

Earthquake Preparedness Measures and Response Of the Calatagan and Mabini Municipalities in Batangas Province

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ABSTRACT

The study concentrated on the earthquake disaster preparedness and measures of Calatagan, and Mabini Municipalities in the province of Batangas. It described the geographical locations of the aforementioned municipalities and provided information on the preparatory measures observed by the barangay and the households in terms of earthquake disaster preparedness. It also assessed the extent of the factors such as communication, logistics, and awareness maximized in households as well as the problems and issues met by the families in earthquake disaster preparedness as well as the LGU's initiatives and mechanism to capacitate the individuals as to becoming earthquake prepared and responsive community.

The study is quantitative-qualitative design in nature and involved 312 constituents in Calatagan and Mabini, Batangas. The study employed weighted mean, frequency, percentage, and composite mean as the statistical treatment of data.

Findings of the study revealed that Calatagan and Mabini municipalities are both near the Philippine Fault Zone and the Manila Trench, making them susceptible to earthquakes. There were limited preparatory measures observed in household and barangay among the community members in Calatagan and Mabini, Batangas. Further, earthquake preparations relative to communication, logistics, and awareness were delivered to a moderate extent. The respondents also identified inability to receive in information, education, and communication campaigns, lack of knowledge in using 911 and joining the first aid training as the main problems and issues met in earthquake preparations. Likewise, public awareness campaigns and education programs, training sessions and drills to prepare individuals for earthquakes are the LGU's initiatives. The proposed community extension program includes seminars and trainings on disaster preparations of the families in an earthquake.

Keywords: earthquake preparedness and measures, communication, logistics, awareness, initiatives, problems met, community extension program

INTRODUCTION

Background of the Study

The importance of earthquake preparedness and response in Calatagan and Mabini, Batangas is emphasized due to their high seismic activity and proximity to the West Valley Fault System. The geological setting, historical seismic events, and socio-economic impact highlight the need for proactive strategies to mitigate earthquake effects and enhance community resilience. While efforts have been made to improve preparedness, challenges such as resource constraints and capacity building persist. Recommendations include strengthening public awareness, enhancing building codes, investing in infrastructure resilience, and developing community-based preparedness programs. Historical seismic events like the 1990 Luzon Earthquake, 2017 Batangas Earthquake Swarm, and the Taal Volcano Eruption in 2020 have underscored the vulnerability of these areas to seismic activity. Efforts such as public awareness campaigns, regular drills, and building code enforcement have been made, but gaps in enforcement and resource limitations still exist. The importance of community engagement, early warning systems, and capacity building in enhancing earthquake preparedness in Calatagan and Mabini is

highlighted in order to protect lives, livelihoods, and infrastructure in the event of seismic activity.

Calatagan and Mabini Geographical and Geological Background

Calatagan and Mabini are two cities in Batangas, known for their landscapes and geological features. Calatagan is coastal with the Cape Santiago Lighthouse and limestone formations at Burot Beach. Mabini is near Taal Volcano and has a varied landscape. With the recent increase in seismic activity in Batangas, it is important to assess the earthquake preparedness of these cities. The study aims to identify strengths and weaknesses in their disaster management plans and offer recommendations for improvement. This includes evaluating emergency supplies, communication systems, public awareness, and coordination among local agencies and stakeholders. The study may suggest conducting more drills, updating building codes, establishing evacuation routes and shelters, and improving early warning systems. By enhancing preparedness measures, Calatagan and Mabini can lessen the impact of earthquakes on lives and property. Collaboration between local governments, community groups, and individuals is essential to promote a culture of readiness and resilience in the face of seismic events.

Statement of the Problem

This study aimed to determine the earthquake disaster preparedness measures and response of selected municipalities in Batangas for the purpose of preparing a community extension program for the locality of Calatagan and Mabini Batangas.

The main question answered by this research was: What precautionary measures were observed and how do communication, logistics and awareness maximize in earthquake preparation and response?

The study was guided by the following specific questions:

1. How may the following municipalities be geographically described?
 - a. Calatagan
 - b. Mabini
2. What are the preparatory measures observed by the following;
 - a. Household; and
 - b. Barangay?
3. To what extent are the following factors maximized in the household in earthquake preparation:
 - a. Communication;
 - b. Logistics; and
 - c. Awareness?
4. What are the problems and issues met by the families in earthquake disaster preparedness?
5. How may the local government units capacitate individuals towards resiliency and active response to earthquake?
6. Based on the findings, what community extension program may be proposed?

Objectives of the Study

The general objective was to prepare a community extension program for Mabini and Calatagan community.

Specifically, the objectives were:

1. To describe the geographical location of Mabini and Calatagan, Batangas;
2. To identify the precautionary measures observed;
3. To determine the extent of application as to earthquake preparation;
4. To ascertain the problems and issues in earthquake preparedness as well as the LGU's initiatives to capacitate constituents.

Significance of the Study

Earthquakes are a natural disaster that can strike at any moment, causing devastation and destruction in their wake. In order to minimize the impact of earthquakes on communities, it is crucial to study earthquake preparedness and response. By understanding how to properly prepare for and respond to earthquakes, communities can save lives, reduce damage, and expedite recovery efforts.

Local Governments and Families in Calatagan and Mabini Batangas

This may help them to strengthen their familiarity and awareness and lessen their vulnerabilities to disasters. It will also provide ideas in dealing with disasters especially on earthquakes, and building a culture of safety in preparation for disasters. This can give ideas on building an efficient community extension project in the adopted community in such a way that this could provide a source of information regarding the need of communities as to disaster preparedness.

Municipal Disaster Risk Reduction Officers

This can provide them with ideas on providing service to the community in terms of disaster preparedness as it is both a national and local priority.

Researchers and Academe

This can strengthen their community-based disaster management curricula. This could include educating, preparing, and supporting local residents and communities in their everyday efforts in reducing risks and arranging their own local response mechanisms to address disaster emergencies.

The study concentrated on the earthquake disaster preparedness and measures of Calatagan and Mabini, Batangas. It described the geographical locations of the aforementioned municipalities and dealt with the preparatory measures observed by the barangay and the households in terms of earthquake disaster preparedness. It also assessed the extent of the factors such as communication, logistics, and awareness maximized in households as well as the problems and issues met by the families in earthquake disaster preparedness as well as the LGU's initiatives and mechanism to capacitate the individuals as to becoming earthquake prepared and responsive community.

Meanwhile, other municipalities were not covered in the study as this only concentrated on Calatagan and Mabini Batangas which were frequently hit by the earthquake.

Definition of Terms

Awareness. This means an understanding of the activities of others, which provides a context for your own activity (Dourish & Belloti, 2016). In this study, it refers to the knowledge and comprehension of the selected household leaders on the earthquake disaster preparations

MDRRMC. This means Municipal Disaster Risk Reduction and Management Council (Republic Act No. 10121). As used in this study, it refers to the organization that promotes monitors, organizes, and conducts training orientations and knowledge management about disaster like earthquake.

Communication. It refers to the process of transmitting information and common understanding from one person to another (Keyton, 2011). As manipulated in this study, it is the imparting or exchanging of information or news of the family leaders with their members using different communication mediums like social media about earthquake disaster preparedness.

Disaster Preparedness. It denotes to the knowledge and capacities developed by government, professional response and recovery organization, communities and individuals to effectively anticipate respond to and recover from the impacts of likely, imminent or current hazard events or conditions (Republic Act. 10121). As used in this study, it refers to the right prevention practices that family must do in times of pre-disaster just like earthquake.

Household Leader. It refers to the head who has the authority over members in the family members (Republic Act No. 10121). As used in this study, he/she may be referred as the respondents just like fathers, mothers, eldest siblings or relative who has the authority at the moment of disaster just like earthquake.

Logistics. This is the planning, organizations and control of all activities (Jonsson, et.al. 2005). As used in this study, it refers to the way of preparedness of the household leader in relation to the organization of the resources and capitals to promote earthquake disaster preparedness.

Community Extension Program. It refers to the services that allow individuals to be part of that aimed to increase competence in the areas concerned (Boyd, 2016). As employed in this study, it refers to the program aimed to capacitate community members in Calatagan and Mabini in terms of earthquake preparation and response.

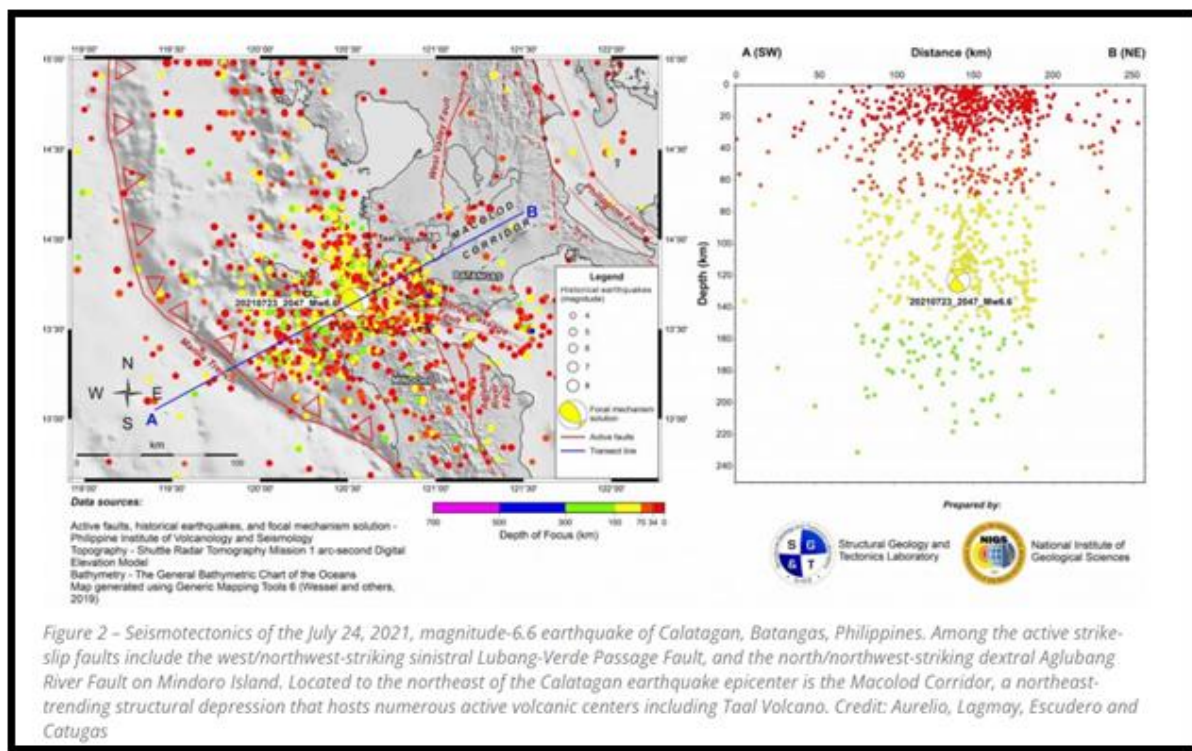


Figure 2 – Seismotectonics of the July 24, 2021, magnitude-6.6 earthquake of Calatagan, Batangas, Philippines. Among the active strike-slip faults include the west/northwest-striking sinistral Lubang-Verde Passage Fault, and the north/northwest-striking dextral Aglubang River Fault on Mindoro Island. Located to the northeast of the Calatagan earthquake epicenter is the Macolod Corridor, a northeast-trending structural depression that hosts numerous active volcanic centers including Taal Volcano. Credit: Aurelio, Lagmay, Escudero and Catugas

REVIEW OF LITERATURE

In this chapter, existing literature relevant to the research have been gathered and reviewed. Concepts and ideas from books, research journals, as well as from reports from different government agencies were systematically compiled to serve as theoretical basis for this research work.

Geographical Descriptions and Locations

The Philippines has faced many devastating events, including earthquakes that can cause widespread destruction due to their unpredictable nature. In 2017, earthquakes in Batangas led to significant damages, injuries, and

evacuations. The local government units worked with families to enhance disaster preparedness and resilience. Disaster preparedness is essential for communities to mitigate the impacts of disasters such as earthquakes. Additionally, Calatagan and Mabini in Batangas offer beautiful landscapes and cultural attractions, making them popular destinations for tourists. Calatagan features pristine beaches, historical sites, and a lighthouse, while Mabini is known for its diving spots, hiking trails, and scenic views of Balayan Bay. Both towns are characterized by their warm and welcoming communities, making them ideal places to visit for those looking to experience the natural beauty and rich culture of the Philippines. Overall, Calatagan and Mabini are two charming municipalities in Batangas that offer a unique blend of natural beauty, cultural heritage, and warm hospitality.

Whether you are looking for a beach getaway, a diving adventure, a hiking expedition, or a cultural exploration, Calatagan and Mabini have something to offer for everyone. With their stunning landscapes, rich history, and vibrant communities, these towns are definitely worth a visit for anyone seeking a memorable and enriching travel experience. Mabini, Batangas: A Traveler's Guide". Pinoy Adventurista. www.pinoyadventurista.com. The Philippines recently experienced a magnitude-6.6 earthquake in Luzon, with the epicenter off the coast of Calatagan Peninsula. This region is prone to seismic events due to its tectonic complexity, with subduction zones, strike-slip faults, and active volcanic centers like Taal Volcano. The country has six active subduction zones and experiences oblique convergence between tectonic plates. The Manila Trench, where the earthquake hit, has a steep subducting slab and northwest-striking thrust faults. The event is part of a series of destructive earthquakes in recent years, highlighting the need for ongoing monitoring and preparedness. Disaster preparedness involves various activities and programs aimed at reducing the impact of disasters and ensuring a rapid and effective response. This includes training individuals and teams to work together in emergency situations, as well as developing contingency plans, stockpiling supplies, and establishing early warning systems. Mitigation and preparedness activities are crucial in reducing human and property losses, and regular drills and exercises help optimize response effectiveness. Every household should have a family disaster plan, be aware of community vulnerabilities, and conduct risk assessments to mitigate potential hazards. Overall, disaster preparedness is essential for protecting lives and property during emergencies.

Key Concepts

Effective communication is crucial in disaster preparedness, with information being disseminated to the public by governments, emergency management organizations, and disaster responders through various traditional and social media channels. It is important for the message to be accessible to all, including those with special needs, children, and senior citizens. Local authorities play a key role in communicating with their communities, ensuring that the information is consistent, timely, and situation-specific.

The media also play a significant role in educating the public about hazards and risks, although they can sometimes sensationalize events. Analyzing communication channels can help identify which outlets are necessary to address specific needs, such as seeking news about a crisis or verifying the safety of loved ones. Accurate communication can provide timely information and instructions to the public during disasters, helping to reduce risk and increase community resilience.

Communication plays a critical role in helping societies prepare for, respond to, and recover from disasters. Risk communication involves specialists delivering information to individuals and communities to help them make the best decisions for their safety. This is particularly important for at-risk populations, who may face barriers such as limited resources, privacy concerns, and negative attitudes about preparedness. More rigorous evaluations of risk communication strategies targeting at-risk populations are needed to improve the effectiveness of communication efforts.

Logistics

Logistics in a household setting are crucial for emergency preparedness, especially in earthquake-prone areas. It involves actions such as collecting survival items, creating an earthquake plan, retrofitting buildings, and developing survival skills. Supply management is essential in emergency planning, with individual responsiveness being key in selecting the right supplies. Family leaders must decide what items to keep in stock and what to outsource, distinguishing between response-generated needs and agent-generated needs. Disaster

preparedness in familial logistics includes tangible activities like inventory management and infrastructure management, as well as intangible activities such as investing in training and knowledge management. Community involvement is vital in raising awareness and preparing families for disasters, with community-based approaches being effective in mobilizing resources and creating proactive communities capable of responding to calamities. Creating a community committee focused on relief efforts can help ensure that communities are informed and able to sustain themselves during disasters.

Awareness

The community preparedness and awareness are an environmental factor that predicts a family's disaster response. To the agencies, their advocacies focuses more in spreading information through mass media, improving people's awareness through conducting of disaster management form briefing, observance of disaster consciousness month, Training and Educating the local officials, delegated coordinators, auxiliaries, self-imposed individual or the volunteers, conduction of some drills and exercises, community based disaster risk management trainings and resources that includes manpower, materials, methods, machines and money. They may also advocate relief activities that include medical attention, body identification, providing transport access, providing survival requirements, water purification kits, cooking utensils, foods, safe areas, relocation, shelter and general living and psychological support.

Experiences on natural hazards have also contributed to the development of a household preparedness. In improving the preparedness to a natural disaster, the term "experience" needs to be taken into account; it tends to make people gather and collect some information about the said disaster, it has also the capability to inform the individuals about the possible occurrence of the same events in the future and as a result brings better judgment toward natural disaster preparedness.

Problems and Issues Met

Earthquakes pose a constant threat to communities worldwide, leading to widespread destruction and loss of life. Various strategies have been implemented for earthquake preparedness and response, but several challenges hinder effectiveness. These challenges include the lack of public awareness, inadequate infrastructure, limited resources, and communication issues between agencies and organizations.

A major issue is the lack of resources, particularly in developing countries, which struggle to allocate sufficient funding and manpower for earthquake preparedness programs. This results in vulnerable communities lacking essential initiatives like infrastructure reinforcement and early warning systems. Another challenge is the lack of public awareness and education, causing people to underestimate earthquake risks and respond inadequately. Furthermore, communication and coordination between different stakeholders can be problematic, leading to confusion, duplicated efforts, and response gaps. The unpredictable nature of earthquakes also complicates preparedness and response efforts, as they cannot be predicted accurately. Addressing these challenges requires collaboration, increased investment in preparedness programs, and ongoing education and awareness efforts to better protect communities and minimize earthquake impacts.

Development of Community Extension Program

The development of disaster-risk management and mitigation (DRRM) extension program aims to address existing and emerging disaster risks, with the community taking responsibility for developing programs to deal with the impact. The importance of educating vulnerable stakeholders about disaster preparedness is emphasized, with recommendations including integrating disaster preparedness in schools and encouraging participation in DRR-DRM programs. Extension programs are informal educational processes directed toward rural populations, aimed at solving their problems and improving their lives. Principles for developing an extension program include working with people, not for them, and being accountable to clients. Higher education institutions are authorized to provide extension services to help fulfill the needs of rural communities. The University of the Philippines' Office of Community Extension Services focuses on educating and training Filipino families and communities, coordinating extension projects, and providing linkages with various sectors. Former Senate President Marcelo B. Fernan stressed the importance of people empowerment through

human resource development and technology application in community extension services. Coordinated extension approaches are expected to address multifaceted group issues effectively and enhance the capacity of faculty members in their fields of expertise. Community extension services not only respond to the needs of the community but also align with the Vision and Mission of the University to provide education to underserved populations and promote social relevance and solidarity. Various models have been developed to guide decision makers and practitioners in community development programs.

Research Gaps

Earthquakes are one of the most destructive natural disasters, causing widespread damage to infrastructure and loss of lives. In recent years, the Philippines has experienced several devastating earthquakes, including the 2019 earthquakes in Batangas. Calatagan and Mabini are two areas that are particularly vulnerable to earthquakes due to their proximity to major fault lines. Despite the high risk of earthquakes in Calatagan and Mabini, there is a significant research gap in studying earthquake preparedness and response in these areas. While there have been studies on earthquake preparedness and response in other parts of the Philippines, there is limited research specific to Calatagan and Mabini. This lack of research hinders efforts to effectively prepare for and respond to earthquakes in these areas.

One reason for this research gap is the lack of funding for studies on earthquake preparedness and response in Calatagan and Mabini. Research requires funding to conduct surveys, interviews, and data analysis, but funding for research in these areas is scarce. Without adequate funding, researchers are unable to collect the necessary data to understand the unique challenges faced by these communities in preparing for and responding to earthquakes. Another reason for the research gap is the lack of collaboration between researchers and local communities in Calatagan and Mabini. Research on earthquake preparedness and response is most effective when it involves input from local stakeholders, including residents, local government officials, and disaster management agencies. However, there is a lack of collaboration between researchers and local communities in these areas, leading to a disconnect between research findings and community needs.

To address the research gap in studying earthquake preparedness and response in Calatagan and Mabini, it is essential to prioritize funding for research in these areas. By providing funding for studies on earthquake preparedness and response, researchers can collect the data needed to understand the unique challenges faced by these communities and develop effective strategies to mitigate the impact of earthquakes. Additionally, it is crucial to foster collaboration between researchers and local communities in Calatagan and Mabini. By involving local stakeholders in research efforts, researchers can gain valuable insights into community needs and develop tailored solutions to improve earthquake preparedness and response in these areas. In conclusion, there is a significant research gap in studying earthquake preparedness and response in Calatagan and Mabini, Batangas. To address this gap, it is essential to prioritize funding for research in these areas and foster collaboration between researchers and local communities. By closing the research gap, we can better understand the unique challenges faced by these communities and develop effective strategies to mitigate the impact of earthquakes in Calatagan and Mabini.

The notions about the study were derived from the different sources like books, journals and studies conducted provided insights, which made possible the emergence of a clear understanding of the conceptual framework of this study. Figure 1 shows the conceptual framework of this study. The model was used as it is the common framework of any scientific research to know the flow of the study.

Calatagan and Mabini are two municipalities located in the province of Batangas, Philippines. Calatagan is situated on the southernmost tip of the Calatagan Peninsula, facing the South China Sea. It is known for its beautiful beaches and diving spots. Mabini, on the other hand, is located on the southeastern part of Batangas and is famous for its marine sanctuaries and diving sites. In preparing for earthquakes, households in Calatagan and Mabini take various measures to ensure their safety and readiness. This includes conducting regular earthquake drills, securing heavy furniture and appliances, and having emergency kits stocked with necessities such as food, water, and first aid supplies. Barangays, on the other hand, play a crucial role in earthquake preparedness by disseminating information and organizing community-based disaster preparedness trainings. In maximizing factors in earthquake preparation, households in Calatagan and Mabini focus on communication by

establishing emergency communication plans with family members and neighbors. Logistics are also prioritized by ensuring that emergency kits are readily accessible and regularly updated. Awareness is heightened through continuous education and training on earthquake preparedness and response.

Despite these efforts, families in Calatagan and Mabini face various problems and issues in earthquake disaster preparedness, such as limited resources, lack of access to information, and complacency towards disaster risks. To address these challenges, local government units can capacitate individuals towards resiliency and active response by conducting information campaigns, providing resources and training, and establishing community-based disaster response teams. The proposed extension community program for earthquake preparedness and response in Calatagan and Mabini aims to create a holistic approach to disaster risk reduction by addressing the interrelations of communication, logistics, and awareness. By integrating these variables into the program, individuals and communities can be better equipped to respond to earthquakes and other disasters effectively. Through collaboration between households, barangays, and local government units, Calatagan and Mabini can build a culture of preparedness and resilience that will help mitigate the impact of earthquakes and save lives.

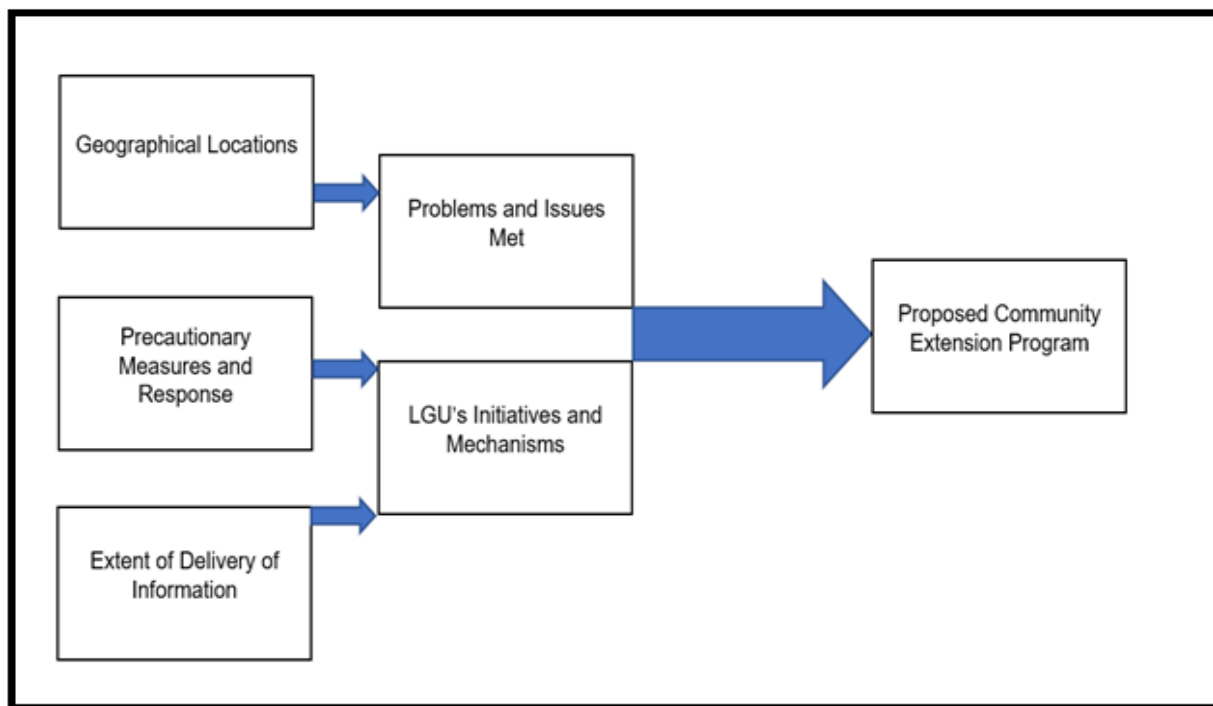


Figure 1 Research Framework

The input of the study comprised of earthquake preparatory practices maximized by the families and the local government unit specifically their observations, capitalized provisions, communication system, level of awareness, and problems and issues meet regarding to earthquake disaster preparedness. This was done to determine the behaviors and preparations in earthquake disaster preparedness of the aforementioned community.

The process of the study was the use of the self-structured questionnaire and interview which were developed by the researchers primarily to gather data.

METHODS

In this chapter is a detailed discussion of the research processes that have been carried out in gathering, analyzing and interpreting data to be able to answer the research questions and objectives.

Research Design

This study utilized descriptive qualitative method of research to gather data in assessing the earthquake disaster preparedness of selected households in Calatagan and Mabini, Batangas to fulfill this research endeavor. The method involved expressive collecting and interpreting the data in order to gather the information needed.

Zulueta (2019) purported that descriptive research seeks to provide information of one or more variables. It focused on the present conditions and its purpose is to find new truth, hence, it is suitable in deliberating the present status of earthquake disaster preparedness among chosen families in the aforesaid barangay. This method was developed by means of simultaneously collecting and analyzing data from published and unpublished theses and dissertations. Therefore, the data collection in this method focused on discovering the earthquake disaster preparations of chosen family of the barangay.

Data Gathering

The study used a researcher-made questionnaire, and interviews as data gathering instruments.

Interview. To guarantee the essential information, semi-structured qualitative interview guide was developed to gather data from the MDRRMC (Municipal Disaster Risk Reduction Management Council) and target respondents from the households in the study. The research instruments were assembled through vast reading of numerous dissertations and studies in line with the earthquake disaster preparedness. The researchers carefully deliberated and analyzed the information for the number of questions. The sets of interview questions were consulted to their panel members. Suggestions and comments were considered in the final draft and exhibited to the adviser for the approval.

The expertise of a Filipino subject professor was used to translate the linguistics of the interview guide questions into Filipino language for the respondents to be comprehensible. The researchers organized the interview upon the endorsements approved by the municipal mayor, LDRRMC Director and Barangay Captain of the target barangay. The interview set-up was executed through one-on-one interface with the interviewee represented upon by the barangay captain of the barangay for the set for interview questions at the BDRRMC and household leaders for another set of interview questions at household. The interviewer proceeded upon by the researcher.

The researcher inquired personally all the questions for the interviewees and wait for their responses to be documented with series of accompanying questions for clarification and support. For the interview guide questions of MDRRMC level it consists of series of questions that identifies how the barangay prepares for the disaster in terms of communication, logistics and awareness with the participation of the constituents. The set of interview questions for the household leaders-respondents was composed of three parts. The responses were tabulated based form the affirmative and negative responses supported with their corresponding explanations from the supplementary questions asked by the interviewer.

Questionnaire. The main instrument used in gathering data was a researcher-made questionnaire. The questionnaire contained a series of questions and other prompts for gathering information from the respondents.

Construction. The research instrument was conceptualized through reading magazines, newspapers dissertations and observations. The researchers carefully studied and analyzed the construction of the questionnaires so that all the items would be relevant to the study.

Validation. The questionnaire was presented to their chairperson, and panel members to validate all the items of the instrument. Suggestions and comments were considered in the final draft and showed to the adviser for approval. A grammarian was consulted to guarantee the grammatical accuracy and clarity of the directions. Filipino translator was also consulted to decode the medium of language of the questionnaire into Filipino for its accessibility for the respondents. The questionnaire was subjected for validation by presenting it to the panel members of this study. Suggestions and revisions were considered and incorporated in the questionnaire and interview guide for its final copy. Then, the researchers personally fielded out the entire questionnaire and interview to the respondents after the modifications and production.

Administration. The researchers wrote a letter to Municipal Mayor, Director of Local Disaster Risk Reduction and Management Office and to the barangay captains concerned. The researcher personally distributed the questionnaire to the respondents after the barangay captain of abovementioned barangay granted the approval. Questions and inquiries from the respondents were entertained and clearly explained. After answering all the questions, the questionnaires were immediately collected, tallied, and evaluated.

Scoring of Responses. The responses that were tabulated, analyzed, and interpreted utilizing the descriptive designation with its corresponding meaning and value with one as the lowest and four as the highest. Descriptive equivalents or verbal interpretations were used for the interpretation of numerical results.

The following scale continuum was used with corresponding verbal interpretations.

Option	Scale Range	Verbal Interpretation
4	3.50 – 4.00	Great Extent
3	2.50 – 3.49	Moderate Extent
2	1.50 – 2.49	Slight Extent
1	1.00 – 1.49	Least Extent

The researcher used questionnaire and interview to gather information with the preparatory measures observed by the household leaders and the barangay and the extent of maximization of the following factors such as communication, logistics and awareness of the household leaders in terms of earthquake disaster preparedness. Several references were systematically reviewed and analyzed to gather the necessary data. Upon the approval of the letter request from the mayor and barangay captain, the copies of questionnaire and interview questions were distributed, administered, and retrieved personally to and from the respondents.

The researchers also conducted tallying and tabulating to yield more valid and reliable information. The researcher presented, interpreted, and analyzed the data. They also used tables for clearer presentations of data. The responses will be measured and treated by means of the enumerated statistical tools.

Study Sites

The study involved several household leaders from selected families approximately 1,652 in total. The researcher had 312 households as the target respondents based from the whole population in Barangay Anilao East, Taal-taalan, Dau, Lalao, Tibagan, Gulod and Grahe while for Calatagan were Balibago, Tanayan, Santa Ana, Lucsuhin and Gulod. The computed sample population was taken using the Raosoft calculator which was utilized to determine the needed number of respondents.

RESULTS AND DISCUSSION

Geographical Location and Descriptions

As a coastal municipality in Batangas, Calatagan is situated in a geologically active area known for having fault lines that make it susceptible to earthquakes. On the other hand, Mabini is another municipality in Batangas that is also at risk of earthquakes due to its proximity to major fault lines like the West Valley Fault. Both Calatagan and Mabini have experienced devastating earthquakes. In terms of geographical location, Calatagan and Mabini have unique features that can impact their vulnerability to earthquakes. Calatagan, being a coastal municipality, is at risk of tsunamis triggered by underwater earthquakes. This adds an additional layer of complexity to their preparedness and response efforts, as they must also consider the possibility of being hit by a tsunami in the event of a major earthquake. Mabini, on the other hand, is located near a major fault line, making it more prone to ground shaking and structural damage during earthquakes. The hilly terrain of Mabini also poses a challenge for search and rescue operations in the aftermath of an earthquake.

In order to effectively respond to earthquakes in these areas, it is crucial for local authorities and residents to be well-prepared and informed about the potential risks. This includes having evacuation plans in place, conducting regular drills, and ensuring that buildings and infrastructure are designed to withstand seismic activity. Furthermore, community engagement and awareness are key components of earthquake preparedness and response. By educating residents about the risks and providing them with the tools and resources they need to

protect themselves during an earthquake, local authorities can help minimize the impact of these natural disasters.

The geographical location and descriptions of Calatagan and Mabini in Batangas play a significant role in their vulnerability to earthquakes. By taking proactive measures and working together as a community, residents in these areas can enhance their preparedness and response efforts, ultimately saving lives and minimizing the destruction caused by earthquakes.

Both Calatagan and Mabini are near the Philippine Fault Zone and the Manila Trench, making them susceptible to earthquakes. The 2017 Batangas Earthquakes, with magnitudes ranging from 5.5 to 6.0, caused damage in the area. The high seismic activity in the region and the presence of volcanic rocks and loose sediments increase the risk of ground shaking and damage. To minimize the impact of future earthquakes, it is essential to enforce strict building codes, invest in early warning systems, and educate the public about earthquake preparedness. These strategies are crucial due to the high population density in coastal areas and the vulnerability of buildings and infrastructure in both towns. Overall, effective mitigation measures are necessary to protect the residents and infrastructure of Calatagan and Mabini, Batangas, from the potential impacts of seismic activity.

Preparatory Measures Observed

Preparatory measures observed regarding earthquake disaster preparedness were interviewed from the MDRRMC (Municipal Disaster Risk Reduction Management Council) of Calatagan, and Mabini, Batangas and selected families of the aforesaid community.

Barangay

Building the sense of security and responsibility to the community greatly influenced by the disaster preparedness of the local government unit. The barangay-based approaches were more and more essential to the groundwork of resiliency and tactics of a family towards disaster preparedness. An interview was conducted with Vilma Guia Dolor, the Barangay Captain. The interview aimed to gather information with the preparatory measures observed by the Council to promote disaster preparedness.

During the interview, the captain was asked about how well prepared they are whenever earthquake disaster occurs, she clearly stated that they were not prepared at all regarding with the last year earthquake swarms. This is because earthquake in the was not a common occurrence especially with their Barangay.

With her response it can be defined that it was the first time for them to experience this kind of catastrophe. Having no experience from this calamity may result of not totally being geared up to face this disruption. This fits in to the study of Lindell that disaster familiarity has equal incidental consequence and a direct outcome on threat regulation and adoption.

What is more, she added that...

A certain barangay was more prone to devastating floods rather than earthquakes as this disaster is not often happens to their community. Floods are always experienced in low topographical areas specifically in Sitio Grahe and Sitio Lalao. She also shared that last Typhoon Glenda; their court was filled with flood as high as the chest of a normal person. This clearly indicates that families from the aforesaid barangay were more set to handle the floods fairly than earthquake. This is possible for the reason that Barangay Anilao East served as a “catch basin” of the nearby barangays from the Municipality of Mabini, Batangas. In addition, she shared that most of the families were displaced from the nearby evacuation areas in Anilao Elementary School, and Municipal Plaza from the last earthquake.

This obviously shows that the community know that these areas were positioned at high terrestrial settings. This is because they firmly believed that when flashfloods or tsunami run into their area all they need to do is to go to in elevated locations to prevent any damages or casualties within their part. A portion from writings of Kangabam may provision the results that a community is capable to respond from such situations would be a community that is capable and able to sustain itself and mitigate damages and losses during such eventualities.

Also, the MDRRMC was prepared for the occurrence of flooding rather than earthquake through activities like de-clogging of sewage canal, but any activities for earthquake was not practice at all.

Mrs. Vilma shared that after the catastrophic event last year, the Municipal Government was able to provide a seminar for the official members of BDRRMC about disaster preparedness and responses, the said seminar is set only for the Barangay staff and members and does not include all the residents due to unavailability of them. After the earthquake occurrences, the BDRRMC Council were able to round a check between the affected houses of selected families in the area but they were not able to provide even a small symposium regarding disaster preparations especially first-aid training and earthquake drills with the families of the barangay.

This clearly indicates that the barangay was not able to exercise their work to generate agendas that will raise the awareness of their society. This is because based from the interview with the barangay captain, crafting an assembly for her people from the residents is a hard task due to the geological backgrounds of the place wherein consolidating a number of participants needs a widespread broadcasting of encouragement. The result is in contrast to the study of Viloría that barangays should create the consciousness in the community through some activities is important it leads the community to becoming a disaster conscious resilient group.

She stated that the barangay did not have any emergency service vehicle that will provide an initial response for the need of the residents.

This result is a certain indicator of deficiency in monetary budget to fund this kind of emergency resources, and activities to develop and extend it more for the families. Supporting to this is the concept from Makarem that the barangay or the community should encourage themselves to find preparedness fund because there are a number of grant programs exists to fund for disaster preparedness activities that reduce losses and protect life and property from future disaster damages.

What's more, she clarified that to promote awareness with the calamity; a Geo-Hazard Map was provided but only displayed inside the Barangay Hall. This campaign clearly shows the risks of their barangay on landslide and floods, but it is limited into the geographical menace of the whole barangay not within their sitios. This shows a lack of work to present more an effective Information Campaign of the obstructing vulnerabilities with their community.

This result is unaligned with the concept of the MDRRMC contingency Plan of Mabini, Batangas that one of the objectives of the barangay is to increase the level of awareness of the communities to the threats and impacts of all hazards, risk and vulnerabilities.

Household

The researcher assessed the household preparations observed by the family leaders that involve their annotations concerning disaster preparedness through informal interview. The researcher found out that most of the families, specifically the household leaders are still able to discuss some of the earthquake preparations with their family members. This undoubtedly illustrates that household leaders are great builders of an interactive rapport with their family members that makes the family more tough and equipped. This is because many family leaders firmly believe that a productive communication make every member well informed on what to do in any tragedy. In that case, household leaders must be guided with a notion of Rotimi that communication which has a sense of accuracy can provide timely and useful information and instructions to the public especially with the families and its members, which is necessary during the entire disaster, not only during the early-warning period but during the occurrence.

Additionally, the researcher also found out that most of the family leaders were not able to receive or acquire any Information, Education and Communication Campaigns regarding the aforementioned disaster preparedness. This shows that family leaders were having a lack of knowledge of the specific actions to adopt, cope and recover from a disaster. The barangay had lack of fund to turn out an efficient campaign to boost up the sense of awareness of disaster preparedness of the families in the community. This affirms the concept of Meredith of the challenges and barriers that were raised to risk communications at risks population such as lack of resources for addressing diversity and limited resource for emergency preparedness.

Another thing is, half of the total number of respondents were not able to remind their family members to practice urgent texting and calling when an earthquake strikes. This is a clear indication that family leaders are having lack of care and responsibility to inculcate a mindset of immediate contact through technology for his family members. This is maybe due to many respondents are not believing that instilling this practice inside their home makes their family more ready to inquire the statuses of their members immediately at the moment of time through technology. Such findings are in contrast to the concept of Huppert and Sparks that communications media help household leaders to be informed on verifying the safety of family members and friends.

In addition, the researcher found out that most of the respondents have an affirmative response in using social media networks in communicating their family members when an earthquake strikes. Specifically, based from the interview the most commonly used social media concerning earthquake disaster preparations is Facebook/Messenger. This clearly manifested those parents invest to use technology to create an immediate connection among their family members. This is because with these technologies having free messaging applications is better than to buy a load for a text. This is related with the findings of Mckeena that software or social media applications are more favored to communicate with the others to know valid information regarding any disaster like earthquake.

Next, it also came out that majority of the respondents designated that mother should be the one who will manage the flow of information regarding the disaster preparations within the family. This is because mothers are well known managers of their home and they know more the ways and tactics to lead their family members with their own processes. As a support from the findings of Kirschenbaum, there is a significant affirmative partiality toward female household leaders in developing and upgrading the level of information dissemination and emergency skills, as well as the act of investing into the protective measures of preparing into a disaster such as earthquake.

Next, it was also found out that household were prepared of having “flashlights” and “blankets” in their emergency supply kit and least prepared of having “dust mask” and “whistles”. It also found out that majority of the respondents were not able to provide or were not prepared with any first aid materials such as band aid, alcohol, antiseptics, and medications. This clearly manifested that household leaders are having an impression of knowledge of what items should be prepared but not placed in specific kits. Most of the items were readily available inside every home but were scattered. Consecutively, those items that were not prepared were the items rarely used inside their home. Also, household leaders lack the familiarity on the value of these items specially the medications and first aid materials. This conforms to the study of Aberilla that most of the families prepared some emergency supplies and first aid kits but there were dispersed and not placed in an emergency bag.

The study also found out that majority of the selected households were not able to prepare their disaster escape plan. This certainly shows that household leaders were having lack of information about what is inside the plan. This is because household leaders are having too much work to do in a day. Also, they tend to attend more their responsibilities inside their homes. Moreover, the study gave rise to show that wide number of the respondents were not able to join into any first aid training. The barangay was not able to provide any training for the respondents. The study also conveyed that majority of the respondents were confirmatory in saving money for preparing for their family’s emergency purposes in an earthquake. This is maybe because many respondents believed that having an emergency fund with these tragedies may help them to cope up within the crises at the moment.

The study also shows majority of the respondents were most aware of the earthquake related agency just like NDRRMC (National Disaster Risk Reduction Management Council). This clearly indicates that these agencies are able to reach out the families through selective use of media. This agency is responsible to send them a number of emergency texts at every moment when a catastrophe hits. The study also showed that majority of the respondents have considered television as the primary source of information regarding earthquake and its disaster preparations. These results may imply that household leaders also choose traditional media to become a source of their information regarding with disaster preparedness. Many of the households believe that having this technology will give them enough, factual and instantaneous data about the status of an incident. This is supported by the notion of Mckeena that television is used as an alternative media to become source of disaster preparedness information. Meanwhile, it also showed that most of the respondents had also experienced several

disasters other than earthquake such as storms, flashfloods, and fire. This obviously shows that the aforementioned barangay is prone to other calamities. This is maybe because of the topographical setting of the place that greatly contributes to the impeding hazards within the community.

Earthquake Disaster Preparedness

Factors that are desired as objectives to reinforce the aptitude of a family to deal with, adopt and make progress from any misfortune such as earthquake through crafting are a well-organized communication-based system, increasing the level of awareness, and formulating concrete and subtle assets on disaster preparedness and response.

Communication. Commencing an interactive communication may help to increase awareness regarding the disaster preparedness. The family is mindful and informed about disaster risks and how to manage them. Table 1 presents the assessed list of household earthquake preparations maximized in terms of communication as a factor.

As it appeared on the table, communicating the other important details about safety to the members of the household was maximized to a very great extent by the respondents as indicated with a highest weighted mean of 3.50. This clearly manifests that household leaders were very much concerned of the importance of discussions concerning earthquake disaster preparations, as it will increase the level of awareness of everyone to the disaster. This is because most of them believed that it would lead them to ensure everyone’s safety when an earthquake strikes. With their interactive dialogues everyone in the family was more ready and

Table 1 Household Earthquake Preparations in terms of Communication

Items	WM	VI
1. Communicating the other important details about safety to the members of the household.	3.50	GE
2. Talking over what information to send with the members when earthquake hits.	3.45	GE
3. Creating a paper copy of the contact information for my family and other important people	3.44	GE
4. Practicing sending a text message or calling our out-of-town contact and sending a group text to mobile phone group list.	3.43	GE
5. Talking about who will be the lead person to send out information about the designated meeting place for the household.	3.37	GE
6. Preparing household and emergency contact information into all household members’ mobile phones or devices.	3.29	GE
7. Using the Internet to communicate by email, Twitter, Facebook.	3.26	GE
8. Keeping a prepaid phone card to use if needed during or after a disaster.	1.81	SE
9. Maintaining a household landline and analog phone that can be used when mobile phone service is unavailable.	1.77	SE
10. Making sure everyone, including children, knows how and when to call 911 for help.	1.61	SE
COMPOSITE MEAN	2.89	ME

Legend: WM – Weighted Mean VI – Verbal Interpretation GE – Great Extent

ME – Moderate Extent SE – Slight Extent

steadfast to react when it hits. This discovery is in contrast to the findings of Nakagawa and Yamamomoto's study that revealed that a minority number of families of noninstitutionalized individuals with severe motor and intellectual disabilities have discussed the specific response in the event of the disaster.

Meanwhile, talking over what information to send with the members when an earthquake strike was maximized to a great extent as indicated with a weighted mean value of 3.45. It is evidently noticeable that the household leaders were able to teach among his/her members to reply the needed information from them when a disaster strikes. This is due to the characteristics of household leaders which is sense of consciousness through simplifying and controlling the situation to know immediately the statuses of their family members and make a proper judgement within the coincidences. Every parent is very much concerned with their fellows, and it will help secure the worries of every mother and father regarding the situation. This finding is relative to Tanner's concept that communication should be addressed to social units just like family rather than to individuals and should be conveyed through social channels, as they are believed to possess better situation awareness toward to their families and communities.

The analysis revealed that communicating important safety details to family members, discussing what information to send during an earthquake, and creating a paper copy of contact information were considered highly important by respondents. Practices like practicing communication methods, assigning a lead person for communication, and ensuring contact information is on everyone's devices were also prioritized. However, items such as keeping a prepaid phone card, maintaining a household landline, and ensuring everyone knows how to call 911 were rated lower in importance.

The overall composite mean of 2.89 suggested that households are moderately prepared for earthquake communication, with some areas needing more attention and improvement. The analysis emphasized the need for improvement in ensuring all household members know how to call emergency services and having backup communication methods. By focusing on improving lower-rated areas and maintaining high-priority practices, households can enhance their overall preparedness for earthquake-related communication. This analysis provides valuable insights for households to prioritize and improve their communication strategies for better preparedness in case of earthquakes.

Lastly, creating a copy of the contact information for their families and other important people was maximized to a great extent and expressed with a weighted mean value of 3.44. This result may attest that local respondent are having preparation for emergency that is needed by them to cope easily with a disaster through the help of the persons in their contact lists. This is because household leaders understand that it is their duty to provide everyone a dint of knowledge where to call and what to inquire with the different contacts copied as such being responsible in creating a secure and peaceful home through these practices as a home manager.

As enumerated in the table, the household leaders noted that making everyone including children know how to call 911 for help was maximized to a moderate extent that is revealed in the lowest weighted mean values of 1.61. This clearly shows that household leaders were not able to teach exactly the main function of emergency hotlines provided by the government. This is because when there is an abrupt emergency needed to fulfil, a family will rely or call with their relatives or with their barangay captain based from the situation. Supported by the result of interview, the respondents are well informed with the present emergency hotline numbers but do not know how to call with 911 and also with the 8888, which are the national emergency hotlines. Majority of the household leaders choose to depend with the contacts of their relatives or barangay staff. These inferences are in agreement with Basolo's study that the participation of local government units had an effect with the family's or individual's assurance to cope with any disaster.

Next, the respondents revealed that maintaining a household landline and analog phone when mobile phone service is unavailable was maximized to a moderate extent by the household leaders. This got a lower weighted mean value of 1.77. It makes sense that small number of household leaders have provided a landline or analog phone in their houses. This is due to a great number of respondents relying now on their smart and android phones nowadays. Most of the households that have landline phone have intended to use it for their home

businesses and not for disaster preparedness. Lastly, keeping a phone card during or after the disaster was maximized to a moderate extent. It obtained a low weighted mean value of 1.81. This implies that prepaid phone cards nowadays were rarely seen and used because most of the families rely more on free messaging applications in their cellular phones to connect with their family members. The results are relevant with the outcomes of Lama’s study that many of the citizens received further information about disaster preparedness from the internet using mobile devices and television.

As can be observed from the table, sending a text message or calling out of town contact and sending a group text to their mobiles phone group list; talking about who will be the lead person to send out information about the designated meeting place; preparing household and emergency contact information into all household members’ mobile phones or devices; and using internet to communicate by email, Twitter, Facebook, and other social media accounts was maximized to a great extent by the household leaders. These results clearly indicate that traditional and social media are greatly used in developing the level of disaster preparedness of a family. These are obtained because household leaders are greatly concerned in creating a strong bridge of connections with their family members through communication with the use of technology against with these catastrophes. These findings support the concept of Huppert and Spark wherein communication media help household leaders to be informed and to inform everyone with the specific needs during the entire crisis.

Generally, household leaders revealed that they maximized these items at a great extent. This got a composite mean of 2.89. Household leaders have observed and trained the lists of household earthquake preparations in terms of communication but they were not well informed in taking into account of developing family communication plan for tragedies in case of a mobile network failure.

Logistics. Logistics are the arrangement of the supplies and properties required mostly within the family. In this development the super vision of the accompanying supplies is fundamental to uphold high emergency levels. It involves the judgments on what actions and objects to retain in family and what to contract out. Table 2 presents the assessed list of household earthquake disaster preparations maximized by the household leaders in terms of logistics.

As indicated in the table, teaching their family members to switch off the gas tank, waterlines and circuit breakers immediately after an earthquake was maximized to a great extent. This got the highest weighted mean value of 3.54. This indicates that household leaders were well informed in practicing this item, as they know the possible aftermath in a powerful earthquake such as electrical and fire hazards inside their homes. With this preparation, it is an effort always done in very normal situation inside a home or in different catastrophe such as typhoons, localized thunderstorms, and monsoon rains. Meanwhile, the household leaders remarked that checking the security of their large furniture and fixtures inside their houses was maximized to a very great extent reflected in a weighted mean value of 3.53. This clearly denotes that household leaders are generally responsive to check the structural strength of their houses because they observed that the last earthquake greatly affects the furniture and fixtures inside their homes.

Table 2 Household Earthquake Preparations in terms of Logistics

Items	WM	VI
1. Teach my family in switching off the gas tank, waterlines, and circuit breaker	3.54	GE
2. Check the security of our large furniture inside our house.	3.53	GE
3. Conduct an observation on safe and unsafe spots in my house	3.49	GE
4. Orient my family members with my ideas about earthquake and its hazards.	3.43	GE
5. Prepare and discuss our family evacuation procedure and method	3.39	GE
6. Prepare my family earthquake disaster supply and emergency kit	3.08	GE

7. Check the location of the house if along of near an active fault prone to landslide and tsunami	3.02	GE
8. Teach my family about basic first aid	2.60	ME
9. Teach my family about the usage of some fire safety tools such as fire extinguisher	2.30	SE
10. Conduct earthquake drill with my members inside our house	1.77	SE
COMPOSITE MEAN	3.01	ME

Legend: WM – Weighted Mean VI – Verbal Interpretation GE – Great Extent

ME – Moderate Extent SE – Slight Extent

The data shows the importance and frequency of various household earthquake preparation activities, with activities like teaching family members to switch off gas tanks, securing large furniture, and identifying safe spots being highly prioritized and regularly practiced. Sharing knowledge about earthquake hazards and having a well-prepared evacuation plan are also considered crucial and widely implemented. However, maintaining an emergency kit and checking the location of the house for geographical risks are less frequently updated or assessed. Basic first aid knowledge and fire safety tool usage are important but may not be as heavily emphasized or practiced. Overall, the household earthquake preparation activities are moderately practiced, with some critical tasks being done to a great extent while others, such as conducting earthquake drills and using safety tools, are less frequently performed. Recommendations include increasing the frequency of practical drills, emphasizing fire safety tool usage, and continuous education about first aid and updating emergency kits to improve overall household preparedness. The analysis suggests a good level of awareness and preparation for earthquakes in terms of logistical activities, with some areas needing more frequent practice to ensure comprehensive preparedness.

Lastly, the data revealed that conducting an observation on safe and unsafe spots in their house was maximized to a great extent by the respondents. It obtained a weighted mean of 3.49. Family leaders were very flexible regarding the unsafe spots inside their homes, as they were able to fix it immediately to prevent or lessen the chance of accidents inside. This is because plurality of affirmative responses of the family leaders reasoned out that it was their primary responsibility to ensure the security of their family members based from the interview. The results from the first three highest items are cognizant to the idea of Spittal that household undertaking earthquake mitigations actions such as retrofitting the inner design of their houses and securing the instrument and equipment of every resident to lessen the impact of an earthquake or any disaster.

Along with this, conducting earthquake drills with their family members inside their houses was maximized to moderately extent. It clearly manifests that many of the household leaders were not able to join to any preemptive programs concerning earthquakes. This may have happened because the barangay failed to implement an activity that will simulate an earthquake together with their family members. Most of them had an idea of what is an earthquake drill based from the participation of their children to the program in their schools, but they were not able to implement this as a household activity because no one was able to provide them the actual process of earthquake drills. Contradicts the concept of Mutunga and Mwangi, rehearsal drills in disaster preparedness must be done to optimize the effectiveness and efficiency of the response toward an earthquake. Thus, with more frequent the rehearsals, there would be better retention of the process among family member.

Moreover, teaching their family about the importance of usage of fire safety tools such as fire extinguisher was maximized to a moderate extent. This got a lower weighted mean value of 2.30. This shows that most of the household leaders were hesitant in availing fire safety tools such as fire extinguisher because many of them choose to reserve enough supply of water as a need for daily purposes but not for emergency such as fires. This finding supports the concept of Leeuw that one of the challenges of making a distinction between goods that are needed in any kind of disaster water and medicines (response-generated needs) versus the goods which are needed only with a specific kind of disaster such as fire extinguisher and sand bags (agent-generated needs).

On the other hand, teaching their family members about basic first aid was maximized to great extent expressed

with a weighted mean value of 2.60. It can be inferred that large number of families were not able to join into any first aid training because families tend to focus more on their priorities at home. Consequently, their ideas of first aid application are unaligned with the right way of performing it based from the interview. Most of them rely on their indigenous knowledge regarding first aid. This is cognizant to the study of Baumwoll that families valued indigenous knowledge about their cultural traditions associated with disaster risk reduction and prevention concentrated in line with the application self-medication as an alternative response to basic first aid.

In addition to this, orienting their family members with their own ideas about earthquake and its hazards; preparing and discussing their family evacuation procedure and method; preparing their family earthquake disaster supply and emergency kit and checking the location of their house according to its prone to active fault, lands line and tsunami were maximized to a great extent by the household leaders. These initial items were applied because the household leaders learned to be more adaptable with the changing situation through this preparation. These findings verify the concept of Jahre that activities in familial logistics studies comprises two kind of activities, intangible and tangible activities.

As a whole, the household leaders revealed that they maximized the specific logistics preparations inside their houses to great extent. This got a composite mean of 2.89. This clearly shows that family leaders were more active in building a strong and flexible family with the use of their capabilities as a parent. Family leaders were capable enough to maximize the preparation of important material resources in lined with earthquake disaster preparations but less equipped with basic lifesaving practices.

Awareness. The community’s awareness and aptitude to react to disasters and adversities are of maximum significance. Having the public become conscious of the diverse intimidations would definitely go a long way. Table 3 presents the assessed list of household earthquake preparations acknowledged and maximized by the household leaders.

As listed in the table, the respondents were very much aware that assessing the strength of their houses is required. This got a highest weighted mean value of 3.61. This specifies that great number of family leaders experienced the maximum impact of the earthquake to their lives specifically with the damages in their houses. This is because many of the families have responded that ensuring the structural capacity of their houses to cope with an unexpected earthquake is a great anticipatory activity.

Along with this, household leaders were aware that if an earthquake strike again, their family would be greatly affected. It gained a high weighted mean of

Table 3 Household Earthquake Disaster Preparations in terms of Awareness

Items	WM	VI
1. Assessing the strength of my house is required	3.61	GE
2. If an earthquake struck, my family and I would be greatly affected	3.47	ME
3. Investing money for preparing an earthquake is necessary.	3.43	ME
4. Managing our evacuation method and routes will greatly help us.	3.42	ME
5. If I prepare for an earthquake, I can minimize its impact on my family	3.33	ME
6. Preparations before, during, and after the earthquake	3.30	ME
7. Source of initial information about the disaster preparedness.	3.26	ME
8. Able to access emergency transportation facilities of the barangay.	3.04	ME

9. Basic Earthquake Disaster Preparedness Kit must last 3 days.	3.02	ME
10. Any government (local or national) or private agencies that deal with disaster preparedness.	2.94	ME
11. The disaster management related programs and projects implemented by the barangay.	2.42	SE
12. Developing our Family Disaster Plan is essential.	2.40	SE
COMPOSITE MEAN	3.14	ME

Legend: WM – Weighted Mean VI – Verbal Interpretation GE – Great Extent

ME – Moderate Extent SE – Slight Extent

This denotes that majority of the respondents were affected psychologically with the earthquake because family leaders learned a lot with the results. The respondents greatly believed that it is inevitable and nothing to do but to prepare themselves physically and mentally. This finding is relevant with the study of Lindell and Perry claiming that individuals with disaster experience may be more aware and attentive to disaster danger and later will be better equipped to elude injuries and damages. Meanwhile, household leaders were aware of investing or saving money as preparation for an earthquake. This got a high weighted mean value of 3.43. This clearly indicates that majority of the respondent believe that it will help them to meet the unexpected financial needs for every emergency for every disaster. This is because family leaders acknowledged that savings is an integral part of family budget to fulfill the unanticipated demands of emergencies.

On the other hand, household leaders were aware of any government (local and national) and private agencies related with disaster preparedness. It earned a weighted mean of 2.94. This distinctly manifests that disaster related agencies/programs were slightly accredited by the respondents. This is because the agencies were able to meet their roles through disseminating the latest updates about the disaster to inform a great number of families but family leaders were unable to recognize its locations especially with the private organizations and agencies. This result confirms the concept of Perry that agencies specifically their advocacies focused more in spreading information through mass media, improving people’s awareness through several activities because the community preparedness and awareness is an environmental factor that predicts a family’s disaster response.

As itemized in the table, household leaders were moderately aware of disaster management related programs and projects implemented by the barangay. This got a lower weighted mean value of 2.42. This presents that the household leaders were a little conscious with the programs related to disaster preparedness implemented in the barangay. This is because the family leaders chose to focus more to be a home manager inside their homes and let their children encourage themselves in joining to disaster preparedness programs in their schools. This result is in disagreement with Kangabam’s concept that local government units should play a more significant part in improving the consciousness of every household family through mobilizing resources.

Moreover, household leaders were moderately aware of developing their own Family Disaster Plan. It obtained a lowest weighted mean value of 2.40. This could mean that household leaders were not well versed on writing a backup plan because many of the families rely with immediate “flight” response. Most of them had a plan through words but not written and designed systematically. The result supports with Federal Emergency Management Agency’s concept that a Family Disaster Plan shall be considered as an essential part of ‘Basic Preparedness’ in every family.

Further, household leaders were aware of the importance of managing their evacuation method and routes; any preparations before, during, and after an earthquake that can immunize the impact to their family; source of initial information about disaster preparedness; ability to access emergency transportation facilities of the barangay; and the idea of Basic Earthquake Disaster Preparedness must last for 3 days. These results clearly show that household leaders were very adaptive with any situation to be safe intelligently through knowing these prominent items regarding earthquake preparations. With proper human resource such as knowledge, every family leader can tactfully tackle some preventive measures with the conditions.

The data shows that households understand the importance of earthquake disaster preparedness but there is room for improvement. Key findings include the recognition of the need to assess house strength, the impact on family, financial investment in preparedness, evacuation methods, and minimizing impact through preparation. Despite moderate awareness of comprehensive preparedness, information sources, emergency transportation facilities, disaster preparedness kit, and government roles, there is still room for improvement. The barangay disaster management programs and family disaster plan are areas that need more attention. The overall composite mean score indicates a moderate extent of awareness, highlighting the need for enhanced education, communication, and practical engagement in preparedness activities. Recommendations include promoting regular structural assessments, conducting comprehensive awareness campaigns, providing financial incentives for preparedness, fostering community involvement, and strengthening collaboration between government agencies and communities. As disclosed from the data gathered, household leaders were aware of the following items relevant to earthquake disaster preparedness. This got a composite mean of 3.14. This signifies that household leaders prepare themselves more to come up with the unavoidable disaster such as earthquake.

Problems and Issues Met

Earthquake Disaster Preparedness composed of activities taken upon before the disaster to reduce human and property losses. However, there are problems and issues met in preparing for it by the family leaders. Table 4 presents the assessed problems and issues met by the household in Earthquake Disaster Preparedness.

Table 4 Problems and Issues Met

ITEMS	FREQUENCY	PERCENTAGE
Unable to receive an Information, Education and Communication Campaigns.	145	85
Lack of knowledge to call 911	134	78
Incapability to join to any first aid training	109	64
Incapability to join earthquake drill	100	58
Lack of knowledge to Local Hotlines Related to Earthquake	88	51
Incapability to practice Urgent Texting and Calling	88	51

(N= Multiple Responses)

The data provided shows that a large majority of respondents are facing issues with accessing information, education, and communication campaigns related to emergency preparedness, with 85% unable to receive such crucial information. Additionally, a significant portion of respondents lack knowledge on how to call 911, join first aid training, participate in earthquake drills, and access local hotlines for earthquake emergencies. These findings reveal major gaps in emergency preparedness and response capabilities among the respondents. It is evident that there is a need for improved outreach, education, and training programs to address these challenges and enhance preparedness for emergencies. By addressing these issues, individuals can better equip themselves to respond effectively during emergencies and seek appropriate help when needed.

Based from the table, 85% or majority of the respondents were not able to receive any IEC (Information, Education, and Communication) campaigns. This indicates that household leaders were having lack of information regarding earthquake disaster preparedness. This is because the barangay was not able to prepare any alternatives programs to elevate the level of consciousness of the households in relation to earthquake disaster preparedness. The result is in contrast with the concept of the Municipal Disaster Risk Reduction Management Contingency Plan of Mabini, Batangas that in order to assess disaster preparedness, the local government unit shall strengthen the programs such as Information Education and Communication Campaigns

and advocacy plan within its communities.

Furthermore, an item was assessed to 78% or majority of the respondents were having lack of knowledge to call 911. This clearly shows the perception of the respondents that they tend to call immediately their family relatives or barangay officials for help rather than calling 911. This is maybe because barangay officials are much more accessible and urgent to respond to the emergency. Also, upon calling 911 one-peso load is needed to proceed with the process. Moreover, 64% or great number of respondents were not able to join into any first aid training. It shows the lack of commitment of the BDRRMC to establish the implementation of the training. This is because the household leaders were also hesitant to join in these activities, as comply first with their responsibilities and priorities as a parent. Next, 58 % or majority of the respondents were not able to join in any earthquake drill. This is because many of them were complacent and hesitant to try this intensive preparation. Meanwhile, 51% or half of the total number of respondents have no knowledge on emergency hotlines which can be reached in time of emergencies. More so, the household leaders were confused what emergency hotlines must be called based from their inquiries. Many of the household leaders rely more on their barangay captains rather than these emergency hotlines. These findings are cognizant to Arnaldo's study which identified problems and issues regarding lack of appropriate hazard trainings and knowledge when calamity happens.

Lastly, 51% or half of the household leaders were not able to remind their family members to practice the act of urgent call and text from their family members informing their parents with their present situation after an earthquake. The household leaders believed that their family members already know what to do when an earthquake strikes.

Local Government Units Initiatives and Mechanisms

Local government units play a crucial role in capacitating individuals towards resiliency and active response to earthquakes. Earthquakes are natural disasters that can cause devastating effects on communities, and it is essential for individuals to be prepared and equipped to respond effectively in such situations. Thus, municipal government units have the responsibility to educate and train their constituents on earthquake preparedness, response, and recovery efforts.

One way that both Calatagan and Mabini municipalities had capacitated individuals towards resiliency is through public awareness campaigns and education programs. These campaigns informed the whole community about the risks and potential impacts of earthquakes, as well as the necessary steps to take before, during, and after an earthquake occurs. This includes creating emergency plans, securing heavy furniture and objects in buildings, and knowing how to safely evacuate a building or area. Further, they also organized training sessions and drills to prepare individuals for earthquakes. These drills involved simulating earthquake scenarios to practice response procedures such as drop, cover, and hold on, as well as evacuation and communication protocols. By participating in these drills, individuals become familiar with the actions to take in the event of an earthquake and are better prepared to respond effectively when a real earthquake occurs.

In addition to education and training, both municipalities had worked on improving infrastructure and building codes to enhance community resilience to earthquakes. This included ensuring that buildings and structures are designed and constructed to withstand seismic activity, as well as implementing early warning systems and emergency response plans. By investing in resilient infrastructure, they reduced the impact of earthquakes on communities and minimize the loss of life and property. Furthermore, they also collaborated with other stakeholders such as non-governmental organizations and community groups to strengthen community resilience. These partnerships can help in pooling resources, sharing knowledge, and coordinating efforts to effectively respond to earthquakes. By working together, individuals can access additional support and resources to enhance their capacity to cope with and recover from earthquakes.

Proposed Community Extension Program

The "Family Disaster Preparedness Development Program: 'Tara na... Makinig at Makiisa tungo sa Isang Ligtas na Pamayanan, anumang Sakuna!'" is a community-based initiative. It focused on providing earthquake disaster preparedness seminars and training sessions for household leaders in Calatagan and Mabini, Batangas. The program aims to benefit households and barangay officials by enhancing their skills and capabilities related to

disaster preparedness.

The project will cover topics such as basic first aid training, earthquake drills, developing a family disaster plan, fire safety precautions, and knowing how to call emergency hotlines.

Family Disaster Preparedness Development Program

“Tara na.. Makinig at Makiisa tungo sa Isang Ligtas na Pamayanan, anumang Sakuna!”

Duration: Three Weeks

Type of Community Extension Service: Community Based Disaster Programs

Pool of Experts:

Philippine Red Cross-Batangas City Chapter Representatives (Basic First Aid Training and Earthquake Drill) MDRRMC (Municipal and Disaster Risk Reduction Management Council) of Mabini, Batangas (Know WHEN, WHAT and HOW to call in every Emergency Hotlines) Bureau of Fire and Protection (Calatagan and Mabini, Batangas Chapter) (Basic Fire Safety Precautions) Department of Social Welfare and Development (Mabini, Batangas Chapter) (Developing “Family Disaster Plan”)

As municipality committed to continuously extend its services to communities, the program aims to help the household leaders uplift their level of earthquake disaster preparedness through free seminars and trainings on preparations of the families in disasters like an earthquake.

Relative to this, the Calatagan and Mabini Council initiated to create a project proposal that will render such trainings and seminars from the experts coming from the different agencies related to disaster preparations. The solutions were developed, considered and lined-up to solve the problems outstretched from the study conducted. The difficulties concerning lack of first aid training and earthquake drill, developing family disaster plan, and irrelevant perceptions with fire safety regulations were believed to be solved through trainings and seminars. The struggle of some families to acquire awareness and knowledge will be solved through a suggested information, education and communication campaigns which will discuss preparations for an emergency. From the meeting of the Municipal Mayor, Barangay Captain and Officials, and Sangguniang Kabataan, it should be agreed that there will be two sessions for the program in twos separate schedules.

General Objective:

To conduct earthquake disaster preparedness seminar and trainings with the household leaders from concerned Barangays in Calatagan and Mabini Batangas

Specific Objectives:

·To enhance household’s skills and capabilities on the mentioned topics and other related topics.

The disaster preparedness-seminar will be held at the Barangay Covered Court. The program will have two sessions with the same topics: Know WHAT, WHEN and HOW to call an Emergency Hotlines, Basic First Aid Training, Simulating an Earthquake Drill in your Family, Developing a “Family Disaster Plan”, and Basic Fire Safety Precautions, which will be discussed by four (4) trained lecturers. The first session will be held on 2nd Sunday of the month with the participants/household leaders. There will be a short forum and extensive trainings after every lecture. The participants will receive an information, education and communication campaign that discusses some of the specific preparations in an earthquake.

Assistance to be Provided

Sangguniang Barangay and Sangguniang Kabataan: The venue will be provided by the concerned barangay, as well as the chairs, and tables for the program. The participants are expected to participate fully by performing the task that will be given to them.

MDRRMC (Municipal Disaster Risk Reduction Management Council) Calatagan and Mabini Chapter:

One lecturer will be provided by the aforementioned agency, as he/she will explain the important details of disaster preparedness among leaders and households. The representative from the agency will uplift the consciousness of the household leaders with the different agencies that are playing an important role in emergency services.

DSWD (Department of Social Welfare and Development): There will be a social welfare and development officer from the aforementioned department who will discuss on how to develop a “Family Disaster Plan” among every household leader in the program. He/She will also explain the various function of the department in terms of these phenomena.

Philippine Red Cross: With the participation of the household leaders, the agency will provide trainers and lecturers in Basic First Aid applications and how to simulate an Earthquake Drill with their family inside their homes. The lecturers will greatly uplift the capabilities of the household leaders to cope up with this scenario

Bureau of Fire Protection: the agency will provide a lecturer who will clearly explain the basic fire safety precautions that should be learned by household leader specifically on the usage of fire safety tools in their homes.

SUMMARY, CONCLUSION, AND RECOMMENDATION

This chapter presents the summary of research conducted, relevant findings, conclusions and recommendations.

Summary of the Findings

This study aimed to determine the earthquake disaster preparedness measures and response of selected municipalities in Batangas for the purpose of preparing a community extension program for the locality of Calatagan and Mabini Batangas.

The study was guided by the following specific questions:

1. How may the following municipalities be geographically described?
 - a. Calatagan
 - b. Mabini
2. What are the preparatory measures observed by the following;
 - a. Household; and
 - b. Barangay?
3. To what extent are the following factors maximized in the household in earthquake preparation:
 - a. Communication;
 - b. Logistics; and
 - c. Awareness?
4. What are the problems and issues met by the families in earthquake disaster preparedness?
5. How may the local government units capacitate individuals towards resiliency and active response to earthquake?
6. Based on the findings, what community extension program may be proposed?

The descriptive method of research was utilized in this study. A researcher – made questionnaire complemented by interviews were the main data –gathering instruments. Respondents were 312 household leaders. Frequency, percentage, and weighted mean were utilized as statistical tools to treat gathered data.

Geographical Location and Descriptions

Calatagan and Mabini in the Philippines are at risk of earthquakes due to their proximity to the Philippine Fault Zone and Manila Trench. The region's high seismic activity and presence of volcanic rocks and loose sediments increase the risk of ground shaking and damage. Effective mitigation measures are essential to protect residents and infrastructure from seismic activity.

Preparatory Measures Observed

There were limited preparatory measures observed in household and barangay among the community members in Calatagan and Mabini, Batangas.

Earthquake Disaster Preparedness

Communication. In terms of communication, communicating other important details about safety to the members of the household was assessed to a great extent while making sure everyone, including children, knows how and when to call 911 for help was assessed to a slight extent. The composite mean revealed moderate extent of household preparations relative to communication.

Logistics. In terms of logistics, teaching family members in switching off the gas tank, waterlines, and circuit breaker was assessed to a great extent while conducting earthquake drill with family members inside the house was assessed to a slight extent. The composite mean revealed moderate extent of household preparations relative to logistics.

Awareness. In terms of awareness, assessing the strength of house as a requirement was assessed to a great extent while developing Family Disaster Plan was assessed to a slight extent. The composite mean revealed moderate extent of household preparations relative to awareness.

Problems and Issues Met

The respondents identified inability to receive in information, education, and communication campaigns, lack of knowledge in using 911 and joining the first aid training as the main problems and issues met in earthquake preparations.

Local Government Units Initiatives and Mechanisms

Both Calatagan and Mabini capacitate individuals towards resiliency is through public awareness campaigns and education programs, training sessions and drills to prepare individuals for earthquakes.

Proposed Community Extension Program

The proposed extension community program as a community-based initiative focused on providing earthquake disaster preparedness seminars and training sessions for household leaders in Calatagan and Mabini, Batangas. The program aims to benefit households and barangay officials by enhancing their skills and capabilities related to disaster preparedness.

Conclusions

Based on the aforementioned findings, the following conclusions were drawn:

1. Calatagan and Mabini municipalities are both near the Philippine Fault Zone and the Manila Trench, making them susceptible to earthquakes.

2. There were limited preparatory measures observed in household and barangay among the community members in Calatagan and Mabini, Batangas.
3. Earthquake preparations relative to communication, logistics, and awareness were delivered to a moderate extent.
4. The respondents identified inability to receive in information, education, and communication campaigns, lack of knowledge in using 911 and joining the first aid training as the main problems and issues met in earthquake preparations.
5. Public awareness campaigns and education programs, training sessions and drills to prepare individuals for earthquakes are the LGU's initiatives.
6. The proposed community extension program includes seminars and trainings on disaster preparations of the families in an earthquake.

Recommendations

The following recommendations were based on the findings and conclusions generated from the study.

1. The proposed community extension program may be assessed and evaluated prior to its implementation.
2. Problems and issues met concerning inability to receive in information, education, and communication campaigns, lack of knowledge in using 911 and joining the first aid training may be given considerable time and attention.
3. Further evaluation and sustainability of the program may be crafted to ensure assessment with the earthquake disaster preparedness with the nearby barangays in the Municipalities.