

# Exploring Urban Growth and Morphological Changes in Ranaghat Town

Gopal Sadhukhan, Gouri Sankar Bhunia\*

*Department of Geography, Seacom Skills University, Kendradangal, Bolpur, District: Birbhum, West Bengal, India, PIN: 731236*

**Abstract:** Urbanization in small towns like Ranaghat, located in the Nadia district of West Bengal, India, has accelerated due to population growth, industrial expansion, and the improvement of transportation and public services. This research paper examines the urban growth and morphological changes in Ranaghat, focusing on the transformation of its physical infrastructure, housing, land use, and socio-economic conditions. Present study showed that the urbanization has reshaped community dynamics, with improved neighborhood cohesion and social networking opportunities for some but reduced participation in community events and weaker connectivity to extended families for others. The interplay between these factors underscores the dual-edged nature of urban growth in Ranaghat Town—enhancing infrastructure and opportunities while posing significant social and environmental challenges. Through both qualitative and quantitative data, the paper aims to provide a comprehensive understanding of urbanization in a small Indian town.

**Keywords:** Urban morphology, Ranaghat town, community dynamics, urban planning, Sustainable urban development

## INTRODUCTION

In India, the phenomenon of urbanization is primarily concentrated in small towns that act as regional hubs. From 1901 to 2011, the urban population in India grew from 25.9 million to 377.1 million, reflecting an average annual growth rate of around 3.1%. Over this period, India has seen both population growth in existing cities and the creation of new urban centers. The growth rate of urban populations has been especially high in the post-1981 period, which coincides with the liberalization of the economy and the rise of industrialization (Smith & Kumar, 2020). As of the 2011 Census, West Bengal had an urbanization level of 31.89%, slightly higher than the national average of 31.20%. This reflects a gradual yet steady increase in urbanization since the post-independence period (Sharma, 2019). The southern plain region, which includes Kolkata and its

metropolitan area, exhibits the highest urbanization level at 45.07%, but the growth rate here is relatively lower (1.87%) compared to other regions (Liu et al., 2018). In contrast, the coastal plains and northern plains experienced more rapid urban growth, with growth rates of 5.02% and 3.58%, respectively. Ranaghat, a historically agricultural town, has transformed into a growing urban center, with significant changes in its physical form, infrastructure, and social dynamics (Bhagat & Mohanty, 2009). Understanding the processes behind these changes and their impacts on residents' everyday lives is essential for guiding sustainable urban development.

Historically, West Bengal's urbanization traces back to the colonial era, with key towns like Kolkata, Murshidabad, and Malda serving as important commercial and administrative centers. Post-independence, the urbanization trend was slow but steadily increased, particularly due to factors like migration, natural population growth, and the expansion of urban areas (Singh, 2021). The state's major urban centers such as Kolkata continue to play a central role in the region's economic, social, and political life, but smaller towns and newly emerging urban centers have also contributed significantly to the overall growth (Pavlov & Gupta, 2019). Urbanization has also introduced challenges in terms of infrastructure, environmental sustainability, and spatial inequalities. Inadequate land use planning and failure to effectively manage growth often led to haphazard construction, particularly in suburban or fringe areas (Bhan et al., 2015). Thus, addressing these urban challenges while ensuring sustainable growth is a key focus in urban policy and planning.

To understand the factors influencing urban growth in West Bengal, it's important to consider the contributions of various components such as migration, reclassification, and the expansion of urban boundaries. Additionally, the state's urbanization process has been influenced by its

historical geography, with rivers and water transport historically facilitating urban development.

Study area

Ranaghat, located in the Nadia district of West Bengal, India, has witnessed substantial urbanization in recent years. Urban growth in Ranaghat is driven by several factors, including its proximity to Kolkata, the capital of West Bengal, and the growth of its agricultural and small-scale industrial sectors. The town's population has seen a steady increase over the past few decades, with urbanization pushing it from a small town towards a more densely populated and diverse urban area. The population of Ranaghat has grown significantly in recent years, driven by migration from nearby rural areas seeking better employment opportunities and access to infrastructure. The establishment of local industries and the growth of retail markets have brought economic dynamism to the town, attracting migrants seeking work in the industrial, retail, and service sectors.

METHODS

Data collection

Administered to households in Ranaghat to gather data on demographic characteristics, housing conditions, access to basic services, and perceptions of urbanization. Engaging with local authorities, urban planners, and residents to understand the qualitative aspects of urban growth, challenges, and infrastructural development.

Qualitative and Quantitative analysis

Thematic analysis of interview and focus group data to identify common themes related to residents'

experiences of urban growth, challenges, and opportunities. Descriptive statistics (e.g., frequency, percentage) for survey responses on housing, infrastructure, and urbanization perceptions. Cross-tabulation and correlation analysis to explore relationships between urban growth factors (e.g., migration, housing affordability) and socio-economic variables (e.g., income, employment).

RESULTS

Morphological Changes

The majority of respondents have lived in Ranaghat for over 15 years, indicating a well-established community with significant historical perspective on urban changes. A marked increase in residential development was observed, signifying urban sprawl and densification. A smaller percentage noted commercial growth, reflecting evolving economic activities. Public utilities have seen moderate to significant improvement, particularly roads and water supply, aligning with urban growth trends. A vast majority highlighted a decline in green spaces, pointing to environmental concerns stemming from urban expansion. Over 60% of respondents reported rising housing costs, signaling challenges in maintaining affordability amidst urban growth. There is a strong consensus that Ranaghat has become significantly urbanized, supported by visible infrastructure and demographic shifts. Urbanization has fostered job growth for the majority, although a minority feels unchanged or negatively impacted. Most respondents rate infrastructure development positively, but there remains a notable portion expressing dissatisfaction.

Table 1: Survey response on Morphological Changes in Ranaghat Town

Question	Responses	Number	Percentage
How long have you lived in Ranaghat?	Less than 5 years	50	14.30%
	5–15 years	120	34.30%
	More than 15 years	180	51.40%
What changes have you observed in the land use pattern?	Increase in residential areas	210	60.00%
	Increase in commercial zones	90	25.70%
	No significant change	50	14.30%
Have public utilities (roads, water supply) improved?	Improved significantly	150	42.90%

	Somewhat improved	130	37.10%
	No improvement	70	20.00%
How do you perceive the changes in green spaces?	Increased	30	8.60%
	Decreased	270	77.10%
	No change	50	14.30%
What is your opinion on housing affordability?	Affordable	100	28.60%
	Expensive	210	60.00%
	Unchanged	40	11.40%
Do you feel the town has become more urbanized?	Strongly agree	220	62.90%
	Agree	90	25.70%
	Disagree	40	11.40%
How has employment changed due to urbanization?	Increased opportunities	210	60.00%
	No change	80	22.90%
	Decreased opportunities	60	17.10%
How do you rate infrastructure improvements?	Good	180	51.40%
	Average	110	31.40%
	Poor	60	17.10%

*Source: Primary survey by the Researcher*

Positive correlation is observed ( $r = 0.79$ ) between improved infrastructure and enhanced employment opportunities; whereas, negative correlation ( $r = -0.65$ ) is calculated between increased housing costs and perceptions of affordability.

#### Household Experiences of Urban Morphology

The analysis of the data highlights diverse perspectives on urbanization's impact across various dimensions. In terms of Duration of Residence, nearly half of the respondents (48.60%) have lived in the area for more than 15 years, indicating a significant portion with a long-term perspective on changes. About 34.30% have resided for 5–15 years, while 17.10% are relatively new residents (less than 5 years). This range in residence duration reflects a mix of experiences that inform perceptions of urban changes. Regarding Changes in Land Use, the majority (62.90%) observed an increase in residential areas, demonstrating urban expansion to accommodate growing populations. Commercial areas have also expanded, as noted by 25.70%, highlighting economic development. A smaller segment (11.40%) reported no noticeable change, suggesting pockets of stability in land use.

The Perception of Green Spaces paints a concerning picture, with 71.40% indicating a decrease, suggesting that urban growth is coming at the

expense of natural environments. Only 11.40% observed an increase, and 17.10% saw no change, reflecting varied impacts on greenery. In terms of Housing Affordability, 65.70% consider housing expensive, underscoring affordability challenges in urbanized areas. While 22.90% find housing affordable, a small portion (11.40%) perceive no significant change, hinting at disparities in housing markets.

Infrastructure Improvements were positively perceived, with 74.30% acknowledging enhancements, a testament to urban investments in public services. However, 14.30% saw no improvement, and 11.40% reported deterioration, emphasizing areas requiring attention. Employment Opportunities appear to have increased for 57.10% of respondents, indicating positive economic trends. However, 22.90% observed a decrease, and 20.00% noted no change, reflecting uneven job market dynamics.

Lastly, the Quality of Life Post-Urbanization has improved for 51.40%, signifying general satisfaction with urbanization outcomes. However, 31.40% report a decline, and 17.10% see no significant change, indicating mixed results in balancing growth with livability. This data collectively underscores the multifaceted nature of urbanization, with both opportunities and challenges shaping residents' experiences.

Table 2: Survey response on Household Experiences of Urban Morphology in Ranaghat Town

Question	Responses	Number	Percentage
Duration of Residence	Less than 5 years	60	17.10%
	5–15 years	120	34.30%
	More than 15 years	170	48.60%
Changes in Land Use	Residential areas increased	220	62.90%
	Commercial areas expanded	90	25.70%
	No noticeable change	40	11.40%
Perception of Green Spaces	Increased	40	11.40%
	Decreased	250	71.40%
	No change	60	17.10%
Housing Affordability	Affordable	80	22.90%
	Expensive	230	65.70%
	No change	40	11.40%
Infrastructure Improvements	Improved	260	74.30%
	No improvement	50	14.30%
	Deteriorated	40	11.40%
Employment Opportunities	Increased	200	57.10%
	Decreased	80	22.90%
	No change	70	20.00%
Quality of Life Post-Urbanization	Improved	180	51.40%
	Decreased	110	31.40%
	No significant change	60	17.10%

Negative correlation ( $r = -0.75$ ) is calculated between air quality and increased building density; whereas, positive correlation ( $r = 0.82$ ) is observed between waste management challenges and perceptions of environmental degradation.

#### Urban morphology and Environmental Challenges

The data reflects significant environmental and infrastructural changes due to urbanization. Changes in Urban Layout show an increased density of buildings for 60.00% of respondents, signaling intensified development. Road expansions were observed by 25.70%, while 14.30% noted no significant changes, highlighting selective growth patterns. Loss of Green Cover is a major concern, with 68.60% reporting significant loss and 20.00% observing minor loss, underscoring environmental degradation. Waterlogging Issues have worsened for 57.10%, likely due to inadequate drainage systems, while 17.10% reported improvements, and 25.70%

saw no change. Perceptions of Air Quality reveal deterioration for 54.30%, while only 17.10% noticed improvements, and 28.60% observed no change, indicating a negative trend in urban air conditions.

In Waste Management, 48.60% felt it had worsened, 34.30% acknowledged improvements, and 17.10% noted no change, reflecting varying efficiency in handling urban waste. Access to Public Spaces has decreased for 51.40%, highlighting a decline in communal areas, while 28.60% reported increased access. Flood Risks have escalated for 62.90% of respondents, emphasizing vulnerabilities in urban planning, though 17.10% observed reduced risks. Overall, the Environmental Impact is perceived as negative by 65.70% due to issues like loss of greenery, waterlogging, and poor air quality. Only 14.30% considered the impact positive, and 20.00% viewed it as neutral, indicating significant environmental challenges amidst urban expansion.

Table 3: Survey Response on urban morphology and environmental challenges in Ranaghat Town

Question	Responses	Number	Percentage
Changes in Urban Layout	Increased density of buildings	210	60.00%
	Expansion of roads	90	25.70%

	No change	50	14.30%
Loss of Green Cover	Significant loss	240	68.60%
	Minor loss	70	20.00%
	No change	40	11.40%
Waterlogging Issues	Increased	200	57.10%
	Decreased	60	17.10%
	No change	90	25.70%
Air Quality Perceptions	Deteriorated	190	54.30%
	Improved	60	17.10%
	No change	100	28.60%
Waste Management	Improved	120	34.30%
	Worsened	170	48.60%
	No change	60	17.10%
Access to Public Spaces	Increased	100	28.60%
	Decreased	180	51.40%
	No change	70	20.00%
Flood Risks	Increased	220	62.90%
	Decreased	60	17.10%
	No change	70	20.00%
Overall Impact on Environment	Negative	230	65.70%
	Positive	50	14.30%
	Neutral	70	20.00%

Negative correlation ( $r = -0.78$ ) is calculated between green cover and flood risks; whereas, positive correlation is observed ( $r = 0.65$ ) between waste management issues and environmental degradation perceptions.

#### Community and Social Networks on urban morphology

The data highlights the nuanced social impacts of urbanization on communities. Neighborhood Cohesion has seen improvements for 42.90% of respondents, indicating strengthened ties in some areas. However, 37.10% experienced a decline, and 20.00% observed no change, reflecting a varied impact on community bonding. Participation in Community Events has decreased for 48.60%, suggesting challenges in maintaining active communal engagement, while 34.30% reported

increased participation, and 17.10% noticed no change. In terms of Social Networking Opportunities, 40.00% noted an expansion, indicating enhanced interaction and connections. Yet, 45.70% found opportunities limited, and 14.30% saw no change, pointing to barriers for some groups. Connectivity to Extended Families worsened for 51.40%, likely due to urban migration or distance, though 28.60% reported improvements. Access to Shared Resources increased for 37.10%, but 48.60% saw a decline, signaling uneven distribution of communal facilities. Perception of Safety in Social Settings was also mixed, with 45.70% feeling less secure, 40.00% noting improvements, and 14.30% seeing no change. Overall, the impact on Social Networks was positive for 40.00% of respondents but negative for 48.60%, reflecting a polarized social experience in urbanized areas.

Table 4: Survey response on Community and Social Networks related to Urban Morphology in Ranaghat Town

Question	Responses	Number	Percentage
Impact on Neighborhood Cohesion	Improved	150	42.90%
	Declined	130	37.10%
	No Change	70	20.00%
Participation in Community Events	Increased	120	34.30%
	Decreased	170	48.60%

	No Change	60	17.10%
Social Networking Opportunities	Expanded	140	40.00%
	Limited	160	45.70%
	No Change	50	14.30%
Connectivity to Extended Families	Improved	100	28.60%
	Worsened	180	51.40%
	No Change	70	20.00%
Access to Shared Resources	Increased	130	37.10%
	Decreased	170	48.60%
	No Change	50	14.30%
Perception of Safety in Social Settings	Improved	140	40.00%
	Declined	160	45.70%
	No Change	50	14.30%
Overall Impact on Social Networks	Positive	140	40.00%
	Negative	170	48.60%
	Neutral	40	11.40%

Positive correlation is observed between neighborhood cohesion and participation in community events ( $r = 0.68$ ); whereas, negative correlation ( $r = -0.55$ ) is observed between expanded social networking opportunities and access to shared resources.

#### DISCUSSION

The findings indicate that while urbanization has brought significant improvements in infrastructure and housing quality, it has also introduced challenges. The rising cost of living and income instability are central issues affecting household stability (Gupta & Misra, 2016). Additionally, while urban growth has improved access to services, it has also caused environmental degradation and social fragmentation, particularly in newly developed areas where infrastructure has not kept pace with population growth.

Residents reported substantial changes in urban layouts, with 60% noting increased building density and 25.7% observing road expansions, underscoring urbanization's focus on maximizing land use. However, these developments often came at the expense of green spaces, with 68.6% reporting significant losses. Housing affordability has emerged as a concern, with 65.7% describing it as expensive, a recurring observation from earlier trends where urban growth strained housing supply and demand. These factors collectively affect quality of life, as only 51.4% felt an improvement post-urbanization, highlighting the uneven benefits of urban morphology.

Environmental repercussions of urban morphology are evident. The deterioration of air quality (54.3%) and increased flood risks (62.9%) illustrate the adverse effects of high-density urban development. Similar observations of waterlogging (57.1% reporting an increase) and inadequate waste management (48.6% noted worsening) reflect gaps in urban planning and infrastructure. These findings align with earlier discussions on stormwater monitoring systems and the need for GIS-based solutions for urban planning and water management. Despite 74.3% recognizing infrastructure improvements, the negative environmental impact perceived by 65.7% of respondents underlines the need for more sustainable urban policies.

Urbanization's impact on social cohesion and networks reveals mixed outcomes. Neighborhood cohesion improved for 42.9%, but declined for 37.1%, suggesting that urban morphology can both strengthen and weaken community ties. Participation in community events has decreased (48.6%), reflecting potential social isolation in denser urban environments. While 40% observed expanded social networking opportunities, 45.7% felt these were limited, revealing disparities in access to social capital. Earlier observations of declining connectivity to extended families (51.4%) and reduced access to public spaces (51.4%) further demonstrate the social challenges of rapid urbanization.

Urban morphology changes in Ranaghat Town have mixed effects on community and social networks. Positive impacts include enhanced neighborhood

cohesion for some and expanded social opportunities. However, significant challenges, such as reduced family connectivity and decreased community event participation, highlight the need for inclusive urban planning. Overall, the survey underscores the complex interplay between urban growth and community dynamics, suggesting targeted interventions to strengthen social networks amidst urban transformation.

### CONCLUSION

The case of Ranaghat highlights the complex interplay between urban growth and morphological changes in small towns. Urban growth and morphological changes in Ranaghat have reshaped the town's physical and social landscape. The interplay between urban morphology, environmental challenges, and community dynamics presents a complex picture. While urbanization drives infrastructural improvements and economic opportunities, it often compromises environmental quality and social well-being. These findings reiterate the importance of balanced urban planning that integrates sustainability, community-building efforts, and equitable resource distribution. References to earlier insights, such as GIS and MIS-based solutions for monitoring water and green spaces, highlight the potential of technology in addressing these challenges. Incorporating these tools into urban planning can help mitigate the adverse effects while fostering inclusive, resilient urban growth.

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