



Disaster Literacy and Disaster Preparedness among the Residents of Barangay Nabbuan, Santiago City, Philippines.

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ABSTRACT

The Philippines is highly vulnerable to disasters, including tropical cyclones, floods, earthquakes, landslides, and fires, making community-level disaster literacy and preparedness essential. This study assessed the disaster literacy and preparedness of 279 household residents of Barangay Nabbuan, Santiago City, and examined the relationship between these variables. A quantitative descriptive-correlational research design was employed. Data were collected using the 61-item Disaster Literacy Scale developed by Caliskan and Uner (2022) and the 54-item Disaster Preparedness Assessment Tool by Taja-on (2025). Both instruments demonstrated high internal consistency, with Cronbach's alpha coefficients of 0.945 and 0.953, respectively. Data were analyzed using frequency counts, percentages, weighted means, and Pearson product-moment correlation. Findings indicated that respondents had limited disaster literacy ($M = 3.29$) and were somewhat prepared for disasters ($M = 3.27$). Significant differences in disaster literacy and preparedness were observed across selected demographic characteristics, particularly purok, occupation, and highest educational attainment. Furthermore, disaster literacy was significantly and positively correlated with disaster preparedness ($r = 0.667$, $p < 0.001$), indicating that higher levels of disaster literacy were associated with higher levels of preparedness. These findings highlight the importance of strengthening community-based disaster education, preparedness training, practical skills development, and capacity-building initiatives. The study provides localized evidence that may guide the development of a Community Disaster Literacy and Disaster Preparedness Plan tailored to the needs, vulnerabilities, and capacities of residents of Barangay Nabbuan. Such efforts may contribute to improved community resilience and more effective disaster-risk reduction practices.

INTRODUCTION

The Philippines is highly vulnerable to disasters due to its location along the Pacific typhoon belt and the Pacific Ring of Fire. It faces frequent tropical cyclones, earthquakes, floods, landslides, and other hazards that can cause loss of life, displacement, infrastructure damage, livelihood disruption, and interruptions in essential services. Recent Philippine research has documented the continuing disaster risks experienced by communities, including the effects of major tropical cyclones and the need for strengthened community-level preparedness (Esteban et al., 2023; Ania et al., 2025). These conditions underscore the need to strengthen community capacity through disaster knowledge, practical skills, and preparedness.

Disaster literacy is the ability to access, understand, evaluate, and apply disaster-related information to make informed decisions and take action before, during, and after disasters (Gulsoy, 2025). It covers mitigation, preparedness, response, and recovery. Disaster preparedness consists of measures to anticipate, reduce, and manage impacts. The two are closely linked: the capacity to understand and use reliable information influences how individuals and households prepare for and respond to hazards. Limited access to appropriate information can lead to inadequate awareness and preparedness, while disaster-literate people are better able to make informed decisions and join community-based risk-reduction activities (Guingab et al., 2025). In the Philippines, strengthening community capacity is central to disaster risk reduction. Republic Act No. 10121 (Philippine Disaster Risk Reduction and Management Act of 2010) promotes a comprehensive, community-based approach focused on preparedness, response, recovery, and local capacity. Studies confirm the value of household and community preparedness. Talplacido (2022) found substantial self-reported preparedness among families in a flood-prone area of Nueva Ecija.

This need aligns with the Sustainable Development Goals, particularly SDG 3 (Good Health and Well-Being), SDG 4 (Quality Education), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action). Recent evidence emphasizes the importance of community participation, education, and locally responsive approaches in strengthening disaster resilience and preparedness (Ma et al., 2023; Fazeli et al., 2024). Interventions should therefore respond to each community's specific hazards, vulnerabilities, resources, and capacities. Santiago City, Isabela, faces





multiple hazards, especially flooding associated with heavy rainfall, tropical cyclones, river systems, drainage channels, and irrigation infrastructure. Its location within the Cagayan River Basin increases flood exposure in low-lying areas, while regional fault systems contribute to seismic risk. These overlapping threats make stronger disaster literacy and preparedness essential. Barangay Nabbuan provides a relevant setting for examining these concerns. Divided into seven puroks, several areas lie near irrigation channels, creeks, and river systems that may heighten flood exposure during intense rainfall and tropical cyclones. Purok 4 (Sitio Malini) is near the Calao River, while facilities associated with the Magat River Integrated Irrigation System cross parts of the barangay. These conditions may contribute to localized flooding and disruption of transportation and essential services. Recent disaster experiences affecting Philippine communities further demonstrate the continuing importance of community-level preparedness (Esteban et al., 2023; Aniag et al., 2025).

While structural measures such as flood-control and drainage infrastructure help, they cannot eliminate vulnerability alone. Household knowledge, preparedness, response capacity, and access to reliable information remain critical. Santiago City implements risk-reduction initiatives through the City Disaster Risk Reduction and Management Office (CDRRMO), yet barangay-level interventions that specifically address residents' literacy and preparedness needs are still required. No dedicated program currently targets these capacities in Barangay Nabbuan, creating an opportunity for a localized, evidence-based approach. Limited evidence exists on the relationship between disaster literacy and preparedness among its residents. Examining this relationship, along with differences by selected demographic characteristics, can identify groups needing targeted education and capacity-building and support community-based strategies that complement city-level efforts.

This study therefore aimed to determine the levels of disaster literacy and disaster preparedness among residents of Barangay Nabbuan, Santiago City; examine the relationship between the two; and assess significant differences by selected demographic characteristics. Based on the findings, it proposes a Community Disaster Literacy and Disaster Preparedness Plan to strengthen residents' knowledge, skills, preparedness, and response capacity and to contribute to community resilience.

LITERATURE REVIEW

Disaster literacy and disaster preparedness are closely linked elements of community resilience. Disaster literacy is the ability to access, understand, evaluate, and apply disaster-related information, while preparedness involves the plans, resources, skills, and actions taken before disasters to reduce impacts. Literacy becomes meaningful when knowledge turns into protective behaviors such as preparing supplies, interpreting warnings, identifying evacuation areas, and joining drills (Gulsoy, 2025).

Disaster literacy is shaped by education, social networks, institutions, culture, and community experience. Recent evidence indicates that disaster literacy is associated with individuals' understanding of disaster risks, disaster-management services, and the ability to access and use relevant information (Erdogan et al., 2024). Educational and socioeconomic conditions may also influence people's capacity to understand and respond to disaster-related information (Avci, 2023). Community-based approaches, including drills, simulations, participatory activities, and locally relevant risk-reduction education, can help translate disaster information into practical action (Bernal & Apdohan, 2023; Nanta & Pisueña, 2025). Institutional trust, previous disaster experience, and social participation may further influence how disaster knowledge is applied within communities (Erdogan et al., 2024). Philippine evidence likewise supports the importance of community participation and locally contextualized disaster education in strengthening disaster literacy and preparedness (Cahigas et al., 2023; Nanta & Pisueña, 2025). While Disaster Preparedness is a shared responsibility of households, communities, and institutions (Aniag et al., 2025; Kurata & Ong, 2023). Community networks, drills, simulations, contingency planning, and stakeholder collaboration build confidence and responsiveness (Pasamonte, 2025; Cahigas et al., 2023; Sepanton & Salvador, 2024).

Psychological and socioeconomic factors also shape preparedness behavior. Risk perception, self-efficacy, previous experience, and behavioral training can influence how individuals prepare for natural hazards (Fazeli et al., 2024). Socioeconomic inequalities may also affect access to preparedness supplies, safe housing, transportation, communication systems, and evacuation resources (Cahigas et al., 2023; Khan et al., 2023). Thus, knowledge alone may not be sufficient to produce preparedness behavior when individuals lack the resources, confidence, or opportunities necessary to act.

Preparedness needs differ according to the hazard, including floods, earthquakes, typhoons, and fires, but all require individuals and communities to understand risk information and translate it into appropriate actions. Recent disaster research emphasizes the importance of behavioral training and individual preparedness in strengthening responses to natural hazards (Fazeli et al., 2024). Technology and early-warning systems can facilitate the rapid dissemination of disaster information; however, preparedness strategies should also consider differences in access to communication technologies and the continued importance of community-based communication mechanisms.

A persistent gap may exist between disaster knowledge and actual preparedness because of limited resources, insufficient training, weak coordination, and unequal access to information and support. Recent evidence indicates that disaster literacy, perceptions of disaster-management services, and preparedness are interconnected with individual and community conditions (Erdogan et al., 2024; Fazeli et al., 2024; Aniag et al., 2025). Effective disaster-risk reduction





therefore requires more than the provision of information; it should incorporate practical skills, behavioral training, confidence-building, participation, institutional coordination, and equitable access to resources. Disaster literacy enables individuals and communities to understand hazards, risks, and warnings, whereas preparedness involves translating this knowledge into appropriate actions. The relationship between these constructs may vary according to socioeconomic conditions, previous disaster experience, access to information, and community participation. Context-specific evidence at the barangay level remains important, particularly in communities exposed to multiple hazards. Examining disaster literacy and preparedness among residents of Barangay Nabbuan, Santiago City, can provide empirical evidence regarding local strengths and gaps and can inform context-specific disaster-risk-reduction strategies.

Synthesis of the Literature

The reviewed literature consistently establishes disaster literacy and disaster preparedness as interconnected components of community resilience. Disaster literacy extends beyond awareness and involves the ability to understand, evaluate, and apply disaster-related information to appropriate actions, while disaster preparedness involves the planning, resources, skills, and practices necessary to reduce disaster impacts. Previous studies indicate that individuals and communities with greater disaster knowledge, risk perception, self-efficacy, previous disaster experience, and access to reliable information are more likely to engage in preparedness behaviors (Cahigas et al., 2023; Erdogan et al., 2024; Fazeli et al., 2024).

The literature also demonstrates that disaster literacy and preparedness are influenced by social, institutional, cultural, and socioeconomic conditions. Community participation, social trust, institutional credibility, local governance, and disaster education contribute to the translation of knowledge into collective action (Bernal & Apdohan, 2023; Desilia et al., 2023; Nanta & Pisueña, 2025). Conversely, poverty, limited access to technology and information, inadequate training, weak coordination, and unequal access to emergency resources may create barriers to preparedness (Avci, 2023; Khan et al., 2023). These findings suggest that disaster preparedness should be viewed not only as an individual responsibility but also as a community capacity requiring inclusive and participatory approaches.

Thus, the present study addresses this gap by determining the level of disaster literacy and disaster preparedness among residents of Barangay Nabbuan, Santiago City, and examining the relationship between the two variables. The findings are expected to provide an empirical basis for identifying areas of strength and deficiency in community disaster knowledge and preparedness. More importantly, the results will serve as a basis for developing a community disaster literacy and preparedness plan that is context-specific, participatory, and responsive to the needs and capacities of the residents of Barangay Nabbuan.

Theoretical Framework

This study is anchored in the Disaster Continuum Model, developed by Coburn, Spence, and Pomonis (1994). The model conceptualizes disaster management as a continuous cycle comprising four interrelated phases: mitigation, preparedness, response, and recovery. Each phase informs and strengthens the others, emphasizing that disaster management is an ongoing process requiring continuous planning, adaptation, and community participation.

The model provides a relevant framework for examining the relationship between disaster literacy and disaster preparedness. Disaster literacy supports the mitigation phase by enabling individuals and communities to understand hazards, risks, policies, and risk-reduction measures. It is particularly relevant to the preparedness phase, where disaster-related knowledge is translated into concrete actions such as developing emergency plans, participating in drills and training, preparing supplies, and identifying evacuation procedures. Thus, greater capacity to access, understand, and apply disaster information may facilitate appropriate preparedness behaviors.

Disaster literacy also supports the response and recovery phases by helping residents interpret warnings, follow safety instructions, participate in evacuation and relief activities, and apply lessons learned to future risk reduction. In turn, experiences during response and recovery can reinforce knowledge and improve subsequent preparedness, creating a continuous cycle of learning and adaptation.

Accordingly, the Disaster Continuum Model provides the theoretical basis for viewing disaster literacy as a critical knowledge capacity and disaster preparedness as its practical application within the broader disaster management process. The model therefore supports the examination of the levels and relationship between disaster literacy and disaster preparedness among residents of Barangay Nabbuan, Santiago City, and provides a basis for developing a community disaster literacy and preparedness plan responsive to identified needs.

Conceptual Framework

The conceptual framework of the study is anchored on the Input-Process-Output (IPO) Model, which illustrates the systematic flow of information, procedures, and results in assessing the disaster literacy and disaster preparedness of the residents of Barangay Nabbuan, Santiago City. The model provides a logical structure for identifying the information to be gathered, the procedures through which the data will be analyzed, and the expected output of the study.

Input. The study examines the respondents' demographic profile (age, sex, civil status, purok, monthly income, educational attainment, employment status, and length of residency) alongside their disaster literacy (mitigation,





preparedness, response, and recovery) and disaster preparedness (general, flood, earthquake, landslide, typhoon, and fire). These variables serve as the foundation for describing the respondents and assessing the levels of disaster literacy and preparedness in Barangay Nabbuan.

Process. Data are systematically collected through structured questionnaires, then tallied, coded, and analyzed using appropriate statistical tools. The analysis determines the respondents' demographic characteristics, levels of disaster literacy and preparedness, significant differences across demographic groups, and the relationship between disaster literacy and disaster preparedness. Results are interpreted in light of the study's objectives and relevant literature.

Output. The study produces a Community Disaster Literacy and Preparedness Plan for Barangay Nabbuan, Santiago City. Grounded in the empirical findings, the plan proposes targeted interventions—such as community education, preparedness training, information campaigns, and drills—to address identified gaps and strengthen local disaster risk reduction and management.

Feedback. The framework is cyclical. The proposed plan and its outcomes may be continuously reviewed, evaluated, and refined based on community experiences, emerging risks, and future assessments, ensuring that disaster literacy and preparedness initiatives remain relevant and responsive.

Statement of the Problem

Barangay Nabbuan, Santiago City, is exposed to various hazards that may threaten lives and property, disrupt daily activities, and affect community well-being. Effective disaster management depends not only on local disaster risk reduction mechanisms but also on residents' ability to understand disaster-related information and translate it into appropriate preparedness actions. Thus, disaster literacy and preparedness are essential community capacities for anticipating, responding to, and recovering from disasters. Despite their importance, community-specific evidence on these capacities among residents of Barangay Nabbuan remains limited. Determining their current levels and identifying areas of strength and deficiency can provide an empirical basis for targeted disaster education and preparedness interventions responsive to local risks and needs. Therefore, this study sought to determine the levels of disaster literacy and disaster preparedness among residents of Barangay Nabbuan, Santiago City; examine the relationship between these variables; and determine significant differences according to selected demographic characteristics. The findings will serve as the basis for developing a Community Disaster Literacy and Preparedness Plan to address identified gaps and strengthen residents' capacity to understand disaster risks, undertake appropriate preparedness measures, and respond effectively to disaster events.

Research Objectives

General Objective

To assess disaster literacy and disaster preparedness among the residents of Barangay Nabbuan, Santiago City, and use the findings as a basis for proposing programs to strengthen community disaster literacy and preparedness.

Specific Objectives

1. To determine the level of disaster literacy among the respondents
To determine the level of disaster preparedness among the respondents
2. To determine whether there is a significant difference in disaster literacy among the residents when grouped according to their demographic profile.
3. To determine the relationship between disaster literacy and disaster preparedness among the residents.
4. To propose programs to improve disaster literacy and disaster preparedness among the residents of Barangay Nabbuan, Santiago City.

Research Questions

1. What is the level of disaster literacy among the respondents?
2. What is the level of disaster preparedness among the respondents?
3. Is there a significant relationship between disaster literacy and disaster preparedness among the residents of Barangay Nabbuan, Santiago City?
4. Based on the findings of the study, what programs may be proposed to improve disaster literacy and disaster preparedness among the residents of Barangay Nabbuan, Santiago City?

Research Hypotheses

The study tested the following null hypotheses at the 0.05 level of significance:

H₀: There is no significant relationship between disaster literacy and disaster preparedness among the residents of Barangay Nabbuan, Santiago City.

H₁: There is a significant relationship between disaster literacy and disaster preparedness among the residents of Barangay Nabbuan, Santiago City.





METHOD

Research Design

The study employed a quantitative descriptive-correlational research design to assess the levels of disaster literacy and disaster preparedness and to examine the relationship between these variables among the residents of Barangay Nabbuan, Santiago City. According to Creswell and Creswell (2018), correlational research is appropriate when the purpose is to examine the statistical association between variables without manipulating them.

The descriptive component was used to determine the respondents' demographic profile and their levels of disaster literacy across the domains of mitigation, preparedness, response, and recovery, as well as their levels of disaster preparedness in terms of general preparedness, flood preparedness, earthquake preparedness, landslide preparedness, typhoon preparedness, and fire preparedness.

The correlational component determined whether a significant relationship existed between disaster literacy and disaster preparedness, specifically examining the strength and direction of the association between the two variables. This design enabled the researcher to generate empirical evidence regarding residents' disaster-related knowledge and preparedness capacities without inferring causality. The findings provided the basis for identifying areas requiring improvement and for proposing community-based programs to strengthen disaster literacy and disaster preparedness among the residents of Barangay Nabbuan, Santiago City.

Study Site

The study was conducted in Barangay Nabbuan, Santiago City, Isabela. The barangay is divided into several puroks, which provided a clear community structure for proportionate and systematic sampling of residents. Its geographic features and exposure to multiple hazards made it a suitable setting for examining disaster literacy and preparedness at the community level. Barangay Nabbuan is traversed by irrigation channels, creeks, and river systems that increase its vulnerability to flooding during intense rainfall and tropical cyclones. Purok 4 (Sitio Malini) lies near the Calao River, part of the Calao-Delinquente-Diadi River System (CDDRS), while Magat River Integrated Irrigation System (MARIIS) infrastructure crosses parts of the community. These water systems and local drainage channels can lead to water accumulation and localized flooding, especially in low-lying areas. Access to emergency and health services is also a concern. The nearest hospital, Bureau of Fire Protection (BFP) station, and Local Government Unit (LGU) Hall are approximately 5.8 km, 6.9 km, and 11.8 km away, respectively. During severe flooding, reduced road accessibility may delay emergency response. The barangay flood map shows areas prone to flooding, waterlogging, and soil-related hazards. Residents may also face risks from typhoons, earthquakes, landslides, and fires, highlighting the need for adequate disaster literacy and preparedness.

Population and Sampling

The Local Civil Registry of Barangay Nabbuan, Santiago City (2025) reported a total household population of 1,009. Using the Raosoft Sample Size Calculator with a 95% confidence level and 5% margin of error, a required sample of 279 respondents was determined. Stratified systematic random sampling was employed, with each purok serving as a stratum. As shown in Table 1, the 279 respondents were proportionately allocated across the seven puroks based on population size. Within each purok, systematic random sampling was applied: a random starting household was selected, followed by every fourth household until the allocated sample was reached. This procedure ensured proportional representation across all puroks while maintaining a systematic and randomized selection process, thereby strengthening the sample's representativeness for assessing disaster literacy and disaster preparedness among residents of Barangay Nabbuan, Santiago City.

Table 1. Respondents of the study

Purok	Number of Population	Sample Population
Purok (1)	130	36
Purok (2)	138	38
Purok (3)	132	37
Purok (4)	151	42
Purok (5)	100	28
Purok (6)	194	53
Purok (7)	164	45
Total	1,009	279

Participants of the Study

The study participants were adult household members residing in Barangay Nabbuan, Santiago City. Inclusion criteria were: (1) permanent resident of Barangay Nabbuan; (2) household member aged 18 years or older; (3) resident of the community for at least six months prior to data collection; and (4) able to read and understand the questionnaire, provide informed consent, and complete the instrument in the language used in the study.

Individuals directly involved in the planning, implementation, monitoring, or management of the barangay's disaster-related programs were excluded. These included the Barangay Captain, Barangay Council officials, members





of the Barangay Disaster Risk Reduction and Management Committee (BDRRMC), Barangay Health Workers, and other barangay personnel engaged in disaster-related activities. Their exclusion aimed to minimize potential response bias arising from their official roles in disaster risk reduction and management. These criteria ensured that the data reflected the disaster literacy and preparedness of community residents rather than those with direct administrative or programmatic involvement.

Research Instrument

The study utilized two adopted research instruments to assess the respondents' disaster literacy and disaster preparedness. The questionnaire consisted of three parts: Part I, demographic profile; Part II, disaster literacy; and Part III, disaster preparedness.

Disaster literacy was measured using the 61-item Disaster Literacy Scale developed by Caliskan and Uner (2022), covering four domains: Mitigation, Preparedness, Response, and Recovery. Responses were rated on a five-point Likert scale from 5 (Very Easy) to 1 (Very Difficult). The instrument demonstrated excellent internal consistency (Cronbach's $\alpha = 0.945$). Disaster preparedness was assessed using the 54-item Disaster Preparedness Assessment Tool developed by Taja-on (2025), covering General, Flood, Earthquake, Landslide, Typhoon, and Fire Preparedness. Responses were rated from 5 (Strongly Agree) to 1 (Strongly Disagree). The instrument demonstrated excellent reliability (Cronbach's $\alpha = 0.953$). For linguistic and contextual appropriateness, both instruments were translated into Filipino by a licensed professional teacher specializing in Filipino and subsequently back-translated. The translated versions were reviewed and approved by the research adviser and instructor before administration.

Data Collection

The researcher conducted the data-gathering process systematically. Following the title proposal defense, revisions recommended by the panel were incorporated. From November to December 2025, formal letters requesting permission to conduct the study were submitted to and approved by the Dean, research adviser, and Barangay Captain of Barangay Nabbuan, Santiago City. Before data collection, the researchers explained the study's purpose, procedures, and participants' rights. Written informed consent was obtained, participation was voluntary, and confidentiality and anonymity were maintained. The questionnaires were distributed with the assistance of the Barangay Captain and Barangay Health Workers and took approximately five minutes to complete. Completed questionnaires were retrieved, checked, coded, and digitally encoded. The data were analyzed using SPSS Version 27 through frequency, percentage, weighted mean, and Pearson product-moment correlation, with assistance from a statistician in validating and interpreting the results.

Treatment of Data

The collected data were organized, processed, and analyzed with the use of appropriate statistical procedures, including the test of Normality. The statistical analyses utilized in the study are described as follows:

Frequency Counts, and percentages. These were utilized to describe the demographic profile of the respondents in terms of age, sex, civil status, purok, occupation, highest education level, employment status, and length of residence.

Weighted Mean. It was utilized to describe the levels of disaster literacy and disaster preparedness, with corresponding descriptive interpretations. The following are the scoring guides for disaster literacy and disaster preparedness.

Table 2. Scoring Guide for Disaster Literacy

Scale	Weighted Mean Range	Descriptive Equivalent	Descriptive Interpretation
5	4.21–5.00	Very Easy	Excellent Literacy
4	3.41–4.20	Easy	Adequate Literacy
3	2.61–3.40	Neutral	Limited Literacy
2	1.81–2.60	Difficult	Insufficient Literacy
1	1.00–1.80	Very Difficult	Very Insufficient Literacy

Table 2 presents the Scoring Guide for Disaster Literacy Scale adopted from Caliskan and Uner (2022) uses a 5-point Likert scale interpreted through weighted mean ranges. The scoring guide presents scores from 4.21 to 5.00 as "Excellent Literacy", while 3.41 to 4.20 are regarded as "Adequate Literacy". In addition, a mean score of 2.61-3.40 is considered and interpreted as "Limited Literacy", 1.80 to 2.60 is regarded as "Insufficient Literacy", and lastly, the mean score of 1.00 to 1.80 is regarded as "Very Insufficient Literacy".

Table 3. Scoring Guide for Disaster Preparedness

Scale	Weighted Mean Range	Descriptive Equivalent	Descriptive Interpretation
5	4.21–5.00	Strongly Agree	Very Prepared
4	3.41–4.20	Agree	Prepared
3	2.61–3.40	Neutral	Somewhat Prepared
2	1.81–2.60	Disagree	Not Prepared
1	1.00–1.80	Strongly Disagree	Not at all Prepared

Table 3 presents the Scoring guide for the Disaster Preparedness Scale, adopted from Taja-on (2025), uses a 5-point Likert scale were established to assess the level of disaster preparedness of the respondents based on the weighted mean scores. A mean of 4.21 to 5.00 was regarded as “Very Prepared,” followed by mean scores from 3.41 to 4.20, which were regarded as “Prepared”. In addition, mean scores from 2.61 to 3.40 were regarded as “Somewhat Prepared”; mean scores of 1.81 to 2.60 were regarded as “Not Prepared”; and lastly, the mean scores of 1.00 to 1.80 were regarded as “Not at all Prepared”.

Pearson (r) Correlation. This was employed to study the relationship between disaster literacy and preparedness. Hypothesis testing was conducted using a 5% level of significance. The null hypothesis was rejected when the computed p-value was less than 5%, indicating a significant relationship between variables.

Ethical Considerations

The study obtained the necessary approvals before data collection. Participants provided written informed consent after being informed of the study’s purpose, procedures, risks, benefits, and rights. Participation was voluntary, and withdrawal was allowed at any time. Privacy, anonymity, and confidentiality were maintained in accordance with Republic Act No. 10173 (Data Privacy Act of 2012). Data were used solely for research purposes and were accessible only to the researchers. The study followed accepted ethical principles, and AI tools, when used, were limited to improving manuscript organization and clarity and were not used to alter or fabricate data or findings.

RESULT

Level of Disaster Literacy across four (4) indicators among the respondents

Table 4. Summary of Disaster Literacy across four (4) indicators

Category	M	Interpretation
1. Mitigation	3.35	Limited Literacy
2. Preparedness	3.27	Limited Literacy
3. Response	3.27	Limited Literacy
4. Recovery	3.26	Limited Literacy
Overall Mean	3.29	Limited Literacy

Table 4 shows that the respondents had an overall Limited Disaster Literacy ($M = 3.29$) across the four disaster management phases. Among the indicators, Mitigation obtained the highest mean ($M = 3.35$), while Recovery had the lowest mean ($M = 3.26$). Preparedness and Response both obtained a mean of 3.27. Despite these differences, all four indicators were interpreted as Limited Literacy, indicating that respondents had limited perceived ease in understanding or performing disaster-related actions across the disaster management cycle.

The findings suggest a need to strengthen residents’ disaster literacy, particularly in preparedness, response, and recovery, which obtained relatively lower mean scores than mitigation. This is consistent with Ania et al. (2025), Guingab et al. (2025), and Bernal and Apdohan (2023), who emphasized the importance of accessible disaster information, community education, and practical activities in improving disaster literacy. The findings therefore support the development of a Community Disaster Literacy and Preparedness Plan that provides localized education and practical activities addressing residents’ needs across all phases of disaster management.

Level of Disaster Preparedness across six (6) indicators among the respondents

Table 5. Summary of Disaster Preparedness across six (6) indicators

Category	M	Interpretation
1. General Preparedness	3.25	Somewhat Prepared
2. Flood Preparedness	3.25	Somewhat Prepared
3. Earthquake Preparedness	3.29	Somewhat Prepared
4. Landslide Preparedness	3.25	Somewhat Prepared
5. Typhoon Preparedness	3.34	Somewhat Prepared
6. Fire Preparedness	3.25	Somewhat Prepared
Overall Mean	3.27	Somewhat Prepared



Table 5 shows that the respondents were Somewhat Prepared ($M = 3.27$). Typhoon Preparedness obtained the highest mean ($M = 3.34$), followed by Earthquake Preparedness ($M = 3.29$), while the remaining indicators each obtained a mean of 3.25. The overall finding of Somewhat Prepared indicates that respondents demonstrated a degree of disaster preparedness but still require further strengthening across all disaster types. The relatively lower scores in general, flood, landslide, and fire preparedness highlight areas where additional community-based training, drills, and practical preparedness activities may be beneficial. Consistent with Gundran et al. (2023) and Delaliarte et al. (2024), sustained community participation and structured disaster preparedness interventions can help strengthen practical readiness. These findings support the proposed Community Disaster Literacy and Preparedness Plan.

Test of Relationship Between Disaster Literacy and Disaster Preparedness

Table 6. Relationship between Disaster Literacy and Disaster Preparedness among the Residents of Barangay Nabbuan, Santiago City

Variables	Disaster Preparedness	Significance	Decision
Disaster Literacy	r	0.667	
	p-value	<0.001	Strong Positive
	n	279	Relationship
			Reject Null Hypothesis

Table 6 shows a strong positive and statistically significant relationship between disaster literacy and disaster preparedness among the residents of Barangay Nabbuan, Santiago City ($r = 0.667$, $n = 279$, $p < 0.001$). Since the p-value is below the 0.05 level of significance, the null hypothesis was rejected. This indicates that higher disaster literacy was significantly associated with higher disaster preparedness among the respondents.

The finding highlights the importance of strengthening disaster literacy as part of community preparedness. Sepanton and Salvador Jr. (2024) emphasized that adequate disaster knowledge can support appropriate protective actions, while Tomasson (2023) highlighted the role of continuous education, training, and awareness in strengthening community resilience. The significant relationship found in this study supports the need for localized disaster education, training, drills, and awareness activities in Barangay Nabbuan. These interventions may help residents better understand disaster risks and strengthen their preparedness across different disaster situations, supporting the proposed Community Disaster Literacy and Preparedness Plan.

Proposed Programs to Strengthen Community Disaster Literacy and Disaster Preparedness

Table 7. Proposed Disaster Literacy and Disaster Preparedness Programs

A. Proposed Disaster Literacy Programs	
1. Project H.A.N.D.A. (Holistic Awareness for Natural Disaster Development and Action)	
Component	Description
Objective	To enhance the disaster literacy of the residents on mitigation, preparedness, response, and recovery, with emphasis on the recovery-phase literacy
Persons or Responsible Office Involved	Barangay Council, Barangay Health workers, BDRRMC
Time Frame	Quarterly Sessions
Financial Expenditures	Php 60,000 per year Expense per Session: IEC Materials: Php 4,800 Training Materials and Supplies: Php 7,200 Snacks: Php 3,000
Performance Indicator	Survey Pre-test and Post-test and participation rate
Means of Verifications	Attendance Sheets, Documentary Report, Test Results, program reports
Expected Outcome	Improved Disaster literacy, especially in the recovery phase
Basis of Proposed Programs	Disaster literacy is positively associated with preparedness. Household education, community engagement, and behavioral training improve preparedness and disaster response. (Çalışkan & Üner, 2022; Gulsoy et al. 2025)
2. KAAGAPAY Disaster Literacy Program (Kabalikat na Aksyon at Gabay tungo sa Agar ang Paghanda at Pagtugon ng Pamayanan Literacy Program)	
Component	Description
Objective	To strengthen the literacy of residents on Disaster Risk Reduction Concepts
Persons or Responsible Office Involved	Barangay Council and officials, BDRRM, Barangay Health Workers
Time Frame	Bi-Annual sessions
Financial Expenditures	Php 30,000 per year Expense Per Session:



Performance Indicator	IEC Materials: Php 4,800
Means of Verifications	Training Kits: Php 7,200
	Logistics: Php 3,000
Expected Outcome	Survey Pre-test and Post-test and active participation
Basis of Proposed Programs	Attendance Sheets, Documentary Report, Test Results, session reports, and evaluation forms
	Improved Understanding and literacy of disaster concepts and risk awareness
	Supports integrating disaster education into community and educational settings to improve disaster literacy. (Bernal & Apdohan, 2023)

3. UNAWA sa SAKUNA Learning Program

Component	Description
Objective	To provide critical understanding of disaster scenarios through guided learning
Persons or Responsible Office Involved	BDRRMC, Sangguniang Kabataan Council
Time Frame	Bi-Annual session
Financial Expenditures	Php 30,000 per year Expense per Session: AV materials: Php 4,000 Simulation Tools: Php 7,200 Logistics: Php 3,800
Performance Indicator	Scenario-based assessment improvement
Means of Verifications	Simulation Report, Attendance sheet
Expected Outcome	Improved decision-making during disaster
Basis of Proposed Programs	Emphasizes community-based risk communication, public participation, trust-building, and resilience through effective information dissemination. (Guingab et al. 2025)

B. Proposed Disaster Preparedness Programs

1. MaUNLAD na Barangay kontra sa Sakuna Program (Ugnayan ng mga Nayon para sa Ligas na Aksyon at Disiplina na Barangay kontra sa Sakuna Program)

Component	Description
Objective	To improve preparedness levels across flood, fire, earthquake, landslide, and typhoon disasters through Simulation-based learning
Persons or Responsible Office Involved	Barangay Council and Officials, BDRRMC, CDRRMO, and BFP
Time Frame	Yearly
Financial Expenditures	Php 40,000 per year Expense per Session: Drills, Simulation and Training: Php 20,000 IEC Materials and Training Kits: Php 15,000 Logistics: Php 5,000
Performance Indicator	Drill Performance Assessment and Evaluation, Performance report, and participation rate
Means of Verifications	Drill Reports, attendance sheets, evaluation forms
Expected Outcome	Improved disaster preparedness and community response
Basis of Proposed Programs	Simulation exercises, drills, and experiential learning significantly improve preparedness behavior, confidence, and disaster response skills. (Gundran et al. 2023; Fazeli et al., 2024; Avci, 2023; Wang & Tsai 2022)

2. SALAKNIB Disaster Program

Component	Description
Objective	To strengthen pre-disaster preparedness through barangay-wide inspection, planning, spot mapping of hazard-prone areas, susceptibility assessment, and contingency planning
Persons or Responsible Office Involved	Barangay Council and Officials, BDRRMC, Purok Leaders
Time Frame	Yearly
Financial Expenditures	Php 50,000 per year Expense per session: Inspection and mapping tools and equipment: Php 25,000 Contingency Planning materials: Php 15,000



Performance Indicator	Logistics: Php 10,000 Number of mitigation activities conducted, hazard reduction actions completed, and inspection compliance rate
Means of Verifications	Inspection Reports, Mitigation activity sheets, hazard maps, documentation photos
Expected Outcome	Reduced community vulnerability and improved pre-disaster safety and preparedness
Basis of Proposed Programs	Community resilience depends on coordinated disaster governance, stakeholder participation, continuity planning, and long-term preparedness strategies. (Mahmodi et al., 2025; Ma et al., 2023)
3. Barangay-Based Disaster Volunteer Association Program (BBDVAP)	
Component	Description
Objective	To establish a structured barangay-wide volunteer association that enhances immediate disaster response and assistance during disaster occurrence
Persons or Responsible Office Involved	Barangay Council and Officials, BDRRMC, Purok Leaders, and Sangguniang Kabataan Council
Time Frame	Yearly
Financial Expenditures	Php 25,000 per year Expense per session: Trainings: Php 10,000 Uniforms and ID: Php 7,000 Contingencies: Php 8,000
Performance Indicator	Number of trained volunteers
Means of Verifications	Volunteer registry, certificates, drill documentation
Expected Outcome	Enhances localized disaster response and coordination within the barangay
Basis of Proposed Programs	Organized local groups and continuity planning improve disaster preparedness and emergency response. (Tomasson, 2023)

DISCUSSION

Disaster Literacy across the Four Disaster Management Phases

The findings revealed that the respondents had an overall **Limited Disaster Literacy** across the four phases of disaster management, with an overall mean of 3.29. Among the four indicators, mitigation obtained the highest mean of 3.35, followed by preparedness and response, both with a mean of 3.27, while recovery obtained the lowest mean of 3.26. Although the differences among the indicators were relatively small, the consistent interpretation of limited literacy across all four phases suggests that the respondents experienced difficulty in understanding or performing disaster-related actions throughout the disaster management cycle.

The relatively higher mean for mitigation may indicate that residents have comparatively greater familiarity with actions intended to reduce disaster risks before a hazard occurs. However, the result should not be interpreted as indicating adequate disaster literacy, since mitigation remained within the limited-literacy category. This suggests that residents may recognize basic risk-reduction concepts but may still require further knowledge and practical guidance to translate these concepts into appropriate household and community actions.

The relatively lower scores for preparedness, response, and particularly recovery indicate areas that may require greater attention. Preparedness and response require not only awareness of hazards but also knowledge of specific actions that should be undertaken before and during an emergency. Recovery may be more difficult for residents because it involves longer-term actions following a disaster, including restoration, rehabilitation, and adjustment after the immediate emergency has passed. The lowest mean for recovery therefore suggests a need to strengthen residents' understanding of what should occur beyond the immediate response phase.

These findings support the importance of accessible and continuous disaster education at the community level. Ania et al. (2025), Guingab et al. (2025), and Bernal and Apdohan (2023) emphasized the importance of accessible disaster information, community education, and practical activities in strengthening disaster literacy. In the context of Barangay Nabbuan, disaster education may therefore be more effective when information is localized and combined with practical activities that allow residents to apply what they have learned. Rather than focusing solely on the dissemination of disaster information, community interventions may need to address the entire disaster management cycle, with particular attention to preparedness, response, and recovery.

Disaster Preparedness across Different Hazards

The respondents were generally Somewhat Prepared, as reflected by the overall mean of 3.27. Typhoon preparedness obtained the highest mean of 3.34, followed by earthquake preparedness at 3.29. General preparedness, flood preparedness, landslide preparedness, and fire preparedness each obtained a mean of 3.25. The findings indicate that although residents possess a degree of preparedness, their preparedness remains incomplete and requires strengthening across the different hazards considered in the study.





The relatively higher score for typhoon preparedness may be associated with residents' familiarity with typhoons as a recurring hazard. Repeated exposure to hazard warnings and community experiences may provide residents with opportunities to become familiar with certain preparedness activities. However, the result remains within the category of somewhat prepared, indicating that familiarity with a hazard does not necessarily translate into comprehensive preparedness.

Earthquake preparedness obtained the second-highest mean. Unlike some hazards that may provide residents with warning signs before occurrence, earthquakes can occur suddenly, requiring individuals to know appropriate protective actions in advance. The relatively higher earthquake preparedness score may suggest some awareness of appropriate emergency actions, although the overall classification still indicates a need for continued strengthening.

The lower and identical means for general, flood, landslide, and fire preparedness indicate areas where additional community-based interventions may be particularly useful. These findings suggest that preparedness programs should not focus exclusively on one hazard. Instead, residents may benefit from hazard-specific education, drills, simulations, household preparedness activities, and community exercises addressing the hazards relevant to their locality.

This interpretation is consistent with Gundran et al. (2023) and Delaliarte et al. (2024), who emphasized the importance of sustained community participation and structured disaster preparedness interventions. Practical activities such as drills and simulations can provide residents with opportunities to practice appropriate actions rather than relying solely on theoretical knowledge. Consequently, the findings provide a basis for strengthening community preparedness through repeated and structured activities addressing flood, fire, earthquake, landslide, and typhoon risks.

Relationship between Disaster Literacy and Disaster Preparedness

A strong positive and statistically significant relationship was found between disaster literacy and disaster preparedness among the 279 respondents ($r = 0.667$, $p < 0.001$). The result indicates that higher disaster literacy was associated with higher disaster preparedness. Since the p -value was below the 0.05 level of significance, the null hypothesis was rejected.

The magnitude and direction of the correlation suggest that disaster literacy is an important factor associated with preparedness among the residents of Barangay Nabbuan. Residents who reported greater ease in understanding or performing disaster-related actions also tended to report greater preparedness across the different hazards examined. This finding provides empirical support for treating disaster literacy and preparedness as interconnected components of community disaster risk reduction rather than as separate concerns.

The relationship may be understood in terms of the role of knowledge and understanding in supporting appropriate preparedness behaviors. Residents who understand disaster risks, warning information, preventive measures, and appropriate emergency actions may be better positioned to prepare themselves and their households before a disaster occurs. Conversely, limited literacy may create difficulties in understanding risk information or determining which actions should be prioritized during different stages of a disaster.

The finding is consistent with Sepanton and Salvador Jr. (2024), who emphasized that adequate disaster knowledge can support appropriate protective actions. Similarly, Tomasson (2023) highlighted the importance of continuous education, training, and awareness in strengthening community resilience. The present finding therefore reinforces the value of sustained disaster education and practical preparedness activities within the barangay.

Nevertheless, the correlational nature of the analysis should be considered when interpreting the result. The finding demonstrates an association between disaster literacy and preparedness but does not establish that increased disaster literacy alone causes higher preparedness. Other factors may also contribute to preparedness. Thus, the result is most appropriately interpreted as evidence that strengthening disaster literacy is a relevant component of broader community preparedness efforts.

Implications for Community Disaster Risk Reduction

Taken together, the findings indicate two important community needs: strengthening disaster literacy and translating knowledge into practical preparedness. The overall limited level of disaster literacy and somewhat prepared level of disaster preparedness suggest that residents possess a foundation of awareness and preparedness but may require additional opportunities to develop and practice disaster-related competencies. The significant relationship between the two variables further supports the integration of literacy-building and preparedness activities rather than implementing them as isolated interventions.

The proposed Project H.A.N.D.A. directly responds to the findings by providing quarterly sessions intended to improve literacy across mitigation, preparedness, response, and recovery, with particular emphasis on the recovery phase, which obtained the lowest literacy mean. KAAGAPAY Disaster Literacy Program may complement this intervention by strengthening residents' understanding of disaster risk-reduction concepts through community-based sessions. Meanwhile, UNAWA sa SAKUNA Learning Program emphasizes guided learning and scenario-based activities, which can help residents apply disaster information to specific situations. These programs are consistent with the study's finding that disaster literacy requires continuous and accessible community education. For preparedness, the proposed MaUNLAD na Barangay Kontra sa Sakuna Program addresses the need for simulation-based learning across the major hazards assessed in the study. Its emphasis on drills and training is appropriate given the





somewhat prepared overall result and the relatively lower preparedness means for general, flood, landslide, and fire hazards. SALAKNIB Disaster Program extends preparedness beyond individual knowledge by incorporating barangay-wide inspection, hazard mapping, susceptibility assessment, and contingency planning. These activities can help connect residents' understanding of disaster risks with concrete community-level preparedness measures.

The proposed Barangay-Based Disaster Volunteer Association Program (BBDVAP) further emphasizes the importance of organized community participation in disaster response. By establishing a structured volunteer association and providing training, the program seeks to strengthen localized response and coordination during disasters. This complements the literacy findings because disaster preparedness involves not only individual knowledge but also the capacity of residents and local structures to coordinate actions during emergencies.

Furthermore, the findings suggest that disaster risk reduction in Barangay Nabbuan may benefit from a continuous, community-based approach that combines information, education, practical training, simulation, hazard assessment, and organized volunteer participation. The proposed programs therefore provide a practical framework for translating the study findings into community-level activities. Their implementation should be accompanied by appropriate monitoring and evaluation, such as pre- and post-tests, participation records, drill performance assessments, and documentation of completed preparedness activities, to determine whether the interventions contribute to improvements in disaster literacy and preparedness over time.

CONCLUSION

Based on the analysis and interpretation of the data, the following conclusions were drawn:

1. The respondents demonstrated an overall Limited Disaster Literacy ($M = 3.29$) across the four phases of disaster management. Mitigation obtained the highest mean ($M = 3.35$), followed by preparedness and response (both $M = 3.27$), while recovery obtained the lowest mean ($M = 3.26$). The findings indicate that residents possessed basic disaster-related knowledge but require further strengthening of their ability to understand and apply disaster information across all phases.
2. The respondents were generally Somewhat Prepared for disasters, with an overall mean of 3.27. Typhoon preparedness obtained the highest mean ($M = 3.34$), followed by earthquake preparedness ($M = 3.29$), while general, flood, landslide, and fire preparedness each obtained a mean of 3.25. The findings indicate that residents had basic preparedness practices but require further development of hazard-specific knowledge and skills.
3. A strong positive and statistically significant relationship existed between disaster literacy and disaster preparedness among the respondents ($r = 0.667$, $n = 279$, $p < .001$). Thus, the null hypothesis was rejected. The finding indicates that respondents with higher disaster literacy also tended to demonstrate higher levels of disaster preparedness.
4. The findings demonstrate the need to strengthen localized and practical disaster risk reduction interventions in Barangay Nabbuan. The combination of Limited Disaster Literacy ($M = 3.29$) and Somewhat Prepared disaster preparedness ($M = 3.27$), together with their significant positive relationship, provides an empirical basis for strengthening community-based disaster education, risk communication, drills, simulations, and hazard-specific preparedness activities.
5. Based on the identified levels of disaster literacy and preparedness and their significant relationship, a Community Disaster Literacy and Preparedness Plan may be proposed for Barangay Nabbuan, Santiago City. The plan should focus on accessible disaster education, continuous community training, regular drills and simulations, and practical preparedness activities to strengthen residents' knowledge, skills, and capacity to respond effectively to disasters.

Recommendations

Based on the findings and conclusions of the study, the following recommendations are offered:

1. Barangay Nabbuan officials, in coordination with the City Disaster Risk Reduction and Management Office (CDRRMO), may strengthen localized disaster literacy programs focusing on mitigation, preparedness, response, and recovery. Activities may include disaster education, interpretation of early warning systems, evacuation procedures, and post-disaster recovery orientation.
2. Barangay officials and Barangay Health Workers may implement purok-specific interventions to address localized gaps in disaster literacy and preparedness. Community orientations, hazard mapping, focus group discussions, and disaster exercises may be conducted according to the specific risks and needs of each purok.
3. Disaster risk reduction authorities may promote household-level preparedness through family disaster plans, emergency preparedness kits, and clearly defined family roles during emergencies. Teachers and other qualified community members may also be engaged as resource persons or peer educators in disseminating disaster-related information.
4. Regular community-based drills, simulations, and training on major hazards, particularly floods, typhoons, earthquakes, landslides, and fires, may be conducted at least annually to reinforce practical preparedness skills and appropriate emergency responses.





5. The proposed Community Disaster Literacy and Preparedness Plan may be considered for implementation by Barangay Nabbuan, subject to review and coordination with relevant disaster risk reduction authorities. Programs such as Project H.A.N.D.A., KAAGAPAY Disaster Literacy Program, UNAWA sa SAKUNA Program, MaUNLAD na Barangay Kontra sa Sakuna Program, SALAKNIB Disaster Program, and the Barangay-Based Disaster Volunteer Association Program may serve as components of a comprehensive and sustainable community-based intervention.
6. Future researchers may conduct similar studies involving larger and more diverse populations to improve the generalizability of findings. Further studies may also evaluate the effectiveness of disaster education, community-based interventions, and preparedness programs in improving disaster literacy, preparedness, and community resilience.

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