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FROM AWARENESS TO ACTION: EXAMINING CITIZENS' ENGAGEMENT IN URBAN ENVIRONMENTAL GOVERNANCE IN RAJSHAHI AND BARISHAL CITY CORPORATIONS OF BANGLADESH

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ABSTRACT

With rapid urbanization, environmental issues have grown increasingly severe, and urban environmental governance requires public awareness and citizen participation. This study employs a convergent parallel mixed-methods design to explore the link between public awareness and citizen participation in two urban local government organizations in the country: Rajshahi City Corporation (RCC) and Barishal City Corporation (BCC). Data were collected quantitatively from a survey of 410 residents (225 in RCC and 185 in BCC) and qualitatively through in-depth interviews, key informant interviews, and focus group discussions. The survey results indicated that 84.9% of respondents recognized public awareness programmes, but only 29.0% had participated. Awareness levels differed significantly between the two city corporations ($\chi^2 = 43.455$, $p < 0.001$), with RCC showing a comparatively higher level. Qualitative results also highlighted the role of education, institutional communication, access to environmental information, and opportunities for public participation in shaping citizen participation. Together, the findings indicate that awareness does not necessarily lead to active participation. To strengthen participatory governance of the urban environment, the study proposes continuous community-level awareness-raising, open information exchange, enabling consultation processes, and enhanced cooperation among local authorities, civil society, and citizens.

1. INTRODUCTION

Rapid urbanization has intensified environmental challenges in cities, including waste management problems, pollution, ecosystem degradation, and pressure on urban infrastructure, requiring more inclusive and adaptive approaches (Hickmann, 2021; Vedeld et al., 2021) to urban environmental governance (Haque et al., 2023; Bulkeley & Betsill, 2005; UN-Habitat,

2022). Contemporary urban governance increasingly emphasizes collaboration among governments, citizens, civil society (Cotler et al., 2022), and private actors, recognizing that institutional action alone cannot achieve environmental sustainability (Rhodes, 1996).

Public awareness and citizen engagement (Wang et al., 2024) are critical elements of effective environmental governance because they influence environmental behaviour, collective responsibility (Cotler et al., 2022), and participation in decision-making processes (Arnstein, 1969; Reed, 2008). Recent research further highlights that citizen-centred approaches and participatory mechanisms (Vedeld et al., 2021) can improve environmental knowledge generation, local problem identification, and sustainable urban management outcomes (Bautista-Puig et al., 2024; Ravi & Brück, 2025).

However, awareness does not automatically translate into meaningful participation unless supportive institutional mechanisms, information access, and responsive governance structures (Haque et al., 2023) are established (Kollmuss & Agyeman, 2002). In developing countries such as Bangladesh, urban environmental governance faces challenges related to limited institutional capacity, inadequate public participation opportunities, and uneven access to environmental information (World Bank, 2020; Alam & Zakaria, 2021).

City corporations therefore need stronger connections among citizens, governance institutions (Hossain & Haque, 2024; Wang et al., 2023), and stakeholder networks to improve transparency, accountability, and environmental service delivery (Jager et al., 2019; Azzahra, 2024). Public awareness programmes are particularly important because they can transform citizens from passive recipients of services into active participants in environmental management processes (Pretty, 2003; Reed, 2008; Kiss et al., 2022; Zhang et al., 2024).

Despite increasing recognition of participatory environmental governance (Mohuya et al., 2025; Haque et al., 2022), empirical evidence regarding differences in citizens' awareness and engagement across urban contexts in Bangladesh remains limited. This study addresses this gap by examining the relationship between public awareness, citizen participation, and urban environmental governance in Rajshahi and Barishal City Corporations, providing insights into how awareness and stakeholder involvement influence governance responsiveness and environmental outcomes.

2. LITERATURE REVIEW

2.1 Public Awareness and Environmental Knowledge

Public awareness and environmental knowledge are fundamental to effective urban environmental governance because they shape citizens' understanding of environmental challenges, responsibility, and willingness to participate in environmental management (Zhang et al., 2024; Alam & Zakaria, 2021; Wang et al., 2023). Environmental knowledge, access to information, and awareness initiatives enhance citizens' environmental perceptions and encourage participation in governance processes by improving their capacity to identify and respond to local environmental problems (Zhang et al., 2024). Recent studies further demonstrate that informed citizens are more likely to engage in environmental actions (Haque et al., 2023), particularly when awareness programmes are supported by institutional communication, participatory mechanisms, and accessible information systems (Ravi & Brück,

2025; Bautista-Puig et al., 2024).

2.2 Urban Environmental Governance and Participatory Approaches

Urban environmental governance has evolved from traditional government-centred management toward collaborative systems involving multiple actors, institutions, and communities. Contemporary governance approaches emphasize that sustainable urban environmental management (Zhang et al., 2024; Mohuya et al., 2025) requires coordination among government authorities, civil society, private actors, and citizens rather than relying solely on administrative institutions (Bulkeley & Betsill, 2005; Azzahra, 2024). Recent studies highlight that effective urban sustainability depends on multi-level governance arrangements, institutional capacity, and inclusive decision-making processes that integrate diverse stakeholder perspectives (Meerow et al., 2021; Sharifi, 2022).

Participatory governance has become central to environmental management because it enhances transparency, accountability, and social legitimacy in decision-making. Citizen participation integrates local knowledge, improves problem identification, and strengthens collective responsibility for environmental protection (Reed, 2008; Nahar et al., 2022). Recent research indicates that citizen-centred approaches, including participatory sensing and community-based environmental monitoring (Jager et al., 2019), can create stronger links between environmental information, public engagement, and urban governance outcomes (Ravi & Brück, 2025).

However, participation alone does not guarantee effective governance outcomes. The quality of participation depends on institutional responsiveness, access to information, power relations, and citizens' ability to influence decisions (Arnstein, 1969; Newig et al., 2020; Fleischman & Solorzano, 2018). Therefore, understanding how citizens interact with governance institutions is essential to evaluating the effectiveness of urban environmental governance.

2.3 Public Awareness and Citizen Engagement in Environmental Governance

Public awareness is considered a fundamental factor influencing environmental attitudes, behaviors, and participation. Environmentally informed citizens are more likely to adopt sustainable practices, engage in environmental activities, and demand improved services from governing institutions (Kollmuss & Agyeman, 2002; Wang et al., 2023). Recent evidence suggests that environmental awareness is strongly associated with access to information, education, awareness programmes, and opportunities for community involvement (Alam & Zakaria, 2021).

Awareness programmes play an important role in transforming citizens from passive recipients of urban services into active participants in environmental governance. Such initiatives improve environmental knowledge, encourage behavioral change, and strengthen community responsibility (Pretty, 2003; Kiss et al., 2022; Bautista-Puig et al., 2024). However, previous studies also indicate that awareness does not automatically lead to participation unless supportive institutional mechanisms, complaint systems, and opportunities for engagement are available (Reed, 2008; Fischer et al., 2021). Recent urban environmental studies further demonstrate that citizen engagement is increasingly important for addressing complex challenges such as climate adaptation, waste management, and urban sustainability. Digital participation tools (Hossain & Haque, 2024), community monitoring, and collaborative

platforms have expanded opportunities for citizens to contribute to environmental decision-making (Daher et al., 2022; Ravi & Brück, 2025).

2.4 Governance Challenges and Research Gaps in Developing Urban Contexts

In developing countries, urban environmental governance faces significant challenges, including rapid urban growth, limited institutional capacity, weak coordination, and insufficient mechanisms for citizen participation (Jager et al., 2019). Although local governments deliver environmental services, inadequate resources, fragmented responsibilities, and limited stakeholder collaboration often constrain governance effectiveness (UN-Habitat, 2022; World Bank, 2020; Syam et al., 2026).

Bangladesh's rapidly expanding cities experience increasing environmental pressures, including waste management difficulties, pollution, drainage problems, and declining environmental quality (Jager et al., 2019; Botchwey et al., 2026). Previous research suggests that socioeconomic characteristics (Cho et al., 2021), educational background, access to information, and opportunities for institutional engagement (Alam & Zakaria, 2021) influence urban residents' environmental awareness. However, understanding how awareness and participation vary across urban governance contexts remains limited.

Existing literature mainly examines environmental awareness, participation, or governance performance separately, while fewer studies investigate how these elements interact to shape urban environmental governance outcomes. Therefore, this study addresses this gap by examining the relationship between public awareness, citizen engagement, and governance responsiveness in Rajshahi and Barishal City Corporations. By integrating citizen perspectives, institutional factors, and environmental governance processes, the study contributes to a deeper understanding of how awareness and participation can strengthen sustainable urban governance.

2.5 Research Questions

RQ1: How does public awareness influence citizen engagement in urban environmental governance?
RQ2: How does citizen engagement affect urban environmental governance outcomes?

2.6 Research Objectives

RO1: To examine the role of public awareness in shaping citizen engagement in urban environmental governance.
RO2: To assess the contribution of citizen engagement to improving urban environmental governance outcomes in Rajshahi and Barishal City Corporations.

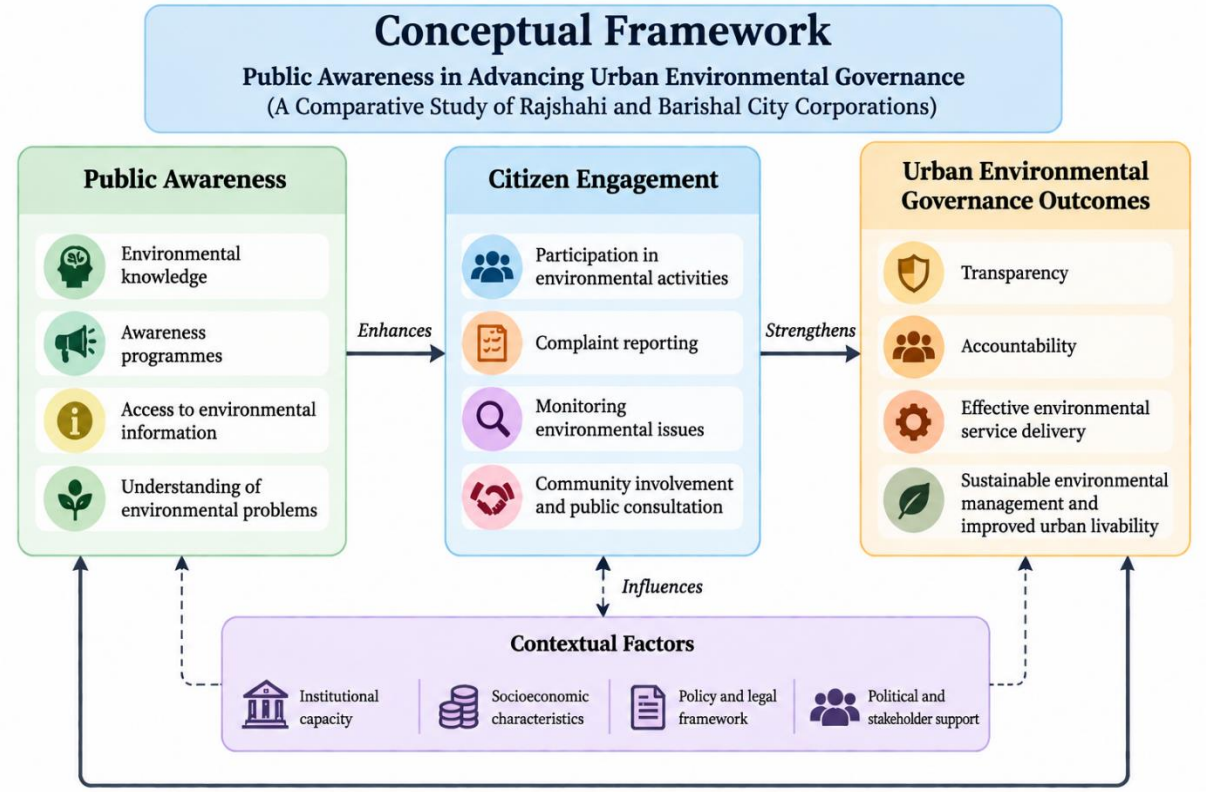
3. CONCEPTUAL FRAMEWORK

The conceptual framework of **Figure 1** illustrates the relationship between public awareness, citizen engagement, and urban environmental governance outcomes. Public awareness, represented by environmental knowledge, awareness programmes, information access, and understanding of environmental problems, enhances citizen engagement in environmental governance processes. Citizen engagement acts as a key mechanism through participation, complaint reporting, monitoring, and community involvement to strengthen governance outcomes. Contextual factors, including institutional capacity, socioeconomic characteristics, policy frameworks, and stakeholder support, influence these relationships. Overall, the framework demonstrates that improved awareness and meaningful citizen participation

contribute to more transparent, accountable, and sustainable urban environmental governance.

Figure 1

Conceptual Framework



Note. Created by Researcher, 2026, based on Easton, 1965

4. MATERIALS AND METHODS

The methodological flow chart **(Figure 2)** presents the systematic research process used to examine the relationship between public awareness, citizen engagement, and urban environmental governance in Rajshahi City Corporation (RCC) and Barishal City Corporation (BCC). The study follows a mixed-methods convergent parallel design, integrating quantitative and qualitative approaches to obtain a comprehensive understanding of environmental governance practices.

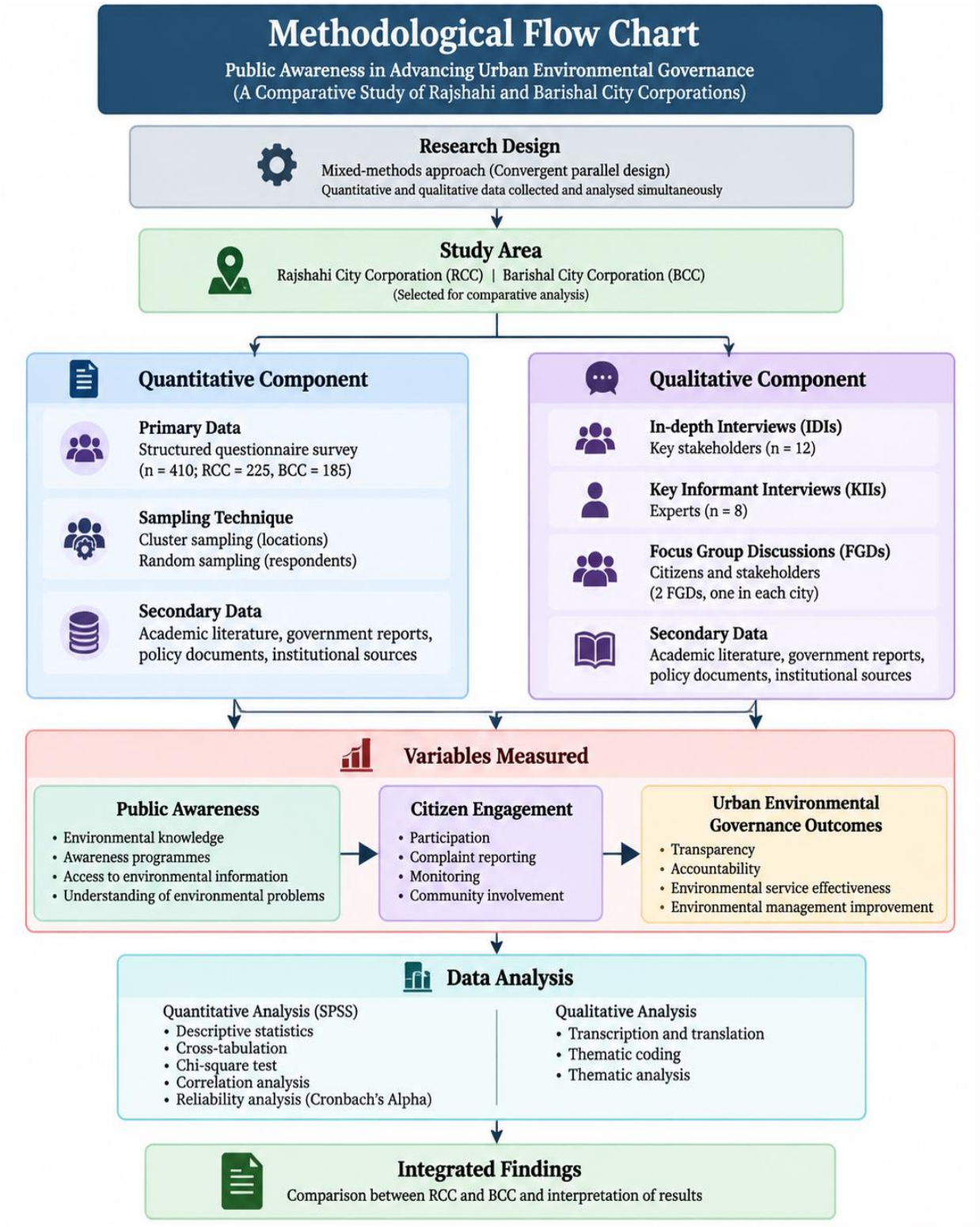
The quantitative component is based on a structured questionnaire survey of 410 respondents selected through cluster and random sampling techniques, while the qualitative component incorporates 12 In-Depth Interviews (IDIs), 8 Key Informant Interviews (KIIs), and 2 Focus Group Discussions (FGDs) to explore stakeholder perspectives. The framework measures three key dimensions: public awareness (environmental knowledge, awareness programmes, information access, and understanding of environmental problems), citizen engagement (participation, complaint reporting, monitoring, and community involvement), and urban environmental governance outcomes (transparency, accountability, service effectiveness, and environmental management improvement). The collected data are analyzed through complementary methods, including descriptive statistics, cross-tabulation, chi-square tests, correlation analysis, reliability analysis, and thematic analysis. Finally, integrating quantitative and qualitative findings enables a comparative assessment of RCC and BCC, providing a

deeper understanding of how public

awareness and citizen engagement influence urban environmental governance outcomes. The framework therefore ensures methodological consistency between data collection, variable

Figure 2

Methodological Flow Chart



Note. Created by Researcher, 2026

measurement, analysis, and interpretation of research findings.

5. RESULTS

5.1 Descriptive overview of indices

Table 1

Descriptive Overview

Variable	Category	Frequency	Percent
CCs	Rajshahi (RCC)	225	54.9
	Barishal (BCC)	185	45.1
Age	18-30	169	41.2
	31-40	118	28.8
	41-50	78	19.0
	51-60	27	6.6
	61+	18	4.4
Education Level	Primary	73	17.8
	Secondary	79	19.3
	Higher Secondary	146	35.6
	Undergraduate	104	25.4
	Honors+	8	2.0
Occupation	Govt. Job	25	6.1
	Non-Govt. Job	57	13.9
	Business	89	21.7
	Farmer-Laborer	59	14.4
	Student	106	25.9
	Self-employed	44	10.7
	Retired	8	2.0
	Others	22	5.4
Monthly Family Income (BDT)	≤ 10,000	40	9.8
	10,001–20,000	190	46.3
	20,001–30,000	80	19.5
	30,001–40,000	40	9.8
	40,001–50,000	26	6.3
	> 50,000	34	8.3

Note. Based on the questionnaire survey, 2025 (N = 410)

Table 1 shows that the survey included 410 respondents from Rajshahi City Corporation (RCC) and Barishal City Corporation (BCC), with 54.9% and 45.1% of respondents, respectively. Most of the respondents were young adults aged 18–30 years (41.2%), followed by those aged 31–40 years (28.8%). Male respondents represented the majority of the sample (76.8%), while females accounted for 23.2%.

Regarding residential experience, nearly half of the respondents had lived in the study areas for 1–10 years (45.6%), indicating substantial representation of relatively recent urban

residents. In terms of education, the largest group had higher secondary education (35.6%), followed by undergraduate education (25.4%).

The occupational distribution showed that students constituted the largest group (25.9%), followed by business professionals (21.7%) and non-government employees (13.9%). Regarding monthly family income, most respondents fell into the BDT 10,001–20,000 group (46.3%), while other income categories represented smaller proportions.

Overall, the respondent profile reflects a diverse urban population across demographic and socioeconomic characteristics, providing a broad basis for analyzing public awareness, citizen engagement, and perceptions of urban environmental governance.

5.2 Public Awareness and Environmental Knowledge

Public awareness and environmental knowledge provide the foundation for citizens' understanding of environmental issues, responsibilities, and sustainable practices. Higher awareness levels enhance citizens' capacity to participate in environmental governance and support effective environmental management.

5.2.1 Role of Public Awareness Programmes

Public awareness programs constitute an important mechanism for strengthening local Citizens' engagement in environmental governance is enhanced by improving their understanding of environmental responsibilities and community-level actions. Assessing citizens' perceptions of these programs provides insight into how awareness-building initiatives facilitate public participation in urban environmental management. The survey data indicate that a substantial majority of respondents (84.9%) perceive public awareness programmes as an effective mechanism for strengthening urban environmental protection, while 6.3% disagreed and 8.8% were uncertain, suggesting that citizens recognize the importance of knowledge, behavioural change, and collective responsibility in environmental governance. This quantitative evidence is supported by IDI, KII, and FGD findings, where respondents emphasized that awareness initiatives can improve waste management practices, increase environmental responsibility, and encourage citizens to participate in solving local environmental problems. Local political representatives and voluntary activists from both RCC and BCC highlighted that many environmental problems persist because residents lack adequate knowledge about their environmental rights and responsibilities (IDI-01; IDI-04). Similarly, KII respondents argued that,

> Awareness programmes are essential for transforming citizens from passive service users into active participants in urban environmental governance, particularly through campaigns, school-based education, and community engagement activities (KII-02; KII-05).

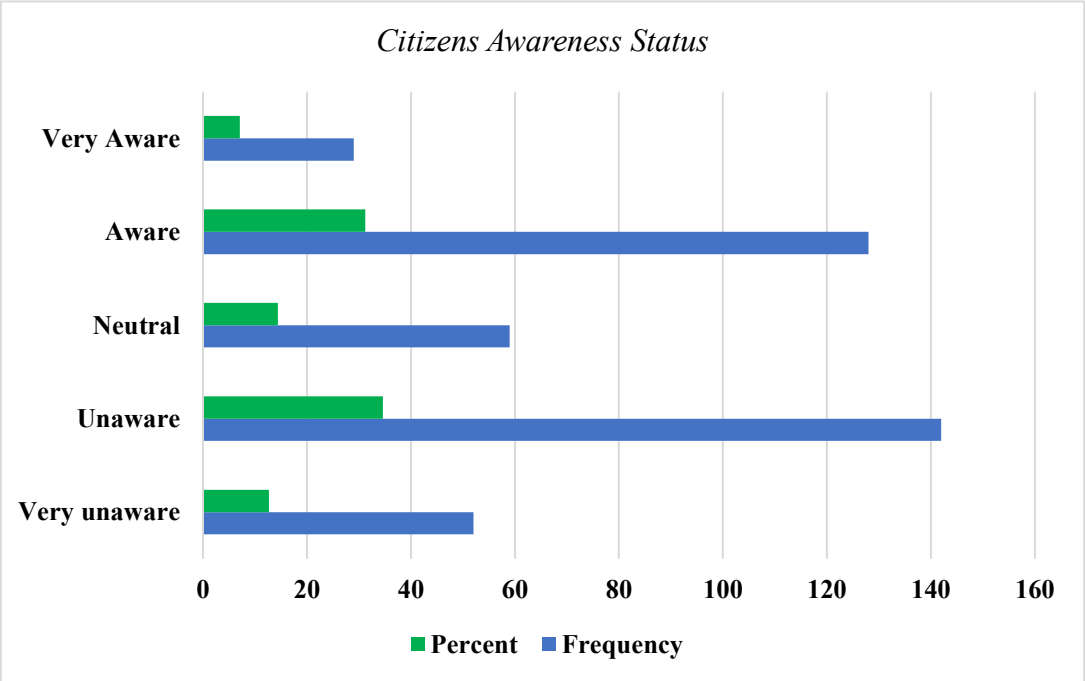
However, qualitative evidence also suggests that awareness alone is insufficient without effective institutional support. Some FGD participants noted that although people may become aware of environmental issues, their participation remains limited when complaint mechanisms, enforcement systems, and coordination with city authorities are weak (FGD-01; FGD-02). Thus, the high level of public agreement in the survey reflects citizens' expectation that awareness programmes should be linked with responsive governance structures to achieve meaningful environmental protection.

5.2.2 Citizens' Environmental Awareness Status

Citizens' awareness status reflects the extent to which local residents understand environmental issues, governance mechanisms, and their potential roles in urban environmental management. Evaluating awareness levels helps assess citizens' capacity to participate effectively in environmental governance processes. **Figure 3** reveals mixed but concerning perceptions of

Figure 3

Citizens Awareness Status



Note. Survey data, 2025

citizens' environmental awareness: nearly half of respondents (47.3%) considered citizens unaware or very unaware of environmental issues, while only 38.3% perceived them as aware or very aware, and 14.4% remained neutral. This indicates a gap between the recognized importance of awareness programmes and urban residents' actual level of environmental knowledge. Environmental awareness was perceived more positively in Rajshahi, where 51.6% of respondents considered citizens aware or very aware, compared with 22.2% in Barishal. Conversely, perceived unawareness was higher in Barishal (56.8%) than Rajshahi (39.6%), indicating notable city-level differences.

Table 2

Level of Citizens' Awareness in CCs

	Rajshahi City Corporation		Barishal City Corporation	
Level of Awareness	***f***	***%***	***f***	***%***
Very unaware	22	9.8	30	16.2
Unaware	67	29.8	75	40.5
Neutral	20	8.9	39	21.1
Aware	99	44.0	29	15.7
Very Aware	17	7.6	12	6.5

Note. Pearson Chi-square (χ^2) = 43.455, df = 4, $p < 0.001$

Citizens' environmental awareness differs significantly between Rajshahi and Barishal City Corporations **(Table 2).** Rajshahi had a higher proportion of respondents reporting citizens as aware (44.0%) than Barishal (15.7%), while Barishal reported higher levels of unawareness (40.5% unaware and 16.2% very unaware). The Pearson Chi-square test confirmed a statistically significant difference between the two City Corporations ($\chi^2 = 43.455$, df = 4, $p < 0.001$), indicating variation in perceived environmental awareness levels.

Table 3

Mann-Whitney U test

City Corporation	N	Mean Rank	Mann-Whitney U test	Z	p	Effect Size (r)
Rajshahi	225	228.90	15548.000	-4.590	< .001	.23
Barishal	185	177.04				

Note. Mann-Whitney U test 15548.000; p < .001.

A Mann–Whitney U test **(Table 3)** examined whether citizens' perceived environmental awareness differed between Rajshahi and Barishal City Corporations. The results revealed a statistically significant difference between the two groups (U = 15,548.00, Z = −4.590, p < .001). Respondents from Rajshahi City Corporation had a higher mean rank (228.90) than those from Barishal City Corporation (177.04), indicating higher perceived environmental awareness among Rajshahi respondents. The effect size (r = .23) suggests a small-to-moderate magnitude of difference between the two groups. These findings imply that citizens' environmental awareness levels varied significantly across the two city corporations.

Qualitative evidence supports this observation, as IDI respondents from both RCC and BCC highlighted that many residents have limited understanding of waste segregation, pollution prevention, and their responsibilities in maintaining urban environmental quality (IDI-06; IDI-11; IDI-12).

KII respondents further explained that low awareness stems from insufficient environmental education, limited community outreach, and weak engagement between city corporations and local communities. They argued that awareness activities are often occasional rather than continuous, reducing their long-term impact on citizens' behavior (KII-01; KII-08). Similarly, FGD participants observed that many residents become concerned only when environmental problems directly affect them, such as waterlogging, waste accumulation, or public health risks, rather than proactively participating in environmental protection activities (FGD-01; FGD-02). However, some respondents noted that awareness is gradually improving among educated groups, youth, and communities involved with NGOs or local environmental initiatives (IDI-05; FGD-02). Therefore, the quantitative result reflects not only a lack of environmental knowledge but also the need for sustained awareness campaigns, participatory approaches, and stronger institutional communication.

5.3 Citizen Participation and Engagement in Environmental Governance

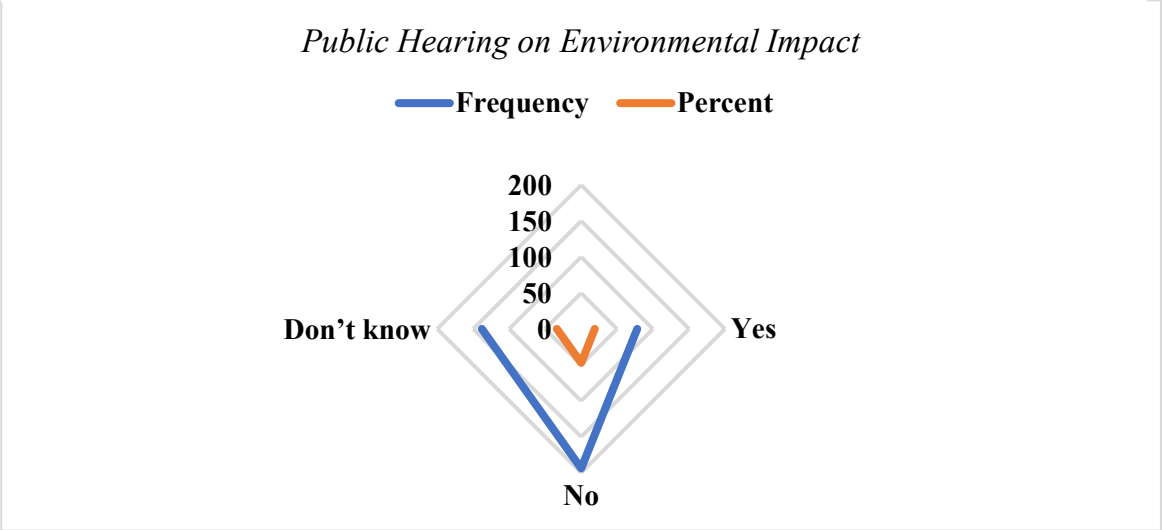
Citizen participation and engagement are essential to translate environmental awareness into practical action and strengthen local environmental governance. Active involvement through participation, complaint reporting, monitoring, and community initiatives enhances institutional responsiveness and collective environmental management.

5.3.1 Public Hearing and Participatory Environmental Decision-Making

Public hearings on environmental impacts represent an important participatory mechanism that enables citizens to express concerns, share local knowledge, and contribute to environmental decision-making processes. Examining citizens' access to and awareness of public hearings provides insight into the inclusiveness and responsiveness of urban environmental governance practices. **Figure 4** shows limited institutionalization of public participation in urban environmental decision-making: only 19.0% of respondents reported attending public hearings

Figure 4

Participation in Public Hearing



Note. Survey data, 2025

before project implementation, 47.3% reported that such consultations were not conducted, and 33.7% were unaware of these processes. This suggests that environmental governance mechanisms remain largely administrative rather than participatory, with many citizens having limited opportunities to express concerns or influence decisions affecting their surroundings.

The respondents of IDIs, particularly local residents and community representatives from RCC and BCC, stated that development projects are often implemented without adequate consultation with affected communities, resulting in limited citizen ownership and awareness of environmental consequences (IDI-02; IDI-06; IDI-12). KII participants similarly argued that although public consultation provisions exist in planning practices, they are not regularly applied at the city level due to institutional limitations, time constraints, and inadequate mechanisms for citizen engagement (KII-03; KII-07).

FGD participants further highlighted that ordinary residents are rarely invited to formal discussions unless projects create direct problems such as displacement, drainage obstruction, or pollution. Some participants also noted that lack of information sharing by city authorities contributes to citizens' uncertainty about whether public hearings are conducted (FGD-01; FGD-02). However, a few stakeholders acknowledged that consultation practices have improved in some projects through NGO involvement and community-based initiatives (IDI-05; FGD-02). Therefore, the survey findings indicate a significant gap between the principle of participatory environmental governance and its practical implementation in city corporations.

5.3.2 Participation in Environmental Awareness Programmes

Participation in environmental awareness programmes reflects the extent of direct citizen engagement in initiatives designed to improve environmental knowledge, attitudes, and collective responsibility. Assessing residents' involvement in such programmes provides insight into the practical opportunities available for public participation in urban environmental governance. The survey findings indicate that citizen involvement in environmental awareness programmes remains limited, as only 29.0% of respondents reported participating in such activities, while a substantial majority (71.0%) had no experience of participation. This suggests a significant gap between public recognition of the importance of awareness programmes and actual engagement opportunities available to local residents. An environmental lawyer noted that,

> Many awareness programmes are conducted without proper follow-up or evaluation. As a result, it is difficult to understand whether people's knowledge, attitudes, and environmental practices are improving or whether additional interventions are required. (KII-07

The qualitative findings from interviews and FGDs explained that environmental awareness activities are often organized irregularly and are frequently concentrated in specific areas or among selected groups rather than reaching the wider population (IDI-01; IDI-05). Some local residents said they rarely receive information about awareness campaigns, clean-up activities, or environmental training programmes run by city authorities (IDI-06).

KII respondents further identified weak institutional communication, limited coordination with community organizations, and insufficient budgetary support as major barriers to expanding citizen participation in environmental awareness activities (KII-02; KII-06). FGD participants also emphasized that many residents are willing to participate when opportunities are accessible, but lack of information, absence of regular programmes, and limited encouragement from local authorities reduce their involvement (FGD-01; FGD-02). However, NGO representatives and environmental activists noted that

> community-based initiatives have successfully engaged citizens in some areas, indicating that participatory approaches can improve environmental awareness when supported by effective collaboration between city corporations, civil society, and local communities. (IDI-04; FGD-02)

Therefore, the survey results reflect not only low participation but also the need for more inclusive, continuous, and community-oriented awareness programmes to strengthen local residents' role in urban environmental governance.

Survey data show that participation in environmental awareness programmes was relatively low, with only 119 of 410 participants reporting involvement. Female respondents had higher participation (92) compared to male respondents (27), reflecting greater female engagement among participants. However, most respondents (291) reported no participation, indicating limited community involvement in awareness activities. The findings suggest the need for more inclusive and effective awareness programmes to enhance public engagement in urban environmental governance.

Table 4

Chi-Square Test

Test	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.022[a]	1	0.882		
Continuity Correction[b]	0.000	1	0.985		
Likelihood Ratio	0.022	1	0.882		
Fisher's Exact Test				1.000	0.496
Linear-by-Linear Association	0.022	1	0.883		

Note: a. 0 cells (0.0%) have expected counts less than 5. The minimum expected count is 27.57. b. Computed only for a 2x2 table

Table 4 shows that Participation in environmental awareness programmes was almost identical among female (29.2%) and male respondents (28.4%). Gender was not significantly associated with participation, $\chi^2(1, N = 410) = 0.02$, $p = .882$, $\varphi = .01$. Thus, programme participation did not meaningfully differ by gender, and all chi-square assumptions were satisfied.

5.4 Relationship Between Awareness and Citizens' Engagement

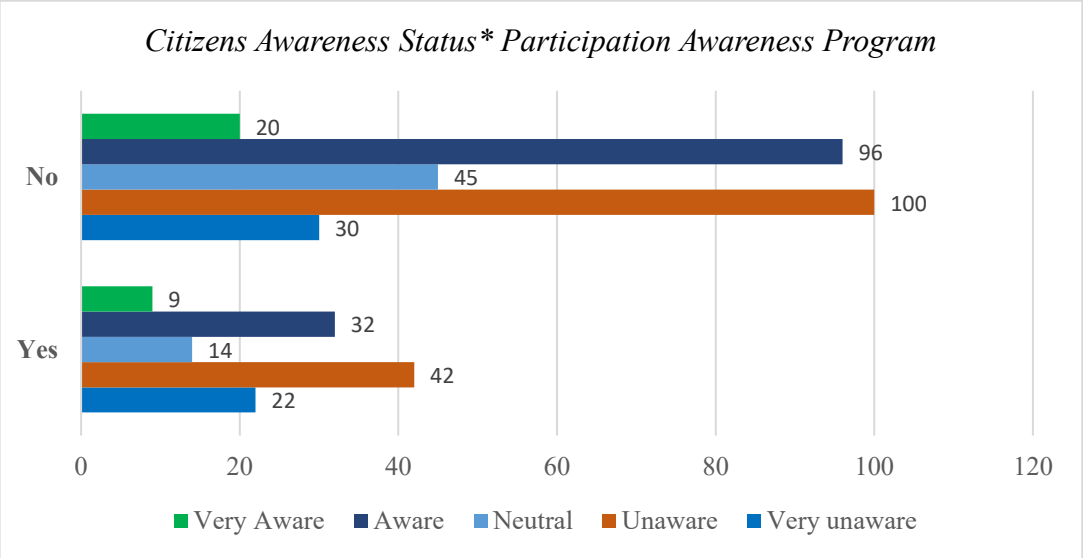
Public awareness drives citizen engagement by strengthening environmental understanding, responsibility, and willingness to participate in governance activities. Greater awareness can encourage active participation, monitoring, and collaboration, thereby strengthening environmental governance processes.

5.4.1 Awareness Status and Participation in Awareness Programmes

Participation in environmental awareness programmes varied across perceived awareness levels, ranging from 23.7% among neutral respondents to 42.3% among those classified as very unaware (**Figure 5**). However, no consistent pattern was evident between perceived citizen awareness and participation in programmes.

Figure 5

Citizens' Awareness Status and Participation in awareness programmes



Note. Survey data, 2025

Chi-square test results **(Table 5;** N = 410) indicate no statistically significant association between the examined categorical variables. The Pearson Chi-square value was $\chi^2(4) = 6.341$, $p = 0.175$, which is greater than the 0.05 significance level. The Likelihood Ratio test also showed a non-significant result ($\chi^2(4) = 6.097$, $p = 0.192$). The assumption of the chi-square test was satisfied and overall findings suggest the variables are independent and not statistically related among respondents. Overall, the findings suggest the variables are independent and not statistically related among respondents.

Table 5

Chi-Square Tests

Chi-Square Tests	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.341[a]	4	0.175
Likelihood Ratio	6.097	4	0.192
Linear-by-Linear Association	2.858	1	0.091

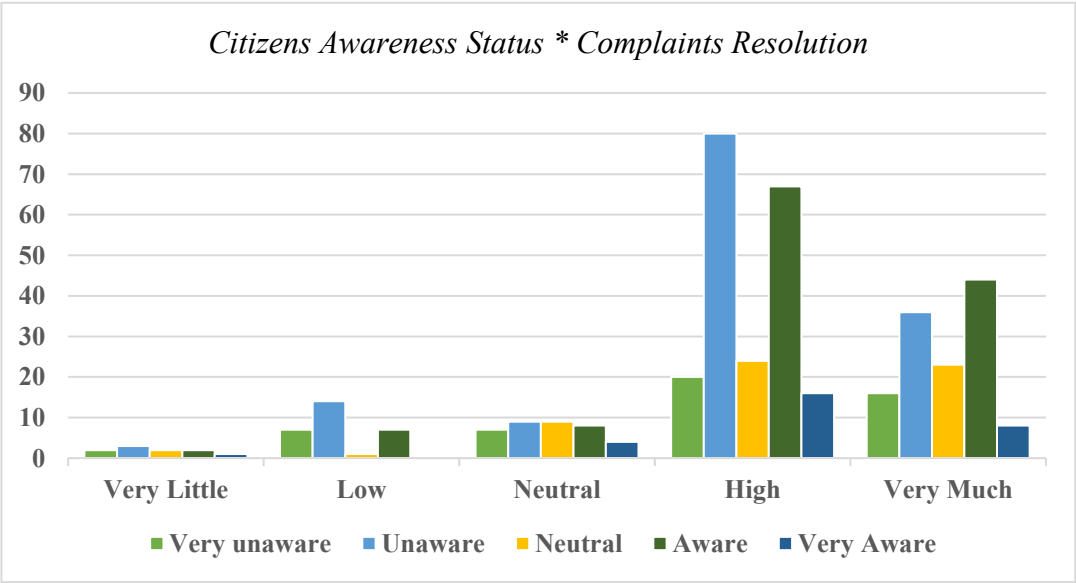
Note. a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.42.
N 410

5.4.2 Awareness Status and Complaint Resolution Mechanisms

Citizens' awareness status can shape their interaction with environmental governance institutions, including their ability to communicate concerns and engage with complaint resolution mechanisms. Examining the relationship between awareness levels and complaint resolution offers insight into how public knowledge shapes access to, and perceptions of, administrative responsiveness.

Figure 6

Citizens' Awareness Status and Complaint Resolution



Note. Survey data, 2025

Figure 6 demonstrates that support for strengthening complaint-resolution systems was high across all citizen-awareness categories. Combined "high" and "very much" responses ranged from 69.2% among the very unaware group to 86.7% among the aware group, indicating broad support regardless of perceived awareness status. A chi-square test is needed to determine statistical significance.

5.5 Socioeconomic Factors Influencing Environmental Awareness

Socioeconomic factors such as education, income, and access to information influence citizens' environmental awareness and capacity to engage in environmental governance. These factors shape environmental knowledge, participation opportunities, and the effectiveness of awareness-building initiatives among different social groups.

5.5.1 Influence of Educational Qualification on Awareness Status

Educational qualification influences environmental awareness by improving knowledge, access to information, and understanding of environmental issues. However, awareness also depends on broader social and institutional factors.

Table 6

Influences of Education on Citizens' Awareness Status

Citizens Awareness Status	Education of the respondent				
	Primary	Secondary	Higher Secondary	Undergraduate	Honors
Very unaware	8	4	25	14	1
Unaware	16	26	50	46	4
Neutral	10	6	26	15	2
Aware	32	30	39	26	1
Very Aware	7	13	6	3	0

Note. Survey data, 2025

Crosstabulation **Table 6** indicates that educational background influences citizens' environmental awareness, although formal education does not determine awareness alone. Respondents with higher secondary, undergraduate, and honors-level education generally showed greater awareness than those with lower educational attainment. For example, among respondents with higher secondary education, 45 respondents were aware or very aware, while among undergraduate respondents, 29 respondents reported being aware or very aware. However, a considerable number of respondents with higher education also remained unaware, indicating that formal education alone does not automatically translate into environmental awareness.

Table 7

Chi-Square Tests

Test	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	40.728[a]	16	0.001
Likelihood Ratio	40.935	16	0.001
Linear-by-Linear Association	20.052	1	0.000

Note, a. 5 cells (20.0%) have expected count less than 5. The minimum expected count is .57.

In **Table 7** perceived citizen awareness differed significantly by respondents' education, $\chi^2(16, N = 410) = 40.73$, $p = .001$, Cramér's $V = .16$, indicating a small association. Primary- and secondary-educated respondents reported awareness more frequently.

5.5.2 Influence of Income on Citizens Awareness Status

Table 8 shows that citizens' environmental awareness varies across income groups, although the pattern does not show a consistent linear relationship between household income and awareness level.

Table 8

Influences of Income on Citizens' Awareness Status

	Citizens awareness of the environment				
Income (BDT)	**Very unaware**	**Unaware**	**Neutral**	**Aware**	**Very Aware**
≤ 10,000	3	14	4	16	3
10,001–20,000	19	55	26	75	15
20,001–30,000	13	29	13	20	5
30,001–40,000	4	23	5	7	1
40,001–50,000	4	8	6	5	3
> 50,000	9	13	5	5	2

Note. Survey data, 2025

The largest share of respondents belonged to the BDT 10,001–20,000 income group, where awareness was mixed: 90 respondents identified as aware or very aware, while 74 perceived themselves as unaware or very unaware.

Table 9

Spearmen rho Correlations

Spearman's rho		**Income (BDT)**	**Citizens Awareness**
Income (BDT)	Correlation Coefficient	1.000	-.194**
	Sig. (2-tailed)		0.000
Citizens Awareness	Correlation Coefficient	-.194**	1.000
	Sig. (2-tailed)	0.000	

Note. **. Correlation is significant at the 0.01 level (2-tailed).

Spearman's rho correlation **(Table 9)** analysis (N = 410) revealed a weak but statistically significant negative relationship between income and citizens' awareness ($\rho = -0.194$, $p < 0.01$). This indicates that higher income levels were associated with slightly lower levels of citizens' awareness in the study sample. Although the correlation is weak, it is statistically significant at the 1% level. Overall, the findings suggest a significant relationship among the respondents. This suggests that environmental awareness is influenced not only by economic capacity but also by access to information, education, and community engagement opportunities. The qualitative findings from RCC and BCC noted that lower-income residents often prioritize immediate livelihood concerns, making environmental issues a secondary concern unless they directly affect daily life, such as waste accumulation, drainage problems, or health risks (IDI-03; IDI-06). However, some low-income community members showed awareness when they were connected with NGO programmes or local campaigns, indicating that economic status alone does not determine environmental consciousness (IDI-05; FGD-02). KII respondents emphasized that awareness differences among income groups largely stem from unequal access to environmental information and limited participation opportunities, rather than income alone. They argued that affluent groups may have better access to digital information, while lower-

income groups often depend on ward-level communication and community-based initiatives (KII-04; KII-07). FGD participants similarly highlighted that awareness increases when residents are directly involved in environmental activities, regardless of their economic background (FGD-01; FGD-02). The results indicate a need to communicate with different socioeconomic classes to build environmental awareness. CCs need to strengthen community-based programs, especially in economically precarious neighborhoods, to support participatory and accessible UEG.

6. INTEGRATED DISCUSSION

The integrated findings demonstrate that public awareness is an essential foundation for improving urban environmental governance; however, awareness alone does not automatically translate into meaningful citizen action. The quantitative findings show that 84.9% of respondents considered public awareness programmes effective for strengthening environmental protection. IDI, KII, and FGD findings supported this, with participants emphasizing that awareness initiatives improve environmental responsibility, waste management practices, and community engagement. However, qualitative evidence also highlighted that weak institutional support, limited complaint mechanisms, and inadequate coordination constrain the conversion of awareness into active participation.

Comparative analysis between Rajshahi City Corporation (RCC) and Barishal City Corporation (BCC) revealed significant differences in perceived environmental awareness. RCC showed higher awareness perceptions, with 51.6% of respondents identifying citizens as aware or very aware compared with 22.2% in BCC. The Chi-square test confirmed significant variation between the two city corporations ($\chi^2 = 43.455$, df = 4, $p < 0.001$), and the Mann–Whitney U test indicated higher awareness perceptions among RCC respondents (U = 15,548, $p < .001$). Qualitative evidence suggests that differences in institutional outreach, community communication, and local initiatives contributed to these variations.

Despite strong recognition of awareness programmes, actual participation remained limited, with only 29.0% of respondents reporting involvement in environmental awareness activities. Qualitative findings identified irregular programmes, insufficient information sharing, weak coordination, and limited participation opportunities as major barriers. Similarly, limited public hearing experiences indicate a gap between participatory governance principles and practical implementation. The relationship between awareness and engagement showed a complex pattern. Although awareness is expected to encourage participation, the chi-square analysis found no significant association between awareness status and participation in awareness programmes ($\chi^2 = 6.341$, $p = 0.175$). This indicates that awareness must be supported by institutional mechanisms, accessible participation channels, and responsive governance systems to produce meaningful citizen action. Socioeconomic findings indicate that education and social conditions influence environmental awareness. Educational qualification showed a significant association with awareness status ($\chi^2 = 40.728$, $p = 0.001$), while income demonstrated a weak but significant negative relationship with awareness ($\rho = -0.194$, $p < 0.01$). Qualitative evidence suggests that awareness differences are related not only to socioeconomic status but also to access to information, community involvement, and institutional support. City corporations should promote inclusive awareness, strengthen citizen

participation, and improve institutional collaboration to ensure sustainable environment.

7. CONCLUSION

The study has certain limitations, such as being confined to Rajshahi and Barishal City Corporations, depending on respondents' perceptions, lacking stakeholder representation to draw generalized conclusions, and using a cross-sectional design that could not assess change over time. However, the results show the need for public awareness to ensure citizens' participation and good urban environmental governance. City corporations should develop awareness programs based on a continuous, inclusive, and community-based approach, including public consultations, digital information systems, effective complaint management systems, and better cooperation between local government, NGOs, civil society organizations, and communities. Policy interventions should also address socioeconomic differences and ensure that vulnerable groups can engage in environmental interventions in meaningful ways. Institutional coordination, public participation, transparency, accountability, and monitoring must be strengthened to convert environmental awareness into action and support good governance of a sustainable urban environment in Bangladesh.

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