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Perceived Effectiveness of DRRM Programs Across Thematic Areas: Comparative Perspectives of Beneficiaries and Facilitators in Catanduanes, Philippines

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Abstract

As one of the world's most hazard-prone countries, the Philippines faces recurring disasters such as typhoons, floods, earthquakes, and volcanic eruptions, intensified by climate change. Peripheral provinces like Catanduanes are particularly vulnerable. To address these risks, Republic Act No. 10121 and the National Disaster Risk Reduction and Management Plan (2011–2028) institutionalized a multi-sectoral, community-based framework across four thematic areas: prevention and mitigation, preparedness, response, and rehabilitation/recovery. However, limited comparative analyses exist on stakeholder perceptions of program effectiveness in geographically isolated provinces. Grounded in Stakeholder Theory and Program Evaluation Theory, this study employed a descriptive-comparative quantitative design. A validated researcher-made questionnaire was administered to 444 participants, including Municipal DRRM Officers, Barangay Captains, and household heads across Catanduanes' eleven municipalities. Data were analyzed using descriptive statistics and independent samples z-tests to assess perceptual differences. Findings indicate that both beneficiaries and facilitators perceive DRRM programs as generally effective. Facilitators reported higher confidence in disaster response and rehabilitation/recovery, while moderate ratings in prevention and preparedness highlight gaps in community engagement and capacity-building. Consensus was observed in prevention, preparedness, and response, but significant perceptual disparities emerged in rehabilitation and recovery. The study underscores the need for inclusive feedback mechanisms, adaptive governance, and participatory risk reduction. A Strategic Action Plan is proposed to strengthen hazard-resilient infrastructure, enhance preparedness through capacity-building and early warning systems, and improve post-disaster rehabilitation and livelihood recovery, ensuring alignment between institutional intentions and community experiences.

Keywords: Disaster Risk Reduction and Management (DRRM), stakeholder perceptions, program evaluation, Catanduanes, Philippines, flood-prone communities, preparedness and response, rehabilitation and recovery

INTRODUCTION

Natural disasters continue to pose persistent and complex challenges for the Philippines, one of the most hazard-prone countries globally. Each year, the nation experiences multiple typhoons, floods, earthquakes, volcanic eruptions, and droughts, often exacerbated by the growing impacts of climate change. These hazards result in extensive loss of life, property damage, and economic disruption, disproportionately affecting vulnerable populations and peripheral island provinces (Asian Development Bank [ADB], 2022; United Nations Office for Disaster Risk Reduction [UNDRR], 2023). In response, the institutionalization of Disaster Risk Reduction and Management (DRRM) through Republic Act No. 10121 (Philippine DRRM Act of 2010) and the National Disaster Risk Reduction and Management Plan (NDRRMP 2011–2028) has established a comprehensive, multi-sectoral, and community-based disaster governance framework. This framework is operationalized through four thematic areas—(a) disaster prevention and mitigation, (b) disaster preparedness, (c) disaster response, and (d) disaster rehabilitation and recovery—intended to reduce vulnerabilities, enhance adaptive capacity, and promote resilience across all levels of governance (NDRRMC, 2020; Republic Act No. 10121, 2010).

Recent empirical studies have examined DRRM implementation across these thematic pillars, revealing both institutional progress and

persistent systemic challenges. Balanggoy (2024a) reported that while prevention, preparedness, and rehabilitation components were perceived as effective in Benguet's secondary schools, response capacities remained relatively weak. Similarly, Domingo and Manejar (2021) observed uneven DRRM effectiveness across local government units (LGUs) due to disparities in financial resources, administrative capacity, and stakeholder participation. On the policy front, Executive Order No. 120 (2020) established the Build Back Better Task Force to expedite post-disaster recovery and integrate climate resilience principles into reconstruction processes (Lawphil.net, 2020). However, the Philippine Institute for Development Studies (PIDS, 2021) and Catarata and Villa (2024a) emphasize that gaps remain in translating national policy frameworks into localized, participatory, and evidence-informed DRRM interventions, particularly in geographically isolated and economically constrained areas.

Despite the growing body of DRRM literature, comparative perception studies between key stakeholder groups—beneficiaries (community members) and facilitators (implementers)—remain limited. Drawing on Stakeholder Theory (Parmar et al., 2021) and Program Evaluation Theory (Rossi, Lipsey, & Henry, 2019), effective disaster governance depends on the alignment of perceptions, values, and actions among diverse actors engaged in risk reduction and resilience-building. Stakeholder Theory underscores the interdependence between institutions and communities in achieving socially responsive outcomes, while Program Evaluation Theory emphasizes the systematic assessment of program processes and impacts through stakeholder feedback. Misalignments between implementers' intentions and community experiences can undermine trust, participation, and adaptive learning within DRRM systems (Delina, 2022; UNDRR, 2023). Yet, few empirical analyses have systematically compared these perspectives across the four thematic areas, especially in island provinces such as Catanduanes, a locality recurrently devastated by typhoons, landslides, and flooding (Cordial, 2025a, 2025b).

Although the Philippines possesses a robust DRRM legal and policy architecture, the effectiveness of these programs varies across thematic and administrative dimensions. Disaster prevention and preparedness often receive greater institutional focus, supported by early warning systems, community drills, and local risk assessments; in contrast, response and recovery components frequently lag due to limited funding, weak coordination, and fragmented capacity (Catarata & Villa, 2024a; PIDS, 2021). Empirical evidence further reveals perceptual disparities between program facilitators—who report strong institutional compliance—and beneficiaries—who experience operational constraints and uneven outcomes (Cordial, 2025b). These discrepancies and differences suggest that existing evaluation metrics insufficiently capture the nuanced realities of DRRM implementation at the community level.

To address this research gap, the present study assessed the perceived effectiveness of DRRM programs in Catanduanes, Philippines, across the four thematic areas of prevention and mitigation, preparedness, response, and rehabilitation and recovery. Guided by Stakeholder and Program Evaluation Theories, a descriptive-comparative quantitative design was employed to determine the extent of effectiveness as perceived by both beneficiaries and facilitators, test for significant differences in their assessments, and formulate a strategic action plan to enhance DRRM implementation and impact. Strikingly, the findings reveal that while both stakeholders acknowledge the general effectiveness of DRRM programs, facilitators demonstrate markedly higher confidence in response and recovery operations, whereas moderate ratings in prevention and preparedness expose persistent gaps in community engagement and capacity-building. By structuring the discussion around thematic areas, perceptual contrasts, and actionable strategic recommendations, this study delivers a compelling, evidence-informed blueprint for strengthening local DRRM governance, aligning stakeholder perspectives, and advancing resilience in disaster-prone Philippine islands.

LITERATURE REVIEW

The literature on Disaster Risk Reduction and Management (DRRM) highlights the growing integration of theory, policy, and practice, reflecting its complex governance in the Philippines. Scholars note that effective DRRM depends on aligning frameworks, institutions, stakeholder participation, and evaluation systems for lasting resilience (Parmar et al., 2021; Rossi et al., 2019; UNDRR, 2023). Key research areas include its conceptual foundations, policy context, stakeholder perceptions, implementation assessment, and strategic implications for adaptive governance—forming a solid basis for understanding DRRM in vulnerable island settings like Catanduanes.

Theoretical and Conceptual Foundations of Disaster Risk Reduction and Management (DRRM). Disaster Risk Reduction and Management (DRRM) is increasingly conceptualized as a multi-stakeholder governance system, requiring dynamic interaction among state actors, local institutions, and communities to achieve resilience (Parmar et al., 2021; UNDRR, 2023). Grounded in Stakeholder Theory, DRRM effectiveness depends on aligning the diverse interests, perceptions, and contributions of beneficiaries and facilitators within a shared governance framework. This theoretical lens emphasizes that collaborative participation, transparency, and trust among stakeholders enhance both the legitimacy and sustainability of disaster programs (Freeman et al., 2020). Recent empirical evidence underscores that inclusive stakeholder engagement directly influences preparedness, adaptive capacity, and recovery outcomes in disaster-prone contexts (Delina, 2022; Cordial, 2025).

Complementing this, Program Evaluation Theory (Rossi, Lipsey, & Henry, 2019) provides a systematic structure for assessing DRRM program effectiveness across the four thematic areas—prevention, preparedness, response, and recovery—through measurable outcomes, stakeholder feedback, and contextual indicators. Studies such as Villanueva et al. (2023) and Catarata and Villa (2024b) demonstrate that program evaluation frameworks foster data-driven decision-making and continuous improvement in local DRRM planning. Integrating these theories allows a holistic understanding of DRRM as both a participatory governance mechanism and an evaluative process aimed at optimizing community resilience. This combined framework underscores the importance of evidence-based stakeholder collaboration in disaster governance, particularly in fragile, hazard-exposed island provinces such as Catanduanes.

Policy and Institutional Context of DRRM in the Philippines. The Philippines has long been recognized as one of the most disaster-prone countries globally, situated along the Pacific Ring of Fire and the typhoon belt (UNDRR, 2023). The nation's policy and institutional framework for DRRM is anchored in Republic Act No. 10121, or the Philippine Disaster Risk Reduction and Management Act of 2010, which institutionalized a paradigm shift from reactive disaster response to proactive risk reduction and resilience building. Over the years, this law has been operationalized through the National Disaster Risk Reduction and Management Plan (NDRRMP) 2020–2030, aligning local government systems with the Sendai Framework for Disaster Risk Reduction 2015–2030 (NDRRMC, 2020; UNDRR, 2023).

Despite this comprehensive framework, implementation challenges persist, including fragmented coordination, limited funding, and uneven capacities across local government units (LGUs) (Ortega et al., 2022; Villanueva et al., 2023). These institutional gaps hinder the translation of national frameworks into localized, context-sensitive actions—particularly in remote, archipelagic provinces such as Catanduanes, where logistical isolation magnifies disaster vulnerabilities (Delina, 2022). Current policy discussions therefore emphasize adaptive governance, participatory planning, and data-informed decision-making as key levers for strengthening local DRRM systems (Catarata & Villa, 2024b; Nguyen et al., 2023). Understanding this policy-institutional

environment is thus crucial for evaluating DRRM program effectiveness, as it frames both the operational practices of facilitators and the lived experiences of beneficiaries.

Stakeholder Perspectives on the Effectiveness of DRRM Programs. Empirical studies on DRRM reveal varied perceptions of effectiveness across the four thematic domains—prevention and mitigation, preparedness, response, and rehabilitation/recovery—largely shaped by resource availability, institutional capacity, and levels of community participation (Villanueva et al., 2023; Catarata & Villa, 2024a). Prevention and preparedness activities such as risk mapping, early-warning systems, and capacity-building initiatives are typically rated higher in perceived effectiveness, as they are well-defined and easily monitored. Conversely, response and rehabilitation programs often face implementation challenges stemming from coordination gaps, logistical barriers, and post-disaster funding delays (Balanggoy, 2024a; Nguyen et al., 2023).

Notably, perception-based analyses reveal asymmetries between beneficiaries and facilitators. Implementers tend to assess effectiveness based on procedural success and institutional output, while beneficiaries emphasize outcome-based measures—timeliness, adequacy, and sustainability of recovery support (Cordial, 2025b; PIDS, 2021). Cordial's recent studies in Catanduanes further highlight statistically significant differences in perceived recovery effectiveness, underscoring the need for participatory feedback mechanisms in DRRM evaluation (Cordial, 2025a). Quantitative approaches such as t-tests and mean comparisons, coupled with qualitative triangulation, thus provide a more accurate representation of program success and guide evidence-based improvement (Rossi et al., 2019; Villanueva et al., 2023).

Program Evaluation Across the Four Thematic Areas of DRRM. Program Evaluation Theory offers a structured lens for analyzing DRRM initiatives along four thematic areas: (a) prevention and mitigation, (b) preparedness, (c) response, and (d) rehabilitation and recovery. Evaluation in this context extends beyond output measurement to examine efficiency, relevance, effectiveness, and sustainability (Rossi, Lipsey, & Henry, 2019). Empirical analyses indicate that prevention and preparedness programs often yield higher perceived success due to institutionalized practices like hazard mapping, training, and public awareness campaigns (Nguyen et al., 2023; Catarata & Villa, 2024b). Conversely, the response and rehabilitation phases frequently underperform due to coordination inefficiencies and limited post-disaster resources (Balanggoy, 2024b; Cordial, 2025b).

By integrating quantitative findings with stakeholder feedback, evaluations can reveal where resource allocations and management systems require recalibration. Such processes foster adaptive governance—enabling DRRM offices to refine plans, enhance inter-agency coordination, and institutionalize learning mechanisms. Ultimately, continuous evaluation transforms DRRM from a compliance-oriented framework into a dynamic governance tool that strengthens resilience and accountability across all programmatic areas.

Strategic Implications and Action Plan for Enhanced DRRM Governance. Synthesizing insights from Stakeholder Theory and Program Evaluation Theory enables a holistic understanding of how participatory governance and systematic assessment jointly enhance DRRM effectiveness. Findings from recent studies highlight that bridging perceptual and operational gaps between beneficiaries and facilitators is central to improving disaster governance, particularly in island provinces like Catanduanes (Parmar et al., 2021; Rossi, Lipsey, & Henry, 2019).

A strategic action plan should therefore target three interrelated priorities: (1) capacity development, through continuous training for DRRM officers, barangay officials, and volunteers to promote data-driven, adaptive leadership (Delina, 2022; Nguyen et al., 2023); (2) communication and coordination enhancement, via institutionalized digital reporting systems, early warning networks, and

participatory monitoring to ensure real-time collaboration (Catarata & Villa, 2024b); and (3) policy responsiveness, embedding evaluation feedback loops into planning cycles to ensure decisions are informed by both quantitative and qualitative evidence (Cordial, 2025a).

This synthesis underscores that effective DRRM governance is not solely technical—it is relational, participatory, and iterative. Strengthening stakeholder alignment, institutional accountability, and evaluative learning ultimately transforms DRRM systems into adaptive frameworks capable of sustaining community resilience in the face of recurrent and emerging hazards.

METHODS

Design. This study employed a descriptive-comparative survey design to systematically examine the perceived effectiveness of DRRM programs across four thematic areas: prevention and mitigation, preparedness, response, and rehabilitation and recovery. The design enabled comprehensive analysis of beneficiaries' and facilitators' perceptions, revealing perceptual similarities and gaps. This approach provided an empirical foundation for developing a strategic action plan to enhance DRRM implementation, stakeholder alignment, and community resilience in Catanduanes.

Population and Sampling. The respondents of the study consisted of 444 participants drawn from the 11 municipalities of Catanduanes, comprising 11 Municipal DRRM Officers (MDRRMOs), 32 Barangay Captains, and 401 household heads representing local beneficiaries of DRRM programs. A 10% sampling allocation was applied to both barangays and household heads in each municipality to ensure proportional representation. Utilizing stratified sampling, this approach captured the perspectives of both facilitators and beneficiaries, thereby ensuring balanced insights across urban and rural contexts within the province.

Instrumentation. A researcher-made questionnaire served as the principal instrument for gathering data to assess the perceived effectiveness of Disaster Risk Reduction and Management (DRRM) program implementation across four thematic areas: disaster prevention and mitigation, disaster preparedness, disaster response, and disaster rehabilitation and recovery. Designed to capture the perceptions of both beneficiaries and facilitators, the instrument underwent a rigorous validation process by experts in DRRM, public administration, and research methodology to ensure content relevance, clarity, and alignment with the study's objectives. Responses were quantified using a 4-point Likert Scale (4 = Very Effective, 3 = Effective, 2 = Less Effective, 1 = Not Effective) to determine the degree of effectiveness of each program area. Prior to data collection, the instrument was pilot-tested, and its reliability was established through the Pearson Product-Moment Correlation (Pearson r), yielding a coefficient of 0.98, which confirmed its excellent consistency and dependability.

Table 1
4-Point Likert Scale Legend

Numerical Rating	Descriptive Rating	Interpretation
4 (3.50–4.00)	Very Effective	The PDRRMP has achieved its goals to a **very great extent (76%–100%)**.
3 (2.50–3.49)	Effective	The PDRRMP has achieved its goals to a **great extent (51%–75%)**.
2 (1.50–2.49)	Less Effective	The PDRRMP has achieved its goals to a **moderate extent (26%–50%)**.
1 (1.00–1.49)	Not Effective	The PDRRMP has achieved its goals to a **very limited extent (1%–25%)**.

Data Source. To generate the necessary data for analysis, the study utilized responses collected from a structured researcher-made questionnaire administered to both beneficiaries and facilitators across the 11 municipalities of Catanduanes. The sampling frame was derived from official records of the Provincial and Municipal Disaster Risk Reduction and Management Offices (PDRRMO and MDRRMOs), ensuring accurate identification of respondents. Surveys were conducted within selected barangays to capture localized perspectives on DRRM program

implementation. All data were gathered with informed consent, adhering to ethical standards of confidentiality and integrity.

Table 2

Distribution of Samples Across Municipalities, Selected Barangays, and Households in the Province of Catanduanes

Municipality	Total No. of Barangays	Selected Barangays (10%)	MDRRM Officers	Total Key Informants (MDRRMOs + Barangay Captains)	Total Household Heads	Sampled Household Heads (10%)	Aggregate Sample Size
East Catanduanes							
Bagamanoc	18	2	1	3	250	25	28
Baras	28	3	1	4	400	40	44
Bato	27	3	1	4	370	37	41
Viga	32	3	1	4	380	38	42
Gigmoto	9	1	1	2	100	10	12
Pandan	26	3	1	4	360	36	40
Panganiban	23	2	1	3	240	24	27
San Miguel	24	2	1	3	250	25	28
West Catanduanes							
Caramoran	27	3	1	4	510	51	55
San Andres	38	4	1	5	340	34	39
Virac	63	6	1	7	810	81	88
Total	**315**	**32**	**11**	**43**	**4,010**	**401**	**444**

Legend: Sampling employed a 10% proportional allocation of barangays and households per municipality, including MDRRM Officers and Barangay Captains to ensure balanced representation and credible comparative assessment of DRRM program effectiveness in Catanduanes.

Data Analysis. Data were systematically encoded, organized, and analyzed using SPSS version 23. Descriptive statistics, specifically the weighted mean, were utilized to evaluate the perceived effectiveness of DRRM programs across the four thematic areas. To examine perceptual variations between facilitators and beneficiaries, an independent samples z-test was employed, providing the empirical foundation for evidence-based strategic action planning.

RESULTS

Extent of Disaster Risk Reduction and Management (DRRM) Program Effectiveness. Table 3 shows that both beneficiaries and facilitators perceived the DRRM programs in Catanduanes as generally effective, with facilitators providing consistently higher ratings. The grand weighted means of 3.14 and 3.42 indicate overall satisfactory implementation, with facilitators expressing stronger confidence in program outcomes. Disaster Response received the highest ratings (3.55 and 3.58), reflecting effective emergency operations, followed by Disaster Rehabilitation and Recovery (3.05 and 3.59). In contrast, Disaster Prevention and Mitigation (2.97 and 3.50) and Disaster Preparedness (2.98 and 2.99) were rated moderately, underscoring the need for enhanced community engagement, training, and preventive initiatives. Overall, facilitators demonstrated a more favorable perception of program effectiveness than beneficiaries.

Table 3

Extent of Disaster Risk Reduction and Management (DRRM) Program Effectiveness Across Thematic Areas: Perspectives of Beneficiaries and Facilitators

	Programs and Activities for Disaster Risk Management	Beneficiaries		Facilitators	
No.	**A. Disaster Prevention and Mitigation**	**WM**	**QR**	**WM**	**QR**
1	Incorporation of DRRM principles into local development planning and budgeting frameworks	3.05	3	3.64	4
2	Execution of environmentally focused DRRM initiatives (e.g., ecosystem restoration, sustainable waste management)	2.89	3	3.07	3
3	Enhancement of infrastructure resilience to withstand disaster impacts (e.g., structural retrofitting, hazard-resistant designs)	3.04	3	3.05	3
4	Implementation of participatory risk assessments, hazard mapping, and ongoing community monitoring	2.13	2	2.94	3
5	Facilitation of access to risk transfer mechanisms such as disaster insurance and financial safety nets	2.59	3	3.13	3
6	Development of comprehensive monitoring, forecasting, and early warning systems for disaster events	3.48	3	3.88	4
	General Weighted Mean	**2.97**	**3**	**3.50**	**4**
No.	**B. Disaster Preparedness**	**WM**	**QR**	**WM**	**QR**
1	Promotion of public awareness and community capacity-building on disaster readiness	2.98	3	3.05	3
2	Provision of competency-building and skills training for DRRM personnel and volunteers	3.04	3	2.83	3
3	Institutional strengthening of local DRRM councils and offices to improve preparedness capacity	1.59	2	2.04	2
4	Formulation and updating of preparedness and emergency response plans	2.13	2	3.05	3
5	Establishment of collaborative networks and partnerships with relevant stakeholders and organizations	3.69	4	3.85	4
	General Weighted Mean	**2.98**	**3**	**2.99**	**3**
No.	**C. Disaster Response**	**WM**	**QR**	**WM**	**QR**
1	Execution of organized disaster response operations, including mobilization and deployment of resources	3.56	4	3.65	4
2	Rapid assessment of immediate needs and disaster-induced damages	3.08	3	3.57	4
3	Enhancement and mobilization of search, rescue, and retrieval (SRR) operations	2.87	3	3.57	4
4	Assurance of timely and secure evacuation procedures for affected populations	3.64	4	3.88	4
5	Delivery of temporary shelter solutions to displaced households	3.74	4	3.92	4
6	Provision of essential social services and health care in disaster-stricken areas	3.25	3	3.57	4
7	Implementation of psychosocial support and mental health interventions for affected individuals	3.23	3	3.52	4
8	Integration of early recovery mechanisms into post-disaster response efforts	3.00	3	3.09	3
	General Weighted Mean	**3.55**	**4**	**3.58**	**4**
No.	**D. Disaster Rehabilitation and Recovery**	**WM**	**QR**	**WM**	**QR**
1	Conduct of comprehensive damage and loss assessments to guide recovery planning	3.56	4	4.0	4
2	Rollout of livelihood recovery programs and economic revitalization initiatives	3.05	3	3.59	4
3	Integration of DRRM considerations in human settlements development and land-use planning	2.62	3	3.56	4
4	Rehabilitation and reconstruction of infrastructure with disaster-resilient standards	2.82	3	2.61	3
5	Support for psychological recovery and the restoration of normal community functioning	3.21	3	3.64	4
	General Weighted Mean	**3.05**	**3**	**3.59**	**4**
	GRAND WEIGTHED MEAN	**3.14**	**3**	**3.42**	**3**

Comparative Analysis of DRRM Program Effectiveness Across Thematic Areas. Table 4 presents the comparative evaluation of DRRM program effectiveness across thematic areas, revealing that there was no statistically significant difference between the perceptions of beneficiaries and facilitators in three areas—

Disaster Prevention and Mitigation (p = 0.065), Disaster Preparedness (p = 0.889), and Disaster Response (p = 0.817)—indicating consensus that these were effectively implemented. However, a significant difference was found in Disaster Rehabilitation and Recovery (p = 0.043), where facilitators rated the area higher (GWM = 3.59) than beneficiaries (GWM = 3.05), suggesting differing views on post-disaster recovery initiatives. Overall, the computed z-value (1.67) and p-value (0.095) support the decision to fail to reject the null hypothesis, implying no significant difference in the overall perceptions of program effectiveness between the two groups.

Table 4
Comparative Evaluation of DRRM Program Effectiveness Across Thematic Areas

Thematic Areas	Test Statistic	Computed z-value	p-value	Decision	Interpretation
A. Disaster Prevention and Mitigation	z-test	1.85	0.065	Fail to reject Ho	No significant difference; both groups rated the area as *Effective* (GWM: 2.97 vs. 3.50).
B. Disaster Preparedness		0.14	0.889	Fail to reject Ho	No significant difference; both groups rated the area as *Effective* (GWM: 2.98 vs. 2.99).
C. Disaster Response		0.23	0.817	Fail to reject Ho	No significant difference; both groups rated the area as *Highly Effective* (GWM: 3.55 vs. 3.58).
D. Disaster Rehabilitation and Recovery		2.03	0.043	Reject Ho	Significant difference; facilitators rated this area higher (GWM: 3.59) than beneficiaries (GWM: 3.05).
Overall Result		1.67	0.095	Fail to reject Ho	Overall, no significant difference in perceptions between beneficiaries and facilitators (Grand Weighted Mean: 3.14 vs. 3.42).

Level of Significance (α) = 0.05

Proposed Strategic Action Plan

Title: Disaster Risk Reduction and Management (DRRM) Program Enhancement Plan in Catanduanes

Vision. A disaster-resilient Catanduanes with empowered communities, strengthened institutional
capacity, and sustainable systems that ensure safety, preparedness, and swift recovery from disasters.

Mission. To enhance the effectiveness and inclusivity of DRRM programs through proactive prevention, robust preparedness, coordinated response, and sustainable rehabilitation and recovery efforts across all communities in Catanduanes.

Objectives

1. Strengthen the integration of DRRM principles in local governance, planning, and development frameworks.
2. Improve community-based disaster preparedness and response competencies.
3. Enhance post-disaster rehabilitation and recovery programs with equitable stakeholder participation.

Table 5
Matrix of Proposed Strategic Disaster Risk Reduction and Management Action Plan for Catanduanes

Objectives	Key Result Areas	Performance Indicators (PI)	Strategies	Projects and Activities	Time Frame	Personnel Involved	Resources
1. Strengthen disaster prevention and mitigation measures	Integrated DRRM planning and risk-sensitive infrastructure	Inclusion of DRRM in annual investment and development plans; improved infrastructure resilience ratings	Mainstream DRRM in LGU development plans	- Conduct training on DRRM-integrated local planning - Implement hazard-resistant infrastructure projects - Establish community-based hazard mapping systems	Year 1–3	LGU DRRM Officers, Planning Officers, Barangay Officials	LGU funds, NDRRMC grants, NGO support
2. Enhance community preparedness and response capabilities	Improved public awareness and operational readiness	Increased number of trained responders and volunteers; improved emergency response time	Strengthen DRRM training and simulation programs	- Conduct regular disaster drills and simulations - Organize community-based DRRM training for volunteers - Establish barangay-level early warning systems	Year 1–2	MDRRMO/CDRRMO, DepEd, BFP, PNP	DRRM Fund, Local Budget
3. Facilitate efficient disaster rehabilitation and recovery	Accelerated recovery operations and livelihood restoration	Reduced recovery time; increased livelihood program beneficiaries	Integrate sustainable recovery and livelihood initiatives	- Implement livelihood recovery and microfinance programs - Conduct post-disaster needs assessments - Provide mental health and psychosocial support services	Year 2–4	DSWD, DOLE, LGUs, Civil Society Groups	Rehabilitation Fund, National Support
4. Foster community engagement and awareness in DRRM	Active community participation in DRRM programs	Increased participation rate in DRRM initiatives; enhanced local knowledge	Promote inclusive and participatory DRRM education	- Conduct DRRM information campaigns in schools and communities - Develop IEC materials on disaster awareness - Form community DRRM committees	Continuous	DepEd, LGUs, NGOs	IEC Materials Fund, CSR Support
5. Ensure equitable and inclusive DRRM implementation	Inclusive policies and practices	Representation of vulnerable sectors in DRRM councils	Institutionalize gender-responsive and inclusive DRRM policies	- Establish DRRM inclusion framework for women, elderly, and PWDs - Conduct sensitivity and inclusion workshops for			

4. Promote sustainable risk reduction initiatives emphasizing environmental resilience.
5. Establish strong collaborative networks among local government units (LGUs), communities, and partner agencies.

DISCUSSION

The findings reveal that both beneficiaries and facilitators perceived the Disaster Risk Reduction and Management (DRRM) programs in Catanduanes as generally effective, with facilitators demonstrating stronger confidence in program outcomes. This aligns with Parmar et al. (2021) and UNDRR (2023), who describe DRRM effectiveness as a function of collaborative governance among local institutions and communities. The higher facilitator ratings, particularly in disaster response and recovery, may reflect institutional familiarity with operational protocols and access to resources, consistent with observations by Villanueva et al. (2023) and Catarata and Villa (2024b) that implementers often emphasize procedural efficiency over community-level outcomes. Conversely, the moderate ratings in prevention and preparedness underscore persistent challenges in fostering participatory risk reduction and capacity-building, echoing Delina's (2022) findings on the need for stronger community engagement and localized early-warning systems. Anchored in Stakeholder and Program Evaluation theories (Freeman et al., 2020; Rossi et al., 2019), these results emphasize the importance of participatory monitoring, equitable resource allocation, and evidence-based planning to enhance DRRM program legitimacy and sustainability in hazard-prone areas like Catanduanes.

The results presented in Table 4 reveal that both beneficiaries and facilitators shared a generally consistent perception of the DRRM program's effectiveness across three thematic areas—prevention and mitigation, preparedness, and response—indicating alignment in their evaluation of these interventions. This convergence supports the notion that collaborative governance fosters coherence in DRRM implementation, as emphasized by Parmar et al. (2021) and UNDRR (2023), who argue that effective DRRM outcomes emerge from coordinated multi-stakeholder engagement. However, the significant difference in perceptions regarding rehabilitation and recovery suggests disparities in how post-disaster initiatives are experienced and assessed, consistent with Cordial (2025) and Villanueva et al. (2023), who note that beneficiaries often evaluate effectiveness based on the adequacy and timeliness of assistance, while facilitators rely on institutional benchmarks and procedural completion. The overall finding of no significant difference in aggregate perceptions underscores the presence of a shared understanding of DRRM success but also signals the need for strengthened participatory feedback mechanisms to reconcile differing post-disaster experiences and promote inclusive program evaluation (Rossi, Lipsey, & Henry, 2019; Catarata & Villa, 2024b).

The proposed Strategic Action Plan reflects an evidence-based and theory-driven framework grounded in Stakeholder Theory and Program Evaluation Theory, emphasizing participatory, adaptive, and data-informed disaster governance. The plan's objectives—ranging from strengthening prevention and mitigation to promoting inclusive and equitable DRRM implementation—align with the national policy direction under Republic Act No. 10121 and the NDRRMP 2020–2030, which advocate proactive risk reduction, resilience building, and community empowerment (UNDRR, 2023; NDRRMC, 2020). Literature highlights that the success of DRRM initiatives depends on localized integration of planning, capacity-building, and post-disaster recovery systems (Rossi, Lipsey, & Henry, 2019; Villanueva et al., 2023). By prioritizing training, community engagement, and inclusive governance, the plan operationalizes the multi-stakeholder approach recommended by Parmar et al. (2021) and Delina (2022), ensuring that beneficiaries and facilitators collaboratively strengthen institutional preparedness and response efficiency. Moreover, integrating livelihood recovery, psychosocial support, and gender-

responsive policies reflects global best practices for sustainable rehabilitation and social resilience (Nguyen et al., 2023; Cordial, 2025). Overall, the plan serves as a strategic mechanism to bridge perceptual and operational gaps in DRRM implementation, fostering adaptive, participatory, and equitable disaster governance in Catanduanes.

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