



Towards Sustainable Urban Practices in India: A Study of the Impact of AMRUT in Kochi Municipal Corporation

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Abstract

Urbanisation in India has been marked by unprecedented growth in population and spatial expansion, particularly after the economic liberalisation of 1991. This rapid urban transformation has placed immense pressure on urban infrastructure, governance systems, and basic service delivery, thereby necessitating innovative, sustainable, and inclusive urban planning models. In response to these challenges, India has adopted several urban renewal missions, among which the Atal Mission for Rejuvenation and Urban Transformation (AMRUT), launched in 2015, stands out as a flagship initiative aligned with Sustainable Development Goal 11—making cities inclusive, safe, resilient, and sustainable. This paper critically examines the trajectory of urbanisation in India in the post-LPG (Liberalisation, Privatisation, and Globalisation) era, focusing on the evolution of urban governance frameworks and the role of AMRUT in shaping sustainable urban development. It explores the institutional structure, funding mechanisms, and performance indicators of AMRUT, while also identifying its strengths and limitations. A detailed case study of Kochi, Kerala, is undertaken to assess the on-ground implementation of AMRUT, with emphasis on projects related to water supply, sewerage systems, storm water drainage, and urban green spaces. The study draws from secondary sources, government reports, and field observations to evaluate how effectively the mission has addressed urban challenges in Kochi. Furthermore, the paper analyses the degree to which AMRUT aligns with the targets of SDG 11 and whether it fosters decentralised, citizen-centric governance. It concludes that while AMRUT has made notable progress in expanding urban infrastructure and institutional capacity, gaps remain in participatory planning, transparency, and environmental sustainability. The findings underscore the need for a more integrated, accountable, and climate-resilient approach to urban governance in India. The study offers policy recommendations for enhancing future urban missions and calls for a reorientation of urban planning practices to meet the evolving demands of India's urban future.

Key Words

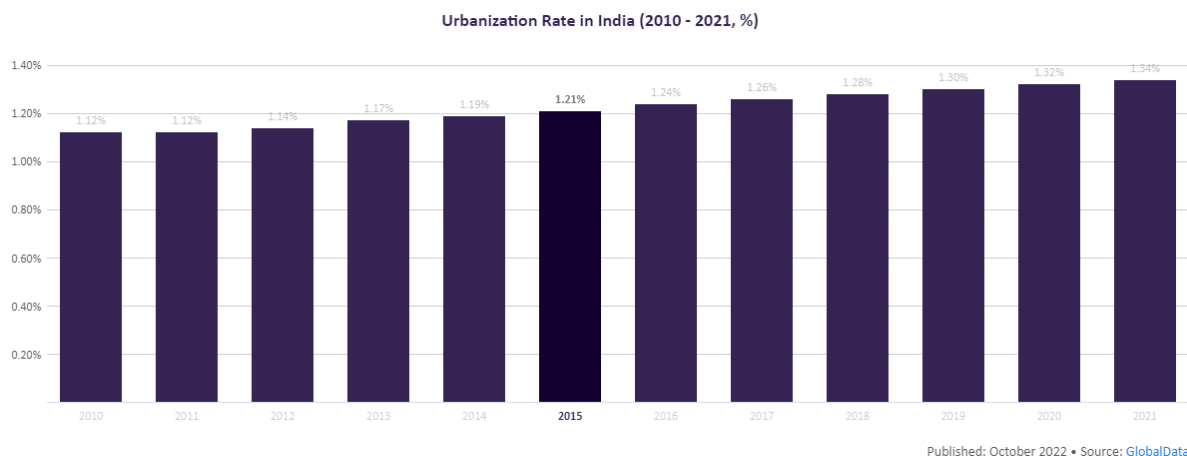
Urbanisation, Sustainable Development Goals, Kochi Municipal Corporation, Urban Local Bodies, AMRUT

Introduction

Urbanisation

When we go back in history, we can see that there were numerous cities in ancient times. The biggest examples include the Indus Valley civilisation, Mesopotamia civilization, Egypt civilization, and China civilization. We commonly refer to places where agriculture does not exist as urban, although the term is shifting. Historically, urban areas were trade, commerce, and small-scale industry centres. However, towards the end of the mediaeval period, numerous large-scale industries emerged due to the introduction of the steam engine, so people left agriculture and began living in areas where industry existed. Nowadays, the tertiary sector is also thriving, which is encouraging large number of people to come to that place. Industrialism led to the concentration of large populations of workers and their families in urban areas, which ultimately gave rise to modern urban living for the majority of people around the world. Throughout the twentieth and twenty-first centuries, sustained economic development and population explosion fuelled the formation of megalopolises—concentrations of metropolitan centres that can span hundreds of kilometres (Encyclopædia Britannica, n.d.).

The term "urban area" does not have a universally agreed-upon definition, as its meaning varies across different regions. Generally, it is associated with population size. Even the United Nations does not provide a fixed definition, instead relying on the individual criteria set by each country, which can differ significantly. A commonly accepted understanding of urbanisation is the permanent concentration of a large number of people within a relatively limited geographic space, leading to the development of cities. For instance, in the United States, an "urban place" is defined as any area with a population exceeding 2,500 residents (Encyclopædia Britannica, n.d.).



The urbanization rate in India has exhibited a consistent and stable trend over the past decade, with the percentage of urbanization showing minor fluctuations from 2010 to 2021. According to data sourced from GlobalData and published in October 2022, the urbanization rate has remained within a narrow range, fluctuating between 0% and 1.4% during this period. Although the data reveals a slight upward trend, indicating gradual urban growth, the overall pace of urbanization has been steady without any significant or abrupt changes.

According to the 2018 Revision of World Urbanization Prospects by the Population Division of the United Nations Department of Economic and Social Affairs (UN DESA), the bulk of future growth in the global urban population is predicted to mainly occur in a select few countries. From 2018 to 2050, India, China, and Nigeria are projected to contribute to 35% of the expected increase in the world's urban population. It is projected that 416 million additional people would reside in Indian cities by 2050, 255 million in China, and 189 million in Nigeria (United Nations, 2018).

Urban Planning and Governance

An area will likely become more populous as a result of the expanding number of people living in cities worldwide. Planning is required to stop this since it will have negative repercussions including pollution and a scarcity of resources. A wide range of spatial planning techniques, such as resource distribution, land use, land planning and management, and spatial morphologies, are referred to as urban planning. Spatial planning is the process of coordinating socioeconomic activities and producing plans, maps, or diagrams that

indicate the locations of these activities in order to achieve certain goals. Urban planning has particular objectives for towns, cities, and metropolitan areas (Huxley, 2009).

In other words, the way that space is organised and used draws attention to the ways that different activities are positioned within the urban environment and to its physical attributes, sociological ramifications, and economic goals. Urban planning is considered a technical field, a political endeavour that involves public engagement, and an academic subject due to its integration of engineering, architecture, and social and political aspects (Encyclopædia Britannica, n.d.)

Sustainable development Goals SDG 11

The UN General Assembly adopted the Sustainable Development Goals (SDGs) in 2015, and all nations are required to adhere to them. In order to propel global development initiatives toward a more sustainable future, the 17 Sustainable Development Goals (SDGs) were established. A wide range of challenges are addressed by the Sustainable Development Goals (SDGs), including as poverty and hunger, gender equality, climate action, and sustainable cities and communities. Sustainable cities are a key element of the Sustainable Development Goals (SDG), as cities are home to over half of the world's population and generate a substantial amount of greenhouse gas emissions.

Cities throughout the world are growing more quickly than ever before, especially in developing countries. Cities are a key cause of environmental degradation in addition to their contribution to the growth of the global economy. The United Nations Environment Programme (UNEP) collaborates with member states and others to accomplish the pertinent Sustainable Development Goals (SDGs) for cities, including SDG 11 (sustainable cities and human settlements). Special attention is paid to policies that lower the risk of disasters, sustainable transport systems, sustainable urbanisation, access to public spaces, sustainable buildings, per capita environmental impact of cities, and affordable housing and basic services (*Sustainable Cities | GEF*, n.d.; *Sustainable Cities | UNEP - UN Environment Programme*, n.d.).

The SDGs for cities are focuses on making cities more sustainable and liveable, while also reducing their impact on the environment. Enhancing urban dwellers' quality of life, encouraging sustainable economic growth, cutting carbon emissions, and guaranteeing access to basic services like healthcare, sanitation, and water are the objectives.

There are several SDGs that are particularly relevant to sustainable cities. These include:

1. **Goal 11: Sustainable cities and communities** - This goal focuses on promoting inclusivity, safety, resilience, and sustainability in urban areas and human settlements. It demands that all urban dwellers have access to sufficient housing, reliable transit, and essential services, and that the natural and cultural legacy be preserved.
2. **Goal 12: Responsible consumption and production** - The main goals of this purpose are to promote sustainable patterns of production and consumption, reduce waste and pollution, and increase resource efficiency.
3. **Goal 13: Climate action** - The goal is to address climate change and its consequences as quickly as feasible. It comprises of actions to reduce greenhouse gas emissions, increase the use of renewable energy, and build defences against climate change-related threats.
4. **Goal 15: Life on land** - Protecting, rehabilitating, and encouraging the sustainable use of terrestrial ecosystems are the main objectives of this aim. It consists of steps to preserve biodiversity in urban and peri-urban regions, fight desertification, and preserve forests.

By working towards these goals, cities can become more sustainable, liveable, and resilient. They can also contribute to the achievement of the broader SDGs, as sustainable cities are essential for achieving many of the other goals, such as those related to poverty reduction, gender equality, and sustainable consumption and production (United Nations. (2015). *transforming our world: the 2030 Agenda for Sustainable Development*).

Trends in Urban Governance in the Post LPG Era

“The LPG reform has brought many changes to this country. In the post-LPG era, urban governance in India has undergone significant changes due to rapid urbanization, economic growth, and technological advancements”(Gupta et al., 2015). Some of the trends and advances in Indian urban governance include decentralization, the urban development mission, e-Governance and digitization, and sustainable urban planning.

Decentralization – The Indian Constitution meticulously incorporates measures to safeguard democracy within the ambit of Parliament and state legislatures, fostering its resilience and growth within these institutions. However, the Constitution does not explicitly require the development of local self-government in metropolitan areas. Although the Directive Principles of State Policy include provisions for Village Panchayats, municipalities are only mentioned in Entry 5 of the State List, which defines local self-governance as a responsibility of the states (MoUD, 1992).

In response to this gap, the 74th Amendment was introduced as a collaborative effort in Parliament. The bill successfully passed through Lok Sabha on 22/12/1992, followed by Rajya Sabha's approval on 23/12/1992, receiving presidential assent on 20/04/1993, and taking effect on 01/06/1993 (MoUD, 1992). The 74th Amendment to the Constitution, enacted in 1992, added a new section—Part IXA—focused on urban local governance. It classified municipalities into three categories based on their size and characteristics: Nagar Panchayats for areas transitioning from rural to urban, Municipal Councils for smaller towns, and Municipal Corporations for major metropolitan centres. The determination of the specific type of municipality to be formed depends on diverse demographic and contextual considerations, thus lying within the jurisdiction of state legislatures. Empowered with requisite authority, all municipalities are endowed with the responsibility to function as effective self-governing entities. The State Legislature has the jurisdiction to give functions and authorities to municipalities through laws, such as developing economic development plans, ensuring social fairness, and implementing authorized programs. The Twelfth Schedule of the Constitution contains an exemplary list of functions that can be allocated to urban local organizations (MoUD, 1992).

e-Governance and digitalization - To bridge the digital divide and promote digital access, inclusion, and empowerment, India's MeitY¹ started the 'Digital India' programme, with the goal of converting India into a knowledge-based economy and society. This all-encompassing approach has significantly narrowed the divide between the public and the government, resulting in transparent, corruption-free service delivery. The programme has changed people's lives, enhanced service delivery, and involved the public in participatory governance through a number of initiatives, including Common Services Centres, DigiLocker, Unified Payment Interface (UPI), e-District Mission Mode Project (MMP), CO-WIN, MyGov, MeriPehchaan, MyScheme, Direct Benefit Transfers, and Diksha. Additionally, significant strides have been made in the agricultural sector with initiatives like the National Agriculture Market (e-NAM), M-KISAN, Farmers Portal, Soil Health Card, and Mobile-based advisory system (M4AGRI). While the draft National Data Governance Framework Policy seeks to maximize India's digital government vision and improve data-driven governance, public service delivery, and research and innovation, the government's data governance initiatives include Open Government Data and API Setu (*E-Governance*, n.d.).

Urban development mission – The PMAY-U², a significant flagship program launched by the Indian government in June 2015 under the MoHUA³, aims to provide all-weather pucca houses to eligible beneficiaries across the country's urban areas through collaborative efforts involving States, UTs, and Central Nodal Agencies. The program's four verticals— CLSS⁴, ISSR⁵, AHP⁶, and BLC⁷—cover all metropolitan regions as determined by the 2011 Census and subsequent announcements. In August 2022, the Union Cabinet gave its approval to extend PMAY-U until December 31, 2024, except CLSS. The completion of the previously approved homes by March 31, 2022, remains the main goal, nevertheless. All PMAY-U homes provide basic amenities including kitchens, bathrooms, electricity, and water supplies. These facilities promote women's empowerment by empowering women to possess property, either individually or collectively. The initiative prioritizes marginalized populations, including those with disabilities, older adults, SCs, STs, OBCs, minorities, single women, transgender individuals, and other vulnerable groups. These homes, which represent a cafeteria approach that adjusts to various individual demands based on regional, economic, and infrastructural concerns, provide a sense of security and dignity. They are a realisation of dignified living (*PMAY (U)*, n.d.).

¹ Ministry of Electronics and Information Technology

² Pradhan Mantri Awas Yojana-Urban

³ Ministry of Housing and Urban Affairs

⁴ Credit Linked Subsidy Scheme

⁵ In-situ Slum Redevelopment

⁶ Affordable Housing in Partnership

⁷ Beneficiary Led Construction/Enhancement

Sustainable Urban Planning -

Smart city mission - Launched on June 25, 2015, by the Hon'ble Prime Minister, the Smart Cities Mission's central aim is to foster cities that offer fundamental infrastructure, sustainable environments, and improved living standards through the application of intelligent solutions. The mission, which is based on extensive improvements in social, economic, physical, and institutional facets, not only promotes economic growth but also raises citizens' standard of living in general. The emphasis is on fostering sustainable and inclusive progress by establishing models that can be replicated, serving as guiding beacons for other aspiring cities. Through a two-stage competition, this organization has selected 100 cities to become Smart Cities (*About The Mission | Smartcities*, n.d.; Murugaiah et al., 2018).

The Central Government is expected to contribute Rs. 48,000 crores over five years, or an average of Rs. 100 crore per city annually, as part of the Centrally Sponsored Scheme. In addition to the additional funds obtained from convergence, ULBs' internal funds, grants from the Finance Commission, creative financial vehicles like Municipal Bonds, other government programs, and borrowings, State/ULBs must equal this amount. Another major goal is to promote business sector involvement through Public business Partnerships (PPP). Selected cities developed the Smart City Proposals (SCPs), which reflected the desires of the populace. When taken as a whole, these proposals included 5,000 projects totaling more than Rs. 2,00,000 crores, of which 45% were to be financed by Mission funds, 21% by convergence, 21% by PPP, and the remaining amount from other sources (Caragliu et al., 2015).

AMRUT (Atal Mission for Rejuvenation and Urban Transformation) - Launched on June 25, 2015, AMRUT is a city-centric initiative aimed at enhancing key urban infrastructure such as water supply, sewage and septage management, stormwater drainage, green spaces, and facilities for non-motorized transport. The goal combines capacity-building initiatives with infrastructure improvements. A total of 82,222 crore has been invested in 5,873 projects under AMRUT (Ministry of Housing and Urban Affairs, 2021; MOUD, 2015). All States and Union Territories have adopted State Annual Action Plans (SAAPs) totaling ₹77,640 crore, and the Central Government has committed ₹35,990 crore in aid. 4,676 projects totaling ₹32,793 crore have already been finished, while 1,197 projects totaling ₹49,430 crore are in various phases of completion. At an approximate cost of ₹59,615 crore, physical work of ₹66,313 crore has been completed. Against the set targets of 139 lakh and 145 lakh, the mission has achieved the installation of 134 lakh new household tap water connections and 102 lakh sewer connections, which also cover Faecal Sludge and Septage Management (FSSM) (Ministry of Housing and Urban Affairs, 2021; MOUD, 2015).

Launched on October 1, 2021, AMRUT 2.0 builds on the goals of its predecessor and offers funding for current AMRUT 1.0 initiatives through March 31, 2023. AMRUT 2.0, which will run from FY 2021–22 to FY 2025–26, intends to handle sewage and septage in 500 cities while guaranteeing that every home has access to 100% tap water (Ministry of Housing and Urban Affairs, 2021; MOUD, 2015). Through City Water Balance Plans (CWBP), which prioritize water conservation, water body rejuvenation, sewage reuse, and rainwater collection, the effort fosters a circular water economy by directing project selection and design according to these sustainability objectives (Ministry of Housing and Urban Affairs, 2021; MOUD, 2015).

Atal Mission for Rejuvenation and Urban Transformation (AMRUT)

The Atal Mission for Rejuvenation and Urban Transformation (AMRUT), a flagship project started by the Indian government in 2015, intends to address the fundamental infrastructure and service requirements of 500 Indian cities in order to enhance their quality of life. The earlier JNNURM⁸, which was launched in 2005, was where this programme got its start. Despite being comprehensive, JNNURM proved to be complex and time-consuming to install. AMRUT became in response, developing a more efficient and economical programme with a targeted and quick implementation schedule (MOUD, 2015).

Cooperation is the cornerstone of AMRUT's organizational structure. The Ministry of Housing and Urban Affairs (MoHUA), which is in charge of the project, works closely with state organizations and urban local bodies (ULBs). City Development Plans (CDPs), which outline the desired improvements for services and infrastructure, are created by Urban Local Bodies. Funding and realisation of the project are made possible by later approvals from the MoHUA and state governments (MOUD, 2015).

⁸ Jawaharlal Nehru National Urban Renewal Mission

The multifaceted functions of AMRUT encompass a range of crucial aspects. It extends financial support to bolster several critical areas, including water supply, sanitation, road and bridge development, solid waste management, storm water drainage, urban transport, green spaces, and affordable housing. Furthermore, AMRUT extends its reach by providing technical expertise to Urban Local Body's, empowering them to efficiently execute the program's objectives (MOUD, 2015).

The significance of AMRUT lies in its potential to revolutionize urban living conditions across India. By channelling basic infrastructure and services to countless urban inhabitants, it carries the power to transform the urban landscape. Serving as a government flagship program, AMRUT sets a model for other nations, showcasing a blueprint for effective urban development. The planning process through AMRUT operates with transparency, inclusivity, and public participation at its core. Here's a succinct outline of this process:

- Urban Local Body's meticulously craft City Development Plans that extensively outline the specific infrastructure and service enhancements required.
- These City Development Plans receive the crucial seal of approval from both MoHUA and the respective state governments.
- Following this, required funds are disbursed to the Urban Local Body's, facilitating project initiation and progress.
- Urban Local Body's, equipped with resources, undertake the intricate process of project implementation, ensuring tangible results (MOUD, 2015).

Crucially, this planning process emphasizes community engagement and involvement. Urban Local Bodies are mandated to solicit public and stakeholder input during City Development Plans formulation, ensuring alignment between projects and the needs of the populace, while simultaneously fostering transparency and accountability. AMRUT's trajectory signifies a significant stride forward in the Indian government's quest to uplift urban living standards. It encapsulates a comprehensive, audacious endeavour poised to reshape urban India. The efficacy of the planning process through AMRUT guarantees the program's efficient execution, guaranteeing the fruition of intended benefits for the citizens it serves (MOUD, 2015).

Thrust area

The major focus of the AMRUT is to address the fundamental aspects of urban development in Indian cities. Water supply, sewerage facilities and seepage management, storm water drainage, pedestrian and non-motorized transportation infrastructure, and the improvement of municipal amenity values through parks, green spaces, and recreation centres are among the mission's top priorities (Murugaiah et al., 2018). This all-encompassing strategy is based on a dedication to improving urban dwellers' quality of life by supporting necessary services and infrastructure.

AMRUT's ambit extends to a wide array of cities, with a comprehensive scope that includes:

- Cities and towns with a population of one lakh or more, including notified municipalities and Cantonment Board civil districts.
- States, UTs, and their capital cities are not included in the previously specified group.
- Towns and cities that the Ministry of Urban Development (MoUD) has designated as Heritage Cities under the HRIDAY Scheme.
- Thirteen cities and towns with populations ranging from 75,000 to one lakh are located along the major rivers..
- Ten cities chosen from various states that are hill states, islands, and popular tourist locations.

AMRUT's program components align with its mission thrust. These components include:

- **Water Supply:** Emphasizes strengthening water distribution networks, expanding capacity, establishing treatment facilities, rehabilitating existing systems, and rejuvenating water bodies for both potable use and groundwater replenishment, particularly in difficult geographical areas.
- **Sewerage:** Includes the development of decentralized underground sewerage networks, expansion of existing systems, creation of treatment plants, and reuse of treated wastewater for productive applications.
- **Septage:** Focuses on efficient faecal sludge management through affordable collection, transportation, and treatment methods, along with mechanical and biological cleaning of sewer lines and septic systems.
- **Storm Water Drainage:** Aims at building and upgrading drainage infrastructure to prevent urban flooding and resolve associated problems.
- **Urban Transport:** Involves the promotion of inland ferry services, infrastructure for non-motorized transport, construction of multi-level parking, and implementation of Bus Rapid Transit Systems (BRTS).
- **Green Space and Parks:** Encourages the creation and enhancement of parks and green areas, with a particular focus on features that cater to the needs of children.
- **Reforms Management & Support:** Establishes frameworks, actions, and financial assistance to enable the execution of reforms, supported by independent monitoring bodies.
- **Capacity Building:** Aims to strengthen the abilities of individuals and institutions, extending these initiatives beyond the designated Mission Cities to include other Urban Local Bodies (ULBs).

AMRUT's clear standards aim to produce urban transformations that are both holistic and sustainable. The mission's inadmissible components demonstrate its commitment to concentrated resource usage, since they exclude areas such as project land purchases, staff wages, power, telecom, health, education, wage employment programs, and staff components (Murugaiah et al., 2018). In essence, AMRUT is a monument to India's aim for inclusive urban development, focusing on crucial aspects that contribute to an enhanced quality of life for its urban inhabitants while fostering transparency, efficiency, and long-term profitability (Murugaiah et al., 2018).

Implementation of AMRUT in Kerala

In the state of Kerala, the AMRUT has significantly improved urban services and infrastructure. Thirteen municipalities and six municipal corporations totaling nine cities in the state have been designated as recipients of the AMRUT funds allocation. This strategic allocation is intended to directly affect 34.71 lakhs people, or around 22% of the entire urban population (Local Self Government Department, 2018).

Water Supply and Management – Under the AMRUT mission, Kerala has undertaken ambitious water supply projects to address the growing urban population's needs. These projects include the establishment of seven water treatment plants with a combined capacity of 208 MLD, 20 water tanks with a capacity of 135 lakh liters, and an extensive 1462-kilometer water supply network. The goal of providing 1.53 lakh water tap connections for universal coverage has resulted in benefiting 32 lakh beneficiaries. The successful completion of 137 projects underscores the commitment to efficient water management and utilization, generating 2.7 crore man-days of employment (Local Self Government Department, 2018).

Sewerage, Drainage, and Transport – Kerala's urban transformation under AMRUT encompasses comprehensive sewerage and drainage projects. The establishment of 14 sewage treatment plants with a total capacity of 43.36 MLD and 5 septage treatment plants with a capacity of 320 KLD underscores the focus on efficient waste management. Universal coverage has been achieved through the provision of 2967 sewer connections and coverage of 87,600 households under septage management. The mission has also targeted stormwater drainage, with 1093 waterlogging points eliminated through the construction of a 389-kilometer stormwater drainage network. The urban transport sector has seen the creation of pedestrian infrastructure, including 75.58 kilometers of footpaths, 17 foot over bridges, and 7 multi-level parking facilities, fostering safer and more accessible urban spaces (Local Self Government Department, 2018).

Green Spaces, Reforms, and Capacity Building – AMRUT's impact extends to enhancing green spaces and parks, ensuring sustainable urban development. The state has developed 72 parks, covering a total area of 33 acres, with a focus on creating environmentally friendly and recreational spaces (Local Self Government Department, 2018). Initiatives to push reforms include streetlight replacement for energy efficiency, credit rating for certain cities, and the development of GIS-based master plans. AMRUT's capacity-building efforts are remarkable; over 2493 personnel have been trained, contributing to improved urban administration and project execution (Local Self Government Department, 2018).

The AMRUT projects in Kerala, initially slated for completion by 2020, have faced delays, with the revised timeline extended to 2022. This delay underscores the immense demand for improved urban infrastructure and services, driven by increased urbanization and migration from other states. The collaborative efforts of the Urban Local Bodies and Kerala Water Authority have been crucial in realizing the goals of AMRUT, particularly in water supply, sewage management, and other vital areas of urban development.

Kerala's participation in the AMRUT mission demonstrates a comprehensive strategy to addressing urbanization concerns and fostering long-term growth. The projects carried out across multiple sectors reflect the state's dedication to improving the quality of life for its metropolitan citizens and providing a pattern for other regions to follow (Local Self Government Department, 2018).

Urbanisation and Urban Governance in Kerala

Kerala, a southern state in India, has witnessed a remarkable trajectory of urbanization over the years. According to the 2011 census, the urbanization rate of Kerala stood at 47.72%, surpassing the national average of 31.16%. Notably, four of the top 15 fastest-growing cities in India are located in Kerala, including Malappuram, Kozhikode, Thrissur, and Kollam, with Malappuram exhibiting the highest growth rate of 44.05% (Aravindan & Warriar B, 2020). This urban transition has unfolded across distinct phases, each marked by unique socio-economic dynamics.

First Phase (1956 – 1975) - In the initial phase following Kerala's formation in 1956, the state prioritized agricultural development, leading to a gradual economic growth trajectory. Industries such as coir, cashew, and handloom prevailed, contributing to labor-intensive economic activities. Despite facing challenges of poverty and unemployment, the government's emphasis on social-welfare policies and investments in education and agricultural advancement set the foundation for future growth (Pulikkamath & Palathara, n.d.).

Second Phase (1975 – 1991) - During the subsequent phase, a lack of private sector and limited secondary sector presence prompted a substantial portion of the population to seek employment opportunities abroad, particularly in Gulf nations. This migration wave not only boosted income levels and consumption patterns for migrant households but also triggered significant economic changes across labor markets, income distribution, and regional development. The resulting social mobility contributed to Kerala's urbanization, backed by private investments and moderate growth trends (Pulikkamath & Palathara, n.d.).

Third Phase (1991 – Present) - The onset of the third phase coincided with India's neo-liberal policy reforms, initially met with reservations by the Kerala government. Despite a slower urbanization rate in the initial years, this phase witnessed a surge in the tertiary sector, notably in education and health, driven by private investments. The 'gulf boom' effect, coupled with the pace of urbanization at 21%, outstripping the national trend of 6%, brought about significant transformations. The number of towns expanded remarkably, underscoring the dynamism of Kerala's urbanization (Pulikkamath & Palathara, n.d.).

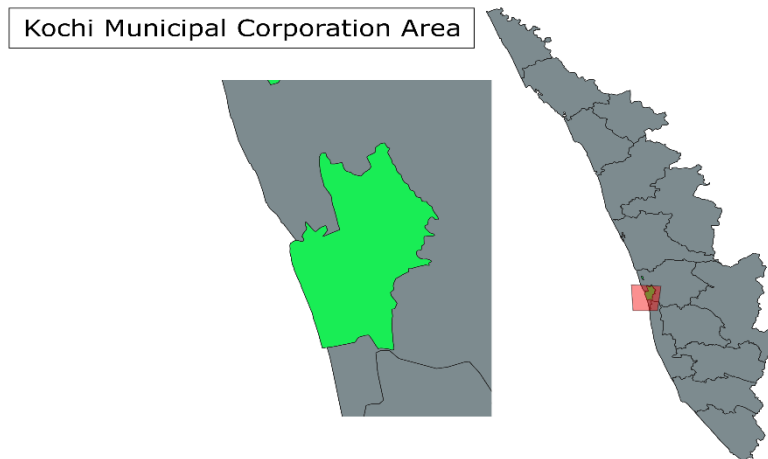
Urban Local Body (ULBs) Evolution

The formation and evolution of ULBs in Kerala have mirrored the state's socio-economic and political developments since its inception. The first ULBs appeared in 1960, and they were classified as municipalities and panchayats respectively. Over time, these groups have played an essential role in decentralizing power and promoting progress. Reforms in the 1970s established ward committees, municipal corporations, and enhanced powers for taxing and revenue production" (Government of Kerala, 1994). "Subsequent constitutional amendments in the 1980s empowered local bodies further, necessitating the provision of basic services and seat reservations (Government of Kerala, 1994).

The 1990s witnessed additional reforms, including building regulations and service delivery projects. In recent years, the Kerala Urban and Rural Sanitation Mission, Smart Cities Mission, and AMRUT have all demonstrated a dedication to sustainable urban development. Throughout these phases, ULBs have navigated challenges and evolved, aligning with Kerala's changing urban needs (Mathew, 2017).

Kerala's urbanization journey is a testament to its economic, social, and political evolution. The state's phases of growth have been accompanied by shifts in urban governance, with ULBs adapting to emerging demands while contributing significantly to urban development and living standards (Mathew, 2017).

Kochi and Kochi Municipal Corporation



The roots of Kochi Municipal Corporation trace back to the 19th century, with Fort Cochin, Mattancherry, and Ernakulam serving as its early municipalities. Over time, this historic journey led to the establishment of the corporation on November 1, 1967. A confluence of ancient municipalities and panchayats formed the city's administrative fabric, paving the way for a vibrant urban center (History | Cochin Corporation, n.d.).

Spanning an area of 94.88 sq. km, the corporation caters to a population of 602,046. Its governance is divided into six zones, each with distinct social offices. The headquarters, adjacent to the boat port, is home to essential departments, including the Mayor's and Deputy Mayor's offices, City Planning, and Health. A comprehensive framework, represented by dedicated departments, fuels the city's administrative functions (General Information | Cochin Corporation, n.d.).

Further insight reveals an intricate network of services. Mother and child care centers, along with an array of Anganwadis, emphasize the city's commitment to community well-being. With 22 health circle offices spread across diverse wards, Kochi Municipal Corporation's health endeavors exhibit its dedication to holistic care (General Information | Cochin Corporation, n.d.).

Kochi's urbanization paints a captivating narrative. Formerly known as 'Perumpadappu Swaroopam,' the city's growth from a historic trading hub to a cosmopolitan metropolis is emblematic. Situated at the confluence of ancient kingdoms, Kochi's evolution encapsulates the essence of diverse cultures. Its coastal allure facilitated international trade, contributing to its early prosperity (History | Cochin Corporation, n.d.).

A timeline of development from 1956 to 2021 showcases Kochi's remarkable journey. Evolving from a trading center, the city diversified its economy, embracing sectors like textiles and shipbuilding. The city's charm attracted tourists, drawn by its cultural heritage and architectural marvels. Modern eras saw growth in industries like IT and biotechnology, supported by enhanced infrastructure (Krishnan, 2018; Mishra, 2014; Balakrishnan, 2012).

Amidst this growth, Kochi confronted urbanization challenges. Strains on infrastructure led to congestion and pollution. However, the city responded with resilience. Initiatives promoting sustainable development, bolstered public transport, and expanded green spaces depict Kochi's proactive approach (Nair, 2020; Chandramouli, 2019).

Kochi's journey unfolds as a testament to its ability to adapt, transform, and sustain. From its historical roots to a bustling urban hub, the city is poised to embrace the future, fostering sustainable development and creating a harmonious urban landscape (History | Cochin Corporation, n.d.)

Evaluation of AMRUT Project in Kochi Municipal Corporation

Kochi is one among the 500 cities selected for AMRUT mission, with Kochi Municipal Corporation and Kerala Water Authority as the implementing agencies. The Kerala State Annual Action Plan (SAAP) proposed 999 projects for the 9 cities in which 98 project were to be executed in Kochi. The cost of the entire project proposed in SAAP is 328.78 crore, the administrative sanction to the total projects was changed to 272.06 crore, the technical sanction to this project was changed to 264.26 crore.

Sector	Number of projects
Water Supply	19
Sewerage and Septage Management	4
Storm Water Drainage	49
Urban Transport	21
Green Space and Parks	5

Water and Sanitation: Transforming Kochi's Hygiene and Health

The AMRUT project has brought about a remarkable transformation in the water and sanitation infrastructure of Kochi Municipal Corporation. Recognizing the challenges posed by the city's waterlogged terrain and polluted groundwater sources, the project has focused on ensuring a reliable and clean water supply. The city's principal source of drinking water, the Periyar River, has been harnessed to meet the growing demands. Through the efforts of the Kerala Water Authority and the corporation, projects such as pipeline development and construction of new water tanks have significantly enhanced the water distribution network. The implementation of Over Head Water Tanks has proven instrumental in maintaining consistent water pressure across the city, ensuring equitable access even in distant areas. Additionally, initiatives like replacing concrete pipes with steel and PVC pipes have not only improved flow efficiency but also curbed non-revenue water losses. The integration of Rain Water Harvesting tanks under the Public-Private Partnership model is yet another stride towards water security, engaging citizens' participation to mitigate water scarcity risks. The journey towards a robust water supply system under the AMRUT mission stands as a testament to Kochi's commitment to public health and sustainable urban development.



Sewerage Treat Plant (STP) at Elamkulam



Storm Water Drainage at Thevara



40 LL capacity OHSR, Kaloor



Rain Water Harvesting tanks built in AMRUT

Urban Mobility: Paving the Path for Efficient City Travel

Kochi's urban mobility landscape has witnessed a remarkable overhaul through the AMRUT project's urban transport initiatives. The city's vibrant growth had led to concerns regarding non-motorized transportation options, pedestrian safety, and congestion. The corporation's proactive commitment to constructing pedestrian-friendly infrastructure such as footpaths and walkways has had a significant impact on improving the safety and convenience of urban commuting. The creation of dedicated cycling tracks has not only promoted eco-friendly commuting but has also added a touch of vibrancy to the cityscape. The well-conceived road junctions and junction development projects have streamlined traffic flow, contributing to reduced congestion and improved overall mobility. These efforts have not only elevated the quality of life for Kochi's residents but have also aligned with global trends toward sustainable and efficient urban transportation networks. The AMRUT mission's focus on urban mobility showcases Kochi's commitment to creating a city where accessibility, safety, and environmental concerns are seamlessly integrated.



Footpath built in AMRUT (a) K.P. Vallon road (b) Panambilly nagar

Parks and Green Spaces: Breathing Fresh Life into Kochi's Urban Fabric

In a bustling cityscape like Kochi, the AMRUT project's emphasis on parks and green spaces has been a breath of fresh air, enhancing the quality of life and fostering community well-being. The initiative to create and renovate parks and open areas has addressed the challenges posed by urban congestion and pollution. These green oases provide residents with essential spaces for relaxation, recreation, and socialization. The rejuvenation of existing parks like St. John Park and the establishment of new ones such as Mythri Nagar Park have contributed to transforming the urban environment into a healthier and more inviting one. Not only do these green spaces offer a respite from the daily urban hustle, but they also serve as venues for cultural and sports events, further fostering community bonding. The AMRUT project's focus on parks and green spaces underscores Kochi's commitment to nurturing a harmonious urban ecosystem where people can thrive amidst the natural beauty that complements the city's dynamic spirit.



Kudumbi Colony Green Space at Elamkulam

Discussion and Conclusion

Achievements of the AMRUT Mission:

The AMRUT mission in Kochi Municipal Corporation has made tremendous progress toward improving municipal infrastructure and the general quality of life for its residents. The mission's emphasis on water supply has resulted in increased access to safe and reliable drinking water, reducing household burdens and assuring better public health outcomes. The introduction of Over Head Water Tanks has revolutionized water distribution, ensuring equitable supply to all parts of the city. The establishment of Rain Water Harvesting tanks under the PPP model has not only contributed to water security but has also fostered community engagement. The efforts in urban mobility, including the development of footpaths, walkways, and cycling tracks, have enhanced safety and convenience for pedestrians and commuters. The creation and revitalization of parks and green spaces have provided essential breathing spaces for residents, promoting well-being and community interaction. The AMRUT mission's achievements are evident in the transformation of Kochi's urban landscape, contributing to a more sustainable and livable city.

Challenges Faced and Way Forward:

Despite the successes, the AMRUT mission in Kochi has encountered several challenges that warrant attention for future endeavors. The geographical and soil constraints of the region have posed difficulties in construction, impacting project timelines and outcomes. Addressing these challenges requires innovative engineering solutions and careful planning to ensure the durability and effectiveness of infrastructure. Public protests and concerns over land use have at times impeded project progress, emphasizing the need for transparent communication and community engagement. The unexpected disruptions caused by natural disasters like the Kerala Floods in 2018 and the COVID-19 pandemic highlight the necessity for robust contingency plans to manage unforeseen circumstances. As AMRUT 1.0 comes to an end, the transition to AMRUT 2.0 provides an opportunity to build on past accomplishments and lessons gained, with a focus on vital sectors such as water supply, sewerage, and waste management.

Suggestions and Future Directions:

1. **Community Awareness and Engagement:** Strengthen communication with the public through awareness campaigns, community meetings, and workshops to ensure that residents understand the benefits and long-term impact of the projects. Address concerns and misconceptions to build support and ownership.
2. **Innovative Construction Techniques:** Collaborate with engineering experts to develop innovative construction techniques that overcome soil and geographical challenges, ensuring the longevity and stability of infrastructure.
3. **Climate-Resilient Infrastructure:** Incorporate climate-resilient designs in drainage systems and flood management to mitigate the impact of heavy rains and floods, safeguarding both infrastructure and communities.
4. **Timely Project Implementation:** Implement strict project timelines and monitor progress to ensure timely completion, reducing the risk of project delays and cost overruns.

5. **Integrated Urban Planning:** Foster collaboration between various departments and agencies involved in urban planning to ensure seamless integration of projects and maximize their overall impact.
6. **Sustainability and Maintenance:** Develop a comprehensive plan for the maintenance and sustainability of the created infrastructure, ensuring that assets remain functional and well-maintained over time.
7. **Citizen Feedback Mechanism:** Establish a robust feedback mechanism that allows residents to provide input on project performance and suggest improvements, promoting accountability and continuous improvement.
8. **Public-Private Partnerships:** Explore opportunities for increased participation from private entities, leveraging their expertise and resources to accelerate project implementation and enhance outcomes.

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