CHAPTER 67

Exploring Liveability and City Systems as measures of Urban Competitiveness in India

Ramakrishna Nallathiga[1] and Samruddhi Tambe[2]

ABSTRACT

As global urbanization accelerates, cities face increased competition for investment, talent, and opportunities. In India, where urban areas are expected to house more than 40% of the population by 2030, the demand for sustainable, resilient, and competitive cities is critical. This study investigates the relationship between liveability and city systems, examining their roles as indicators of urban competitiveness in the Indian context. This study is based on secondary data on the liveability index and city systems that focus on Indian cities and cluster them according to geographical and demographic factors. The research identifies major patterns and trends, providing insights into Indian cities' triumphs and problems in improving liveability and competitiveness. The findings emphasize the significance of specific governance systems, regional planning, and public participation in ensuring sustainable urban expansion. The paper makes concrete recommendations to legislators and urban planners to improve infrastructure, governance, and citizen-centric services. This study lays the groundwork for future research into constructing resilient, liveable, and competitive cities in India.

Keywords: Urban competitiveness; Liveability; City systems; Masterplans; Smart cities.

1.0 Introduction

The world is witnessing the largest wave of urbanization. More than 50 percent of the world's population is now living in the cities. This ratio is expected to rise to 70 percent by 2050. In India, urban areas are currently home to over 31 percent of population and are projected to house more than 40 percent of its population by the year 2030. Also, the people migrating from rural to urban areas have dreams and aspirations to improve their quality of life with better facilities for living and livelihood that includes physical, social, institutional and economic infrastructure.

Liveability, as measured by housing affordability, environmental quality, access to essential amenities, and social infrastructure, has a direct impact on urban dwellers' quality of life and well-being.

[1]*Corresponding author; School of Real Estate and Facilities Management, NICMAR University, Pune, Maharashtra, India (E-mail: nramakrishna@nicmar.ac.in)*
[2]*School of Architecture and Planning, NICMAR University, Pune, Maharashtra, India*

DOI: 10.17492/JPI/NICMAR/2507067 *ISBN: 978-93-49790-54-4*

City systems, which include governing frameworks, transportation networks, waste management, water supply, and digital infrastructure, ensure that cities run and operate efficiently. It uses frameworks such as the Ease of Living Index and the Annual Survey of India's City Systems to evaluate and analyze urban performance. This study aims to investigate the interrelationships between liveability, city systems, and urban competitiveness in Indian cities, with a focus on how these aspects form and impact one another in the larger context of urban development strategies. This research makes a substantial addition by focusing on regional disparities and demonstrating how spatial, socioeconomic, and governance variations affect urban competitiveness. Furthermore, it fills a major gap in the existing research by combining liveability and city systems into a single framework for assessing urban competitiveness. This study aims to analyze liveability and city systems in Indian cities to assess their impact on urban competitiveness. It evaluates the effectiveness of governance models, infrastructure development, and policy implementation in shaping sustainable and competitive cities.

The objectives include:

- Identifying key factors that contribute to urban competitiveness.
- Examining the role of governance in improving city performance.
- Analyzing infrastructure development and its impact on liveability.
- Comparing liveability indices and city systems in Indian metropolitan areas.

2.0 Methodology

For this study, a Systematic Literature Review (SLR) was conducted to analyze the relationship between urban competitiveness, livability, and city systems. The SLR methodology, involved comprehensive Thematic analysis using NVIVO, a tool for constructing and visualizing thematic networks. The review focused on peer-reviewed publications from 2014 to 2024, retrieved from Scopus, a leading academic database. A structured search strategy was employed to compile a robust dataset, ensuring relevance and academic rigor.

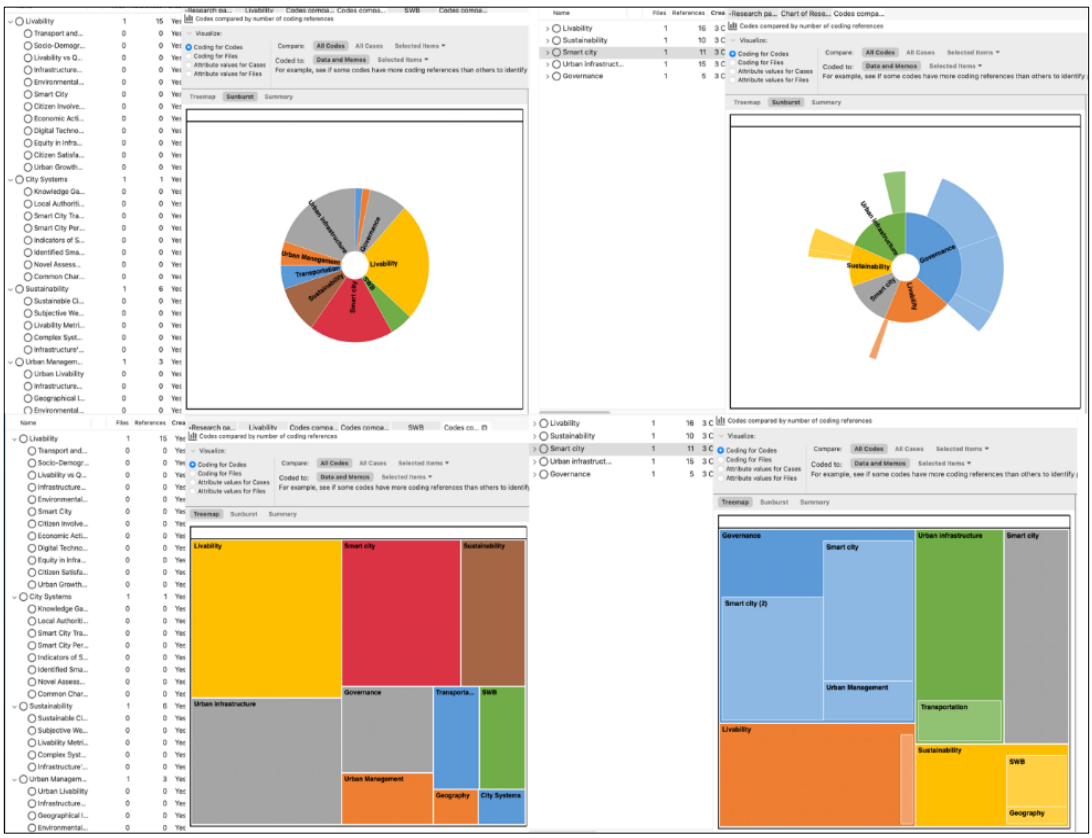
Table 1: Criteria for Selecting publications for Review

Parameter	Criteria
Database	Scopus
Keywords	"Urban competitiveness", "Livability", "city systems".
Subject Area	Social sciences, urban studies, Environmental studies
Document Type	Journal articles
Peer-reviewed Status	Only peer-reviewed documents
Language	English
Year	2021-2024

DOI: 10.17492/JPI/NICMAR/2507067 *ISBN: 978-93-49790-54-4*

The search was conducted using a combination of keywords: “urban competitiveness,” “liveability,” “urban governance,” “infrastructure,” “sustainable development,” and “citizen participation.” Articles were confined to peer-reviewed journal publications in the social sciences, ensuring academic rigor. Only articles published between 2014 and 2024 were included to ensure the relevance of recent contributions. Publications were filtered based on abstract screening, keyword co-occurrence, and citation relevance. A final set of 45 relevant studies was selected for in-depth content analysis.

Figure 1: Thematic Analysis Done on NVIVO



This literature review synthesizes insights from six research papers, categorized into four themes: urban governance, urban infrastructure, sustainable development, and citizen participation. Thematic analysis using NVivo software was employed to code and categorize findings, providing a comprehensive understanding of the interdependence of these factors in shaping urban competitiveness.

DOI: 10.17492/JPI/NICMAR/2507067 *ISBN: 978-93-49790-54-4*

Theme 1: Urban Governance Urban governance plays a pivotal role in shaping the success of smart city initiatives and overall urban competitiveness. Critiques existing governance frameworks and calls for refined measurement methodologies to better reflect ground realities. These studies collectively underscore the need for adaptive, place-based governance strategies to address urban challenges effectively.

Theme 2: Urban Infrastructure Urban infrastructure is a cornerstone of livability and competitiveness for assessing infrastructure's impact on livability, emphasizing the need for participatory approaches and spatial equity.

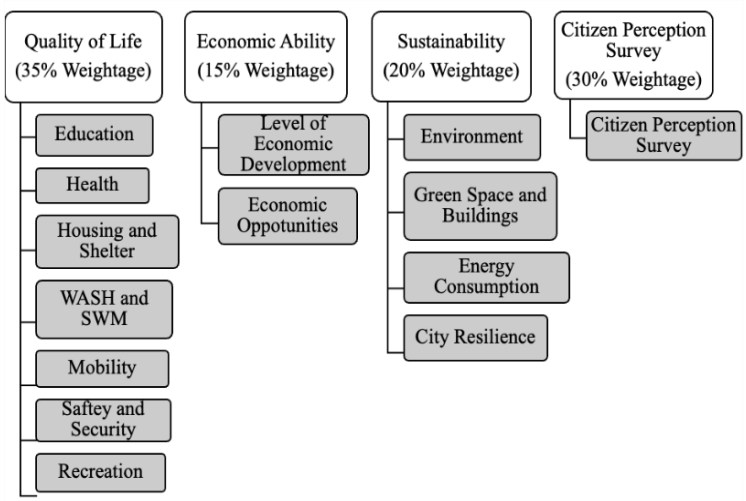
Theme 3: Citizen Participation: Citizen engagement is increasingly recognized as a critical factor in urban planning and governance highlight the importance of participatory approaches in assessing and improving urban livability. These studies advocate for inclusive urban planning strategies that prioritize equity and community well-being.

Theme 4: Sustainable Development Sustainable development is integral to long-term urban competitiveness and livability provide frameworks for evaluating sustainability in diverse contexts, highlighting the need for tailored policy interventions.

Papers spanning multiple themes: Several studies explore the intersection of governance, infrastructure, citizen participation, and sustainability. These studies underscore the interconnectedness of urban systems and the need for holistic approaches to urban development.

Framework and methodology to assess liveability index: The four pillars of the Ease of Living Index are Quality of Life, Economic Ability, Sustainability, and inhabitants Perception Survey. These factors are used to assess the well-being of Indian inhabitants in 111 cities. In total, 14 categories were used to analyze 49 indications.

Figure 2: Components to assess Livability



DOI: 10.17492/JPI/NICMAR/2507067 *ISBN: 978-93-49790-54-4*

Table 2: Classification of cities

Classification	Population Range
Less than Million	Population <1 million
Million+	Population >1 million

Table 3: Million+ Category Rankings in Ease of Living Index

City	Liveability Score	Rank	City	Liveability Score	Rank
Bengaluru	66.70	1	Gwalior	53.72	31
Pune	66.27	2	Prayagraj	53.29	32
Ahmedabad	64.87	3	Patna	53.26	33
Chennai	62.61	4	Aurangabad	52.90	34
Surat	61.73	5	Agra	52.58	35
Navi Mumbai	61.60	6	Meerut	52.41	36
Coimbatore	59.72	7	Hubli Dharwad	51.39	37
Vadodara	59.24	8	Nashik	51.29	38
Indore	58.58	9	Vasai Virar	51.26	39
Greater Mumbai	58.23	10	Faridabad	51.26	40
Thane	58.16	11	Vijayawada	50.35	41
Kalyan Dombivali	57.71	12	Ranchi	50.31	42
Delhi	57.56	13	Jabalpur	49.94	43
Ludhiana	57.36	14	Kota	49.52	44
Visakhapatnam	57.28	15	Amritsar	49.36	45
Pimpri Chinchwad	57.16	16	Guwahati	48.52	46
Solapur	56.58	17	Bareilly	47.73	47
Raipur	56.26	18	Dhanbad	46.96	48
Bhopal	56.26	19	Srinagar	42.95	49
Rajkot	55.94	20			
Jodhpur	55.80	21			
Madurai	55.78	22			
Jaipur	55.70	23			
Hyderabad	55.40	24			
Nagpur	55.33	25			
Lucknow	55.15	26			
Varanasi	54.67	27			

In order to facilitate better analysis, cities were categorized into various tiers based on their differing population sizes and diverse stages of development throughout India. All cities covered by the Smart Cities Mission (regardless of their population size) and all cities with a population of more than one million people as per the population projections through 2019 (all metropolitan and megapolis cities) were included in the comprehensive investigation. In

DOI: 10.17492/JPI/NICMAR/2507067 *ISBN: 978-93-49790-54-4*

conclusion, 111 cities in all were chosen to be assessed using the Ease of Living Index. These cities have mostly been divided into two groups: 1) "Million+" cities, which have a population of one million or more, and 2) "Less than Million" cities, which have a population of less than one million.

Table 4: Less than Million Category Rankings in Ease of Living Index

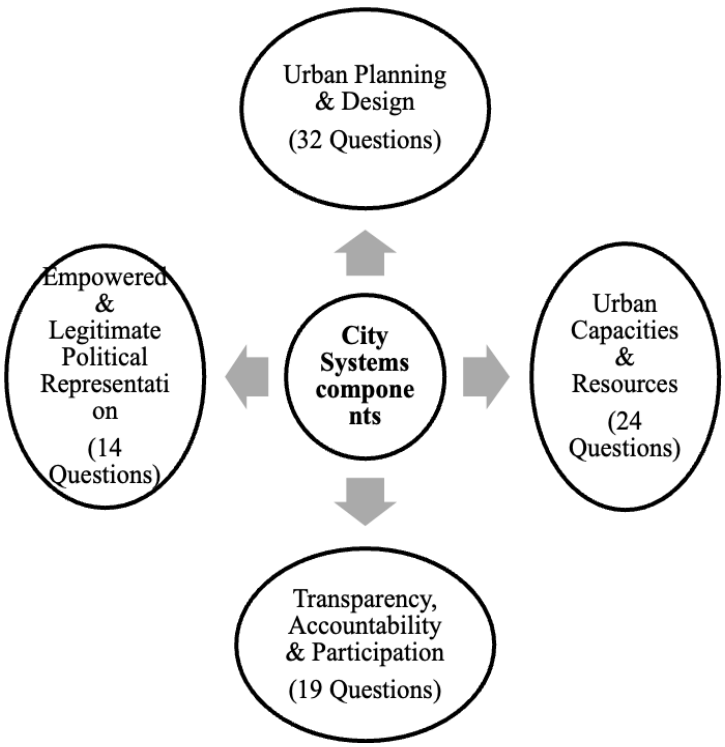
City	Liveability Score	Rank	City	Liveability Score	Rank
Shimla	60.90	1	Thanjavur	52.18	31
Bhubaneswar	59.85	2	Jalandhar	52.18	32
Silvassa	58.43	3	Ujjain	52.04	33
Kakinada	56.84	4	Jhansi	51.71	34
Salem	56.40	5	Shillong	51.65	35
Vellore	56.38	6	Kavaratti	51.58	36
Gandhinagar	56.25	7	Dharamshala	51.51	37
Gurugram	56.00	8	Moradabad	51.43	38
Davanagere	55.25	9	Kochi	51.41	39
Tiruchirappalli	55.24	10	Rae Bareli	51.21	40
Agartala	55.20	11	Gangtok	51.18	41
Ajmer	54.89	12	Port Blair	51.13	42
Puducherry	54.78	13	Thoothukudi	51.12	43
Diu	54.64	14	Saharanpur	50.91	44
Karnal	54.48	15	Amravati	50.38	45
Panaji	54.44	16	Tirupati	50.33	46
Tirunelveli	54.04	17	Belagavi	50.28	47
Tiruppur	54.03	18	Udaipur	50.25	48
Warangal	54.01	19	Kohima	49.87	49
Mangalore	53.95	20	Imphal	49.64	50
Thiruvananthapuram	53.93	21	Dahod	49.40	51
Karimnagar	53.27	22	Bilaspur	49.19	52
Tumakuru	53.06	23	Itanagar	48.96	53
Erode	52.87	24	Rourkela	48.89	54
Sagar	52.86	25	Pasighat	48.78	55
Shivamogga	52.86	26	Dindigul	48.34	56
Jammu	52.49	27	Aizawl	48.16	57
Bihar Sharif	52.42	28	Aligarh	47.15	58
Dehradun	52.41	29	Rampur	46.88	59
Bhagalpur	52.19	30	Namchi	46.46	60
Thanjavur	52.18	31	Satna	45.60	61
Jalandhar	52.18	32	Muzaffarpur	45.53	62
Ujjain	52.04	33			

DOI: 10.17492/JPI/NICMAR/2507067 *ISBN: 978-93-49790-54-4*

2.1 Methodology for assessing city system

With 89 questions encompassing 150 factors and 3900 points of investigation, ASICS 2017 is an objective benchmarking of 23 Indian cities in 20 states. It employs a methodical, data-driven approach to urban government and assigns cities a score between 0 and 10. Additionally, it contrasts Indian cities with benchmark cities like London and New York, which are seen as providing a high standard of living for their residents and have functioning democracies. The strategy used in ASICS editions since 2013 is expanded upon in ASICS 2017. The inclusion of Guwahati and Visakhapatnam in the evaluation has expanded the survey's breadth and representativeness in this edition. In an attempt to strengthen the survey, 16 new questions were added, and the evaluation methodology for 15 preexisting items was changed to make them more pertinent. AMRUT's guidelines and the goal of smart cities were taken into consideration in this regard. The primary factors used by ASICS to determine which cities are included in the study are their size (in terms of population) and geographic spread. Individual scores are a reflection of the quantitative evaluation used by ASICS. Administrators and politicians are intended to use the city-to-city comparison score sheet to diagnose the systemic changes that are required in their particular regions.

Figure 3: City Systems Components and Number of Questions within them



DOI: 10.17492/JPI/NICMAR/2507067 *ISBN: 978-93-49790-54-4*

Table 5: Classification of Cities

Mega cities (5+ Mn)	Ahmedabad, Bengaluru, Delhi, Hyderabad and Mumbai
Large cities (1+ to 5 Mn)	Bhopal, Chennai, Jaipur, Kanpur, Kolkata, Lucknow, Ludhiana, Patna, Pune, Surat and Visakhapatnam
Medium cities (upto 1 Mn)	Bhubaneshwar, Chandigarh, Dehradun, Guwahati, Raipur, Ranchi and Thiruvananthapuram

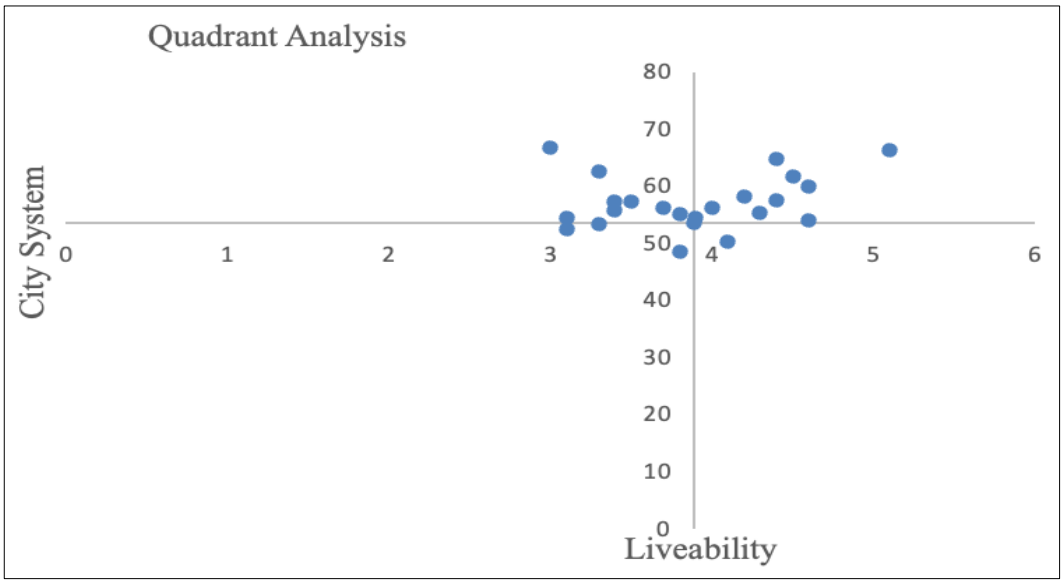
Table 6: Cities Ranked for City Systems

City	Score	Score Change over 2016	Rank
Pune	5.1	0.9	1
Kolkata	4.6	0.5	2
Thiruvananthapuram	4.6	0.2	3
Bhubaneswar	4.6	1.1	4
Surat	4.5	1.3	5
Delhi	4.4	0.8	6
Ahmedabad	4.4	1.1	7
Hyderabad	4.3	0.3	8
Mumbai	4.2	0.1	9
Ranchi	4.1	0.8	10
Raipur	4.0	0.7	11
Kanpur	3.9	0.2	12
Lucknow	3.8	0.5	13
Guwahati	3.8	--	14
Bhopal	3.7	--	15
Ludhiana	3.5	0.5	16
Visakhapatnam	3.4	--	17
Jaipur	3.4	0.8	18
Chennai	3.3	-0.3	19
Patna	3.3	-0.1	20
Dehradun	3.1	--	21
Chandigarh	3.1	1.0	22
Bengaluru	3.0	-0.3	23

DOI: 10.17492/JPI/NICMAR/2507067 *ISBN: 978-93-49790-54-4*

3.0 Analysis

Figure 4: Quadrant Analysis Diagram



3.1 Quadrant analysis interpretation

The quadrant analysis of cities based on their City System Score and Liveability scores provides a comprehensive understanding of urban performance. High liveability scores suggest cities that are more attractive and comfortable for inhabitants. Together, these metrics provide a holistic view of urban performance, helping identify areas that require attention and improvement. Cities in the Top-Right Quadrant--High City System Score, High Liveability include Bhubaneswar, Pune, Ahmedabad, Surat, Greater Mumbai, Delhi, and Raipur. These cities have a balanced approach to development, with strong infrastructure enabling a good standard of living. They demonstrate how effective systems can improve the well-being of residents and act as examples for integrated urban planning.

Low Liveability, High City System Score (Bottom-Right Quadrant): This category includes cities like Thiruvananthapuram and Ranchi. Although these cities have adequate infrastructure, their lack of liveability shows a gap between the well-being of their citizens and the effectiveness of the system. These cities face the difficulty of closing this disparity by tackling the causes of their poor liveability. Include investing in healthcare and educational facilities to improve quality of life, establishing environmental conservation initiatives to improve living circumstances, and boosting community involvement in urban planning to answer local needs and improve social infrastructure. Cities in the Top-Left Quadrant—which

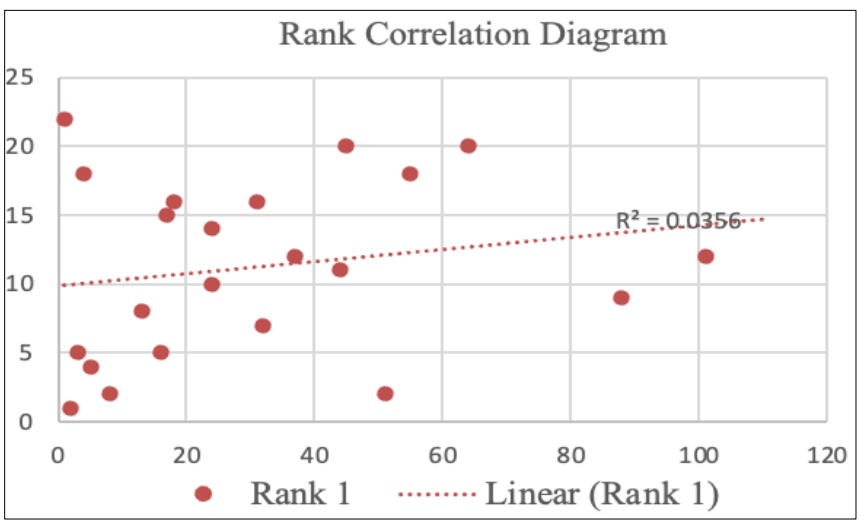
DOI: 10.17492/JPI/NICMAR/2507067 *ISBN: 978-93-49790-54-4*

includes Bengaluru, Chennai, Ludhiana, Visakhapatnam, Bhopal, Jaipur, Hyderabad, Lucknow, Kanpur, Chandigarh, Patna, and Dehradun—have a low city system score and high liveability. Despite having lower infrastructure rankings, these places continue to have high liveability, indicating that quality of life is influenced by strong social and cultural variables. Improving public services like waste management and water supply, creating affordable housing developments to serve all income levels, and giving infrastructure development a priority to support expanding populations and economic activity are other recommendations.

Guwahati is the main city in the bottom-left quadrant, with low liveability and a low city system score. It faces difficulties in both areas. Urban regeneration is required. Developing and implementing integrated urban development plans that address infrastructure and quality of life, encouraging economic development initiatives to raise living standards and create jobs, and strengthening disaster resilience to guard against natural disasters and guarantee long-term sustainability are some of the recommendations made for Guwahati.

3.2 Correlation analysis

Figure 5: Rank Correlation Diagram



3.3 Correlation analysis interpretation

The quality of urban infrastructure, government, and services is represented by the city systems rank, which is shown on the y-axis. Better systems are indicated by lower numbers. On the x-axis, the liveability rank indicates how livable a city is; more liveability is indicated by lower values. The R2 value of 0.0356 indicates that there is a modest association between these two metrics, indicating that liveability cannot be strongly predicted by city systems rank alone

DOI: 10.17492/JPI/NICMAR/2507067 *ISBN: 978-93-49790-54-4*

with the best city systems ranking (1) and the second-highest liveability ranking (2), Pune is clearly a top performer. This suggests that Pune's excellent liveability is mostly due to its well-managed urban systems. With a city systems rating of 2 and a liveability rank of 8, Bhubaneswar similarly performs well, supporting the notion that good municipal systems can improve citizens' quality of life. Consistency is also evident in Ahmedabad and Surat, which have high liveability rankings (3 and 5, respectively) and solid city systems rankings (5 and 4, respectively). These cities are prime examples of how strong urban government and infrastructure improve livability.

Bengaluru has the highest liveability rating (1) but a comparatively low city systems ranking (22). This disparity raises the possibility that Bengaluru's high liveability is being driven by elements outside of city systems, such as economic prospects, cultural attractions, or climate. Conversely, Ranchi and Guwahati have relatively low liveability rankings (88 and 101, respectively) but moderate city systems rankings (9 and 12, respectively). This suggests that even while they have decent urban infrastructures, their liveability may be adversely affected by other issues like social problems, economic situations, or geographic isolation. Cities like Patna, Chandigarh, and Dehradun, liveability rankings are low (55, 45, and 64, respectively), even if their city systems rankings are moderate (18, 20, and 20, respectively). This may indicate problems that have a substantial impact on liveability but are not fully represented by the city systems rating, such as poor healthcare, education, or environmental quality.

4.0 Conclusion

The intricacy of urban liveability is highlighted by the weak overall association, even if there is a general trend that stronger city systems are associated with higher liveability. How livable a city is probably influenced by a number of factors, including social infrastructure, economic opportunity, environmental conditions, and cultural attractions. In order to improve the general quality of life for inhabitants, this research emphasizes the necessity of a more comprehensive approach to urban planning, one that takes into account a wide range of elements beyond only city systems. Insights into urban performance and the elements impacting the standard of living in Indian cities may be gained from the quadrant and correlation analyses of cities according to their City System Score and Liveability scores. These studies demonstrate how intricately government, sociocultural elements, and urban infrastructure interact to determine a city's liveability.

The results highlight the significance of a well-rounded strategy for urban development, wherein people' well-being is improved by giving equal weight to hard and soft social infrastructure.The quality of life in cities is also greatly influenced by other elements, including social cohesiveness, cultural amenities, economic opportunity, and environmental quality. While Bengaluru and other exceptions illustrate that non-infrastructure elements can also influence liveability, Pune, Bhubaneswar, Ahmedabad, and Surat show that well-managed urban systems

DOI: 10.17492/JPI/NICMAR/2507067 *ISBN: 978-93-49790-54-4*

can improve liveability. Cities like Ranchi and Guwahati, on the other hand, demonstrate how socioeconomic or topographical issues can jeopardize liveability even in the case of modest urban systems. The results of the correlation and quadrant analyses highlight how urban liveability is a complex idea impacted by a range of sociocultural elements, governance, economic possibilities, and hard infrastructure. To achieve sustainable and equitable urban development, investments in social infrastructure and inclusive planning must be made in addition to strong urban systems. Successfully incorporating these components into a city can set an example for others, improving everyone's quality of life and advancing urban India as a whole.

References

Alderton, A., Davern, M., & Nitvimol, K. (n.d.). *Planning healthy, liveable, and sustainable cities: How can indicators inform policy?*

Alderton, A., Davern, M., & Nitvimol, K. (n.d.). *The Urban Liveability Index: Developing a policy-relevant urban liveability composite measure and evaluating associations with transport mode choice*.

Das, K., Chakrabarti, S., Basu, R., & Roy, M. (2022). Connecting the dots between urban infrastructure, well-being, livability, and equity: A data-driven approach. *Sustainable Cities and Society*, *87*, 104203. https://doi.org/10.1016/j.scs.2022.104203

Fachinelli, A. C. (2023). Urban smartness and city performance: Identifying Brazilian smart cities through a novel approach. *Cities*, *132*, 103961. https://doi.org/10.1016/j.cities.2022.103961

Giap, T. K., Thye, W. W., & Aw, G. (n.d.). *A new approach to measuring the liveability of cities: The Global Liveable Cities Index*.

Giffinger, R., & Kramar, H. (n.d.). *Defining indicator systems for liveable cities*.

DOI: 10.17492/JPI/NICMAR/2507067 ISBN: 978-93-49790-54-4