

Level of awareness and practices of the barangay officials towards disaster risk reduction and management in San Vicente, Palawan, Philippines

Mitch Ferlyn Joy P. Bascos¹ and Kathleen Faith P. Evina^{2*}

¹Intellectual Property Office, Western Philippines University, Aborlan, Palawan, Philippines

²Department of Forestry and Environmental Sciences, Western Philippines University, Aborlan, Palawan, Philippines

*Corresponding author: kathleenfaith.evina@wpu.edu.ph

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ABSTRACT

Barangay officials have a significant role in local disaster management in the Philippines, where natural hazards such as typhoons frequently occur. This study assessed the level of awareness and practices of barangay officials towards disaster risk reduction and management (DRRM). A descriptive-correlational research design was employed using a structured questionnaire. Gathered data from a total of 75 barangay officials in San Vicente, Palawan were analyzed using descriptive statistics and correlation tests. The results found that most of the respondents are male 53%, with ages between 39-48 years old, have attained college level education, a long-term resident of San Vicente, and had more than six years in government service. The respondents have identified typhoons, flooding, and landslides as the most common disasters experienced within the municipality. Results also revealed that the barangay officials showed high awareness particularly in search and rescue operations, their roles in DRRM, and designated evacuation centers. They also showed regular participation in DRRM activities, specifically training on first aid, search and rescue, and disaster management and information dissemination. However, they identified lack of training, lack of funds, and low community participation as the primary challenges to DRRM implementation. Moreover, results showed that there was no significant correlation between demographic profile and awareness, but disaster experience and DRRM practices did. These findings suggest that prior disaster experiences increase awareness, which in turn increases DRRM involvement. Though, barangay-level DRRM implementation necessitate institutional, financial, and participatory improvements.

Keywords: climate, community-based, disaster management, hazards, resilience, vulnerability

INTRODUCTION

A disaster is a major disturbance that affects a community's capacity to prosper (UNDRR 2017). It may result in significant human, environmental, and economic losses and impacts (UNDRR 2017). Although the impact of a disaster can be abrupt and localized, they are often extensive and may last for a long time (UNDRR 2017). Some communities require assistance externally, if the impact is beyond its ability to manage with its own resources (Republic Act No. 10121 2010). The Sendai Framework for Disaster Risk Reduction (DRR) emphasizes the importance of knowledge in disaster mitigation, claiming that increasing comprehension at different levels and in different domains strengthens the success of the strategy (UNDRR 2015).

The Philippine Disaster Risk Reduction and Management Act of 2010 (Republic Act 10121 2010) highlight the roles of the local government in disaster management requiring a barangay disaster risk reduction and management (BDRRM) plan. The law specifies a proactive disaster management such as the early warning systems, evacuation protocols, risk assessments, and community engagement. It also emphasizes the creation of BDRRM committee (BDRRMC) which is tasked with the implementation of DRRM at the barangay level (DILG 2010; NDRRMC 2011). In addition, the law is strengthened through Department of the Interior and Local Government (DILG) Memorandum Circular No. 2025-035 through implementation of Listo sir KAP. The Listo si KAP (Komunidad at Punong Barangay) encourages barangay officials and the community to accomplish their responsibilities in disaster risk reduction and management (DRRM). This set of regulations emphasizes the importance of barangays in DRRM by highlighting their local needs and vulnerabilities, their potential to mobilize local resources, and their role in educating and involving the community in DRRM initiatives. At the barangay level, officials play a key role in DRRM through the BDRRMC, supporting preparedness, risk assessment, early warning, evacuation, response, and community information activities within their respective jurisdictions. Their responsibilities are coordinated with the municipal government and relevant agencies when risks exceed barangay-level capacity. Although barangay officials have defined DRRM responsibilities, their technical expertise in emergency response may vary according to their training and experience.

The geographical location of the Philippines within the Pacific typhoon belt and the "Pacific Ring of Fire" makes it highly susceptible to natural hazards, including typhoons, earthquakes, volcanic eruptions, storm surges, landslides, flooding, and drought (ADRC 2019; DOST-PHIVOLCS 2022). Palawan, a province in the Philippines known for its natural beauty, is also susceptible to hazards. For instance, San Vicente, in northern Palawan, is prone to storm surges, floods, and landslides typically due to tropical storms and prolonged rainfall (DOST-PHIVOLCS 2022). Previous events such as the tropical depression Usman (in 2018) and powerful

typhoons like Quinta (in 2020) and Odette (in 2021) known to have caused widespread flooding and damage in the area (PAGASA 2021).

While Republic Act 10121 establishes local disaster governance standards, studies show varying levels of community preparedness across Philippine local government units. Villanueva and Villanueva (2017) found high awareness but training gaps among BDRRMC members in Nueva Ecija, while Tanguid and Tanguid (2023) highlighted the role of local disaster exposure in response capacity. Nacaya et al. (2023) likewise emphasized structured local networks for effective disaster response. However, studies examining both the awareness and practices of barangay officials in vulnerable coastal areas such as San Vicente, Palawan remain limited. Hence, this study aimed to assess the level of awareness and practices of barangay officials towards DRRM in San Vicente, Palawan. It sought to determine their demographic profiles, disaster experiences, awareness levels, practices, and challenges in DRRM implementation, as well as examine the correlations among these variables. The study recognizes the critical role of barangay officials in community-based disaster management. This study may contribute to the formulation of the local DRRM programs of San Vicente especially at the barangay level.

METHODS

Study Area

The study was conducted in San Vicente, Palawan. San Vicente is located along the northwestern side of mainland Palawan (10°24'45"N, 119°10'39"E), 186 km from Puerto Princesa City. It is found between the municipalities of Taytay (northeast), Roxas (east), and Puerto Princesa City (southwest). Its northwestern side is where the West Philippine Sea is found. It has a total land area of 165,797 ha and has jurisdiction over 10 barangays. It also has 22 islands/islets included within its borders (Figure 1).

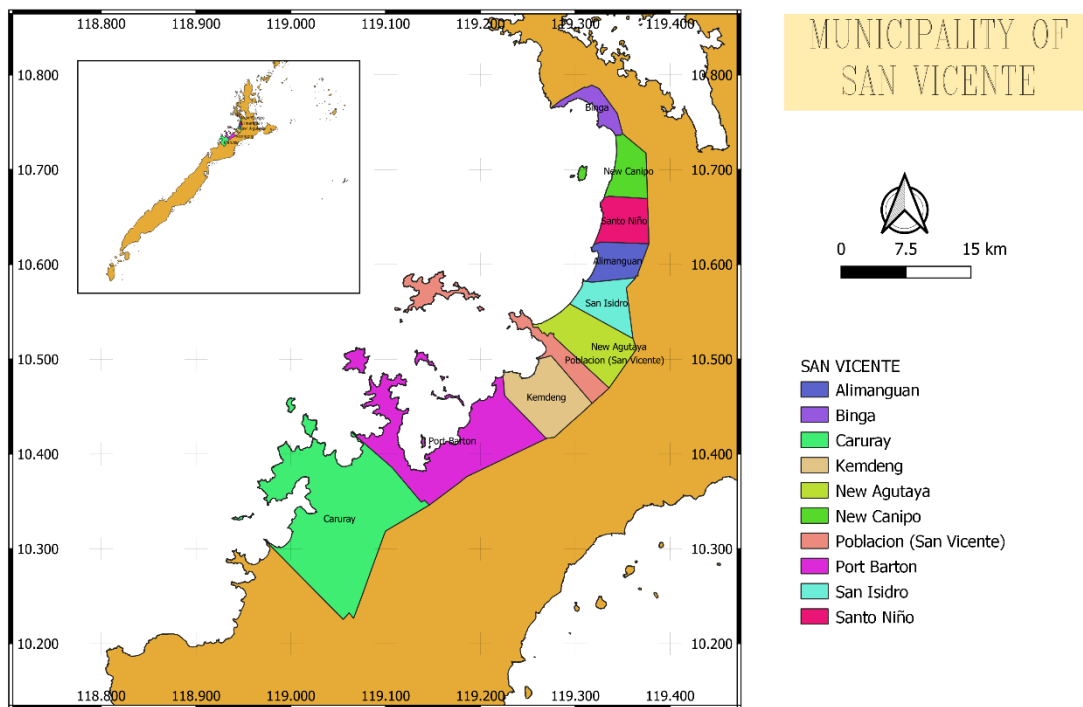


Figure 1. Map showing the barangays of San Vicente, Palawan.

Research Design

The study used quantitative research through a correlational descriptive method to investigate the relationship between awareness and disaster experience, demographic profile and DRRM awareness, and awareness and practices of the barangay officials.

Respondents of the Study

The study used total enumeration of barangay officials across the 10 barangays of San Vicente, Palawan. A total of 75 respondents were recruited through coordination with the municipal disaster risk reduction and management office and barangay captains during regular barangay council sessions. Participation was voluntary, with written informed consent obtained before administering the structured questionnaire.

Survey Questionnaire and Data collection

The study utilized a structured, 42-item questionnaire adapted and modified from established national DRRM assessment framework guidelines (NDRRMC 2011). Part I contained 5 items on demographic profiling. Part II consisted of 1 checklist item on disasters experienced and 22 items assessing DRRM awareness. Part III evaluated DRRM practices across 15 items and 1 checklist item on implementation challenges. The study used a 5-point Likert scale to assess the level of awareness and practices of the respondents (Table 1).

Table 1. Likert scale and their description used in the study.

Rating	Statistical range	Descriptive Equivalent			
		Awareness		Practices	
		Item definition	Interpretation	Item definition	Interpretation
5	4.50 – 5.00	Fully aware	Very High	Very Often	Very good
4	3.50 – 4.49	Aware	High	Often	Good
3	2.61 – 3.49	Neither	Average	Sometimes	Poor
2	1.81 – 2.60	Not Aware	Low	Seldom	Very Poor
1	1.00 – 1.80	Fully Not Aware	Very Low	Never	Needs Improvement

Data Analysis

The study used statistical tools such as frequency counts, means, percentages for data analysis and Pearson r coefficient for the correlation tests (Table 2).

Table 2. Pearson coefficient and their interpretation used in the study.

R values	Interpretation
0.90 – 1.00	Very high positive (negative) correlation
0.70 – 0.90	High positive (negative) correlation
0.50 – 0.70	Moderate positive (negative) correlation
0.30 – 0.50	Low positive (negative) correlation
0.00 – 0.30	Negligible correlation

RESULTS

Demographic Profile of the Barangay Officials

The majority of the respondents are male, aged 39–48 years old, and long-term residents of San Vicente. Most had attained college education and have been in government service for over six years (Table 3). These suggest that most respondents already have a strong familiarity and experience in the local community's conditions.

Table 3. Socio-demographic profile of the respondents (n = 75).

Profiles	Number of respondents (n)	Percentage (%)
Sex		
Male	40	53.33
Female	35	46.67
Age		
18 – 28	6	8.00
29 – 38	12	16.00
39 – 48	27	36.00
49 – 60	24	32.00
61- Above	6	8.00
Educational Attainment		
Elementary	2	2.67
High School	16	21.33
College Level	35	46.67
College Graduate	15	20.00
Vocational/Technical	7	9.33
Years of residence		
1 – 5	1	1.33
6 – 10	2	2.67
11 – 15	5	6.67
16 – 20	10	13.33

21-Above	57	76.00
Years in government service		
Less than 1	9	12.00
1 – 3	16	21.33
4 – 6	16	21.33
6-Above	34	45.33

Disasters Experienced in San Vicente

The respondents have identified typhoons, floods, and landslides as the most common disasters experienced in the municipality (Figure 2). These are in line with the local DRRM plan, which acknowledges the geographic susceptibility of the municipality to a range of hazards according to DRRMO Plan of San Vicente (2024).

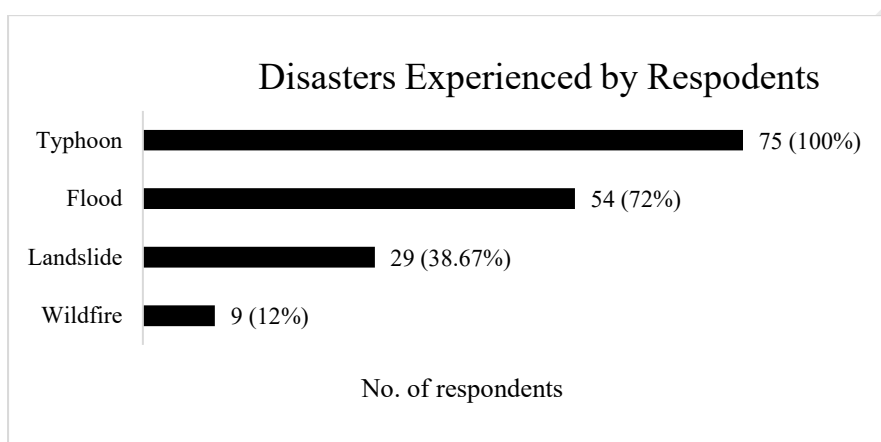


Figure 2. Disasters experienced by the respondents within the municipality.

Level of Awareness Towards DRRM

The respondents showed high awareness regarding DRRM (overall mean = 4.49). They revealed a clear understanding on procedures on search and rescue operations, their roles and responsibilities in DRRM, and the designated evacuation centers in their barangay. In addition, respondents have very high awareness on the resources in their barangay, communication systems and the procedures for distributing relief goods. Awareness regarding the disaster preparedness drills and trainings, availability of disaster response equipment, and procedures for activating the barangay disaster response plan was somewhat diminished (Table 4).

Table 4. Level of awareness of the respondents towards disaster risk reduction and management (DRRM) (n=75).

Statements	Mean	Descriptive Rating
Familiarity with DRRM concepts		
Different types of disaster	4.47	Aware
Barangay Disaster Risk Reduction and Management Plan (BDRRMP)	4.53	Fully Aware
Early Warning System	4.53	Fully Aware
Designated evacuation centers in the barangay	4.60	Fully Aware
Roles and responsibilities of the barangay officials in DRRM	4.69	Fully Aware
Available resources in the barangay for disaster response	4.57	Fully Aware

Community participation in DRRM	4.49	Aware
Legal framework related to DRRM in the Philippines	4.45	Aware
Average	4.54	Fully Aware
Preparedness Measures		
Conduct of disaster preparedness drills and trainings	4.32	Aware
Updated list of vulnerable residents	4.55	Fully Aware
Communication systems during disasters	4.55	Fully Aware
Disaster preparedness planning meetings and activities	4.41	Aware
Dissemination disaster preparedness information	4.47	Aware
Importance of preparing household emergency go-bags	4.41	Aware
Availability of disaster response equipment	4.36	Aware
Average	4.44	Aware
Response and Recovery Mechanisms		
Procedures for activating the barangay disaster response plan	4.40	Aware
Procedures for search and rescue operations	4.75	Fully Aware
Coordination mechanisms with other agencies during a disaster	4.47	Aware
Procedures for distributing relief goods	4.55	Fully Aware
Post-disaster damage assessment processes	4.48	Aware
Post-disaster recovery and rehabilitation resources	4.43	Aware
Support and counselling services for affected residents	4.44	Aware
Average	4.50	Fully Aware
OVERALL	4.49	Aware

Practices Towards DRRM

The respondents frequently participated in DRRM activities (overall mean = 4.23). High levels of practice were observed in the use social media and other communication channels to disseminate information, and training the barangay officials, tanods, and volunteers on first aid, search and rescue and disaster management. A relatively lower levels of practice were noted in evacuation planning and drills and early warning systems (Table 5).

Table 5. Practices of the respondents towards disaster risk reduction and management (DRRM) (n = 75).

Activities	Mean	Descriptive Rating
Barangay Disaster Risk Reduction and Management Planning (BDRRMP)		
Developing and regular updating of a comprehensive BDRRMP	4.25	Often
Mapping of hazard prone areas within the barangay	4.25	Often
Identifying of evacuation centers and routes	4.41	Often
Maintaining a resource inventory (equipment, personnel and supplies)	4.13	Often
Implementing communication protocols and early warning systems	4.33	Often
Average	4.27	Often
Early Warning Systems		
Installing of warning devices for different hazards	4.25	Often
Establishing of a system for disseminating warnings to residents (e.g. through text messages, social media, announcements)	4.25	Often
Training of community members on how to recognized and respond to warnings	4.07	Often
Average	4.19	Often
Evacuation Planning and Drills		
Conducting evacuation drills to familiarize residents with procedures	3.87	Often
Equipping evacuation centers with essential supplies	3.85	Often
Identifying and training evacuation volunteers	3.87	Often
Average	3.86	Often
Training and Capacity Building		
Training barangay officials, <i>tanods</i> , and volunteers on first aid, search and rescue and disaster management	4.77	Very Often

Conducting community-based training on disaster preparedness skills	4.23	Often
Information Dissemination and Education		
Holding community assemblies and meetings on discuss disaster preparedness	4.28	Often
Distributing information materials (e.g., pamphlets and posters on disaster preparedness)	4.29	Often
Using social media and other communication channels to disseminate information	4.56	Very Often
Average	4.38	Often
Vulnerable groups		
Developing special evacuation and assistance plans for vulnerable populations (elderly, PWD's pregnant women, children)	4.44	Often
Maintaining a registry of vulnerable residents	4.37	Often
Average	4.41	Often
Resource Mobilization		
Securing funding for disaster preparedness and response activities	4.37	Often
Establishing partnerships with other organizations for assistance	4.13	Often
Average	4.25	Often
OVERALL	4.23	Often

Problems and Challenges Towards DRRM Implementation

Respondents identified the lack of funds (77.33%), low community participation (60%), and lack of training (41.33%) as the major challenges in DRRM implementation (Figure 3). These reflect that the primary constraints in barangay-level DRRM implementation could both instutional and financial even though RA 10121 and DILG MC 35-25 is in place.

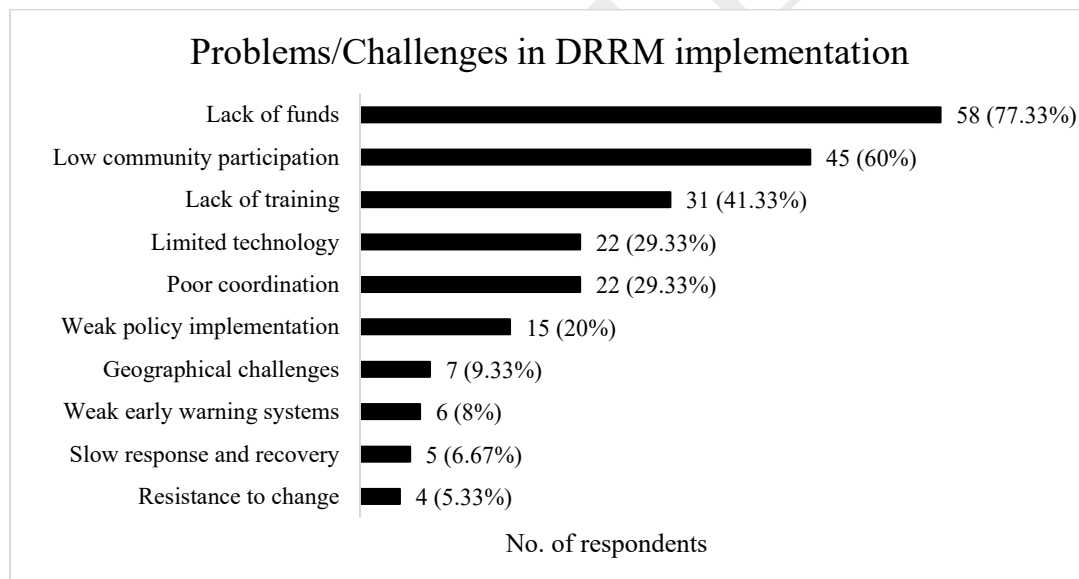


Figure 3. Problems and challenges encountered by the respondents in disaster risk reduction and management (DRRM) implementation.

Correlational Findings

The results revealed a significant positive, although weak relationship between the prior disaster experiences and awareness ($r = 0.25$, $P = 0.03$) (Table 6). This suggests that respondents with prior disaster experiences tended to have more awareness of DRRM, although the observed association was modest.

Additionally, findings showed no significant correlation between demographic variables and awareness (Table 7). In contrast, awareness was strongly correlated with DRRM practices, especially in Barangay Disaster Risk Reduction and Management Planning ($r = 0.873$, $P = 0.00$), early warning systems ($r = 0.897$, $P = 0.00$), and evacuation planning and drills ($r = 0.904$, $P = 0.00$) (Table 8). These findings indicate that awareness was positively associated with prior disaster experience while higher awareness was also associated with more frequent DRRM practices.

Table 6. Relationship between socio-demographic profile of the respondents and their level of awareness towards disaster risk reduction and management (DRRM) at 5% significance level. ns – not significant.

Demographics	r	P-value
Sex	0.106 ^{ns}	0.367
Age	0.153 ^{ns}	0.190
Educational Attainment	-0.081 ^{ns}	0.489
Years of Residence	0.066 ^{ns}	0.572
Years in Government Service	-0.062 ^{ns}	0.597

Table 7. Relationship between the awareness and practices of the respondents towards disaster risk reduction and management (DRRM) at 5% significance level. *Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).

Themes	r	P-value
Barangay Disaster Risk Reduction and Management Planning (BDRRMP)	0.873**	0.000
Early Warning Systems	0.897**	0.000
Evacuation Planning and Drills	0.904**	0.000
Training and Capacity Building	0.253*	0.029
Resource Mobilization	0.616**	0.000
Community Preparedness Organization	0.794**	0.000
Information Dissemination and Education	0.763**	0.000
Vulnerable Groups	0.654**	0.000

DISCUSSION

Sociodemographic Background

The composition of the demographic profile of the barangay officials in San Vicente suggests a group of officials equipped with local background, community conditions and risks since mostly are middle-aged and long-term residents of the area. This reflects other Philippine studies where experience and tenure heightened the pressure on disaster responsibilities (Villanueva and Villanueva 2017; Tanguid and Tanguid 2023). The objectives of RA 10121, particularly its emphasis on strengthening local DRRM capacity and preparedness, are consistent with the respondents' educational and training background. The relatively high proportion of officials with tertiary

education and training also supports the priorities of the UNDRR (2019), particularly in advancing knowledge, capacity-building, and evidence-based disaster risk governance under the Sendai Framework for Disaster Risk Reduction 2015–2030.

Disasters Experienced within the Municipality

The disasters identified by the respondents confirm the vulnerability of the municipality to weather-related risks. This agrees with national assessments which specified that the Philippines is highly vulnerable to the disasters from hazards. In addition, the occurrence of disasters like Typhoon Odette in 2021 illustrates the necessity for localized preparedness programs. This finding is consistent with the results of Nacaya et al. (2023), which indicate that barangays with frequent hazard exposure tend to develop more robust disaster response networks.

Awareness and Experiential Learning

The high level of DRRM awareness among the respondents indicates that barangay officials demonstrated substantial knowledge of DRRM principles. This is one of the outcomes of the decentralization efforts under RA 10121 and the National Disaster Risk and Reduction Management Plan (NDRRMP), which institutionalize local DRRM responsibilities and emphasize preparedness and capacity-building at the community level. Based on the studies of Tanguid and Tanguid (2023) and Villanueva and Villanueva (2017), systematic orientations and community drills are believed to help officials better grasp their duties in disaster preparedness. The correlation analysis revealed a statistically significant, positive relationship between disaster experience and DRRM awareness. This empirical result directly grounds the discussion, suggesting that firsthand exposure to major local hazards—such as typhoons and flooding—serves as a primary driver of hazard awareness among barangay leaders. Kato (2021) stressed that reflecting on prior disasters is very important for how ready a community is and how well it adapts. A study of evacuation behavior during the 2020 Taal Volcano eruption (Lim and Anabo 2025) showed that families with past disaster experience were more likely to respond quickly to evacuation alerts and adopt preparatory steps. These findings indicate that direct experience with disasters contributes greatly to the development of risk consciousness and determines how local stakeholders respond to future hazard situations. In San Vicente, recent exposure to typhoons may have contributed this experiential learning process. This kind of learning is similar to the experiential and community-based resilience paradigm that Matthies (2017), discussed about, in which small groups of people in a community create adaptive knowledge by working together and being socially connected.

Practical Engagement and Institutional Dynamics

The BDRRMC system works at the community level because officials take part in drills, meetings, and response measures. This matches the findings of Cuya-Antonio and Antonio (2017) and Nacaya et al. (2023), both of whom indicated that distinct assignments and roles within BDRRMCs improve coordination and response to disasters. However, the effectiveness of performance is still dependent on the culture of the organization and the commitment of its leaders. Matthies (2017) emphasized that participative leadership facilitate mobilization and fosters mutual trust which are also observed among the officials of San Vicente. Moreover, the use of social media platforms enhances information dissemination and promotes greater engagement in community-based DRRM activities. As Congjuico (2014) observed, municipal governments were increasingly reliant on social media for immediate communication and coordination, supporting the findings of this research that social media and mobile messaging are essential for disseminating early warnings.

Systemic and Resource Limitations

Despite high levels of awareness and engagement among barangay officials, the findings indicate persistent constraints related to financial resources and technical capacity. These challenges are widely documented across local government units in the Philippines. The Commission on Audit (2020) reported underutilization and delayed expenditure of the local DRRM Fund, indicating systemic deficiencies in fund management and program implementation. Similarly, Geronimo and Gonzaga (2021) stated that rural communities typically require assistance from external parties since they lack the necessary technical skills. These align with the results of this study, in which respondents viewed resource limitations as the main challenge to maintaining DRRM operations. Moreover, Bawagan (2011) stressed that real community participation and engagement in local government systems are necessary for DRRM initiatives to persist.

Barangay officials in San Vicente demonstrate significant awareness and engagement in disaster risk reduction and management, however, they continue to encounter institutional and resource-related challenges. The consistency of the current findings with research from other provinces (Villanueva and Villanueva 2017; Nacaya et al. 2023; Tanguid and Tanguid 2023) indicated that local DRRM systems throughout the Philippines exhibit similar patterns of development and constraint. Reyes et al. (2021) asserted that using indigenous and experience knowledge in formal planning processes can enhance the cultural relevance of preparedness initiatives and strengthen community ownership.

Strengthening coordination across barangays, providing regular education and training, and encouraging communication methods that are tailored to the area would help local efforts better match the goals set forth in the Sendai Framework for Disaster Risk Reduction (UNDRR 2015).

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GENERATIVE AI STATEMENT

The authors used ChatGPT (GPT-5, OpenAI, 2025) and QuillBot Premium to assist in improving the grammar, structure, and clarity of the manuscript. These tools were employed solely for language refinement and organization. All data analyses, interpretations, and conclusions are the original work of the authors, who reviewed and verified the accuracy and integrity of the final text prior to submission.

ETHICAL CONSIDERATIONS

The authors secured an inform consent from the respondents and the participation was voluntary prior to data collection. No additional ethical approval was required beyond the use of consent forms.

DECLARATION OF COMPETING INTEREST

The authors declare that there is no conflict of interest relevant to the publication of this paper.

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