FWU Journal of Social Sciences, Fall 2025, Vol.19, No.3, 79-95
DOI: http://doi.org/10.51709/19951272/Fall2025/6

Geographic and Socioeconomic Predictors of Disaster Preparedness among Barangay Health Emergency Responders and Residents: Evidence from Dapitan City

John Wayne V. Jacinto, Victor B. Bernido and Bobmil C. Flores
Jose Rizal Memorial State University-Dapitan City, Philippines

This study investigated the levels of disaster awareness and preparedness among Barangay Health Emergency Response Teams (BHERTs) and residents in Dapitan City, Philippines, specifically examining the influence of geographic and socioeconomic factors. Employing a descriptive-correlational design, data were collected from 380 respondents, comprising BHERT members and randomly selected residents, across 15 barangays in Dapitan City. Structured questionnaires assessed disaster awareness, attitude, and preparedness. Ordinal logistic regression analysis, using maximum likelihood estimation ($\alpha = 0.05$), identified significant geographic and socioeconomic predictors of awareness, attitude, and preparedness levels. Findings indicate high levels of awareness regarding common hazards such as typhoons (87.9%), earthquakes (84.2%), and floods (75.8%), yet overall practical preparedness remains low. Higher family monthly income ($p = 0.007$) and residential proximity to river-plain ($p < 0.001$), near river ($p = 0.010$), and near river-mountain areas ($p = 0.006$) were significant predictors of a more favorable disaster awareness attitude. For BHERT preparedness, higher educational attainment ($p = 0.024$) and classification as a very highly vulnerable barangay ($p = 0.023$) were significant positive predictors. Conversely, age ($p = 0.030$) was inversely correlated with BHERT preparedness. Sex, occupation, and attendance at disaster preparedness training did not emerge as significant predictors.BHERTs were consistently rated as "Partially Prepared" across all dimensions, including systems and structures, policies and plans, building competencies, and equipment and supplies.The study concludes that a persistent gap exists between awareness and practical preparedness, with geographic and socioeconomic factors critically shaping both. However, a crucial observation is that while statistically significant, the models' explanatory power for both awareness attitude (Nagelkerke $R^2 = 0.031$) and BHERT preparedness (Nagelkerke $R^2 = 0.0445$) is low. The result suggests that these measured factors are not the sole determinants of awareness and preparedness, highlighting the need for future research to investigate a broader range of variables and informing the development of targeted interventions addressing topography, income, and education .

Keywords: BHERT, vulnerability, education, disaster awareness, disaster preparedness, geography, socioeconomic predictors, Philippines

The Philippines, located within the Pacific Ring of Fire and exposed to an average of 20 typhoons annually, is one of the world's most disaster-prone nations (United Nations Office for Disaster Risk Reduction, 2023). In 2022, natural disaster-related damages reached approximately 30 billion pesos, underscoring the country's severe and recurring threats (Statista Research Department, 2024). The World Bank and the Philippine government have invested in proactive risk management and resilience-building efforts, recognizing the critical importance of effective local disaster risk reduction (World Bank, 2023).

Correspondence concerning this article should be addressed to Dr. John Wayne V. Jacinto, Associate Professor,College of Teacher Education, Jose Rizal Memorial State University-Dapitan City, Philippines, Email: johnwaynejacinto@jrmsu.edu.ph

Climate-related disasters in the Philippines disproportionately affect socioeconomically vulnerable areas. Provinces such as Pangasinan, Pampanga, Nueva Ecija, and Cagayan report among the highest aggregated and average damage ratios, indicating widespread structural damage during extreme weather events (Cabico, 2023; Esquire Philippines, 2023; Noriega, 2023). These provinces also rank among thecountry's poorest (Philippine Statistics Authority, 2022). Poverty limits disaster preparedness. Poor households often reside in high-risk areas due to economic necessity and have less access to protective infrastructure (Hallegatte, 2020; Castañeda et al., 2020). With fewer resources, they invest less in prevention and recovery (Hallegatte et al., 2017, as cited in SAMHSA, 2017), further compounding their vulnerability.

Within this national context, local government units (LGUs) and their constituent barangays, as the lowest administrative units, play a pivotal role in ensuring community preparedness (Porio & Roque-Sarmiento, 2019). This study focuses explicitly on Dapitan City in Zamboanga del Norte, Western Mindanao, which recorded a poverty incidence of 36.1% in 2021, significantly higher than the national average of 18.1% (Laput, 2019; PSA, 2019; PSA, 2022b; 2022c). This high poverty incidence is particularly relevant, as poor populations are disproportionately affected by natural disasters due to fewer resources for prevention and mitigation, and often reside in hazardous locations with less protective infrastructure. By concentrating on Dapitan City, the research provides a localized examination of disaster preparedness challenges within a highly vulnerable and socioeconomically disadvantaged urban-rural setting, thereby contributing specific, actionable data for local policymakers.

This study integrated Social Capital Theory and risk perception to develop a comprehensive framework for analyzing disaster awareness and preparedness. Social capital, long recognized as pivotal in disaster risk management, underpins this approach (Zhao et al., 2025). Bourdieu conceptualizes social capital as the aggregate of actual or potential resources accessible through durable social networks (Bourdieu & Wacquant, 1992, cited in Gauntlett, 2011; Claridge, 2015). Toyon (2022) further emphasizes its role in accessing social potential within agent-controlled systems. This study posits that social networks and the resources they facilitate—such as mutual assistance and information exchange—are central to preparedness. In the Philippines, cultural values like *bayanihan* (community spirit) exemplify bonding social capital, promoting resilience through mutual support in turbulent times (Vadil et al., 2025).

Risk perception complements social capital by shaping individual and collective disaster management behaviors. It has been consistently linked to preparedness actions, particularly when risks are perceived as imminent and severe (Twigg, 2013; Kalın & Yeşilyurt, 2025). This study measured risk perception via disaster awareness and preparedness attitudes. Prior research indicates that greater knowledge of hazards enhances risk perception, encouraging proactive behavior (Bahramzadeh Gendeshmin et al., 2025).The framework also incorporates the influence of socioeconomic conditions and prior experience. Higher education correlates with improved awareness and disaster responsiveness (Bahramzadeh Gendeshmin et al., 2025; Rivera, 2021), while socioeconomic status strengthens engagement in preparedness (Han & Wu, 2024). Likewise, past disaster experience or residing in hazard-prone areas elevates risk perception, prompting greater preparedness (Kalın & Yeşilyurt, 2025). By grounding the study in these theoretical constructs, the research aims to explain how and why geographic and socioeconomic factors shape disaster awareness and preparedness, moving beyond correlation to uncover underlying mechanisms (Zhao et al., 2025).

While existing literature has broadly addressed disaster knowledge and awareness in regions like Zamboanga del Norte (Padua, et al., 2015; Telen, 2015; Campiseño, 2015; c& Aquino, 2015; Flores, 2015; Jacinto & Campiseño, 2015; Subong & Luza, 2015; Banquiao & Maratas, 2015), a significant gap persists in the comprehensive understanding of how specific geographic and socioeconomic factors interact to predict both disaster awareness and practical preparedness at the granular barangay level, particularly in a multi-hazard, high-poverty urban-rural context such as Dapitan City. Previous studies often focus on general awareness or preparedness without deeply exploring these combined factors' predictive relationships on residents and the designated local emergency responders (BHERTs).

This study can have several key contributions. First, it provides a dual perspective by analyzing residents and BHERTs, offering a more holistic view of community-level preparedness that includes the general populace and the frontline responders. Second, it employs a quantitative approach to identify predictors rather than merely describing correlations, providing actionable policy and intervention design insights. Third, the research integrates specific geographic variables (e.g., topography, proximity to rivers/mountains) with socioeconomic factors (e.g., income, education) to offer a nuanced understanding of localized vulnerability and its impact on preparedness. This comprehensive analysis addresses a critical void in the local literature, providing data directly relevant to policymakers in Dapitan City and contributing to the broader academic discourse on community resilience in vulnerable settings.

In line with the identified gaps, this study aims to (1) describe the profile of BHERTs and residents; (2) assess their levels of disaster awareness, attitudes, and preparedness; and (3) identify significant geographic and socioeconomic predictors of disaster awareness, attitudes, and preparedness. Therefore, the study addresses the following core research questions: (a) What is the disaster awareness, attitude, and preparedness level among BHERTs and residents? (b) Which geographic and socioeconomic variables significantly predict disaster awareness attitude and disaster preparedness?

Method

This study utilized a descriptive-correlational research design. This approach was selected as it allows for the systematic description of the characteristics of a population (e.g., disaster awareness and preparedness levels) and the examination of relationships between variables (e.g., geographic and socioeconomic factors as predictors of awareness and preparedness). Fifteen Dapitan City, Philippines barangays participated in the study within a three-month data gathering period (October to December 2024), such as Oyan, Daro, San Vincente, Carang, Sto. Niño, Ilaya, Sulangon, Dampalan, Opao, Oro, Sicayab-Bucana, Selinog, Sinonoc, Tag-ulo, and Taguilon. Using the maps of the Dapitan City Disaster Risk Reduction and Management Office, these barangays were categorized according to their vulnerability to hazards in terms of infrastructure, roadways, and population. It ensured representation from diverse geographic areas within the city. The study population consisted of residents and all members of Barangay Health Emergency Response Teams (BHERTs) in Dapitan City (Barangay Executive Officer, Barangay Tanod, and two Barangay Health Workers [Department of the Interior and Local Government, 2020]) from the participating barangays, representing a census of these key local responders. The residents within these 15 barangays were randomly selected to participate. The total sample size of 380 respondents from a population of 28278 was determined using the Cochran formula. This formula was applied with a 95% confidence level, a 5% margin of error, and an estimated population proportion of 0.5 (to maximize sample size for unknown proportions), ensuring that the sample was statistically representative of the target population within the selected barangays.

Data were collected using a structured instrument with three parts. The first part gathered data on the respondents' profilesin terms of age, sex, education, income, sources of disaster information, barangay classification (as to vulnerability to disaster), and topography of residence. The second part of the instrument, assessing the respondents' disaster awareness attitude, was adopted from a standardized instrument referenced by Hargono et al., (2023) from Tuladhar et al., (2015). Responses for this instrument were measured using a five-point Likert scale, with scores of 1 (strongly disagree) as the lowest to 5 (strongly agree) as the highest level of disaster awareness attitude. The third part, which focused on the preparedness of BHERTs, was based on the study by Dariagan (2021) and categorized into four dimensions: systems and structures, policies and plans, building competencies, and DRRM equipment and supplies. Statements in this instrument were rated on a three-point scale: 1 - not prepared (1.00-1.66), 2 – partially prepared (1.67-2.33), and 3 – prepared (2.34-3.00).To ensure these multi-item scales' internal consistency and reliability, Cronbach's Alpha coefficients were calculated for each dimension among the 30 pilot individuals who were not part of the target respondents. All scales demonstrated good internal consistency, with Cronbach's Alpha values ranging from 0.84 to 0.99 (awareness attitude=0.95; preparedness: system = 0.84; policies and plans = 0.98; building competence = 0.99; equipment and supplies = 0.98). Ethical

clearance was obtained prior to data collection from the Jose Rizal Memorial State University Research Ethics Committee, and all respondents were provided informed consent. Confidentiality of responses was strictly maintained.

Descriptive statistics, including frequencies, percentages, and means, were employed to characterize the demographic profile of the respondents and to assess their levels of disaster awarenessattitude and preparedness. For inferential analysis, ordinal logistic regression was utilized to investigate the influence of predictor variables on the ordinal outcomes of preparedness levels and disaster awareness attitude. The predictor variables included sex, age, barangay classification (as to vulnerability to disaster), topography of residence, highest educational attainment, family monthly income, source of disaster information, and attendance at disaster preparedness training. These were converted into dummy variables to accommodate the categorical nature of variables such as barangay classification and topography. For instance, in the topography analysis, "plain" areas served as the reference category, allowing for the interpretation of other topographic classifications (e.g., "near river-plain," "near river," "near river-mountain") relative to this baseline. Similarly, "Highly Vulnerable" was established as the reference category for barangay classification. Maximum likelihood estimation with a significance level of $\alpha = 0.05$ was used for all regression models. All statistical analyses were conducted using Jamovi 2.3.28.0. Table 1 provides the operational definitions and measurement types for all key variables used in this study to clarify the key variables.

Table 1

Key Variables and Operational Definitions

Key Variables	Operational Definition (with Measurement Type)
Disaster Awareness	Refers to therespondent's recognition of various disaster types commonly or seldom experienced in their locality (e.g., typhoon, earthquake, flood, tornado, industrial accident, etc.), measured using a dichotomous scale (Yes/No) across 13 disaster types.
Disaster Awareness Attitude	Refers to therespondent's level of agreement with positive behaviors and values related to disaster awareness and risk reduction (e.g., participation in campaigns, retrofitting knowledge, emergency bag preparation, prioritization at different levels), measured using a Likert-type scale (Ordinal).
Disaster Preparedness	Refers to the perceived readiness of barangays in terms of systems and structures, policies and plans, building competencies, and equipment and supplies, as evaluated by BHERTs, measured through mean scores using a 3-point descriptive scale (1 = Not Prepared, 2 = Partially Prepared, 3 = Fully Prepared).
Geographic Predictors	Refers to locational and physical features of the respondents' residence, such as topography (e.g., plain, mountain, coastal, near river, valley, island) and barangay classification in terms of vulnerability. Measured as nominal/categorical variables.
Socioeconomic Predictors	Refers to respondents' social and economic characteristics that may influence awareness, attitude, and preparedness, including sex, age, occupation (Resident or BHERT), educational attainment, and family monthly income. Measured using categorical (nominal/ordinal) and continuous variables.

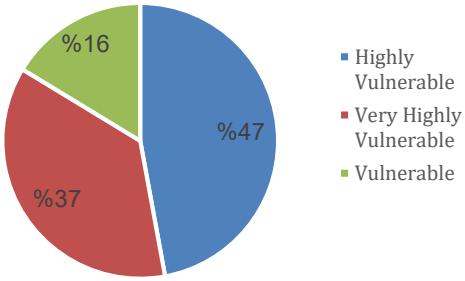
Results

Respondents' Demographic Profile

The study included 380 respondents, aged 18 to 81 years. The sample was almost equally distributed by sex, with males constituting 60% and females 40%. Residents accounted for most respondents (81.3%), while BHERT members comprised 18.7%. Many respondents resided in highly vulnerable barangays (47%), followed by those in very highly vulnerable areas, as depicted in Figure 1.

Figure 1

Distribution of Respondents by Barangay Classification as to Vulnerability



Regarding the topography of residence, over a quarter of the respondents (26.8%) lived in plain areas, followed by those in coastal (23.2%) and near-river areas (21.1%). This distribution highlights the significant proportion of the population residing in areas susceptible to water-related hazards (Table 2).

Table 2

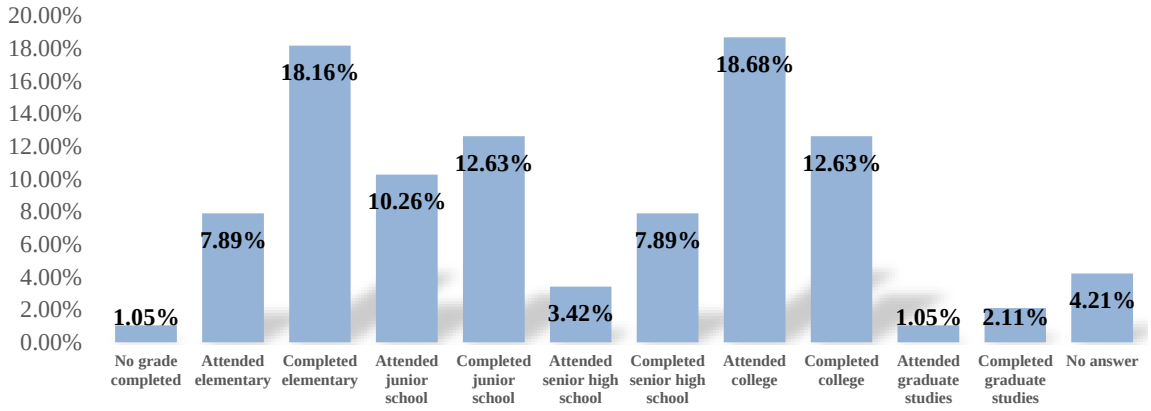
Distribution of Respondents by Topography of Residence

Topography of residence	Frequency	Percentage
Plain	102	26.8%
mountain	75	19.7%
Coastal	88	23.2%
near river-plain	6	1.6%
near river	80	21.1%
none of the above	5	1.3%
near river - mountain	5	1.3%
Valley	8	2.1%
Island	9	2.4%
near road	2	0.5%

Educational attainment varied, with60.3% of respondents having completed basic education (elementary to senior high school), and only 3.2% having pursued graduate studies. This educational profile (Figure 2) illustrates respondents' predominant basic education level.

Figure 2

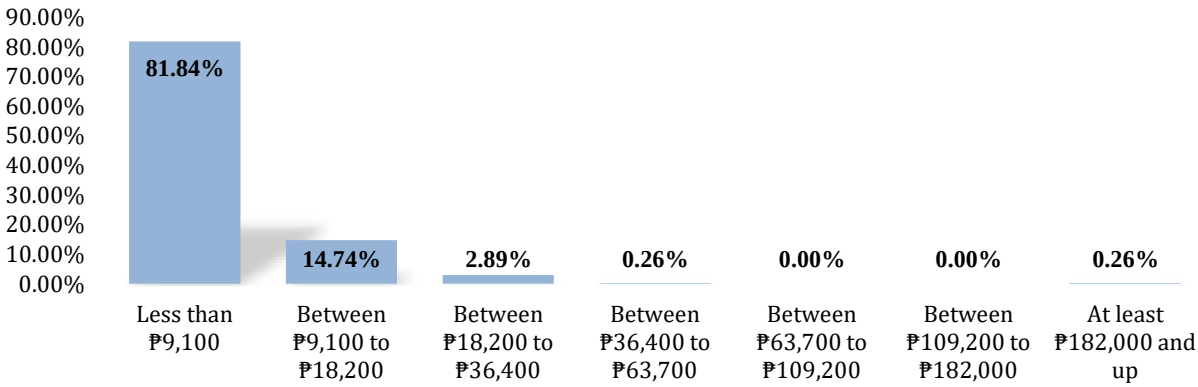
Distribution of Respondents by Highest Educational Attainment



Regarding family monthly income, a substantial majority (81.84%) reported earning less than ₱9,100 per month, highlighting the widespread low-income status among the respondents (Figure 3).

Figure 3

Distribution of Respondents by Monthly Income

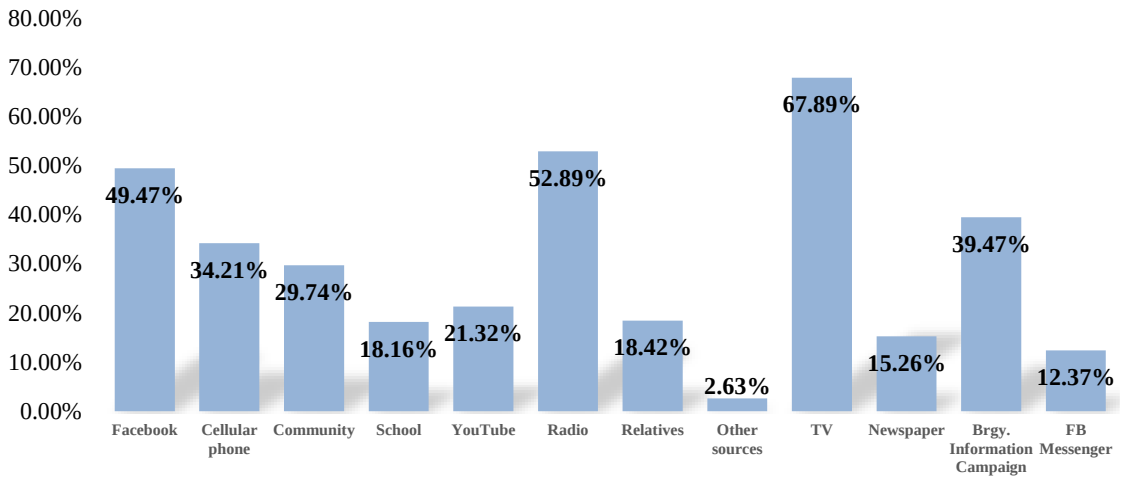


Source of Information, Disaster Awareness, Attitude, and Experiences

Respondents primarily obtained disaster information from TV (67.89%), radio (52.89%), and Facebook (49.47%). Barangay information initiatives and community efforts were cited as information sources by39.47% and 29.74% of respondents, respectively. It illustrates continued reliance on traditional mass media alongside social media (Figure 4).

Figure 4

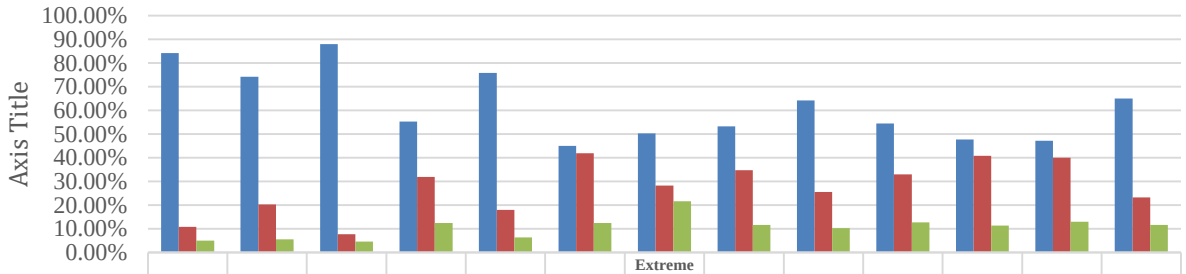
Frequency Distribution of Sources of Disaster Information



Disaster awareness was highest for typhoons (87.9%), earthquakes (84.2%), and floods (75.8%). Conversely, awareness was lower for tornadoes (45.4%), mining disasters (47.8%), and industrial accidents (47.1%). Figure 5, displaying the percentage of "Yes" responses for each disaster type, visually highlights these disparities in awareness.

Figure 5

Frequency Distribution on Disaster Awareness



	Earthquake	Landslide	Typhoon	Storm Surge	Floods	Tornado	Extreme Climatic Variability	War	Pollution	Deforestation	Mining Disasters	Industrial Accidents	Fire
Yes	84.21%	74.21%	87.89%	55.26%	75.79%	45.00%	50.26%	53.16%	64.21%	54.47%	47.63%	47.11%	65.00%
No	10.79%	20.26%	7.63%	31.84%	17.89%	41.84%	28.16%	34.74%	25.53%	32.89%	40.79%	40.00%	23.16%
No Answer	5.00%	5.53%	4.47%	12.37%	6.32%	12.37%	21.58%	11.58%	10.26%	12.63%	11.32%	12.89%	11.58%

Respondents exhibited a generally positive disaster awareness attitude, with an overall mean attitude score of 3.98, indicating an "Agree" verbal description. The highest mean score was recorded for "having a good relationship with neighbors and community" (4.28, "Strongly Agree"). Table 3 provides a detailed breakdown of these attitudes.

Table 3
Disaster Awareness Attitude of the Respondents

Statements	Mean	Verbal Description
I used to participate in voluntary activities for disaster awareness campaigns	3.91	Agree
I am aware of retrofitting of buildings	3.55	Agree
I used to prepare emergency bags for disasters	4.13	Agree
I have a good relationship with my neighbors and community	4.28	Strongly Agree
I think repair of road blockage and transportation breaks are important	3.81	Agree
I give priority to disaster awareness in local, regional, and national level	4.16	Agree
I know recovery after disaster is a crucial work	4.14	Agree
Overall Mean	3.98	Agree

The frequency of experienced disasters varied (Table 4), with typhoons reported as experienced "sometimes" (mean 2.85), while earthquakes (mean 2.25) and floods (mean 2.28) were experienced "rarely". Less common hazards, such as tornadoes, mining, and industrial accidents, were reported as "never" experienced. The observed pattern suggests that awareness levels generally align with the frequency of direct experience with specific hazards.

Table 4
Frequency of Experienced Disasters

Disasters	Mean	Verbal Description
Earthquake	2.25	Rarely
Landslide	1.81	Rarely
Typhoon	2.85	Sometimes
Storm Surge	2.00	Rarely
Floods	2.28	Rarely
Tornado	1.40	Never
ECV	2.41	Rarely
War	1.22	Never
Pollutions	2.08	Rarely
Deforestation	1.58	Never
Mining	1.23	Never
Industrial	1.52	Never
Fire	1.68	Never

Disaster Preparedness

As shown in Table 5, participation in disaster preparedness training was relatively low across respondents, with a higher proportion among BHERTs (35.21%) compared to residents (19.74%). A substantial number in both groups did not specify their training status (64.79% of BHERTs; 66.02% of residents), limiting a more complete assessment of training coverage.

Table 5
Distribution of Respondents to Disaster Preparedness Training Grouped by Occupation

Group by occupation	Disaster preparedness training attended	Frequency	Percentage
BHERTs	Did not specify	46	64.79%
	Attended	25	35.21%
	Total	71	100.00%
Residents	Did not specify	204	66.02 %
	Attended	61	19.74 %
	None	44	14.24 %
	Total	309	100.00%

Furthermore, organized disaster preparedness efforts at the barangay level were reported by a relatively small proportion of BHERTs (Table 6). Only18.31% indicated that training orientations had been organized, and 15.49% reported the availability of preparedness equipment and facilities. These figures suggest that fewer than one in five BHERTs perceived their barangays to have operational structures, which may partly explain the low training participation observed (Table 5).

Table 6

Frequency of BHERTs *who identified as having the Training Organized, Disaster Preparedness Equipment and Facility, and Disaster Preparedness and Management Plan*

Training, equipment, facility, and management plan	Frequency	Percentage
Training Orientation Organized	13	18.31
Disaster preparedness equipment and facility	11	15.49
Disaster preparedness and management plan	8	11.27

Overall, BHERTs' self-perceived disaster preparedness was consistently rated as "Partially Prepared" across all dimensions, with a grand mean of 2.15. Individual dimensions, including systems and structures (2.16), policies and plans (2.18), building competencies (2.18), and equipment and supplies (2.10), showed similar levels of preparedness. These results in Table 7 highlight significant preparedness gaps at the barangay level.

Table 7

Disaster Preparedness of Barangays as Perceived by the BERTs

Statements	AWV	Verbal Description
1. Systems and structures		
Mobilization of BDRRM plan/structures and activation of systems and processes	2.22	Partially Prepared
Evacuation and Relief	2.11	Partially Prepared
Mean	**2.16**	**Partially Prepared**
2. Policies and plans		
Early warning	2.19	Partially Prepared
Mobilization of DRRM structures and activation of systems and processes	2.21	Partially Prepared
Evacuation and Relief	2.14	Partially Prepared
Search and Rescue	2.20	Partially Prepared
Mobilization of DRRM Structures and Activation of Systems and Processes	2.17	Partially Prepared
Mean	**2.18**	**Partially Prepared**
3. Building competencies		
Early warning	2.25	Partially Prepared
Evacuation and relief	2.14	Partially Prepared
Mobilization of DRRM structures and activation of systems and processes	2.13	Partially Prepared
Search and rescue	2.20	Partially Prepared
Lifelines	2.18	Partially Prepared
Mean	**2.18**	**Partially Prepared**
4 Equipment and supplies		
Early warning	2.14	Partially Prepared
Mobilization of DRRM structures and activation of systems and processes	2.05	Partially Prepared
Evacuation and relief	2.04	Partially Prepared
Search and rescue	2.11	Partially Prepared
Lifelines	2.15	Partially Prepared
Mean	**2.10**	**Partially Prepared**
Grand mean	**2.15**	**Partially Prepared**

AWV – Average Weighted Value

Ordinal Logistic Regression Analysis for Disaster Awareness Attitude of the Respondents.

The ordinal logistic regression analysis for disaster awareness attitude revealed that family monthly income and specific topographic locations were significant predictors (Table 8). Higher family monthly income was significantly associated with a more favorable attitude toward disaster awareness ($p = 0.007$, Odds Ratio = 1.54, 95% CI [1.13, 2.10]), indicating that for every unit increase in income category, the odds of having a more favorable attitude increased by 54%.Geographically, respondents living near river-plain

areas showed a significantly greater likelihood of a favorable disaster awareness attitude ($p < 0.001$, Odds Ratio = 21.37, 95% CI [3.81, 119.8]), compared to those in plain areas. Similarly, those near river areas ($p = 0.010$, Odds Ratio = 2.06, 95% CI [1.19, 3.57]) and near river-mountain areas ($p = 0.006$, Odds Ratio = 14.71, 95% CI [1.99, 108.7]) also exhibited more favorable attitudes, relative to plain areas. These findings suggest that exposure to specific environmental hazards is strongly associated with heightened awareness attitudes.

Conversely, living in valley-plain areas was marginally associated with a lower disaster awareness attitude ($p = 0.051$, Odds Ratio = 0.25, 95% CI [0.06, 1.00]), suggesting a potentially diminished perception of danger in these locations. Sex ($p = 0.857$), barangay classification ($p = 0.243$ to 0.465), educational attainment ($p = 0.269$), occupation ($p = 0.576$), age ($p = 0.601$), and frequency of disaster experience ($p = 0.148$) did not significantly influence disaster awareness attitude in this model.

The goodness-of-fit of the ordinal logistic regression model was assessed using several indices. The model yielded a statistically significant overall improvement over the null model, $\chi^2(17) = 56.30$, $p < 0.001$. However, the effect size was modest, as indicated by a Nagelkerke R^2 value of 0.031 and a McFadden R^2 of 0.0291, suggesting that the predictors explained approximately 3% of the variance in disaster awareness attitude. Themodel's Deviance was 1879, with an AIC of 1983 and BIC of 2183, supporting an acceptable, though not strong, model fit. These results imply that specific predictors (e.g., income, topographic location) significantly influence disaster awareness attitude, but other unmeasured factors may also play a substantial role.

Table 8

Ordinal Logistic Regression Analysis for Disaster Awareness Attitude Based on Sex, Barangay Classification (as to vulnerability to disaster), Highest Educational Attainment, Occupation, Family Monthly Income, Age, Frequency of Disaster Experienced, and Topography of Residence for both Residents and BHERTs

Model Coefficients - Disaster Awareness Attitude Mean

						95% Confidence Interval	
Predictor	**Estimate**	**SE**	**Z**	**p**	**Odds ratio**	**Lower**	**Upper**
Sex:							
Male – Female	-0.03620	0.20111	-0.1800	0.857	0.964	0.65027	1.43
Brgy Class:							
Very Highly Vulnerable – Highly Vulnerable	0.25483	0.21829	1.1674	0.243	1.290	0.84118	1.98
Vulnerable – Highly Vulnerable	-0.22711	0.31082	-0.7307	0.465	0.797	0.43253	1.47
Highest Educational Attainment	0.04688	0.04238	1.1063	0.269	1.048	0.96450	1.14
Group by occupation:							
Residents – Barangay Officials	-0.15286	0.27359	-0.5587	0.576	0.858	0.50248	1.47
Family Monthly Income	0.43184	0.15958	2.7061	0.007	1.540	1.12912	2.13
Age	0.00411	0.00786	0.5234	0.601	1.004	0.98878	1.02
Ave Dis-Often	0.22823	0.15774	1.4469	0.148	1.256	0.92205	1.71
Topography of residence:							
mountain – plain	-0.05470	0.29096	-0.1880	0.851	0.947	0.53475	1.67
coastal – plain	-0.02301	0.26736	-0.0861	0.931	0.977	0.57869	1.65
near river-plain – plain	3.06196	0.91284	3.3543	< .001	21.369	4.02728	167.33
near river – plain	0.72552	0.28297	2.5639	0.010	2.066	1.18756	3.60
none of the above – plain	-0.11504	0.87112	-0.1321	0.895	0.891	0.15955	5.04
near river - mountain – plain	2.68857	0.98285	2.7355	0.006	14.711	2.34997	126.39
valley – plain	-1.39978	0.71883	-1.9473	0.051	0.247	0.05824	1.03
island – plain	0.21290	0.70073	0.3038	0.761	1.237	0.30617	4.85
near road – plain	-1.28109	2.05139	-0.6245	0.532	0.278	0.00852	8.47

Model Fit Measures

Overall Model Test

Model	Deviance	AIC	BIC	R^2_{McF}	R^2_{CS}	R^2_N	χ^2	df	p
1	1879	1983	2183	0.0291	0.00450	0.0313	56.3	17	< .001

Note. The dependent variable 'Disaster Awareness Attitude Mean' has the following order: 1.00 | 1.14 | 1.43 | 2.00 | 2.14 | 2.29 | 2.33 | 2.43 | 2.57 | 3.00 | 3.14 | 3.17 | 3.29 | 3.33 | 3.40 | 3.43 | 3.50 | 3.57 | 3.67 | 3.71 | 3.75 | 3.83 | 3.86 | 4.00 | 4.14 | 4.17 | 4.20 | 4.29 | 4.33 | 4.43 | 4.50 | 4.57 | 4.71 | 4.80 | 4.86 | 5.00

Ordinal Logistic Regression Analysis for Disaster Preparedness of BHERTs

For BHERT preparedness, the ordinal logistic regression analysis identified the highest educational attainment, barangay classification, and age as significant predictors (Table 9). Higher educational attainment was a significant positive predictor of BHERT preparedness (p = 0.024, Odds Ratio = 1.29, 95% CI [1.04, 1.63]), indicating that for each unit increase in educational level, the odds of higher preparedness increased by 29%.Barangay classification also significantly influenced BHERT preparedness. BHERTs in "Very Highly Vulnerable" barangays showed significantly higher preparedness (p = 0.023, Odds Ratio = 4.68, 95% CI [1.25, 18.17]) compared to those in "Highly Vulnerable" areas. Similarly, BHERTs in "Vulnerable" barangays also demonstrated higher preparedness (p = 0.050, Odds Ratio = 2.99, 95% CI [1.10, 9.17]) relative to "Highly Vulnerable" areas.

Conversely, age was inversely correlated with BHERT readiness (p = 0.030, Odds Ratio = 0.95, 95% CI [0.91, 0.99]), suggesting that for every one-year increase in age, the odds of higher preparedness decreased by 5%. Family monthly income (p = 0.466), sex (p = 0.403), disaster preparedness training attended (p = 0.977, p = 0.268), and disaster awareness attitude (p = 0.578) were not significant predictors of BHERT preparedness in this model. The overall model was not statistically significant, $\chi^2(9) = 14.8$, p = 0.096, suggesting that the whole model did not significantly improve upon the null model. Furthermore, model fit indicators such as the Nagelkerke $R^2 = 0.0445$, Cox & Snell $R^2 = 0.0404$, and McFadden $R^2 = 0.00837$ all suggest the model has very low explanatory power, explaining less than 5% of the variance in preparedness.

Table 9

Ordinal Logistic Regression Analysis for Disaster Preparedness Based on Age, Highest Educational Attainment, Family Monthly Income, Sex, Barangay Classification (as to vulnerability to disaster), Occupation, Disaster Preparedness Training Attended by BHERT

Model Coefficients - Grand Mean Disaster Preparedness

						95% Confidence Interval	
Predictor	**Estimate**	**SE**	**Z**	**p**	**Odds ratio**	**Lower**	**Upper**
Age	-0.0496	0.0229	-2.1693	0.030	0.952	0.908	0.994
Highest Educational Attainment	0.2574	0.1137	2.2638	0.024	1.294	1.041	1.629
Family Monthly Income	-0.3106	0.4263	-0.7286	0.466	0.733	0.318	1.716
Sex:							
Male – Female	-0.4178	0.4993	-0.8368	0.403	0.658	0.246	1.755
Brgy Class:							
Very Highly Vulnerable – Highly Vulnerable	1.5428	0.6783	2.2743	0.023	4.678	1.255	18.172
Vulnerable – Highly Vulnerable	1.0963	0.5602	1.9570	0.050	2.993	1.010	9.170
Disaster preparedness training attended:							
Attended – Did not specify	0.0151	0.5136	0.0294	0.977	1.015	0.368	2.790
None – Did not specify	1.7346	1.5658	1.1078	0.268	5.667	0.183	177.030
Disaster Awareness Att	0.1575	0.2832	0.5560	0.578	1.171	0.677	2.081

Model Fit Measures

							Overall Model Test		
Model	**Deviance**	**AIC**	**BIC**	R^2_{McF}	R^2_{CS}	R^2_N	χ^2	**df**	**p**

Model Fit Measures

							Overall Model Test		
Model	**Deviance**	**AIC**	**BIC**	**R^2_{McF}**	**R^2_{CS}**	**R^2_N**	**χ^2**	**df**	**p**
1	353	425	502	0.0404	0.00837	0.0445	14.8	9	0.096

Note. The dependent variable 'Grand Mean Disaster Preparedness' has the following order: 2.0 | 1.0 | 3.0 | 1.94 | 1.73 | 1.76 | #DIV/0! | 2.06 | 2.41 | 1.88 | 2.94 | 2.12 | 1.65 | 1.69 | 2.82 | 2.19 | 2.13 | 1.06 | 2.08 | 2.88 | 1.5 | 2.35 | 1.71 | 2.69 | 1.57 | 2.2 | 2.5 | 2.86

Discussion

This study aimed to assess disaster awareness and preparedness among BHERTs and residents in Dapitan City, identifying the influence of geographic and socioeconomic predictors. The findings reveal a critical dichotomy: while general awareness of common hazards is high, practical preparedness measures remain largely insufficient, particularly at the community and BHERT levels. The analysis successfully identified key socioeconomic factors (education, income) and geographic vulnerabilities as significant predictors, underscoring their crucial role in shaping awareness, attitudes, and preparedness levels. These results directly address the study's objectives and provide a nuanced understanding of local disaster readiness.

Theoretical Engagement and Interpretation of Predictors

Socioeconomic Factors: Education and Income. Higher educational attainment significantly predicts BHERT preparedness, aligning with evidence oneducation's role in disaster readiness (Bahramzadeh Gendeshmin et al., 2025; Rivera, 2021; Han & Wu, 2024). Education enhances cognitive capacities to process complex information, interpret risks, and apply knowledge, thereby improving protocol adherence, training participation, and community-level risk reduction. Knowledge also positively predicts disaster-risk perception (Heydari et al., 2022, as cited in Bahramzadeh Gendeshmin et al., 2025), reinforcing the pathway from education to preparedness. Izquierdo-Condoy et al., (2023) consistently highlighted that preparedness—often developed through undergraduate and postgraduate disaster training—is critical to the effectiveness of health personnel and essential for mitigating disaster impact.

Higher family monthly income is positively associated with a favorable disaster awareness attitude, since wealthier households can afford preparedness resources such as emergency supplies and home retrofitting (Yuan et al., 2021). Low-income households face systemic barriers, limiting their ability to convert awareness into preparedness, often prioritizing basic needs over disaster planning (Yuan et al., 2021). This relationship highlights that while awareness exists across income levels, converting it to proactive attitudes is often economically mediated, forming a resource-action nexus.Addressing socioeconomic disparities is crucial for equitable preparedness, as lower-income individuals face barriers regardless of knowledge.

Despite individual predictor significance, the ordinal logistic regression model for disaster awareness attitude, though overall statistically significant ($\chi^2(17) = 56.30$, $p < 0.001$), showed limited explanatory power (Nagelkerke $R^2 = 0.031$), explaining only about 3% of variance. This low power indicates unmeasured determinants beyond demographics and location, such as psychosocial motivators, cultural beliefs, or information credibility, which may be stronger drivers. Future research should broaden its scope to capture these nuanced influences.

Geographic Factors: Vulnerability and Topography. The study's results indicate that residing in highly vulnerable barangays significantly predicts BHERT preparedness, and proximity to rivers and mountainous areas correlates with a more favorable disaster awareness attitude among residents. This aligns with Risk Perception Models: direct, frequent hazard exposure (e.g., floods, landslides) heightens perceived risk, fostering proactive awareness and, for BHERTs, a greater imperative for robust preparedness. Findings are consistent with Dariagan et al. (2021) on varying geographic preparedness levels.

A noteworthy nuance is that disaster awareness was lower in valley-plain areas, suggesting potential risk underestimation due to less frequent direct disaster experiences. This highlights a risk communication challenge: less threatened areas may develop "optimism bias" or "normalcy bias," reducing preparedness despite vulnerabilities. This underscores that risk communication must be tailored to perceived risk levels and historical experiences of geographic subgroups. Perceived risk is critical; Vergil and Khan (2025) found that risk assessment shapes aid program participation, and flood-prone respondents showed that subjective insecurity drives preparedness and aid reliance.

The overall model for BHERT preparedness was not statistically significant ($\chi^2(9) = 14.80$, $p = 0.096$), with a Nagelkerke $R^2 = 0.0445$, explaining only about 4.5% of variance. This indicates that while some individual variables (age, education, barangay vulnerability) were significant, the combined predictors offer limited explanatory value for BHERT preparedness. The low R^2 suggests measured factors are poor predictors of barangay preparedness, implying unmeasured factors like institutional readiness, training quality, or psychosocial motivators may be more influential.

Age and Preparedness. The inverse correlation between age and BHERT preparedness is complex. This contrasts with Kim and Kim (2022),who reported higher disaster preparedness in older age brackets, but aligns with Titko and Ristvej (2020), suggesting the relationship is not universally positive. Contributing factors in Dapitan City may include older BHERT members' diminished physical capacity, reduced engagement in technology-reliant training, or generational differences in information-seeking. This points to a systemic issue in supporting older BHERT members, suggesting current training/dissemination methods may not be accessible or tailored to older adults, leading to reduced perceived preparedness. Inclusive preparedness strategies that consider diverse demographic needs are crucial.

Bridging Awareness and Preparedness: The Role of Information and Action

A central finding of this study is the persistent "knowledge-action gap" between high disaster awareness for common hazards and the overall lack of practical preparedness. Information alone does not translate to tangible behaviors; bridging this gap requires addressing factors beyond cognitive awareness, such as resource access, perceived self-efficacy, and collective efficacy, which are closely linked to social capital theory. Reliance on traditional mass media (radio, TV) and social media (Facebook) for disaster information, coupled with lower engagement in barangay-level campaigns, suggests a disconnect in dissemination strategies. While mass media raises general awareness, localized campaigns translate this into actionable behaviors, foster community engagement, and build collective efficacy.

The positive attitude towards "good relationships with neighbours and community "reflects strong cultural social cohesion, a key bonding social capital component. Social Capital Theory posits these relationships as resources for refuge and resilience, facilitating information exchange and mutual support. However, Su and Thayaalan (2024) note that while social capital is valued, its functional application may be limited or context-dependent, primarily for economic support where trust is confined to immediate relatives. This nuanced understanding is vital for effective community-based DRRM, moving beyond simplistic views of community ties. Preparedness in high-risk areas is shaped by economic capacity, cultural, and social bonds; Okun and Arun's (2020) study shows that collectivist cultures enhance preparedness through social resources and family cohesion, mirroring the finding that vulnerable area respondents rely on community-based knowledge over formal training.

Systemic Gaps in Barangay Preparedness

The consistent "Partially Prepared" status of BHERTs across all dimensions (systems and structures, policies and plans, building competencies, equipment and supplies) indicates significant systemic deficiencies at the barangay level. Low rates of organized training, equipment availability, and formal management plans further compound this. These institutional shortcomings impede translating individual awareness into a collective, effective disaster response. This situation reflects a lack of organizational capacity or institutional resilience within local governance, which is critical for comprehensive DRRM.

Despite individual BHERT awareness or positive attitudes, the absence of robust systems, adequate equipment, and consistent training prevents higher preparedness. These findings align with Dariagan et al., (2021) on varying LGU preparedness, underscoring the need to shift focus from individual to foundational and structural elements of local disaster management.

Limitations and Future Research

This study, while insightful for Dapitan City, has limitations. Its cross-sectional design precludes definitive causal relationships; associations were identified, but direct causality cannot be inferred. Reliance on self-reported data may introduce social desirability bias. The specific geographic focus limits direct generalizability to other regions without further validation. Future research could address these limitations. Longitudinal studies would track changes and establish causal links between interventions and outcomes. Qualitative research (e.g., interviews, focus groups) could explore underlying barriers to preparedness, providing richer contextual data. Intervention studies testing tailored programs based on identified predictors would offer practical validation. Expanding geographic scope would enhance generalizability and allow broader comparative analyses.

Conclusion

This study reveals a complex interplay of geographic and socioeconomic factors shaping disaster awareness and preparedness in Dapitan City. While residents exhibit high awareness of common hazards, a significant gap persists in their practical preparedness. This finding directly challenges a simplistic view of risk perception, suggesting that awareness alone is an insufficient driver of preparedness behavior.

The analysis showed that higher educational attainment and income were significant predictors of BHERT preparedness and more favorable awareness attitudes, respectively. Geographic vulnerability also played a crucial role, with residents in riverine and mountainous areas exhibiting heightened awareness compared to those in valley-plain areas. An inverse relationship between age and BHERT preparedness was also found. However, systemic deficiencies at the barangay level often undermine these individual strengths, where teams consistently reported being "Partially Prepared." Furthermore, while community relations indicate a strong foundation of social capital, a lack of institutional and physical resources limits its practical utility.

A key finding from our statistical models is their low explanatory power (low R^2), demonstrating that the measured variables are not the sole determinants of readiness. This underscores that current theoretical frameworks, which often focus on individual demographics and knowledge, are incomplete. Therefore, a more holistic theoretical framework is necessitated, incorporating institutional capacity, training quality, and psychosocial motivators to explain preparedness outcomes better. This approach moves beyond simple correlation to uncover underlying mechanisms and inform the development of more effective interventions.

Based on the study's findings, the following actionable recommendations are proposed to enhance disaster preparedness in Dapitan City:

- **For Local Government Units (LGUs) and Barangay Councils:**
  Strengthen Localized Training: Implement regular, targeted training beyond individual knowledge to build collective efficacy. These programs should be tailored to specific barangay risks and address the limitations highlighted by the study's statistical models.
  Increase Resource Allocation: Advocate for increased funding to improve barangay-level equipment and facilities, directly addressing the "Partially Prepared" status of BHERTs.
  Develop Tailored Plans: Support barangays in creating disaster management plans that reflect their unique vulnerabilities.

- **For community leaders and local organizations:**
  Improve Dissemination: Use media (radio, TV, and Facebook) for campaigns that explicitly

promote practical preparedness behaviors, not just general awareness.
Foster Community Initiatives: Build on the cultural value of *bayanihan* by supporting community-led initiatives like drills and early warning systems to convert social capital into tangible actions.

- **For the City Disaster Risk Reduction and Management Office (CDRRMO):**
  Enhance BHERT Training: Re-evaluate and improve BHERT training curricula to be more practical and hands-on, focusing on psychosocial resilience and institutional readiness.

References

Bahramzadeh Gendeshmin, S., Rostamzadeh, S., & Dowlati, M. (2025). Evaluation of disaster risk perception and influencing factors among hospital personnel using structural equation modeling. *Scientific Reports, 15*, 12780. https://doi.org/10.1038/s41598-025-97747-0

Banquiao, Q. & Maratas, E. N. (2015). Knowledge on Natural and Anthropogenic Disasters of Political Leaders in the First District of Zamboanga del Norte. *The Threshold,* 10(1). http://researchnew.jrmsu.edu.ph/index.php/files/article/view/100

Claridge, T. (2015). Bourdieu on social capital – theory of capital. *Institute for Social Capital*. https://www.socialcapitalresearch.com/bourdieu-on-social-capital-theory-of-capital/

Cabico, G. K. (2023 March 1). *Philippine provinces among areas at most risk from climate damage*. Philstar.com.https://www.philstar.com/headlines/climate-andenvironment/2023/03/01/2248552 /philippine- provinces-among-areas-most-risk-climate-damage

Campiseño, J.S. (2015). Disaster Knowledge and Awareness Associated to Preparedness in the First Congressional District in Zamboanga del Norte. *The Threshold,* 10(1). http://researchnew.jrmsu.edu.ph/index.php/files/article/view/95

Castañeda, J.V., Bronfman, N.C., Cisternas, P.C. (2020). Understanding the culture of natural disaster preparedness: exploring the effect of experience and socio demographic predictors. *Nat Hazards* 103, 1881–1904 (2020). https://doi.org/10.1007/s11069-020-04060-2

Dariagan, J. D., Atando, R. B., & Asis, J. L. B. (2021). Disaster preparedness of local governments in Panay Island, Philippines. *Natural hazards (Dordrecht, Netherlands), 105*(2), 1923–1944. https://doi.org/10.1007/s11069-020-04383-0

Department of the Interior and Local Government (2020). *Memorandum Circular No. 2020-023: Amended Guide to Action Against the 2019 Novel Coronavirus Acute Respiratory Disease.* https://www.dilg.gov.ph/PDF_File/issuances/memo_circulars/dilg-memocircular-202026_9dec468b19.pdf

Esquire Philippines (2023 February 27). *These are the highest at-risk Philippine Provinces for Climate Change-Driven Disasters.* https://www.esquiremag.ph/politics/news/the-17-highest-at-risk-provinces-for-climate-change-in-the-philippines-a00203-20230227

Flores, B. (2015). Estimating the Vulnerability for Natural Hazards of Zamboanga del Norte Based on Knowledge, Awareness, and Preparedness. *The Threshold,* 10(1). http://researchnew.jrmsu.edu.ph/index.php/files/article/view/97

Gauntlett, D. (2011). Three approaches to social capital. In *Making is Connecting* (p. 131). https://davidgauntlett.com/wp-content/uploads/2018/04/gauntlett2011-extract-sc.pdf

Guillena, M.D. & Aquino, J. (2015). Knowledge on Natural and Anthropogenic Disaster of the Various Sectors in the Second District of Zamboanga del Norte. *The Threshold,* 10(1). http://researchnew.jrmsu.edu.ph/index.php/files/article/view/96

Hallegatte, S., Vogt-Schilb, A., Rozenberg, J., Bangalore, M. & Beaudet, C. (2020). From Poverty to Disaster and Back: A Review of the Literature. *EconDisCliCha* 4, 223–247. https://doi.org/10.1007/s41885-020-00060-5

Han, Z., & Wu, G. (2024). Why do people not prepare for disasters? A national survey from China. *npj Natural Hazards, 1*(1), 1. https://doi.org/10.1038/s44304-024-00001-2

Hargono, A., Artanti, K. D., Astutik, E., Widodo, P. P., Trisnawati, A. N., Wardani, D. K., & Lioni, E. (2023). Relationship between disaster awareness and disaster preparedness: online survey of the community in Indonesia. *Journal of public health in Africa*, 14(9), 2376. https://doi.org/10.4081/jphia.2023.2376

Izquierdo-Condoy, J. S., Montiel-Alfonso, M. A., Nati-Castillo, H. A., Saucedo, R., Jaramillo-Aguilar, D. S., Nanjari-Barrientos, C., García-Arévalo, C., Rivera-Flores, D., Díaz Batista, M. I., Loaiza-Guevara, V., & Ortiz-Prado, E. (2023). Knowledge, perceptions, and practices on risks and disasters among medical students: A multicenter cross-sectional study in 9 Latin American and Caribbean countries. *Advances in Medical Education and Practice, 14*, 225–235. https://doi.org/10.2147/AMEP.S394331

Jacinto, J. W. V., & Campiseño, E. R. (2015). Knowledge on Natural and Anthropogenic Disasters of People in Isolated Areas in the Province of Zamboanga del Norte. *The Threshold*, 10(1). https://doi.org/10.5281/zenodo.7358026

Kalın, B., & Yeşilyurt, M. (2025). The effect of disaster risk perceptions on disaster preparedness levels of students at a university in Turkey. *BMC Emergency Medicine, 25*, 114. https://doi.org/10.1186/s12873-025-01263-3

Kim Y, Kim MY (2022) Factors affecting household disaster preparedness in South Korea. *PLOS ONE* 17(10): e0275540. https://doi.org/10.1371/journal.pone.0275540

Laput, G. (2019, May 18). *Jalosjos proclaimed mayor in Dapitan City*. https://www.pna.gov.ph/articles/1070167

Noriega, R. (2023 February 23). *17 PH provinces among top at-risk areas for climate damage — report*. GMA News Online. https://www.gmanetwork.com/news/topstories/nation/861738/17-philippine-regions-among-top-at-risk-areas-for-climate-damage-report/story/

Okun, O., & Arun, K. (2020). Relationships between Psychological Resilience and Work Engagement: Field Study in the Geography of Tragedies; Afghanistan Universities. *FWU Journal of Social Sciences*, *14*(3), 88-101. https://ojs.sbbwu.edu.pk/fwu-journal/index.php/ojss/article/view/53/1

Padua, R. & Campiseño, E., & Campiseño, L. (2015). Knowledge for Disaster Preparedness: A Literature Review. *The Threshold*, 10(1). http://researchnew.jrmsu.edu.ph/index.php/files/article/view/91

Philippine Statistics Authority. (2019, July 10). https://psa.gov.ph/sites/default/files/City%20and%20Municipal-level%20Small%20Area%20Poverty%20Estimates_%202009%2C%202012%20and%20 2015_0.xlsx

Philippine Statistics Authority (2022). *Table 1. Annual Per Capita Poverty Threshold and Poverty Incidence Among Families with Measures of Precision, by Region and Province: 2015, 2018, and 2021p-PX-Web*. (2022, January 14). PX-Web. https://openstat.psa.gov.ph:443/PXWebPXWeb/pxweb/en/DB/DB__1E__FY/0011E3DF010.px/

Philippine Statistics Authority (2022b). *Proportion of Poor Filipinos was Recorded at 18.1 Percent in 2021*. Retrieved from https://psa.gov.ph/poverty-press releases/nid/167972

Philippine Statistics Authority (2022c). *2021 Full Year Official Poverty Statistics of the Philippines*: *Preliminary 2021 full report*. Retrieved from https://psa.gov.ph/sites/default/files/Preliminary%202021%20Full%20Year%20Poverty%20Statistics%20Publication_15Aug2022.pdf

Porio, E., and Roque-Sarmiento, E. (2019). "*Barangay*." In Orum, A. (ed) The Wiley Blackwell Encyclopedia of Urban and Regional Studies. *John Wiley & Sons Ltd.*, New Jersey. DOI: 10.1002/9781118568446.eurs0016

Rivera, J.D. (2021). Factors Influencing Individual Disaster Preparedness Information Seeking Behavior: Analysis of US Households. *Natural Hazards Review, 22*(4). https://doi.org/10.1061/(ASCE)NH.1527-6996.0000510

SAMHSA (2017). *Greater Impact: How Disasters Affect People of Low Socioeconomic Status.* Disaster Technical Assistance Center Supplemental Research Bulletin. https://www.samhsa.gov/sites/default/files/dtac/srb-low-ses_2.pdf

Statista Research Department (2024 January 9). *Natural disasters in the Philippines*. https://www.statista.com/topics/5845/natural-disasters-in-the-philippines-at-a-glance/

Su, Y. & Thayaalan, S. (2024). Empty pantries: The death of survival myths among typhoon Haiyan survivors in resettlement sites during COVID-19. *International Journal of Disaster Risk Reduction, 108.* https://doi.org/10.1016/j.ijdrr.2024.104460.

Subong, J. & Luza, R. (2015). Knowledge on Natural and Anthropogenic Disasters of the Various Sectors in the Third District of Zamboanga del Norte. *The Threshold,* 10(1). http://researchnew.jrmsu.edu.ph/index.php/files/article/view/98

Telen, J. & Villadarez, C. (2015). Disaster Risk Preparedness Among People in Isolated Areas in the Province of Zamboanga del Norte. *The Threshold,* 10(1). http://researchnew.jrmsu.edu.ph/index.php/files/article/view/94

Titko, M., & Ristvej, J. (2020). Assessing Importance of Disaster Preparedness Factors for Sustainable Disaster Risk Management: The Case of the Slovak Republic. *Sustainability*, *12*(21), 9121. https://doi.org/10.3390/su12219121

Toyon, M. A. S. (2022). The Three 'R's of Social Capital: A Retrospective. *FWU Journal of Social Sciences*, *16*(4), 1-15. http://doi.org/10.51709/19951272/Winter2022/1

Twigg, J. (2013). Risk perception, public education and disaster risk management. In *Advances in natural and technological hazards research* (pp. 171–182). https://doi.org/10.1007/978-94-007-6184-1_10

United Nations Office for Disaster Risk Reduction (2023 March 28). *Vulnerable Philippines – working towards climate adaptation.* PreventionWeb. https://www.preventionweb.net/news/vulnerable-philippines-working-towards-climate-adaptation

Vadil, C. F., Castriciones, S. O., Anduyan, D., Zulueta, D., & Quimzon, L. L. (2025). Filipino organizational resilience (FilOR): Development of research framework and instrument in Philippine setting. *International Journal of Research Studies in Education, 14*(9), 143–150. https://doi.org/10.5861/ijrse.2025.25096

Vergil, H., & Khan, A. U. I. (2025). The Hidden Drivers of Social Transfers: Understanding How Risk Perception Influences Social Transfer Decisions in Turkey. *FWU Journal of Social Sciences*, *19*(1), 12-24. http://doi.org/10.51709/19951272/Spring2025/2

World Bank (2023, November 2). *Towards a Comprehensive Disaster Risk Management System for the Philippines*.https://www.worldbank.org/en/country/philippines/brief/towards-a-comprehensive-disaster-risk-management-system-for-the-philippines#:~:text=The%20Philippines%20is%20one%20of,record%20of%20typhoons%20every%20year.

Yuan, F., Esmalian, A., Oztekin, B., & Mostafavi, A. (2021). Unveiling spatial patterns of disaster impacts and recovery using credit card transaction variances. *arXiv*.https://arxiv.org/abs/2101.10090

Zhao, G., Xu, H., Zhao, F., Feng, L., Lu, Y., & Zhang, Y. (2025). How does social capital facilitate community disaster resilience? A systematic review. *Frontiers in Environmental Science*, *12*, 1496813. https://doi.org/10.3389/fenvs.2024.1496813