Environment and Social Psychology (2023) Volume 8 Issue 3
doi: 10.54517/esp.v8i3.1671

RESEARCH ARTICLE

Assessing citizen satisfaction of urban local government service and infrastructure in Bangladesh: A case study of Pabna municipality

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ABSTRACT

The provision of essential services to residents heavily relies on the infrastructure and functioning of urban local government institutions. The satisfaction citizens have with these institutions is an important indicator of the effectiveness of governance mechanisms. This study aims to assess the degree of citizen satisfaction with urban local government services and infrastructure, specifically in the context of Pabna municipality in Bangladesh. A qualitative and quantitative research approach was employed, utilizing survey data from 120 structured questionnaires and 20 interviews. The study results show that a significant proportion of municipality residents (56%) express deep dissatisfaction with basic services and infrastructure performance. The municipality has failed to effectively deliver sanitation, disaster management, waste management, roads and bridges, traffic infrastructure, and public utilities services as required. The study also identified key challenges in delivering basic services, including poor infrastructure, a lack of initiatives, adequate resources, a large workforce, and sufficient equipment. The findings suggest that the municipality should prioritize sustainable city planning through democratic participation and consideration of residents' perceived experiences to deliver a high degree of citizen satisfaction.

Keywords: citizen satisfaction; urban governance; infrastructure; municipality; service quality

1. Introduction

Satisfaction is a critical component of human well-being and happiness. Considering that it is founded on expectations, treasured values, and beliefs, among other things, as may be inferred from the literature on satisfaction, satisfaction in its conceptualization is typically extensive and value-laden. It is fundamental to contemporary marketing theories and methods for providing consumer satisfaction (not simply products) and generating profits[1]. The degree of satisfaction and the components that define satisfaction for an individual or a collective may be contingent on many interconnected elements. These elements may include but are not limited to the individual's or group's social standing, such as their ethnicity or economic stratification, as well as their psychological composition, belief and ethical systems, and the environmental and cultural factors that are relevant to context-specific contentment, such as their occupation, utilization of public or private services, and general quality of life[2]. The sensation of achievement and gratification that satisfaction brings can enhance an individual's self-esteem and fulfillment. For this reason, consumer satisfaction is essential to fulfilling the diverse requirements of consumers, businesses, and society as a whole.

ARTICLE INFO
Received: 27 April 2023 | Accepted: 31 July 2023 | Available online: 13 October 2023

CITATION
Bhuiyan MAF, Islam MA. Assessing citizen satisfaction of urban local government service and infrastructure in Bangladesh: A case study of Pabna municipality. *Environment and Social Psychology* 2023; 8(3): 1671. doi: 10.54517/esp.v8i3.1671

Acknowledging this significance, there has been a surge in consumer satisfaction research in the public and private sectors during the preceding two decades. The impact of consumer expectations on private enterprises' products is a well-established notion. However, public organizations' recognition of the significance of consumer expectations commenced during the early 1900s[3]. The consistent issue with public sector reform has been citizens' discontent with public services. Several administrative reform initiatives have explicitly established a link between the necessity of public service reform, the enhancement of citizen satisfaction with public services, and the preservation or restoration of public trust in government. Throughout the administrative reform movements of the 1980s and 1990s, the concept of treating citizens as clients and rendering public services more client-centric emerged. This entailed, among other things, separating the service delivery process from the outcome, striving to provide clients with a pleasant service experience, and transforming the traditional bureaucratic state into a service delivery machine. The emphasis on client-centricity is demonstrated by the proliferation of specialized resources designed to support public service providers in delivering greater services and help citizens and clients safeguard that they are served correctly, particularly in urban areas[4].

Municipal governments are transforming through the adoption of reform initiatives and advanced technologies. Quality plays a pivotal role in the revolution of municipal facilities and is a vital driving force for improved citizen satisfaction. Many countries' governments are focused on developing efficient and effective delivery systems due to society's insistence and expectations for local authorities to provide services that meet taxpayers' expected quality standards. However, delivering first-class and cost-effective municipal services takes much work. To ensure effective service delivery, it is necessary to establish organizations with effective infrastructure and suitable strategies, define precise methods for delivering services, designate capable personnel to address citizens' requirements, develop sound policies, implement them effectively, have a thorough understanding of citizens' expectations and needs, provide adequate resources and technology, cultivate a culture of responsiveness within the organization, and train staff to a high standard. At the same time, municipalities need to balance their income and the expenses incurred in providing more effective services, which citizens increasingly demand. Identifying and meeting the exact expectations of citizens is the key to defining and providing satisfactory services. Obtaining feedback from citizens allows for precious insights into how well the municipal expert is meeting their client's requirements. This data can be used in programs focused on improving infrastructure, and the quality of services, helping municipal council members recognize areas for improvement, and cultivating a favorable view of the municipality among citizens.

Additionally, evaluating the quality of services through quantitative measures can reveal the gap between citizens and council members' perspectives[5]. Therefore, the objective of this research is to evaluate citizen satisfaction with urban local government services and infrastructure in Bangladesh, with a specific focus on Pabna Municipality. It is expected that the study will contribute to the understanding of citizen satisfaction and its impact on educational and social aspects, ultimately leading to the improvement of local government services and the overall well-being of the community.

2. Background of the study

The story of the evolution of urban government in Bangladesh is similar in numerous behaviors to that of India and Pakistan due to their shared history. Urban governments, in some shape or form, have existed on the Indian subcontinent for decades[6]. The current structure of urban local government institutions in Bangladesh did not materialize overnight; rather, it has a long-standing tradition. The evolution of urban local government in Bangladesh underwent various stages that transformed its entire structure. The British established the formal structure of urban local government organizations, although it originated during the Mughal era. The structure

of these institutions continued to evolve. After British rule, Pakistan took over, but there were no significant changes until 1959 when the Basic Democracy system was introduced.

Following the liberation of Bangladesh in 1971, different government regimes brought about considerable changes[7]. The urban local government system in post-independent Bangladesh underwent various changes from 1972 to 1976 regarding power and authority distribution. Initially, members of the National Parliament were given greater importance than government officials, followed by an emphasis on electing local representatives. Similarly, changes were introduced in the governance of Dhaka City, which was initially established as the Dhaka Municipal Corporation in 1974 (Act 56) and later upgraded to City Corporation status in 1983. However, it is noteworthy that Bangladesh was ruled by undemocratic, dictatorial regimes from 1975 to 1990. The first mayoral election in Dhaka City Corporation (DCC) was held in 1994 under the Local Government Act of 1993, followed by elections in other city corporations and municipalities. The democratization process was further strengthened in 1999 by introducing direct elections for Women Commissioners to reserve seats. In 2008, all Pourashava (municipality) chairpersons were renamed mayors, while Ward Commissioners became Councilors, contributing to the democratization process's consolidation[8].

The present-day municipal government of Bangladesh is composed of multiple tiers, which include city corporations and Pourashavas, also known as municipalities. As of now, there are a total of 12 city corporations and 279 Pourashavas that are distributed throughout the country. These municipal corporations operate under various ordinances and acts that have been modified periodically. Adult citizens participate in direct voting to elect chairmen and commissioners of Pourashavas, as well as mayors and commissioners of city corporations, with women members occupying reserved seats[6].

3. Statement of the problem

Municipal governments play a crucial role in driving grassroots development. Their multifaceted responsibilities foster closer relationships between cities and their inhabitants, which enhances living standards. It is incumbent upon them to uphold high standards of integrity and inclusivity when providing efficient service infrastructure to citizens. With the global surge in urbanization, city and town planners face increasing responsibilities to ensure that citizens are satisfied with high service quality and infrastructure levels. Although urbanization yields positive economic and societal effects, it is not devoid of drawbacks, particularly in Bangladesh, where its rapid pace poses significant challenges[9].

Despite the critical role played by the municipality in delivering widespread goods and services to improve the standard of living for a large number of residents, no research has been conducted on citizen satisfaction with municipal services in the area[10–12]. Many studies have overemphasized the role of city services in creating livable cities, often neglecting the perspective of the residents[11]. These studies have sometimes resulted in counterintuitive findings at odds with residents' perceptions of the city's ability to provide a desirable living infrastructure[13]. Additionally, existing literature has mostly focused on citizen satisfaction with urban infrastructure in city corporations of large cities, leaving a gap in the literature regarding citizen satisfaction with municipal services in grassroots areas. Therefore, this study aims to address this gap in the literature by assessing the satisfaction of municipal services and infrastructure in the Pabna municipality of Bangladesh. The results of the study are expected to provide policymakers and municipal stakeholders with the necessary knowledge and information on citizen satisfaction with services, enabling them to create useful measures for promoting and evaluating the quality of municipal service and infrastructure.

4. Literature review

Urban local government services and infrastructure play a crucial role in the lives of citizens, and

assessing citizen satisfaction has become a significant area of research and policy interest. As urban areas continue to experience rapid growth and transformation, understanding citizen satisfaction is essential for local governments to improve service delivery and infrastructure development.

Scholars have identified various factors that influence citizen satisfaction with urban local government services and infrastructure. Mokhlis et al.[5] emphasize the importance of the responsiveness of local government officials, accessibility to services, and quality of infrastructure in determining citizen satisfaction. They argue that citizens are more likely to be satisfied when their concerns are addressed promptly and efficiently, when services are easily accessible, and when infrastructure meets their expectations. Similarly, Salim et al.[14] highlight the role of transparency, accountability, and citizen participation in fostering citizen satisfaction. They argue that citizens who are informed about decision-making processes, have opportunities to provide feedback, and are involved in shaping policies and services are more likely to be satisfied. Other factors identified in the literature include service reliability, affordability, and public safety[5,15]. For example, citizens expect services to be reliable and consistent, affordable and accessible, and for their neighborhoods to be safe.

The methodological approaches employed in previous studies to assess citizen satisfaction have varied. Surveys have been widely used to collect quantitative data and measure overall satisfaction levels among a representative sample of citizens. Van Ryzin et al.[16] employed a telephone survey-based approach to assess citizen satisfaction with local government services in a large urban area. They found that overall satisfaction levels were influenced by factors such as service quality, responsiveness, and accessibility. Similarly, Bogoro et al.[17] conducted a survey to assess citizen satisfaction with urban infrastructure, and they identified key factors such as reliability, affordability, and ease of use as significant determinants of satisfaction. On the other hand, qualitative methods such as focus groups and interviews have been utilized to gain deeper insights into citizens' attitudes, preferences, and specific concerns regarding service provision and infrastructure development. Longe et al.[18] conducted focus groups to explore citizen perspectives on local government infrastructure projects. Their findings highlighted the importance of involving citizens in decision-making processes and considering their specific needs and preferences when planning and implementing infrastructural projects. The integration of quantitative and qualitative approaches provides a comprehensive understanding of citizen satisfaction and supports informed decision-making for local governments.

Citizen satisfaction has significant implications for urban governance. Van Ryzin[19] argues that citizen satisfaction is closely linked to trust in government, and when citizens are satisfied, they are more likely to cooperate with government programs and contribute to the development of their communities. Conversely, dissatisfaction with service delivery and infrastructure can erode trust, negatively affect public perception, and hinder effective governance. Morgeson and Petrescu[20] emphasize that citizen dissatisfaction can result in decreased public confidence and engagement, which may lead to increased public criticism and even social unrest. Therefore, understanding the factors driving citizen satisfaction is vital for local governments to allocate resources effectively, improve service quality, and address infrastructure gaps. Moreover, monitoring citizen satisfaction over time serves as a performance indicator, allowing local governments to track progress, identify areas for improvement, and enhance overall urban governance.

Further studies have examined the relationship between citizen satisfaction and specific urban local government initiatives. For instance, Ali et al.[21] investigated the impact of e-government services on citizen satisfaction. They found that the availability and accessibility of online services significantly influenced citizen satisfaction, highlighting the importance of technological advancements in enhancing service delivery. Similarly, Chen et al.[22] focused on the role of air pollution and environmental sustainability in citizen satisfaction with urban infrastructure. The results indicate that individuals who are exposed to higher levels of

industrial dust emissions and sulfur dioxide (SO_2) are less likely to experience satisfaction with environmental administration. The way citizens perceive air pollution is influenced by quantifiable industrial emissions and ultimately impacts their level of satisfaction.

It is important to note that while this literature review provides valuable insights into the assessment of citizen satisfaction with urban local government service and infrastructure, further research is warranted. Future studies could explore additional factors influencing satisfaction, such as cultural and socio-economic considerations, as well as the effectiveness of specific strategies in enhancing citizen satisfaction. Additionally, comparative studies across different cities and regions can provide a broader understanding of the dynamics of citizen satisfaction and inform context-specific policy interventions. Overall, a comprehensive understanding of citizen satisfaction will enable local governments to create more responsive, inclusive, and sustainable urban environments that meet the diverse needs and expectations of their citizens.

5. Methods

5.1. Study area

The empirical research was based on the data collected from the residents of Pabna, a city of Bangladesh. Pabna City is located 153 km away from Dhaka, the capital of Bangladesh. The city has the advantage of being situated adjacent to the Isamoti River and enjoys easy access to both road and waterway transportation, as well as railways. It obtained municipal status in 1876 and is recognized as one of the oldest settlements in the subcontinent. According to the Bangladesh Bureau of Statistics population and housing census in 2011, Pabna had a total population of 144,442 residents and 15 wards (**Figure 1**).

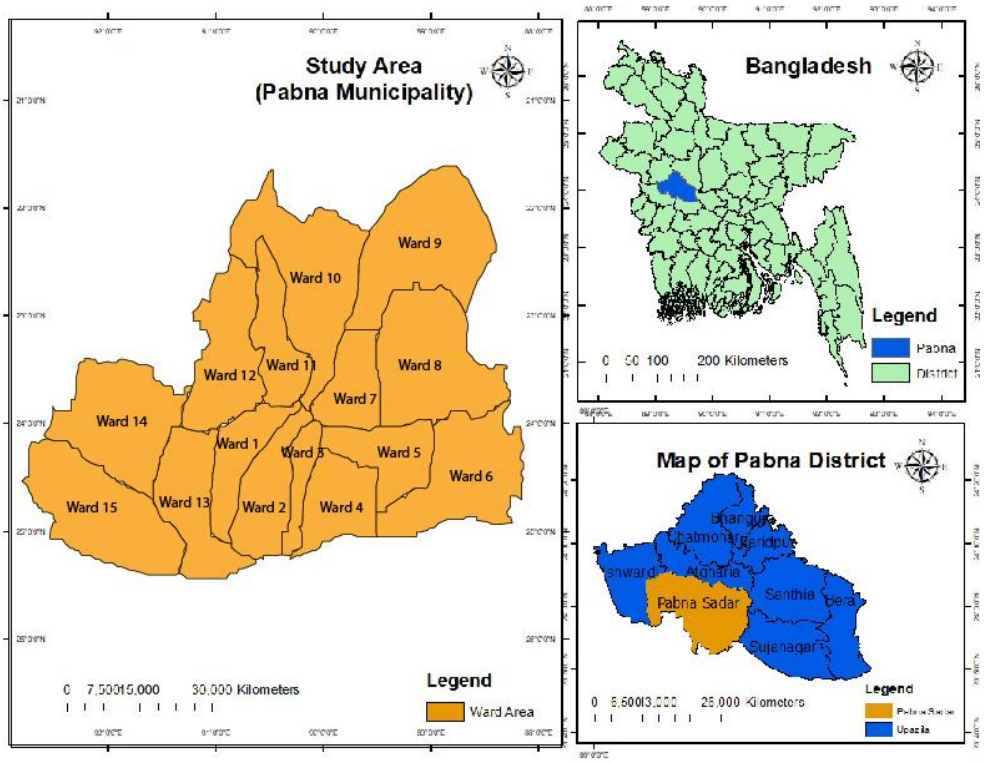

Figure 1. Location map of the study area.

Source: Prepared by authors.

The municipality of Pabna has a road network spanning 213 km, including 162 km of bituminous roads, 4.5 km of Herring-Bone-Bond (HBB) roads, 20.10 km of normal concrete roads, 1.8 km of Water Bound

Macadam (WBM) roads, and 24.60 km of earthen roads[23]. The city is gradually expanding due to the rapid growth of urbanization and is contributing to the substantial socioeconomic development of the state. More and more people are moving to Pabna, particularly within the Pabna Municipal area, in search of improved urban amenities and employment opportunities. The provision of essential urban services in these areas falls under the jurisdiction of the municipality, which is responsible for improving the residents' quality of life. Therefore, the municipality plays a critical role in ensuring citizen satisfaction by delivering high-quality basic services. Consequently, it is crucial to understand the current level of citizen satisfaction with municipal services.

5.2. Research design

The research used a face-to-face survey method and drew upon insights from the literature review to develop a structured questionnaire consisting of four segments (**Table 1**). The first segment aimed to gather information on the socio-demographic characteristics of the respondents, including age, gender, education, and income. The second segment focused on the citizens' perceptions of basic services and urban infrastructure in order to understand their overall satisfaction level[13,24,25]. In the third segment, citizens were asked to rank their satisfaction with a range of urban services and infrastructure that are widely available and accessible to all. The fourth segment of the questionnaire aimed to gather data on the participants' perceptions of potential policy measures that could improve urban services and infrastructure[24]. The Likert 5-point scale was employed to evaluate the variables, reflecting the extent of performance from low to high. This scale has five ranges: 1–1.80 for strongly disagree, 1.81–2.60 for disagree, 2.61–3.40 for neutral, 3.41–4.20 for agree, and 4.21–5 for strongly agree[26].

Table 1. Questionnaire segments and corresponding variables.

Segment	Purpose	Items
1	Socio-demographic Characteristics	Age, gender, education, income
2	Perception of basic services and infrastructure	Overall satisfaction level
3	Satisfaction level of selected services and infrastructure	Sanitation, disaster management, waste management, environmental service, urban security, cultural service, recreational service, roads and bridges, public buildings, public utilities, parks and open spaces, street lighting, its infrastructure, shopping center, traffic infrastructure
4	Perception of potential policy measures	Customer service and support, accessibility and inclusivity, training and professional development, transparency and accountability, sustainable and resilient planning, collaboration and partnerships, efficient and effective management, public engagement and feedback, technology integration, upgrading and modernizing infrastructure, regular maintenance and repair

Furthermore, an interview questionnaire was formulated with the objective of obtaining information from a range of individuals, including government officials, municipal authorities, civil society representatives, and stakeholders. Participants were selected based on their expertise and involvement in local governance and public service delivery. The interview was open-ended and conducted face-to-face, with a focus on identifying the fundamental difficulties associated with delivering citizen satisfaction. By incorporating interviews, the research aimed to complement the survey data and gain valuable insights, contributing to a comprehensive understanding of the factors influencing citizen satisfaction.

5.3. Population and sampling

To assess the satisfaction of citizens regarding municipal services, data was collected through structured

questionnaires and interviews in this study. Since the primary objective of the study was to determine service satisfaction within the municipality, a purposive sampling approach was used[27]. The researcher should focus on gathering information from individuals who have experience accessing services for diverse purposes. Thus, the survey respondents should be selected based on the researcher's judgment or intended purpose. From 1 October 2022 to 30 October 2022, surveyors employed purposive sampling techniques while maintaining a one-week interval. Collecting data from a large number of respondents is desirable; however, due to time and financial constraints, it was not feasible to include every individual in the population. According to the study of Singh and Masuku[28], a sample size of 100 is considered sufficient for studies involving > 100,000 participants, with a 95% confidence level and a precision level of ±10%. The sampling size of this study comprised 140 respondents, consisting of 120 questionnaires and 20 interviews, out of the 144,442 population, with a confidence and precision level of 95% and 8%, respectively.

5.4. Data analysis

The objective of this research was to assess the level of satisfaction among citizens concerning urban local government services and infrastructure through the use of descriptive (frequency) analysis. Additionally, ANOVA tests were employed to investigate statistical correlations between the collected data and socio-demographic factors[24]. To test the significance of the relationship, as mentioned in the study's purpose, the chi-square (χ^2) test was also utilized[25]. After the data collection process was completed, IBM SPSS (Statistical Package for Social Sciences), version 25.0, was employed to conduct the statistical analyses.

Assessing consistency and reliability is essential in any study, commonly evaluated through Cronbach's alpha. This study yielded a Cronbach's alpha value of 0.68, surpassing the widely accepted threshold of 0.6 considered suitable for social science research[29]. The data analysis in this study involved qualitative and quantitative methods, which can be divided into several stages. The first stage entailed examining variables associated with socio-demographic information and service performance. Analyzing socio-demographic data provided insight into respondents' information and background, ensuring that all subcategories in the target population were adequately represented in the data collection process. The second stage involved statistical analysis of service performance variables to determine users' perceptions of basic services and infrastructure. Descriptive statistics of citizen satisfaction were also performed to identify citizen satisfaction in general for a better understanding of the research.

Table 2. Example of coding interview data based on thematic analysis.

Data transcription sample	Themes searched and formed	Review the theme	Define the theme
"*The municipality, despite its size, the number of skilled manpower is insufficient. The day-to-day increase in expenditures is accompanied by the same level of cash resources. For a lot of development projects, we are financially dependent on the central government. The central government entirely dominates the budgeting process, and there is a lack of proper policy provision and fiscal consistency. With such limited funding, it becomes more difficult to operate a range of services. Consequently, public complaints continue to evolve, and they never satisfy.*"	Skilled manpower is insufficient. An increase in expenditures is accompanied by the same level of cash resources. The central government dominates budgeting and limited funding.	1. Insufficient manpower. 2. Inadequate resources for the expenditure. 3. Limited government funding.	Lack of skilled manpower, Lack of resources, Limited budgetary allocation.

Source: Field survey.

In the third stage, key informant interviews were subjected to a thematic analysis using Nvivo12 software to uncover the factors influencing citizen satisfaction. This powerful tool allows the electronic coding of texts and images, enabling data synchronization and the construction of robust statistical intersections[30]. The analysis involved transcribing the data and carefully reviewing it to identify patterns and themes. The data

were then classified into groups, or "nodes", based on the study's theoretical foundation and research objectives. When necessary, multiple themes within a single study were coded as separate theming units (**Table 2**). The NVivo-encoded nodes were scrutinized to reveal meaningful broader patterns of the theme. Finally, descriptive statistics of citizen perception were analyzed to identify possible policy measures to enhance urban local government service and infrastructure.

6. Results

6.1. Socio-demographic information

The socio-demographic characteristics of the respondents are presented comprehensively in **Table 3**, providing valuable insights into the diverse demographic makeup of the population under investigation. The study's sample size was 120, of which 55.83% were male, and 44.16% were female, suggesting a representative gender distribution. To ensure inclusivity, we provided participants with options to self-identify their gender as male, female, or other, allowing for a more nuanced understanding of gender diversity within the sample. We are committed to respecting and representing the full spectrum of gender identities in our research. The age distribution of the respondents was broad, ranging from 20 to over 60 years old, with the largest proportion of the sample (27.50%) belonging to the age group of 20–30 years.

Table 3. Socio-demographic information of the respondents.

Variables	Frequency (*n*)	Percentage (%)
Gender		
Male	67	55.83
Female	53	44.16
Age		
20–30	33	27.50
31–40	29	24.16
41–50	22	18.33
51–60	20	16.66
>61	16	13.33
Literacy		
Illiterate	17	14.16
Primary	20	16.66
SSC	29	24.16
HSC	25	20.83
Undergraduate or above	29	24.16
Income (USD)		
<46	17	14.16
47–92	26	21.66
93–139	29	24.16
140–184	25	20.83
>185	23	19.16

Source: Field survey.

The distribution of education levels among the respondents revealed that a cumulative 54.98% of the sample had completed at least secondary school (SSC), while 16.66% had completed primary or lower levels

of education. Of the literate respondents, 24.16% had an undergraduate or higher degree. The income distribution of the sample was also diverse, with the majority of respondents falling into the income range (BDT converted to USD) of 93–139 (24.16%), followed by 47–92 (21.66%), and less than 46 (14.16%). The remaining 39.99% of respondents were distributed across other income categories, highlighting the socioeconomic diversity of the sample. Overall, the socio-demographic characteristics of the sample revealed a wide range of ages, educational backgrounds, and income levels, with a gender distribution representative of the population under investigation.

6.2. Performance of basic service and infrastructure

The outcomes of the investigation concerning the fundamental amenities' operational efficiency by the municipal authorities, as perceived by the citizens, are depicted in **Figure 2**. The findings of the study reveal that the municipality has not been successful in fulfilling its citizens' expectations. The citizens' perceptions revealed several pressing issues that require immediate attention, including inadequate waste management (M = 2.50; SD = 1.22), insufficient disaster management facilities for coping with natural and artificial hazards (M = 2.50; SD = 1.02), and inadequate sanitation systems (M = 2.58; SD = 1.21), encompassing cleanliness, public latrines, and garbage disposal. These issues obtained a mean Likert score ranging from 1.81 to 2.60, indicating suboptimal service quality. Additionally, a considerable performance gap was observed in the provision of public services such as environmental services, namely recycling, air quality, and energy treatment (M = 2.66, SD = 1.23), urban security (M = 3.15, SD = 1.23), and recreational services (M = 3.25, SD = 1.23). The performance of these services indicates that they are neither satisfactory nor unsatisfactory but rather fall in between, signifying that they do not meet the citizens' expectations for high satisfaction levels. Specifically, the citizens expressed their dissatisfaction with garbage disposal, public latrines, disaster response promptness, and water management services.

Figure 2. Assessment of basic public service of the municipality.

Source: Field survey.

However, the cultural service performed relatively better (M = 3.45, SD = 1.19), indicating that citizens were generally satisfied with the quality of this service. The citizens perceived the cultural service to be of high quality, meeting their expectations and delivering a high level of satisfaction, which is crucial for the mental health and well-being of urban residents.

The results for infrastructural services in the municipality show that urban residents are largely dissatisfied with most of the indicators. As illustrated in **Figure 3**, public utilities (M = 2.25, SD = 1.22), roads and bridges (M = 2.50, SD = 1.16), and traffic infrastructure (M = 2.54, SD = 1.15) were rated as poor quality,

failing to meet the standards set for them. Most respondents complained about public utilities such as housing, gas, electricity, and water treatment units. They also expressed dissatisfaction with the existing traffic system, which often leads to frequent traffic congestion, disastrous roads and bridge conditions, sidewalks, and safety issues.

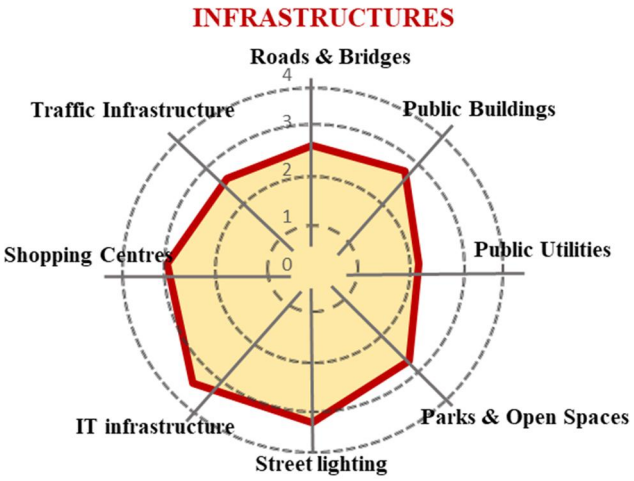

Figure 3. Assessment of infrastructural service of the municipality.

Source: Field survey.

Similarly, the results related to infrastructure related to public buildings (M = 2.75, SD = 1.13), parks and open spaces (M = 2.90, SD = 1.30), street lighting (M = 3.35, SD = 1.24), and shopping centers (M = 3.05, SD = 1.16) are in a neutral state, indicating that the city administration needs to exert more effort to meet the threshold of citizen satisfaction. Citizens perceive this infrastructure as not dissatisfactory, but it still needs improvement for better urban physical infrastructure. However, the case was different for IT infrastructure (M = 3.55, SD = 1.20), where most citizens were satisfied with the existing technical infrastructure required to develop a modern and technology-savvy smart city.

In addition to the evaluation of urban services and infrastructure, the study attempted to assess the overall satisfaction of the respondents of the municipal government. The results presented in **Table 4** reveal, in a nutshell, that approximately 34% of individuals are dissatisfied with the municipal service, which received the highest value of all the other satisfaction indicators. The total range of discontent, from very dissatisfied to dissatisfied, is 56%. On the other hand, the whole range of satisfaction, from satisfied to very satisfied, was approximately 20%. This indicates that a small number of customers are satisfied with the service and have ranked their level of satisfaction anywhere from satisfied to highly satisfied. The vast majority of respondents are under the impression that the municipality needs to offer a flexible service that can be tailored to each person's specific requirements. Approximately one-quarter (23.33%) of the population was in a condition of neutrality, meaning they were neither satisfied nor dissatisfied.

Table 4. Descriptive statistics of citizens' overall satisfaction.

Satisfaction	Frequency	Percentage (%)	x^2 value	*df*	*p* value
Very dissatisfied	27	22.50	-	-	-
Dissatisfied	41	34.16	-	-	-
Neutral	28	23.33	28.762	4	0.000
Satisfied	13	10.83	-	-	-
Very satisfied	11	9.16	-	-	-
Total	120	100.0	-	-	-

Source: Field survey.

6.3. Fundamental flaws

The key informant interviews provided valuable insights into the factors influencing citizen satisfaction with municipal services. The data were subjected to a thematic analysis using Nvivo12 software, enabling the identification of patterns and themes that emerged from the interviews. The analysis revealed several fundamental flaws affecting citizen satisfaction with municipal services (**Figure 4**). Among the most frequently cited issues was the lack of resources, identified by 18.18% of the respondents. This finding underscores the importance of resource allocation for improving service delivery and infrastructure development. The second most common issue, mentioned by 16.88% of the respondents, was poor infrastructure. This indicates a pressing need for investments and improvements in the existing infrastructure to meet citizens' expectations and enhance their satisfaction. Furthermore, the lack of initiatives and skilled human resources were also identified as significant issues, with 14.28% of the respondents highlighting the problem. Additionally, insufficient manpower and limited budgetary allocations were major concerns raised by 9.09% of the respondents.

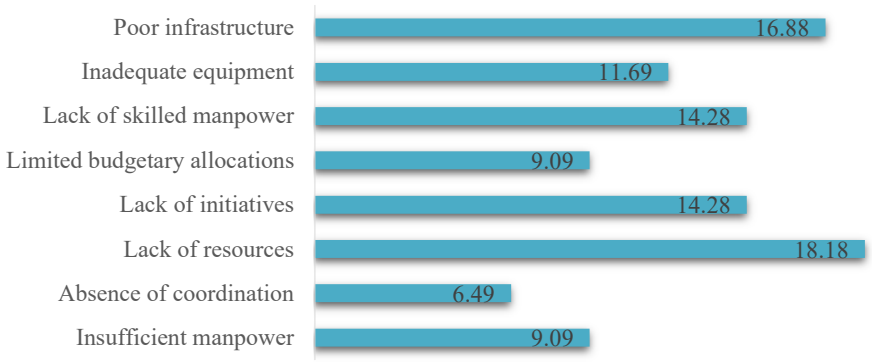

Figure 4. Major constraints affecting the satisfaction of municipal services.
Source: Field survey.

Less frequently mentioned but still noteworthy was the absence of coordination and inadequate equipment, with 6.49% and 11.69%, respectively. Coordinated efforts and adequate equipment play vital roles in ensuring seamless service provision and addressing citizen needs effectively. Overall, the findings from the key informant interviews highlight the significance of resource allocation, infrastructure development, proactive initiatives, skilled human resources, coordination, and adequate equipment in enhancing citizen satisfaction with municipal services. Addressing these fundamental flaws will be essential for the municipality to improve service quality and meet the diverse needs and expectations of its citizens.

6.4. Possible improvements and policy measures

In general, the results indicate a positive attitude towards the potential adoption of new measures by the municipal government in terms of service and infrastructure. On average, none of the measures was rated below 3.8 out of a possible 5 points, suggesting that citizens were receptive to potential improvements in these areas (**Figure 5**). The regular maintenance and repair of service infrastructure (M = 4.27; SD = 0.50), public engagement and feedback in the policy-making process (M = 4.10; SD = 0.64), customer service and support (M = 4.20; SD = 0.61) and accessibility and inclusivity (M = 4.15; SD = 0.61) stand out over the other possible measures to improve the existing service delivery infrastructure of the municipality.

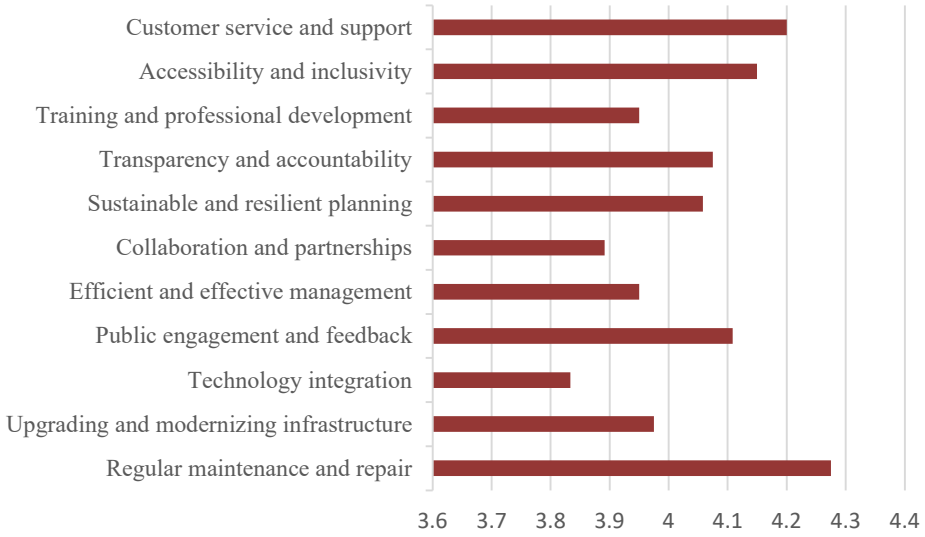

Figure 5. Policy measures and possible future improvements by respondents.
Source: Field survey.

Table 5. Differences of possible measures by respondents' key demographics.

Policy measures & improvements	**Gender**						**ANOVA**
	Male			**Female**			
	n	**M**	**SD**	***n***	**M**	**SD**	
Regular maintenance and repair*	67	4.50	0.50	53	4.20	0.40	F (1119) = 12.33; $p = 0.001$
Training and professional development*	67	3.89	0.58	53	4.09	0.44	F (1119) = 4.208; $p = 0.042$
Accessibility and inclusivity*	67	4.08	0.62	53	4.41	0.56	F (1119) = 8.742; $p = 0.004$
Customer service and support*	67	4.17	0.38	53	4.33	0.47	F (1119) = 4.139; $p = 0.044$
	Education						**ANOVA**
	SSC and below			**HSC and above**			
	n	**M**	**SD**	***n***	**M**	**SD**	
Upgrade and modernize infrastructure*	66	4.02	0.74	54	4.29	0.50	F (1119) = 6.246; $p = 0.014$
Public engagement and feedback*	66	4.00	0.60	54	4.25	0.58	F (1119) = 5.560; $p = 0.020$
Transparency and accountability*	66	3.90	0.79	54	4.22	0.71	F (1119) = 4.996; $p = 0.027$
Training and professional development*	66	4.15	0.40	54	3.98	0.53	F (1119) = 3.979; $p = 0.048$
	Income						**ANOVA**
	Group 1			**Group 2**			
	n	**M**	**SD**	***n***	**M**	**SD**	
Regular maintenance and repair*	72	4.11	0.49	48	4.37	0.60	F (1119) = 6.887; $p = 0.010$
Upgrade and modernize infrastructure*	72	3.93	0.45	48	4.14	0.46	F (1119) = 6.394; $p = 0.013$
Public engagement and feedback*	72	4.02	0.58	48	4.29	0.65	F (1119) = 5.396; $p = 0.022$
Accessibility and inclusivity*	72	3.94	0.50	48	4.16	0.47	F (1119) = 5.901; $p = 0.017$
Customer service and support*	72	4.02	0.33	48	4.25	0.83	F (1119) = 4.099; p = 0.045

* All study variable comparisons appended in the table correspond to significant differences ($p < 0.050$).
Source: Field survey.

In other words, the study results indicate a high perceived priority for improving city services and infrastructure through active maintenance and repair, citizen engagement, and support over other relevant

measures, such as technology integration, collaboration, and staff training and development. It is worth noting that most of the measures were more highly rated by females than males. However, there were only significant differences between the two groups in four items, all of which were related to improving basic service infrastructure, such as maintenance and repair, training and development of staff, accessibility and inclusivity, and customer service and support (**Table 5**). Moreover, significant differences were observed according to the education level regarding upgradation, engagement, transparency and accountability, and the development of the staff. Those who are highly educated are likely to give more points on the upgradation of infrastructure, transparency and accountability, and public engagement and feedback, while those who are less educated tend to rate more on the training and development of staff. Similarly, in five items, significant differences were found in monthly income between the high-income (more than 140 USD) and lower-income (less than 139 USD) groups. The high-income group was likely to rate most of the items, such as regular maintenance, upgradation of services, public engagement, accessibility and inclusiveness, and customer service and support, higher than the low-income group. This highlights that the demand for updated public service and infrastructure significantly varies with individual income range, where the higher income group has more demand for urban service and infrastructure than the low-income group.

7. Discussion

The study revealed that a large proportion of residents in Pabna municipality are aware of the services provided by the local municipality, including services related to waste management, water supply, roads, and transportation. The majority of these residents believe that the provision of these services is an essential responsibility of the municipality to secure the safety and welfare of the city. However, the study also identified areas in which the municipality can improve its services to increase citizen satisfaction. Sanitation, disaster management, and waste management were identified as critical basic services that require attention. Residents expressed their dissatisfaction with the quality and effectiveness of these services, indicating that they need to be improved to meet citizens' expectations and experiences. The findings reveal that waste management was the poorest performing service, with citizens perceiving it to have poor service quality. This finding is consistent with studies conducted by Islam et al.[31] and Zurbrugg[32], emphasizing the importance of efficient waste management for the well-being of city residents and the environment. Collaboration between public organizations and research institutions, NGOs, and international agencies is viewed as crucial in promoting and facilitating the spread of best practices in waste management services. These actors are seen as vital in enhancing and supporting waste management efforts[32].

The study also highlights that there are considerable performance gaps in sanitation and disaster management services. The quality of the sanitation service was perceived to be below standard, with citizens dissatisfied with the disposal of garbage and public latrines. This finding indicates that the municipality needs to improve its services to meet the expectations of its citizens. This is in line with those of Alam and Mondal[33] and Bhuiyan and Islam[12]. The municipality must prioritize the development of sustainable city planning through democratic participation and consideration of residents' perceived experiences. The inclusion of urban services must be balanced with maintaining high levels of quality across all facilities. Failure to address discrepancies between residents' perceptions and expectations may result in worsening circumstances. If residents are significantly dissatisfied, it may lead to a further deterioration in the community's general value of life.

Additionally, the findings of this study provide insights into the level of citizen satisfaction with urban physical and IT infrastructure in a smart city context. Infrastructure such as public utilities, roads and bridges, and traffic management was the poorest public infrastructure identified by the citizens. Also, the neutral state

of satisfaction with public buildings, parks and open spaces, street lighting, and shopping centers indicates that the city administration needs to improve these infrastructure elements to meet the expectations of citizens. The provision of adequate infrastructure facilities, such as public buildings, parks, and open spaces, is essential for creating a loveable and healthy environment in the city. Street lighting is also important for ensuring safety and security in the city at night, while shopping centers are critical for providing convenient access to goods and services.

On the other hand, the high level of satisfaction with IT infrastructure indicates that citizens are aware of the importance of technology in modern cities and have high expectations of their city's technological capabilities. The provision of modern IT infrastructure is essential for creating a smart city that can leverage technology to enhance the quality of life of its citizens. A city with a well-developed IT infrastructure can provide citizens with easy access to information and services, facilitate communication and collaboration, and promote innovation and entrepreneurship[34,35].

Based on the research findings, it was observed that the performance of the service provided had a significant influence on the extent of satisfaction experienced by the citizens. The basic amenities provided to the citizens are still falling short of meeting their expectations, and this is a major cause of disappointment for them. Most citizens expressed a high level of dissatisfaction with the quality of the services they received, indicating a need for improvement. The authors suggest that an increase in the value of service quality and responsiveness will lead to a significant level of citizen satisfaction, especially for services related to disaster management, waste management, and sanitation service along with infrastructure such as the provision of roads and bridges, traffic management, and public utilities such as gas, electricity and water supply.

The finding also highlighted the issues affecting satisfaction with municipal services. Lack of resources was identified as the most frequently cited issue, followed by poor infrastructure, a lack of initiatives, and skilled manpower. Despite this, providing urban services poses several challenges for municipalities, the most significant of which is the need for adequate funding. Other challenges include properly trained and skilled labor, an absence of cutting-edge equipment and methods, a lack of support from the general public, and a failure to assume responsibility for one's responsibilities. The authors suggest that the municipality needs to address issues related to resource allocation and infrastructure development as well as take initiatives to improve the responsiveness of public service in order to enhance the satisfaction of their municipal service. The high perceived priority for active maintenance and repair, citizen engagement, and support highlights the importance of addressing basic service infrastructure needs to enhance the quality of life of citizens. The findings are supported by previous research conducted by Rölle[36] and Vigoda[37], which demonstrate the importance of responsiveness in relation to satisfaction with public institutions. These scholars have established that responsiveness plays a significant role in fostering satisfaction within public institutions.

Regular maintenance and repair of infrastructure can improve the safety and functionality of public spaces, while citizen engagement and support can foster a sense of community and promote civic participation. The differences observed in priorities based on gender, education level, and income suggest that urban services and infrastructure needs vary among different groups of citizens. Females tended to rate the measures higher than males, which may reflect their greater awareness of the importance of basic service infrastructure for daily life[24]. Similarly, highly educated respondents prioritized measures related to transparency, accountability, and public engagement, which may reflect their greater awareness of civic responsibilities and participation in decision-making processes. On the other hand, low-income respondents may prioritize staff training and development, which may reflect their desire for job opportunities and skill development. Furthermore, the prioritization of measures such as regular maintenance, upgradation of services, public engagement, accessibility and inclusiveness, and customer service and support by high-income respondents suggests that

they have a greater demand for updated urban services and infrastructure than low-income respondents. This highlights the need for targeted interventions to address the varying needs of different income groups.

Moreover, most of the municipal challenges can be conquered if appropriate steps are taken to improve the efficacy and effectiveness of the municipal government in providing adequate urban services. Overall, the study highlights the importance of monitoring and evaluating the performance of municipal services and infrastructure to ensure that they meet the expectations of citizens and improve their quality of life.

8. Practical implications

In conclusion, the study intends to investigate citizen satisfaction with urban local government services in Bangladesh. The findings highlight the need for municipal authorities to recognize the importance of providing basic services such as sanitation, waste management, and disaster management to ensure citizen satisfaction. The municipality of Pabna needs to prioritize efficient service delivery, allocate appropriate funding to various services, conduct proper cost and risk assessments on development projects, and adopt innovative technology to increase efficiency and cost savings. Sustainable city planning that includes a clear mission and vision statement, ensuring equal participation in decision-making, and analyzing public demand is also essential to improving the service quality.

To enhance citizen satisfaction with basic services and infrastructure in Pabna, it is recommended that the municipality establish a dedicated task force to oversee the implementation of these recommendations, conduct regular citizen satisfaction surveys to identify areas for improvement and enhance training programs for personnel to improve service delivery skills. Collaboration with private entities or other municipalities can also help access additional resources and expertise to improve service delivery. By addressing the identified issues and implementing the recommended actions, the municipality can significantly improve service quality and ultimately enhance citizen satisfaction with municipal services in urban areas of Bangladesh.

Moreover, citizen participation in decision-making is crucial for improving service quality and achieving sustainable development goals. The municipality must create opportunities for citizen participation in decision-making processes, such as community engagement programs, participatory budgeting, and information sharing. The municipality must also prioritize transparency and accountability by providing citizens with accessible and relevant information regarding the provision of municipal services.

Overall, the study emphasizes the importance of efficient service delivery, sustainable city planning, citizen participation in decision-making, and transparency and accountability in improving service quality and citizen satisfaction with municipal services in urban areas of Bangladesh. The municipality of Pabna must take immediate action to address the identified issues and implement the recommended actions to ensure efficient infrastructures are provided to citizens, leading to improved citizen satisfaction and, ultimately, a better quality of life for urban residents. Future studies can explore the long-term effects of the necessary policy measures on citizen satisfaction and the sustainability of service improvements. Further investigation can also focus on evaluating the effectiveness of community-driven initiatives and participatory governance models in fostering citizen engagement and enhancing service delivery outcomes. By continuing to study and refine these approaches, we can contribute to the ongoing enhancement of urban local government services and further advance citizen satisfaction in the context of Bangladesh.

Author contributions

Conceptualization, MAFB and MAI; methodology, MAFB; software, MAI; validation, MAFB; formal analysis, MAI; investigation, MAFB and MAI; resources, MAFB; data curation, MAFB and MAI; writing—original draft preparation, MAI; writing—review and editing, MAI and MAFB; visualization, MAI;

supervision, MAFB. All authors have read and agreed to the published version of the manuscript.

Ethics approval and consent to participate

Not applicable.

Acknowledgments

The authors are thankful to all the respondents to the study for their cooperation during the field survey.

Conflict of interest

The authors declare no conflict of interest.

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Appendix

Questionnaire Survey (for general citizens)
(This data will only be used for academic purposes)
Please tick the appropriate choice (✓).

1. Socio-demographic information of the respondents								
Age groups		**Gender**		**Education level**		**Income level (BDT)**		
20–30		Male		Illiterate		<5000		
31–40		Female		Primary		5000–9999		
41–50		Others		SSC		10,000–14,999		
51–60				HSC		15,000–19,999		
>61				Undergraduate or above		>20,000		

2. To what extent you are satisfied with the municipal services and infrastructure in general?				
Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied

3. How would you like to rank your satisfaction of following services and infrastructure?					
Sanitation	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Disaster management	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Wastage management	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Environmental service	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Urban security	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Cultural service	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Recreational service	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Roads and bridges	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Public buildings	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Public utilities	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Parks and open spaces	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Street lighting	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
IT infrastructure	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Shopping centre	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Traffic infrastructure	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied

4. How would you like to rate the following policy measures to improve service quality and infrastructure?					
Customer service and support	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Accessibility and inclusivity	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Training and professional development	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Transparency and accountability	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Sustainable and resilient planning	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Collaboration and partnerships	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Efficient and effective management	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Public engagement and feedback	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Technology integration	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Upgrade and modernize infrastructure	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Regular maintenance and repair	Strongly disagree	Disagree	Neutral	Agree	Strongly agree