

Original Article

Awareness and Preparedness on Volcanic Eruption among Residents in the Danger Zone

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Abstract

This study investigated the levels of awareness and preparedness regarding volcanic eruptions among residents in the municipality of Mambajao, Camiguin, a locale where all the barangays are situated within volcanic danger zones. Utilizing a quantitative-descriptive design, data were gathered from 378 respondents across 15 barangays using a non-probability purposive sampling technique. Before the actual implementation, research protocols and ethical standards were religiously observed in carrying out the inquiry. Appropriate statistical tools were used to produce reliable results for dissemination. The findings revealed that the residents possess a moderate level of awareness ($M=3.13$), and a high level of preparedness ($M=3.34$). Moreover, the residents exhibited a statistically significant and very strong positive correlation ($r = 0.812$, $p < .001$) between awareness and preparedness, with awareness explaining 65.93% of the variation in preparedness levels. Results also showed significant differences across all explanatory variables. Notably, newer residents (less than one year) and those in close proximity to the volcano demonstrated higher vigilance compared to long-term residents, who exhibited normalization of awareness for having known it a long time. Additionally, low-income and smaller households showed significantly higher readiness, likely due to simplified coordination and a higher perceived vulnerability. This study concluded that although cultural memory and folk awareness drive high preparedness, critical gaps remain in formal information dissemination, particularly regarding specific evacuation routes and the

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filtering of misinformation on social media. The results underscore the need for local government units to bridge the last mile of risk communication to ensure that high psychological readiness translates into effective, coordinated action during a volcanic event.

Keywords: danger zone, disaster awareness and preparedness, volcanic eruptions

1. Introduction

Places with identified existing volcanoes are always at risk, regardless of the time of day. Volcanic eruptions pose a huge hazard or danger to all people within their reach. This remains the most catastrophic natural hazard, whose damage can certainly ruin socio-economic stability and endanger human lives. In the global context, volcanic crises have shown that, notwithstanding the advanced monitoring systems, community resilience entirely depends on the awareness and proactive preparedness of the residents in the locality. The Philippines is no exception to this since it lies within the Pacific Ring of Fire, and is always a subject of laboratory studies due to its numerous active vents and at-risk people (Newhall & Solidum, 2017).

The effect of volcanic eruptions is inevitable, as in the recurring activity of Mount Mayon, particularly in 2018, which displaced 82,000 residents from their homes and sources of livelihood. Back then, the 1951 eruption of Mount Hibok-Hibok, which claimed over 3,000 lives, gave birth to the creation of the Commission on Volcanology, now known as the Philippine Institute of Volcanology and Seismology (PHIVOLCS). However, Behera (2021) confirmed that, as decades pass, people simply put the horror of volcanic eruptions into amnesia, while socio-economic pressures often lead residents to reoccupy the danger zones for agricultural and tourism activities. This is evident in the island born of fire, the Province of Camiguin, where business establishments and tourist destinations are mushrooming in volcanic danger zones.

Martinez et al. (2022) demonstrated that, despite the early warnings issued months in advance, the 2020 eruption of Taal Volcano created widespread displacement and infrastructure damage due to communication gaps and preparedness at the community level. According to Bollettino (2020), awareness of a volcano's presence in the locality does not automatically imply or translate into preparedness behavior among the people in the community. In a province surrounded by water like Camiguin, evacuation routes are geographically constrained, a real gap to understand carefully.

To strengthen the analytical framework of this inquiry, this study aligns with the Protection Motivation Theory (PMT), which suggests that individuals protect themselves based on four factors: the perceived severity of a threatening event, the perceived probability of the occurrence, the efficacy of the recommended preventive

behavior, and the perceived self-efficacy. By anchoring the variables of awareness and preparedness on this theoretical foundation, the study provides a rigorous basis for understanding how residents process volcanic risks and translate that knowledge into protective actions.

Since the safety of life is paramount to everything, this research aims to evaluate the current level of awareness and preparedness among the residents residing within the identified volcanic hazard zones of Camiguin. Through this, the local Disaster Risk Reduction and Management (DRRM) can formulate steps to strengthen existing precautionary measures to effectively safeguard the lives of the Camiguinons. The findings of this undertaking can serve as a springboard for an evidence-based action plan to enhance local resilience and get rid of that tragic history in 1951. Laingo et al. (2024) posited that the preparedness of the people living in the danger zone and the local government units are the best tools to keep lives safe.

2. Methodology

This study utilized a quantitative-descriptive research design. However, qualitative techniques were employed, specifically casual interviews and focus group discussions (FGDs), exclusively during the preparatory phase to ensure the research instrument was contextually grounded and culturally sensitive. The primary investigation follows a quantitative approach to statistically describe the levels of awareness and preparedness and to determine the correlations and differences across demographic variables.

The researcher conducted this inquiry in the province of Camiguin, specifically in the municipality of Mambajao. According to PHIVOLCS, this town is a high-risk area, having historically suffered significant casualties during the 1948–1953 eruption of Mt. Hibok-Hibok. All 15 barangays of Mambajao were included in this inquiry, as the entire municipality is situated within the identified volcanic danger zones.

Since the researcher does not possess control over the target respondents, a purposive-convenience sampling design was employed to identify respondents across the 15 barangays of Mambajao, Camiguin. As reflected in the inclusion criteria, the study was purposive in nature, specifically targeting residents residing within the designated volcanic danger zones. However, the final selection was conducted via convenience sampling based on the availability and voluntary consent of the residents during the data collection period.

Before the actual gathering of data, the researcher coordinated with the respective Barangay Chairpersons of the 15 localities to facilitate access to the residents. Due to the unpredictable availability of inhabitants and the necessity of strictly voluntary participation, a non-probability approach was deemed the most feasible logistical strategy.

Prospective participants were briefed on the study's objectives, and those who expressed willingness to participate were provided with an Informed Consent Form. Only those who executed the signed consent were recorded as official samples for their

respective barangays. This process ensured that the sample size of 378 respondents, determined through the application of Slovin's Formula based on the municipal population of approximately 41,782 to achieve a 95% confidence level, was built upon a foundation of active cooperation and ethical clearance.

The primary data collection tool was a researcher-made survey questionnaire. The development of the instrument involved three stages: (1) an extensive literature review of volcanic hazard studies in the Philippines, (2) preliminary casual interviews and FGDs with local residents to capture community-specific terminologies, and (3) the synthesis of these inputs into a structured 4-point Likert scale format.

The instrument is divided into two parts: Part A collects demographic data (barangay affiliation, residency years, income, and household size), and Part B measures the latent variables through ten (10) indicators each for Awareness (Independent Variable) and Preparedness (Dependent Variable). To ensure comprehension across various educational levels and besides the English language, the tool was administered in the local Bisaya/Cebuano dialect.

To establish content validity, the instrument was subjected to a rigorous evaluation by four (4) subject matter experts from PHIVOLCS, the NDRRMC, and local DRRM offices. These experts assessed the items for relevance, clarity, and technical accuracy using a validation rubric. Following their feedback, items were refined to ensure they accurately measured the intended constructs of volcanic risk.

The reliability of the instrument was established through a pilot test with 30 residents from a neighboring high-risk municipality, particularly in the municipality of Catarman of the same province. Internal consistency was measured using Cronbach's Alpha. The analysis yielded a coefficient of 0.87 for the Awareness scale and 0.85 for the Preparedness scale, both exceeding the 0.70 threshold for high reliability.

Data collection was conducted in three phases. First, administrative clearances were secured from the Municipal Mayors of Catarman (for pilot testing) and Mambajao (for the actual study). Second, the researcher conducted site visits and coordinated with Barangay Chairpersons to distribute the questionnaires and Informed Consent Forms. Participants were given two weeks to complete the survey. Finally, retrieved instruments were audited for completeness before the data were encoded into a Microsoft Excel worksheet for analysis.

Since the perceptions of the respondents in terms of awareness and preparedness regarding volcanic eruptions among respondents in the danger zones of Mambajao, Camiguin, a structured scoring procedure was provided for this purpose.

Table 1 below provides arbitrary values and statistical limits with their corresponding qualitative description and interpretation. The arbitrary values were used to appreciate the individual responses, while the statistical limits were used to determine the extent of awareness per construct and the overall perception of the respondents.

Table 1. Guide in appreciating the perceived awareness of volcanic eruptions among the respondents.

Arbitrary Value	Statistical Limit	Qualitative Description	Interpretation
4	3.26 – 4.00	Very High Extent	Respondents possess comprehensive knowledge and are fully aware of volcanic hazards and warning systems.
3	2.51 – 3.25	High Extent	Respondents possess sufficient knowledge and are aware of volcanic hazards and warning systems.
2	1.76 – 2.50	Moderate Extent	Respondents possess limited knowledge and are only slightly aware of volcanic hazards and warning systems.
1	1.00 – 1.75	Low Extent	Respondents possess no significant knowledge and are not aware of volcanic hazards and warning systems.

Similarly, Table 2 used the same arbitrary values, statistical limits, and qualitative descriptions. This differs only in terms of the interpretation of results.

Table 2. Guide in appreciating the perceived preparedness of volcanic eruptions among the respondents.

Arbitrary Value	Statistical Limit	Qualitative Description	Interpretation
4	3.26 – 4.00	Very High Extent	Respondents consistently practice and are always prepared for volcanic eruption contingencies.
3	2.51 – 3.25	High Extent	Respondents frequently practice and are generally prepared for volcanic eruption contingencies.
2	1.76 – 2.50	Moderate Extent	Respondents occasionally practice and are only slightly prepared for volcanic eruption contingencies.
1	1.00 – 1.75	Low Extent	Respondents do not practice readiness measures and are not prepared for volcanic eruption contingencies.

Based on the inquiries of the study, the appropriate statistical tools were determined based on the assumptions of using parametric tests; otherwise, the non-parametric tests were used as a robust alternative statistical tool to analyze data regardless of its distribution. The analysis of data was done using the Jamovi statistical software. Frequency and percentage were used to describe the demographic profile of the respondents of the study. Mean and standard deviation were used to describe the perceived awareness and preparedness on volcanic eruptions. For inferential problems, one-way analysis of variance (ANOVA) and independent samples t-test for the test of significant difference when respondents were grouped by variable. Tukey's test was utilized for post hoc analysis. Finally, the Pearson Product-Moment Correlation Coefficient was used to test the significant association between awareness and preparedness in volcanic eruptions.

Ethical integrity was maintained by securing informed consent, ensuring voluntary participation, and guaranteeing the anonymity and confidentiality of all

respondent data. The researcher ensured that all participants were fully informed of the study's purpose and their right to withdraw at any point without penalty.

3. Results

According to the PHIVOLCS-Camiguin, around 90 percent of the barangays comprising the municipality of Mambajao, the capital town of the province of Camiguin, are within the volcanic danger zone. This makes it appropriate for the target of the inquiry. As shown in Table 3, Poblacion got the highest involvement at 13.49 percent, followed by Balbagon at 11.11 percent. This range of involvement among the residents ensures that the findings represent the voices or perceptions of the communities, from coastal to upland areas in the locality.

Table 3. Profile in terms of barangay affiliation among the respondents.

Barangay Affiliation	Counts	Percentages
Agoho	13	3.44
Anito	38	10.05
Balbagon	42	11.11
Baylao	22	5.82
Benhaan	28	7.41
Bug-ong	26	6.88
Kuguita	23	6.08
Magting	20	5.29
Naasag	17	4.50
Pandan	33	8.73
Poblacion	51	13.49
Soro-soro	21	5.56
Tagdo	12	3.17
Tupsan	10	2.65
Yumbing	22	5.82
Total	378	100.00

Table 4 shows that none of the respondents had actually experienced the 1951 volcanic eruption in Camiguin, much less the 32.80 percent who have just resided in one of the barangays of Mambajao. The high proportion of recent settlers indicates a potential gap, as they lack background or informal knowledge about the horrific effects of volcanic eruption in the area. While those 20.37 percent of the respondents who resided in Mambajao for more than two decades could have possibly heard the tragedy more than 70 years ago.

Table 5 displays that more than half of the respondents belong to low-income groups (55.56%) with earnings between PhP 13,000 and PhP 26,000. This group of earners stands just above the poverty line but is susceptible to economic shocks that may occur at any time. Then, this is followed by those in the lower middle-income group (25.13%) with earnings between PhP 26,000 and PhP 52,000. Only 19.31 percent of the respondents are struggling to live with an income of less than PhP 13,000, the so-called poor group.

Table 4. Profile as to number of years of residency (n=378).

Years of Residence	Counts	Percentage
Less than 1 year	124	32.80
1 - 5 Years	85	22.49
5 - 10 Years	92	24.34
10 - 25 Years	77	20.37
Total	378	100.00

Table 5. Demographic profile in terms of family monthly income (n=378).

Family Monthly Income	Counts	Percentage
Less than Php 13,000	73	19.31
Between Php 13,000 and Php 26,000	210	55.56
Between Php 26,000 and Php 52,000	95	25.13
Total	378	100.00

Table 6 shows that the highest counts (45.50%) are found in medium-sized families with 4-6 members. This is followed by a small-sized family (43.12%), while the large-sized family (7 or more members) has the smallest count at 11.38 percent. In times of calamities, household size is a crucial factor in safety maneuvers.

Table 6. Demographic profile in terms of household size (n=378).

Household Size	Counts	Percentage
Below 3 members	163	43.12
4 - 6 members	172	45.50
7 & above	43	11.38
Total	378	100.00

Table 7 shows the perceived awareness of volcanic eruptions among the respondents of the study. Already arranged according to their individual means, ten (10) indicators were used to capture the latent variable, the awareness of the respondents in volcanic eruptions. The respondents have voiced out that they are sometimes aware of volcanic eruptions ($M=3.13$), particularly when there are incidents of this kind in other places. This implies that the presence of Mount Hibok-Hibok does not trigger high awareness among the respondents. This is supported in the respondent's consensus, as shown in the standard deviation ($SD=0.71$).

On top of the indicators is the recognition of early warning signs ($M=3.39$) as well as the knowledge of protecting oneself, such as the wearing of appropriate clothing ($M=3.30$). This can be attributed to the intensive campaign of the local government units in addressing disaster-related events. The respondents have shown moderate awareness of the provision of information materials ($M=2.74$) and knowledge of specific emergency procedures and routes ($M=2.71$). This calls the attention of the local disaster government unit. The idea that the respondents are in a danger zone of volcanic eruptions ($M=3.29$) does not imply knowledge of how to execute correct responses. Again, since the respondents know the danger of being in the volcanic area, this makes them highly aware, but they fail to know the mechanics of evacuation.

Table 7. Respondent's perceived awareness on volcanic eruptions (n=378).

Indicators	Mean	Description
I am aware of the early warning signs of a volcanic eruption.	3.39	High Extent
I know that I should wear protective clothing during volcano eruption if I go outdoors.	3.30	High Extent
I know which areas are considered danger zones in case of volcanic eruptions	3.29	High Extent
I know where the nearest evacuation center or safe location is in case of a volcanic eruption.	3.24	Moderate Extent
I know where to find evacuation routes and shelter locations in case of a volcanic eruption	3.24	Moderate Extent
I know how to distinguish irrelevant information (fake news) from social media platforms regarding volcanic eruptions.	3.20	Moderate Extent
I believe I should wear masks to protect me from inhaling the ashes during volcanic eruption.	3.13	Moderate Extent
I know that I should limit myself from going outdoors to reduce my ash exposure.	3.07	Moderate Extent
I am provided with any materials or information about volcanic risks and safety procedures (e.g., flyers, local government announcements, or hazard maps)?	2.74	Moderate Extent
I know the emergency procedures and evacuation routes in case of a volcanic eruption in your area.	2.71	Moderate Extent
Area Mean	3.13	Moderate Extent
Standard Deviation	0.71	

Table 8 shows that there were significant differences in the extent of awareness among the respondents grouped by barangay affiliation ($F(14) = 39.54, p < 0.001$), years of residency ($F(3)=39.54, p < .001$), family monthly income ($F(2)=10.85, p < .001$), and household size ($F(2)=9.76, p < .001$). This suggests that, although the respondents are indeed aware of being in a place surrounded by volcanoes, their awareness varies when grouped by barangay affiliation, years of residency, income, and household size.

Table 8. Test of significant difference in the extent of awareness in volcanic eruptions.

Variable	F-value	df	p-value	Decision
Barangay Affiliation	3.20	14	< .001	Reject H_0
Number of Years of Residence	39.54	3	< .001	Reject H_0
Family Monthly Income	10.85	2	< .001	Reject H_0
Household Size	9.76	2	< .001	Reject H_0

Using Tukey's Honestly Significant Difference (Tukey's HSD) on the account of equal variances between groups, post hoc analysis showed that, for barangay affiliation, significant differences occurred in favor of Naasag ($M=3.33$) over Pandan ($M=2.82$), in favor of Anito ($M=3.26$) over Pandan ($M=2.82$), in favor of Balbagon ($M=3.18$) over Pandan, in favor of Benhaan ($M=3.29$) over Pandan, and in favor of Bug-ong ($M=3.24$) over Pandan. This result could have been influenced by the hazard proximity awareness of the barangays.

For years of residency, post hoc analysis showed that respondents with less than a year of residency ($M=3.41$) significantly differ from those with 1-5 years of residency ($M=3.13$), 5-10 years residency ($M=2.91$), and 10-25 years of residency ($M=2.94$). Likewise, those with a residency of 1-5 years ($M=3.13$) significantly differs from 5-10 years of residency ($M=2.91$) and 10-25 years of residency ($M=2.94$). It is obvious that those with a lesser number of years of residency exhibited a high awareness of volcanic eruption.

For the family's monthly income, those respondents who come from low-income families (PhP12,082 – PhP 24,164) have a significantly higher awareness of volcanic eruptions ($M=3.32$) compared to those from poor families ($M=2.24$) with income less than PhP 12,082. This finding is similar to household size, where results showed that the volcanic awareness of small households ($M=3.26$) and large households ($M=3.22$) significantly differ from those residents in the medium-sized households ($M=2.24$). These findings suggest that the coordination of family members in small and large households naturally varies.

Table 9 shows the proactive community stance with an area mean ($M=3.34$) interpreted as “High Extent” and a standard deviation ($SD=0.73$) implying the respondents’ consensus on preparedness at all times. On top of the indicators, the respondents exhibited their willingness to evacuate ($M=3.50$) as the only option available to keep lives safe. For a smooth evacuation process, the respondents express their willingness to participate in drills ($M=3.48$), and follow the instructions of the authorities ($M=3.44$). These manifestations indicate the respondent's high level of psychological readiness and cooperation with the authorities. While at the bottom of the indicators, the respondents showed at high extent their preparedness in terms of having a container or a go-bag stuffed with the most important items ($M=3.29$), and the family’s movement during the volcanic eruptions ($M=3.28$). However, the respondents have a moderate extent of sharing contact details and knowing about emergency contacts ($M=2.92$). This indicates a gap in establishing a good network of communication between the respondents, in particular, or the residents of barangays in the danger zone of volcanic eruptions.

Table 10 revealed that there were significant differences in the extent of preparedness among the respondents grouped by barangay affiliation ($F(14) = 2.68, p < 0.001$), years of residency ($F(3)=51.51, p < .001$), family monthly income ($F(2)=13.10, p < .001$), and household size ($F(2)=14.81, p < .001$). This suggests that there are subgroups in every explanatory variable in which the respondents’ preparedness is significantly different from the other subgroups.

In barangay affiliation, post hoc analysis showed that significant difference happens in favor of Anito ($M=3.56$) over Benhaan ($M=2.52$). Since Anito is closer to the location of volcanoes than Benhaan, this finding suggests that proximity implies higher preparedness among the residents of Mambajao. While years of residency, calculations reflected that those residents with less than a year of residency have the highest preparedness ($M=3.74$) which significantly differ from those with 10-25 years of residency. This happens since those who are new in the area do not have experience

Table 9. Respondent's perceived preparedness in volcanic eruptions (n=378).

Indicators	Mean	Description
My family is willing to leave anything behind to be in the safest place in the fastest way possible.	3.50	High Extent
I am willing to participate in any volcanic eruption preparedness programs or drills.	3.48	High Extent
I am willing to adhere to the authorities' instructions if they tell me to evacuate.	3.44	High Extent
I plan for the evacuation or safety of pets and livestock.	3.43	High Extent
I will establish a plan for family members, ensuring everyone knows where to meet in case you are separated.	3.39	High Extent
Store emergency supplies in an easily accessible, waterproof container or bag, and ensure everyone in the household knows where it is located.	3.36	High Extent
Prepare a carrier or emergency kit for animals that may need to be evacuated.	3.34	High Extent
Pack a "go-bag" for each family member, especially for children, the elderly, and relatives. Include personal identification, credit cards, and necessary medications.	3.29	High Extent
Conduct family drills regularly to ensure everyone knows how to react in the event of an eruption or evacuation.	3.28	High Extent
I will share contact details and ensure each family member knows who to contact in an emergency.	2.92	Moderate Extent
Area Mean	3.34	High Extent
Standard Deviation		0.73

Table 10. Test of significant difference in the extent of preparedness in volcanic eruptions.

Variable	F-value	df	p-value	Decision
Barangay Affiliation	2.68	14	< .001	Reject H_0
Number of Years of Residence	51.51	3	< .001	Reject H_0
Family Monthly Income	13.10	2	< .001	Reject H_0
Household Size	14.81	2	< .001	Reject H_0

nor gather relevant information about the risk of being within the danger area of volcanic eruptions.

In terms of family income, the residents from the low-income have the highest preparedness ($M=3.47$) which significantly differ from the poor families ($M=2.98$). This implies that preparedness for tragedies requires financial support to buy the necessary equipment and supplies. While in household size, respondents from small households ($M=3.50$) have demonstrated a significant preparedness compared to large households ($M=2.84$). This indicates that, in a family of three, coordination as well as preparation of very relevant things for evacuation can be done and managed easily.

Table 11 reveals that there was a statistically significant and very strong association between awareness and preparedness of volcanic eruptions among the respondents ($r(1)=0.812, p<.001$). Although there was a moderate extent of awareness among the residents, the preparedness was at high extent. This means that, for the residents, the mere idea of existing volcanoes, be it dormant or not, is enough for everyone to always be prepared in the event of volcanic eruptions. Hence, the moderate awareness of the residents could have been influenced by those who already

Table 11. Test of the significant relationship between two latent variables.

Variables	<i>r</i>	df	p-value	Interpretation	Decision
Awareness vs Preparedness	0.812	1	< .001	Significant	Reject H_0

knew the danger of volcanoes, but tend to know nothing about it. The coefficient of determination ($r^2=0.6593$) indicates that 65.93 percent of the variation in the preparedness for volcanic eruption can be explained by their awareness. Hence, the moderate extent of awareness holds for a high extent of preparedness among the respondents of the study.

4. Discussion

The study found that there was a good representation of respondents from the coastal to the upland areas in the locale of the study. This range of involvement ensures that the findings really come from the voices of the respondents of the study. This aligns with the study of Mia et al. (2022), who argued that geographic accessibility often dictates the reach of disaster education. Thus, the respondents were taken from all the barangays of Mambajao to accurately capture their awareness and preparedness in volcanic threats. While the years of residency showed that the respondents did not have firsthand experience since the tragedy caused by the volcanic eruption happened more than 70 years ago. According to Lyu and Li (2024), the longer people live in volcanic places, the higher the possibility of becoming aware of the horrific effects it may have on all. However, when the volcanoes are dormant, residents tend to become complacent in their awareness and preparedness during their lifetime.

The monthly income of the respondents revealed that more than half of them belonged to low-income families. Orencio and Fujii (2020) emphasized that the economic profile of the respondents plays an important role in the prioritization of family endeavors. This is a primary determinant of disaster readiness, like the preparation of food, procurement of emergency kits or go-bags, and other necessities for survival. Finally, the household size showed that almost half of the respondents have small families, and slightly followed by medium-sized families. Samonte (2023) pointed out that the size of the family really matters during evacuation periods. Larger households with high dependency ratios require more specialized evacuation protocols and external support from the local government, particularly in a rapid situation like volcanic eruptions.

The overall awareness of the respondents in volcanic eruptions was pegged with consensus at a moderate extent. The respondents have a high level of awareness in terms of recognizing early warning signs, wearing of protective clothing, and knowing areas considered as danger zones. This can be attributed to the intensive campaign of the local government units in addressing disaster-related events. For people of Camiguin in general, by just looking at Mount Hibok-Hibok, there goes with it the visual of what a volcanic eruption may do and how to evade it. Bankoff and Hilhorst (2022) emphasized that people who are always reminded of a possible tragic event

develop a high level of informal or folk awareness based on the horrific events passed down by word of mouth.

On the same vein, the respondents have a moderate extent of awareness about limiting oneself to going outdoors to reduce ash exposure, about being provided with information materials, and about knowing the emergency procedures and evacuation routes in case of a volcanic eruption in the area. The respondents are aware of being in the volcanic area, but fail to know the mechanics of evacuation. This indicates that while the PHIVOLCS and local government successfully communicated the existence of risk, something was clearly missed up during the campaign. This gap is supported in the study of Martinez et al. (2022), who emphasized that risk reduction usually fails at the last mile when formal hazard maps and flyers of evacuation procedures do not reach every household. Another significant finding is that the respondents posted a moderate extent in distinguishing fake news on social media. This indicates the vulnerability of the respondents to misinformation that may likely cause negative effects. This is emphasized in the work of Newhall and Solidum (2017) that people nowadays must carefully filter social media information since this is vital to survival, as in recognizing physical volcanic signs.

The study found that the extent of awareness among respondents varies when grouped according to barangay affiliation, years of residency, income, and household size. The significant variation of responses among the respondents indicates that the awareness campaign has not completely reached every household in the community, and if it has indeed gotten to households, this is not being taken seriously. This is a normal phenomenon since people may likely have different perceptions of something they see and believe. For instance, new settlers are likely to show vigilance as their coping mechanism for being new in the area. For long-term residents, however, this represents a socio-cultural normalization of risk. In the Camiguinon context, the long period of volcanic quiescence since 1951 has transformed the volcano from a source of active threat into a benign part of the landscape, a phenomenon known as the tranquility trap. Long-term residents may perceive the environment as stable because their personal lived experience lacks a disaster event, leading to a psychological distancing from the danger despite living within it. This aligns with the work of Bankoff (2022), who noted that newly relocated individuals show more proactive movements to address their perceived vulnerability to calamities or tragedies. Besides, household sizes also significantly vary since there is more coordination of small families than larger families. The study of Cabiles-Bacalla and Martinez-Alba (2025) supported the present findings that, according to them, family structure can really affect awareness of tragedies, even in disaster preparedness and response.

The perceived preparedness was pegged with consensus among respondents at high extent, indicating their readiness at all times. The overall perceptions of the respondents can be attributed to the news about volcanic eruptions in other parts of the Philippines, as heightened risk perception is often fueled by mediated experiences of nearby disasters (Baytiyeh, 2018). On top of the indicators, the respondents expressed their willingness to evacuate, participate in drills, and follow instructions from

authorities. These are indications of the respondent's high level of psychological readiness and cooperation with authorities. These are considered critical assets for the Disaster Risk Reduction and Management Office (DRRM) in the entire country, as community trust in official directives significantly reduces casualty rates during paroxysmal events (DeCorby-Watson et al., 2018). While at the bottom of the indicators, the respondents showed at high extent their preparedness in getting ready with the most important items and coordination of their movements during a disaster, but to a moderate extent in sharing and knowing contact details. Hence, there is a gap in establishing a good network of communication among the residents of barangays in the danger zone of volcanic eruptions. Such communication gaps are common in rural settings where physical preparation often outpaces formal networking (Bayot et al., 2025).

The perceived preparedness of the respondents significantly differed when grouped according to barangay affiliation, years of residency, income, and household size. Post hoc analysis revealed that the proximity of a barangay to the location of the volcanoes dictates higher preparedness for volcanic eruptions. According to Alcayna (2020), those at higher risk of volcanic eruptions are always worried about the presence of active volcanoes in the area, leading to higher manifestation of preparedness. In terms of years of residency, those respondents who are new to the area manifested high preparedness since they have seen the effects of volcanic eruptions on social media. Conversely, residents with more than a decade of residency manifested lower preparedness. This specific lag suggests that socio-cultural memory in Camiguin may have been diluted over generations; while the stories of Hibok-Hibok remain, the absence of recent tremors leads to a creeping normalcy where volcanic hazards are overshadowed by daily socio-economic concerns. In Camiguin, the volcano is also the primary driver of tourism and fertility in soil, creating a hazard-benefit irony where the economic rewards of staying in the danger zone outweigh the perceived necessity of active preparedness. Bankoff (2022) explained that the low preparedness of residents with long years of stay in the area could be attributed to the lack of volcanic activity in the entire province of Camiguin.

In the same context, the respondents from low-income families have significantly higher preparedness compared to those from poor families. This indicates that preparedness for tragedies requires financial backing to support unexpected mobility. This finding is supported by the work of Orencio and Fujii (2020), who argued that income matters in dealing with preparedness. Finally, small families significantly demonstrated higher preparedness compared to large households. This means that coordination, as well as preparation of very relevant things for evacuation, can be done and managed easily. The study of Suhari (2025) confirmed that, for large families, there is a need for planning as to assigning what each member in the family should carry or perform during the evacuation period.

As to the association of awareness and preparedness of volcanic eruptions, there was a statistically significant and very strong relationship between the two variables. Awareness is moderate, but the preparedness among respondents is high. It can be

understood that the mere presence of volcanoes in the area could have influenced the preparedness of the residents. Hence, the moderate awareness of the residents could have been influenced by those who already knew the danger of volcanoes, but tend to know nothing about it. The coefficient of determination suggests that the variation in the preparedness of volcanic eruption can be explained by their awareness. Hence, the moderate extent of awareness holds for a high extent of preparedness among the respondents of the study. On these results, Luminarias and Liquido (2025) theorize that disaster campaigns in hazard-prone areas are not just academic but a functional requirement for people to change their behavior. The volcanic eruptions that happened more than 70 years ago, in which the horrific stories have been told to the new generation, make the residents become more receptive to turning awareness into tangible readiness. On the other hand, Ferrer (2026) emphasized that if the foundation of awareness is shaky, the resulting preparedness will be incomplete, regardless of the residents' willingness to cooperate.

5. Conclusion

Based on the findings, this inquiry concluded that the residents living in the danger zone of volcanic eruptions have a moderate level of awareness and a high level of preparedness. These latent variables exhibit a very strong association, indicating that as the residents' awareness increases, their proactive preparedness likewise significantly strengthens. This statistical alignment suggests that the moderate awareness currently held by residents serves as a critical driver for their high level of preparedness. Residents with long years of residency exhibited lower awareness compared to newer residents, which is a manifestation that they take the risk lightly, having normalized the horrific stories of the tragedy from more than 70 years ago. The perceptions of the residents in terms of their awareness and preparedness for volcanic eruptions differ when grouped by their explanatory variables. On these latent variables, the responses of the residents differ in terms of barangay affiliation, years of residency, family monthly income, and household size. Those who live in proximity to the volcano's location, with less than a year of residency, lower income, and in small households, have manifested a significantly high level of awareness and preparedness for volcanic eruptions. These findings indicate that people in Camiguin who are in danger zones of volcanic eruptions are going to be resilient in facing this threat or risk anytime this happens. This requires that the local government units are in close coordination with other national agencies, should the unexpected volcanic eruption force people to evacuate to safe areas in the island province of Camiguin.

6. Recommendations

Based on the findings, the researchers have recommended several interconnected interventions to translate volcanic risk awareness into active community preparedness. As a starter, the Provincial and Municipal DRRM Offices are encouraged to look

beyond standard campaigns and implement a mandatory "Residency-Based Disaster Vigilance Program" for new settlers and long-term residents. For this to happen, the Barangay Councils and Local Leaders are advised to provide households with localized physical hazard maps and conduct tailored evacuation drills for distant areas.

To ease the socioeconomic anxieties that delay evacuation, the Department of Social Welfare and Development (DSWD) may set aside budgetary reserves for immediate family support, while Local Agriculture and Veterinary Offices may advocate the implementation of a standardized livestock and pet evacuation framework. Finally, for sustained long-term resilience, the Department of Education (DepEd) - Division of Camiguin should integrate volcanic literacy and proactive mitigation into school curricula, while the PHIVOLCS - Camiguin Station is urged to conduct workshops that translate complex scientific alert levels into simplified, actionable guidelines for community leaders and the general public.

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Conflict of Interest Statement

The authors declare no conflict of interest.

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