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Assessing Quality of Life in Smart Cities vs Non-Smart Cities: A Geographical Study of Faridabad and Rohtak Districts of Haryana

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Abstract

This study examines the differences in quality of life between the Smart City of Faridabad and the Non-Smart City of Rohtak in Haryana, focusing on socio-economic, environmental, and infrastructural aspects. Using selected indicators such as education, income, housing, sanitation, air quality, and health, the research assesses how urban governance models influence living standards. Faridabad, as part of the Smart Cities Mission, exhibits improved income levels and enhanced access to sanitation and housing facilities, reflecting the benefits of planned urban development. However, it also faces challenges such as rising pollution and urban congestion, with its air quality often falling into the "poor" category, affecting public health and livability. Rohtak, although not a smart city, offers a more community-focused lifestyle with moderate income levels, stronger social cohesion, and a relatively healthier environment in certain aspects. Yet, limitations in healthcare infrastructure and employment opportunities remain. The comparison reveals that smart city initiatives improve infrastructure and economic growth but do not automatically guarantee social and environmental well-being. The study concludes that quality of life depends not only on technological or infrastructural progress but also on social inclusivity, environmental sustainability, and equitable access to basic amenities, highlighting the need for a more human-centred approach to urban development.

Keywords*— *Environmental Sustainability, Smart Cities Mission, Quality of Life, Life Expectancy.

I. INTRODUCTION

Urbanisation in India has emerged as one of the defining forces shaping the social, economic, and environmental fabric of the nation. However, this rapid urbanisation also brings challenges such as congestion, environmental degradation, and unequal access to infrastructure. In response to these complexities, the Government of India launched the **Smart Cities Mission (SCM)** in 2015 under the Ministry of Housing and Urban Affairs (MoHUA, 2025), aiming to promote sustainable and inclusive urban development through the adoption of digital technologies, improved infrastructure, and participatory governance. The central goal of this mission is to enhance the **Quality of Life (QoL)** for urban residents by ensuring better service delivery, transparent governance, and efficient use of resources (MoHUA, 2024).

Quality of life (QoL) is a multi-dimensional concept that includes material well-being, health, education, environmental quality, public services, and subjective life satisfaction (health, housing, sanitation, mobility, and safety). Across India, the Smart Cities Mission (SCM)—launched by the Government of India—aims to utilise technology, data, and integrated planning to enhance urban living conditions in select cities. Faridabad (part of the Delhi metropolitan region) is one of the cities chosen for smart city development under SCM and has established an institutional and online presence for implementing smart projects. Rohtak, another administrative and economic centre in Haryana, is not listed among the SCM flagship cities and thus serves as a useful comparator as a non-Smart City district within the same state. This comparative study asks: Do smart city designations and related investments lead to better measurable QoL outcomes compared with

non-Smart City districts in the same regional context? The selection of Faridabad and Rohtak accounts for the state-level policy environment, while allowing for the examination of urban scale, industrial profile, and governance differences associated with the SCM. Faridabad's Smart City programme emphasises ICT-enabled services, urban infrastructure upgrades, and project-based urban renewal initiatives. The city's official smart city profile and baseline assessments highlight priorities such as water management, mobility, and e-governance. Rohtak, governed through traditional municipal frameworks, exhibits distinct investment patterns, with a focus on social infrastructure and regional connectivity. Population differences are significant: Faridabad district and city have substantially larger populations than Rohtak, which in turn influences service demand and the complexity of urban governance. Baseline demographic data (Census 2011 and district profiles) show Faridabad's urban and industrial concentration, whereas Rohtak exhibits a mixed urban–rural profile with distinct human development dynamics. These differences make the two districts suitable for evaluating how smart interventions interact with existing conditions to influence QoL outcomes.

Faridabad: as a Smart City

On May 21, 2016, Faridabad was selected for the Fast-Track Smart City initiative. "Developing Faridabad through Transit Oriented Development, smarter mobility, and urbanism for creating development which provides social, economic, and environmental benefits for its citizens and promotes overall quality of life" is the city's overarching aim. On August 12, 2016, Faridabad Smart City Limited (FSCL), a Special Purpose Vehicle (SPV), was established to implement the city's objectives. FSCL has included the city's residents as partners in the planning and development process. During implementation, the co-creation process, which involves a combination of cooperation and competition, will continue to be used to prepare the Smart City Proposals (SCP).

Significance of the Study: -

By comparing Faridabad (a Smart City) and Rohtak (a Non-Smart City) in Haryana, the research provides critical insights into the spatial, social, and environmental dimensions of urban living. It examines how infrastructural improvements, digital systems, and citizen participation in smart cities translate into tangible benefits for residents, and how non-smart cities maintain livability despite limited technological interventions. The geographical lens enriches this comparison by analysing the spatial distribution of resources, accessibility of services, and regional disparities in development.

The study is significant for policymakers, urban planners, and researchers as it contributes to the ongoing debate about the inclusivity and sustainability of smart urbanisation. The findings can guide future urban policies by emphasising the need for people-centred, place-specific, and environmentally sustainable development strategies rather than relying solely on technological solutions. It will also help identify best practices from both smart and non-smart cities that can be integrated into holistic urban planning. Ultimately, the research highlights that enhancing the quality of life should remain the primary objective of urban development, extending beyond the mere adoption of smart technologies.

Study Area: -

The present study examines Faridabad and Rohtak, two major urban centres in Haryana that embody different models of urban growth and governance within the same regional context. Faridabad, situated in the southeastern part of Haryana, is a key component of the National Capital Region (NCR) and serves as one of the state's largest industrial and commercial hubs. Covering about 741 square kilometres, the district had a population of 1.81 million according to the 2011 Census, which is expected to increase to approximately 2.48 million by 2025 (Census of India, 2011). Faridabad was chosen under the Smart Cities Mission in 2016, aiming to upgrade urban infrastructure, improve mobility, and deliver better services through digital technologies. The city has launched several projects, including the Integrated Command and Control Centre (ICCC), smart street lighting, waste management systems, and e-governance platforms, to enhance efficiency and livability. However, despite these efforts, Faridabad continues to face ongoing challenges, including air and water pollution, traffic congestion, waste disposal problems, and urban inequality, highlighting the complex issues associated with rapid urbanisation in the NCR region.

In contrast, Rohtak, situated in the central part of Haryana, offers a different urban experience shaped by traditional and institutional growth rather than technological modernisation. The district, covering 1,745 square kilometres, had a population of 1.06 million in 2011, which is projected to reach 1.29 million by 2025 (Census of India, 2011). Rohtak serves as a regional educational and healthcare hub, housing prominent institutions such as Maharshi Dayanand University (MDU) and the Pandit Bhagwat Dayal Sharma Postgraduate Institute of Medical Sciences (PGIMS). The city's economy mainly relies on education, public administration, and small-scale industries. Although Rohtak is not part of the Smart Cities Mission, it features a moderate cost of living, lower congestion, and strong social cohesion, which positively influence residents

perceived well-being. Comparing Faridabad and Rohtak thus provides an ideal geographic framework to evaluate how different models of urban governance—smart versus conventional—affect the quality of life and sustainability of cities in Haryana.

Objectives of the Study

This research aims to undertake a comparative geographical assessment of Quality of Life between Faridabad (Smart City) and Rohtak (Non-Smart City) with the following objectives:

1. To assess the spatial variation in quality-of-life indicators across Faridabad and Rohtak districts.
2. 2. To identify key socio-economic, infrastructural, and environmental factors that influence quality of life in both cities.

II. RESEARCH METHODOLOGY

The study is based on both primary and secondary data sources. Secondary data were collected from the 2011 Census of India, published and unpublished government documents, Reports, NFHS-5, and Statistical Abstract of Haryana. Primary data were collected in the study area through an extensive door-to-door survey. Various Bar diagrams were created using Microsoft Excel. After the data was analysed, a logical evaluation of the socioeconomic conditions of the research area was drawn. For the primary survey in this study, 50 Households, totalling 150 respondents, were selected from the Faridabad and Rohtak Districts.

Analytical Framework: -

Although determining a household's quality of life status is a complex task, it is nonetheless necessary for a thorough examination. Although it may not always be possible to obtain such data directly, academics frequently use asset indices as proxies. To determine quality of life status, these indices consider various variables, including income level, educational attainment, and Household Amenities. Ownership of televisions, refrigerators, automobiles, bikes, and tractors, as well as access to gas connections and sanitary facilities, are examples of indicators that fall under the category of Household amenities.

Details about each household member are collected, including the total number of family members, gender, age, relationship to the household, marital status, level of education attained, and highest degree obtained. The following lists the particular indicators that were used in the primary survey: -

- Education Level Attained
- Income-Level
- Sanitation Facility

Secondary data have been used for the following indicators: -

- Air Quality
- Housing Quality
- Health Dynamics

Data Analysis: -

The data analysis section systematically examines the collected information using both quantitative and qualitative methods to identify spatial and socio-economic differences in quality-of-life indicators. Graphical representations are employed to interpret variables such as housing, infrastructure, health, education, and environmental quality. The analysis aims to find patterns, correlations, and disparities that reflect the living conditions and development status of the study area. By combining numerical data with perceptual responses, this section provides an evidence-based understanding of urban livability and supports the development of meaningful policy recommendations.

Table No. 1: Education Level Achieved by the Respondents

Sr. No.	Districts	Education Level of Respondents					
		10th	12th	Graduation	Masters	Illiterate	Others
1.	Rohtak	10	23	55	34	8	20
2.	Faridabad	22	25	51	15	16	21

Source: Primary Survey

The educational profile of respondents in Rohtak and Faridabad districts highlights crucial differences that directly influence their respective quality of life. Education is a fundamental dimension of human development and a key determinant of social well-being, employment opportunities, and civic awareness. In Rohtak, 55 of the respondents are graduates, 34 hold master's degrees, and only 8 are illiterate. This reflects a strong educational foundation supported by major institutions, including Maharshi Dayanand University, IIM Rohtak, and PGIMS.

The dominance of higher education in Rohtak indicates a knowledge-oriented urban economy where people possess greater awareness of health, sanitation, and governance. Educated individuals are more likely to access better jobs, healthcare, and digital services, resulting in an overall higher quality of life. The low illiteracy rate further enhances social inclusion and equitable growth within the district.

In contrast, Faridabad, despite being a Smart City, exhibits lower educational attainment beyond secondary school, with 51 graduates and only 15 holding postgraduate degrees. The illiteracy rate of 16—double that of Rohtak—reflects gaps in educational outreach, particularly among industrial and migrant populations. Faridabad's economy is largely dependent on the manufacturing and service sectors, which rely on semi-skilled labour, explaining the higher proportion of respondents who are educated up to the 10th and 12th levels. Although the city benefits from advanced infrastructure and smart technologies, the limited spread of higher education restricts residents' ability to fully utilise digital and civic opportunities.

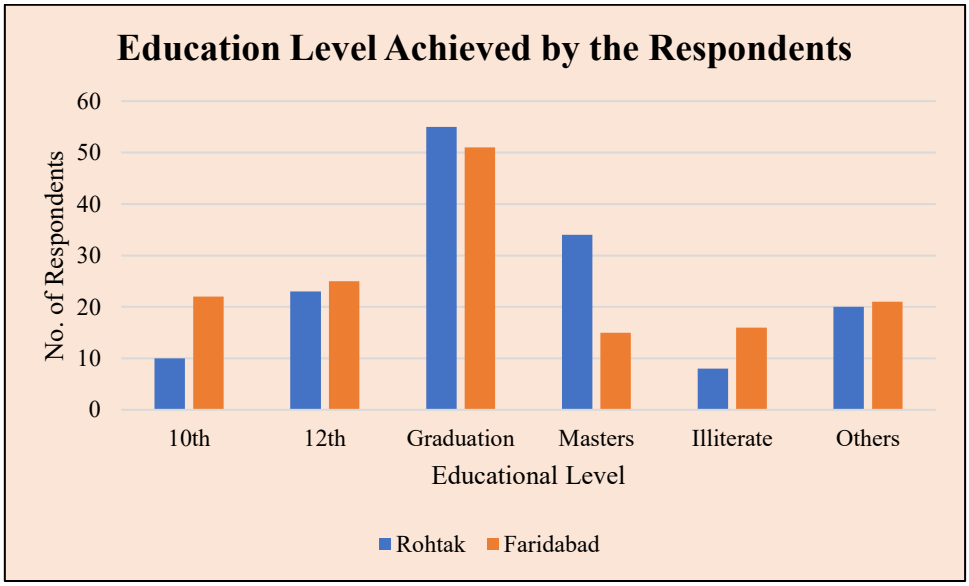

Fig. No. 1: Education Level Achieved by the Respondents

Source: Table No. 1

Thus, while Faridabad's development is driven by infrastructure, Rohtak's progress stems from educational empowerment. The comparison suggests that true urban well-being extends beyond technological modernity to include human capital development. A well-educated population, as seen in Rohtak, contributes to better health, environmental awareness, and civic participation—all essential components of a high quality of life.

Table No. 2: Comparing Educational Structure and Social Equity

Aspects	Rohtak	Faridabad
Literacy and Higher Education	High literacy and a strong presence of higher education institutions.	Moderate literacy; fewer higher educational institutions relative to the population.
Skill Profile	More professional and academic workforce (teachers, medical professionals, administrators).	More industrial and technical workforce (mechanics, factory workers, service employees).
Social Awareness	Higher awareness about civic rights, healthcare, and environmental issues.	Lower awareness among marginalised or migrant communities due to education gaps.
Urban Inclusivity	Education plays a crucial role in promoting social inclusion and mobility.	Socioeconomic inequalities persist between industrial workers and the elite.

Table No. 3: Linkage Between Education and Quality of Life Dimensions

Quality of Life Dimension	Role of Education	Rohtak	Faridabad
Economic Well-being	Education improves employability and income potential.	Highly diverse employment in education, healthcare, and services.	Moderate—industrial dependency and low-skilled labour.
Health and Hygiene	Education leads to better health awareness and sanitation practices.	Strong correlation—better health awareness.	Moderate—awareness is lower in slum and industrial worker areas.
Social Inclusion	Education reduces gender and caste disparities.	Higher inclusivity through access to universities.	Persistent social stratification due to the informal labour economy.
Governance Participation	Literate citizens engage more in governance and planning.	Active civic participation.	Lower civic engagement despite the use of Smart City apps.

Table No. 4: Income Level of the Respondents

Sr. No.	Districts	Income Level of Respondents				
		Below 5000	**5001-10000**	**10001-25000**	**25001-50000**	**Above 50000**
1.	**Faridabad**	0	05	50	71	24
2.	**Rohtak**	0	07	94	36	13

Source: Primary Survey

The income distribution of respondents in Faridabad and Rohtak districts offers significant insight into the relationship between economic status and quality of life, particularly in the context of Smart and Non-Smart Cities. Faridabad, identified as a **Smart City**, exhibits a relatively higher income profile, with 71 respondents earning between ₹25,001 and ₹50,000, and 24 earning above ₹50,000, while none fall below ₹5,000. This reflects the district's strong industrial and service sector base, supported by its integration into the National Capital Region (NCR) and its inclusion under the **Smart Cities Mission**. The development of smart infrastructure, improved connectivity, and digital governance mechanisms has created economic opportunities and enhanced the material well-being of many urban residents. However, this income-driven growth also brings disparities, as much of Faridabad's labour force is employed in industries or informal sectors where income inequality persists. High living costs, pollution, and urban congestion partly offset the benefits of higher income levels, highlighting that technological advancement alone cannot guarantee overall quality of life.

In contrast, Rohtak, a **Non-Smart City**, presents a more moderate-income profile—94 of respondents fall within the ₹10,001–₹25,000 range, with only 13 earning above ₹50,000. Although income levels are lower compared to Faridabad, Rohtak's economy is primarily driven by education, healthcare, and administrative services rather than heavy industries. The city's smaller scale, lower cost of living, and cohesive social environment often translate into a stable and satisfactory lifestyle despite lower earnings. The availability of educational and health facilities, such as Maharshi Dayanand University and PGIMS, improves social well-being and human development.

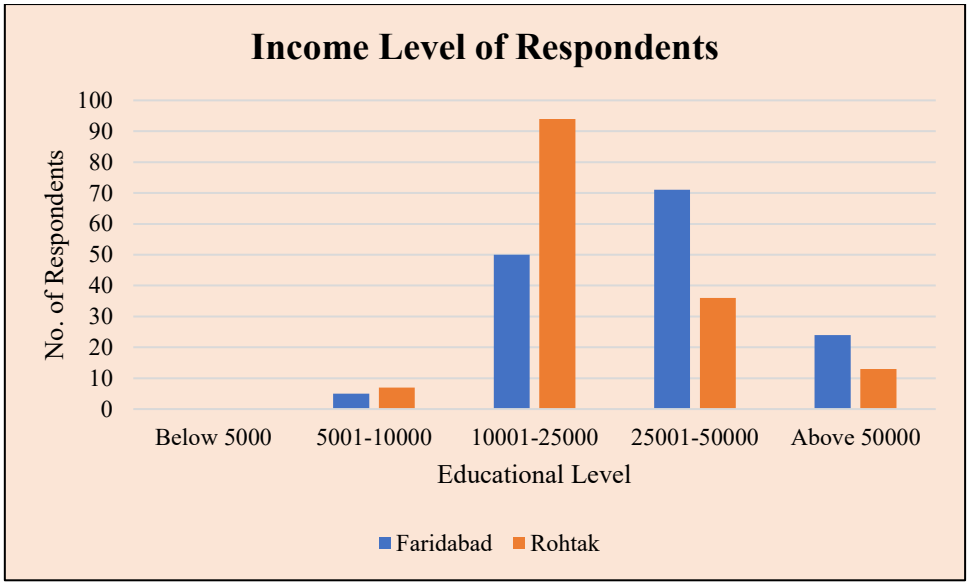

Fig. No. 2: Income Level of the Respondents

Source: Table No. 4

Thus, while Faridabad's Smart City model promotes economic affluence and infrastructural growth, Rohtak's Non-Smart City character emphasises social cohesion and affordability. The comparison illustrates that quality of life is not solely determined by income or smart infrastructure, but by the balance between economic prosperity, environmental quality, and social inclusivity.

Table No. 5: Availability of Sanitation Facilities

Sr. No.	Districts	Sanitation Facility among the Respondents		
		Toilets Available	Under Construction	Not Available
1.	Faridabad	134	16	00
2.	Rohtak	141	08	01

Source: Primary Survey

The data on sanitation facilities among respondents in Faridabad and Rohtak districts reveals a crucial dimension of quality of life, highlighting the relationship between urban infrastructure, public health, and living standards in Smart and Non-Smart Cities. Sanitation is one of the most significant determinants of a population's well-being, influencing health outcomes, environmental hygiene, and social dignity. The table shows that in Faridabad, a **Smart City**, 134 respondents have access to toilets, 16 reported that toilets are under construction, and 0 respondents have no access to toilets. In contrast, in Rohtak, a **Non-Smart City**, 141 respondents have access to toilets, 8 have toilets under construction, while 1 respondent lacks any facility. While both districts demonstrate high levels of sanitation coverage, subtle differences reflect broader socio-economic and infrastructural contrasts between smart and non-smart urban spaces.

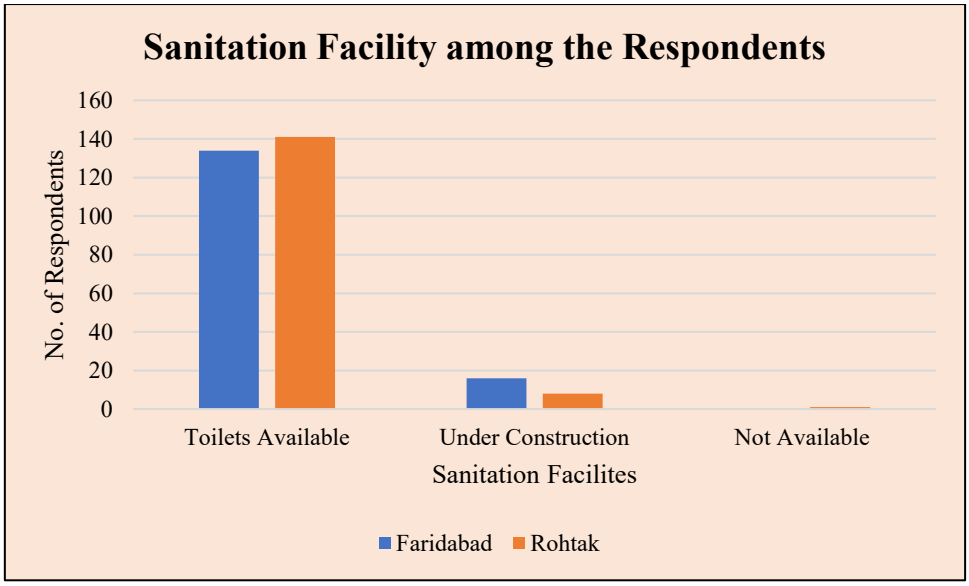

Fig. No. 3: Availability of Sanitation Facilities

Source: Table No. 5

In Faridabad, the near-universal availability of toilets (over 90%) reflects the impact of urban modernisation initiatives under the **Smart Cities Mission** and national programs such as the **Swachh Bharat Mission**. The city's integrated approach to urban management—combining digital monitoring, waste management systems, and urban sanitation planning—has strengthened hygiene standards and reduced open defecation. The ongoing construction of toilets for a small number of respondents indicates continuous infrastructural expansion and administrative responsiveness. Access to proper sanitation not only prevents water-borne diseases but also enhances women's safety, privacy, and social dignity, which are key aspects of quality of life in urban areas. However, challenges such as maintenance of community toilets, waste disposal, and uneven access in informal settlements still persist, reflecting the complexity of urban sanitation even in Smart Cities.

In Rohtak, the high proportion of households with access to toilets (approximately 94%) reflects the effectiveness of government interventions and increasing awareness in smaller, non-urban cities. Despite being outside the Smart City framework, Rohtak has benefited from rural–urban development programs, such as the Swachh Bharat Mission, and state-level initiatives aimed at achieving universal sanitation coverage. The lower number of toilets under construction (8) and minimal cases of non-availability (1) indicate a strong local implementation of sanitation schemes and community participation. The city's smaller scale and close-knit social structure may also facilitate more effective monitoring and behavioural change compared to larger urban centres.

Table No. 6: Various Indicators of Quality of Life

Sr. No.	Districts	Various Indicators of Quality of Life among Respondents				
		Air Quality Index	Housing Structure			Total Crime (IPC)
			Pucca	Kutcha	Other Material	
1.	Faridabad	218	322114	5343	23281	10294
2.	Rohtak	348	149968	2980	49356	6358

Source: The Indian Express, 2025, DCHB, 2011, Statistical Abstract of Haryana

The data on various indicators of quality of life—Air Quality Index (AQI), housing structure, and total crime under the Indian Penal Code (IPC)—for Faridabad and Rohtak districts highlight the multidimensional nature of urban well-being, especially when comparing a Smart City (Faridabad) and a Non-Smart City (Rohtak). Faridabad's AQI of 218 indicates a "poor" air quality category, while Rohtak's higher AQI of 348 falls into the "very poor"

category, suggesting that air pollution significantly affects residents' health in both districts, with more severity in Rohtak. This reflects industrial activities, vehicular emissions, and limited green spaces, which decrease environmental quality and directly impact the livability and sustainability of urban life. In terms of housing structure, Faridabad has 3,22,114 pucca houses, 5,343 kutcha houses, and 23,281 made of other materials, indicating a high proportion of durable and permanent dwellings—an encouraging sign of infrastructure quality and housing stability. Rohtak, on the other hand, reports 1,49,968 pucca houses, 2,980 kutcha houses, and 49,49,356 of other material types. Although the total number of pucca houses is lower due to its smaller population, the proportion remains notable, showing that even non-smart cities are improving housing through state-level schemes and rural-urban development programs. Regarding safety, Faridabad reports 10,294 IPC crimes compared to 6,358 in Rohtak, reflecting how rapid urbanisation and population density in smart cities can correlate with higher crime rates and social stress. While Faridabad's smart city framework emphasises physical infrastructure and digital governance, issues such as pollution and urban crime still affect its overall quality of life. Conversely, Rohtak, despite being a non-smart city, benefits from moderate housing density, better community cohesion, and lower crime rates, illustrating that social harmony and sustainable development are equally vital in defining urban quality of life beyond technological advancements.

Table No. 7: Health Indicators

Sr. No.	Districts	Indicators		
		Sex Ratio of Birth	Life Expectancy	Infant Death
1.	Faridabad	91	70.62	298
2.	Rohtak	85	71.25	6957

Source: Statistical Abstract of Haryana, 2023-24, Payal Taver et.al (2025)

The demographic indicators—sex ratio at birth, life expectancy, and infant deaths—offer deep insights into the social and health dimensions of quality of life in **Faridabad (Smart City)** and **Rohtak (Non-Smart City)** districts of Haryana. Faridabad records a sex ratio of 91 females per 100 males at birth, a life expectancy of 70.62 years, and 298 infant deaths. In contrast, Rohtak reports a slightly lower sex ratio of 85, a marginally higher life expectancy of 71.25 years, and a significantly higher number of infant deaths at 6,957. These variations reveal that economic progress and urban infrastructure, although vital, do not uniformly translate into improved social and health outcomes. Faridabad's relatively better sex ratio at birth indicates moderate success in addressing gender bias through awareness programs, education, and the enforcement of laws such as the *Pre-Conception and Pre-Natal Diagnostic Techniques (PCPNDT) Act*. However, the persistence of a low ratio still reflects deep-rooted socio-cultural preferences and gender inequality that continue to challenge overall social well-being. Rohtak's poorer sex ratio highlights similar patriarchal norms more pronounced in non-metropolitan settings, despite widespread literacy and healthcare accessibility. In terms of life expectancy, Rohtak marginally surpasses Faridabad, which may be attributed to its lower levels of industrial pollution, less stressful lifestyles, and community-based healthcare access, suggesting that smaller cities can sometimes offer healthier living conditions despite fewer smart infrastructures. However, the high number of infant deaths in Rohtak compared to Faridabad points to gaps in maternal and child healthcare facilities, nutrition, and medical infrastructure in semi-urban areas. Faridabad's lower infant mortality, supported by better-equipped hospitals and improved sanitation under the *Smart Cities Mission*, reflects the role of urban modernization in enhancing health outcomes. Overall, while Faridabad's smart city status contributes to improved healthcare and gender awareness, Rohtak's data demonstrate that social attitudes, healthcare reach, and environmental quality are equally critical determinants of quality of life beyond the scope of smart infrastructure.

III. CONCLUSION

In conclusion, the comparative assessment of quality of life between the smart city of Faridabad and the non-smart city of Rohtak reveals that technological advancement and infrastructural development alone do not guarantee holistic well-being. Faridabad, as a smart city, reflects the benefits of urban modernisation—better connectivity, housing, sanitation, and digital governance—which have enhanced material comfort and access to services. However, the challenges of environmental degradation, urban congestion, and social inequalities continue to hinder the realisation of sustainable urban living. On the other hand, Rohtak, despite lacking the institutional framework of a smart city, demonstrates that smaller and traditionally planned cities

can provide a good quality of life through social cohesion, lower living costs, and stronger community networks.

The study highlights that quality of life is a multidimensional concept encompassing not only economic and infrastructural factors but also environmental health, gender equity, safety, and social well-being. Smart cities must therefore move beyond their focus on technological solutions and integrate human-centric approaches, emphasising inclusivity, environmental sustainability, and participatory governance. Non-smart cities like Rohtak, meanwhile, can learn from the efficient service delivery models of smart cities while retaining their community-based strengths. Thus, the path toward improved quality of life in both contexts lies in a balanced model that combines smart urban planning with social equity and ecological consciousness—ensuring that progress reaches every section of society, not just through technology but through sustainable and inclusive development.

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