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Perceptions of Disaster Risk Reduction Management Implementation: Evidences from Catanduanes Island, Philippines

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Abstract

This study provides a comprehensive assessment of Disaster Risk Reduction and Management (DRRM) program implementation in Catanduanes, Philippines, a region highly vulnerable to natural hazards. Adopting a descriptive-comparative quantitative research design, the study investigates the perceived implementation of the program from the perspectives of program providers (43 municipal and barangay officials) and beneficiaries (401 household heads). The assessment spans the four thematic areas of DRRM: prevention and mitigation, preparedness, response, and rehabilitation and recovery. Guided by Stakeholder Theory and Systems Theory, and utilizing an Input-Process-Output (IPO) model, the research quantifies perceptual differences and aims to offer strategic recommendations. Using weighted mean and z-tests for independent samples, data analysis reveals consistent disparities, with providers generally reporting higher implementation levels than beneficiaries. Key findings indicate strong perceived implementation in "Increase of awareness and capacity" and "On-time safe evacuation," but significant gaps in areas like infrastructure resilience and access to disaster financing. These perceptual gaps underscore challenges in coordination, trust, and program impact. The study emphasizes the critical need for inclusive, evidence-based assessments that integrate lived experiences with institutional metrics. The proposed strategic action plan aims to bridge these identified gaps, fostering more resilient and context-sensitive disaster governance in Catanduanes.

Keywords: Disaster Risk Reduction and Management (DRRM), Catanduanes Island, natural hazards, stakeholder perception, beneficiaries, program providers, community resilience, strategic action plan

INTRODUCTION

Disaster Risk Reduction Management (DRRM) has become a central element of global and national governance due to increasing natural and climate-induced hazards. The Sendai Framework for Disaster Risk Reduction 2015–2030 underscores risk understanding, institutional strengthening, risk investment, and preparedness (UNDRR, 2022). In the Philippines—highly vulnerable to typhoons, floods, and seismic events—DRRM has been institutionalized through Republic Act No. 10121, or the Philippine Disaster Risk Reduction and Management Act of 2010. This law mandates local government units (LGUs) to implement DRRM along its four thematic areas: prevention and mitigation, preparedness, response, and rehabilitation and recovery, forming the foundation for localized action, especially in high-risk provinces like Catanduanes. However, despite this robust framework, DRRM implementation remains uneven, particularly in geographically isolated and disadvantaged areas (GIDAs) such as Catanduanes. Implementation challenges often stem from limited institutional capacity, fragmented funding, and misalignment between programs and community needs (Carreño et al., 2023; Villanueva-Merino et al., 2023). A significant concern is the perceptual gap between DRRM providers (e.g., local officials) and beneficiaries (e.g., residents), which hampers coordination, weakens trust, and undermines program impact (Marchezini et al., 2021).

Recent literature emphasizes stakeholder-inclusive assessments to bridge these gaps by capturing lived experiences alongside institutional metrics (Raj et al., 2021;

Linnenluecke, & McKnight, 2020). Comparative perception studies have shown that examining both provider and beneficiary perspectives helps uncover strengths and deficiencies in DRRM efforts, guiding more adaptive governance. In Catanduanes—frequently struck by extreme weather, such as Super Typhoon Rolly in 2020—stakeholder-based assessments are especially critical for building community resilience.

Thus, this study assesses the perceived level of DRRM program implementation in Catanduanes from both provider and beneficiary perspectives. Guided by Stakeholder Theory, Systems Theory, and the Input–Process–Output (IPO) model, the research aims to quantify perceptual differences and offer strategic recommendations. The findings will inform inclusive, evidence-based enhancements to local DRRM frameworks, contributing to more resilient and context-sensitive disaster governance.

Statement of the Problem. This study aims to assess the extent to which DRRM programs are implemented in Catanduanes, as perceived by both beneficiaries and providers, across the four essential thematic pillars: disaster prevention and mitigation, preparedness, response, and rehabilitation and recovery. It further seeks to determine the existence of significant perceptual disparities between these stakeholder groups, thereby uncovering potential gaps in program delivery and reception. Based on the findings, the study intends to formulate a comprehensive strategic action plan to improve the implementation, effectiveness, and sustainability of DRRM efforts in the province.

1. What is the level of implementation of the Disaster Risk Reduction Management (DRRM) programs in Catanduanes as perceived by beneficiaries and providers along the following four thematic areas:

    1.1 Disaster prevention and mitigation;
    1.2 Disaster preparedness;
    1.3 Disaster response; and,
    1.4 Disaster rehabilitation and recovery?

2. Is there a significant difference between the perceptions of the level of implementation of the DRRM programs as reported by beneficiaries and providers?

3. What strategic action plan can be proposed based on the findings of the study?

Scope of the Study. This study focused on assessing the perceived level of implementation of Disaster Risk Reduction Management (DRRM) programs in the province of Catanduanes, specifically through the perspectives of two primary stakeholder groups: beneficiaries and providers. The scope included municipal DRRM officers (MDRRMOs), barangay officials, and other local authorities as providers responsible for program delivery, as well as household heads representing the beneficiaries or end-users of these interventions. Additionally, the research involved the examination and validation of documentary evidence sourced from the Provincial Disaster Risk Reduction and Management Council (PDRRMC) and various Municipal Disaster Risk Reduction and Management Offices (MDRRMOs) to support and contextualize stakeholder responses.

The investigation was structured around the four core thematic areas of DRRM as prescribed by the Philippine DRRM framework: (1) disaster prevention and mitigation; (2) disaster preparedness; (3) disaster response; and (4) disaster rehabilitation and recovery. Within these domains, the study examined how DRRM initiatives are experienced, interpreted, and evaluated by stakeholders in terms of their relevance, adequacy, and effectiveness.

The study further explored whether significant differences exist between the perceptions of beneficiaries and providers regarding program implementation, aiming to uncover potential gaps in delivery and reception. Based on these insights, the research sought to propose a strategic action plan tailored to address the identified issues and strengthen DRRM systems in the province. The scope of this study was confined to data collected and analyzed within the timeframe of October 2024 to March 2025.

Theoretical/Conceptual Framework. This study is anchored on two complementary theories: Stakeholder Theory and Systems Theory. These theoretical perspectives provide a robust foundation for examining the varying perceptions of Disaster Risk Reduction Management (DRRM) program implementation among beneficiaries and providers in Catanduanes Island, Philippines.

Stakeholder Theory, originally introduced by Freeman (2010), emphasizes that the effectiveness and sustainability of programs or policies are significantly influenced by the active engagement and satisfaction of all stakeholders involved. In the realm of disaster risk reduction, this theory has increasingly been recognized as pivotal in designing inclusive and community-sensitive responses to climate and disaster risks. Linnenluecke and McKnight (2020) argues that stakeholder-centric approaches foster organizational resilience by enhancing collaborative networks. Similarly, Marchezini et al. (2021) highlight the effectiveness of participatory early warning systems when communities are not just recipients but active shapers of DRRM strategies. In this study, the key stakeholders include beneficiaries (e.g., household heads) and providers (e.g., MDRRMOs, BDRRMOs, barangay officials), whose views offer critical insights into the real-world implementation of DRRM initiatives. Stakeholder Theory supports the notion that understanding and addressing differing stakeholder perceptions can bridge gaps in program execution and foster inclusive, community-based resilience strategies. This approach also aligns with recent policy recommendations from the UN Office for Disaster Risk Reduction (Aronsson-Storrier, 2023), which emphasize the need for participatory governance in disaster risk frameworks. The theory reinforces the need to integrate bottom-up insights to improve the design, communication, and responsiveness of DRRM programs, particularly in vulnerable and archipelagic regions like Catanduanes.

Systems Theory, advocated by van Bertalanffy (2008), conceptualizes organizations and programs as interconnected and dynamic systems. In the realm of disaster risk management, this theory has gained renewed relevance as scholars and practitioners emphasize the importance of viewing DRRM as a holistic, multi-sectoral process (Raj et al., 2021). The DRRM framework in the Philippines—structured around the four thematic areas of disaster prevention and mitigation, preparedness, response, and rehabilitation and recovery—mirrors a systems-based approach. Each thematic area functions as a subsystem that must operate in coordination with the others for the overall system to be effective. Systems Theory highlights the importance of feedback loops, continuous evaluation, and adaptation based on local contexts and stakeholder inputs. This theory also underscores how imbalances or failures in one area (e.g., preparedness) can undermine the integrity of the entire system.

Raj et al. (2021) emphasize that a systems-thinking approach is crucial in addressing the complexity of disaster risk governance, especially where resource constraints and climate threats intersect. The theory also complements new frameworks advocating for anticipatory systems—those capable of adjusting based on signals from both internal evaluation and community feedback mechanisms (UNDRR, 2022). In this context, Systems Theory justifies not only the examination of each DRRM thematic area independently but also the exploration of how these components interact within a local government and community ecosystem.

Together, Stakeholder Theory and Systems Theory guide the analysis of how differing perceptions can influence the effectiveness of DRRM programs and contribute to identifying both structural and relational gaps. These frameworks support the use of a quantitative, perception-based approach in the present study, enabling the formulation of a responsive, evidence-based strategic action plan. By anchoring the investigation in these theories, the study advances a deeper understanding of the complex interplay between stakeholder engagement, system integration, and disaster governance outcomes.

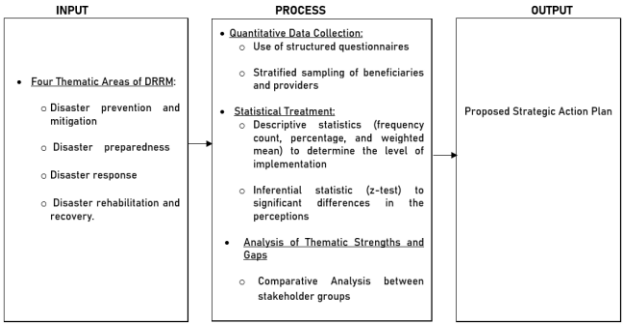

Figure 1
The Conceptual Paradigm of the Study

The conceptual paradigm of the study adopts the Input–Process–Output (IPO) model, which serves as a systematic framework to guide the structure, flow, and coherence of the research. The model begins with the Input stage, which encompasses all the essential elements required to carry out the study. These inputs include relevant data and information concerning the implementation of Disaster Risk Reduction Management (DRRM) programs in the province, with specific focus on the four thematic areas: disaster prevention and mitigation, disaster preparedness, disaster response, and disaster rehabilitation and recovery. These serve as the core variables forming the basis of inquiry and analysis.

The Process stage involves the series of methodological steps undertaken to generate reliable and meaningful results. This includes the design and administration of survey questionnaires, the systematic collection of data, and the use of appropriate statistical tools to analyze the information gathered. The perceptions of two distinct groups—beneficiaries and providers—are examined to assess the perceived levels of DRRM implementation. The analysis also includes the evaluation of significant differences in their perceptions, as well as interpretation of results to uncover patterns, strengths, gaps, or inconsistencies in the implementation of DRRM efforts.

The Output of the study goes beyond merely presenting findings; it culminates in the formulation of a strategic action plan designed to enhance the overall effectiveness of DRRM program implementation in Catanduanes. This plan serves as the most significant product of the research. It translates the insights derived from the data into concrete, evidence-based strategies that can guide local government units, community leaders, and DRRM practitioners in strengthening disaster risk governance. The action plan addresses identified gaps in the four thematic areas, proposes capacity-building initiatives, recommends community-based engagement strategies, and enhances coordination mechanisms between providers and stakeholders. As a critical output, it embodies the practical application of the research, ensuring that the study contributes directly to improving disaster resilience, preparedness, and recovery efforts in the province.

By integrating Stakeholder and Systems Theories within the IPO conceptual model, the study is equipped to generate both theoretical insights and actionable solutions. This hybrid framework not only strengthens the methodological coherence of the study but also ensures that it remains grounded in current scholarly and institutional best practices in disaster risk management.

LITERATURES

The legal foundation for Disaster Risk Reduction and Management (DRRM) in the Philippines is established under Republic Act No. 10121, the Philippine DRRM Act of 2010. This law signaled a shift from reactive disaster response to proactive risk reduction, emphasizing decentralization and the integration of climate change adaptation into local development planning (Gabriel, Santiago, & Casimiro, 2021). Ideally, this empowers Local Government Units (LGUs) to develop tailored strategies based on their unique vulnerabilities and capacities.

In practice, however, implementation remains challenging in geographically isolated and disadvantaged areas (GIDAs) like Catanduanes. Distor (2025) and San Jose (2022) noted that LGUs often lack adequate financial resources, technical expertise, and administrative infrastructure to fully operationalize DRRM mandates. These issues are further

complicated by competing governance priorities, bureaucratic delays, and leadership turnover, which hinder policy continuity and program sustainability.

Domingo and Manejar (2021) pointed out that the mere establishment of local DRRM offices is insufficient without harmonized planning, steady funding, and inter-agency collaboration. Asio (2020) added that institutional fragmentation and top-down decision-making processes often sideline grassroots initiatives, weakening the overall effectiveness of DRRM. These studies emphasize that strong governance, coordination, and transparent resource allocation are essential for successful DRRM implementation at the local level.

Beyond legal and institutional frameworks, the success of DRRM efforts heavily depends on community perception and participation. Amil (2024) argued that collaborative governance—where both authorities and citizens are involved—leads to more adaptive and responsive strategies. Such participatory approaches promote a sense of ownership, trust, and alignment with local needs and realities.

Research by Toyado (2022) and Tablate (2023) in Catanduanes revealed significant perception gaps between officials and residents. While LGU leaders often view DRRM efforts positively, community members report feelings of vulnerability and inadequate preparedness. This disconnect stems from poor communication, limited community engagement in planning, and uneven implementation across DRRM's four core areas: prevention, preparedness, response, and recovery. This issue is not unique to Catanduanes. Catarata and Villa (2024), in their study in Negros Oriental, highlighted the shortcomings of DRRM initiatives that lack localized risk communication and community-led planning. Badoc-Gonzales and Mandigma (2021), analyzing post-disaster recovery in Tacloban, stressed the importance of recognizing local knowledge and involving affected populations in decision-making to ensure meaningful and effective interventions.

Education is another critical pillar of disaster resilience. According to Cruz and Ormilla (2022) and Arcegono et al. (2024), disaster literacy—awareness and skills related to hazard preparedness and response—is strongly correlated with community readiness and quicker recovery post-disaster. However, disaster education in Catanduanes remains inconsistent. Toyado (2022) noted that while DRRM topics appear sporadically in classrooms, there is no structured or localized curriculum addressing the island's specific risks.

Tabangcura et al. (2023) and Dollete (2020) observed that basic awareness of DRRM concepts is present among teachers and students, but it rarely translates into practical preparedness. Emergency drills are infrequent, and hands-on simulations are often underfunded. A lack of contextualized training materials also limits the real-world application of learned concepts. These gaps underscore the need for a more holistic, multi-sectoral educational approach—one that integrates formal instruction, experiential learning, public seminars, media campaigns, and local partnerships to instill a culture of preparedness.

Technology has the potential to greatly enhance DRRM efforts, particularly in hazard mapping, early warning, and rapid response. Robielos et al. (2020) emphasized the growing use of artificial intelligence (AI), geospatial technologies, and big data analytics in disaster forecasting and risk assessment. Baltazar et al. (2024) further noted that smart technologies, when localized and integrated into community systems, can significantly improve the speed and accuracy of emergency responses.

Despite this potential, the adoption of such technologies in Catanduanes remains limited. Challenges include unreliable internet connectivity, limited digital literacy, and lack of real-time data access. Many rural barangays lack the technical infrastructure and trained personnel necessary to manage and maintain advanced systems. Thus, while technology is

valuable, its effectiveness is constrained by the local context.

International insights reinforce this need for balance. Tumenjargal et al. (2024), comparing Mongolia and Southeast Asia, found that resilience depends not only on technological capacity but also on social capital—community networks, trust, and cultural values. They argue that technologies must be embedded in culturally appropriate frameworks and complemented by local knowledge to succeed.
Taken together, the effectiveness of DRRM implementation in Catanduanes is shaped by more than policies or technologies alone. It is the outcome of a complex interplay between legal mandates, governance capacity, community perceptions, educational systems, and technological readiness. Bridging the gap between institutional plans and community experiences, investing in localized disaster education, promoting participatory governance, and leveraging inclusive, culturally sensitive technologies are crucial steps toward building a resilient, prepared, and empowered Catanduanes.

METHODS

Research Design. The study adopted a descriptive-comparative quantitative research design to assess the implementation of Disaster Risk Reduction Management (DRRM) programs in Catanduanes from the perspectives of program beneficiaries and providers. Statistical tools, including weighted mean and z-test for independent samples, were used to compare stakeholder perceptions. This approach is supported by recent literature emphasizing the utility of comparative designs in DRRM evaluations (delacruz 2023 & Baluran, 2023). It provided a systematic method for identifying perceptual gaps and implementation barriers. The findings served as a foundation for proposing a strategic, evidence-based action plan to improve DRRM program outcomes and resilience in the province.

Population Samples and Sampling Technique. Table 1 details the distribution of respondents by municipality, barangay, and household in Catanduanes. The study included both DRRM providers—Municipal Disaster Risk Reduction and Management Officers (MDRRMOs) and barangay captains—and household heads as beneficiaries. Catanduanes comprises 11 municipalities with 315 barangays, grouped into East and West districts. Using stratified random sampling at a 10% rate, 32 barangays were selected, ensuring proportional representation across all municipalities.

Table 1
Distribution of Samples by Municipality, Barangays, and Households in Catanduanes

Geographical Area	Total Barangays	Sampled Barangays (10%)	MDRRMOs per Municipality	Total Providers (MDRRMOs & Barangay Captains)	Total Households	Sampled Households (10%)	Total Samples
East District							
1. Bagamanoc	18	2	1	3	250	25	**28**
2. Baras	28	3	1	4	400	40	**44**
3. Bato	27	3	1	4	370	37	**41**
4. Viga	32	3	1	4	380	38	**42**
5. Gigmoto	9	1	1	2	100	10	**12**
6. Pandan	26	3	1	4	360	36	**40**
7.Panganiban	23	2	1	3	240	24	**27**
8. San Miguel	24	2	1	3	250	25	**28**
West District							
9. Caramoran	27	3	1	4	510	51	**55**
10.San Andres	38	4	1	5	340	34	**39**
11. Virac	63	6	1	7	810	81	**88**
Total	**315**	**32**	**11**	**43**	**4,010**	**401**	**444**

Stratified random sampling is ideal for studies involving diverse populations across administrative divisions (Bai et al, 2024). This method allowed the study to represent both highly populated areas like Virac (63 barangays) and smaller municipalities such as Gigmoto (9 barangays), supporting comprehensive analysis of DRRM implementation across varied local contexts. Stratification ensured all areas had an equal chance of inclusion, improving statistical efficiency and minimizing sampling bias (Merrillees & Du, 2021).

From each municipality, the MDRRMO and the barangay captains of selected barangays were surveyed, totaling 43 provider respondents. These key informants play a vital role in local DRRM governance. Prior studies emphasize the importance of including institutional actors in DRRM evaluations, as their insights significantly shape program effectiveness (Maskrey et al, 2020; UNDRR, 2022).

To assess community-level experiences, systematic sampling was applied to select roughly 10% of households per sampled barangay, resulting in 401 household respondents. Every 10th household from an ordered list was chosen, a method known for its

reliability and practicality with large populations (Lohr, 2019; Taherdoost, 2023). These household respondents offered valuable insights into how DRRM efforts are perceived and experienced at the grassroots level.

In total, 444 individuals participated in the study—43 providers and 401 beneficiaries—enabling a dual-perspective understanding of DRRM practices. According to UNDRR (2022), engaging multiple stakeholders is essential for evaluating DRRM systems, as it bridges policy implementation with lived realities, supporting inclusive and evidence-based planning.

Combining stratified and systematic sampling ensured a representative, diverse dataset aligned with best practices in disaster resilience research (Shaw et al., 2024). These methodological choices enhanced the study's external validity and its ability to reflect localized needs and capacities for effective DRRM planning.

Instrumentation. The study utilized a structured survey questionnaire to assess the implementation and impact of DRRM programs. The instrument was broken down into DRRM components with measurable sub-activities, allowing a detailed analysis of program delivery at the local level. Specifically, the four thematic areas of DRRM are: prevention and mitigation, preparedness, response, and rehabilitation and recovery.

It was administered to both program providers (MDRRMOs and barangay officials) and program beneficiaries (household representatives), offering a balanced view of DRRM effectiveness. A three-point Likert scale (Table 2) was used with the following scale descriptions: Fully Implemented (3), Partially Implemented (2), Not Implemented (1). This was used for consistency and to facilitate cross-site comparisons. This format followed the recommended practices in disaster studies, which advocate multi-stakeholder and evidence-based evaluation tools (Mercer, 2025; UNDRR, 2022).

Face and content validation of the questionnaire were conducted by former provincial MDRRM officers, researchers, and environmental specialists. Feedback from this expert panel was incorporated to refine the questionnaire. To ensure reliability, the instrument was pilot-tested among 24 household heads from both districts who were not part of the main sample. A 10-day interval was observed between tests. Results yielded a Pearson correlation of r = 0.98, indicating excellent reliability.

Table 2
Three-point Likert Scale for Assessing the Level of Implementation of DRRM Programs

Quantitative Rating	Qualitative Rating	Interpretation
3	Fully implemented	The DRRM program objectives were fully achieved.
2	Partially implemented	The DRRM program objectives were achieved to a limited extent.
1	Not implemented	The DRRM program objectives were not initiated or not accomplished.

Data Analysis. Quantitative statistical tools were employed to analyze the perceptions of DRRM implementation among 401 community beneficiaries and 43 program providers. The survey focused on four core DRRM themes: prevention and mitigation, preparedness, response, and rehabilitation and recovery. Responses were organized by role and geography to ensure clarity and representativeness.

Weighted mean scores were calculated to assess average implementation levels across groups. To determine if differences in perceptions between providers and beneficiaries were statistically significant, a z-test for independent samples was conducted. This inferential approach provided a rigorous assessment of intergroup variations.

The application of stratified and systematic sampling enhanced analytical balance and reduced bias, thereby improving the generalizability of findings. This comprehensive analysis helped identify trends, gaps, and opportunities for evidence-based improvements in DRRM implementation across Catanduanes.

Ethical Considerations. The study followed strict ethical protocols to protect participant rights and autonomy. Informed consent was

secured through signed forms, with verbal explanations and witness validation for those with limited literacy. Participation was voluntary, with the right to withdraw assured. Data confidentiality and anonymity were maintained via encrypted storage and unique identifiers, in compliance with the Philippine Data Privacy Act of 2012. Cultural sensitivity was observed through respectful engagement with local leaders. These safeguards upheld the ethical integrity and credibility of the research, consistent with best practices in disaster risk reduction studies (Shaw et al., 2024; Mercer, 2025; UNDRR, 2022).

RESULTS

Table 3 presents the extent of implementation of Disaster Risk Reduction and Management (DRRM) programs in Catanduanes as perceived by both beneficiaries and providers across the four thematic areas—prevention and mitigation, preparedness, response, and rehabilitation and recovery. A critical comparison of weighted means (WM) reveals consistent divergences between the perspectives of the two groups, with providers tending to assess the implementation levels more favorably than the beneficiaries.

In the area of Disaster Prevention and Mitigation, providers reported a general weighted mean (GWM) of 2.58, rated as "fully implemented," while beneficiaries gave a lower rating of 2.07, indicating "partially implemented." Providers consistently rated the integration of DRRM into policy and monitoring and early warning systems highly (WM = 2.96), while beneficiaries rated access to disaster risk financing (WM = 1.17) and infrastructure resilience (WM = 1.70) as least addressed.

For Disaster Preparedness, a similar pattern emerged. Providers reported a GWM of 2.60 (fully implemented), whereas beneficiaries rated it 2.22 (partially implemented). Both groups acknowledged efforts to raise public awareness (WM = 2.54 and 2.90), but differed on community capacity-building, with beneficiaries assigning a lower WM of 1.93 compared to providers' 2.40.

Table 3

Extent of Implementation of DRRM Programs in Catanduanes as Assessed by Beneficiaries and Providers Across Four Thematic Areas

DRRM Programs & Activities	Beneficiaries		Providers	
Disaster Prevention Mitigation Programs & Activities	**WM**	**QnR**	**WM**	**QnR**
1. Integration and mainstreaming of DRRM in national, sectoral, regional, and local development policies, plans and budget.	2.65	2	2.96	3
2. DRRM environmental management	2.15	3	2.55	2
3. Increase of disaster resilience of infrastructure systems	1.70	1	2.90	2
4 Conduction and Improvement of community based and scientific assessment, mapping, analysis and monitoring.	2.20	2	2.10	2
5. Access to effective and applicable disaster risk financing and insurance of the communities.	1.17	1	1.99	1
6. Establishment and improvement of an end-to-end monitoring system (monitoring and response) forecasting and early warning.	2.55	3	2.96	3
General Weighted Mean	**2.07**	**2**	**2.58**	**3**
Disaster Preparedness Programs & Activities				
1. Increase on the level of awareness and enhance capacity of the communities to the threats and impacts of all hazards.	2.54	3	2.90	3
2. Equip the communities with necessary skills and capability to cope with the impacts of disasters.	1.93	2	2.40	2
3. Increase of DRRM capacity of local DRRM councils and offices at all levels.	2.40	2	2.25	2
4. Development and implementation of comprehensive regional and local preparedness and response policies, plans and systems.	2.01	2	2.60	2
5. Strengthen partnership and coordination among all key players and stakeholders.	2.23	2	2.83	3
General Weighted Mean	**2.22**	**2**	**2.60**	**3**
Disaster Response Programs & Activities				
1. Well establishment of disaster response operations	2.10	2	2.95	3
2. Adequate and prompt assessment of needs and damages at all Levels	2.05	2	2.52	3
3. Integration and coordination of search, rescue and retrieval (SRR) capacity	2.40	3	2.60	3
4. On time safe evacuation of affected communities.	2.93	3	2.81	3
5. Address an adequate temporary shelter needs.	2.55	3	2.94	3
6. Provision of basic social/health services to affected population whether inside or outside ECs.	1.93	2	2.61	3
7. Promotion of psycho-social well-being and risks reduction of mental health problems.	1.25	1	1.50	2
8. Implementation of coordinated and integrated early recovery system on the national and local levels.	2.06	2	2.68	3
General Weighted Mean	**2.16**	**2**	**2.58**	**3**
Disaster Rehabilitation Programs & Activities				
1. Needs assessment of damages and losses	2.49	2	2.81	3
2. Strengthen or expansion and restoration of economic activities	2.50	3	2.62	3
3. Mainstream of DRRM elements and human settlement	2.30	2	2.21	2
4. Reconstruction of disaster resilient infrastructure.	2.40	2	2.50	3
5. Protection of a psychologically sound, safe and secured citizenry and restoration to normal functions after each disaster.	1.49	1	1.58	2
General Weighted Mean	**2.24**	**2**	**2.34**	**2**
GRAND WEIGHTED MEAN	**2.17**	**2**	**2.53**	**3**

**Legend: 1.00 – 1.49 – Not implemented; 1.50 - 2.49 – Partially implemented; 2.50 - 3.00 – Fully implemented*

In Disaster Response, providers rated this aspect at 2.58, while beneficiaries rated it at 2.16. Both groups recognized strengths in timely evacuation and shelter provision. However, significant gaps were noted in psychosocial support services, with beneficiaries rating it as not implemented (WM = 1.25), and providers at 1.50 (partially implemented).

In Disaster Rehabilitation and Recovery, both groups gave relatively lower ratings—providers at 2.34 and beneficiaries at 2.24. While economic and infrastructure recovery were rated higher (2.30–2.62), psychosocial safety and return to normalcy received the lowest ratings (WM = 1.49 and 1.58), indicating a shared concern.

Overall, the grand weighted mean was 2.17 from beneficiaries (partially implemented) and 2.53 from providers (near fully implemented), reflecting a consistent perception gap. These findings suggest divergent experiences

between DRRM providers and recipients, particularly in areas such as psychosocial support, access to financing, and resilience-building—pointing to possible operational gaps, communication issues, or uneven program reach.

Table 4 outlines the comparative summary of perceptions between beneficiaries and providers regarding the level of implementation of Disaster Risk Reduction and Management (DRRM) programs in Catanduanes, assessed across the four core thematic areas: disaster prevention and mitigation, disaster preparedness, disaster response, and disaster rehabilitation and recovery. A z-test was utilized to statistically evaluate the differences in perception between the two respondent groups.

Table 4
Comparative Summary of Beneficiaries' and Providers' Perceptions on the Implementation Level of DRRM Programs in Catanduanes

Thematic Areas	Test Statistic	Computed Value	p-value	Decision	Interpretation
1. Disaster prevention and mitigation	z-test	-3.92	0.0001	Reject Ho	Significant difference exists between responses
2. Disaster preparedness		-2.92	0.0035	Reject Ho	Significant difference exists between responses
3. Disaster response		-3.23	0.0012	Reject Ho	Significant difference exists between responses
4. Disaster rehabilitation and recovery		-0.77	0.44	Accept Ho	No significant difference between responses
Overall result		**-3.38**	**0.00007**	**Reject Ho**	**Significant difference exists between responses**

In the area of disaster prevention and mitigation, the z-value of –3.92 and p-value of 0.0001 indicate a statistically significant difference at the 0.05 level, showing that beneficiaries rated the implementation significantly lower than providers. Hence, there is a significant difference between the responses of the providers and beneficiaries on the level of implementation of DRRM Programs in Catanduanes

For disaster preparedness, the z-value of –2.92 and p-value of 0.0035 (level of significance is 0.05) also confirms a significant perceptual gap, suggesting that beneficiaries view preparedness efforts less favorably than providers.

In the disaster response domain, the z-value of –3.23 and p-value of 0.0012 similarly reflect a significant difference, with beneficiaries again providing lower ratings, reinforcing the trend of differing views on response effectiveness.

In contrast, disaster rehabilitation and recovery showed a z-value of –0.77 and a p-value of 0.44, indicating no significant difference between the two groups' assessments, suggesting aligned perceptions in this area.

Overall, the aggregated z-value of –3.38 with a p-value of 0.00007 confirms a statistically significant difference in perceptions across most thematic areas, highlighting consistent divergence between beneficiaries and providers in evaluating DRRM implementation, except in the area of rehabilitation and recovery.

Proposed Strategic Action Plan

Title. "Bridging Gaps, Building Resilience: A Strategic Action Plan for Inclusive and Sustainable DRRM in Catanduanes"

Vision. A disaster-resilient Catanduanes where empowered communities, proactive governance, and sustainable systems work together to reduce vulnerabilities and enhance resilience to disasters.

Mission. To institutionalize and enhance inclusive, efficient, and adaptive DRRM systems that bridge perception gaps, address community-specific needs, and reinforce recovery capacities through participatory governance and capacity-building in Catanduanes.

Objectives

1. To bridge the implementation-perception gap between DRRM program providers and beneficiaries.
2. To enhance community access to and engagement in DRRM planning, financing, and recovery efforts.
3. To reinforce the psychosocial, infrastructural, and economic resilience of communities across all disaster phases.
4. To institutionalize sustainable, participatory, and science-based DRRM initiatives at all governance levels.

Table 5

The Strategic Action Plan

Objectives	Key Result Areas	Performance Indicator (PI)	Strategies	Projects and Activities	Time Frame	Personnel Involved	Resources
1. To close the perception gap between beneficiaries and providers in DRRM implementation.	DRRM Program Alignment and Transparency	% reduction in perception gap in periodic surveys	Enhance DRRM communication, feedback, and transparency mechanisms	- Launch DRRM Transparency Dashboard - Establish Community-Provider DRRM Dialogues every quarter - Feedback integration in LGU DRRM planning	Year 1–2	LGUs, MDRRMCs, PDRRMO, DILG, Barangay Councils	Digital platforms, feedback tools, public forums
2. To improve access to DRRM financing and risk insurance at the community level.	Financial Resilience & Risk Mitigation	# of households enrolled in DRRM financing/insurance schemes	Integrate DRRM financing options in barangay-level planning and IEC campaigns	- Barangay DRRM Insurance & Financing Orientation Campaigns - Micro-insurance partnership development - Community DRRM Savings and Risk Pooling Program	Year 1–3	LGUs, Local Finance Committees, NGOs, Insurance Providers, CSOs	IEC materials, partnership MOUs, training kits
3. To strengthen community capacity for disaster preparedness and skill development.	Community Capability Building	% increase in preparedness ratings in community drills and assessments	Capacity building through inclusive and context-based training	- Barangay DRRM Boot Camps - Localized DRRM Skills Certification (search & rescue, first aid, etc.) - School-based DRRM Clubs with simulation activities	Year 1–2 (continuing annually)	DepEd, BDRRMCs, Red Cross, DSWD, Local Trainers	Training manuals, simulation kits, venue and food logistics
4. To institutionalize end-to-end early warning and response systems in high-risk barangays.	Early Warning and Rapid Response Systems	% coverage of early warning systems in high-risk areas	Upgrade systems and involve communities in monitoring and response	- Establish Community-Based Monitoring Units - Expand and digitalize Early Warning Devices - Integrate SMS and radio-based alert systems in barangays	Year 1–3	PDRRMO, PAGASA, Barangay Councils, Telecommunications partners	Monitoring devices, tech infrastructure, training expenses
5. To improve access to psychosocial support and recovery mechanisms post-disaster.	Psychosocial Recovery & Rehabilitation	% of disaster-affected individuals receiving psychosocial services	Mainstream psychosocial interventions into all post-disaster protocols	- Deploy trained local Psychosocial Response Teams - Establish DRRM Healing Spaces in evacuation centers - Include MHPSS (Mental Health and Psychosocial Support Services) in LGU DRRM Plans	Year 1–2	DSWD, DOH, LGUs, NGOs, Guidance Counselors, Mental Health Professionals	Mobile health kits, training resources, therapy supplies
6. To reinforce disaster-resilient economic recovery and infrastructure rebuilding.	Livelihood & Infrastructure Recovery	% of affected households restored to pre-disaster livelihood status	Integrate livelihood support and resilient infrastructure design	- Cash-for-Work and Livelihood Recovery Programs - Resilient Infrastructure Reconstruction Workshops - DRRM-based Spatial Planning in LGUs	Year 2–3	DPWH, LGUs, DTI, DA, Local Contractors	Funds for reconstruction, livelihood kits, engineering designs
7. To institutionalize continuous program evaluation and inclusive planning at local levels.	DRRM Policy & Governance	# of barangays with updated and community-validated DRRM plans	Establish DRRM Monitoring & Evaluation Units	- Conduct Annual Community DRRM Audits - Barangay Participatory Planning Summits - Development of DRRM Scorecard System	Annually	PDRRMO, DILG, Barangay Officials, Academe	M&E tools, facilitators, audit templates

This "Strategic Action Plan" in Table 5 serves as a locally grounded, data-informed roadmap to systematically enhance DRRM implementation and community resilience in Catanduanes. It directly responds to statistically significant gaps in stakeholder perceptions across disaster phases, with an emphasis on transparency, psychosocial support, community empowerment, and participatory recovery. The multidimensional design ensures alignment with national DRRM frameworks while contextualizing actions to address the unique socio-geographic vulnerabilities and implementation realities in the province.

DISCUSSION

The assessment of DRRM programs in Catanduanes reveals a significant perceptual gap between providers and beneficiaries across the thematic areas of Prevention and Mitigation, Preparedness, Response, and Rehabilitation and Recovery. While providers rated these programs as "fully implemented," beneficiaries viewed them as only "partially implemented," especially in areas such as financing access, psychosocial support, and infrastructure resilience.

This divergence echoes Toyado (2022) and Tablate's (2023) observations that institutional self-assessments often present an overly optimistic view compared to community experiences. For instance, while providers rated infrastructure resilience at 2.90, beneficiaries gave it only 1.70, and access to disaster financing was rated as low as 1.17. These findings support Domingo and Manejar's (2021) argument that weak inter-agency coordination and poor policy implementation often underpin these gaps. Psychosocial support, crucial for recovery, was rated by beneficiaries as "not implemented" (WM = 1.25), aligning with Asio's (2020) critique of the overemphasis on infrastructure over community well-being, with providers themselves rating it only slightly higher at 1.50. General ratings—2.17 for beneficiaries and 2.53 for providers—point to broader structural and operational constraints, consistent with Distor's (2025) assertion that LGUs, especially in GIDAs like Catanduanes, face issues such as limited funding, lack of trained personnel, and political turnover. Low scores in community-based assessments and preparedness efforts further affirm Gabriel, Santiago, and Casimiro's (2021) claim that RA 10121's goals are undermined by the insufficient technical capacity of local governments to use risk data effectively.

Community engagement remains limited, as shown by weak implementation of participatory planning and training. Amil (2024) stresses that meaningful community involvement is vital to effective DRRM, yet current approaches seem transactional, leading to mistrust and low program ownership. Although evacuation was generally rated positively, health service provision lagged (WM = 1.93), indicating that logistical efficiency is not matched by holistic support—an imbalance that may hinder long-term resilience.

To address these gaps, a strategic action plan should include three core strategies. First, participatory governance must be strengthened by co-designing DRRM initiatives with communities, as Catarata and Villa (2024) suggest, to enhance engagement and innovation. Second, LGU capacity and access to fiscal resources should be expanded through partnerships with academic institutions and NGOs, with improved access to national DRRM trust funds. Third, psychosocial support should be institutionalized by embedding mental health

services into DRRM protocols and training frontline responders in trauma-informed care.
In conclusion, the study highlights a key paradox: despite sound policies on paper, DRRM programs falter in execution due to weak capacity, low community participation, and misaligned priorities. While providers believe they are delivering effectively, beneficiaries see fragmented, insufficient interventions—particularly in psychosocial recovery, risk financing, and infrastructure. This disconnect calls for inclusive, responsive, and human-centered reforms that bridge policy and lived experience, moving DRRM from a compliance-driven model to a community-rooted resilience framework.

Recommendations include creating multi-stakeholder DRRM evaluation boards, expanding community education on risk financing, establishing localized psychosocial support networks, providing technical training for LGUs, and conducting regular policy audits aligned with RA 10121. These measures aim to foster accountability, inclusion, and local resilience, contributing to a more sustainable DRRM system in Catanduanes. The study affirms previous literature while offering concrete, context-specific insights for building a more inclusive and effective disaster governance model.

The study's comparative analysis of perceptions from DRRM providers and beneficiaries in Catanduanes reveals a significant mismatch in three of four thematic areas: disaster prevention and mitigation, preparedness, and response. Only in disaster rehabilitation and recovery did both groups show perceptual alignment. These differences point to deeper issues in disaster governance—particularly in how policies translate into lived community experiences.

Beneficiaries consistently rated DRRM implementation lower than providers, indicating breakdowns in communication, implementation, or both. For disaster prevention and mitigation, the significant z-value (–3.92, p = 0.0001) suggests dissatisfaction with hazard management, risk-sensitive planning, and infrastructure protection—echoing Domingo and Manejar's (2021) findings on fragmented planning and limited community monitoring. Providers' high ratings may reflect overemphasis on administrative metrics rather than actual community-level risk reduction outcomes.

Disaster preparedness (z = –2.92, p = 0.0035) results support Gabriel et al. (2021), who noted that local DRRM councils often lack the skills to turn data into meaningful community training. Low beneficiary ratings suggest limited access or poorly contextualized preparedness efforts. This aligns with Amil (2024), who observed that top-down campaigns rarely lead to real behavioral change in vulnerable communities.
In disaster response (z = –3.23, p = 0.0012), the gap highlights persistent issues in emergency coordination, service delivery, and logistics. Though evacuation received some approval, shortcomings in health services and logistics stood out—mirroring Asio's (2020) critique that response strategies often overlook food, mental health, and continuity needs, limiting their effectiveness.

Conversely, disaster rehabilitation and recovery showed no significant perceptual difference (z = –0.77, p = 0.44). This could reflect either actual alignment or shared dissatisfaction with minimal efforts in this area. For example, both groups gave low scores for psychosocial support (1.25 beneficiaries, 1.50 providers), suggesting a mutual recognition of institutional neglect rather than program success.

The overall z-value (–3.38, p = 0.00007) emphasizes a critical insight: DRRM implementation is experienced unequally, with providers often unaware of gaps experienced by communities. This aligns with Distor's (2025) concept of the "implementation illusion," where paper compliance hides real-world failures.

Key structural issues likely contribute to this gap. Financial limitations—especially in geographically isolated and disadvantaged areas (GIDAs) like Catanduanes—hamper full DRRM implementation. Human resource

constraints, such as high turnover and low technical capacity, further weaken efforts. Political pressures often prioritize infrastructure over capacity building and social services, as observed by Toyado (2022) and Tablate (2023).

This leads to an infrastructure-heavy, compliance-driven approach rather than a people-focused, resilience-oriented system. Communities need not just warnings and evacuations but access to insurance, psychosocial care, and sustainable livelihoods—all of which the study highlights as overlooked.

Conclusion. While DRRM structures are in place, the gap in perceived effectiveness between implementers and recipients reveals weaknesses in program reach and relevance. This perceptual divide erodes trust and limits the system's capacity to build real resilience. Addressing these differences requires shifting from policy-centric to people-centric approaches, from compliance to impact, and from top-down governance to participatory models.

Based on the Strategic Action Plan, several key recommendations are proposed to address the identified challenges. First, inclusive feedback mechanisms should be institutionalized through platforms like the DRRM Transparency Dashboard and regular dialogues, promoting co-governance and shared accountability as emphasized by Catarata and Villa (2024). Second, community-based DRRM financing must be expanded by integrating micro-insurance, savings schemes, and local risk pooling into barangay-level plans to provide financial protection for vulnerable households. Third, localized training programs, including DRRM clubs and simulation drills, should be enhanced to improve preparedness and engagement at the grassroots level. Fourth, psychosocial support must be mainstreamed in all DRRM protocols by deploying trained trauma responders, setting up mental health spaces in shelters, and offering sustained community care. Fifth, recovery initiatives should promote resilience by incorporating cash-for-work opportunities, livelihood restoration kits, and disaster-resilient spatial planning. Lastly, participatory monitoring and evaluation systems—such as audits, scorecards, and planning summits—should be implemented to support real-time improvements, build community ownership, and ensure accountability.

In summary, bridging DRRM implementation gaps in Catanduanes requires both structural reforms and community empowerment. Elevating beneficiaries from passive recipients to active co-creators transforms disaster governance from reactive to resilient. The Strategic Action Plan offers a scalable and localized framework to foster inclusive, accountable, and sustainable DRRM in the province.

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