Inter-Agency Coordination in Disaster Response in Surigao City: Assessing Institutional Strengths, Operational Gaps and Governance Strategies for Public Sector Improvement

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ABSTRACT

This study assessed inter-agency coordination in disaster risk reduction and management (DRRM) and its relationship with perceived disaster response effectiveness among local government units and government agencies in Surigao City, Philippines. A quantitative descriptive-correlational design was employed with 117 respondents. The researcher-made instrument was adapted from the Department of the Interior and Local Government's Local Government Unit Disaster Preparedness Journal: Engagement of Stakeholders Tool (LISTO) and measured coordination across prevention and mitigation, preparedness, response, and rehabilitation and recovery. Descriptive statistics and Spearman rank-order correlation were used as the principal analyses. Overall inter-agency coordination was rated Very High, as was perceived disaster response effectiveness. Operational challenges were Moderate overall, led by communication breakdowns, limited resources and equipment, and lack of joint training. Overall coordination was strongly and positively associated with perceived disaster response effectiveness. All four coordination domains were significantly associated with effectiveness. Respondents also expressed Very High support for governance strategies emphasizing communication systems and technology, stronger policies and guidelines, monitoring and evaluation, capacity building, and inter-agency partnerships. The findings indicate that strong institutional coordination can coexist with persistent operational vulnerabilities. Strengthening interoperable communication, joint preparedness activities, resource capacity, and formal coordination protocols may help sustain and refine local disaster governance.

Keywords: inter-agency coordination; disaster response effectiveness; disaster risk reduction and management; disaster governance; local government; LISTO framework; Surigao City

INTRODUCTION

The Philippines is highly exposed to typhoons, floods, earthquakes, landslides, storm surges, and other hazards. In this setting, disaster response is not the responsibility of a single institution. Local governments, police, fire services, health offices, social welfare units, humanitarian organizations, barangays, and other actors must exchange information, clarify authority, mobilize resources, and act collectively under severe time pressure. The quality of inter-agency coordination is therefore a central concern in disaster governance.

Republic Act No. 10121, the Philippine Disaster Risk Reduction and Management Act of 2010, institutionalized a comprehensive approach to disaster risk reduction and management across four thematic areas: prevention and mitigation, preparedness, response, and rehabilitation and recovery. It also established local DRRM councils and offices as mechanisms for multi-sectoral coordination. The National Disaster Risk Reduction and Management Framework reinforces this integrated approach, while the Department of the Interior and Local Government (DILG) Operation LISTO framework provides practical guidance for local preparedness, stakeholder engagement, institutional responsibilities, and coordination (DILG, 2019; NDRRMC, 2011; Office of Civil Defense, 2011).

Formal structures, however, do not automatically produce seamless operational coordination. Crisis-

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management research identifies cognition, communication, coordination, and control as interdependent dimensions of performance (Comfort, 2007). Emergency-management networks may still experience fragmented information flows, role ambiguity, resource constraints, incompatible procedures, and uneven organizational capacity. Communication and coordination are therefore not merely administrative arrangements; they are operational capabilities that must be maintained before, during, and after emergencies (Sienkiewicz-Małyjurek, 2020).

Preparedness is particularly important because relationships and procedures that are expected to function during an emergency must be developed before the emergency occurs. Joint planning, drills, simulation exercises, early-warning arrangements, resource pre-positioning, and communication protocols enable agencies to test responsibilities and identify weaknesses under controlled conditions. Philippine studies have likewise emphasized simulation-based preparedness and the continuing need to strengthen disaster-response competencies among participating agencies (Gundran et al., 2022, 2023).

Surigao City provides a relevant setting for examining these issues. Its coastal location and proximity to active fault systems expose the city to multiple hazards, and recent disasters have demonstrated the vulnerability of communication, transportation, power, and essential services. The local DRRM system consequently depends on sustained coordination among the City Disaster Risk Reduction and Management Office (CDRRMO), barangays, police, fire services, health and social welfare offices, humanitarian responders, and other government partners.

Although national policy establishes formal coordination mechanisms, there remains a need for local empirical evidence on how stakeholders assess coordination across the entire DRRM cycle and whether stronger coordination is associated with more effective response operations. A geographic assessment alone is insufficient; the more substantive issue is whether institutionalized coordination translates into a coherent pattern of perceived operational performance and where vulnerabilities remain despite favorable overall assessments.

This study therefore examined inter-agency coordination in Surigao City across the four DRRM thematic areas, assessed perceived disaster response effectiveness, identified operational gaps, tested the relationship between coordination and effectiveness, and examined stakeholder support for governance strategies. By connecting institutional strengths with persistent communication, resource, and preparedness gaps, the study contributes a local public-administration perspective to disaster governance.

THEORETICAL AND POLICY FRAMEWORK

The study is anchored on Disaster Risk Reduction, Institutional Theory, and Capacity Building Theory. The disaster risk reduction perspective emphasizes proactive governance across prevention, preparedness, response, and recovery (Wisner et al., 2004). Institutional Theory explains how formal rules, structures, roles, responsibilities, and procedures shape organizational behavior and performance (Meyer & Rowan, 1977). In a multi-agency emergency setting, this perspective draws attention to mandate clarity, communication channels, command arrangements, and the consistency with which protocols are implemented.

Capacity Building Theory complements the institutional perspective by emphasizing that formal structures are insufficient without knowledge, skills, resources, technology, and organizational learning (Morgan, 1998). In disaster management, capacity is reflected in joint training, communication interoperability, logistics, resource availability, monitoring, and the ability to translate plans into coordinated action.

The legal and policy context is provided by Republic Act No. 10121, the NDRRM Framework, DILG Operation LISTO, and the Sendai Framework for Disaster Risk Reduction 2015–2030 (UNDRR, 2015). In the analytical model, inter-agency coordination is the explanatory construct and perceived disaster response effectiveness is the outcome construct. Coordination is examined across prevention and mitigation, preparedness, response, and rehabilitation and recovery; effectiveness is assessed through efficiency,

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timeliness, coordination in the use of resources, and overall response performance.

MATERIALS AND METHODS

Research Design and Study Setting

A quantitative descriptive-correlational design was used. The descriptive component characterized inter-agency coordination, perceived disaster response effectiveness, operational challenges, and governance strategies. The correlational component tested the association between inter-agency coordination and perceived disaster response effectiveness. The design was cross-sectional; consequently, the analysis identifies statistical association and does not establish causal effects.

The study was conducted in Surigao City in northeastern Mindanao, Philippines. The city has 54 barangays and established local DRRM structures, including the CDRRMO and the Local Disaster Risk Reduction and Management Council. The setting was selected because of its multi-hazard exposure and the operational importance of coordination among city offices, barangays, uniformed services, health and social welfare agencies, and humanitarian partners.

Participants

The study targeted 139 personnel and representatives from local government units and partner agencies directly involved in disaster preparedness, coordination, response, recovery, or related support functions. A total of 117 usable responses were obtained, equivalent to an 84.17% response rate. The final sample comprised respondents from barangay LGUs, CDRRMO, the Philippine National Police (PNP), Bureau of Fire Protection (BFP), City Health Office/medical responders, City Social Welfare and Development Office (CSWDO), and Philippine Red Cross/volunteers. No NGO/CSO responses were included in the final sample. The sample therefore represents responding members of identified disaster-response stakeholder groups rather than a probability sample of the general population.

Agency/sector	Target N	Usable n	Response rate (%)
CDRRMO	15	15	100.00
PNP	14	13	92.86
BFP	10	10	100.00
City Health Office/Medical Responders	15	15	100.00
CSWDO	15	15	100.00
Barangay DRRM/Barangay Officials	54	41	75.93
Philippine Red Cross/Volunteers	10	8	80.00
NGOs/CSOs	6	0	—
Total	139	117	84.17

Research instrument

Data were collected using a researcher-made questionnaire adapted from the DILG Local Government Unit Disaster Preparedness Journal: Engagement of Stakeholders Tool (LISTO). The coordination component contained 28 items divided equally across the four RA 10121 thematic areas. Disaster response effectiveness was assessed using 10 items covering efficiency of response, timeliness of actions, coordination in the use of

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resources, and overall performance. Separate 10-item sections assessed operational challenges and governance strategies.

The instrument underwent adviser review and a dry run with 14 non-study participants. Cronbach's alpha coefficients were .879 for prevention and mitigation, .936 for preparedness, .892 for response, .871 for rehabilitation and recovery, .965 for the combined coordination scale, .925 for disaster response effectiveness, .948 for operational challenges, and .841 for proposed governance strategies. These values provide preliminary evidence of internal consistency, although the small pilot sample warrants cautious psychometric interpretation.

Items were rated using five-point Likert-type scales. For coordination and effectiveness, mean scores of 4.21–5.00 were interpreted as Very High, 3.41–4.20 as High, 2.61–3.40 as Moderate, 1.81–2.60 as Low, and 1.00–1.80 as Very Low. Governance-strategy ratings are interpreted in this article as stakeholder agreement or support for the proposed strategies, rather than as evidence that the strategies have already been proven effective.

Data Collection and Ethical Considerations

Permission was sought from the appropriate local authorities before data collection. Structured questionnaires were distributed personally or electronically depending on respondent accessibility. Participants were provided instructions and sufficient time to complete the instrument. Participation was voluntary, responses were treated confidentially, and no personal identifiers were disclosed in the analysis.

Statistical Analysis

Frequencies and percentages summarized categorical respondent characteristics, while means and standard deviations summarized scale-based responses. Shapiro–Wilk tests indicated significant departures from normality for the overall coordination composite ($W = .892$, $p < .001$) and disaster-response-effectiveness composite ($W = .857$, $p < .001$). Spearman's rank-order correlation was therefore used as the primary inferential test. Pearson's product-moment correlation was retained only as a supplementary reference statistic. The null hypothesis was evaluated at $\alpha = .05$. All principal analyses reported in this article use $n = 117$.

RESULTS

Respondent Profile

The 117 respondents represented multiple components of the local disaster-response system. The largest age group was 20–29 years (33.3%), followed by 30–39 years (23.9%). Men comprised 64.1% of respondents and women 35.9%. Barangay LGU personnel constituted the largest agency group (35.0%), followed by CSWDO, City Health Office, and CDRRMO at 12.8% each. The profile reflects a multi-agency sample but also indicates that barangay perspectives have greater numerical weight in the aggregate results.

Inter-Agency Coordination across the DRRM Cycle

Overall inter-agency coordination was rated Very High ($M = 4.39$, $SD = 0.58$). Disaster Response obtained the highest domain rating ($M = 4.57$, $SD = 0.64$), followed by Prevention and Mitigation ($M = 4.35$, $SD = 0.65$), Rehabilitation and Recovery ($M = 4.33$, $SD = 0.71$), and Preparedness ($M = 4.31$, $SD = 0.72$). Although all domains were favorably assessed, the comparatively lower preparedness score points to opportunities for strengthening routine coordination meetings, joint planning, drills, and other pre-disaster activities.

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DRRM coordination domain	Mean	SD	Interpretation
Prevention and Mitigation	4.35	0.65	Very High
Preparedness	4.31	0.72	Very High
Response	4.57	0.64	Very High
Rehabilitation and Recovery	4.33	0.71	Very High
Overall Inter-Agency Coordination	4.39	0.58	Very High

Perceived disaster response effectiveness

Perceived disaster response effectiveness was rated Very High overall (M = 4.46, SD = 0.52). Overall performance of disaster response operations obtained the highest area mean, followed by coordination in the use of resources, timeliness of actions, and efficiency of response. The pattern indicates generally favorable stakeholder assessments of leadership, protocols, communication, partnerships, resource mobilization, planning, and operational execution.

Effectiveness dimension	Area mean	Interpretation
Efficiency of Response	4.43	Very High
Timeliness of Actions	4.44	Very High
Coordination in the Use of Resources	4.49	Very High
Overall Performance of Disaster Response Operations	4.53	Very High
Overall Disaster Response Effectiveness	4.46	Very High

Operational Gaps and Challenges

Operational challenges were Moderate overall (M = 3.26, SD = 0.92). Communication breakdowns were the highest-rated challenge (M = 3.58, SD = 1.07), followed by limited resources and equipment (M = 3.52, SD = 1.23). Lack of joint training (M = 3.38, SD = 1.17) and delays in information sharing (M = 3.37, SD = 1.22) followed. The results show that favorable assessments of coordination and effectiveness coexist with operational friction, particularly in communication, resource capacity, and preparedness.

Operational challenge	Mean	SD	Rank
Communication breakdowns among agencies	3.58	1.07	1
Limited resources and equipment	3.52	1.23	2
Lack of joint training among agencies	3.38	1.17	3
Delays in information sharing	3.37	1.22	4
Differences in agency priorities	3.26	1.07	5
Bureaucratic procedures	3.24	1.14	6

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Overlapping roles and responsibilities	3.21	1.21	7
Delayed logistics/resource distribution	3.16	1.26	8
Inconsistent local-national coordination	3.00	1.18	9
Some agencies not fully prepared	2.86	1.32	10
Composite	3.26	0.92	—

Relationship between inter-agency coordination and disaster response effectiveness

Overall inter-agency coordination was strongly and positively associated with perceived disaster response effectiveness (Spearman's $\rho = .763$, $p < .001$, $n = 117$). The null hypothesis of no significant relationship was therefore rejected. Pearson's r, reported as a supplementary statistic, produced a closely comparable coefficient ($r = .769$, $p < .001$). The finding indicates that respondents who perceived stronger coordination also tended to perceive disaster response as more effective; it does not establish that coordination caused the observed effectiveness ratings.

Each coordination domain was also significantly associated with perceived disaster response effectiveness. Preparedness produced the largest observed coefficient ($\rho = .674$), followed by Rehabilitation and Recovery ($\rho = .668$), Response ($\rho = .663$), and Prevention and Mitigation ($\rho = .638$), all $p < .001$. Because the coefficients are close and were not statistically compared with one another, the results should not be interpreted as demonstrating that one domain is definitively more influential than the others.

Coordination variable	**Spearman's ρ**	**p-value**	**Interpretation**
Overall Inter-Agency Coordination	.763	< .001	Strong positive
Prevention and Mitigation	.638	< .001	Strong positive
Preparedness	.674	< .001	Strong positive
Response	.663	< .001	Strong positive
Rehabilitation and Recovery	.668	< .001	Strong positive

Governance Strategies

Respondents expressed Very High overall agreement with the proposed governance strategies (M = 4.71, SD = 0.48). Improving communication systems and technology ranked first (M = 4.78), followed by strengthening disaster response policies and guidelines and continuous monitoring and evaluation (both M = 4.73), capacity-building programs (M = 4.72), and stronger inter-agency partnerships (M = 4.71). The alignment between the highest-rated challenge—communication breakdowns—and the highest-supported strategy—improved communication systems and technology—provides a clear basis for prioritizing communication reform.

Governance strategy	**Mean**	**SD**	**Rank**
Improve communication systems and technology	4.78	0.41	1
Strengthen disaster response policies and guidelines	4.73	0.44	2

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Continuous monitoring and evaluation	4.73	0.44	3
Capacity-building and training	4.72	0.45	4
Strengthen inter-agency partnerships	4.71	0.46	5
Clear information-sharing protocols	4.71	0.49	6
Joint drills and simulation exercises	4.70	0.46	7
Increase budget for disaster response resources	4.70	0.53	8
Unified command system	4.67	0.47	9
Regular inter-agency coordination meetings	4.62	0.57	10

DISCUSSION

The findings depict a local disaster-governance system that participating stakeholders perceive as both highly coordinated and highly effective, while still experiencing meaningful operational constraints. This coexistence is analytically important. High institutional ratings do not imply that coordination problems have disappeared; rather, they suggest that a functioning coordination architecture may still contain vulnerabilities that become consequential under emergency conditions.

The strongest coordination rating occurred during Disaster Response. This may reflect the visibility and urgency of operational coordination when an emergency is underway. During response, agencies activate command arrangements, exchange urgent information, mobilize personnel and equipment, conduct evacuation and rescue, provide health and social services, and distribute relief. From an institutional perspective, repeated activation of formal roles and procedures can reinforce expectations about authority and responsibility (Meyer & Rowan, 1977). Yet the comparatively lower preparedness rating suggests that coordination may be more consistently activated during emergencies than institutionalized during routine periods.

Preparedness is therefore a particularly noteworthy result. Although it received the lowest domain mean, it produced the largest observed correlation with perceived response effectiveness. The difference from the other domain correlations is small and was not tested for statistical significance, so preparedness cannot be declared the most influential dimension. Nevertheless, the pattern supports attention to joint planning, regular coordination meetings, drills, communication testing, and pre-positioning. Simulation-based research in the Philippines similarly emphasizes the value of preparedness exercises in strengthening emergency competencies and inter-agency familiarity (Gundran et al., 2022, 2023).

Communication is the clearest cross-cutting operational concern. Communication breakdowns ranked first among the reported challenges, delays in information sharing ranked fourth, and improving communication systems and technology was the most strongly supported governance strategy. This convergence strengthens the interpretation that communication remains a priority area even within a system rated highly overall. Comfort (2007) treats communication as one of the core dimensions of crisis-management performance, while emergency-network research likewise emphasizes communication and coordination as mutually reinforcing capabilities (Sienkiewicz-Małyjurek, 2020).

Resource constraints form a second recurring vulnerability. Limited resources and equipment ranked second among operational challenges, while respondents strongly endorsed greater resource investment and partnerships. Resource coordination involves more than the availability of funds: agencies must know what resources exist, where they are located, who can authorize their use, and how quickly they can be mobilized.

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The findings therefore support resource mapping, pre-positioning, mutual-aid arrangements, and clear procedures for requesting and sharing assets.

The strong association between overall coordination and perceived response effectiveness is the central statistical finding. A Spearman coefficient of .763 indicates that respondents who rated coordination more favorably also tended to rate response effectiveness more favorably. This pattern is consistent with the theoretical expectation that inter-organizational coordination and performance are closely connected in disaster settings. However, both constructs were measured through the same questionnaire at one point in time. Common-source measurement and general response tendencies may therefore contribute to the magnitude of the association. The result should be interpreted as a strong relationship between stakeholder perceptions, not as a causal estimate of the effect of coordination on objective disaster outcomes.

The four domain-level correlations, all in a relatively narrow range, further support a whole-of-cycle view of coordination. Prevention and mitigation, preparedness, response, and rehabilitation and recovery are not independent administrative compartments. Risk information informs preparedness; preparedness shapes response; response experience affects recovery; and lessons from recovery can influence subsequent mitigation and planning. Sustained coordination across the cycle is therefore more defensible than concentrating exclusively on emergency response.

From a public-administration perspective, the findings frame disaster management as an inter-organizational governance problem. Effective local response requires alignment of mandates, information, authority, personnel, budgets, logistics, and accountability across institutions. Coordination should consequently be treated as an institutional capability that requires maintenance between disasters, not merely as an ad hoc activity activated during crises.

Governance Implications for Public Sector Improvement

First, communication arrangements should be strengthened through interoperable channels, updated contact directories, redundant communication options, clear information-sharing protocols, and regular testing. Technology investment should be paired with administrative rules specifying who communicates what information, to whom, through which channel, and under what authority.

Second, preparedness coordination should be institutionalized between disasters through a fixed schedule of inter-agency meetings, joint drills, simulation exercises, contingency-plan reviews, and communication tests. These activities can clarify roles and expose weaknesses before agencies operate under crisis pressure.

Third, resource management should combine budget planning with resource mapping and pre-positioning. Agencies should maintain current inventories of transport, rescue equipment, medical capacity, shelters, relief supplies, communication assets, and specialized personnel. Partnership and mutual-aid arrangements should specify how resources will be requested, shared, tracked, and replenished.

Fourth, monitoring and evaluation should emphasize institutional learning. After-action reviews, drill evaluations, and structured documentation of communication failures, resource delays, and role conflicts can convert operational experience into policy and procedural improvement.

Finally, policy strengthening should focus on concrete administrative instruments: written coordination protocols, information-sharing procedures, escalation mechanisms, command arrangements, and clearly delineated agency responsibilities. Given that coordination and effectiveness were already rated Very High, these measures should be framed as reinforcement and refinement of a functioning system rather than remediation of a failed one.

CONCLUSION

Inter-agency coordination in Surigao City was perceived as Very High across all four DRRM thematic areas, while perceived disaster response effectiveness was likewise Very High. Higher perceived coordination was

strongly associated with higher perceived response effectiveness among the 117 respondents. At the same time, communication breakdowns, limited resources and equipment, insufficient joint training, and delays in information sharing remained important operational concerns.

The study demonstrates that institutional strengths and operational gaps can coexist within the same local disaster-governance system. The appropriate policy response is therefore not to replace an apparently functioning coordination structure, but to strengthen its weaker operational components. Interoperable communication, sustained preparedness activities, resource capacity, formal protocols, monitoring and evaluation, and continued inter-agency learning are central areas for refinement. The evidence supports an association between coordination and perceived effectiveness; it does not establish that coordination causes improved disaster outcomes.

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