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Assessing Local Disaster Governance in Coastal Bangladesh: Comparing Institutional and Community Perspectives on Disaster Management Committees

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ABSTRACT

Despite substantial investments in decentralized disaster governance, Bangladesh's coastal regions remain highly vulnerable to climate-induced hazards. Disaster Management Committees (DMCs) were established to enhance local preparedness, response, and recovery through participatory governance. However, empirical evidence on their effectiveness at the community level remains limited. This study examines the institutional capacity, operational effectiveness, and governance legitimacy of DMCs in two disaster-prone coastal upazilas: Dumki and Kalapara of Patuakhali District. A mixed-methods approach was adopted, combining a community survey (N = 100) with key informant interviews (N = 30). Quantitative data were analyzed using descriptive and inferential statistics, and four composite indices were constructed: Community Awareness Index (CAI), Community Satisfaction Index (CSI), Institutional Capacity Index (ICI), and Operational Effectiveness Index (OEI). Qualitative data were analyzed thematically to contextualize institutional practices and explain the gap between institutional claims and community experience. The findings reveal a pronounced disconnect between institutional self-assessment and community-level perceptions. Community awareness of DMCs was very low (CAI = 0.07), and community



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satisfaction with DMC performance was also very low (CSI = 0.04), indicating limited public engagement and weak service visibility. In contrast, DMC members reported very high institutional capacity (ICI = 0.95) and ceiling-level operational effectiveness (OEI = 1.00), suggesting a substantial mismatch between institutional perceptions and community realities. Union-wise differences in awareness and satisfaction were limited and not statistically significant. Firth penalized logistic regression likewise did not identify any statistically significant predictor of community satisfaction, indicating that dissatisfaction was broad-based rather than confined to specific respondent groups or locations. Overall, the results suggest that decentralization alone is insufficient to ensure participatory and effective disaster governance without accountability, transparency, and sustained community engagement. The study highlights the importance of community-validated performance measures and stronger accountability mechanisms for improving local disaster risk governance in climate-vulnerable settings.

KEYWORDS

Local Disaster Governance; Disaster Management Committees; Coastal Bangladesh; Institutional Self-Assessment; Community Perception; Community Satisfaction; Accountability.

1. Introduction

The coastal zone of Bangladesh is among the most disaster-prone regions in the world. It is regularly exposed to cyclones, storm surges, tidal flooding, and salinity intrusion. 19 coastal districts host more than 35 million people and experience climate-driven shocks that disproportionately affect poor people, such as agriculture- and fishing-dependent communities (MoDMR, 2020; UNDRR, 2020). Bangladesh is internationally recognized for reducing climate-driven mortality through early warning systems, especially institutional reforms. However, challenges remain in reflecting national disaster risk reduction (DRR) policies into effective local action (Cvetković, 2025; Cvetković et al., 2024, 2025, 2026; Cvetković & Šišović, 2024; Cvetković, Nikolić, & Lukić, 2024). In other words, progress at the policy level does not automatically ensure responsive, inclusive, and accountable disaster governance at the local level. The Government of Bangladesh established Disaster Management Committees (DMCs) to decentralize disaster governance and strengthen community-level preparedness at district, upazila, union, and ward levels under the Disaster Management Act 2012. These committees are mandated to coordinate preparedness planning, disseminate early warnings, manage emergency response, and support post-disaster recovery in accordance with the National Plan for Disaster Management (NPDM) 2021–2025 (Government of Bangladesh, 2012; MoDMR, 2020). These committees are expected to play a coordinating role before, during, and after disasters. Before disasters, they are responsible for preparedness planning, risk communication, and the dissemination of early warnings. During disasters, they are expected to coordinate emergency response and local support mechanisms. After disasters, they are expected to facilitate recovery efforts and support affected populations. In principle, therefore, DMCs represent a decentralized and participatory model of disaster governance intended to bring state institutions closer to local communities.

This institutional arrangement reflects a broader governance logic. Decentralization is intended to make public institutions more responsive to local needs by bringing authority, decision-making, and implementation closer to affected populations (Ribot, 2002). In disaster governance, however, decentralization can be effective only when local institutions are not merely present on paper, but are also trusted, visible, and accountable in practice (Canete et al., 2025; Karmaker, 2025; Karmaker & Cvetković, 2025; Kayes et al., 2025; Rahman et al., 2025; Salam et al., 2025). Participatory governance is therefore central to local DRR because community engagement, transparency, and responsiveness shape whether local institutions are regarded as legitimate and whether their actions produce meaningful outcomes. Research on public trust and disaster governance similarly suggests that institutional legitimacy depends not only on formal mandates, but also on whether citizens perceive institutions as credible, fair, and responsive (Grimmelikhuijsen & Knies, 2017; Bonfanti et al., 2024).

Within this perspective, it is important to distinguish several related but analytically distinct concepts used in this study. Institutional capacity refers to the internal readiness of DMCs, including

organizational arrangements, planning processes, role clarity, and procedural preparedness (Cvetković, 2026). Operational effectiveness refers to the extent to which these institutional arrangements are translated into visible performance in early warning dissemination, coordination, response, and support for vulnerable populations. Governance legitimacy, in the context of this study, refers to the extent to which communities recognize DMCs as visible, credible, and publicly meaningful institutions. Empirically, this legitimacy is reflected in community awareness, interaction, and satisfaction. Accountability refers to whether DMC actions are transparent, answerable, and open to community scrutiny. These distinctions are important because institutions may report high internal capacity while still failing to generate effective and legitimate outcomes at the community level.

Existing studies from Bangladesh suggest that local disaster governance often falls short of policy expectations. Earlier research has shown that DMCs and related local institutions face persistent problems, including weak coordination, inadequate training, limited community engagement, and poor transparency in relief and response activities (Alam & Collins, 2010; Haque & Uddin, 2013; Habib et al., 2013; Uddin et al., 2021). Communities in coastal Bangladesh have likewise reported low visibility of institutional action, weak trust in local disaster authorities, and dissatisfaction with the distribution of support and response practices (Paul & Dutt, 2010; Paul et al., 2022). At the same time, wider disaster governance scholarship beyond Bangladesh shows that local DRR institutions often struggle to transform formal mandates into effective local mechanisms when community participation is weak, trust is limited, and implementation remains compliance-driven rather than outcome-oriented (Tuhkanen, 2023; Alcántara-Ayala et al., 2025).

Despite these insights, an important empirical gap remains. Much of the existing literature discusses local disaster institutions either from a policy perspective or through institutional self-reported performance. Far fewer studies directly compare institutional self-assessment with community-level experience using systematically constructed and comparable measures. As a result, the relationship between procedural compliance and actual governance effectiveness remains insufficiently examined. A committee may hold meetings, maintain planning documents, or report coordination activities, yet remain largely invisible to the population it is meant to serve. For this reason, the central concern of this study is not simply whether DMCs formally exist, but whether they function in ways that are visible, trusted, and meaningful to communities. The issue is therefore one of accountability, transparency, and participatory effectiveness rather than formal institutional presence alone.

This problem is especially important in coastal Bangladesh, where repeated exposure to hazards means that local institutions play a critical role in preparedness, response, and recovery. If communities are unaware of DMCs, rarely interact with them, or remain dissatisfied with their performance. The practical legitimacy of these institutions becomes questionable, regardless of their formal administrative structure. Conversely, if institutional actors report high levels of preparedness and effectiveness while communities report limited awareness and weak service delivery, this indicates a significant governance gap between institutional claims and lived experience.

Against this background, this study examines the institutional capacity, operational effectiveness, and governance legitimacy of DMCs in two disaster-prone coastal upazilas, Dumki and Kalapara of Patuakhali District. The study employs a mixed-methods approach, combining a community survey (N = 100) with key informant interviews (N = 30) with DMC members to assess how disaster governance is experienced at the grassroots level. Four standardized composite indices Community Awareness Index (CAI), Community Satisfaction Index (CSI), Institutional Capacity Index (ICI), and Operational Effectiveness Index (OEI) are used to enable systematic comparison between community perceptions and institutional self-assessment.

The study has four specific objectives. First, it assesses community awareness of and engagement with DMCs. Second, it evaluates community satisfaction with DMC performance across preparedness, response, and recovery dimensions. Third, it examines institutional self-assessment of DMC capacity and operational effectiveness. Fourth, it compares these community- and institution-based perspectives in order to determine whether local disaster governance in the study area reflects meaningful public responsiveness or primarily procedural compliance.

By addressing these questions, the study contributes to disaster governance scholarship in three ways. First, it provides empirical evidence on the gap between institutional self-assessment and community experience in a highly hazard-prone coastal context. Second, it integrates standardized composite indices with mixed-methods analysis to assess local disaster governance from both institutional and community perspectives. Third, it offers policy-relevant insight into how accountability, transparency, and community validation can strengthen decentralized disaster governance in Bangladesh and in comparable climate-vulnerable settings.

2. Methods

2.1. Research Design

This study adopted a mixed-methods research design using a convergent parallel approach. It integrated quantitative community survey data with qualitative insights from key informant interviews (KIIs). Mixed-methods designs are widely recommended for disaster governance research because they enable triangulation between institutional performance claims and community-level experiences (Creswell & Creswell, 2018).

This research was cross-sectional and descriptive-analytical in nature. The quantitative component assessed levels of awareness, engagement, and satisfaction with Disaster Management Committees (DMCs). The qualitative component explored institutional capacity, operational practices, coordination mechanisms, and governance challenges from the perspective of DMC members. This study focused on identifying performance and perception gaps, rather than establishing causal relationships.

2.2. Study Area

The study was conducted in Dumki and Kalapara Upazilas of Patuakhali District, located in the southern coastal belt of Bangladesh. This region is highly exposed to cyclones, tidal surges, coastal flooding, and salinity intrusion, making it an appropriate setting for examining the effectiveness of local disaster governance (MoDMR, 2020; UNDRR, 2020). Five unions were purposively selected based on hazard exposure and the presence of functional Disaster Management Committees: Dumki Upazila: Angaria, Lebukhali, Sreerampur; Kalapara Upazila: Latachapli, Mohipur.

The selection of Dumki and Kalapara was purposive and comparative. Kalapara was selected because it is a highly hazard-exposed coastal upazila within Bangladesh's southern disaster-prone belt and experiences recurrent coastal hazards, including cyclonic storms, tidal surges, and related impacts (MoDMR, 2020; UNDRR, 2020). This made it a relevant site for examining DMC performance in a high-risk disaster context. Dumki, by contrast, was selected as a comparatively different administrative and community setting within the same coastal region. Preliminary field understanding suggested differences between the two upazilas in local institutional functioning, community awareness, and interactions with public institutions. At the same time, the two upazilas are geographically close and fall within the broader coastal disaster-prone zone of Patuakhali District, allowing comparison under relatively similar regional hazard conditions (MoDMR, 2020; UNDRR, 2020). This comparative selection was intended to capture variation in local governance and community experience while retaining a shared environmental context for analysis.

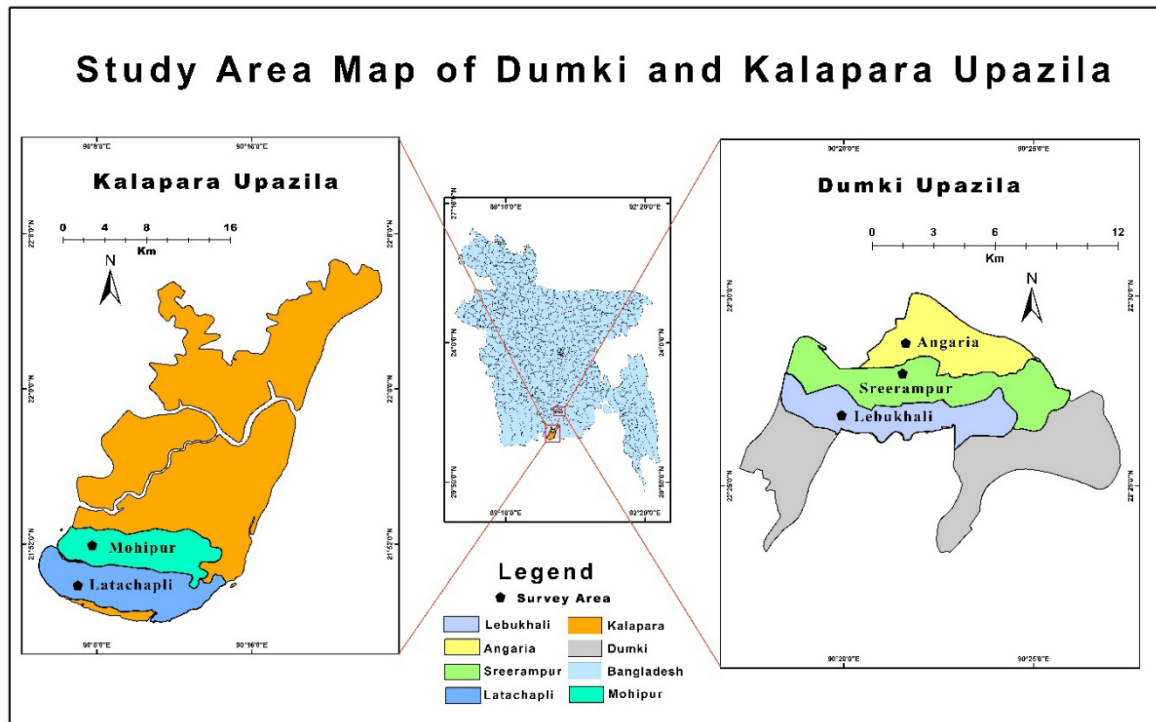


Figure 1. Study area map of Dumki and Kalapara upazilas showing the selected survey unions. Source: Prepared by the author using ArcGIS 10.8, based on administrative boundary data from the Bangladesh Bureau of Statistics (BBS). Scale is indicated by graphic scale bars.

These areas experience recurrent climate-driven hazards and maintain active Union and Upazila DMCs, which provide a relevant institutional context for assessing preparedness, response, and recovery functions.

2.3. Data Collection Methods

Primary data were collected through multiple sources to ensure triangulation and depth.

Community Survey: A structured questionnaire was used to survey 100 community respondents from the five selected unions. To ensure balanced geographic coverage, 20 respondents were selected from each union. The survey collected information on socio-demographic characteristics; awareness of local DMCs; frequency of engagement with DMCs; perceived effectiveness of preparedness, response, and recovery activities; and overall satisfaction with DMC performance. Respondents were purposively selected from adult community members aged 25 years and above who were considered likely to have direct knowledge of recurring disaster events and local institutional responses. Priority was given to individuals with sustained local involvement and familiarity with community conditions, particularly farmers, teachers, and private service holders. Face-to-face interviews were conducted to accommodate variations in literacy and to enhance response accuracy. The questionnaire design was guided by national disaster management guidelines and previous empirical studies in coastal Bangladesh (Alam & Collins, 2010).

Key Informant Interviews (KIIs)

A total of 30 semi-structured key informant interviews were conducted with members of union-level Disaster Management Committees. The KII sample included 5 Union Chairmen, who served as Presidents of the Union DMCs; 5 Union Secretaries, who served as Member Secretaries of the Union DMCs; and 20 Ward Members. The Ward Members served in both Ward DMCs and Union DMCs, providing perspectives at the interface between ward-level community engagement and union-level institutional coordination. These interviews explored institutional structure, deci-

sion-making processes, early warning dissemination, coordination practices, resource availability, and operational challenges. Semi-structured interviews were used to maintain comparability across respondents while allowing flexibility to capture role-specific institutional experience (Patton, 2015).

Informal Community Interviews

In addition, five informal community interviews were conducted with disaster-affected residents. These interviews were used to contextualize the survey findings and to capture lived experiences related to relief distribution, transparency, trust, and perceived institutional responsiveness in local disaster governance.

2.4. Sampling Strategy and Justification

A purposive sampling strategy was employed for both community respondents and key informants. Purposive selection was also applied at the study-area level. Dumki and Kalapara were chosen to represent two coastal upazilas within the same broad hazard-prone region but with differing local administrative and community contexts. This made them analytically suitable for comparing institutional self-assessment and community experience of DMC performance across contrasting local settings.

At the respondent level, purposive sampling was used to identify individuals likely to provide informed perspectives on disaster experiences and local governance processes. For the community survey, respondents were selected from adult residents aged 25 years and above who were familiar with local disaster events and community-level institutional responses. For the KIIs, respondents were selected based on their formal roles within union- and ward-linked DMC structures, including committee leadership, administrative coordination, and ward-level representation. This strategy was considered appropriate because the study aimed to examine institutional performance, community perception, and governance gaps rather than to produce statistically representative estimates for the broader population (Creswell & Creswell, 2018; Tongco, 2007).

However, because the respondents were purposively selected rather than randomly sampled, the findings should be interpreted as analytically informative rather than statistically generalizable to all residents of Dumki and Kalapara upazilas. This limitation is consistent with the logic of qualitative-dominant and mixed-methods inquiry, where the emphasis is placed on depth, relevance, and contextual understanding rather than probability-based representativeness (Creswell & Creswell, 2018; Tongco, 2007).



2.5. Data Analysis

2.5.1. Quantitative Analysis

Quantitative data obtained from community surveys and key informant interviews (KIIs) were coded and analyzed using descriptive and inferential statistical techniques. Frequencies, percentages, means, and standard deviations were computed to summarize respondent characteristics and perception patterns. To enable systematic comparison across multiple indicators and study locations, composite indices were constructed following established procedures in social science and governance research (OECD, 2008; Nardo et al., 2005). Four composite indices were developed to capture different dimensions of disaster governance: 1. Community Awareness Index (CAI), 2. Community Satisfaction Index (CSI), 3. Institutional Capacity Index (ICI) and 4. Operational Effectiveness Index (OEI). The questionnaire items, response categories, and coding procedures used to operationalize these constructs and construct the composite indices are presented in Appendix Table A2.

These indices were designed to aggregate multiple indicators into standardized measures, allowing direct comparison between community-level experiences and institutional self-assessment.

Index Construction and Normalization: Because the survey and KII instruments included indicators measured on different binary and ordinal scales, all item responses were first recoded so that higher values consistently represented better outcomes (e.g., greater awareness, stronger capacity, or higher effectiveness). Appendix Table A2 provides the original questionnaire wording, response categories, and the analytical recoding applied to each item included in the composite indices. To ensure comparability across variables measured on different scales, all indicators were then normalized to a common range of 0 to 1 using min–max normalization (OECD, 2008):

$$X' = \frac{X - X_{min}}{X_{max} - X_{min}}$$

Where:

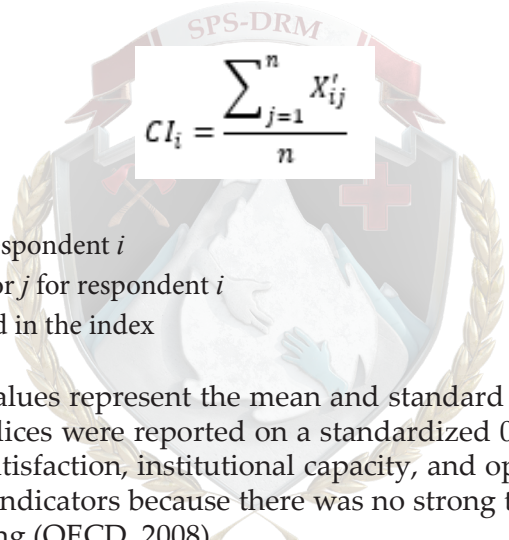
X' = normalized score of the indicator for the respondent i

X = observed value

X_{min}, X_{max} = minimum and maximum possible values of the indicator

This transformation ensured that all indicators contributed on a common metric and could be meaningfully compared across indices.

Composite Index Calculation: Each composite index was calculated as the arithmetic mean of its normalized indicators:



$$CI_i = \frac{\sum_{j=1}^n X'_{ij}}{n}$$

Where:

CI_i = composite index score for respondent i

X'_{ij} = normalized score of indicator j for respondent i

n = number of indicators included in the index

The final reported index values represent the mean and standard deviation of respondent-level composite scores. All four indices were reported on a standardized 0–1 scale, where higher values indicate greater awareness, satisfaction, institutional capacity, and operational effectiveness. Equal weighting was applied to all indicators because there was no strong theoretical or empirical justification for differential weighting (OECD, 2008).

To facilitate interpretation, standardized index values were classified into five categories. The standardized score was interpreted using five categories. Scores from 0.00 to 0.20 indicate a very low level, scores from 0.21 to 0.40 indicate a low level, scores from 0.41 to 0.60 indicate a moderate level, scores from 0.61 to 0.80 indicate a high level, and scores from 0.81 to 1.00 indicate a very high level.

Community Awareness Index (CAI)

CAI measures the level of awareness and engagement of community members with Disaster Management Committees (DMCs). For this study, CAI was constructed using three indicators: Awareness of the DMC's existence, Knowledge of DMC members or activities, and Frequency of interaction or engagement with the DMC. Each indicator was recoded where necessary and normalized to a 0–1 scale. The CAI is expressed as:

$$CAI_i = \frac{Awareness_i + Knowledge_i + Engagement_i}{3}$$

This index was constructed for this study, where higher CAI values indicate greater community awareness and interaction with DMCs.

Community Satisfaction Index (CSI):

CSI captures community perceptions of DMC performance across disaster management phases. This study includes four indicators: Effectiveness of preparedness activities, Coordination during disaster response, Effectiveness of recovery support, and Overall satisfaction with DMC performance. Responses were recoded so that higher scores reflected more positive perceptions, then normalized to a 0–1 scale and averaged to generate the index. The CSI is calculated as:

$$CSI_i = \frac{Preparedness_i + Coordination_i + Recovery_i + Satisfaction_i}{4}$$

This index was constructed for this study, where higher CSI values indicate greater perceived effectiveness and satisfaction.

Institutional Capacity Index (ICI)

ICI evaluates the structural and functional capacity of DMCs based on responses from committee members. This study includes six indicators: Frequency of DMC meetings, Participation in disaster management planning, Awareness of roles during non-disaster periods, Awareness of roles during disasters, Awareness of roles in post-disaster phases, and Knowledge of Standing Orders on Disaster (SOD). All indicators were recoded where necessary so that higher values reflected stronger institutional readiness, and were then normalized to a 0–1 scale. The index is calculated as:

$$ICI_i = \frac{\sum_{j=1}^6 Capacity_{ij}}{6}$$

This index was constructed for this study, where higher ICI values indicate stronger institutional readiness and organizational capacity.

Operational Effectiveness Index (OEI):

OEI measures the perceived effectiveness of DMC operations during disaster management. This study includes four indicators: Effectiveness of early warning dissemination, Coordination with stakeholders, Disaster response and recovery performance, and Support for vulnerable populations. Each indicator was normalized to a 0–1 scale and aggregated using an arithmetic mean, as:

$$OEI_i = \frac{EarlyWarning_i + Coordination_i + Response_i + VulnerableSupport_i}{4}$$

This index was defined for this study, with higher OEI values indicating better operational performance.

Reliability and Internal Consistency:

To assess the internal consistency of multi-item indices, Cronbach's alpha (α) was calculated for each index. Cronbach's alpha measures the extent to which indicators within a composite index are correlated and capture the same underlying construct (Nunnally, 1978).

$$\alpha = \frac{k}{k-1} \left(1 - \frac{\sum \sigma_i^2}{\sigma_T^2} \right)$$

Where:

- k = number of items
- σ_i^2 = variance of individual items
- σ_T^2 = total variance

Following established conventions, $\alpha \geq 0.70$ was considered acceptable (Nunnally, 1978; Hair et al., 2010). The results indicated acceptable to good reliability for all indices, confirming that the selected indicators consistently measure their respective constructs.

Statistical Analysis

Descriptive statistics (mean and standard deviation) were used to summarize index values. Union-wise comparisons were conducted to examine spatial variation in awareness and satisfaction. Inferential analyses included chi-square tests to assess differences across unions and correlation analyses to examine relationships among education, awareness, and satisfaction. Firth penalized logistic regression was used to identify determinants of community satisfaction. Regression estimates were reported as odds ratios with corresponding 95% confidence intervals and p-values. This approach was selected because the number of positive outcome cases was limited and the timely support variable exhibited sparse cell counts, conditions under which penalized likelihood methods provide more stable estimates than standard maximum-likelihood logistic regression (Firth, 1993; Heinze & Schemper, 2002). Prior to model estimation, cross-tabulations were examined to assess sparse cell patterns in the binary outcome, and multicollinearity among the predictors was assessed. No evidence of problematic multicollinearity was observed, and Firth-penalized logistic regression was retained to address the limited number of positive cases and sparse data. For regression analysis, community satisfaction was recoded as a binary outcome (1 = somewhat satisfied/neutral, 0 = dissatisfied). Independent variables included awareness of DMCs, education level, receipt of timely support, and union-level dummy variables, with Angaria used as the reference category. This multi-level analytical approach ensured both descriptive clarity and inferential robustness.

2.5.2. Qualitative Analysis

Qualitative data from key informant interviews and informal community discussions were transcribed and analyzed using thematic analysis, following the six-step framework of Braun and Clarke (2006). The analysis began with repeated readings of the transcripts to become familiar with the data and to identify recurring patterns in how respondents described disaster governance practices, institutional functioning, community engagement, and service delivery. Initial codes were generated inductively from the interview material and then reviewed, refined, and grouped into broader analytical themes aligned with the study's objectives (Braun & Clarke, 2006).

Five major themes were identified from the qualitative data: institutional capacity, operational effectiveness, governance gap, documentation-to-reality gap, and political bias in service and relief distribution. The theme of institutional capacity captured how DMC members described meetings, planning, coordination arrangements, and role clarity within committee structures. Operational effectiveness reflected perceptions of DMCs' practical performance in preparedness, early warning dissemination, disaster response, and recovery support. Governance gap referred to the divergence between institutional self-assessment and community-level experience. Documentation-to-reality gap captured the contrast between formal procedural compliance and the limited visibility of outcomes at the community level. Political bias in service and relief distribution reflected recurrent concerns about unfairness, preferential treatment, and weak transparency in the delivery of local disaster assistance.

In keeping with the convergent parallel mixed-methods design, these qualitative themes were not treated as a separate strand of evidence only; rather, they were used to interpret and contextualize the quantitative findings. In particular, the qualitative analysis was used to explain why institutional respondents reported very high capacity and effectiveness, while community respondents demonstrated very low awareness, weak engagement, and high dissatisfaction. Thus, the qualitative findings served an explanatory and triangulating function in relation to the survey results, composite indices, and regression analysis (Creswell & Creswell, 2018). Quantitative and qualitative data were analyzed separately in the first stage and then integrated during interpretation by comparing areas of convergence and divergence across survey responses, composite index results, regression findings, and interview-based themes. Where appropriate, anonymized interview evidence was incorporated into the Discussion section to clarify how local actors understood institutional performance, community participation, and accountability in practice (Patton, 2015).

2.6. Ethical Considerations

Ethical standards for human-subject research were strictly followed. Participation was voluntary. Verbal informed consent was obtained for each interview or survey. Respondents were assured of confidentiality and anonymity. The research adhered to ethical principles of respect, non-maleficence, and cultural sensitivity (Israel & Hay, 2006).

3. Results

3.1. Socio-Demographic Profile of Community Respondents

A total of 100 community respondents participated in the survey across the five selected unions of Dumki and Kalapara upazilas. The sample was dominated by male respondents (77%), while females accounted for 23%. Respondents were distributed across three age groups: 30% were below 30 years, 41% were between 30 and 50 years, and 29% were above 50 years. Educational attainment was generally low. A substantial proportion of respondents were illiterate (42%), while 20% had completed primary education, 10% had secondary education, and only 28% had completed SSC or above. This profile indicates that a considerable share of the study population belonged to socially and educationally vulnerable groups (Table 1).

Table 1. Socio-demographic characteristics of community respondents (N = 100)

Variable	Category	Frequency	Percentage (%)
Gender	Male	77	77
	Female	23	23
Age group	Below 30	30	30
	30–50 years	41	41
	Above 50 years	29	29
Education	Illiterate	42	42
	Primary (1–5)	20	20
	Secondary (6–8)	10	10
	SSC and above	28	28

3.2. Community Awareness and Engagement with Disaster Management Committees

Community awareness of Disaster Management Committees (DMCs) was extremely limited. Only 8% of respondents reported being aware of a DMC in their locality, while 92% reported no awareness. Community engagement with DMCs was similarly weak. A large majority of respondents (90%) stated that DMCs had never interacted with their community, while only 10% reported rare interaction. These findings indicate that DMCs remained largely invisible to the communities they were intended to serve (Table 2).

Table 2. Awareness and engagement with DMCs

Indicator	Category	Percentage (%)
Awareness of DMC	Yes	8
	No	92
DMC engagement	Never	90
	Rarely	10

3.3. Community Perception of DMC Effectiveness

Community perceptions of DMC effectiveness were overwhelmingly negative across preparedness, response, and recovery dimensions. Most respondents reported not receiving timely support during disasters. Specifically, 87% stated that they had never received assistance from DMCs, while only a small proportion reported any form of support. Likewise, some respondents stated that they had never observed preparedness initiatives undertaken by DMCs in their communities. These findings suggest that DMC activities were either absent, limited, or insufficiently visible to elicit meaningful community recognition (Figures 2 and 3).

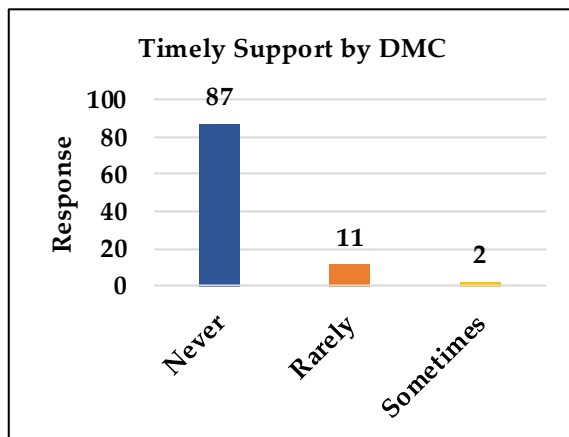


Figure 2. Distribution of community respondents by reported receipt of timely support from DMCs.

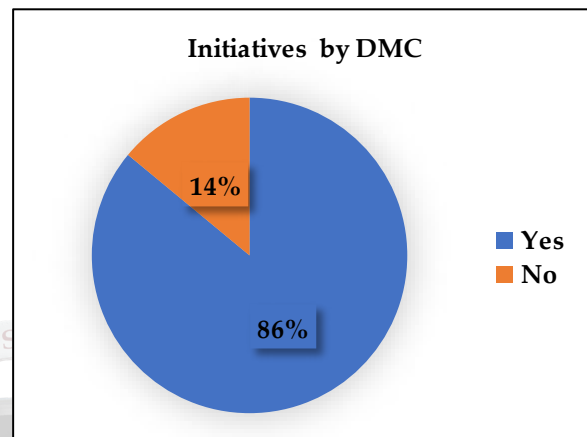


Figure 3. Distribution of community respondents by observed preparedness initiatives undertaken by DMCs.

3.4. Community Satisfaction with DMC Performance

Overall satisfaction with DMC performance was very low. None of the respondents reported being very satisfied. Only 6% were somewhat satisfied, 8% were neutral, and the remaining 86% were dissatisfied. This pattern suggests that negative perceptions of DMC performance were both widespread and consistent across the study population (Table 3).

Table 3. Community satisfaction with DMC performance

Satisfaction level	Percentage (%)
Very satisfied	0
Somewhat satisfied	6
Neutral	8
Dissatisfied	86

3.5. Composite Index Results

To provide a more systematic assessment of disaster governance performance, four standardized composite indices were constructed and reported on a 0–1 scale. The findings show a clear divergence between community-based measures and institutional self-assessment (Table 4).

The Community Awareness Index (CAI) had a mean of 0.07 (SD = 0.16), indicating a very low level of community awareness of DMCs' existence, functions, and activities. The Community Satisfaction Index (CSI) yielded a mean of 0.04 (SD = 0.07), which falls within the very low category and indicates extremely limited satisfaction with DMC performance.

In contrast, the Institutional Capacity Index (ICI) recorded a mean value of 0.95 (SD = 0.02), indicating a very high level of self-assessed institutional capacity among DMC members. Similarly, the Operational Effectiveness Index (OEI) recorded a value of 1.00 (SD = 0.00), representing ceiling-level

self-assessed operational effectiveness. This result should be interpreted cautiously, as the absence of variation in self-reported operational effectiveness may also reflect response bias, institutional pressure, or overreporting rather than uniformly strong performance across all operational dimensions. Together, these findings demonstrate a marked contrast between institutional self-perceptions and community experience.

Table 4. Standardized composite index scores (0–1 scale).

Index	Mean	SD	Interpretation
CAI	0.07	0.16	Very low awareness
CSI	0.04	0.07	Very low satisfaction
ICI	0.95	0.02	Very high self-assessed capacity
OEI	1.00	0.00	Perfect self-assessed effectiveness

Note: All indices were standardized to a 0–1 scale, where higher values indicate better outcomes. CAI and CSI represent community-based measures of awareness and satisfaction, while ICI and OEI represent self-assessed institutional measures of capacity and operational effectiveness. Based on the interpretation thresholds used in this study, scores of 0.00–0.20 indicate very low performance; 0.21–0.40, low; 0.41–0.60, moderate; 0.61–0.80, high; and 0.81–1.00, very high.

3.6. Union-Wise Variation in Awareness and Satisfaction

Union-wise analysis revealed only slight variation in both community awareness and satisfaction, with all scores remaining in the very low range (Figure 4). Lebukhali recorded the highest community awareness score (CAI = 0.19), followed by Angaria (0.07), Latachapli (0.06), Mohipur (0.05), and Sreerampur (0.05). Community satisfaction scores were also very low across all unions. The highest CSI values were observed in Angaria and Mohipur (0.05 each), followed by Lebukhali (0.04), Latachapli (0.04), and Sreerampur (0.03). Chi-square analysis indicated that these differences were not statistically significant. This suggests that low awareness and low satisfaction were not confined to a particular union but were broadly consistent across the study area.

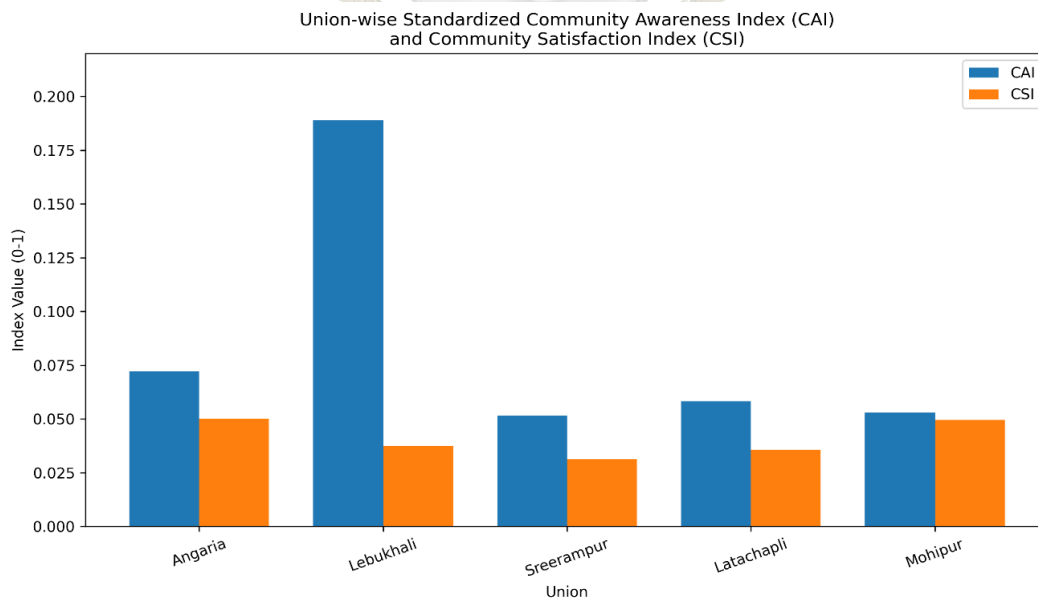


Figure 4. Union-wise variation in standardized Community Awareness Index (CAI) and Community Satisfaction Index (CSI)

3.7. Determinants of Community Satisfaction with DMC Performance

To examine the determinants of community satisfaction, a Firth penalized logistic regression model was estimated. This approach was used because the number of positive-outcome cases was limited and the timely support variable had sparse cell counts. Preliminary diagnostic checks also indicated no serious multicollinearity among the included predictors. Community satisfaction was coded as a binary outcome (1 = somewhat satisfied/neutral, 0 = dissatisfied). Independent variables included awareness of DMCs, education level, receipt of timely support, and union-level dummy variables, with Angaria as the reference category. Regression results are reported as odds ratios with corresponding 95% confidence intervals and p-values to show both the direction and precision of the estimated associations.

The regression results showed that none of the included predictors were statistically significant (Table 5). Awareness of DMCs was positively but non-significantly associated with satisfaction (OR = 1.50, 95% CI: 0.27–8.50, $p = 0.646$). Education level also showed a positive but non-significant association (OR = 1.15, 95% CI: 0.85–1.55, $p = 0.353$). Receipt of timely support showed a negative but non-significant association (OR = 0.19, 95% CI: 0.01–3.50, $p = 0.266$). Likewise, union-level effects were not statistically significant: Latachapli (OR = 1.06, 95% CI: 0.16–7.01, $p = 0.954$), Lebukhali (OR = 2.38, 95% CI: 0.32–17.54, $p = 0.393$), Mohipur (OR = 1.68, 95% CI: 0.28–9.92, $p = 0.567$), and Sreerampur (OR = 1.18, 95% CI: 0.22–6.33, $p = 0.849$). Overall, the regression findings suggest that dissatisfaction with DMC performance was broad-based and not strongly explained by the selected demographic, service-related, or location-specific variables.

Table 5. Firth penalized logistic regression predicting community satisfaction with DMC performance (N = 100), reported as odds ratios with 95% confidence intervals

Predictor	Odds Ratio (OR)	95% CI	p-value
Awareness of DMC (Yes = 1)	1.50	0.27–8.50	0.646
Education level	1.15	0.85–1.55	0.353
Timely support received (Any support = 1)	0.19	0.01–3.50	0.266
Latachapli	1.06	0.16–7.01	0.954
Lebukhali	2.38	0.32–17.54	0.393
Mohipur	1.68	0.28–9.92	0.567
Sreerampur	1.18	0.22–6.33	0.849

Note: Community satisfaction was coded as a binary outcome (1 = somewhat satisfied/neutral, 0 = dissatisfied). Angaria was used as the reference category for union-level comparisons. Odds ratios greater than 1 indicate higher odds of reporting satisfaction, whereas odds ratios below 1 indicate lower odds. Estimates were derived from a Firth-penalized logistic regression model because the number of positive outcome cases was limited and the timely support variable had sparse cell counts.

4. Discussion

4.1. Community-Level Evaluation of DMC Performance

The findings of this study indicate that DMC performance, as experienced by community people, was extremely weak. Community awareness of DMCs was minimal, direct engagement was rare, and most respondents reported never having received support or observed preparedness activities. Taken together, these findings suggest that DMCs are not functioning as visible, community-centered institutions at the grassroots level. In principle, local disaster governance structures are ex-

pected to promote participation, preparedness, and trust. However, in the present study area, these functions appear to be weakly institutionalized in practice. This interpretation is consistent with previous studies documenting low visibility, weak participation, and poor integration of local disaster management institutions in Bangladesh (Habib et al., 2013; Uddin et al., 2021).

The qualitative evidence helps to clarify why community-level evaluations remained so weak. Informal community interview participants repeatedly described DMC activities as limited, irregular, or insufficiently visible in everyday local life, particularly regarding preparedness initiatives and post-disaster support. These accounts suggest that low awareness was associated not only with a lack of information but also with a weak institutional presence, limited outreach, and restricted interaction between DMCs and residents. Community respondents also linked their dissatisfaction to perceptions that local support was not always delivered fairly or transparently. Such perceptions are important because they indicate that dissatisfaction was shaped not only by the absence of service but also by concerns about accountability, trust, and responsiveness in local disaster governance (Paul & Dutt, 2010; Paul et al., 2022).

The very low CAI and CSI scores further reinforce this point. Community members were not only unaware of DMC structures but also dissatisfied with their overall performance. This suggests that DMCs have limited public presence and limited service visibility, both of which are essential for effective local disaster governance. Where institutions remain invisible to the public, trust, participation, and responsiveness are likely to remain weak (Islam & Walkerden, 2017).

4.2. Institutional Self-Assessment versus Community Reality

One of the most important findings of this study is the sharp contrast between community perceptions and institutional self-assessment. While community-based indices remained very low, DMC members rated institutional capacity and operational effectiveness extremely highly. The ICI score of 0.95 and the OEI score of 1.00 suggest that institutional actors perceived their committees as highly prepared, highly coordinated, and fully effective. However, these perceptions are not supported by community experience. These very high institutional ratings should therefore be interpreted with caution. Because the ICI and OEI were derived from self-reported assessments by DMC members, they may reflect internal perceptions of procedural compliance, role fulfillment, and administrative activity rather than independently verified evidence of actual effectiveness at the community level. In this context, the possibility of social desirability bias, institutional pressure, or overreporting cannot be ruled out, particularly when respondents evaluate the performance of committees in which they hold formal roles. The ceiling-level OEI score is especially noteworthy in this regard, as it may indicate not only strong institutional confidence, but also limited variation in self-reporting or a tendency to present committee performance in a favorable light. Communities reported low awareness, low engagement, little visible preparedness, and very high dissatisfaction.

The qualitative findings further illuminate this contradiction. KII respondents frequently described DMC performance in terms of meetings, planning documents, coordination structures, and procedural readiness, suggesting that institutional actors often evaluated effectiveness in terms of administrative compliance and internal organizational functioning. Community respondents, however, framed effectiveness more in terms of visible support, direct engagement, and fairness in service delivery. This difference in evaluative perspective helps explain the coexistence of very high institutional self-ratings and very low community awareness and satisfaction. It also supports the interpretation of a documentation-to-reality gap, in which formal procedures and reported activities may satisfy institutional expectations without generating corresponding legitimacy or confidence at the community level. In this context, the possibility of social desirability bias or overreporting in institutional self-assessment should also be considered, particularly when respondents evaluate the effectiveness of bodies in which they hold formal roles (Uddin et al., 2021; Haque & Uddin, 2013).

This gap is analytically important. It indicates that the existence of meetings, plans, coordination practices, and formal procedures does not necessarily translate into meaningful outcomes at the community level. In other words, institutional performance may appear strong in administrative or

self-reported terms while remaining weak in practical citizen-facing terms. This finding points to a broader documentation-to-reality gap, where formal compliance may mask substantial weaknesses in implementation and service delivery. Similar tensions between institutional reporting and community experience have also been highlighted in earlier studies of disaster governance in Bangladesh (Uddin et al., 2021; Haque & Uddin, 2013).

4.3. Spatial Pattern: A Systemic Rather Than Localized Problem

The union-wise analysis showed only limited variation in awareness and satisfaction, and none of the differences across unions were statistically significant. Although Lebukhali recorded slightly higher awareness and Angaria and Mohipur showed marginally higher satisfaction, all values remained within the very low range. This indicates that the observed weaknesses are not confined to one poorly functioning union. Rather, they appear to reflect a broader institutional pattern across the study area.

This is an important result because it suggests that the problem is structural rather than isolated. If only one or two unions had performed poorly, the issue might have been attributed to local leadership, local politics, or union-specific administrative weaknesses. Instead, the consistency of low community outcomes across all five unions suggests more deeply rooted governance problems, including weak accountability, weak public communication, and insufficient community integration. This interpretation aligns with broader disaster governance literature, which shows that structural constraints and weak public participation often undermine local institutions across multiple locations rather than in isolated settings (Haque & Uddin, 2013; Ribot, 2002).

4.4. Interpretation of the Regression Findings

The regression analysis also supports the view that dissatisfaction with DMC performance was broad-based. None of the predictors included in the penalized logistic model reached statistical significance. Awareness, education, timely support, and union-level location each failed to explain variation in community satisfaction independently. This implies that dissatisfaction was not concentrated within a specific social or geographic subgroup. Rather, it was widespread across the sample.

The negative but non-significant coefficient for timely support should be interpreted cautiously. Because the number of respondents reporting both support and positive satisfaction was extremely limited, model stability was constrained. For this reason, the regression findings should not be interpreted as evidence that support reduced satisfaction. Instead, they highlight the limitations of the available data and suggest that dissatisfaction was shaped by broader, diffuse governance weaknesses rather than by any single predictor captured in the model. More broadly, the absence of significant predictors is consistent with the study's descriptive and index-based findings, which show that dissatisfaction was pervasive and systemic.

The qualitative evidence supports this interpretation by showing that dissatisfaction was rooted in broad governance concerns rather than in any single measured predictor. Respondents emphasized limited institutional visibility, weak communication, perceived unfairness in the distribution of support, and doubts about whether procedural activities translated into meaningful benefits for ordinary residents. These themes suggest that dissatisfaction was embedded in the broader relationship between local institutions and communities, rather than explained solely by education, awareness, or location. The regression findings and qualitative themes therefore converge in indicating that the core problem was systemic and institutional rather than narrowly demographic.

4.5. Implications for Disaster Governance

The overall findings suggest that decentralization alone is not sufficient to ensure effective disaster governance. The formal existence of DMCs does not automatically lead to community inclusion, transparency, or responsive service delivery. What matters is not only whether committees exist and perform administrative functions, but also whether communities know about them, trust them, and experience their actions as meaningful and fair. These concerns are central to broader debates on local governance and public trust, where legitimacy depends not only on institutional form but also on responsiveness and citizen experience (Grimmelikhuijsen & Knies, 2017).

From a policy perspective, the results point to several priorities. First, DMCs need stronger community outreach and communication so that residents understand their roles, functions, and responsibilities. Second, transparency in preparedness activities, relief distribution, and response processes should be strengthened to reduce distrust and improve legitimacy. Third, monitoring systems should include community-validated indicators rather than relying only on institutional self-reporting. Without such reforms, DMCs may continue to function as procedural bodies that appear active on paper but remain detached from the people they are supposed to serve. This interpretation is consistent with arguments that decentralized governance requires accountability, transparency, and active participation to produce meaningful local outcomes (Ribot, 2002; Haque & Uddin, 2013).

The qualitative findings also point to the need for more concrete accountability reforms. First, DMCs should adopt regular public reporting mechanisms at union and ward levels, including disclosure of preparedness activities, meeting decisions, beneficiary selection criteria, and relief distribution lists. Second, community scorecards and participatory monitoring forums could be introduced to enable residents to evaluate DMC performance before and after disasters. Third, accessible grievance redress mechanisms should be established so that complaints concerning exclusion, delayed support, or political bias in relief allocation can be formally recorded and reviewed. Finally, periodic independent evaluation by higher-level administrative authorities or external monitoring bodies could help reduce overreliance on institutional self-reporting and improve public trust in local disaster governance. These mechanisms would strengthen transparency, accountability, and community validation, which are central to effective decentralized governance (Ribot, 2002; Grimmelikhuijsen & Knies, 2017; Paul et al., 2022). Taken together, these measures would help shift DMC performance from procedural compliance toward more transparent, answerable, and community-validated governance practice.

4.6. Contribution of the Study

This study contributes to the literature on disaster governance. It demonstrates, through mixed-methods evidence, that institutional self-perception can differ sharply from community experience. By combining descriptive survey findings, composite index analysis, union-level comparison, and penalized regression, the study provides a more grounded understanding of how local disaster governance is experienced in practice. The findings are especially relevant for coastal Bangladesh, where vulnerability is high and where effective local governance is critical for preparedness, response, and recovery. In this sense, the study extends previous work on disaster governance by showing how procedural compliance and institutional self-assessment can coexist with persistent weaknesses in community-facing performance (Uddin et al., 2021; Habib et al., 2013).

5. Conclusions

This study critically examined the institutional capacity and operational effectiveness of Disaster Management Committees (DMCs) using a mixed-methods approach. By integrating community survey data with key informant interviews and composite index analysis, the research provides robust empirical evidence of how disaster governance is experienced at the local level. The findings reveal a remarkable performance gap between institutional self-assessment and community

experience. DMC members reported very high levels of institutional capacity and operational effectiveness. In contrast, community respondents demonstrated extremely low awareness of DMCs, minimal engagement, and widespread dissatisfaction with preparedness, response, and recovery efforts. However, because the institutional measures were based on self-assessed responses from DMC members, they should be interpreted cautiously and not as independently verified evidence of actual operational performance. This divergence highlights a gap between documentation and reality, where procedural compliance and reporting do not translate into meaningful or visible outcomes for disaster-affected populations. Importantly, the analysis suggests that dissatisfaction is structural rather than confined to particular respondent groups or unions. The penalized regression model did not identify any statistically significant predictor of community satisfaction, and union-level differences in awareness and satisfaction were also not statistically significant. These findings indicate that poor community-level outcomes are systemic across the study area. From a methodological perspective, the study demonstrates the value of combining mixed methods with standardized composite indices to assess governance performance from both institutional and community perspectives. This approach enables systematic comparison and offers a useful framework for evaluating local disaster governance in other climate-vulnerable contexts. Overall, the findings suggest that decentralization alone is insufficient to ensure effective disaster risk reduction. Strengthening DMC performance will require a shift from compliance-driven governance toward community-validated outcomes, supported by inclusive engagement mechanisms, transparent reporting, and stronger accountability systems. Aligning institutional practice with community realities is essential for building trust, enhancing local resilience, and realizing the participatory intent of Bangladesh's disaster management framework.

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Appendix

Appendix Table A1. Summary of major themes identified from KIIs and informal community interviews

Theme	Core qualitative issue	Main source of evidence	Relevance to quantitative findings
Institutional capacity	DMC members emphasized meetings, planning processes, coordination practices, and role clarity within committee structures	KIIs with Union Chairmen, Union Secretaries, and Ward Members	Helps explain the very high self-assessed Institutional Capacity Index (ICI)
Operational effectiveness	Institutional respondents described activities related to warning dissemination, coordination, disaster response, and recovery support, but these were not consistently reflected in community experience	Primarily KIIs, supported by informal community interviews	Helps interpret the contrast between high OEI and low community satisfaction
Governance gap	Strong mismatch between institutional self-evaluation and community awareness, engagement, and perceived effectiveness	KIIs and informal community interviews	Reinforces the divergence between community-based indices (CAI, CSI) and institutional self-assessment (ICI, OEI)
Documentation-to-reality gap	Procedural compliance and administrative reporting were not always visible as meaningful outcomes at the grassroots level	KIIs and informal community interviews	Supports the broader interpretation that formal institutional activity does not necessarily translate into lived community benefit
Political bias in service and relief distribution	Respondents reported concerns about unfairness, preferential treatment, and limited transparency in support and relief distribution	Informal community interviews, supported by KII accounts	Helps explain very low CSI and community dissatisfaction with DMC performance

Appendix Table A2. Questionnaire items, response categories, and operationalization of study variables used in composite index construction.

Part A. Community questionnaire items

Index/construct	Question code	Questionnaire item	Response categories	Operationalization in analysis
CAI	201	Are you aware of the Disaster Management Committee (DMC) in your area?	No; Yes	Binary awareness item. Recoded so Yes = higher awareness and No = lower awareness; normalized to 0–1.
CAI	201.2	Do you know anyone who is involved with the DMC?	No; Yes	Binary knowledge item. Recoded so Yes = higher awareness/knowledge and No = lower awareness/knowledge; normalized to 0–1.
CAI	202	How often does the DMC engage with you or your community to discuss disaster preparedness?	Regularly; Occasionally; Rarely; Never	Ordinal engagement item. Recoded so Regularly = highest and Never = lowest; normalized to 0–1.

CSI	401.2	How effectively does the DMC manage disaster preparedness activities (e.g., early warnings, drills)?	Very effective; Somewhat effective; Not effective	Ordinal preparedness-effectiveness item. Recoded so more positive responses received higher values; normalized to 0–1.
CSI	402.1	During a disaster, how well does the DMC coordinate with other organizations (e.g., NGOs, government agencies)?	Very well; Somewhat well; Poorly	Ordinal coordination item. Recoded so Very well = highest and Poorly = lowest; normalized to 0–1.
CSI	403.1	How effective is the DMC in helping the community recover after a disaster (e.g., rehabilitation, rebuilding)?	Very effective; Somewhat effective; Not effective	Ordinal recovery-effectiveness item. Recoded so more positive responses received higher values; normalized to 0–1.
CSI	503	How satisfied are you with the overall performance of the DMC in your area?	Very satisfied; Somewhat satisfied; Neutral; Dissatisfied	Ordinal satisfaction item. Recoded so Very satisfied = highest and Dissatisfied = lowest; normalized to 0–1. This item was also used to derive the binary dependent variable for penalized logistic regression, as described in Section 3.5.1.

Part B. DMC-member questionnaire items

Index/construct	Question code	Questionnaire item	Response categories	Operationalization in analysis
ICI	301	How frequently do you meet for disaster preparedness or planning activities?	Monthly; Bi-monthly; Quarterly; Half yearly; Annually; As needed	Ordinal institutional-meeting item. Recoded so more regular meetings = higher institutional capacity; normalized to 0–1.
ICI	302	Have you participated in developing and updating a Disaster Management Plan (DMP) in the past two years?	No; Yes	Binary planning-participation item. Recoded so Yes = higher institutional capacity and No = lower institutional capacity; normalized to 0–1.
ICI	303	Are you aware of your roles and responsibilities during intermediate time?	No; Yes; Somewhat	Ordinal role-awareness item. Recoded so Yes = highest, Somewhat = intermediate, and No = lowest; normalized to 0–1.
ICI	304	Are you aware of your roles and responsibilities during a disaster?	No; Yes; Somewhat	Ordinal role-awareness item. Recoded so Yes = highest, Somewhat = intermediate, and No = lowest; normalized to 0–1.
ICI	305	Are you aware of your roles and responsibilities after a disaster?	No; Yes; Somewhat	Ordinal role-awareness item. Recoded so Yes = highest, Somewhat = intermediate, and No = lowest; normalized to 0–1.

ICI	205	Have you heard about SOD?	No; Yes	Binary institutional-knowledge item. Recoded so Yes = higher institutional capacity and No = lower institutional capacity; normalized to 0–1.
OEI	402	How well did you disseminate those early warning messages?	Very effectively; Somewhat effectively; Ineffectively	Ordinal dissemination-effectiveness item. Recoded so that higher performance values corresponded to higher performance; normalized to 0–1.
OEI	404	How well did you coordinate with other stakeholders?	Very well; Somewhat well; Poorly	Ordinal coordination-effectiveness item. Recoded so more effective coordination received higher values; normalized to 0–1.
OEI	406	How well did you respond in the recovery phase?	Yes; No; Rarely	Ordinal recovery-response item. Recoded so Yes = highest, Rarely = intermediate, and No = lowest; normalized to 0–1.
OEI	603	How effectively did you address the needs of vulnerable groups during the recovery phase?	Very effectively; Somewhat effectively; Ineffectively	Ordinal support-effectiveness item. Recoded so more effective support received higher values; normalized to 0–1.

Note: This table summarizes the questionnaire items drawn from the community survey and the DMC-member survey instruments used in constructing the Community Awareness Index (CAI), Community Satisfaction Index (CSI), Institutional Capacity Index (ICI), and Operational Effectiveness Index (OEI). All items were recoded so that higher values represented better outcomes, then normalized to a 0–1 scale prior to index construction.