

Innovative Approaches To Urban Development, Towards A Better Quality Of Life Of Pt. Deen Dayal Upadhyay Nagar, Uttar Pradesh, India

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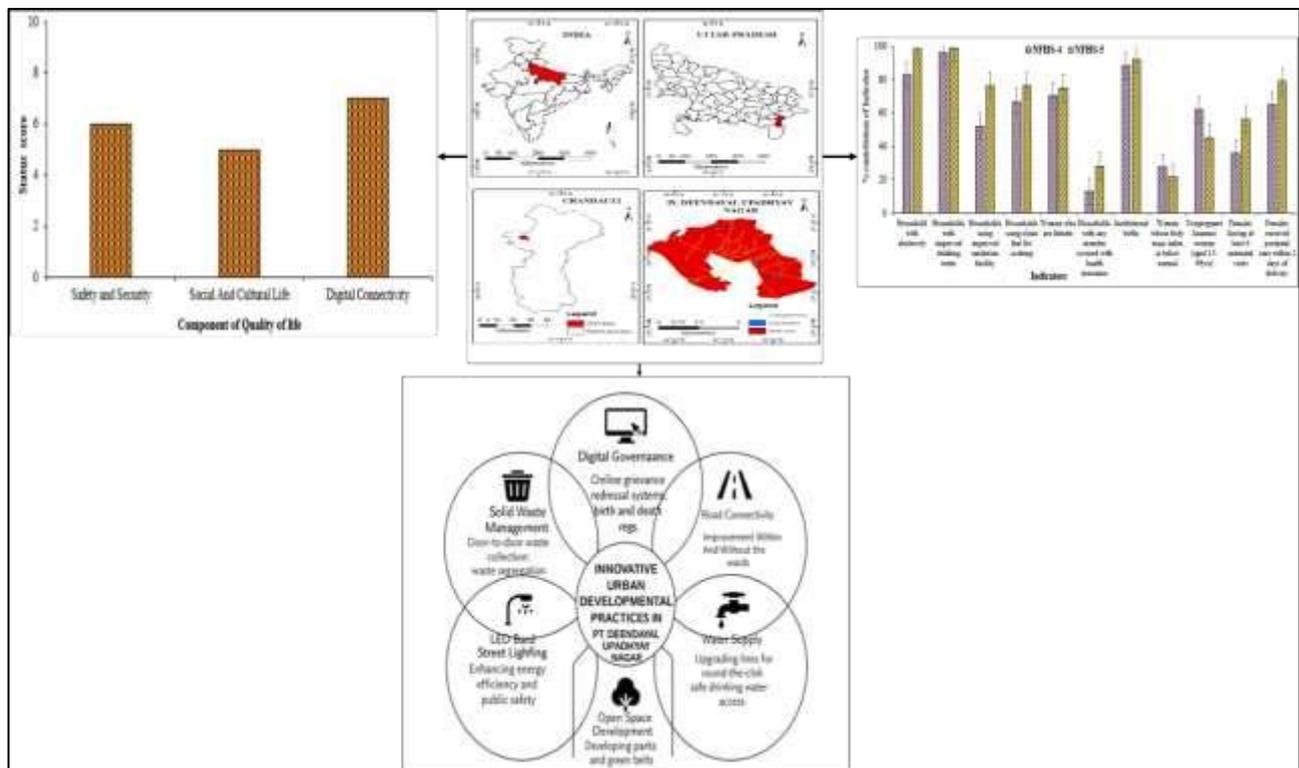
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Graphical Abstract



Abstract

Urban development in India is at a critical crossroads, where the need for sustainable, inclusive, and citizen-centric planning has never been more urgent. This research paper explores emerging strategies and practices that aim to improve the urban environment and the overall well-being of its residents. Pt. Deen Dayal Upadhyay Nagar, formerly known as Mughalsarai, is a growing urban settlement with historical significance and strategic location due to its major railway junction. However, like many tier-2 towns in India, it faces challenges such as unplanned urbanization, inadequate infrastructure, poor waste management, congestion, housing shortages, and insufficient public services. The study investigates the extent to which innovative urban development approaches—such as smart governance, green infrastructure, participatory planning, digital solutions, and sustainable transportation—can be applied effectively to improve the quality of life in this town. Employing both qualitative and quantitative research methodologies, including field surveys, stakeholder interviews, GIS-based spatial analysis, and secondary data review, this paper evaluates the current status of infrastructure, housing, sanitation, education, health facilities, and public services. Special focus is given to assessing public perceptions regarding livability and identifying the key gaps between policy initiatives and on-ground implementation. The findings reveal a strong potential for integrating local resources, traditional knowledge systems, and modern technologies in crafting context-specific solutions. The study emphasizes

the need for coordinated efforts among local government bodies, private sector stakeholders, and civil society to ensure equitable urban transformation. Key recommendations of the study include improving institutional capacity, investing in low-cost sustainable technologies, enhancing community participation, and developing inclusive policies that address the unique socioeconomic fabric of the town. Ultimately, the paper concludes that adopting innovative, adaptable, and participatory approaches to urban development is not only essential for improving the quality of life in Pt. Deen Dayal Upadhyay Nagar but also sets a model for similar towns across India striving for sustainable urban futures.

Keywords: *Development; Governance; Health facilities; Infrastructure; Sanitation; Technology.*

1. INTRODUCTION

Urbanization in India has seen unprecedented growth over the last few decades, significantly reshaping the demographic, socio-economic, and spatial structures of the country. With over 35% of India's population living in urban areas as per Census 2011, and projections estimating it to reach nearly 40% by 2036, the pressure on urban centers has mounted considerably (Pradhan, 2017; Pradhan et al., 2020). This rapid urban expansion, while a symbol of economic dynamism, has brought forth critical challenges including unplanned growth, infrastructural stress, housing shortages, environmental degradation, and social inequality (Sharma et al., 2025). Small and medium towns, in particular, have emerged as both agents and victims of this transformation. Pt. Deen Dayal Upadhyay Nagar, formerly known as Mughalsarai, located in the Chandauli district of Uttar Pradesh, is a prime example of such an emerging urban settlement facing the dual burden of developmental aspirations and infrastructural constraints. Strategically located near the confluence of the Grand Trunk Road and the DelhiHowrah Railway line, Pt. Deen Dayal Upadhyay Nagar holds significant connectivity and economic value, especially as a major railway junction, one of the busiest in India (Batra, 2009). According to the Census of 2011, the town had a population of over 1.09 lakh, with a decadal growth rate of more than 15%, indicating rapid urban expansion. Despite this growth, the urban infrastructure has not kept pace with population demands. Issues such as traffic congestion, inadequate sanitation facilities, poor waste disposal systems, rising air and water pollution, encroachments, and limited access to quality healthcare and education services remain persistent (Pradhan et al., 2020; Chatterjee et al., 2025). These urban deficiencies have a direct bearing on the quality of life of the residents, particularly those in lower-income and marginalized sections. The Urban Quality of Life Index, if applied to the town, would likely reveal disparities in public service delivery, environmental quality, and access to basic amenities.

In this context, the notion of "innovative approaches to urban development" becomes crucial. Traditional models of urban planning and governance, often top-down and infrastructure-centric, have failed to adequately address the complexities of medium-tier towns like Pt. Deen Dayal Upadhyay Nagar. Innovations in urban development now emphasize people-centric planning, sustainability, digital integration, resource efficiency, and community participation (Jain and Verma, 2018). Smart urban practices such as e-governance platforms, sensor-based waste collection, decentralized renewable energy, rainwater harvesting, non-motorized transport networks, inclusive housing schemes, and green public spaces are becoming the new pillars of urban transformation (Mensah et al., 2016; Joshi and Joseph, 2021). Several previous studies have explored these themes in depth. The World Bank's "Financing India's Urban Infrastructure Needs" (2022) highlighted the urgent requirement for \$840 billion in urban investments by 2036, emphasizing blended finance and sustainable infrastructure in mid-sized cities. Similarly, the Ease of Living Index 2018—commissioned by the Ministry of Housing and Urban Affairs—assessed 116 cities based on quality of life, resilience, and governance, offering a framework for city-specific improvements. Case studies like Indore's decentralized waste processing model (Aijaz, 2018; Smart Cities Mission Report, 2020) and Bhubaneswar's Urban95 program, which redesigned public spaces for child-friendly development, provide replicable examples of inclusive planning. Moreover, Surat's integrated urban mobility and flood resilience mechanisms, as evaluated in the NIUA Smart City Performance Assessment, offer useful strategies for dealing with climate-induced urban risks (National Institute of Urban Affairs 2020). This research investigates how innovative, inclusive, and sustainable approaches to urban development can be integrated into the fabric of Pt. Deen Dayal Upadhyay Nagar to promote a better quality of life. Using a multi-disciplinary framework that combines urban geography, spatial planning, socio-economic analysis, and participatory governance models, this study seeks to identify current gaps in urban infrastructure and propose actionable solutions. Furthermore, the

research critically assesses the role of local institutions, urban policies, public-private partnerships, and citizen engagement in shaping urban development. A major emphasis is placed on how resilience, inclusivity, and sustainability—three key pillars of modern urban planning—can be institutionalized within municipal governance in the town. Comparative insights will be drawn from other successful urban development models within India, such as Indore's waste management system or Bhubaneswar's child-friendly urban design, to inspire feasible innovation in Pt. Deen Dayal Upadhyay Nagar (Urjaswita and Tripathi, 2025). Ultimately, the research aims to contribute to both academic scholarship and policy discourse by providing an in-depth, empirical, and spatial analysis of urban development in a Tier-3 Indian town, with practical recommendations for transforming it into a model of inclusive and sustainable urban growth. It also endeavors to shift the narrative from merely managing urban problems to proactively envisioning and implementing a livable, equitable, and future-ready city, tailored to the aspirations and realities of its inhabitants.

The main aim of this study is to understand and improve urban development in the city. Firstly, it aims to assess the current state of urban infrastructure and public services, such as transportation, sanitation, housing, and waste management, to identify existing gaps and challenges. Secondly, the study seeks to analyze the socioeconomic status and quality of life of residents, with a focus on access to basic amenities, education, healthcare, and income levels. Thirdly, it endeavors to explore and evaluate innovative urban development practices currently implemented in the city, including sustainable and inclusive approaches. Furthermore, the study examines the role of local governance, community participation, and institutional frameworks in facilitating effective and sustainable urban transformation. Finally, it critically analyzes the impact of existing urban policies and development programs on the town's growth trajectory to determine their effectiveness and to suggest necessary reforms. Together, these objectives provide a comprehensive framework for enhancing urban living conditions.

2. METHODS AND METHODOLOGY

The present study is primarily based on secondary data sources, employing a descriptive and analytical research methodology. The research aims to explore and evaluate the role of modern urban planning strategies, policies, and infrastructure initiatives in improving the overall quality of life in the study area. To achieve this, the study relies extensively on published government reports, urban development plans, census data (particularly Census of India 2011 and projected estimates), and policy documents from schemes such as AMRUT (Atal Mission for Rejuvenation and Urban Transformation), Swachh Bharat Mission, Smart Cities Mission, and Pradhan Mantri Awas Yojana (Urban). Additional sources include statistical abstracts from the Directorate of Urban Development, Uttar Pradesh, and district-level planning reports from the Chandauli district administration (Urjaswita and Tripathi, 2025). Academic journals, research articles, and urban planning literature have also been reviewed to build the theoretical foundation and to draw comparisons with best practices adopted in other small urban centers. Satellite imagery, land use maps, and urban transport plans were examined using available GIS data to assess spatial transformation and infrastructure growth. Content analysis was applied to qualitative data derived from government documentation, planning reports, and expert commentary in media articles and policy briefs. The study evaluates indicators such as housing availability, access to drinking water, sanitation facilities, waste management systems, road connectivity, and social infrastructure like health and education (Urjaswita and Tripathi, 2025). The methodology emphasizes identifying the extent to which innovative and inclusive planning approaches have been integrated into urban development efforts and how these have impacted socio-economic conditions in Pt. Deen Dayal Upadhyay Nagar. This secondary data-driven methodology allows for a cost-effective, time-efficient, and broad-based understanding of urban dynamics, although it is limited by the accuracy and periodicity of existing data. Nonetheless, it provides valuable insights for policy recommendations aimed at sustainable and livable urban development in small but growing Indian towns.

2.1. Location and extent

Pt. Deendayal Upadhyay Nagar, formerly known as Mughalsarai, is a prominent city situated in the Chandauli district of Uttar Pradesh, India, geographically positioned at latitude 25°28'19" N and longitude 83°11'80" E (Fig. 1). The city is divided into 25 municipal wards and was renamed to honor Pandit Deendayal Upadhyay, a noted thinker and political leader whose ideology of integral humanism continues to influence India's sociopolitical discourse (Urjaswita and Tripathi, 2025). Physiographically, the city lies within the northern part

of the Indo-Gangetic Plain, characterized by flat alluvial terrain, fertile soil, and proximity to the Ganges River, which contributes to its agricultural and urban development potential. Climatically, Pt. Deendayal Upadhyay Nagar experiences a humid subtropical climate, with hot summers, a pronounced monsoon season from June to September, and cool winters.

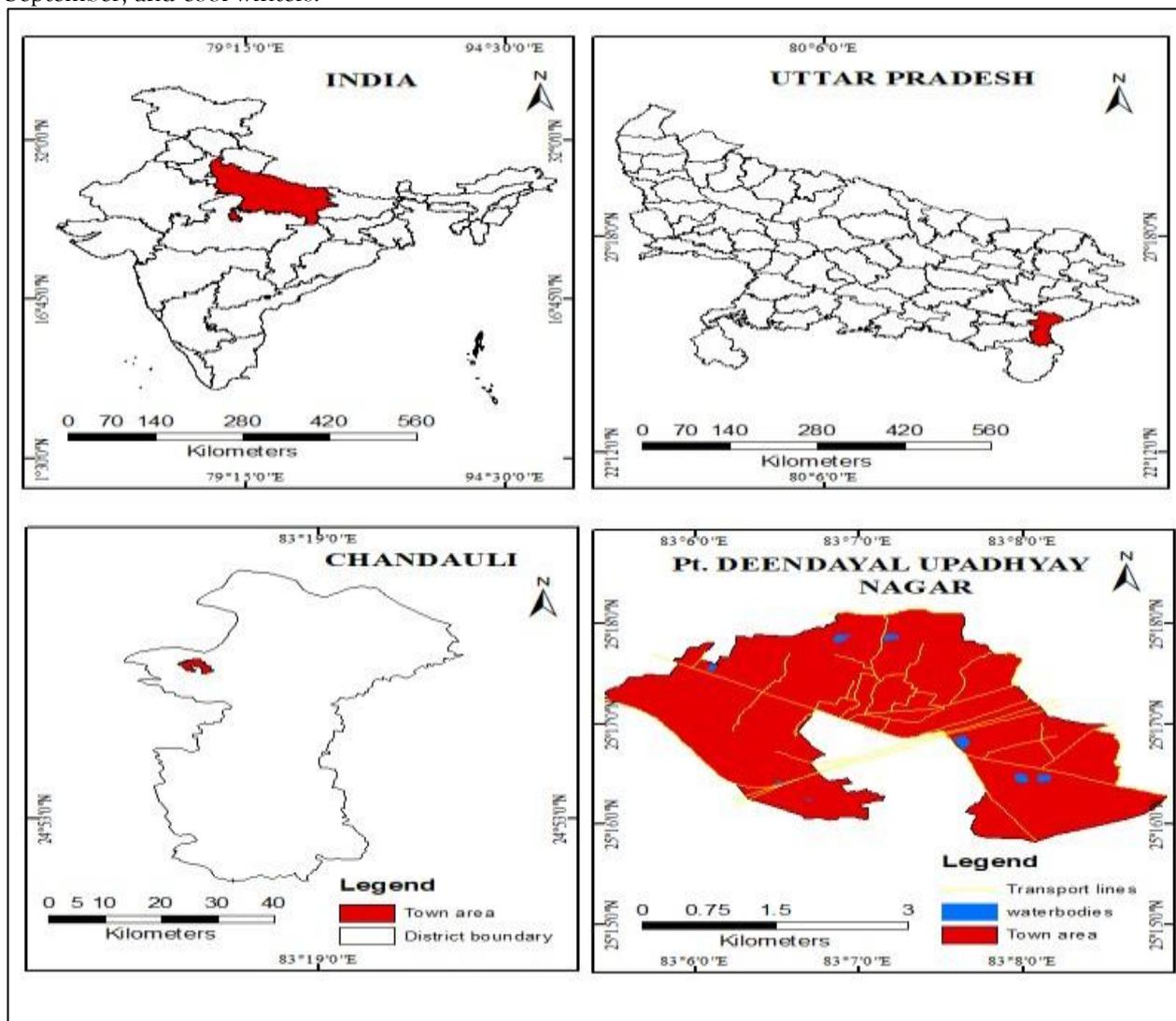


Fig. 1. Location map of study area.

The average annual rainfall ranges between 900 to 1,100 mm, largely concentrated during the monsoon months, while temperatures can vary from as high as 45°C in peak summer to around 5°C in winter (Urjaswita and Tripathi, 2025). The city holds considerable historical, cultural, and economic significance, especially due to its strategic location near Varanasi and its position as a major transportation and logistics hub, housing one of the busiest railway junctions in the country. Pt. Deendayal Upadhyay Nagar exemplifies a dynamic blend of traditional heritage and modern urban growth, making it an ideal case study for examining the challenges and innovations associated with urban development. The diversity in infrastructural development and service accessibility across the city provides critical insights for urban planners, policymakers, and scholars interested in sustainable urban development and equitable growth strategies.

3. RESULTS AND DISCUSSION

3.1. Housing & health status of the city

The comparison of data from Table 1, between NFHS-4 and NFHS-5 for various quality-of-life indicators in Uttar Pradesh, reflects significant improvements in essential urban services and health outcomes, particularly in cities like Pt. Deendayal Upadhyay Nagar. The most notable positive change is observed in the proportion of

households using improved sanitation facilities, which rose from 52.1% in NFHS-4 to 76.3% in NFHS-5 a substantial increase of 24.2 %. This shift is likely due to targeted sanitation schemes such as the Swachh Bharat Mission, increased public awareness, and improved infrastructure investment in urban and peri-urban areas. Similarly, electrification has seen remarkable growth, with households having electricity increasing from 82.7% to 98.4%, a gain of 15.7%. This reflects the success of initiatives like the Saubhagya Scheme and the Deendayal Upadhyaya Gram Jyoti Yojana, aimed at universal household electrification. Households using clean cooking fuels have increased by 9.6 percentage points (from 66.9% to 76.5%), suggesting enhanced access to LPG connections under the Ujjwala Yojana, contributing to better indoor air quality and women's health. The percentage of women who are literate improved modestly from 70.6% to 74.9%, a gain of 4.3%, (Table 1) indicating progress in educational outreach, although further efforts are required to bridge the gender literacy gap.

In the health domain, there is a noticeable rise in the proportion of households with health insurance coverage, increasing from 12.7% to 28.1%, likely due to the expansion of schemes like Ayushman Bharat. Institutional births rose from 88.3% to 92.1%, and the number of females receiving postnatal care within two days increased from 64.7% to 79.1%, both of which underscore the improvements in maternal healthcare services and the growing trust in institutional healthcare (Fig. 2). A major positive trend is seen in antenatal care, where the percentage of women having at least four antenatal visits jumped from 35.9% to 56.2%, reflecting greater health awareness, better access, and effective public health campaigns. In terms of nutritional indicators, the percentage of women with a BMI below normal decreased from 27.4% to 21.4%, a sign of better nutritional status. More significantly, the percentage of non-pregnant anaemic women dropped from 62.3% to 45.2%, indicating better dietary intake, iron supplementation, and maternal health initiatives. These figures point towards a significant overall improvement in the quality of life in urban areas like Pt. Deendayal Upadhyay Nagar, as well as the broader region of Uttar Pradesh.

Table 1. Comparison of the Housing & Health Status of the Pt. Deendayal Upadhyay Nagar (In %).

Indicators	NFHS-4	NFHS-5	Change
Household with electricity	82.7	98.4	15.7
Households with improved drinking water	96.2	98.9	2.7
Households using improved sanitation facility	52.1	76.3	24.2
Households using clean fuel for cooking	66.9	76.5	9.6
Women who are literate	70.6	74.9	4.3
Households with any member covered with health insurance	12.7	28.1	15.4
Institutional births	88.3	92.1	3.8
Women whose body mass index is below normal	27.4	21.4	-6
Nonpregnant Anaemic women (aged 15-49yrs)	62.3	45.2	-17.1
Females having at least 4 antenatal visits	35.9	56.2	20.3
Females received postnatal care within 2 days of delivery	64.7	79.1	14.4

(Source: National Family Health Survey -4 and 5).

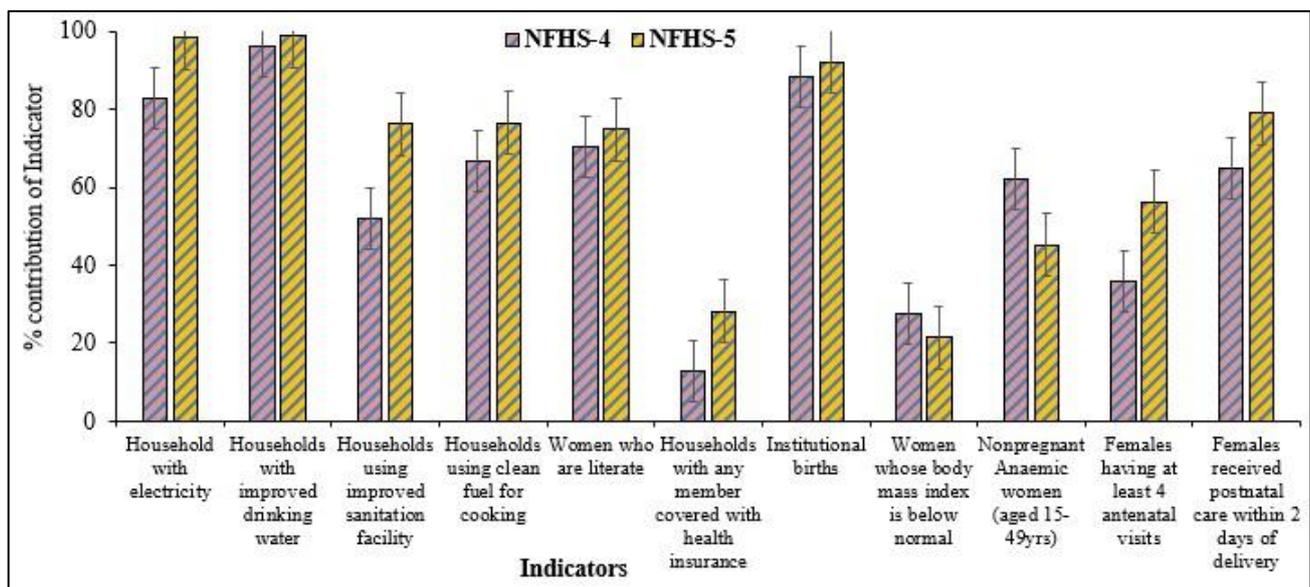


Fig. 2. Comparison of housing and health status of Pt. Deendayal Upadhyay Nagar.

When compared to other cities in Uttar Pradesh, Pt. Deendayal Upadhyay Nagar mirrors similar trends but often demonstrates stronger progress in areas such as sanitation, health insurance coverage, and postnatal care—indicating effective local governance and utilization of central and state welfare programs. Cities like Lucknow and Varanasi, while more advanced in infrastructure, have shown slower growth in certain indicators like clean fuel usage and antenatal visits, possibly due to pre-existing saturation levels. On the other hand, smaller urban centers like Hardoi or Bahraich continue to lag in health insurance coverage and sanitation, highlighting the uneven urban development landscape across the state. Overall, the data suggest that while Uttar Pradesh is progressing in key areas affecting urban quality of life, cities like Pt. Deendayal Upadhyay Nagar have leveraged development programs more effectively, resulting in a tangible rise in living standards and public health outcomes. Continued investment in infrastructure, health, and education—along with focused policy implementation—will be critical in ensuring this progress is sustained and replicated across other urban centers in the state.

3.2. Employment and livelihood

Employment and livelihood are crucial pillars in determining the quality of life and driving sustainable urban development, especially in growing urban centers like Pt. Deen Dayal Upadhyay Nagar. The city, being a significant transport and commercial hub due to its strategic location on the Grand Trunk Road and one of the busiest railway junctions in India, presents varied employment opportunities across transportation, warehousing, retail, and informal sectors. With the development of the Eastern Dedicated Freight Corridor and logistics parks in nearby regions, the scope for employment in logistics, ancillary services, and warehousing has increased significantly. However, a large proportion of the workforce remains engaged in informal and low-income occupations such as street vending, small-scale trading, and daily wage labour. According to the Periodic Labour Force Survey (PLFS) 2022-23, Uttar Pradesh's urban unemployment rate stood at 7.2%, with underemployment and informal employment still widespread (Fig. 3). Income levels in Pt. Deen Dayal Upadhyay Nagar vary greatly, with a significant section of the population earning below ₹10,000 per month, indicating persistent economic vulnerability and lack of upward mobility for many. Nevertheless, urban development schemes such as PM SVANidhi (Prime Minister Street Vendor's AtmaNirbhar Nidhi) have helped formalize street vendors and provide micro-credit to boost self-employment. Similarly, the Mudra Yojana has enabled access to credit for small businesses and entrepreneurs, although awareness and reach of these schemes remain uneven.

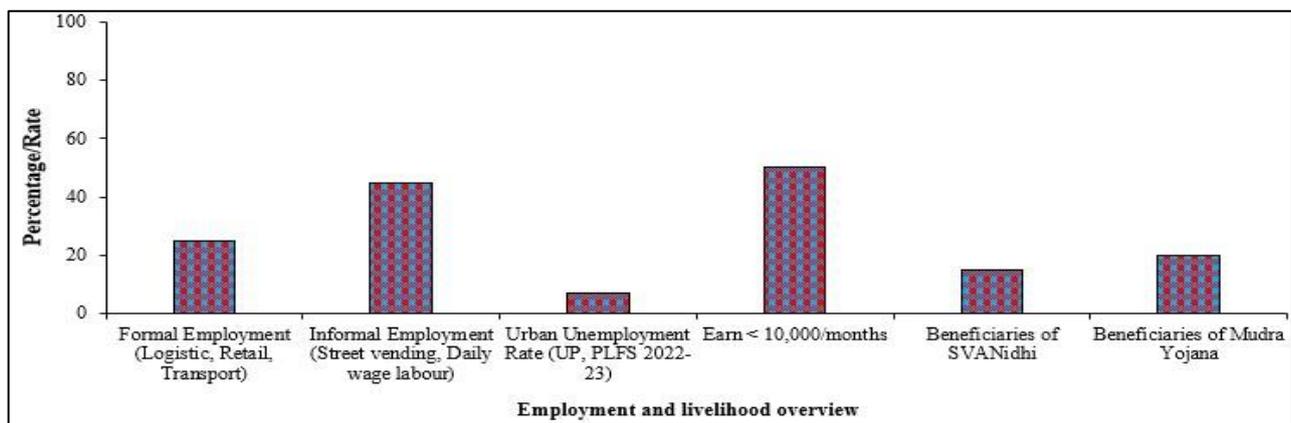


Fig. 3. Employment and livelihood overview in Pt. Deendayal Upadhyay Nagar.

There is potential to enhance livelihood opportunities through skill development initiatives like Deen Dayal Upadhyay Grameen Kaushalya Yojana (DDU-GKY) and urban skilling centers under DAY-NULM, focusing on youth and women. Strengthening linkages between urban planning and employment generation such as developing commercial zones, promoting start-ups, and creating micro-enterprise clusters—can contribute to both economic stability and inclusive growth. Overall, fostering a robust ecosystem for employment and livelihood through innovative planning, improved infrastructure, and targeted policy interventions is essential for improving the quality of life in Pt. Deen Dayal Upadhyay Nagar.

3.3. Transportation and mobility

Transportation and mobility are central to enhancing the quality of urban life, particularly in a rapidly evolving city like Pt. Deen Dayal Upadhyay Nagar. Strategically located as a major railway junction, the city enjoys significant connectivity through railways, serving as a vital node in the national railway network, particularly along the Howrah–Delhi main line. However, while railway infrastructure is robust, the availability and efficiency of public road-based transportation remain limited. Local mobility is primarily supported by auto-rickshaws, cycle rickshaws, e-rickshaws, and a small number of private and government buses (Urjaswita and Tripathi, 2025). The absence of a well-structured urban bus transit system has led to increased dependence on personal vehicles and informal transport, contributing to congestion and air pollution. Road infrastructure in the city is unevenly developed, with major roads such as GT Road (NH-19) being relatively well-maintained, while many internal roads, particularly in residential and commercial wards, suffer from poor surface quality, inadequate width, and lack of drainage (Alam et al., 2021; Praharaaj, 2021). Traffic management poses a significant challenge, especially near high-density areas like the railway station, local markets, and educational institutions, where haphazard parking, mixed traffic, and encroachments lead to bottlenecks (Pradhan et al., 2020; Urjaswita and Tripathi, 2025). The city lacks advanced traffic signaling systems, dedicated lanes, and pedestrian-friendly infrastructure, which diminishes both road safety and commuting efficiency. Urban development strategies need to integrate innovative solutions such as smart traffic management systems, improved last-mile connectivity, non-motorized transport planning, and investment in green mobility. Upgrading transportation infrastructure and systems is essential to reduce travel time, improve safety, and support inclusive and sustainable urban growth in Pt. Deen Dayal Upadhyay Nagar (Urjaswita and Tripathi, 2025).

3.4. Socio-cultural life and safety and security

Safety & security, social & cultural life, and digital connectivity are critical components in assessing and enhancing the quality of life in Pt. Deen Dayal Upadhyay Nagar. In terms of safety and security, the city benefits from its proximity to major administrative centers and hosts multiple police outposts, including a primary police station close to the railway junction (Urjaswita and Tripathi, 2025). However, the increasing urban population and the rapid expansion of commercial activities demand more robust law enforcement and surveillance mechanisms (Tripathi 2020). The absence of adequate street lighting in several inner-city areas and poor urban design often make certain zones vulnerable to petty crimes, particularly affecting women, children, and the

elderly. Community policing, installation of CCTV cameras, and improved urban lighting systems are essential to ensuring safer public spaces.

Social and cultural life in the city is rich and deeply rooted in traditional and religious values, with temples, local fairs, and community events playing a significant role in community bonding. However, there is a visible lack of modern recreational infrastructure such as parks, libraries, sports complexes, and community centers, which limits opportunities for holistic urban living (Tripathi 2020; Urjaswita and Tripathi, 2025). Integrating inclusive public spaces into urban planning can enhance social cohesion and mental well-being. On the front of digital connectivity, Pt. Deen Dayal Upadhyay Nagar has witnessed marked improvement, with mobile penetration exceeding 90% and internet services available through major telecom providers such as Jio, Airtel, and BSNL. Yet, the digital divide remains a concern, especially in lower-income and older populations (Fig. 4). There is a need for public Wi-Fi zones, digital literacy programs, and e-governance platforms to bridge this gap and empower citizens with real-time access to services and information. A comprehensive urban development plan must prioritize safety, nurture cultural vibrancy, and promote digital inclusion to build a more resilient and vibrant urban future for the residents of Pt. Deen Dayal Upadhyay Nagar.

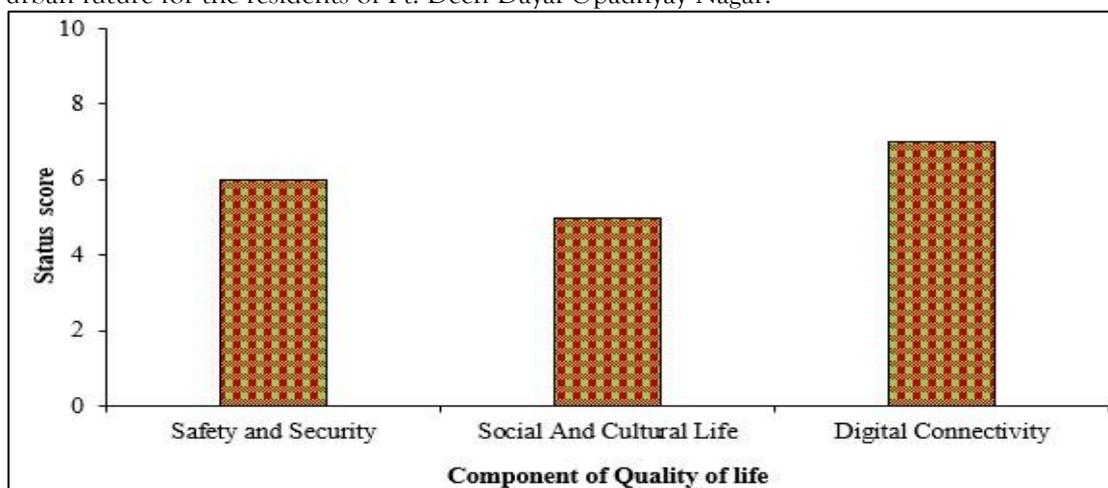


Fig. 4. Key component of quality of Life.

3.5. Evaluation of innovative urban development practices

In recent years, Pt. Deen Dayal Upadhyay Nagar has witnessed a gradual shift towards adopting innovative urban development practices aimed at enhancing the quality of life for its residents. As part of the broader national mission of urban transformation under schemes like AMRUT (Atal Mission for Rejuvenation and Urban Transformation) and Smart Cities initiatives, the town has begun integrating several people-centric and sustainability-driven interventions. One notable practice includes the focus on solid waste management reforms, where the Nagar Palika has implemented door-to-door waste collection in several wards and initiated waste segregation at source to promote cleanliness under the Swachh Bharat Abhiyan (Ministry of Housing and Urban Affairs 2018).

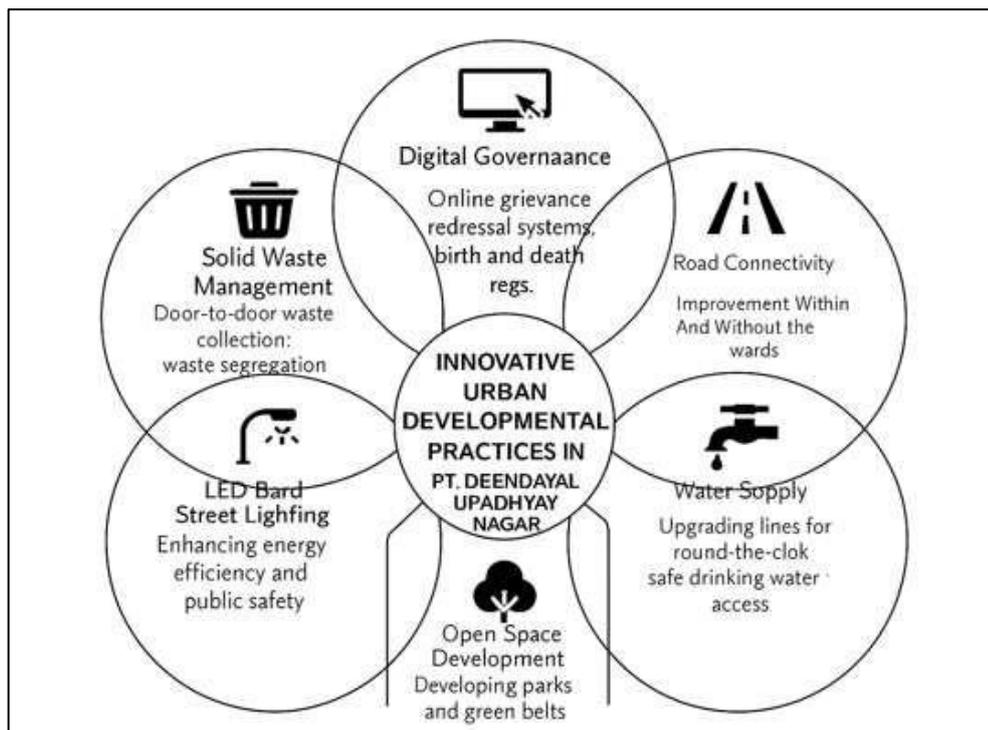


Fig. 5. Innovative urban developmental practices in Pt. Deendayal Upadhyay Nagar.

Moreover, improvements in digital governance have been made through the introduction of online grievance redressal systems, birth and death registrations, and property tax payment portals, thereby making civic services more accessible and transparent. In terms of infrastructure, efforts have been made to improve road connectivity within and between wards and to develop LED-based street lighting to enhance both energy efficiency and public safety (Fig. 5). Additionally, water supply lines have been upgraded to ensure round-the-clock access to safe drinking water in many parts of the city. The city has also focused on revitalizing open spaces by developing parks and green belts in select areas to improve the urban environment and offer recreational opportunities. Though the progress is uneven across the 25 wards of the city, these urban innovations signify a positive trajectory toward inclusive and sustainable development. However, the city still faces challenges such as unplanned expansion, traffic congestion, and uneven service delivery, which need more strategic interventions. Overall, the adoption of modern urban planning concepts and integration of community participation in development projects have started to reshape Pt. Deen Dayal Upadhyay Nagar into a more livable, efficient, and resilient urban space, setting an example for other emerging towns in Uttar Pradesh.

4. CONCLUSION

The city, Pt. Deen Dayal Upadhyay Nagar, is steadily transforming into a model for small-city urban development in Uttar Pradesh through a combination of data-driven policies, innovative planning practices, and active participation in national urban missions. The city has demonstrated notable progress in key quality-of-life indicators as shown by comparative data from NFHS-4 and NFHS-5, with significant improvements in sanitation coverage, electrification, clean fuel usage, maternal health services, and nutritional standards. These gains are largely attributable to focused government initiatives such as Swachh Bharat Abhiyan, Ujjwala Yojana, Ayushman Bharat, and various electrification schemes. Simultaneously, Pt. Deen Dayal Upadhyay Nagar's economic structure, rooted in its strategic location as a major rail and road junction, has allowed for employment generation across sectors like logistics, warehousing, small trade, and informal services. However, a high proportion of the workforce remains trapped in low-paying and unstable jobs, which calls for a more structured approach to livelihood enhancement through skilling programs, credit facilitation, and support for small enterprises. On the mobility front, the city's robust railway connectivity is contrasted by underdeveloped and poorly managed roadbased transportation systems, leading to traffic congestion and safety concerns. Addressing this requires the implementation of smart traffic solutions, pedestrian-friendly infrastructure, and expansion of formal public

transport. Equally vital are the dimensions of safety, social life, and digital inclusion—areas where the city has foundational infrastructure in place but lacks the comprehensive coverage necessary for inclusive urban development. Enhanced policing, better-lit public spaces, and digital infrastructure expansion will ensure that citizens across income and age groups benefit from the city's growth. Social and cultural engagement remains vibrant through traditional events and temples, but urban recreational amenities and public gathering spaces are still insufficient, hampering holistic urban well-being. Despite these challenges, Pt. Deen Dayal Upadhyay Nagar has taken commendable steps toward becoming a resilient, sustainable, and people-friendly city. Its adoption of digital civic platforms, investments in basic services, and integration of environmental consciousness through waste and water management exemplify how smaller cities can lead in urban innovation. With sustained investment, stronger institutional coordination, and inclusive policy frameworks, the city can continue on its upward trajectory and emerge as a beacon of urban transformation for similar mid-sized towns across Uttar Pradesh and India.

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Declarations Ethical Approval

This study is based entirely on secondary data that is publicly available and does not involve any experiments on human participants or animals. As such, ethical approval was not required.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest concerning research, authorship, and/or publication of this article.

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