Disaster mitigation strategies and preparedness of personnel of the municipality of Bulalacao: Basis for disaster management safety plan

Paz, Sarah Vanessa L. ✉
Divine Word College of San Jose, Philippines (pazsarahvanessa@gmail.com)

Limos-Galay, Jenny A.
Divine Word College of San Jose, Philippines (jennygalay05@gmail.com)

Lazaro, Neofe J.
Divine Word College of San Jose, Philippines (mharifel.javier.lazaro@gmail.com)

Abstract

Emergencies and disasters are essentially mirrors of everyday life. There are effects of the economic and social structures that individuals adopt and practice. This is how disaster mitigation strategies were planned for and developed. Reducing people's susceptibility and enabling them to save many lives, hasten recovery, and save costs. Thus, the proponent devised this study. An exploratory sequential mixed method was taken. For the qualitative phase, employees were interviewed to determine what disaster mitigation strategies they practiced. The thematized responses were the basis for the independent variable of the quantitative phase. A descriptive-correlational survey was used for the quantitative phase, with a questionnaire and an interview. Total enumeration was done. The experts validated the questionnaire, and reliability ranged from high to very high using the test-retest method. According to the study results, tripled strategies that contributed highly to the composite mean index were disaster mitigation measures on awareness, hazard mapping, and adoption. Consequently, in terms of DRRM drill, emergency evacuation, and emergency response, respondents' disaster preparedness level gained composite means of 3.77, 3.80, and 3.80, respectively, with very well prepared in the description scale yielding an overall mean of 3.79 and described as very well prepared. Meanwhile, a significant relationship between preparedness level and disaster mitigation strategies was found. Further, the result of this study was expected to support various initiatives aimed at promoting building a culture of safety for safeguarding lives and enhancing the recovery of people living in the Municipality of Bulalacao.

Keywords: disaster mitigation, readiness, awareness, resiliency, emergency rescue operations

Disaster mitigation strategies and preparedness of personnel of the municipality of Bulalacao: Basis for disaster management safety plan

1. Introduction

Disasters have always been a recurring outcome of human interactions with the environment. It is one of the world's most urgent challenges nowadays, and society and the environment are progressively affected (Chaudhary & Piracha, 2021). It happens when an environment that is vulnerable and a risk that might lead to the destruction of life, property, and livelihood come together (Vordzorgbe, 2006). The government and international organizations are working together to promote global awareness and preparedness since natural disasters have severely threatened human life and the economy. This will increase calamity mitigation capacities and lessen the catastrophic impacts (National Disaster Risk Reduction Management Council Manual, 2020). A disaster mitigation strategy is a hazardous event that disrupts the functioning of a society and a community and causes human, material, environmental, and economic losses. The preparedness phase occurs before a disaster hits and facilitates realistic predictions of what it will affect. The response phase continues until immediately after the disaster, and the recovery phase extends until the regular operations and activities are again performed satisfactorily. Decisions made during the preparedness phase will highly impact the time and effectiveness of the response and recovery phases (Patel et al., 2023).

The Center for Global Statistics of Disasters (CGSD) 2018 analysis demonstrates that natural disasters are the most important index of life-threatening causes triggered by climate change. As a result, an annual increase in the population can be expected, along with disastrous effects, including 85 to 97% casualties, a high mortality rate, and financial losses. Areas in the Asia Pacific Region were found to be the most disaster-prone globally because they might frequently experience tragedy. They are particularly susceptible because of their limited size, critical land masses, position, and fragile biodiversity. As a result, low managing capability may result from the catastrophic event. When the National Program on Community Disaster Preparedness was formed and promulgated specifically to protect Filipinos against the devastating consequences of the disaster, the nation's capacity for disaster control was increased through empowered resilience education (Presidential Decree No. 1566, dated June 11, 1978). Filipinos are empowered to face calamities with more awareness, preparedness, and readiness. Numerous strategies have been developed to drive catastrophic management, ensuring life-saving and accelerating mitigation for zero casualties (Primer on the DRRM Act-Republic Act No. 10121).

Moreover, disaster mitigation strategy is the cornerstone of emergency management. It is the ongoing effort to lessen disasters' impact on people and property. Mitigation is sustained action that reduces or eliminates long-term risk to people and property from natural hazards and their effects through proactive measures before an emergency or disaster occurs. Thus, a comprehensive disaster risk reduction and management plan was developed to guide individual efforts in all government agencies because the level of resilience education is crucial in decreasing disaster damage. To guarantee safety and prevent compromise even during unforeseen emergency calls, offices of buildings, highways with dikes, and residential structures must be resilient. National Resilient Month reminds us that we can fight disastrous enemies head-on, blossom the recovery, and move on by being alert, prepared, and ready. The substance of handling disasters will end in significant experiences to remember in every season of life (National Disaster Resilience Month, 2023).

As defined by the Philippine Disaster Risk Reduction and Management Act of 2010, Disaster Risk Reduction Management (DRRM) is a systematic approach to identifying, evaluating, and reducing disaster risk . Intentionally, it envisions decreasing disaster risks through systematic efforts to analyze and manage the effects of disasters, impacting socioeconomic vulnerabilities, environmental and other hazards, lessened susceptibility of people and property, wise management of land and environment, and improved awareness, as well as preparedness in the unpredictable and adverse natural events. Similarly, Ligon (2016) confirmed that knowledge

of disaster's specifics and exposure can help victims feel less vulnerable. Effective catastrophe preparedness is a major concern to address the individual's assurance of life-saving measures. It urges maintaining an instant response so that people can engage and communicate as active members in difficult, resilient societies. Additionally, Bhat et al. (2017) concluded that resilience education has gained popularity and a greater impact on controlling natural troubles. Therefore, It is imperative to raise knowledge and awareness regarding how to avoid casualties from disasters. Understanding and saving the value of life are mandatory concerns of all individuals in the presence or absence of disasters.

The level of resilience education is vital in reducing damage (Gerdan, 2018); thus, Comprehensive Disaster Risk Reduction and Management was issued to lead individual efforts in all government sectors. Offices must be resilient to ensure the quality of service delivery to stakeholders. Based on Executive Order No. 120, Series of 2020, titled Strengthens Rehabilitation and Recovery Efforts in Disaster-hit areas through the establishment of the Build Back Better Task Force. As a result, the fundamental objective of creating resilience education has been to increase the safety of all individuals working in the organization. The Mines and GeoScience Bureau Assessment The report (2021) stated and confirmed that residents in Bulalacao are not protected from natural disasters. Because of its strategic and geographical location, any time can be a tragedy that strikes without warning because of how exposed it is. Additionally, sinkholes in the shape of caves were discovered beneath along covered land areas, which made the neighboring municipality's fault lines vulnerable to the ocean floor.

Statement of the Problem - The study attempted to determine the relationships between the disaster mitigation strategies of local government unit personnel's practice and the level of preparedness for Disaster Risk Reduction and Management at the Municipality of Bulalacao. Specifically, it sought answers to the following questions: (1) What disaster mitigation strategies do the personnel practice in the Municipality of Bulalacao? (2) What is the status of Disaster Mitigation strategies in terms of awareness, hazard mapping, and adoption? (3) What is the level of Personnel Disaster Preparedness in terms of DRRM Drill, Emergency Evacuation and Emergency Response? (4) Is the level of preparedness of the Personnel significantly affected by disaster mitigation strategies in terms of Awareness of Hazard Mapping and Adoption? (5) Based on the study's results, what disaster management safety plan can be developed for local government unit personnel in the Municipality of Bulalacao??

Significance of the Study - The following will likely benefit from the study's findings: To the Local Government Unit Personnel in the Municipality of Bulalacao, the results of this study will help them become aware, ready, and prepared for the catastrophes and calamities brought about by weather and climate changes. The results of this study will encourage personnel from different government agencies to be aware of and prepared for everyday work and the rise of emergency and disaster crises. To the students/learners from Elementary, Secondary, and Tertiary Schools. The results of this study will serve as an eye opener to be aware and prepared for disaster, and saving a life is of utmost importance. To the Barangay/Community Leaders, the results of this study will make them active in planning for the mitigation of disasters in their respective communities and help them be lifesavers for their constituents in times of miserable circumstances and disaster incidents. The result of this study will contribute to people's learning to be watchful and take care of their lives by putting together a thorough strategy to protect everybody against disasters and remove themselves from safe and pleasant living environments. The results of this study will enable future researchers to gain knowledge and expand their horizons of interest in disaster planning, mitigation, recovery, and resiliency measures in this time of uncertainty. At the same time, awareness, readiness, and preparedness are taken into significant account as keys to survival for everyone.

Scope and Delimitation of the Study - The study was focused on the practice of disaster mitigation strategies in terms of awareness, hazard mapping, and adoption, as well as the preparedness level of personnel in the Municipality of Bulalacao. It was conducted only in the fiscal year 2023-2024, where the 144 personnel from 16 functional offices in the local government unit of Bulalacao were tested and quantified their practice of strategies in disaster mitigation and preparedness. Likewise, it was primarily confined to the personnel who work as permanent in positions from various offices and frequently experience disaster-related concerns in working every year.

2. Methodology

Research Design - The proponent in this study used the exploratory sequential mixed method as it is becoming more popular in practical social research that starts with qualitative data collection and analysis and builds to quantitative data collection and analysis, which leads to interpretation. This design uses the qualitative results to develop a new instrument or taxonomy for the quantitative strand. This was characterized by an initial qualitative phase of data followed by a quantitative phase of data collection and analysis with a final phase of integration of data from the two separate strands of data in the study. This method was characterized by an initial qualitative phase of data followed by a quantitative phase of data collection and analysis with final phase of integration of data from the two separate strands of data in the study. This method combines qualitative and quantitative methods in which the qualitative phase requires an interview guide from personnel working in the local government. Questionnaires were also given to respondents to answer on the strategies they practice to determine its status. The findings of the qualitative phase via questionnaires, surveys, and interviews guided the quantitative phase, which used the quantitative findings to corroborate the qualitative conclusions. With permanent LGU personnel, a one-on-one conversation and interview guide prepared during the qualitative phase were conducted. It was a casual and formal conversation. Open-ended questions were created to ensure that all LGU employees in different offices used disaster mitigation strategies. In terms of the quantitative phase, the questionnaire employed a descriptive correlational survey. The qualitative form of the disaster mitigation strategies practiced by personnel and preparedness level as the qualitative form was presented.

Respondents of the Study - The local government unit in the Municipality of Bulalacao is fully operated and serves people in different services, with 16 offices. Employees who work in permanent positions were consulted as respondents of the study. Permission was given by their respective department head to allow them to participate in and act as study respondents. The respondents used in this study were the complete enumeration of 144 permanent employees from 16 offices of the Local Government Unit. Questionnaires were prepared and given to them, and the information they responded to was used to tabulate and analyze the results. Since there were employees who were non-permanent and working in every office, they were not used as respondents. Instead, they were used in the interviews and for test re-test analysis of questionnaires. They also served as handlers in disseminating information about the promotion of building a culture of safety and safeguarding lives by crafting disaster management safety plans for the benefit of the people.

Research Instrument - In the qualitative phase, an interview schedule was the primary tool for data collection. In contrast, a researcher-made instrument was the primary tool for data collection in the quantitative phase. It was specifically created to model pertinent and related literature from various sources. The questionnaires were composed of two parts. The first part was the disaster mitigation strategies, which it was described as (4) strongly agreed with the high description, (3) moderately agreed with the moderate description, (2) slightly agreed with the low description, and (1) disagreed with a very low description. The second part was the respondents' preparedness level, which was designed using a four-point Likert scale. To measure the level of respondents' preparedness, the descriptions used were (4) very well prepared, (3) well prepared, (2) slightly prepared, and (1) unprepared. Meanwhile, the interview schedule focused on the qualitative phase, which was done through casual interviews to fill out items on experiences encountered during a disaster, seemingly like an open-ended question, and coded for thematic analysis.

The researcher-made instrument underwent expert validity, wherein the proponent used the expertise of the Municipal Disaster Risk Reduction and Management Council in additional validation of a questionnaire. The graduate school faculty was also consulted to validate the questionnaires. All suggestions and recommendations were accepted and included upon the revision of the questionnaire. Prior to this, questionnaires were presented to the adviser for final approval, and once approved, reproduction and distribution were done to test the reliability. A group of local government unit personnel served as reliability respondents of the instrument, which was conducted using the test-retest method, and they were not included in the final administration of the study. The researcher ensured that a one-week interval was followed before the second administration of the instrument. The LGU

personnel responded to items in the questionnaire, which covers two areas: disaster mitigation strategies with eight items each and level of preparedness of LGU personnel with five items each. The Cronbach's Alpha measure was used to test the inter-item consistency of the instrument, and the result is given in the table

Table 1

Reliability Results of the Instruments

Components	Number of items	Reliability Coefficient*	Interpretation
Disaster Mitigation Strategies			
Awareness	8	.737	High
Hazard Mapping	8	.734	High
Adoption	8	.659	High
Level of Preparedness of LGU Personnel			
DRRM Drill	5	.722	High
Emergency Evacuation	5	.705	High
Emergency Response	5	.723	High

*Cronbach's Alpha based on standardized items

The reliability coefficients based on standardized items resulted in a generally high reliability. Five indicators registered a high level of reliability, with indices from 0.705 to 0.739. One indicator reached a moderate reliability, with 0.659. Overall, the reliability result confirms the instrument's acceptability and can be given to the final group of respondents.

Data Gathering Procedure - For both qualitative and quantitative phases, introduction and request letters were delivered by hand to every head of the office. Once approved, the first face-to-face interview was conducted. The interview results were the basis for designing the questionnaire for the quantitative phase. After the questionnaires underwent validity and reliability testing, distribution was the next step for the 144 respondents with enough time allotted. Each respondent was given a one-week interval to answer the questionnaire completely.

Statistical Treatment of the Data - The data coming from the respondents were collected, classified, tabulated, and coded for analysis using stratified software SPSS (Statistical Package for Social Sciences). Thematic Analysis was used to determine the results of the qualitative problem regarding experiences in disasters. The frequency and percentage were used to describe the respondents' awareness and preparedness levels. Weighted mean was used to analyze the respondents' data on the level of preparedness, and the relationship was tested using Spearman's rho correlational coefficient.

Ethical Considerations - Participants were ensured that their involvement in the study was entirely voluntary and that they could withdraw at any time without consequence. The researcher guaranteed that the participants' data would be untraceable and their identities would remain anonymous. The results would be presented in a research article and published without revealing individual identities. Moreover, the research was confirmed to be non-harmful to the participants, and their information was used appropriately. In addition, the researcher followed APA format 7th Edition in acknowledging the authors used in this study.

3. Results and Discussions

Based on the interview, the participants' disaster mitigation techniques were initially described by emerging themes. Following the collection, transcription, coding, and extraction of replies, the themes were displayed in the thematic map. Based on the results, responses were disaster simulation/drill, adoption, emergency evacuation, awareness, mitigation, early warning systems, emergency response, enhancement of safety procedures, and readiness. The last three themes in Figure 1 served as the foundation for the questionnaire's items, which included adoption, hazard mapping, and awareness. These were presented in big semi-circular figures that

described the different disaster mitigation strategies practiced by the local government unit personnel in the Municipality of Bulalacao. The strategies that emerged from the various themes were similarly related to the functions of disaster mitigation as described by the Disaster Risk Reduction Resource Manual (Safer School Resource Manual 2008 Edition). According to them, disaster mitigation is a cornerstone of emergency strategy management for those who are vulnerable because it represents an ongoing effort to lessen the harm that disasters inflict on people and property. It increases public safety by reducing the number of fatalities and property damage while increasing the chances of safety and recovery materializing more quickly.
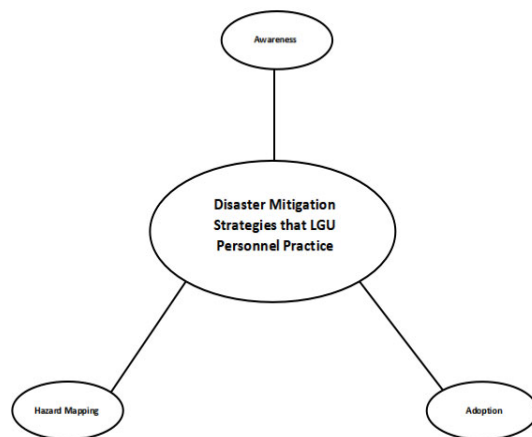

Figure 1. Final Thematic Map (Disaster Mitigation Strategies)

Table 2 discloses the employees' mean of disaster mitigation strategies in terms of awareness. A high composite mean of 3.70 was computed with 8 indicators, which means that there is a high awareness of disaster mitigation strategies and gave a good indicator that respondents were aware of disaster strategy mitigation. Employees and all community members need to know they are safe in all unpredicted hazards and risks. As revealed by Asio (2021). People aware of disasters ought to be able to avert fatalities, damage to homes, and other relevant vulnerabilities, as well as the validity of social, economic, and environmental issues. Awareness must be exercised daily to protect everyone from the potentially fatal effects.

One of the disaster mitigation strategies included in the study was the respondents' awareness. Another strategy employed in disaster mitigation is hazard mapping. It is about finding and creating a map with specific detailed information on the places vulnerable to disaster that employees pass when they are in work and in home. Accordingly, it is one of the most essential tools for helping decision-makers with land-use planning, sustainable infrastructure development, and emergency preparedness, as no complete instrument has been invented to detect disasters. The result with a high value and a mean of 3.77 total indicated that the respondents have a high extent of hazard mapping. This result is associated with the proven facts that hazard mapping reduces existing hazards and risks and contributes to people strengthening resilience capacity. Lindell (2020), on the other hand, affirmed and supported that by knowing hazard mapping, people living in dangerous places can be advised to be ready and take some disaster precautions to be safe. People living in a dangerous area may easily take immediate precautions and preventive measures while alarming calamities have yet to come. The more precautions one takes when practicing exercise, the greater the chances earned.

Table 2

Mean Status of Disaster Mitigation Strategies in Terms of Awareness, Hazzard mapping and Adoption

Indicators (Awareness)	Weighted Mean	Verbal Description
1. The office teaches employees the necessary information to comprehend the risks connected to natural disasters.	3.70	High

2. The office employs informational videos and other platform activities for employees to help minimize the impact of disaster risk.	3.61	High
3. The office encourages its employees by providing information on emergency management.	3.75	High
4. The office initiates that risk reduction and emergency response must be considered by the employees as vulnerability-reducing strategies.	3.71	High
5. The office reports any circumstances that can endanger life or pose a threat to their employees.	3.61	High
6. The office implements safety protocols to prevent significant loss of lives and properties.	3.83	High
7. The office provides staff members with the necessary resources to be prepared for any situation, particularly during a crisis.	3.71	High
8. The office constantly manages disaster safety information.	3.69	High
Composite Mean	3.70	High
Indicators (Hazzard Mapping)		
1. The office had a safety management plan that needed to focus on disaster preparedness.	3.87	High
2. The office had a control measure in approving decisions regarding disaster alternatives, practices, and methods.	3.81	High
3. The office had clear supervision of identifying and analyzing departmental risks related to disaster circumstances.	3.72	High
4. The office had complete and verifiable documentation to substantiate the value of personal protection and safety.	3.80	High
5. The office regularly monitored disaster-prone areas and allotted a budget to finance their effectiveness.	3.82	High
6. The office had a system application to track all employees in their particular places during the calamity.	3.68	High
7. The office performed simulation exercises based on the actual effects of disaster circumstances.	3.71	High
8. The office had access to a localized Google map of disasters to every employee on what to do in an emergency case.	3.72	High
Composite Mean	3.77	High
Indicators (Adoption)		
1. The office knows there is no immediate prevention for disaster occurrence.	3.79	High
2. The office recognizes the importance of discussing disasters with co-workers.	3.56	High
3. The office is optimistic about providing enough reinforcement to help employees recover.	3.96	High
4. The office gains enough knowledge about disaster effects from experts who conduct disaster-related activities.	3.55	High
5. The office exercises the basic principles of safety learned from the conducted disaster training.	3.75	Moderate
6. The office uses their acquired skills to save lives in disaster.	3.61	Moderate
7. The office offers coping techniques for all employees affected by disasters while they are at work.	3.61	Moderate
8. The office promotes resilience and determination among employees to fulfill their responsibilities as public servants in the communities.	3.78	Moderate
Composite Mean	3.70	High

Scale: 3.25-4.00- High; 2.50-3.24-Moderate; 1.75-2.49- Low; 1.00-1.74- Very Low

Considering it as a strategy in disaster mitigation, the respondents used this kind of disaster technique, as disclosed in Table 2, with a composite mean of 3.70. The purpose of this strategy is to lessen susceptibility and reduce the impact of disasters (Khan, 2022). A high composite mean means there was a high extent regarding adopting adoption as a disaster mitigation strategy. Disaster strategies used by the respondents included their acquired skills to save lives in times of disaster, knowing that there is no immediate prevention for the occurrence of disaster, promoting resilience and determination among employees to fulfill their responsibilities as public servants in the communities, gaining enough knowledge about disaster effects from experts who conduct disaster-related activities, recognize the importance of having conversations about disaster with co-workers, offer coping techniques for providing enough reinforcement to help employees recover. Adoption strategy is a highly valued strategy of disaster mitigation used by the respondents; as Hendricks et al. (2022) mentioned, the adoption strategy for disaster conveys information about an individual's self-recovery process. The adoption mechanism is effective in increasing its adoption capacity. Thus, life protection also increases. This idea parallels Antonio's (2017) findings that adoption is key to mobilizing disaster policies and protocols in shielding lives to prevent loss and damage. Adoption strategy contributes to protecting themselves and people from uncontrolled calamities. The higher the adoption of disaster policies and psychosocial aspects, the greater the chances of lessening their vulnerability.

Table 3

Mean Level of Disaster Preparedness of LGU Personnel in Terms of Disaster Risk Reduction and Management Drill, Emergency Evacuation and Emergency Response

Indicators (Disaster Risk Reduction and Management Drill)	Weighted Mean	Verbal Description
1. The office plans and prepares before a disaster risk reduction drill.	3.73	Very Well Prepared
2. The office conducts a regular disaster risk reduction drill.	3.82	Very Well Prepared
3. The office provides information on disaster risk reduction drills.	3.70	Very Well Prepared
4. The office identifies a possible evacuation area for the employees during a disaster.	3.82	Very Well Prepared
5. The office discusses what to do (before, during, and after a disaster.	3.78	Very Well Prepared
Composite Mean	3.77	Very Well Prepared
Indicators (Emergency Evacuation)		
1. The office selects and identifies evacuation areas within the local government unit premises.	3.80	Very Well-Prepared
2. The office distributes evacuation maps to their employees.	3.84	Very Well-Prepared
3. The office discusses the evacuation plan with their employees.	3.77	Very Well-Prepared
4. The office performs simulations on evacuating during an emergency.	3.73	Very Well-Prepared
5. The office discusses the importance of knowing the emergency evacuation in various subject areas with their employees.	3.84	Very Well-Prepared
Composite Mean	3.80	Very Well Prepared
Indicators (Emergency Response)		
1. The office trains local government unit personnel to perform emergency response.	3.75	Very Well-Prepared
2. The office performs simulation exercises on emergency response during an earthquake drill.	3.72	Very Well-Prepared
3. The office integrates emergency response to various LGU activities.	3.95	Very Well-Prepared
4. The office posts emergency hotlines inside the different departments of LGU and within the LGU premises.	3.82	Very Well-Prepared
5. The office discusses the importance of emergency response to various departments of LGU.	3.78	Very Well-Prepared
Composite Mean	3.80	Very Well- Prepared

Scale: 3.25-4.00- Very Well Prepared; 2.50-3.24-Well Prepared; 1.75-2.49- Slightly Prepared; 1.00-1.74- Unprepared

Table 3 shows the mean level of disaster preparedness of LGU personnel regarding disaster risk reduction and management drills, emergency evacuation, and emergency response. Considered the most common way of disaster preparedness, the disaster drill got an overall composite mean of 3.77 with a high description. This usually comes in the form of recommendations made by the government to combat disaster effects and promote the security and safety of life. It was highly perceived that a disaster drill was one of the preparations for facing disaster. People may benefit from simultaneous drills by being ready for a crisis. Because of acquired disaster skills, their level of susceptibility decreases, while a higher level of training was projected to have less effect. As Ronquillo (2020) pointed out, a crucial weapon in the fight against disaster is the exercise and training of people because skills for survival can be gained and applied to personal situations. As a result, the exercise demands that a marginalized group slowly recover, but those who have learned skills on how to survive can easily recover. It is considered healing, which gives more chances of safety for those equipped with a drill and training than those who did not.

Five indicators were used in the study, as disclosed in Table 3, which gave a high composite mean rating of 3.80, which means that there was a high description in terms of emergency evacuation of respondents. In preparedness for disaster, emergency evacuation needs to be established as a bridge of safety and lessen anxiety. As a way of doing this, it distributes evacuation maps and discusses the importance of knowing the emergency evacuation in various subject areas registered with a high mean as evidenced by 3.83, followed by selects and identifies evacuation areas within LGU premises (mean=3.80), discusses evacuation plan (mean=3.77), and performs simulations in evacuating during emergencies (mean=3.73). Based on the findings above, emergency evacuation of disaster preparedness with a high extent of a mean result can be attributed to the knowledge of the concerned authorities on the disaster. This finding is supported by Turmes' (2020) study, which states that an emergency evacuation is a vital precaution against calamity effects that can be used in a disaster event. Emergency evacuation can shield people from the cruelty of disaster and protect their lives in their careful arms. As stated, building protection for human life will create an environment of peace, safety, and security for all.

Furthermore, emergency response to disaster is considered one driving tool for an immediate, systematic response in an unexpected or dangerous occurrence to mitigate the event's impact on people, property, and the environment (PD. No. 1566, RA No. 10121). Table 3 brings out a high mean level of 3.80. Integrating emergency response to various LGU activities was an indicator that gained a high mean result of 3.95. It was followed by another indicator, posted emergency hotlines inside the different departments of LGU and within the LGU premises (mean=3.82), discusses the importance of emergency response in various departments of LGU (mean=3.78), training local LGU personnel to perform emergency and response (mean= 3.75), and performs simulation exercises on emergency response during an earthquake drill (mean=3.72). The findings unveiled an emergency response as high in terms of disaster preparedness. This may be because every Filipino is hospitable with values of charity and volunteerism, as Granberg (2017) supported and contributed, and a response in quick actions allows people to be saved and transported from the sea of pain to a comforting location. Instant reinforcement to affected individuals may provide the proper care to help them recover. In response to emergency calls, altruistic, voluntary, and humanitarian attitudes recognize that no man is an island and that all must work in handy for unity to arise.

The hypothesis test results reveal small to moderate correlation coefficients (β). One of the disaster mitigation strategies focuses on awareness and understanding the basic steps to be done during unpredictable calamities. Being aware of these basic steps posed a positive and direct effect on the level of disaster preparedness in terms of DRRM drill (β=0.338, p<0.001) and emergency evacuation (β=0.248, p=0.003). Awareness has medium and small effects on emergency drills (0.194) and evacuation (0.084). Being more aware of what should be done during calamities may bring about preparedness during drills and emergency evacuation. However, the result shows a negative effect of awareness on emergency response (β= -0.161, p=0.038). This denotes an inverse and small effect (0.044) on emergency response. While the beta value is low, it still entered the structural model and is deemed significant. The disaster mitigation strategies have been tested for a direct relationship with the respondents' preparedness level. As shown in Table 4, the null hypothesis (Ho₁) of no

significant relationship between disaster mitigation strategies and level of preparedness was accepted. This was manifested by the coefficients reflected individually on the presented table when the disaster mitigation strategies were directly related to DRMM drill, emergency evacuation, and emergency response, with the corresponding P-values that exceed the 0.05 level of significance. The result implied that the preparedness of the respondents in terms of DRRM drill, emergency evacuation, and response was influenced by disaster mitigation strategies of local government unit personnel in the Municipality of Bulalacao. Taking into account the effect of the hazard mapping tool on the disaster preparedness level, moderate beta values are recorded. Hazard mapping is essential in helping decision-makers with land-use planning, sustainable infrastructure development, and emergency preparedness. The NDRRMC supports the concept that a community's level of safety increases with the amount of knowledge it has about a danger map. Adopting innovations or technology to daily life has been demonstrated as an effective strategy when a crisis or disaster strikes. The advent of cellular phones, television, radio, and other gadgets provides information sources. In this study, the direct but inverse effect of the adoption strategy on disaster preparedness level, considering the DRRM drill and emergency evacuation, is found relevant, as evidenced by the beta coefficients of -0.273 and -0.281. Meanwhile, adoption positively affects emergency response, as substantiated by the 0.354 coefficient.

Table 4

Path Coefficients and P-values for Ho

Paths	Beta (β) Coefficients	p-values*	Effect Size**	Standard Errors	Interpretation
AWARE→DRILL	0.338	<0.001	0.194	0.086	Highly Significant
AWARE→EVAC	0.248	0.003	0.084	0.088	Significant
AWARE→RESPONS	-0.161	0.038	0.044	0.090	Significant
HAZMAP→DRILL	-0.435	<0.001	0.233	0.084	Highly Significant
HAZMAP→EVAC	-0.405	<0.001	0.173	0.084	Highly Significant
HAZMAP→RESPONS	0.372	<0.001	0.142	0.085	Highly Significant
ADOPT→DRILL	-0.273	<0.001	0.083	0.087	Highly Significant
ADOPT→EVAC	-0.281	<0.001	0.084	0.087	Highly Significant
ADOPT→RESPONS	0.354	<0.001	0.084	0.086	Highly Significant

Significant at p<0.05

** *Effect size coefficient: 0.02 – small, 0.15 – medium, 0.30 – large*

On the other side, adoption is a consistent behavior that helps one become resilient and recover from adversity. This is corroborated by the LGU-Bulalacao's localized disaster guidebook, which states that when people adopt disaster recovery techniques, they can recover from crises quickly. The abovementioned results lead to the rejection of the null hypothesis that the level of preparedness of the local government unit personnel is not significantly affected by disaster mitigation strategies in terms of awareness, hazard mapping, and adoption. As the findings reveal, there is indeed a significant effect of the disaster mitigation strategies in terms of awareness, hazard mapping, and adoption on the level of preparedness of the local government unit personnel in terms of awareness, hazard mapping, and adoption of strategies. The existing structural model illustrating the links between the exogenous and endogenous variables establishes that there is no need to generate a new model since the structural model can reasonably explain the direct connections between the latent variables. Significant relation results of disaster mitigation strategies to preparedness were parallel to Trogrlić's study (2022), which clearly stated that disaster mitigation strategies are crucial because individuals better understand their proactive course of action in advance for natural disasters. Given their current security state, identifying and resolving disaster vulnerability issues will be simple for them. Disaster risk management includes preparedness and mitigation, which measures how people get safe through preemptive measures and efficient response. An efficient mitigation strategy must be in place as a preventive measure against the harshness of disasters to obtain a better tolerance for life safety. The expectation is that individuals will be more prepared for life safety and they will more actively mitigate disasters. Additionally, disaster strategies offer crucial knowledge and information to

assist people in comprehending the effects of risk and natural hazards, allowing for quick mitigation and faster recovery for those impacted.

Table 6

Disaster Management Safety Plan to Promote Building a Culture of Safety: Safeguarding Lives with Comprehensive Plan

TARGET ACTIVITY	OBJECTIVES	STRATEGIES/ ACTIVITIES	TIME FRAME	PERSONS INVOLVED	RESOURCES		SUCCESS INDICATOR
					FUND	SOURCE	
Quarterly Disaster Drill	●Participate in the conduct of disaster drill ● Ensure a safe evacuation of employees in case of disaster crisis ● Orient employees on disaster management safety plan made by MDRRMO	●Organize/develop disaster team to follow simultaneous drills ● Secure evacuation plan/map to MDRRM Office ● Hold orientation for employees with the awareness of disaster management safety plan	May-December January-March	Offices/department heads, employees, community leaders, stakeholders MDRRMO, offices/ department heads, employees, other concerned NGOs	3,000 6,000	IRA-Special fund for DRRM IRA-Special fund for DRRM	● Participated in the conducted disaster Drill ● Ensured safe evacuation of affected employees in disaster crisis ● Oriented all employees which disaster management safety plan
Awareness Dissemination Campaign	Create disaster team responsible for the campaign awareness on disaster	Create of active group/team as frontrunner in the campaign for disaster Awareness	April-May	Offices/department heads, employees, community leaders	5,000	In partnership with other bureaus or agencies of the government	Created active team Who build responsive campaign towards disaster awareness and Disseminated

Resilience Education	Equip employees with disaster skills and Knowledge	● Conduct trainings, seminars, orientations	January-June	Offices/departments heads, employees,MDRRMO,	35,000	IRA fund	Undertaken all activities relative to the reduction impact of Disaster
	Undertake activities in advance to eliminate the impact of hazards and susceptibility	Construct /build infra projects that lessen the likelihood occurrence of disaster's effect			100,000.00 –		
	Reduce long-term risk to employees and property from natural hazards	● Provide pro-active actions that have long term effect from those that are more closely associated with immediate preparedness, recovery, and response	January-December	Community leaders Offices/department community leaders, MDRRMO, Offices/department heads, employees, community leaders, MDRRMO,	500,000.00 depending on the design of the construction	In partnership with NGO's and private groups	Long-term effects of risk to all employee Reduced

Table 6 shows the disaster management safety plan to promote building a safety culture: Safeguarding lives with a comprehensive plan. Unexpected disaster often strikes. When there is a significant disruption to people or an individual's way of life, significant losses and effects on people, property, the economy, or the environment go beyond what the affected can handle on their own. One of the defense tools against approaching disasters is a well-crafted disaster management safety plan, which helps cope with the impact and negative effects of the disaster. Promoting a safety culture by protecting lives, improving protocols that guarantee a higher level of safety, and maximizing assistance to restore normalcy to achieve a speedy and effective recovery are, in essence, among the most important things to people's welfare. A well-designed disaster management safety plan that includes a variety of tactics in addition to particular activity targets may help reduce vulnerabilities and benefit people using technology. As Natividad (2019) pointed out, a disaster management safety plan is crucial to preserving lives. People become more robust and competent in taking precautions for safety as a result of the knowledge of safety it provides, which increases the likelihood of promotion in securing promotion against disaster warfare. A disaster management safety plan enhances people's knowledge about disasters. Re-orientation and significant disaster activities should be done periodically to make everyone more resilient in the face of everyday crises and better able to deal with the psychological impact of disasters.

4. Conclusions

The following conclusions were drawn based on the summary of the findings presented above. Along with

the disaster mitigation strategies practiced by the LGU personnel in the Municipality of Bulalacao, awareness, hazard mapping, and adoption were among the related ones to exercise in facing disaster within their work. Regarding disaster mitigation strategies, it revealed a high status based on its description on the composite mean. In terms of respondents' level of preparedness, it was very well prepared, as stated in the composite mean description. Based on the findings, disaster mitigation strategies have a significant relationship to the level of preparedness of LGU personnel in the Municipality of Bulalacao. The proposed disaster management safety plan is the outcome of the proponent's study. Its basis was from the 2020 manual operation handbook of MDRRM, whose focus was to protect people's lives in the Municipality of Bulalacao, where a safety culture was promoted. The Crafted plan was made to meet the needs of mitigation and recovery in the event of unanticipated disasters.

4.1 Recommendations

Based on the findings and drawn conclusions, the following recommendations are suggested: disaster mitigation constitutes a significant impact on LGU personnel in preparing to face disaster every season, thus it is recommended to add essential mitigation strategies, such as installing warning disaster systems, purchasing radio communications, conducting emergency response training, and planning and zoning to be ready and well prepared for the onset of disaster. Improved status or characteristic of disaster mitigation strategies so that employees may lessen their worries whenever they encounter disaster by sustaining continuous drills and pieces of training with massive education disaster advocacy campaigns. Every employee in the office may have ongoing training and disaster drills so that they may all be prepared for the worst-case scenario and know exactly what to do when it does happen. Disaster mitigation strategies may be strictly implemented, and impact must be assessed so that more improvements can be taken into account for the safety of all employees. Implementation of the plan may be assessed and monitored to benefit the employees and the people living in the municipality. The effects of disasters and the stigma they impose on victims' lives may be thoroughly studied. To create additional mitigation techniques that result in an efficient and successful safety outcome, professionals were permitted to expand current readiness, response, and recovery practices. Strategies and preparations are essential in leading the way to safety and survival in uncertainty.

5. References

Antonio, H. (2017) Effectiveness of the Barangay Disaster Risk Reduction and Management Committees in Flood-Prone Barangays in Cabanatuan City, Philippines. *A Research Journal and Scientific Research,* 7(7),. DOI10.4236/oalib,110.3635

Asio, J. (2020) Disaster Awareness and Level of Compliance to Disaster Programs in a Highly Urbanized City, Gordon College, La Consultation University, Philippines https://doi.org|10.2160||aquademia|9581

Bhat, M., Anees, S.U.M., Geelani, S. N. Z., Nusrat, Jan, I. & Zargar, B.A. (2017) A Study on Disaster Awareness and Preparedness Among College Students in District Ganderbal of Kashmir Valley. *Kashmir University of Agricultural Sciences and Technology.* https://www.researchgate.net/publication/325895339_A_Study_on_Disaster_Awareness_And_Prepared ness_Among_College_Students_In_District_Ganderbal_of_Kashmir_Valley

Center for Global Statistics of Disasters (CGSD), 2018. Collaborative reports on Disaster Risk Reduction and Support Countries to manage disaster risk using databases to lessen catastrophes across the globe. https://www.undrr.org/gar

Chaudhary M. T. & Piracha, A. (2021) Natural Disasters—Origins, Impacts, Management. *Encyclopedia*. 2021; 1(4):1101-1131. https://doi.org/10.3390/encyclopedia1040084

Disaster Risk Reduction Resource Manual (Safer School Resource Manual) (2008 Edition). Published by the *Department of Education in Partnership and support with the United Nations Children's Fund (UNICEF) and Plan International Phil.* https://psba.edu/wp-content/uploads/2018/07/Disaster-Risk-Reduction-Resource-Manual-2008.pdf

Gerdan, S. (2018) Determination of Disaster Awareness, Attitude levels and Individual Priorities. Eurasian

Journal of Educational Research, pages 159- 176. Kocaeli University, Kocaeli, Turkey. https://files.eric.ed.gov

Granberg, T. (2017) Preparedness Measures of Emergency and Disaster Response. Humanitarian and Relief Logistics: *Research Issues Case Studies and Future Trends* DOI 10.1007/978-1-4614-3007-6

Hendricks, M., Luyten, L. & Parrack, C. (2022) Knowledge Exchange and Adoption to enable Safer Post Disaster Self-Recovery. J*ournal On Disaster Knowledge and Adoption.* DOI: 10.5595/idrim.2018.0314

Khan, M. (2022). National Disasters, Resilience-building, and Risk Achieving Sustainable   Cites and Settlements. A Published Article on *Natural Hazards Government Graduate College, Jaranwala.Indonesia* https://doi.org|10.1007|s11069-023-06021

Ligon, K. (2015). Disaster Preparedness Plan for the Study Abroad Student: How to Engage Students in Hazard Preparedness Emergency and Disaster Management Commons, Higher Education Commons, and the International Area Study Commons. https://commons.cu-portland.edu.gradproj

Lindell, M. (2020) Improving Hazard Map Comprehension for Protective Action Decision Making. *Institute for Hazard Mitigation, Planning and Research, University of Washington, Washington D.C.,* USA. https://research.be.uub.edu

National Disaster Resilience Month). Renaming and Shifting Focus of National Disaster Consciousness Month (2023). Executive Order No. 29, Series of 2017 for https://jur.ph/laws/summary/renaming-the-national-disaster-consciousness-month-to-national-disaster-r esilience-month-and-shifting-its-focus-from-disaster-awareness-building-to-disaster-resilience

National Disaster Risk Reduction and Management Council Plan (NDRRMC)for 2011-2028. https://www.adrc.asia/documents/dm_information/Philippines_NDRRM_Plan_2011-2028.pdf

Natividad, M.(2019) Disaster Preparedness of Employees and Students in an Asian   Private Univeristy. *Asia Pacific Journal of Education, Arts and Sciences,* 6(3) College of Nursing, Lyceum of the Philippines University, Batangas City, Philippines https://apjeas.apjmr.com/wp-content/uploads/2019/08/APJEAS-2019-6.3-006.pdf

Patel, R. K., Pamidimukkala, A., Kermanshachi, S., & Etminani-Ghasrodashti, R. (2023). Disaster preparedness and awareness among University Students: A structural equation analysis. *International Journal of Environmental Research and Public Health*, 20(5), 4447. https://doi.org/10.3390/ijerph20054447

Presidential Decree No. 1566, dated June 11, 1978. Strengthening the Philippine disaster control capability and establishing the national program on community disaster preparedness. https://www.officialgazette.gov.ph/1978/06/11/presidential-decree-no-1566-s-1978/

Primer on the DRRM Act-Republic Act No. 10121. https://www.downloads.caraga.dilg.gov.ph/Disaster%20Preparedness/DRRM%20Act%20Primer.pdf

Ronquillo, R.(2020) Teachers' Preparedness on Disaster Risk Reduction and Management   Measures Among Public Senior High Schools in the Division of Batangas City. *An   International Journal of Innovative Science and Research Technology.* Paharang Integrated School, City of Batangas. https://ijisrt.com

The Mines and GeoScience Bureau (2021) Government Agency under the Department of   Environment and Natural Resources, responsible for the Conservation, Management, Development, and use of mineral resources, including those in reservations and Public lands. They conduct geological research to establish danger in hazard and risk-prone areas. https://mgb.gov.ph

Turmes, M. (2020) Emergency Preparedness and Perceptions of Resident University Student: Literature Review, *Study Proposal and Impact on Pandemic Crisis on Research,   Dominican University of California* https://doi.org|10.33015|domenican.edu

Vordzorgbe, S. D. (2006). United Nations International Strategies for Disaster Risk (UNISDR) Making the case for disaster risk reduction in Africa https://www.unisdr.org/preventionweb/files/1356_1356SethDoeVordzorgbedrrinafrica.pdf