E ISSN: (2776-7345)
P ISSN: (2776-7353)

Bina Bangsa International Journal of Business and Management (BBIJBM)
Vol. 5 No. 1, page 424-445, April 2025

URBAN TRANSFORMATION IN RAJASTHAN: AN EVALUATION OF AMRUT AND SMART CITIES INITIATIVES

Nayan Prakash Gandhi [1], Virat Jaiswal [2]
[1] Ph.D Scholar, School of Commerce & Management LNCT University Bhopal, Madhya Pradesh India
[2] Supervisor, Associate Professor School of Commerce & Management LNCT University Bhopal, Madhya Pradesh India

Received: February 22, 2025 Revised: March 30, 2025 Accepted: April 30, 2025

Abstract

This paper critically assesses the impact of two major urban development initiatives in Rajasthan, India: the Atal Mission for Urban Renewal and Transformation (AMRUT) and the Smart Cities Mission (SCM). Using a mixed methodology, integrating secondary data analysis and qualitative interviews with stakeholders from selected cities, the study assesses the progress, challenges, and achievements of these missions in the context of the unique urban landscape of Rajasthan. The analysis focuses on key parameters such as infrastructure development, improved service delivery, economic growth, environmental sustainability, and citizen participation. The results reveal both successes and limitations in the implementation of AMRUT and SCM, highlighting the need for context-specific strategies, better coordination among ministries, and a greater focus on inclusive and sustainable urban development to achieve meaningful urban transformation in Rajasthan.

Keywords: Urban Transformation, Rajasthan, AMRUT, Smart Cities Mission, Infrastructure Development, Service Delivery, Urban Governance, Sustainable Development, India.

DOI: 10.46306/bbijbm.v5i1.163

Homepage: *http://bbijbm.lppmbinabangsa.ac.id/index.php/home*

1. Introduction

The 21st century has undoubtedly been marked by a global demographic shift towards urban centers. Developing countries, especially India, are at the forefront of this rapid urbanization, witnessing unprecedented growth in urban populations. With India's urban population projected to reach 600 million by 2030, the need for robust and forward-looking urban planning has never been more critical (Ministry of Housing and Urban Affairs [MoHUA], n.d.-a). While this rapid expansion promises economic

opportunities and innovation, it is also putting enormous pressure on existing infrastructure, hindering the delivery of essential services and challenging traditional structures of urban governance. The quality of life of millions of citizens, their access to basic services and the sustainability of the urban environment depends on effective policy interventions that can transform thriving cities into vibrant, equitable and resilient habitats. Rajasthan, India's largest state, embodies a unique confluence of historical heritage and contemporary aspirations within this rapidly accelerating urban narrative. Its diverse urban fabric, from ancient cities with intricate historical structures to rapidly industrializing cities, is experiencing significant demographic changes and remarkable economic development. The state's vulnerability to water scarcity, its unique socio-cultural characteristics and its thriving tourism sector add further complexity to the urban development journey. Consequently, the needs in terms of urban infrastructure, housing, transportation and environmental management in Rajasthan's cities are increasing, necessitating strategic and contextualized interventions to ensure sustainable growth and improve the well-being of its citizens. Recognizing these formidable urban challenges and with a clear vision to promote planned and sustainable development, the Government of India launched two landmark initiatives in 2015: the Atal Mission for Urban Rejuvenation and Transformation (AMRUT) and the Smart Cities Mission (SCM). AMRUT was conceived with the fundamental objective of providing universal access to basic urban services, including reliable water supply, robust sanitation, efficient urban transport and creation of green spaces in 500 cities across the country (MoHUA, n.d.-b). Its design was fundamentally conceived to improve the quality of life of all urban dwellers, with a special focus on the health of the poor and vulnerable (Ajmer Development Authority, n.d.). In parallel, the Smart Cities Mission has taken a more ambitious and technology-led path, aiming to promote sustainable and inclusive urban development in 100 selected cities through the application of 'smart' solutions and integrated urban planning (MoHUA, n.d.-c). In Rajasthan, four prominent cities – Jaipur, Udaipur, Kota and Ajmer – have been selected to lead this 'smart' transformation. While these national missions represent a major political commitment to reshape India's urban future, their ultimate success is intrinsically dependent on their effective implementation in the diverse and often challenging local contexts of individual states and cities. Despite massive investments and concerted efforts, a comprehensive and

critical assessment of the synergistic and disparate effects of AMRUT and SCM, particularly in Rajasthan, remains crucial. Existing literature offers valuable insights into national trends and overall challenges, but an in-depth understanding of how these initiatives fit into Rajasthan's unique urban landscape, institutional capacities and socio-economic realities is currently underdeveloped. This research seeks to fill this gap by going beyond aggregate national statistics to provide a more detailed assessment of the successes, failures and transformative potential of these missions on the ground, ultimately reflecting their impact on the daily lives and future aspirations of Rajasthan's urban population. Therefore, this thesis undertakes a critical assessment of the implementation and subsequent impact of AMRUT and SCM programmes in Rajasthan. Drawing on a wide range of secondary data from public policy reports, academic studies and published evaluations, the study aims to assess their contribution to urban transformation in all key dimensions: infrastructure development, improvement of basic services, stimulation of economic growth, improvement of environmental sustainability and development of citizen participation and governance.

2. Background: Urbanization Trends and Policy Landscape in Rajasthan

Rajasthan's urban narrative is a rich tapestry of historical legacies, distinct cultural identities, and evolving economic dynamics. As the largest state in India, its urban centers range from carefully designed historic cities, such as Jaipur, once the principal capital, and Udaipur, famous for its lakes and palaces, to emerging industrial cities and administrative centers (Sharma, 2017). This diverse urban landscape has been subject to significant demographic pressures over the decades. The city's urban population has increased from 23.39% in 1961 to 24.9% in 2001, further consolidating its urban presence in 2011 (Census of India, 2011; Rajasthan Finance Department, 2025). While these numbers may seem modest compared to more industrialized cities, the sheer growth of urban populations and the rapid growth of major regional centers have placed a strain on urban infrastructure, housing, and the existing environmental support capacity. Among the inherent challenges are managing scarce water resources in arid and semi-arid climates, preserving the complex urban heritage, and meeting the

infrastructure needs of a rapidly modernizing economy. Before the advent of AMRUT and SCM, Rajasthan, like other Indian states, was involved in several centrally sponsored urban development programs. In particular, the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), launched in 2005, was a significant forerunner. JNNURM aimed to stimulate reforms and make financial investments in urban infrastructure in selected cities. In Rajasthan, it led to large capital expenditures in critical sectors such as water supply, sanitation, and urban transport (Mathur, 2014). However, comprehensive evaluations of JNNURM have often highlighted persistent implementation challenges, including systemic delays in projects attributable to difficult processes, difficulties in land acquisition, insufficient institutional and technical capacity within Urban Local Bodies (ULBs), and a perceived lack of genuine public participation (Mathur, 2014; Sridhar, 2010). These experiences have highlighted the urgent need for leaner project management, increased financial support mechanisms for ULBs, and truly integrated approaches to urban development – lessons that have been shown to influence the conception and design of subsequent national missions. Simultaneously and sometimes simultaneously with these national initiatives, Rajasthan has also undertaken significant urban development efforts. The Rajasthan Urban Infrastructure Development Project (RUIDP), supported by the Asian Development Bank (ADB), stands out as a long-term initiative that has systematically addressed multisectoral urban needs in many cities of the state (ADB, n.d.; Local Self-Government, Department of Urban Development and Housing, Rajasthan, n.d.). The broad scope of the RUIDP, encompassing water supply, wastewater management, urban transport, drainage, and even rehabilitation of cultural heritage, has laid crucial foundations and strengthened institutional capacity over nearly two decades. Its emphasis on public sector management, financial reforms, and meaningful stakeholder involvement has served as an essential model for large-scale urban interventions in the state, effectively shaping the context in which AMRUT and SCM could take off. The Atal Mission for Urban Renewal and Transformation (AMRUT), launched in 2015, specifically aimed to address the limitations observed in earlier missions by adopting a more outcome-oriented approach with direct linkages to Service Level Agreements (SLBs). For cities in Rajasthan designated as AMRUTs, the main components of the mission were geared towards specific infrastructure objectives: ensuring universal access to clean water, expanding and improving sewerage and wastewater

management systems, developing robust stormwater drainage networks to mitigate urban flooding, improving public and non-motorized urban transport options, and creating and maintaining accessible green spaces and gardens (MoHUA, n.d.-b). A key feature of AMRUT 2.0, its successor, is the focus on "water-safe" cities, with attention to conservation of springs, regeneration of water bodies, and recirculation of treated wastewater, which is of great importance for Rajasthan (MoHUA, 2021). The mission has also introduced funds based on interventions, and specific projects aimed at enhancing liveability, economic viability, and environmental sustainability through integrated urban planning and smart solutions (MoHUA, n.d.-c). Common components across these SCPs included the establishment of Integrated Command and Control Centers (ICCCs) for centralized management of city operations, development of smart mobility solutions (e.g., intelligent traffic systems, pedestrian infrastructure), implementation of smart environmental initiatives (e.g., waste management, renewable energy), and the promotion of smart governance through e-services and citizen engagement platforms (MoHUA, 2024).

The simultaneous implementation of AMRUT and SCM in Rajasthan presents a compelling case study to examine the complexities of multi-pronged urban development strategies at the sub-national level. The success of these national missions is inextricably linked to the state's administrative machinery, its fiscal health, the varying institutional capacities of its ULBs, and the unique socio-economic and environmental specificities of each urban center. Understanding this intricate interplay between national policy aspirations and local ground realities forms the foundational context for evaluating the transformative impact of these initiatives on Rajasthan's urban landscape.

3. Literature Review: Conceptualizing Urban Transformation and Evaluating National Urban Missions in India

3.1. Conceptualizing Urban Transformation

The concept of 'urban transformation' goes far beyond mere physical expansion or infrastructural modernization. In academic parlance, it is understood as a profound

and dynamic metamorphosis that encompasses the physical, social, economic and environmental dimensions of a city (Brenner and Schmid, 2015; Harvey, 2008). This complex process involves not only the provision of tangible assets, such as roads and sewers, but also qualitative improvements in liveability, sustainability, inclusion and the effectiveness of urban governance. It represents a shift towards cities that are not only functional, but also sustainable, equitable and responsive to the needs of their growing populations. In India, National Urban Missions serve as key policy instruments, explicitly designed to catalyze this comprehensive transformation by bridging critical development gaps and promoting more orderly and outcome-oriented urban development.

3.2. Challenges of Indian Urbanization

The existing literature on Indian urbanization consistently illustrates a complex set of challenges that hinder full urban transformation. These include, but are not limited to, the persistent lack of adequate and well-maintained infrastructure, inefficiency and inequality in service delivery, the alarming proliferation of informal settlements and growing urban poverty, rampant environmental degradation and, above all, the widespread weakness in the institutional and financial capacities of Urban Local Bodies (ULBs) (Ahluwalia, 2011; Kundu, 2016). These systemic challenges are often compounded by rapid, often unplanned, urban growth and fragmented and multi-layered urban governance structures that struggle to ensure coordination and accountability between different agencies.

3.3. Lessons from the Jawaharlal Nehru National Urban Renewal Mission (JNNURM)

A critical review of previous urban development missions in India, particularly the Jawaharlal Nehru National Urban Renewal Mission (JNNURM, 2005–2014), offers useful lessons for understanding the course of subsequent initiatives. JNNURM was a significant step towards decentralization of urban planning and mobilization of large central expenditures on urban infrastructure across a wide range of cities. It promoted a reform agenda aimed at improving urban governance and financial stability. While the mission undoubtedly led to a considerable injection of capital and the launch of many projects in water supply, sanitation, and public transport (Mathur, 2014), academic evaluations and public reviews have revealed mixed results. Persistent

challenges include significant delays in projects, often attributable to complex bureaucratic processes, lengthy land acquisition processes, and insufficient technical and administrative capacity within ULBs (Mathur, 2014; Sridhar, 2010). Furthermore, a significant criticism has been the lack of meaningful citizen participation, which has often led to projects that, while ambitious, have not always been well aligned with the real needs and priorities of local communities. The ambitious reform agenda that underpinned JNNURM has often encountered resistance from political economy factors and a clear lack of institutional will at the local and state levels to implement difficult but necessary changes. These accumulated experiences and identified shortcomings have directly affected the strategic conception and design parameters of AMRUT and SCM.3.4. The Atal Mission for Rejuvenation and Urban Transformation (AMRUT)

The Atal Mission for Rejuvenation and Urban Transformation (AMRUT), launched in 2015, can thus be viewed as an evolved response to these historical challenges. Its design deliberately sought to learn from JNNURM's experiences, emphasizing a more project-based and outcome-oriented approach, with a clear focus on establishing universal access to basic urban services. The mission prioritized water supply, sewerage and septage management, stormwater drainage, urban transport, and the development of green spaces (MoHUA, n.d.-b). A distinguishing feature of AMRUT was its shift towards outcome-based funding, wherein central assistance was linked to the achievement of specified service level benchmarks. Nationally, AMRUT has reported significant strides, notably in providing 189 lakh new/serviced water tap connections and 149 lakh new/serviced sewer connections (Press Information Bureau [PIB], 2023). The successor mission, AMRUT 2.0, further intensified this focus by aiming for "water secure" cities through comprehensive water balance plans, source augmentation, rejuvenation of water bodies, and the promotion of wastewater recycling, reflecting a deeper commitment to environmental sustainability (MoHUA, 2021). While these achievements are substantial, literature continues to highlight challenges in ensuring the long-term operational sustainability and maintenance of the created infrastructure, often due to the financial and technical limitations of ULBs (Roy, 2019). The human element of ensuring equitable access and quality of service for all

citizens, particularly the urban poor, also remains a critical area for ongoing research and policy intervention.

3.5. The Smart Cities Mission (SCM)

Simultaneously, the Smart Cities Mission (MSC), along with the AMRUT initiative, has introduced a fundamentally different paradigm to the urban development debate in India. Conceptually, a "Smart City" emphasizes the use of information and communication technologies (ICT) and integrated urban planning to improve efficiency, sustainability, and liveability (MoHUA, n.d.-c). This approach has moved beyond traditional infrastructure provision to embrace digital governance, intelligent transportation systems, smart utilities, and citizen-centric services. Academic and policy analyses have offered a bifurcated perspective on MSC. Proponents laud its potential to drive transformative change by fostering innovation, improving public services through real-time data and analytics, and creating more resilient urban environments (MoHUA, 2024). Impact assessment studies have indeed highlighted positive outcomes, such as improved public safety through extensive CCTV networks (over 59,802 cameras installed in 93 Smart Cities across the country) and improved access to education through smart classrooms (which contributed to a 22% increase in enrollment in the cities studied, including Ajmer in Rajasthan) (PIB, 2024). However, a strong critical literature has also emerged that has questioned various aspects of the applicability and equity of SCM in the Indian context. The main criticisms often revolve around the "area-based development" design philosophy, arguing that the concentration of resources and smart solutions only within designated areas (e.g., redevelopment areas or green development) can inadvertently exacerbate existing urban inequalities, while neglecting larger, often underserved, peripheral areas or informal settlements (Parnell & Robinson, 2018; Roy, 2019). Concerns are also raised about the potential for technological determinism, where technology is seen as a panacea without sufficient consideration of the underlying socio-economic and political complexities. Scholars highlight the dangers of creating "exclusionary enclaves" rather than truly inclusive cities (Roy, 2019). Furthermore, debates continue about the long-term financial sustainability of these technology-intensive projects, the reliance on private sector participation, and the critical need for robust data governance structures. The challenge of integrating these "smart" solutions into

broader urban planning and ensuring citizen ownership and privacy of data remains a significant area of research.

3.6. Urban Challenges and Initiatives in Rajasthan: A Contextual Lens

In Rajasthan, in particular, emerging research provides a critical contextual framework for understanding the nuances of urban transformation. Studies of urban challenges in cities like Jaipur have highlighted the persistent problems of overcrowding, pollution, and housing shortages, suggesting that while sensible solutions are helpful, they must be integrated with fundamental principles of urban planning (Agarwal & Sharma, 2024). An analysis of urban transportation in Jaipur, for example, illustrates how uneven patterns of urbanization and complex institutional structures pose significant barriers, despite technological interventions (Pareek & Pareek, 2022). These localized studies reinforce the understanding that national missions, however well-intentioned, must respond to specific realities on the ground and often require more than just monetary outlays or technological initiatives to achieve comprehensive and equitable urban transformation.

This thesis aims to build on this rich and evolving literature by undertaking a focused, comprehensive, and up-to-date evaluation of both AMRUT and SCM in Rajasthan. By systematically synthesizing the findings obtained from secondary data, the aim is to gain a detailed understanding of the combined effects on urban centres, identify key success factors and persistent challenges, and ultimately provide useful insights for future urban planning and practice in similar development contexts. The study aims to contribute to the broader academic debate by offering a detailed subnational case study, enriching the understanding of how national urban development paradigms translate into tangible outcomes and concrete challenges.

4. Research Methodology

This study adopts a comprehensive and multimodal research approach, which relies primarily on the analysis of a wide variety of secondary data to assess the impact of AMRUT and SCM policies in Rajasthan. The choice of this approach is motivated by

the aim of providing a macro-level assessment of large-scale public interventions and their outcomes in a geographically diverse state, suitable for publication in a peer-reviewed academic journal.

5. Findings and Discussion: Unpacking Urban Transformation in Rajasthan

This section presents a summary of the findings from a comprehensive secondary analysis assessing the multifaceted impact of AMRUT and Smart Cities initiatives on the urban transformation of Rajasthan. While these initiatives have undoubtedly made a significant impact on the city's urban development agenda, emerging data reveal a complex picture of significant progress and ongoing challenges. The discussion will systematically explore each thematic area using relevant statistics, project findings, and critical analysis of the reviewed literature.

5.1. Progress in Infrastructure Development: Addressing Core Deficits

The primary mandate of AMRUT, which focuses on basic urban infrastructure, has translated into visible progress in participating cities in Rajasthan. Data from the Ministry of Housing and Urban Affairs (MoHUA) indicate a national drive to achieve universal water supply and sewerage connections. While detailed and disaggregated data for all AMRUT cities in Rajasthan are difficult to find in easily accessible public documents, national reports confirm significant progress. For example, by mid-2023, AMRUT had facilitated about 189 lakhs new or improved water connections and 149 lakhs new or improved sewerage connections across India (Press Information Bureau [PIB], 2023). Rajasthan's contribution to these national figures is substantial, with cities undertaking initiatives to increase water sources, improve water treatment capacities, and expand distribution networks, which are essential in a water-scarce region. Initiatives to reduce non-returnable water (NRW) have also been part of the water supply initiatives aimed at more efficient resource management. Similarly, investment in new sewage treatment plants (STPs) and expansion of underground sewerage networks are vital for public health and environmental protection.

The Smart Cities Mission has introduced a level of technologically advanced infrastructure development in Jaipur, Udaipur, Kota and Ajmer. The cornerstone of this strategy is the establishment of Integrated Command and Control Centres (ICCs).

These centres act as central hubs for real-time monitoring and management of various urban services, including water supply, public safety and emergency response. Across the country, the installation of more than 59,802 CCTV cameras and emergency call boxes in 93 Smart Cities managed by ICCCs has been proven to contribute to a safer urban environment (PIB, 2024). In Rajasthan's Smart Cities, the operation of these ICCCs represents a significant leap in urban management capabilities, enabling data-driven decisions and rapid response mechanisms. In addition, smart road projects, incorporating features such as intelligent traffic lights, sensor-based monitoring, and dedicated pedestrian and bicycle lanes, aim to improve urban mobility and reduce congestion. The development of 430 kilometers of pedestrian lanes and 43 kilometers of bicycle lanes across the country under AMRUT (PIB, 2023) further complements these efforts, promoting non-motorized transportation. Despite this progress, persistent challenges in infrastructure development are evident. The magnitude of the historic infrastructure deficit in Rajasthan's rapidly growing cities remains enormous. Issues such as bureaucratic bottlenecks, delays in land acquisition, and complex coordination between ministries (e.g., between municipal corporations, public safety engineering ministries, and urban development societies) often delay project implementation times and increase project costs (Agarwal & Sharma, 2024; Mathur, 2014). Furthermore, the quality and long-term durability of newly constructed infrastructure must be ensured through robust monitoring and adherence to construction standards.

5.2. Improvements in Service Delivery: Enhancing Urban Liveability

The key objective of both AMRUT and SCM is to materially improve the quality and affordability of basic urban services, thereby enhancing the urban liveability of citizens. AMRUT's focus on universal access to water and sanitation is of great importance. While the specific baseline data on service levels in Rajasthan are well established, the progress reports of the country missions show substantial improvements in service coverage. The provision of new sewerage and household piped water connections directly contributes to improved public health and living conditions, especially in previously underserved areas (PIB, 2023). AMRUT's focus on sewage and solid waste management (FSSM) also addresses critical sanitation gaps, especially in areas without conventional sewerage networks. The Smart Cities Mission uses technology to simplify

and improve the efficiency and responsiveness of service delivery. ICCCs, as mentioned earlier, play a critical role in this regard. For example, smart water management systems that integrate smart meters and leakage detection technologies, being piloted in some Smart Cities, aim to reduce water losses and improve water distribution efficiency, which is a key focus in Rajasthan. Similarly, smart waste management initiatives, including GPS-equipped waste collection vehicles and smart bins with level sensors, aim to expedite collection, improve source segregation and enhance overall urban cleanliness. In addition to physical services, smart waste management (SCM) is also extending its impact to the provision of social services. The reported success of smart classrooms in public schools, particularly in the case of Ajmer Smart City, indicates a positive impact on educational outcomes, with a 22% increase in enrolment across the country in the smart cities surveyed (PIB, 2024). This indicates a broader understanding of the concept of 'service delivery' that goes beyond physical services alone. However, challenges persist in delivering services in an equitable and sustainable manner. The "area-based development" (ABD) part of SCM, by its very nature, concentrates intensive interventions within specific urban neighborhoods. While this approach facilitates concentrated development, it can inadvertently create disparities, resulting in "smart enclaves" with better services, while other peripheral, often poorer, areas struggle with basic services (Parnell & Robinson, 2018; Roy, 2019). Ensuring that the benefits of improved services reach all segments of the urban population, especially those who are economically weaker and those living in informal settlements, remains a serious equity challenge. Furthermore, the long-term operational costs and technical expertise required to maintain complex and intelligent infrastructures pose a significant barrier for ULBs, potentially jeopardizing the sustainability of these improved services in the absence of continued external support or robust internal capacity building.

5.3. Economic Growth and Opportunities: Investment and Livelihoods

Urban transformation, especially with large investments in infrastructure, is widely recognized as a driver for economic growth and job creation. Large investments under AMRUT and SCM in Rajasthan have injected significant capital into the city's urban economies. These investments directly stimulate the construction sector, creating employment opportunities for both skilled and unskilled workers. Broader

infrastructure improvements, such as better connectivity, more efficient utilities, and more efficient services, aim to create a more attractive environment for businesses and investors. The Smart Cities Mission, with its emphasis on creating a supportive urban ecosystem, aims to enhance economic competitiveness. Improved urban mobility, reliable services, and digital infrastructure can reduce the cost of doing business, improve logistics, and facilitate growth across various sectors. Rajasthan is actively pursuing policies to attract investment, as evidenced by events such as the 'Rising Rajasthan Global Investment Summit 2024', which secured a record ₹35 lakh crore in investments in renewable energy, infrastructure, technology and agriculture (Rajasthan Finance Department, 2025). Smart Cities initiatives, through improved infrastructure and urban governance, are intended to complement such efforts at the state level, making cities more attractive destinations for capital inflows and industrial expansion. The development of digital infrastructure and e-government platforms under the SCM can also foster a more transparent and efficient business environment, potentially fostering new initiatives in the digital economy and entrepreneurship. However, the extent to which these investments translate into widespread and inclusive economic benefits and sustainable livelihoods, especially for the urban poor, deserves careful analysis. While construction activities provide temporary employment, the creation of long-term jobs depends on the growth of formal sectors and the integration of new technologies into local economies. Concerns have been raised that the focus on smart high-tech solutions may not directly benefit the large informal sector or adequately address urban poverty, potentially widening socio-economic disparities (Roy, 2019). Therefore, while missions contribute to economic activity, a strategic focus on skills development, supporting local small and medium-sized enterprises (SMEs), and promoting equitable access to new economic opportunities is essential to ensure truly inclusive growth.

5.4. Environmental Sustainability: Balancing Development with Ecology

Environmental sustainability is a crucial, but often difficult, aspect of urban transformation, especially in a state like Rajasthan, which is characterized by arid and semi-arid conditions and inherent resource scarcity. Both AMRUT and SCM explicitly recognize the importance of environmental considerations, albeit in different ways. AMRUT's focus on water supply and sanitation directly contributes to environmental

protection by reducing pollution of water bodies and promoting efficient water use. Targets for reducing non-returnable water (NRW) are essential for water conservation. Development of new wastewater treatment capacities (e.g., 4,174 million litres per day [MLD] of sewage treatment capacity created nationwide) is of paramount importance to prevent the discharge of untreated wastewater into rivers and lakes (PIB, 2023). Furthermore, AMRUT includes a specific component for the development of green spaces and gardens, contributing to urban biodiversity, improving air quality and providing recreational areas. Across the country, 5,010 acres of green spaces have been developed under this mission (PIB, 2023). The subsequent AMRUT 2.0 further enhances "water security" through spring regeneration, rainwater harvesting and reuse of treated water, which is important for the ecological balance of Rajasthan (MoHUA, 2021).

The Smart Cities Mission integrates environmental sustainability through technologically advanced solutions. Environmental sensors for real-time monitoring of air and water quality provide critical data for pollution control. Smart waste management systems, including waste sorting, door-to-door collection and waste-to-energy projects, aim to reduce the burden on landfills and improve urban sanitation. Initiatives to adopt solar energy and smart energy-efficient street lighting also help reduce carbon footprints. In Rajasthan's Smart Cities, these interventions are significant steps towards creating cleaner and more resource-efficient urban environments. However, the environmental challenges in Rajasthan are formidable and require sustained and comprehensive efforts. Water scarcity remains a critical issue, and while smart solutions are helping, broader changes in water consumption and sound regional water management are needed. Urban pollution, particularly from vehicle emissions and industrial activities, remains a problem, exacerbated by rapid urbanization and inadequate regulatory controls (Pareek & Pareek, 2022). Construction activities for new infrastructure can also generate large amounts of dust and waste if not managed responsibly. Achieving true environmental sustainability requires not only technological solutions, but also rigorous enforcement of laws, effective public awareness campaigns, and greater integration of green principles into all levels of urban planning, beyond the immediate work environment. The long-term impact of

these environmental initiatives will depend on their scale, sustainability, and general commitment to green urban development.

5.5. Citizen Participation and Urban Governance: Towards Responsive Urbanism

Effective urban transformation is intrinsically linked to strong urban governance and meaningful citizen participation, so that development initiatives respond to local needs and priorities. Both AMRUT and SCM explicitly highlight these elements in their key principles. AMRUT encourages active citizen participation in the identification and prioritization of projects (MoHUA, n.d.-b), while the Smart Cities Mission (SCPs) has mandated a strong element of citizen involvement through the preparation of Smart Cities Proposals (SCPs) (MoHUA, n.d.-c). This is often facilitated through web-based platforms such as MyGov and city-specific portals, allowing citizens to provide feedback and suggestions. The 'Pey Jal Survekshan' initiative under AMRUT 2.0, which involves citizen surveys on water services, further illustrates this dedication to gathering citizen responses (MoHUA, 2021). The Rajasthan Urban Infrastructure Development Project (RUIDP) has also highlighted the well-established importance of public consultation in building consensus and securing public support for large infrastructure projects (ADB, n.d.). However, the depth and effectiveness of citizen participation in practice is often debated in the literature. While formal channels of consultation exist, doubts remain as to whether these translate into real power in decision-making, especially for marginalized or vulnerable groups (Roy, 2019). Critics suggest that participation can sometimes be purely symbolic, not sufficiently empowering citizens or effectively addressing their most pressing concerns. From a governance perspective, Rajasthan's Urban Local Bodies (ULBs), like their counterparts across India, struggle with systemic institutional and financial challenges, despite the mandates for reforming these missions. Although AMRUT has sought to improve the creditworthiness of ULBs through appraisal exercises and has encouraged issuance of municipal bonds (with 12 ULBs across the country raising ₹4,684 crore through this route for urban infrastructure development) (PIB, 2023), many of them still face significant financial constraints and heavy dependence on inter-governmental transfers. Insufficient human resources, especially technical and administrative skills,

within ULBs often hinder efficient planning, implementation, and post-completion and maintenance of projects. Coordination between ministries, a perennial difficulty in urban governance, continues to hamper project implementation, leading to inefficiencies and delays (Agarwal & Sharma, 2024). Overcoming these deep-rooted governance shortcomings – by strengthening ULB capacity, promoting inter-agency synergies and ensuring sustained financial self-sufficiency – is of utmost importance for the long-term sustainable performance of AMRUT and SCM, and indeed, for any future urban development initiatives in the State.

5.6. Success Stories and Best Practices in Rajasthan

Despite the aforementioned challenges, Rajasthan's engagement with AMRUT and SCM has yielded several notable successes and offers valuable best practices. These instances underscore the potential for transformative urban development when strategic foresight, adaptive management, and a commitment to local contexts converge:

Ajmer Smart City: A Model of Integrated Heritage and Smart Solutions. Ajmer has distinguished itself through its comprehensive approach, successfully integrating the preservation of its rich heritage with the adoption of intelligent urban solutions. This includes commendable efforts in restoring vital water bodies, such as Ana Sagar Lake, and deploying smart lighting systems in historically significant areas (MoHUA, 2024). Furthermore, the positive impact observed in educational outcomes, particularly through the implementation of smart classrooms and the subsequent rise in student enrollment, highlights a robust social dimension of its smart city endeavors (PIB, 2024).

Jaipur Smart City: Exemplary Centralized Urban Management. Jaipur's Integrated Command and Control Center (ICCC) stands out as a highly effective operational model for centralized urban governance. Its pivotal role in optimizing traffic management, bolstering public safety through enhanced surveillance, and facilitating rapid disaster response capabilities demonstrates the tangible benefits of technology in refining city operations and improving overall urban resilience.

AMRUT's Fundamental Service Reach: Transforming Daily Lives. Across numerous cities participating in the AMRUT mission in Rajasthan, there has been a significant

expansion in the accessibility of piped water connections and a marked improvement in sewerage infrastructure, particularly in previously underserved communities. These foundational advancements, though less technologically 'flashy,' have exerted a profound and direct positive impact on the daily quality of life for a substantial segment of the urban populace by addressing their most basic needs.

The Foundational Role of RUIDP: Paving the Way for Future Initiatives. The enduring legacy of the Rajasthan Urban Infrastructure Development Project (RUIDP) warrants specific recognition. This long-term, multi-sector initiative, operating both prior to and in parallel with AMRUT/SCM, has been instrumental in laying critical groundwork. Its sustained engagement, demonstrable commitment to building institutional capacity within urban bodies, and proactive embrace of public consultations have created a vital framework for implementing large-scale urban projects. This rich experience underscores the indispensable value of sustained, comprehensive state-level efforts in complementing and amplifying the impact of national urban development initiatives (ADB, n.d.).

These cases collectively illustrate that transformative strides in urban development within Rajasthan's unique context are achievable. Such progress is predicated upon a synergy of strong political commitment, agile project management, and a genuine dedication to seamlessly integrating advanced technological solutions with the specific, localized needs and cultural heritage of urban communities. The insights gleaned from these successes, particularly the emphasis on integrated planning, meaningful citizen involvement, and a clear focus on measurable outcomes, offer an invaluable blueprint for guiding future urban policy and practice throughout the state.

6. Conclusion and Policy Recommendations

This study undertakes a critical assessment of the Atal Mission for Urban Renewal and Transformation (AMRUT) and the Smart Cities Mission (SCM) in promoting urban transformation across Rajasthan. Based on a comprehensive analysis of secondary data, including official government reports, academic studies and evaluations, our analysis

reveals a nuanced picture of progress, achievements and persistent challenges in the city's urban development journey.

6.1. Key Conclusions

The results highlight several key findings on the impact of AMRUT and SCM in Rajasthan:

Significant infrastructure improvements: Both missions have demonstrated significant investment in critical urban infrastructure in Rajasthan's cities. AMRUT has played a critical role in enhancing basic services such as water supply and sanitation, helping to improve public health and living conditions for a large segment of the urban population (PIB, 2023). The Smart Cities Mission, in turn, has introduced and operationalized advanced technology infrastructure such as Integrated Command and Control Centres (ICCCs) and smart mobility solutions, improving the efficiency of urban management and public health (MoHUA, 2024). These interventions are a critical step in bridging the current infrastructure gap.

Mixed results in terms of efficiency and equity in service delivery: While there are clear improvements in the coverage and effectiveness of services in mission areas, particularly within Smart Cities regions, challenges remain in ensuring equitable access across urban agglomerations. The "area-based development" (ABD) approach to SCM, while effective for concentrated development, risks exacerbating inequalities, perhaps by neglecting peripheral or informal settlements (Parnell & Robinson, 2018; Roy, 2019). The long-term sustainability of these improved services also depends on robust operation and maintenance (O&M) structures, which often suffer from financial and technical difficulties at the Urban Local Authority (ULB) level.

Economic catalysis with inclusive care: The missions have infused a large amount of capital into Rajasthan's urban economies, boosting the construction sector and attracting funds, thereby contributing to economic activity (Rajasthan Finance Department, 2025). However, the extent to which this growth is translated into inclusive economic opportunities and sustainable livelihoods for all segments of the urban population, especially the urban poor and informal sector workers, deserves further attention (Roy, 2019). The focus on high-tech solutions within Smart Cities may

not be beneficial to all sectors, in the absence of complementary skills development and inclusive economic policies.

Emerging environmental developments amidst global challenges: Both AMRUT and SCM have integrated environmental components, including development of green spaces, rehabilitation of water bodies, and smart waste management (MoHUA, 2021; PIB, 2023). These efforts are commendable, especially in a water-scarce state like Rajasthan. However, the magnitude of environmental challenges, such as water scarcity, pollution due to rapid urbanization, and effective waste management, requires comprehensive, integrated, and sustainable interventions that go beyond isolated projects (Pareek & Pareek, 2022).

Government reforms initiated, but capacity gaps remain: The missions have promoted institutional and financial reforms within ULBs and emphasized citizen participation. Although platforms for participation exist and some ULBs have improved their financial management and accountability (PIB, 2023), fundamental challenges related to ULB autonomy, adequate human resources, technical capacity, and inter-departmental coordination continue to hinder their optimal implementation and long-term sustainability (Agarwal & Sharma, 2024). Genuine and inclusive citizen participation remains a critical area for improvement.

Importance of contextual adaptation: The successes observed in cities like Ajmer and Jaipur show that effective urban transformation in Rajasthan often results from adaptive integration of national plans with local contexts, heritage and specific needs (MoHUA, 2024). The legacy of plans like RUIDP further underlines the value of long-term and comprehensive urban development efforts at the city level.

6.2. Policy Recommendations

Based on the above analysis, the following policy recommendations are necessary to maximize the impact of urban development initiatives in Rajasthan, ensuring a more inclusive, sustainable and inclusive urban transformation:

1. Strengthen the autonomy and financial empowerment of Urban Local Bodies (ULBs): Future policies should prioritize increasing the financial self-sufficiency of Urban Local Bodies. This involves providing strong support for increasing own revenues (e.g.,

efficient collection of property taxes, rationalization of user charges), facilitating access to municipal bond markets for more ULBs, and establishing clear mechanisms for predictable intergovernmental transfers. Dedicated funds and capacity building for operation and maintenance (O&M) of the newly created infrastructure are key to preventing deterioration and ensuring sustainable service delivery.

2. Promote continuous coordination and convergence among agencies: To overcome fragmentation and delays, the state government should establish a more integrated urban governance structure. This may include a single nodal agency with authority for urban development across sectors, simplified approval procedures, and mandatory joint planning and implementation mechanisms that involve all relevant state ministries (e.g., Public Health Engineering Department, Urban Improvement Trusts, Municipal Corporations). The focus should be on breaking down silos to enable holistic implementation of the plan.

3. Promote inclusive urban development beyond the area: Future urban plans and strategies in Rajasthan should truly embrace the city-wide perspective to ensure equitable distribution of infrastructure and services. While concentrated development in central areas is beneficial, specific policies and dedicated funds should be directed towards integrating peripheral and informal settlements into the formal urban fabric, providing universal access to basic services and opportunities. This requires strong considerations of social equity in the design and implementation of the project.

4. Urge operations, maintenance and management of durable assets: The sustainability of expenditures made under AMRUT and SCM depends on effective management after completion. Plans should mandate comprehensive asset management plans for all urban infrastructure, outlining O&M responsibilities, sources of funding and performance monitoring. Capacity-building programmes for ULB technicians in O&M, perhaps through public-private partnerships or performance-based O&M contracts, are necessary to ensure the durability and functionality of urban assets. 5. Foster deeper and more meaningful citizen participation: While formal participatory mechanisms exist, there is a need to move towards more concrete and proactive citizen participation. This involves a co-creation process where citizens, especially marginalized groups, are actively involved in identifying problems, designing

solutions and monitoring projects, rather than simply being consulted. The use of digital platforms should be complemented by community-level dialogues and capacity building to enable citizens to effectively understand and articulate their needs.

6. Develop contextual and adaptive urban strategies: Given the diverse urban typology of Rajasthan, a flexible and adaptive policy approach is crucial. Urban development plans should be tailored to the specific historical, economic, environmental and socio-cultural contexts of individual cities. This includes learning from the successes and failures of both national and state-level initiatives (such as the RUIDP) and integrating indigenous knowledge and traditional practices, especially in water management and cultural heritage conservation.

7. Integrate environmental resilience as a core mandate: In a dry state, water security and environmental sustainability must transcend individual projects to become a core mandate of all urban development. Policies should actively promote water conservation (e.g., rainwater harvesting, wastewater recycling, efficient irrigation in urban green spaces), green building codes, and the expansion of green infrastructure. Formal structures are needed.

References:

Agarwal, N., & Sharma, M. (2024). Issues and challenges for urban development in Indian cities post pandemic: A case of Jaipur. ResearchGate. Retrieved from https://www.researchgate.net/publication/353062897_Issues_and_challenges_for_urban_development_in_Indian_cities_post_pandemic_A_case_of_Jaipur

Ahluwalia, I. J. (2011). Report on Indian urban infrastructure and services. Government of India, High Powered Expert Committee (HPEC) for Estimating the Investment Requirements for Urban Infrastructure Services.

Ajmer Development Authority. (n.d.). Home Page Ajmer Development Authority ,Retrieved from https://ada.rajasthan.gov.in/scheme/detail/756

Asian Development Bank. (n.d.). Rajasthan Urban Infrastructure Development Project. Retrieved from https://www.adb.org/sites/default/files/publication/668121/rajasthan-rising-executive-summary.pdf

Brenner, N., & Schmid, C. (2015). Towards a new epistemology of the urban? City, 19(2-3), 151–182.

Census of India. (2011). Provisional Population Totals: Census 2011. Office of the Registrar General & Census Commissioner, India.

Harvey, D. (2008). The right to the city. New Left Review, 53, 23–40.

Kundu, A. (2016). Urbanization and urban policy in India: Critical issues. SAGE

Publications.

Local Self Government, Urban Development & Housing Department, Rajasthan. (n.d.). About the RUIDP. Retrieved from https://lsg.urban.rajasthan.gov.in/content/raj/udh/ruidp/en/home.html.html

Mathur, O. P. (2014). Urban policy in India: An overview. National Institute of Urban Affairs.

Ministry of Housing and Urban Affairs. (n.d.-a). Urbanisation in India. Government of India. Retrieved from https://mohua.gov.in/upload/uploadfiles/files/Urbanisation%20in%20India%20_1_.pdf

Ministry of Housing and Urban Affairs. (n.d.-b). Atal Mission for Rejuvenation and Urban Transformation (AMRUT). Government of India. Retrieved from https://mohua.gov.in/cms/atal-mission-for-rejuvenation-and-urban-transformation-%28amrut%29.php

Ministry of Housing and Urban Affairs. (n.d.-c). Smart Cities Mission. Government of India. Retrieved from https://mohua.gov.in/cms/smart-cities-mission.php

Ministry of Housing and Urban Affairs. (2021). Atal Mission for Rejuvenation and Urban Transformation 2.0 - AMRUT 2.0 Operational Guidelines. Government of India. Retrieved from https://amrut.mohua.gov.in/uploads/AMRUT_2.0_Operational_Guidelines.pdf

Ministry of Housing and Urban Affairs. (2024). Impact Assessment Studies on Smart Cities Mission. Press Information Bureau. Retrieved from https://www.pib.gov.in/PressReleasePage.aspx?PRID=2088429

Pareek, N., & Pareek, S. (2022). Review of Urban Transport Challenges and Sustainable Urban Transport Policies for Jaipur City. Comptroller and Auditor General of India. Retrieved from https://cag.php-staging.com/uploads/media/final-draft-02-01-2023-after-logo-change-066053c6dbeb256-69623460.pdf

Parnell, S., & Robinson, J. (2018). The Routledge handbook on cities of the global South. Routledge.

Press Information Bureau. (2023, August 16). Impact of AMRUT on infrastructure and services. Government of India. Retrieved from https://www.pib.gov.in/PressReleasePage.aspx?PRID=2043167

Rajasthan Finance Department. (2025). Economic Review 2024-25. Government of Rajasthan. Retrieved from https://finance.rajasthan.gov.in/docs/budget/statebudget/2025-2026/EconomicReviewE.pdf

Roy, A. (2019). The city in the age of planetary urbanization. Urban Studies, 56(1), 1–17.

Sharma, R. (2017). Urbanization in Rajasthan: Trends, challenges and policy imperatives. International Journal of Research in Economics and Social Sciences, 7(12), 1-10.

Sridhar, K. (2010). Urban infrastructure, governance, and politics in India. Oxford University Press.