



International Journal
for research in Economics

Published By:

Green Publications Services Private LTD.

Volume 01 Issue 03 September 2026

ISSN: XXXX-XXXX

DOI: xyzzzz

Dr. Jai Prakash Verma^{1*}

Dr. Khushboo Verma²

^{1*}Regional Director, IGNOU Regional
Centre Lucknow, Lucknow (India)

E-mail: jpverma@ignou.ac.in

²Assistant Professor, Department of
Applied Science & Humanities, Faculty of
Engineering & Technology, University of
Lucknow, Lucknow (India)

E-mail: verma_khushboo@lkouniv.ac.in

*Corresponding Author: Dr. Jai Prakash
Verma (jpverma@ignou.ac.in)*

International Journal for Research in Economics

Sustainable Urban Development: With Special Reference to Uttar Pradesh

Article History:

Article Type: Research\Review

Received Date: 22/06/2026

Revised Date: 16/08/2026

Acceptance Date: 05/09/2026

Published Date: 23/09/2026

Abstract

Cities have the potential to exert a considerable influence on the agenda for global development as they are the primary agents of economic development across the globe. There are millions of people living in densely populated areas, which makes cities more vulnerable to the effects of climate change, natural disasters, resource depletion, chaotic growth, and socio-economic disparities. In the context of India's presidency of the G20, there is an opportunity to demonstrate that the policies and practices established by cities have a substantial impact on the accomplishment of global development priorities. The Group of Twenty (G20) consists of 19 nations, and European Union. India's G20 Presidency (December 1, 2022 to November 30, 2023) was characterised by an unparalleled magnitude, extent, and range, with more than 200 meetings held several cities throughout all major states and union territories of India. The G20 Presidency is a significant chance for India to highlight issues of utmost global significance, present its perspectives on development, and leverage its strengths as the fastest growing major economy to influence the G20 agenda. India's G20 priorities consisted of LiFE - Lifestyle for Environment; Accelerated, Inclusive & Resilient Growth; and Accelerating progress on Sustainable Development Goals (SDGs). Priority areas for Urban 20 event included: (1) Encouraging environmentally responsive behaviour; (2) Ensuring water security; (3) Accelerating Climate Finance; (4) Leveraging 'local' potential and identity; (5) Reinventing urban governance and planning frameworks; and (6) Catalysing digital urban futures. Against backdrop, present paper purports to examine the policy initiatives and their implications for sustainable and inclusive urban development in context of G20 in India and particularly Uttar Pradesh. The paper is based mainly on secondary data besides critical appreciation of pertinent literature on the subject.

Keywords: Sustainable Urban Development, G-20 Declaration, Sustainable Development Goals, Socio-economic Disparities, Resource Depletion

Introduction

India has the second largest urban population in the world. The rapid urbanisation of Indian cities during the past two decades, and in the future, requires significant investment in public infrastructure. Therefore, it is crucial to strategize for the development of cities that are inclusive and environmentally friendly, and that encourage intelligent, inclusive, and sustainable urban growth in order to enhance the well-being of their expanding population. In order to accomplish the aforementioned goal, cities require both access to funding and technological support. The cities must undergo an evaluation of their preparedness to attract climate finance that is both reproducible and scalable, and meets the criteria set by funding agencies. Furthermore, cities need to have a comprehensive understanding of the essential criteria and procedures for obtaining climate financing at the municipal level. India's G20 leadership provides an opportunity to showcase the policies and practices that have been implemented. The Urban 20 engagement group highlighted the potential of city-level initiatives to generate enduring positive results for the entire world, aligning with the overarching theme of the G20. The U20 seeks to transition from mere intention to concrete action and establish a comprehensive plan for worldwide change, led by cities. This will be achieved by addressing deficiencies in policy and implementation across all levels of governance. The Urban 20 cycle has been planned to prioritize several priorities. In order to ensure enforce international treaties and conventions, the idea of 'encouraging environmentally responsible behavior' has been advocated. The priority area of 'Ensuring Water Security' has been recommended to lessen the vulnerability of water ecosystems. Water resource management is a critical issue for future generations to maintain water security. The mainstreaming of youth, women and children in urban planning and governance is imperative for inclusive, equitable and gender just urban development and addressing gender needs and concerns in urban planning for infrastructure development and services delivery. 'Accelerating Climate Finance' is important to facilitating large-scale investments necessary to implement steps to dramatically decrease emissions and alleviate the negative consequences of climate change. Climate change, urban risks and vulnerabilities also affect the delivery of municipal services and quality of life of urban dwellers. Reinventing Frameworks for Urban Governance and Planning' is crucial for investigating creative frameworks for planning and hybrid governance in order to establish shared infrastructure and promote regional economic clusters. Promoting feasible models for implementing and financing renewal of different areas in the city, creating opportunities to plug in principles of place-making, sustainable mobility, circular economy, green buildings, disaster preparedness, etc. can help combat the various externalities of urban.

Urbanization is critical for the development of a nation; however, unplanned and haphazard urbanization leads to severe challenges for policymakers and administrators. Thus, sustainable and planned urban development is imperative. Cities, as critical engines of growth across the world, have an apparent effect on the global development agenda. However, cities are also the most exposed to climate change, catastrophes, environmental degradation, resource depletion, uncontrolled expansion, and socioeconomic disparity. It is thus the appropriate moment to use urbanization's potential as a catalyst to generate the 'correct' form of growth, which is sustainable, inclusive, and equitable. The Urban 20 is a consortium of cities from the G20 nations that met

for the first time in Buenos Aires in 2018. The U20 aims to shift from intention to action and to create a blueprint for global transformation that will be driven by cities by addressing policy and practice gaps at all levels of governance. AMRUT 2.0 will promote circular economy of water through development of city through improving the coverage of water connections, sustainability of water resources, and focusing on recycle/reuse of treated sewage, rejuvenation of water bodies and water conservation. Similarly, SBM 2.0 focusses on garbage free cities and effective management of waste water. Smart City Mission has shifted its focus on making cities resilient towards climate change and disasters.

Review of Literature

Urbanization is critical to the development of country (McKinsey, 2010). There are now significant environmental challenges as a result of unplanned and unsustainable urban expansion (Singh and Pandey, 2012). In densely populated commercial areas, urban heat islands were particularly strong (Mohan, Kikegawa, Gurjar, Bhati&Kolli, 2013). Urban heat islands and land surface temperature vary with the seasons and the day (Singh, Grover & Zhan, 2014). There has never been a more urgent need to address the climate catastrophe in our quickly changing world (Trotta, 2022). People who live in slums and other informal settlements, where access to essential amenities and infrastructure is frequently lacking, are the groups most at risk from climate change (IDS, 2007). The ecological and socioeconomic systems are already under a lot of strain from increasing industrialization, urbanization, and economic expansion. Climate change could add to that pressure (Gupta, 2005). The LiFE, a worldwide mission (NITI Aayog, 2021), issued by India in 2021. Due to sustainable societal values, the average annual carbon footprint per person in India (NITI Ayog, 2022). In India, a sizable portion of the urban population lives in slums, squatter settlements, and unofficial housing that are vulnerable to both direct and indirect dangers (Satterthwaite et al., 2007). People who live in slums and informal settlements, where access to essential amenities and infrastructure is frequently limited, are the groups most at risk from climate change (IDS, 2007). The smaller towns are finding it difficult to deal with population increase and resource rivalry because they lack the necessary infrastructure and funding (McGraham et al., 2007). Policies pertaining to urban resilience and sustainability fundamentally need to address many sectors and dimensions (Nijkamp and Finco, 2000). India is one of the world's fastest expanding economies and the third-highest greenhouse gas emissions (Timperley, 2019). The country's average temperature has already increased as a result of greenhouse gas emissions, (Nithin, 2021). ICWSSM (2019) reported that changes in consumption patterns and pollution as living standards improvement are among the human-induced stresses on water resources, along with withdrawals for agriculture (UNESCO, 2021). The G20 leadership needs to assume the responsibility of being global water stewards (MoHUA-NIUA, 2023). These are concentrating on regenerative systems, minimizing waste and pollution, and maintaining the use of products and materials (Kalaari, 2022). The U20 platform provides the best international collaboration tools for learning about different approaches to adapting planning and governance frameworks to new problems (Pandey, 2023). According to G20-NIUA (2023) the U20 is the greatest forum for cooperative transboundary learning about various strategies for modifying planning and governance frameworks to address new issues. Verma and

Gill (2008) maintain that inclusive urban governance reduces inequality and social tension besides incorporating the knowledge, productivity, social and physical capital of the poor in the city development. Rauniyar (2010) has argued for inclusive development that focuses on investment on infrastructure. Women contribute significantly to the urban development framework, hence inclusive and equitable urban environments is called for (MoHUA-NIUA, 2023). Schrecongost et. al. (2020) reviewed the genesis of City-Wide Inclusive Sanitation and lay out the required public service delivery system's core outcomes. Gambrell et. al. (2020) argue that on-site and decentralised solutions for waste water management must be tailored to growing cities. Over the past five years, open defecation and FSM have greatly improved in India (NFSSM, 2020). Understanding the concepts of resilience, vulnerability, and adaptability is becoming more and more important to policymakers and developmental planners in order to enable proactive and well-informed responses to urban disasters (Dayton and Johnson, 2004).

India's Path towards Localising SDGs

India has embraced the framework of the Sustainable Development Goals and matched the global objectives with its development strategies and missions. Driven by the ideas of inclusive growth and sustainability, the nation has achieved notable strides toward the SDG targets. However, localising SDGs—the process of putting plans into practice at the city level to achieve national and international sustainability goals—is a difficult task. The COVID-19 pandemic has created a number of socio-economic issues that have made the situation even more difficult, even as urban local bodies continue to struggle with limited technical and management capacities. This has not only slowed the momentum towards adopting SDGs but also has increased the spotlight on the functions of urban local bodies which now need to be improved to establish a resilient urban society. In response to the pandemic and economic downturn, the appeal for making an Atmanirbhar India—backed by the five pillars economy, infrastructure, system, demography, and demand—will only be realised if our cities are sustainable and productive. There is no question that a self-reliant India would emerge from self-reliant cities. This attempt will require a strong synchronicity between the national planning strategies and the global frameworks. It is vital that both are implemented locally. Strengthening local economic development—that is, increasing economic capacity by meeting the fundamental socioeconomic needs—is one of the most crucial implementation measures. We must also change from regulatory based planning to strategic planning. Stronger regional networks that boost investments, the development of spatial strategies that encourage growth, and the creation of enabling policies for people, production, and productivity are all made possible by such planning. This is the decade of action for SDGs and it is vital to develop an action-oriented strategy to accomplish the goals of economic self-reliance, inclusion and sustainability. In order to take action at the local level, we must harmonise the policy climate, support creative finance methods, and bolster institutional capacities.

Government has high priority to provide sustainability, inclusivity, and an enhanced standard of living in Indian cities. People who are moving from rural to urban areas hope to improve their quality of life by having access to improved living conditions and chances for employment that include social, institutional, economic, and physical infrastructure. Given the speed at which

cities are expanding, it is a significant challenge. Nonetheless, the administration views it as a significant chance to boost the economy. Investments in urbanisation projects will enhance living conditions, provide jobs, and utilise residents to the fullest extent possible for the benefit of the country. Slum upgrading and other physical improvements have been the main focus of traditional interventions. Nonetheless, the government has taken a comprehensive approach that incorporates social, economic, environmental, and governance aspects of sustainability and urban inclusion. Three-level strategies exist: (1) The three main issues at the first level are sanitation, affordable housing, and poverty alleviation. Nearly 4,400 urban local bodies (ULBs) have implemented the DeenDayalAntyodayaYojana-National Urban Livelihood Mission (DAY-NULM), Pradhan MantriAwasYojana-Urban (PMAY-U), and Swachh Bharat Mission Urban (SBM-U); (2) At the second level, the focus is on basic infrastructure such as water supply, sewerage/septage projects, and green parks. At the third level, 100 cities are being developed under the Smart Cities Mission (SCM) to address the issue of ease of living with improved quality of life, sustainability, and economic-ability by evolving a new paradigm of urban governance with communities at the center and increased use of digital technology to improve the urban infrastructure, services, and optimal utilisation of resources. These sectors require economies of scale and are being implemented through the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) in all statutory cities and towns.

It is commonly known that India's cities have the capacity to spur economic growth. Similarly, Indian cities suffer from the shame of falling behind in terms of political representation, social infrastructure, and economic justice. In order to attain social, economic, and environmental harmony, we must have strong and creative urban solutions since the stakes are so high. There is no question that a progressive urban agenda is essential to achieving the Sustainable Development Goals (SDGs), which are centred on the pursuit of the principles of economic advancement, social equity, and environmental sustainability. Housing, transportation, and other basic needs will become more difficult as Indian cities accommodate their expanding populations. This could result in higher energy and water demands, increased greenhouse gas (GHG) emissions, waste production, declining air quality, and negative effects on human well-being. The Climate Smart Cities Assessment Framework (CSCAF), first of its kind evaluation on climate related criteria, initiated by the Ministry of Housing and Urban Affairs, Government of India, and intended to be used as a tool for cities to monitor urban climate initiatives and monitor its impact. SDG 11.3 primarily focuses on integrated and participatory planning development, efficient land use, and inclusive and sustainable urbanisation. The CSCAF assessment appropriately assesses the climate level sustainable factor focused on urbanisation. The framework also focuses on making the cities aware of their respective existing scenario of the city and advise the activities that need to be followed in improving upon the climate resilient performance at an annual level. The framework strengthens the preparedness and planning process at the grassroots level and becomes advantageous to the cities, as the progressive level recommendations will assist cities to adopt necessary actions. Smart Cities have an urgent need to develop at a sustainable level, and not merely the focus of technology. The cities need to be self-resilient in effectively tackling the detrimental consequences of climate change through integrated governance practice in the planning process.

Sustainable Development in Uttar Pradesh

Uttar Pradesh occupies the central position in the northern India. It is the most populous state in the country. The state witnessed a tremendous growth in its urban population during the last three decades. Uttar Pradesh is the most populous state in the country which accounts for 16.4 percent of the country's population. It is also the fourth largest state in geographical area, covering 9 percent of the country's geographical area. The pace of urbanization has been lowering in the state. The urban population of the state in 2011 was reported to be 4.44 crore, constituting 20.78 percent of the total population of the state (Figure1). Uttar Pradesh occupies the central position in the northern India. It is the most populous state in the country. In the state of Uttar Pradesh, there are 762 urban local bodies. There are 17 Municipal Corporations, 200 Nagar Palika Parishads, and 545 Nagar Panchayats. Given providing basic facilities to the increasing urban population in the state, more than 100 new Nagar Panchayats have been created while the area of 56 Nagar Panchayats has been extended. Moreover, the area of 34 Nagar Palika Parishads has been extended and these were upgraded. The responsibility to provide fundamental civic amenities to the population residing in urban areas has been entrusted to ULBs. These include clean drinking water supply, roads and streets, sewage management, sanitation facilities, waste disposal, sewage systems, street lighting, parks, a clean environment, and more. In this process, the focus is on ensuring that the basic needs of the population are met, fostering better living conditions, and maintaining a sustainable and clean environment. The urban local bodies play a crucial role in fulfilling these duties and responsibilities. As the population residing in urban areas continues to grow, ensuring adequate infrastructure and services becomes even more imperative.

The planning, growth, and development of cities to support increasing populations and raise living standards is referred to as urban development. It involves infrastructure development, housing, transportation, sanitation, and environmental sustainability. Effective urban development assures organised expansion, decreasing congestion and promoting economic opportunities. Modern urban planning incorporates smart city concepts, sustainable architecture, and efficient public services to produce liveable surroundings. Governments and business sectors collaborate to address challenges like pollution, limited housing, and transportation congestion. Technology-driven solutions, such as intelligent traffic management and green and blue infrastructure including buildings, play a key role. There are several advantages to urban development, such as greater public services, transportation, and infrastructure. By drawing in companies, creating jobs, and supporting regional industries, it generates economic prospects. In addition to offering access to healthcare, education, and sanitary services, well-planned cities also lessen traffic.

ULBs in India face a number of obstacles that affect their efficacy. It is, therefore, the appropriate time to utilise the potential of urbanisation as a catalyst to create the 'correct' kind of growth that is sustainable, inclusive, and equitable. By addressing policy and practice gaps at all levels of governance, the U20 hopes to move from intention to action and develop a plan for

global transformation led by cities. In northern India, Uttar Pradesh holds a central place. Cities are now the center of economic growth due to rapid urbanisation, which makes them essential contributors to the GDP of the country. Understanding this crucial role, the federal and state governments have continuously made improving civic facilities in metropolitan areas a top priority through a number of carefully thought-out initiatives. These programs concentrate on several facets of urban development, such as infrastructure, sustainability, sanitation, and general quality of life. Swachh Bharat Mission (SBM) 1.0, SBM 2.0, Atal Mission for Rejuvenation and Urban Transformation (AMRUT) 1.0, AMRUT 2.0, and the Smart City Mission are some of the notable initiatives.

The state government has initiated new state sponsored development projects which target establishment of green and sustainable infrastructure, inclusive, resilient and growth orientated civic facilities and reforms based institutional mechanism for successful delivery of municipal services. The Smart City Mission for Four Municipal Corporations, Mukhya Mantri NavSrijit Nagar Yojana, Mukhya Mantri Vaiswik Nagrodaya Yojana, UPVAN, Mukhya Mantri Green Road Infrastructure Development Yojana, introduction of Metro Rail services, e-buses Scheme for urban centres, CNG City Buses, etc. are the principal state policy initiatives. Additionally, the state is successfully executing the Smart City Mission, AMRUT 2.0, SBM 2.0, PMHFA, DAY-NULM, and PM SVA-Nidhi. By boosting urban infrastructure, sanitation, water supply, waste management, and general quality of life, these programs work together to improve civic amenities. Cleaner streets, better waste management techniques, better water supplies, and improved public areas are just a few of the good changes they have sparked in communities. Nevertheless, there is a dearth of relevant literature, data, and empirical study findings about the effects and ramifications of policy measures in relation to G20 pronouncements.

The G20 Presidency is a critical platform for India to highlight issues of uttermost global concern, express its viewpoints on development, and harness its strengths as the fastest growing major economy to influence the G20 agenda. In this environment, the Urban 20 project takes on fundamental relevance, particularly in the context of India, as we navigate through evolving views, problems, and map a way forward. India, a country rich in diversity and vitality, is about to undergo a significant urban revolution. Its cities are hubs of innovation, culture, and economic expansion rather than just geographical locations. However, this fast urbanisation comes with its own set of challenges and opportunities. With a booming population and substantial migration from rural areas, Indian cities are seeing remarkable expansion. This creates great demand on infrastructure, housing, sanitation, and public services. The need of the hour is sustainable urban design that balances economic development with social inclusion and environmental conservation. ULBs in India face a number of obstacles that affect their efficacy. Decentralisation, governance reforms, efficient management of municipal resources, and financial autonomy are required in light of the strengthening of ULBs.

SBM 1.0 was introduced in 2014 with the goal of achieving universal sanitation coverage, with an emphasis on providing appropriate solid waste management and eliminating open defecation (ODF) throughout India. The initiative resulted to the installation of millions of household toilets, communal toilets, and public toilets, considerably improving sanitation conditions. It also emphasised behavioural change through awareness programs. Launched in 2019, SBM 2.0

expanded on the goals of SBM 1.0 by emphasising efficient waste segregation and comprehensive solid waste management. It aspired to establish a circular economy by fostering waste-to-energy and waste-to-compost enterprises. Eliminating single-use plastics and advancing urban cleanliness and hygiene were the goals of this mission phase. Launched in 2015, AMRUT 1.0 focused on the development of urban infrastructure by guaranteeing fundamental public services like urban transport, sewage management, and water supply. It sought to increase the quality of life for urban people and promote urban reforms through projects relating to water supply, sewerage, drainage, urban transport, and green areas. The mission's effects were evident in increased urban mobility, effective sewage management, and access to clean water. By concentrating on initiatives pertaining to water supply, sewage management, storm water drainage, urban transportation, green areas, and recreational amenities, AMRUT 2.0 aims to further change cities. It seeks to develop sustainable urban environments that offer residents a good standard of living. The Smart City Mission was started in 2015 with the goal of turning 100 communities into sustainable, high-tech urban hubs. Enhancing infrastructure, increasing urban mobility, guaranteeing effective public service delivery, and encouraging citizen involvement are the objectives of the mission. The Smart City Mission has resulted in the construction of contemporary urban infrastructure, integrated traffic management systems, improved waste management, and citizen-centric services through area-based development and pan-city efforts. By boosting urban infrastructure, sanitation, water supply, waste management, and general quality of life, these programs work together to improve civic amenities. Cleaner streets, better waste management techniques, better water supplies, and improved public areas are just a few of the good changes they have sparked in communities. Additionally, by generating jobs in the building, maintenance, and related industries, these programs promote economic growth.

As part of the Namami Gange Program, the Uttar Pradesh government constructed sewage treatment facilities (STPs) to prevent the release of untreated sewage, ensure cleaner water, and restore the biological balance of Ganga River and cleanliness. The government of Uttar Pradesh has created urban infrastructure and services in 66 cities as part of the AMRUT Mission, emphasising sustainable urban development, sewage management, water supply, and sanitation to increase living standards. The UP government prioritised green and sustainable urban development through tree planting programs, the promotion of green building practices, and the use of renewable energy sources in order to guarantee a cleaner and more ecologically friendly metropolitan environment.

To reduce poverty and vulnerability of the urban poor households by enabling them to access gainful self-employment and skilled wage employment opportunities, resulting in an appreciable improvement in their livelihoods on a sustainable basis, through building strong grassroots level institutions of the poor. DAY- NULM focuses at providing shelter equipped with vital services to the urban homeless in a progressive manner. According to DAY-NULM, any initiative that promotes livelihoods can only be scaled up in a timely manner provided that it is directed by the impoverished and their organisations. PM SVA Nidhi scheme is one of such policy efforts. By giving urban street sellers interest-subsidy loans, the program seeks to empower them. It has made a substantial contribution to the reduction of poverty as well as the empowerment and rehabilitation of street sellers. The PM SVA Nidhi Scheme has reached its target of giving loans

to street sellers to enable them relaunch their enterprises. India launched Prime Minister Housing for All (Urban) with the goal of housing all qualified families and recipients by 2022. Through the verticals of (1) Slum rehabilitation of slum dwellers; (2) Promotion of Affordable Housing for weaker sections through credit-linked Subsidy; (3) Affordable Housing in Partnership with Public & Private sectors; and (4) Subsidy for beneficiary-led individual house construction, the Mission aims to address the housing needs of the urban poor, including slum dwellers. With more than 13.3 lakh residences completed under the Pradhan Mantri Awas Yojana (PMAY)-Urban project, Uttar Pradesh has achieved the top spot. This accomplishment demonstrates the state's dedication to offering cheap housing, enhancing urban infrastructure, and guaranteeing higher living conditions for residents through effective planning and quick project completion. Varanasi and Mathura were chosen for the development and beautification of heritage sites under the HRIDAY Scheme, with an emphasis on infrastructural improvements, cultural preservation, and boosting tourism in these ancient cities.

In the dynamic domain of urbanisation, the state of Uttar Pradesh has begun on a revolutionary path to expand municipal services and uplift urban administration through an assortment of innovative projects. The state government has created and carried out a wide range of programs targeted at sustainable development, infrastructure improvement, and general urban well-being in recognition of the distinct difficulties encountered by different urban local bodies (ULBs). Although the Smart City Mission is a national endeavour, the UP government has taken advantage of the chance to concentrate on seven municipalities that were left out of the main Smart City Mission. Improved infrastructure, technology integration, effective service delivery, and comprehensive urban planning are transforming cities like Mathura, Ayodhya, Shahjahanpur, Meerut, Ghaziabad, Firozabad, and Gorakhpur. Uttar Pradesh is the first state to develop its own State Smart City Scheme using state finances. The objectives of this project are to improve public services, encourage sustainable growth, and strengthen urban infrastructure. UP is establishing a standard for autonomous and technologically advanced urban change by autonomously sponsoring smart city initiatives. Uttar Pradesh has created 10 Smart Cities under the Smart Cities Mission and an additional 7 Smart Cities under the State Smart City Scheme. By concentrating on contemporary infrastructure, digital governance, sustainable development, and enhanced urban services, this program positions UP as a pioneer in intelligent and future-ready city development.

Recognising the significance of animal welfare and the importance of sustaining Gaushalas (cow shelters), the state government has made steps to strengthen their infrastructure and general care. The Kanha Gaushala project strives to establish well-equipped and sustainable cow shelters, while the Ashray Shudhar Yojna focuses on improving the living conditions of individuals who take care of these animals. Chief Minister Nagar Srijan Yojana is a benefit for newly constituted urban local bodies and those areas recently enlarged into municipal corporations. In order to ensure that these places expand smoothly, the emphasis is on creating well-planned infrastructure, necessary civic facilities, and urban services that conform to contemporary urbanisation norms.

Uttar Pradesh has built up a Smart City Central Digital Monitoring Centre to oversee and operate 17 Smart Cities efficiently. This cutting-edge solution guarantees stronger infrastructure, improved public services, and smooth coordination for the state's smart city initiatives by

enabling real-time monitoring, data analysis, and increased urban governance. UP has operational metro projects in Agra, Kanpur, and Lucknow that improve urban mobility and ease traffic. Metro projects are also underway in 5+ urban centres, aiming to improve public transport, promote sustainable development, and boost economic growth by providing efficient and eco-friendly mass transit alternatives.

In view of the growing urbanisation trend of nation and the state, it was thought that the infrastructural facilities needed to be strengthened. In light of the aforementioned, the state has added additional urban population by merger of neighbouring villages/ small towns in ten Municipal Corporations and also increased its boundaries. Similarly, upgradation of 04 Municipal Councils, extension of boundary of 42 Municipal Councils and construction of 112 new Nagar Panchayats, expansion of boundaries of 72 Nagar Panchayats has been done. As a result, the state now has 240 urban entities with increased boundaries. Over the past years, 240 newly created, refurbished, and extended urban local bodies in the state have benefited from the Chief Minister Nagar Srijan Yojana (CM-NSY), which aims to develop infrastructural facilities such as drinking water delivery, solid waste management, road construction, street lighting, etc.

The UPVAN (Upvan Yojna) is a large state government project aiming at mitigating urban heat stress and enhancing green cover. The initiative, which has an annual budget of ₹70 crore, turns degraded urban areas into parks and mini-forests in 17 municipal corporations, including Lucknow. The proposal mainly makes use of the dense, multi-layered Japanese plantation technology known as the Miyawaki method. The metropolitan Heat Island (UHI) effect is a phenomenon where high temperatures are frequently recorded in metropolitan regions relative to those in the rural or peri-urban areas that surround them (Oke, 1982). The prevalence of impermeable building materials, changes in surface albedo, reduced evapotranspiration due to the loss of vegetation, and continuous anthropogenic heat emissions from transportation, industry, and air conditioning systems are some of the interrelated factors that contribute to this phenomenon (Voogt & Oke, 2003; Weng, 2009). In rapidly urbanising countries like India, these factors combine to increase heat stress, particularly on the hottest summer days (Mallick et al., 2013). In urban areas, heat stress has grown to be a significant environmental and health concern. Long-term, continuous exposure to high temperatures increases the risk of respiratory, cardiovascular, and heat-related illnesses, lowers labour productivity, and puts additional strain on urban energy systems due to increased cooling activity (UNEP, 2021; Chakraborty et al., 2020). Evidence has revealed that high land surface temperatures, high power use, and poor health outcomes have a strong connection in all Indian cities, and vulnerable people, including the elderly, children, and outdoor workers, are disproportionately harmed (Gupta & Sarif, 2020). Thus, the primary objective of frameworks for sustainable and climate-resilient urban development is now to lessen the UHI effect. In response to the increase in urban heat stress, the Uttar Pradesh government launched the Upvan Scheme, which aims to enhance the amount of green space in cities by creating roadside plantations, mini-forests, and reclaiming degraded or unusable urban land (Government of Uttar Pradesh, 2024). The special characteristic of the design is the application of Miyawaki method that contributes to the intensive planting of high density, multilayered native plants on a compact territory. It is also known that nature-based interventions can lessen urban heat and enhance microclimatic conditions (UNEP, 2021).

To guarantee equitable and sustainable urban growth in the state, the Uttar Pradesh Urban Development Department and the School of Planning and Architecture (SPA), Delhi, has signed a memorandum of understanding (MoU). The agreement, formalised at the Directorate of Urban Local Bodies in Lucknow, has been supported by Tata Trusts, in the context of the Akanshi Nagar Yojana of the Urban Development Department and attempts to support smaller urban local bodies with capacity building and urban planning training. With planned urban growth and contemporary amenities, state keeps moving forward with bolstering citizen-centric infrastructure. With a vision to construct future-ready cities, the state is encouraging integrated townships that mix housing, connectivity, and sustainability, assuring increased quality of life and balanced regional growth. The Uttar Pradesh Government has placed considerable focus on urban transformation in the Budget 2026–27, providing Rs. 26,514 crores to the Urban Development Department to construct a modern, self-reliant, and wealthy “New Uttar Pradesh”.

Conclusion

Rapid urbanization and its effects are emerging as challenges to maintain for the quality of life in the Indian cities. The processes of urbanization are marked by the deterioration of the physical environment and quality of life in the urban areas, due to widening gap between demand and supply of essential services and infrastructure. The problems of urban India are very complex, varied and vast in their magnitude and impacts. Reforms were initiated primarily to improve the institutional efficiency of the urban local bodies, decentralization of urban governance, improving their revenue and above all to improve urban infrastructure and service delivery mechanism through appropriate urban planning, urban development and urban management. The urban reforms are targeted towards strengthening of ULBs, ensuring water security, water and energy efficiency, resilient urban planning, mainstreaming climate change actions and inclusivity in planning for infrastructure development and delivery of services. The Government is committed towards achieving SDGs and therefore development agenda has been redefined in conformity with SDGs. The urban development projects in Uttar Pradesh demonstrate a dedication to smart infrastructure, sustainable growth, and enhanced public services. The state raises living standards, expands economic possibilities, and encourages environmental sustainability through creative policies, metro projects, and smart city initiatives. UP is establishing a standard for liveable and future-ready communities with its sustained investment initiatives in contemporary urban planning.

References

1. Chakraborty, T., & Lee, X. (2019). A simplified urban extent algorithm to characterize surface urban heat islands on a global scale. *Sustainable Cities and Society*, 46, 101449.
2. Chakraborty, T., Sarangi, C., & Lee, X. (2020). Reduction in human activity can enhance the urban heat island: Insights from COVID-19 lockdown. *Environmental Research Letters*, 15(5), 054060.

3. Dayton, B. W., & Johnson, R. A. (2004). The role of local governments in disaster management and resilience. In H. Rodríguez, E. L. Quarantelli, & R. R. Dynes (Eds.), *Handbook of Disaster Research*. New York: Springer.
4. Gambrill, M., et al. (2020). *Citywide Inclusive Sanitation: A Public Service Approach for Reaching the Urban Poor*. Washington, DC: World Bank.
5. Government of Uttar Pradesh. (2024). *Upvan scheme guidelines and urban forestry initiatives*. Department of Urban Development.
6. Gupta, R. D., & Sarif, M. O. (2020). Land surface temperature profiling and its relationship with land use/land cover and vegetation indices: A case study of Lucknow city, India. *Journal of Urban Environmental Engineering*, 14(1), 45–58.
7. Gupta, S. (2005). *Climate Change and Sustainable Development in India*. New Delhi: Tata Energy Research Institute (TERI).
8. ICWSSM (2019). *Proceedings of the International Conference on Water Security, Sanitation and Management*. New Delhi.
9. IDS (2007). *Reducing Urban Poverty and the Risks of Climate Change in Urban Areas*. Brighton, UK: Institute of Development Studies.
10. Kalaari Capital (2022). *Circular Economy*, Kalaari Capital Advisory Group, www.Kalaari.com
11. Mallick, J., Singh, C. K., Shashtri, S., Rahman, A., & Mukherjee, S. (2013). Land use/land cover change and its impact on land surface temperature in Lucknow city, India. *Remote Sensing Applications: Society and Environment*, 2, 1–10.
12. McGranahan, G., Balk, D., & Anderson, B. (2007). The Rising Tide: Assessing the Risks of Climate Change and Human Settlements in Low Elevation Coastal Zones. *Environment and Urbanization*, 19(1), 17–37.
13. McKinsey Global Institute. (2010). *India's Urban Awakening: Building Inclusive Cities, Sustaining Economic Growth*. McKinsey & Company.
14. Ministry of Housing and Urban Affairs (MoHUA) & National Institute of Urban Affairs (NIUA). (2023). *Urban 20 (U20) Communiqué 2023: Cities Leading Climate Action and Sustainable Urban Development*. New Delhi: Government of India.

15. Mohan, M., Kikegawa, Y., Gurjar, B. R., Bhati, S., & Kolli, N. R. (2013). Assessment of urban heat island effect for different land use–land cover from micrometeorological measurements and remote sensing data for Delhi. *Theoretical and Applied Climatology*, 112(3–4), 647–658.
16. National Faecal Sludge and Septage Management Alliance (NFSSM Alliance). (2020). *National Capacity Building Framework for Faecal Sludge and Septage Management in India*. New Delhi.
17. Nijkamp, P., & Finco, A. (2000). *Sustainable cities: Environmental policy and urban development*. In P. Nijkamp & A. Perrels (Eds.), *Sustainable Cities in Europe*. London: Earthscan.
18. Nithin, K. (2021). *Climate Change in India: Trends, Impacts and Adaptation*. New Delhi: Centre for Science and Environment.
19. NITI Aayog. (2021). *LiFE – Lifestyle for Environment*. New Delhi: Government of India.
20. NITI Aayog. (2022). *Mission LiFE: India's National Action Plan for Sustainable Lifestyles*. New Delhi: Government of India.
21. Oke, T. R. (1982). The energetic basis of the urban heat island. *Quarterly Journal of the Royal Meteorological Society*, 108(455), 1–24.
22. Pandey. (2023). [Please verify the complete publication details. The citation "Pandey, 2023" is insufficient for unique identification.]
23. Rauniyar, G. (2010). *Inclusive Development: A Review and Synthesis of Development Literature*. Kathmandu: Nepal Rastra Bank.
24. Satterthwaite, D., Huq, S., Pelling, M., Reid, H., & Lankao, P. R. (2007). *Adapting to climate change in urban areas: The possibilities and constraints in low- and middle-income nations*. International Institute for Environment and Development (IIED) Human Settlements Discussion Paper.
25. Schrecongost, A., Pedi, D., Rosenboom, J., Shrestha, R., & Ban, R. (2020). *Citywide Inclusive Sanitation: A Public Service Approach for Reaching the Urban Poor*. Washington, DC: World Bank.

26. Singh, P., & Pandey, A. C. (2012). Urban growth and its impact on the environment using geospatial techniques. *International Journal of Geomatics and Geosciences*, 2(4), 1090–1102.
27. Singh, P., Grover, A., & Zhan, J. (2014). Monitoring urban heat island and land surface temperature using remote sensing techniques. *Environmental Monitoring and Assessment*, 186(12), 9027–9043.
28. Timperley, J. (2019). The carbon brief profile: India. Carbon Brief. Available at: <https://www.carbonbrief.org/the-carbon-brief-profile-india>
29. Trotta, G. (2022). Climate change mitigation and adaptation: Challenges and opportunities. *Sustainability*, 14(4), 2103.
30. UNESCO. (2021). The United Nations World Water Development Report 2021: Valuing Water. Paris: UNESCO.
31. United Nations Environment Programme. (2021). Nature-based solutions for urban heat mitigation. UNEP.
32. Urban 20 (U20) & National Institute of Urban Affairs (NIUA). (2023). Urban20 Communiqué 2023. New Delhi: NIUA.
33. Verma, G. D., & Gill, K. S. (2008). Urban Governance in India: Issues and Challenges. New Delhi: Deep & Deep Publications.
34. Voogt, J. A., & Oke, T. R. (2003). Thermal remote sensing of urban climates. *Remote Sensing of Environment*, 86(3), 370–384.
35. Weng, Q. (2009). Thermal infrared remote sensing for urban climate and environmental studies: Methods, applications, and trends. *ISPRS Journal of Photogrammetry and Remote Sensing*, 64(4), 335–344.