service panels, advertisement digital boards installed in the inner circles of Connaught Place, with provision for free data, Wi-Fi, and mobile charging points have rendered the positive implementation of smart initiatives, upgrading the quality and aesthetic of the public space, but what has remained constant around the area are deteriorated footpaths, improperly lit walkways at night, drug-addicted children/youth belonging to poorer communities loitering around, and unsanitary conditions (ORF,2020). Thus, a single implementation of a technology-based project, while disregarding the continuing issues of joblessness, unhealthy surroundings, non-inclusive development, and non-upliftment for the poorer sections of the society does not make the place 'smart'. There is a pressing need for consolidated strategies and plans to address the prevailing problems and mitigate them, taking into consideration all aspects of sustainability.

4.2 Indore

Indore was selected among the first 20 Smart cities under the Smart City Mission (SCM). Indore is regarded as the commercial capital and most populous city of Madhya Pradesh. The Indore Smart City proposal includes Retrofitting – Development of ABD; Redevelopment and Pan city project -IT-based solutions to combat solid waste and traffic management. According to SCM, the proposal for Indore is representative and reflective of its citizens' selection of areas and aspects to focus on, for development. The area under Pan city development is 276sq.km with a population of 25 lakhs (2017), and the ABD area is of 3sq.km, with a population of 1.25 lakhs.

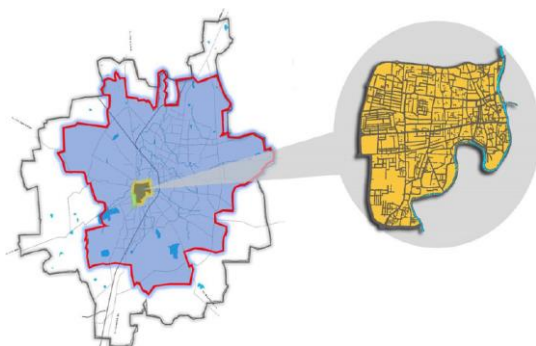


Figure 2:Indore- Area Based Development Map (Source: Official website of Smart City Indore)

One of the major tasks completed as part of the Pan city development was Waste management, and after struggling with mounting challenges of waste management for years, Indore has now been able to set up an efficient garbage disposal system with the incorporation of GPS-enabled waste collection vans tasked to collect garbage from people's homes. The transformation of landfills into beautiful gardens is also reflective of a positive consequence of the smart city initiatives, directly affecting the quality of life.

As per Indore's Smart city proposal, there are five projects that are focused on riverfront development (Smart City in Indore, Centre for Financial Accountability,2020). The basis of criticism of SCM being its utter disregard for reality on the ground is reflected in the case of the riverfront development proposals in Indore. Riverfront development can present potential issues as there is a possibility of the infrastructure encroaching on the floodbank, resulting in problems with rainwater harvesting, groundwater replenishment, and flooding during the monsoon season (CFA,2020).

According to the mission, redevelopment of public land would be undertaken with the aim of creating mixed-use, walkable communities, with shared public open spaces, retaining the identity of the place. One of the projects within the Smart city development was to revive the famous Rajwada and transform it into a vivacious CBD, by combining intelligent regeneration and conservation of historic inner city, market areas, and public spaces while preserving cultural heritage and identity. In the pretext of revival, considerable chances of causing more damage to the city's existing heritage in areas such as Biyabani and Kapra Bazar have been identified (CFA,2020).

Another smart initiative involved the widening of roads, which caused the widespread displacement of people from Jairampore to Cloth Market, with rows of houses and shops being partially demolished. Extensive on-ground studies have suggested the affected population could not voice any of their concerns, out of fear of authority. The portrayal of demolition has been termed a temporary inconvenience on the way to smart development, and the idea of the increased commercial value of properties has kept people in hopes of economic gain while stifling themselves underneath the burden of displacement (CFA,2020).



Figure 3:Houses demolished for road widening in Jairampore in Indore (Source: CFA,2020)

There have also been reports of displacement of the urban poor because of smart initiatives involving housing projects, wherein, the urban poor has been shifted to the city outskirts, away from their source of livelihood, disrupting their sense of community and identity, which have in turn resulted in inverse migration of labour class from Indore city back to their villages (CFA,2020).

4.3 Bhopal

Bhopal was selected as one of the first 20 cities under the Smart Cities Mission. The city is the capital of Madhya Pradesh and the administrative headquarters of Bhopal district and Bhopal

division. As of 1956, the area under the city's urban body was quite small. Eventually, the city continued to expand including the nearby villages within the urban boundaries. The increased area and population of the city have led to sporadic and unplanned development of several areas, increasing pressure on basic civic amenities and services, and the surrounding lakes and green cover suffered from pollution and destruction owing to rapid urbanization.

Redevelopment of North and South TT Nagar, as part of the ABD project, involves developing a high-density, mixed-use layout along the transit zones. The layout has been designed as per the principle of Transit Oriented Development.

Redevelopment of ABD areas has resulted in the widespread cutting of trees and displacement of people in the area, demolition of informal settlements, and commercial establishments. Additionally, neglect of guidelines around ABD work has resulted in massive dust pollution raising concerns of health issues (CFA,2021).



Figure 4: Trees uprooted and cut for smart city projects in Bhopal (Source: CFA,2021)

Another smart city project, termed Boulevard Street; 45 m wide and 1.9km in length serving as a connection between two proposed commercial modes at two metro stations falling in the ABD area has raised criticism owing to the demolition of shops, and informal settlements, with the residents being displaced to other locations as part of the construction strategy. Displaced families have been provided temporary housing that does not consist of adequate spaces for living. Construction materials appear to be flimsy and not very reliable to deal with climatic adversities. In some cases, families have been shifted to far-off places, away from their livelihoods, impacting their income generation; in other cases, they have been shifted away from main city centres, grocery shops, and healthcare facilities, and hence there's less opportunity of quality life in the temporary shelters. There is a considerable impact of smart city projects on poor and marginalised sections, as well as women, offering them no compensation or security, that needs to be addressed (CFA,2021).

5. CONCLUSION

This research paper examined smart city initiatives, with specific reference to quality attributes of smart urban public spaces, while analysing the often-overlooked, yet extremely important part of the study – the significance of public spaces in the lives of the marginalised communities, themes of social sustainability within the smart city paradigm, and key factors that impact the smart city initiatives and determine the gap where smart city proposals fall short of delivering socio-economic and digital equality. The literature review, as well as the case-based studies, have resulted in an understanding of smart city projects being developed as piecemeal, fragmented technology-led projects, aggravating the concept of 'bubble-

urbanism'; with no structure or framework to consolidate the disconnected smart spaces with the broader city network and generate a wider homogeneous impact.

With respect to the case studies, a comparative analysis of the approach towards implementing the smart city initiatives, as well as the threats and bottlenecks that the three selected cities faced has been briefly compiled in the following table.

	New Delhi	Indore	Bhopal
Strength	Capital of the country	Emerging Business and Industrial Centre	Capital of Madhya Pradesh
Approach	* Widening of Roads, Façade redesign and upgradation, Riverfront development, Training Institutes, Waste Management, * Technology-led interventions, Digital Services, Provision for free data.		
Threats	* Demolition of vegetation, rows of houses and commercial establishments to accommodate construction. * Displacement of "informalities" to make way for development, leading to social fragmentation, and loss of livelihood. * Initiatives concentrating on elite and educated classes with minimal facilities for catering to the less privileged.		
Bottlenecks	* Fragmented, piece-meal development with no strategy to connect with broader city networks. * Improper management of resources, leading to technical failures thus weakening digital services. * Finance or maintenance-intensive initiatives.		

Table 1: Brief compilation of approaches and threats, related to Smart City Initiatives in New Delhi, Indore and Bhopal (Source: Authors)

In order to achieve smart solutions for the creation of smart urban public spaces as one of the core aspects of smart sustainable cities, it is very crucial to consider inclusivity, accessibility for all, socio-economic variations, and cater to a wider group of active users, without any bias of prior access to smart technology, data or better life opportunities. The repercussions of smart city projects are multi-fold, especially in the context of the marginalized groups, wherein there is little to no consideration of their health, well-being, social and economic growth, hence resulting in a very diminished quality of life. There is no development without the active participation and fulfilment of all user groups because they not only generate conditions for tangible and intangible physical aspects of public spaces but also contribute to the vibrancy, diversity and character of public spaces, which eventually contributes to the efficient functioning of these spaces. Understanding and taking into account these anomalies of society is undoubtedly a step forward in the correct direction.

Ensuring to understand and involve stakeholder participation in the creation and development of smart public spaces, without the governance authorities limiting themselves to the elite, educated groups but expanding to include and involve the disorderliness of 'informalities' of the society in the process of participatory planning and implementation would result in more effective, workable solutions, without any disregard for the less privileged. Rather exposure to smart public spaces and inclusion in decision-making would generate a sense of

community and identity, which would, in turn, be an asset, addressing the social aspects of smart urban public spaces. This study has ingrained the fact that the result of an ambitious smart city proposal should not just concentrate on the implementation of a few technology-based projects, but should look for integrated development, seamless interconnectedness, value for user groups' concerns and needs and eventually cater to all groups of society, without any prejudices. The marginalized groups of people and informal settlements are most often the first groups to be targeted for reasons of displacement or demolition as a precursor to the initiation of smart city projects, automatically rendering them socially unsustainable. Moreover, most studies have revealed the concentration of smart projects and initiatives to be around already well-established societies, thus catering to the already privileged group (Praharaaj 2021; Prasad 2020). Also, the city-wide implementation of smart initiatives often comes at a price for maintenance, (as is the case of paid toilets, and bike-sharing apps), as well as with a requirement of access to the digital world, with very less consideration for the groups that do not have the social and economic means to afford any of these. Smart solutions being an integral part of smart city projects need to have a more comprehensive approach and intent to provide solutions for the challenges of urbanization, while effectively battling the socio-economic divide, hence enabling attempts towards social sustainability and equal opportunities for all.

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