

**NETWORK-BASED LOCATION ANALYSIS OF THE 4Ps
BENEFICIARIES AFFECTED BY THE 2018 MAYON VOLCANO
ERUPTION IN GUINOBATAN, ALBAY**

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CHAPTER 1

INTRODUCTION AND ITS SETTING

Introduction

Mayon Volcano once again broke its silence after 4 years as it started to produce a column of ash that rose up above sea level which led the government to make precautionary evacuations in the Municipality of Guinobatan. It started showing its activity since October 2017 and on the evening of January 14, 2018, the Philippine Institute of Volcanology and Seismology (PHIVOLCS) raised the Alert Level II to III and recommended that the 6-km and 7-km danger zones be enforced. It has been reported that 774 families or 2,655 individuals which includes the 4Ps beneficiaries from barangays of Maninila, Tandarora, Mabalod, Sitio Basiao and Sitio Hacienda in the municipality of Guinobatan stayed in the elementary school of Guinobatan East and Binogsacan and Muladbucad multi-purpose center.¹

The Municipality of Guinobatan, being part of the Albay Province where the Mayon Volcano is located is expected to be affected in times of eruption. Its residents are likely to suffer in times of this natural disaster and have to cooperate with the local government's first move which is to evacuate. Evacuating is never easy for it has to consider different factors such as their livelihood, the number of family members and their ages and the ones who are most vulnerable in this aspect are the Pantawid Pamilyang Pilipino Program (4Ps) Beneficiaries.

Having the need to evacuate and help the local government in deciding which locations must be aided immediately, this research established a network-based location of the 4Ps Beneficiaries affected by the 2018 Mayon Volcano eruption that is shown in the digital maps. The beneficiaries are considered as the poorest of the poor and with the disaster brought by the eruption, mounting vulnerabilities arise which hinders them from evacuating to safe place. This network-based location helped the researchers in conducting spatial analysis between the location of the houses of the 4Ps beneficiaries and of the evacuation centers. The distance between was evaluated. It also identified the spatial distribution status of the 4Ps beneficiaries inside the danger zones: inside 6-km,

6-7 km, 7-8km, 8-9km, 9-10km and outside 10km radius. Furthermore, it evaluated which household conditions that affect the 4Ps evacuees are most common.

This study used the Geographic Information System GIS-based methodology given that their geographic coordinates were collected by the researchers through the network-based Global Positioning System (GPS) receivers which is not only useful for map production and construction survey, but also for prevention and management². Moreover, interviews with the locals were conducted to know the effects of evacuating and returning back and forth to the evacuation centers.

Locality of the Study

The chosen study area of the researchers is the Municipality of Guinobatan, Province of Albay, Philippines. It has a total area of 244.43 km² which is divided into 44 barangays³.

Guinobatan is one of the municipalities that surrounds the Mayon Volcano. During the 2018 Mayon Eruption, zero visibility was reported in this area. The residents within the 6-km to 8-km radius were ordered to evacuate. The Municipal Social Welfare and Development of Guinobatan reported that the barangays: Doña Tomasa, Maipon, Maninila, Masarawag, Muladbucad Grande, Muladbucad Pequeño, and Tandarora were affected by the said eruption and consequently are being considered in this study.



Figure 1.1 Study Area: Guinobatan from Google Maps

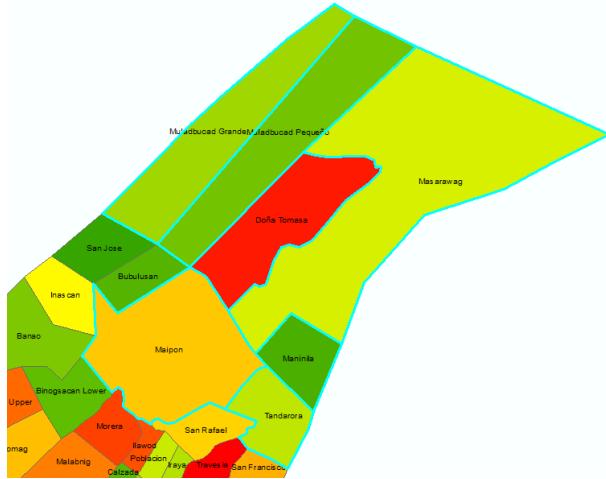


Figure 1.2 Study Area: Seven Barangays

Statement of the Problem

Most of the agencies recognize that vulnerability is a bigger concern for the poor, and that the most vulnerable sectors in society need special attention.⁴ The Department of Social Welfare and Development (DSWD) implemented the Conditional Cash Transfer (CCT) program locally known as 4Ps that provides conditional cash grants. Its beneficiaries are the most vulnerable sector in the country. With the sudden danger brought by volcanic eruption, their vulnerabilities hinder them from evacuating to safe place immediately.

The increase in awareness after the dramatic volcanic disasters of the 1980s lead in most cases to a more structured crisis management program and early evacuations that saved thousands of lives, which demonstrates that mitigation planning pays.⁵ The local government can't address directly to solve their vulnerabilities for it covers a broad scope including people's risk perception and their active role in exploring strategies that ensure livelihood security on the long term. Thus, in times of natural disasters, their only control is disaster response that they should strengthen, and it starts in evacuation. Knowing the locations of those who needed immediate evacuation helps in designing timely, affordable and effective strategies for reducing the negative effects of disasters.

Hypothetical Statement

Vulnerability increases as the 4Ps Beneficiaries houses are situated nearer the Mayon Volcano permanent danger zone.

Research Questions

1. What is the average distance (in kilometers) between the 4Ps Beneficiaries houses and the evacuation centers where they evacuated? What is the farthest distance that they traveled?
2. How sparsely are these 4Ps Beneficiaries distributed inside the 6-km permanent danger zone, 6 to 7-km danger zone, 7 to 8-km danger zone, 8-9km danger zone, 9-10km danger zone and outside 10km radius?
3. What are the factors (in terms of their head of the family employment, number of household members and ages) that contributed to the vulnerability of 4Ps beneficiaries are most common during the 2018 Mayon Eruption?

Scope and Limitation of the Study

This study focuses on establishing a network-based location of the 4Ps Beneficiaries affected by the 2018 Mayon Volcano eruption with the use of GPS receivers and GIS based technology. This study focuses on the year 2018 eruption for it is the latest. The researchers limit the study to the beneficiaries affected by the recent eruption to lessen the population of the study due to the limited period for data collection. In addition to this, only a sample of fifty percent or above of the number of household of the beneficiaries in every barangay was also taken into account in this study.

The data analysis is limited to evaluating the GPS location of the houses with the GPS location of evacuation centers. No other positioning method other than network-based GPS receivers was used. The GIS Based technology was used in data

analysis. The researchers analyzed the distance between the houses of the 4Ps Beneficiaries and of the evacuation centers where they evacuated or re-evacuated during the eruption. It identified the spatial distribution status of the 4Ps beneficiaries inside the 6-km permanent danger zone, 6 to 7-km danger zone, 7 to 8-km danger zone, 8-9km danger zone, 9-10km danger zone and outside 10km radius.

This evaluated which household conditions in terms of their head of the family employment, number of household members and ages that affect the 4Ps evacuees are most common for it has direct effect to their response in evacuation. It is not concerned with the vulnerabilities brought by their risk perception and other factors.

The outputs of this study are maps showing the beneficiaries' houses location and the evacuation center. It also show which evacuation center is nearest to them. In addition to this, graphs are part of the outputs of this study. These show the spatial distribution status and the frequency distribution of each factors that contributed to the vulnerability of the beneficiaries.

Significance of the Study

The established Network-Based locations of the 4Ps beneficiaries affected by the 2018 Mayon Volcano eruption in Guinobatan, Albay will redound and be useful for the following:

Geodetic Engineering. This study shows that the field of geodetic engineering can be applied in the evacuation planning for the disasters.

National Government Agencies. The policy planners and key decision makers can use the produced map as a guide and to help them monitor the 4Ps beneficiaries who were affected and will be affected by Mayon Volcano eruption.

Local Government Units. The officials can use this study in identifying which family/member of the 4Ps beneficiaries needed the most immediate evacuation so that they can provide them health stations, evacuation centers and other concerns timely.

Department of Social Welfare and Development. The result of this study is expected to be one of their basis for the identification of the government social protection for the 4Ps beneficiaries by the use of the databases and the maps. It can serve as their guide of which beneficiaries are nearer to the Mayon Volcano and most vulnerable in times of eruption.

Environmental and Urban Planners: The results of this study are expected to provide good quality maps for more comprehensive land use plan and to serve as guide on which areas make the inhabitants more vulnerable. This will also help in deciding which areas the evacuation center or permanent relocation area are most suited to be built considering the distance that the evacuees have to travel.

4Ps Beneficiaries of Guinobatan, Albay. The produced map will serve as a guide to inform them how vulnerable they are, and how close they are to the danger zone of Mayon Volcano. They will be aware of the closest evacuation center to their house.

Future Researchers. The methods and results will serve as an information and reference for future studies and to motivate the researchers to construct related studies on this area of concern. The parameters of this study can also be applied to other types of disasters.

CHAPTER 2

THEORETICAL BACKGROUND

Related Literature And Related Studies

Mayon Volcano unexpectedly turned the day into night with the ashes it spewed last January 2018. Zero visibility has been reported in the parts of Guinobatan. The volcanic ash was blown towards the southwest as the wind comes from northeast affecting this municipality.⁶ Thousands of people which includes the 4Ps beneficiaries have evacuated for hazardous eruption is likely imminent. They even suffered even more from their vulnerabilities because of this volcanic eruption.

It is known that the 4Ps beneficiaries being considered as poorest among the poor families, are the recipients of the conditional cash transfer program of the Philippine government, the 4Ps program, which aims to eradicate extreme poverty in the country. They were selected by the proxy-mean test and proxy variables were also considered to indicate the family economic category such as the ownership of assets, type of housing, education of the household head, livelihood of the family and access to water and sanitation facilities.⁷ Thus, being a beneficiary means suffering from vulnerabilities.

In the study entitled “Vulnerability: A Matter of Perception”⁸, three different views and resulting strategies to address vulnerability are distinguished: nature as cause, cost as cause and societal structures as cause. The combination of these three is perceived as vulnerability. Most disaster response agencies combine the first two views in their analysis and actions since the third view creates the conditions that adversely affect the ability of communities or countries to respond, to cope with or recover from the damaging effects of disaster events. The third view is also concerned with the social dynamics and the attitudes that serve to perpetuate it. Consequently, this study perceives ‘vulnerability’ as the result of socioeconomic condition (cost as cause) and the proximity to the Mayon Volcano (nature as cause). Socioeconomic condition may reflect the financial capacity of the household. As defined by Currie, Samdal et.al, the socioeconomic condition refers to an individual’s level of income, wealth, education and prestige.⁹ The 4Ps beneficiaries were selected considering their low socioeconomic condition. The main indicators of this are the income and the employment which can be

worsen due to increasing number of household members and age dependency. Another contributor of vulnerability in this study is the proximity to the Mayon Volcano: the beneficiaries' location with respect to the volcano. The eruption is an external dynamic from which human being has no control. Residing around a volcano is a complement of vulnerability suffering brought by danger of sudden eruption and residing nearer the crater comes greater vulnerability.

This study is entitled “Network-based location of the 4Ps Beneficiaries Affected by 2018 Mayon Volcano Eruption in Guinobatan, Albay”. This study is not concerned with addressing the vulnerabilities, its only concern is evaluating which factors are most common among the 4Ps beneficiaries during the eruption. Four factors were considered as indicators of socioeconomic condition: income, head of the family employment, number of household members and age dependency. On the other hand, the other contributor: proximity to the volcano were classified into three: inside 6-km permanent danger zone, 6 to 7-km danger zone, 7 to 8-km danger zone, 8-9km danger zone, 9-10km danger zone and outside 10km radius.

Socioeconomic comes along with four factors in this study: income, head of the family employment, number of household members and age dependency.

In the study entitled “Poverty and Its Many Dimensions: The Role of Income as an Indicator”¹⁰ by Caterina, Ruggeri and Laderchi, explored how comprehensive a picture of poverty can be gained by focusing on an income-based measure. They analyze the role of income both as having a direct impact on a set of indicators of well-being and as proxying the relevant factors affecting them. In this research, socio economic status is also considered as an income-based measure. The 4Ps Beneficiaries were chosen because of their minimal income. Earning a low income particularly by the head of the family, the one responsible mostly for the household income, can greatly affect them especially if it has a high number of family members. As they multiply the greater the expenses. Age is another factor to be considered. Having an elderly and children below five years old in the family needs assistance as they age. They need to be taken care of and they need the extra budget of the family for their necessities. Possessing more of this vulnerabilities means more immediate need to be evacuated.

According to Armando Barrientos, Mark Gorman, and Amanda Heslop in their study “Old Age Poverty in Developing Countries: Contributions and Dependence in Later Life”¹¹, old age poverty is a significant issue in developing countries. It also considers other components of poverty in later life: access to markets, basic services, and social networks. Here in the Philippines, “utang na loob” is part of the culture. Mostly, the elderly lives with their children’s family. Thus, as they age, they become dependent and now their necessity is a responsibility of the younger ones. In this study, the elderly is another consideration for a household to be a 4Ps beneficiary. In addition to this, because of their old age, their ability to evacuate in times eruption make it difficult for them to transfer to safer places therefore they are more vulnerable to risk.

In a study entitled “Household Food Security and Child Nutrition: The Interaction of Income and Gender of Household Head”¹² by Eileen Kennedy and Pauline Peters, in both Kenya and Malawi, the findings suggest that interventions that exploit incentives to invest in children can provide more immediate improvements in child health and nutrition where sustained income growth is possible only in the long term. From this study, it can be reflected that the income is allocated mostly for the children during their feeding practices and other nurturing behavior. Thus, as the number of children in the family, their vulnerability also increases.

Having these vulnerabilities being recorded in the 4Ps Beneficiaries inventory from the DSWD-Region V and their addresses being collected, the researchers conducted spot mapping showing each household with corresponding vulnerabilities in the attribute table. The factor: income is not numerical. The DSWD Regional Office can’t disclose the household income because it is confidential. The researchers just taken into account the household employment instead of including their income. Their house location shall also be categorized whether they are situated inside the 6-km permanent danger zone, 6 to 7-km danger zone, 7 to 8-km danger zone, 8-9km danger zone, 9-10km danger zone and outside 10km radius. The nearer they are to the Mayon Volcano, the more vulnerable they are.

A vulnerability assessment is needed for it will help the concerned agencies in designing strategies where they can focus more to the ones that are urgently needed to be aided. Disaster response agencies increasingly use the concept of vulnerability to analyse processes and conditions that lead to disaster responses. A Vulnerability Assessment is a part of this study which are induced more to be suffered due to Mayon Volcano Eruption. Assessing vulnerability is just one side of how people take risk-related decisions. If we want our disaster responses to be meaningful, we need to give affected communities a voice and recognize their risk perception as well as their active role in exploring strategies that ensure livelihood security on the long-term. The latter means that we should strengthen these strategies to address the root causes of their vulnerability, and to broaden our perspective beyond the disaster response framework.¹⁴ The varying risk perceptions of the residents is not considered in this study as a contributing factor to vulnerability.

In the study “GIS in hazard mapping and vulnerability assessment on Monsterrat”¹⁵, GIS has proved to be an effective tool in disaster management. It is needed at all stages of disaster management, particularly mitigation, preparedness, response, and recovery. Employing standard GIS techniques and incorporating data from other sources, it allowed for the visualization of a disaster situation effectively, thus reducing the loss of life and property. The demand for quick and accurate information and mapping where hazards exist can be met by a GIS. Consequently, this study used GIS technology in data analysis. The researchers gathered the 4Ps Beneficiaries profile from the DSWD-Region V and this non-spatial data are transformed by encoding and entering them to the attribute tables. The addresses of the beneficiaries are also present in their profiles and these are transformed into geographic coordinates with the use GPS receivers. The researchers conducted spot mapping for every household classified according to the danger zones location and thus, every point has an accompanying attribute table where the vulnerabilities are listed. The distance of each point to the point of location of evacuation centers were also evaluated.

In the study entitled “Automatic GIS-Based System For Volcanic Hazard Assessment”¹⁶, a user may input parameters and the system automatically generates the

corresponding map consequently this study also produced digital maps where a user may navigate and access through different factors of vulnerability. The user may also navigate in each point the nearest evacuation center to them. This study presents the results with the help of maps that can be generated using the GIS software.

In an article entitled “Network -based GPS Survey in Japan”¹⁷ by Dr Susumu Hattori it was stated that “The availability of authorized coordinates and daily ERS observations has made practicable network-based GPS surveying using ERS as reference stations. Network-based GPS is a technology to measure in real-time the coordinates of any user station encircled by several reference stations.” A survey that was network-based was officially regulated by the Public Work Regulation of the Ministry of Land, Infrastructure of the Land, which is not only useful for map production and construction surveying, but also for prevention and management. The application named “Handy GPS” was used by the researchers. It is a real navigation tool designed for outdoors sports like hiking, bushwalking, mountain biking, kayaking and trail riding. It allows you to work in UTM or Latitude/Longitude, view your current location in UTM or Latitude/Longitude formats, record and/ or manually enter waypoints, go to a waypoint, record a track log, show your current location, waypoints and track logs on a map, export waypoints and track logs to a KML file for viewing in Google Earth or to a GPX files, supports datum WGS84, GDA94, AGD66, and AGD84, and records locations in every session. The record of location may be then uploaded to the site of Geodataconverter and be converted to .csv file which is compatible for use in GIS Software. In this study, this method was adopted to locate the houses of the 4Ps beneficiaries and the Evacuation centers in Guinobatan Albay, which may serve as guide for evacuation planning.

Synthesis of the Art

This study focuses on locating the houses of the 4Ps beneficiaries and the evacuation centers in Guinobatan, Albay where the researchers make use of a network-based method to establish the locations.

The study entitled “Vulnerability: A Matter of Perception” mentioned that most disaster response agencies combine the first two views (nature as cause and cost as cause) in their analysis and actions. Consequently, this study perceives ‘vulnerability’ as the result of socioeconomic condition (cost as cause) and the proximity to the Mayon Volcano (nature as cause). As defined by Currie, Samdal et.al, the socioeconomic condition refers to an individual’s level of income, wealth, education and prestige. Socioeconomic comes along with four factors in this study: income, head of the family employment, number of household members and age dependency where the last two may induce their vulnerability. These factors were supported by the studies: Poverty and Its Many Dimensions: The Role of Income as an Indicator, Old Age Poverty in Developing Countries: Contributions and Dependence in Later Life, and Household Food Security and Child Nutrition: The Interaction of Income and Gender of Household Head. On the other hand, in the aspect of proximity to the Mayon Volcano (nature as cause), the researchers choose this because here in the Province of Albay, it is one of the natural disasters that the people experienced.

In the studies “Automatic GIS-Based System for Volcanic Hazard Assessment”, “GIS in Hazard Mapping and Vulnerability Assessment on Montserrat”, and from the article “Network-based survey in Japan”, it was mentioned that the methods used can be functional for prevention and evacuation planning which can be beneficial both for the government and the society. These schemes can serve as an action point to assess the location of the affected 4Ps beneficiaries from Guinobatan to the evacuation shelters.

Gap Bridged by the Study

The factors that can make the 4Ps beneficiaries more vulnerable have an impact on evacuating the households when a natural calamity occurs. The local government have a complication when evacuating the affected community. The number of individuals, distance of the evacuation centers from the location of the concerned families, the means of transportation to safe places, and the condition of the evacuation centers have an effect in the operation of evacuating. This study aims to help the 4Ps beneficiaries and the local

government to design for an accessible procedure to prevent difficulties when evacuating the individuals.

Therefore, this study bridge the gap and provide a strategy for the local government and the community.

Theoretical Framework



Figure 2.1 Theoretical Framework

This study is concerned mainly with two variables: 4Ps Beneficiaries Socioeconomic Situation (Cost as Cause) and their proximity to Mayon Volcano (Nature as Cause). The combination of these two is perceived as ‘vulnerability’. In times of eruption, or any kind of disaster, vulnerability means need for immediate evacuation.

During the eruption, the residents of Guinobatan including the 4Ps Beneficiaries consider their assets, type of housing, education of the children, livelihood of the family and access to water and sanitation facilities before evacuating to safer places. By the time that the beneficiaries evacuated, most of the times, they return to their houses for their livelihood, to get materials like wood for cooking, to use the bathroom and because of other more reasons. They needed money for their expenses like food, drinking water and for the education of the children. The support from the government may be enough but they still need it for emergency and for the times that the ration arrived late. Returning to their houses is a risk for their safety especially when they are situated nearer the Mayon Volcano. Furthermore, from the interviews made by the researchers, most of the beneficiaries who evacuated, used their own money to go to the evacuation center and the cost of returning back and forth is even worse.

A Vulnerability Assessment, evaluating the most common contributing factor which are induced more to be suffered due to Mayon Volcano Eruption, is a part of this study. Vulnerabilities cannot be addressed directly and disaster response of local government in terms of evacuating the locals needs attention. This study produce a Network Based Locations of the 4Ps Beneficiaries to know where the immediate evacuation is needed.

In this research, the vulnerability were assessed in terms of age dependency, number of members in a household, head of the family employment, and their proximity to the Mayon Volcano. These factors influence their responses to risk to volcanic catastrophes especially when they are nearer or situated in the danger zones of the Mayon Volcano. Therefore, as the households possess more of these factors, their vulnerability increases and their need for immediate evacuation also increases.

The researchers used a GIS-based technology were assessment in form of map, model, or graphs can easily be generated. Visualization helps in glimpse decision making. In addition to this, a map of lahar prone areas was added for better decision making and the like.

Conceptual Framework

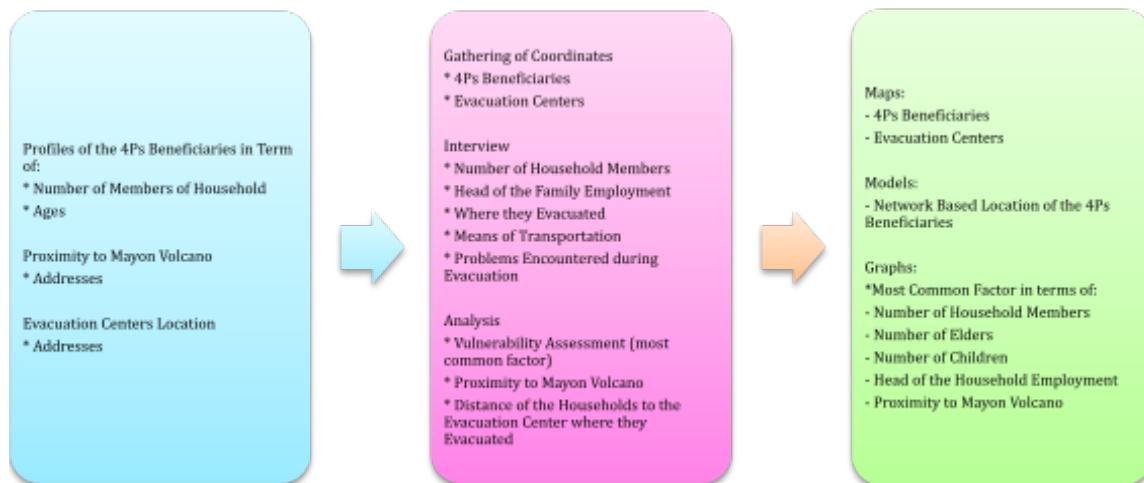


Figure 2.2 Conceptual Framework

The inputs for this study are the profiles of the 4Ps beneficiaries in terms of number of household members, ages and the addresses of the beneficiaries and of the evacuation centers. In order to process these inputs, the researchers conducted interview and gathering of coordinates. During the interview, the number of household members was asked to know whether there are additional members or for any updates, and the head of the family employment since it is the main source of income of the family. The DSWD didn't disclose the numerical value of income due to confidentiality. The location of where they evacuated, the means of transportation to go there, and the problems encountered were also asked from them. The profile and coordinates gathered were entered to ArcMap for analysis. It was used for vulnerability assessment: determining the most common factor, the distance between the households and the Mayon Volcano and the evacuation centers. Models and maps were generated for visualization. Graphs of the most common factors in terms of Number of Household Members, Number of Elders, Number of Children, Head of the Household Employment, and Proximity to Mayon Volcano were also created.

Definition of Terms

For better understanding of this study, the following terms are operationally defined.

4Ps (Pantawid Pamilyang Pilipino Program) – a conditional cash transfer program of the Philippines leads by the government agency DSWD (Department of Social Welfare and Development) where the beneficiaries receive monthly financial assistance/ cash grants that support their needs.

GIS (Geographic Information System)- a framework that the researchers used to store the collected data, plot and process it using the program Arcmap 10.5. It is used to identify the location of the beneficiaries with respect to danger zones.

GPS (Global Positioning System)/ Handy GPS Application- a technology used by the researchers in measuring the real time coordinates of the houses of the beneficiaries

Permanent Danger Zones (PDZ) – composes a hazard zones with a radius from the Mayon Volcano crater that ranges from 6km-10km; categorized into six in this study: inside 6-km PDZ, 6 to 7-km danger zone, 7 to 8-km danger zone, 8-9km danger zone, 9-10km danger zone and outside 10km radius

Proximity – the closeness or the range of how near are the 4Ps beneficiaries located from the Permanent Danger Zones of Mayon Volcano and to the evacuation centers.

Socioeconomic Condition – the state of the 4Ps beneficiaries' household in terms of the household members, age dependency, their level of income, and employment. This condition worsens as they are nearer the Mayon Volcano for they are situated in remote areas.

Vulnerability – is possessed by the 4Ps beneficiaries that hinders them from evacuating to safe place; perceived as the combination of the socioeconomic condition and the proximity to the Mayon Volcano

ArcMap - ArcMap is where you display and explore GIS datasets for your study area, where you assign symbols, and where you create map layouts for printing or publication. ArcMap is also the application you use to create and edit datasets.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

The researchers used the application named “Handy GPS” that can be downloaded in the mobile phones. It is a real navigation tool that allows you to view your current location in UTM or Latitude/Longitude formats, record, show your current location, export waypoints and track logs to a KML file for viewing in Google Earth or to a GPX files, supports datum WGS84, GDA94, AGD66, and AGD84, and records locations in every session. The record of location were uploaded to the site of Geodataconverter and be converted to .csv file which is compatible for use in GIS Software. This method was adopted to locate the houses of the 4Ps beneficiaries and the Evacuation centers in Guinobatan Albay.

In this study, quantitative method is used. With the use of ArcGIS program, ArcMap 10.5, the distances between the houses to the Mayon Volcano and to the evacuation centers can be easily computed. In addition to this, it allows the users to generate graphs and statistics. Determining the most common factors that contributed the vulnerability of the 4Ps beneficiaries during the said eruption was made simple by quantifying the factors common among households.

This study produced a GIS model that can be applied to other situation where a user may navigate and access through several factors of vulnerability. They may focus on a certain factor of interest like the head of the family employment, the number of family members, their ages and their locations with respect to the danger zones assigned to Mayon Volcano.

Research Method

Below is an overview that summarizes all the step and procedures that the researchers used in this study.

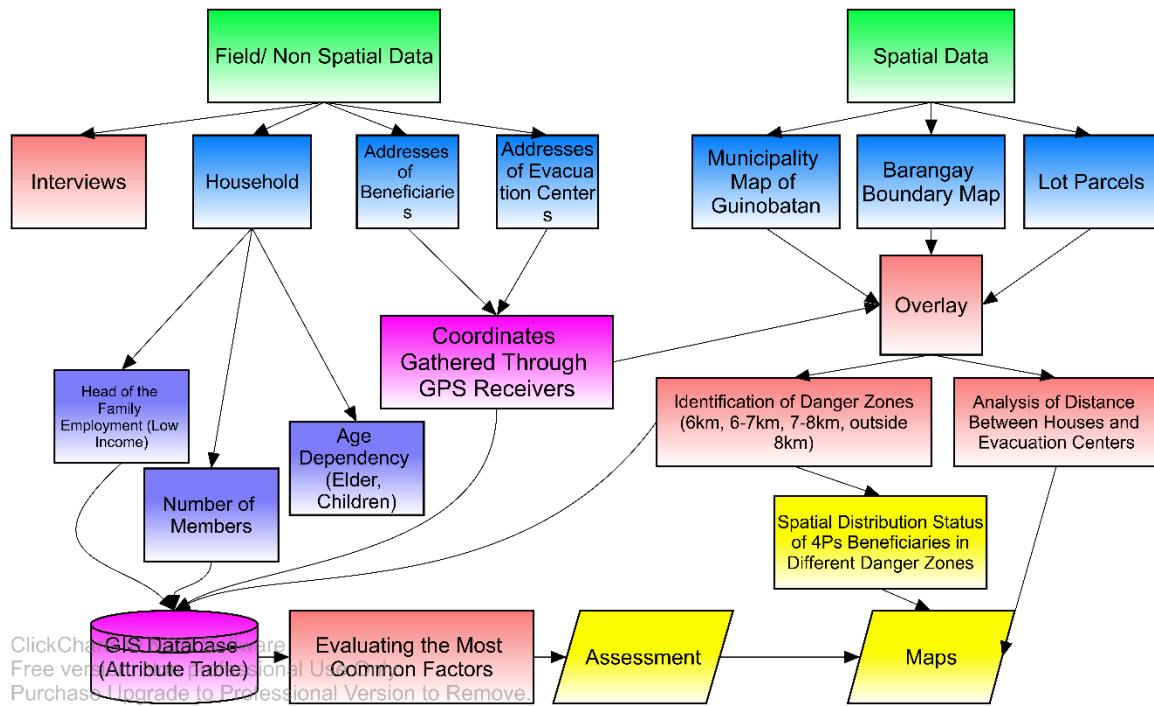


Figure 3.1 Research Methods

Data Capture and Reprocessing

Step 1: (The Green Boxes) The data are categorized as Field/ Non Spatial Data or as Spatial Data. The researchers gathered the non-spatial data from the DSWD and Albay Public Safety Emergency Management Office (APSEMO), and the spatial data from the Department of Environment and Natural Resources (DENR) Technical Services. The researchers prepared request letters and were sent to the agencies.

The non-spatial data collected is the 4Ps Beneficiaries Inventory (household profile) in Guinobatan, Albay that contains details about each household: province, municipality, barangay and purok of their location, the names of the beneficiaries together with their relationship to the household head and ages. Another data acquired is the number of households in every barangay in the municipality of Guinobatan. In addition to request letter, these data were acquired with by submitting a Research Request

Form from the DSWD. The data from the APSEMO contain the addresses of the evacuation centers where the residents of Guinobatan evacuated.

The Municipal Social Welfare and Development of Guinobatan reported that the barangays: Doña Tomasa, Maipon, Maninila, Masarawag, Muladbucad Grande, Muladbucad Pequeño, and Tandarora were affected by the said eruption and consequently are being considered in this study. From the total of 5,154 4Ps beneficiaries' households of Guinobatan, 1,041 households are from the said barangays. The researchers considered only a sample of fifty percent and above.

The list of evacuation centers from APSEMO recorded the number of households that evacuated from different barangay to certain evacuation center. This does not reflect which ones are 4Ps beneficiaries so the researchers conducted interviews among them.

As for the spatial data, municipality map of Guinobatan, barangay boundary map and map of lot parcels were requested. The files gathered from DENR-TS were scanned Cadastral Map of Guinobatan. The blue and violet boxes denote the outputs of the first step. The pink ones are for the process to be made. The scanned map was used to assure that the coordinates gathered lies on the right barangay.

Pre-Processing

Step 2: The researchers conducted spot mapping of the houses, barangay halls and of the evacuation centers with the use of the application Handy GPS.

The researchers visited the barangay captain, sent a letter of permission and asking for help in conducting the research. From there, another help was asked from the barangay kagawad, tanod, and parents' leader in locating the beneficiaries. They are of great help in visiting the beneficiaries' houses. Then, interviews were also conducted.



Figure 3.2 Data gathering in the barangays of Maipon, Maninila and Muladbucad Pequeño

Step 3: The non-spatial data are encoded in MS Excel and converted to .csv files. In every barangay, there are three attribute tables: the Beneficiaries, the Household Profiles, and the Evacuees (contains evacuating information).

The 4Ps Beneficiaries Inventory from DSWD contains the following: province, municipality, barangay, purok, last, first, and middle name, relationship to the household head and age. The excel file: Household Profiles were made by the researchers where the inventory was simplified. Household Number was assigned to each of the household head. The number of members were counted. The number of elder and children in the family were also counted considering the recorded ages. These are manually inputted in the excel file.

Step 4: The Geodataconverter online was used in converting the coordinates acquired using the Handy GPS into .csv file.

Before adding the coordinates to the ArcMap, the .csv files were edited. Together with the latitude and longitude, the household number assigned, household head were added. The data gathered from the interview like the evacuation center and means of transportation were added.

Consequently, the coordinates of the evacuation centers and barangay halls were compiled in an excel file and then converted to .csv file.

Use the method Overlay, to plot this in a map. Open the Arcmap 10.5 and add the data of the base map: Municipality Map of Guinobatan, and Barangay Boundary Map. Then add another data, the .csv file by adding XY data. An additional map of lahar prone areas was georeferenced and added as the base map.

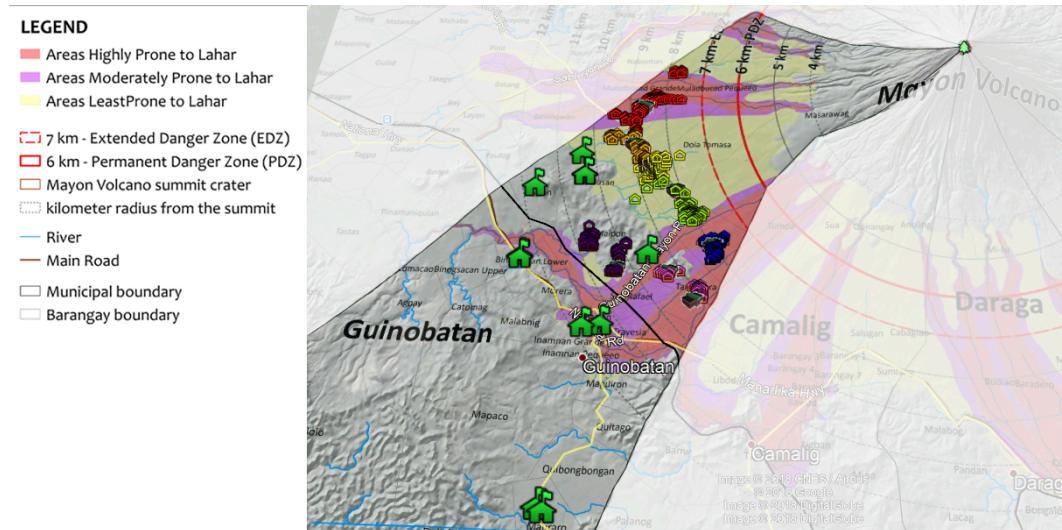


Figure 3.3 Points Shown

Transform the points into Projected Coordinate Systems > UTM > WGS 1984 > Northern Hemisphere > WGS 1984 UTM Zone 51N. Create a KML to be opened using the Google Earth.

The KML file can be opened in the Google Earth online or offline where it enables the user to click the points that consequently shows brief information of the beneficiaries like the

coordinates, household number, name of household head and the means of transportation they used.

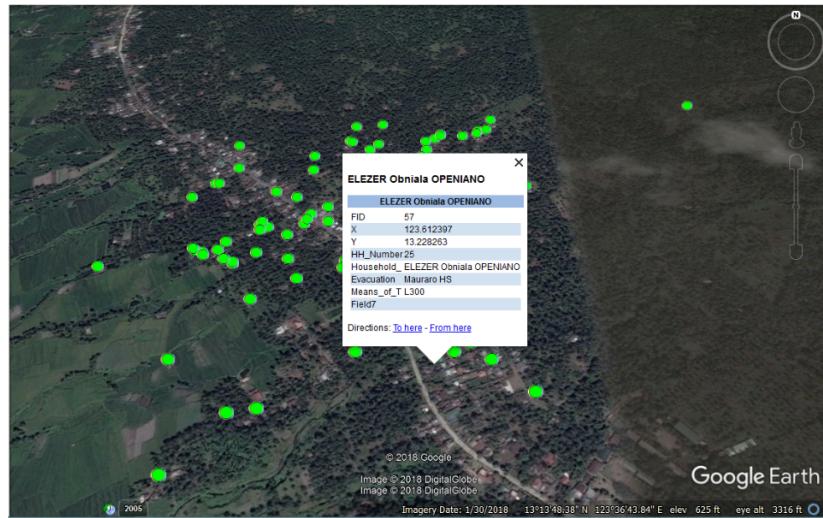


Figure 3.4 Points Shown in Google Earth

The result of the Step 4 is a map with the points for the evacuation center, barangay halls and the 4Ps beneficiaries.

Step 5: To identify their location with respect to danger zones, the distance between the Mayon Volcano and the households was evaluated using the tool: Point Distance.

Create a new point shapefile for Mayon Volcano with Projected Coordinate System. Use the geoprocessing tool: buffer. Buffer 6, 7, 8, 9 and 10-km from the Mayon Volcano Crater.

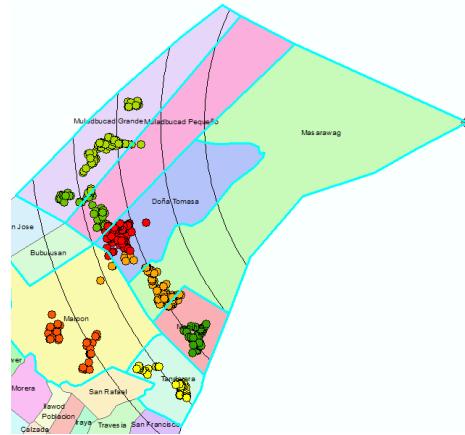


Figure 3.5 4Ps Beneficiaries in Danger Zones

To determine the distance, open the arctoolbox > analysis > proximity > point distance. For the input features is the projected Mayon Volcano while the near features is the projected beneficiaries. Then an output table will be added to the workspace.

Add Field: Proximity and start editing. Classify the distance into: inside the 6-km permanent danger zone, 6 to 7-km danger zone, 7 to 8-km danger zone, 8-9km danger zone, 9-10km danger zone and outside 10km radius. Rename DISTANCE to Distance_to_Mayon.

Observe that the value of the NEAR_FID corresponds to the household number. Join this edited table to the original shapefile of the projected beneficiaries.

Step 6: To know the distance between the 4Ps Beneficiaries and the evacuation center, use the same tool: point distance. Rename the DISTANCE to Distance_to_Evac and join this table to the original shapefile of the projected beneficiaries.

Data Analysis

ArcMap 10.5 allows user to generate statistics. In the attribute table and the field name, different tools are available. Once the statistics tool is clicked, this will be shown.

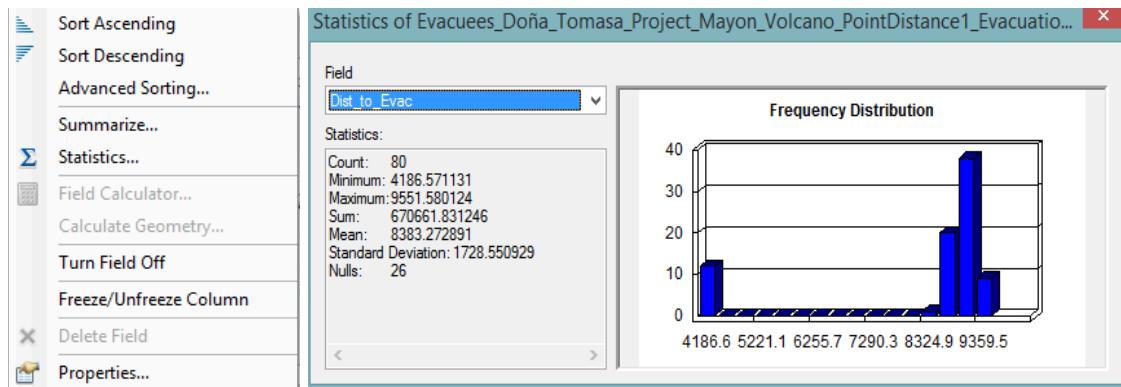


Figure 3.6 Statistics Tool

Manual counting of the values, searching for the maximum and minimum value, and computing the sum, mean and standard deviation are now automatically made by the statistics tool. The nulls are those households that are not plotted because their houses are

distant but the researchers were able to interview them not in their house. A frequency distribution graph is also created. This method is used to answer the first question.

Step 7: From the attribute table that the researchers made where the proximity field was added, the tool: summarize was used. It will produce a table containing the category for Proximity (7 to 8km, 8 to 9km, etc), and the count of households that belong to each danger zone.

Creating graph allows user to choose the graph type, the x and y field and automatically generates the graph.

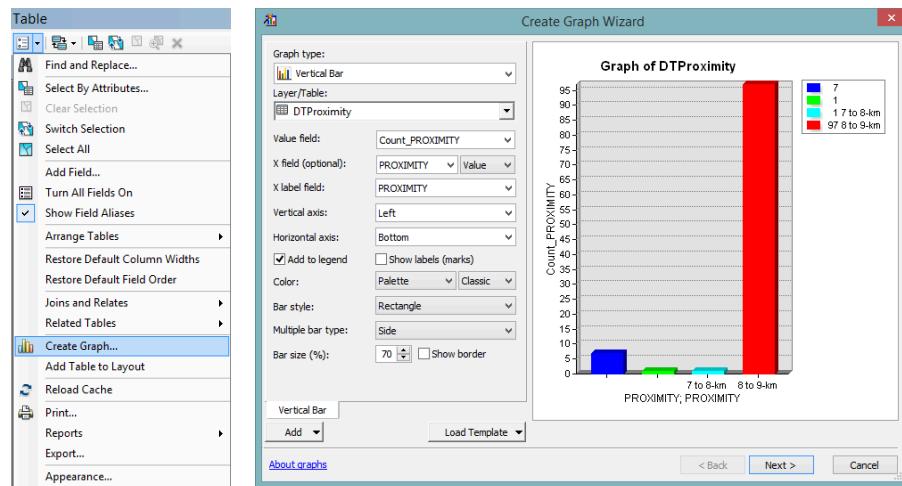


Figure 3.7 Create Graph

To know the percentage, the contents in the table were encoded in the MS Excel and a pie graph was made showing the percentage. This method was used to answer questions 2.

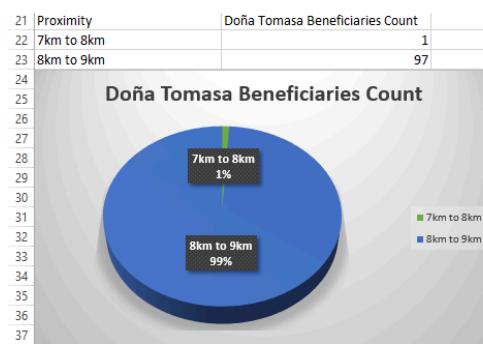


Figure 3.8 Pie Graph

Step 8: The same method in Step 7 was adopted in determining the most common factors (in terms of their head of the family employment, number of household members and ages) that contributed to the vulnerability of 4Ps beneficiaries during the 2018 Mayon Eruption.

For additional information, this method is applied to the field: Means_of_Transportation.

Data Presentation

The yellow boxes denote the outputs: maps, tables and graphs. The results are presented with the use of maps. Each household point were buffered for some meters away so that it will be more visible. Each categories of vulnerabilities are shown with different colors. Their spatial distribution and the most common factors were also be assessed using the Arcmap Tools and are presented in graphs.

Just by making maps, analysis can be made for it includes decision making about which information to include and how to present that information.

Sources of Data

The researchers will gather the non-spatial data from the Department of Social Welfare and Development (DSWD) and Albay Public Safety Emergency Management Office (APSEMO) and the spatial data from the Department of Environment and Natural Resources (DENR) Technical Services. The information about the barangays affected are from the Municipal Social Welfare and Development of Guinobatan. The names of the officials: the Barangay Captain and Mayor of Guinobatan are from the records of the Albay Capitol.

As for the spatial data, municipality map of Guinobatan, barangay boundary map and map of lot parcels shown from the scanned Cadastral Map are from the DENR-TS.

Population and Samples of the Study

The population for this study are the 4P's Beneficiaries in the Municipality of Guinobatan. This study focuses on the beneficiaries affected by the 2018 Mayon eruption. The researchers limit the study to the beneficiaries affected by the recent eruption (those who evacuated) to lessen the population of the study due to the limited period for data collection. In addition to this, only a sample of fifty percent or above of the number of household of the beneficiaries in every barangay was also taken into account in this study.

This study is concerned about the locations of the 4Ps Beneficiaries Residences and of the evacuation centers.

Research Instrument

This uses the Geographic Information System GIS-based methodology given that their geographic coordinates were collected by the network-based GPS application, Handy GPS. This is the software used in data analysis. Survey questionnaires were also filled up during the interview with the 4Ps Beneficiaries.

Data Gathering Process

The data were gathered thru request letters to DENR-TS and DSWD. In acquiring the data from the DSWD, a form was filled up together with the contract for the formal request. The data was sent through email. As for the data from the DENR-TS, the scanned Cadastral Map was copied to the flash drive. The data from are APSEMO and Capitol were personally gathered.

CHAPTER 4

DISCUSSION AND ANALYSIS

Presentation of Data

A total of 562 4Ps Beneficiaries' Households are taken into account in this study out of 1,041 households from the seven barangays. This constitutes to 53.99% of the total household population. The numbers of households from the barangays of Doña Tomasa, Maipon, Maninila, Masarawag, Muladbucad Grande, Muladbucad Pequeño and Tandarora are 78, 54, 73, 130, 109, 75 and 43.

44 households did not evacuate and the others evacuated to Bicol University College of Agriculture, Guinobatan East Central School (Building 1), Elementary Schools of Bubulusan, Inascan, Libas, Lower Binogsacan, Mauraro, Quitago and San Jose, and High Schools of Lower Binogsacan and Mauraro.

The maximum distance from a household to evacuation center is 9.551580124 km and the average distance between is 4.690054255 km. The household headed by LINA Justiniano MONTERO of Doña Tomasa travelled the farthest by means of truck to Mauraro High School. Their house is situated inside the 7 to 8km danger zone.

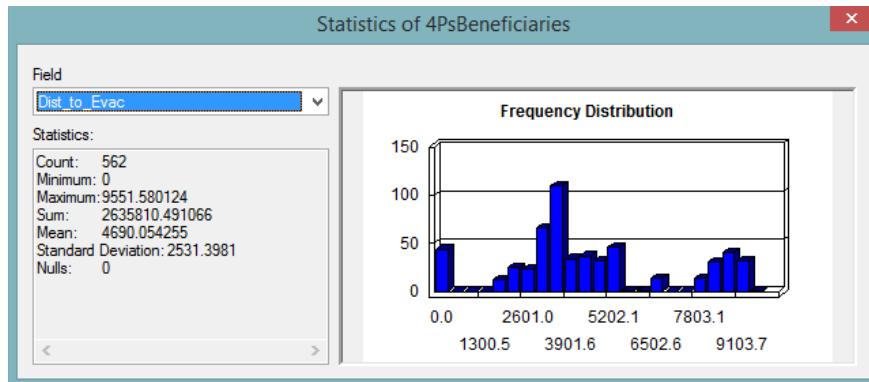


Figure 4.1 Statistics on Distance to Evacuation Center

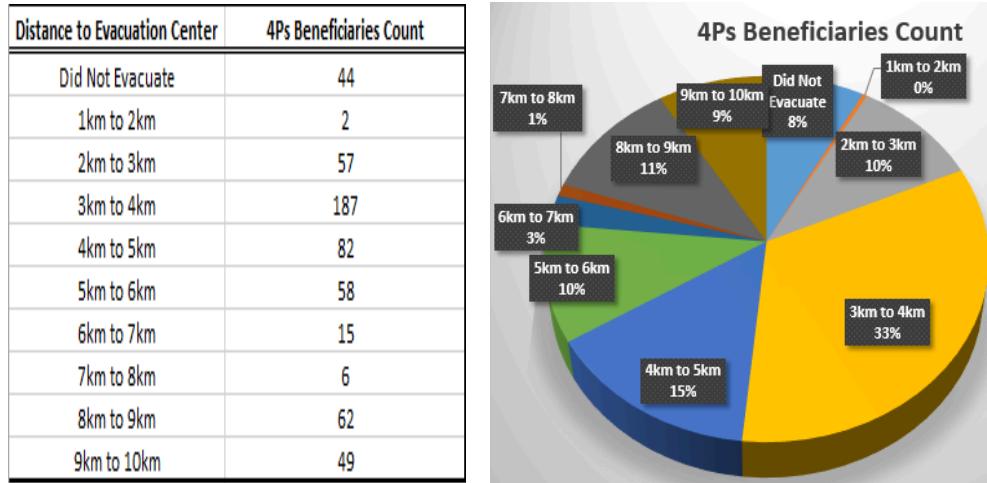


Figure 4.2 Categorized Distance to Evacuation Center in Pie Graph

The distances to evacuation center that range from 3 to 4km are the most common: 187 households (33%) belong to this.

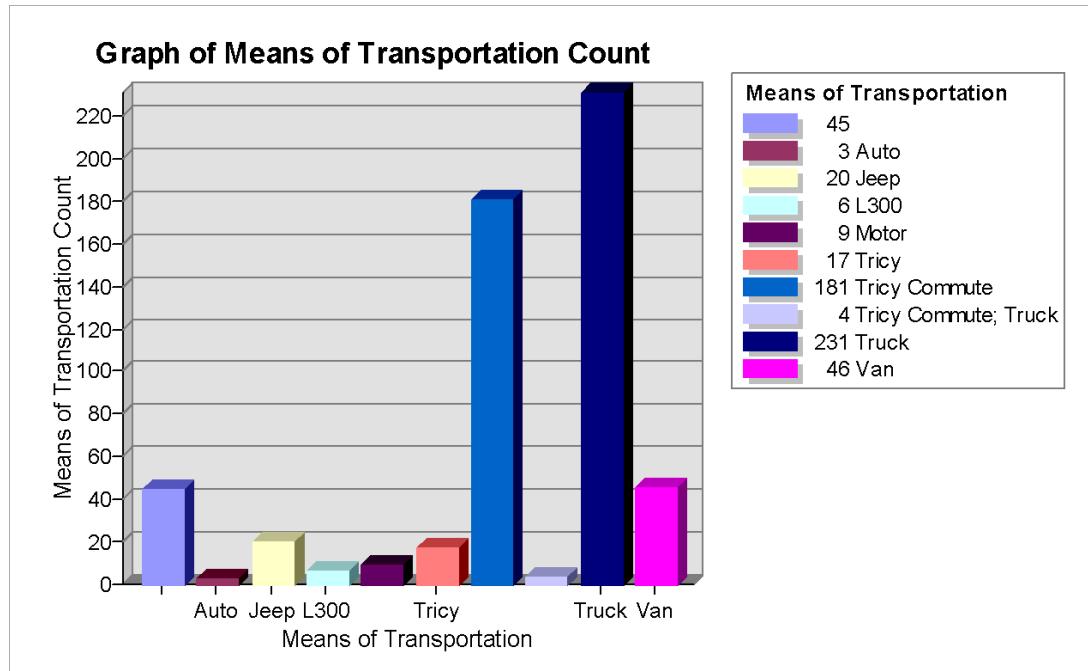


Figure 4.3 Graph of Means of Transportation Count

Truck has the highest count of households who used it as means of transportation to the evacuation centers. The second to the highest is the tricycle where the evacuees commuted.

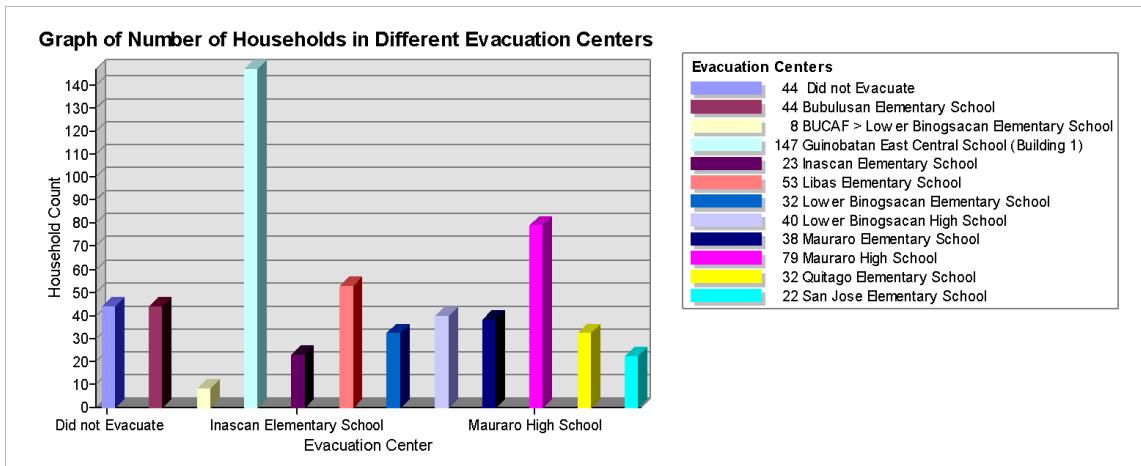


Figure 4.4 Graph of Number of Households in Different Evacuation Centers

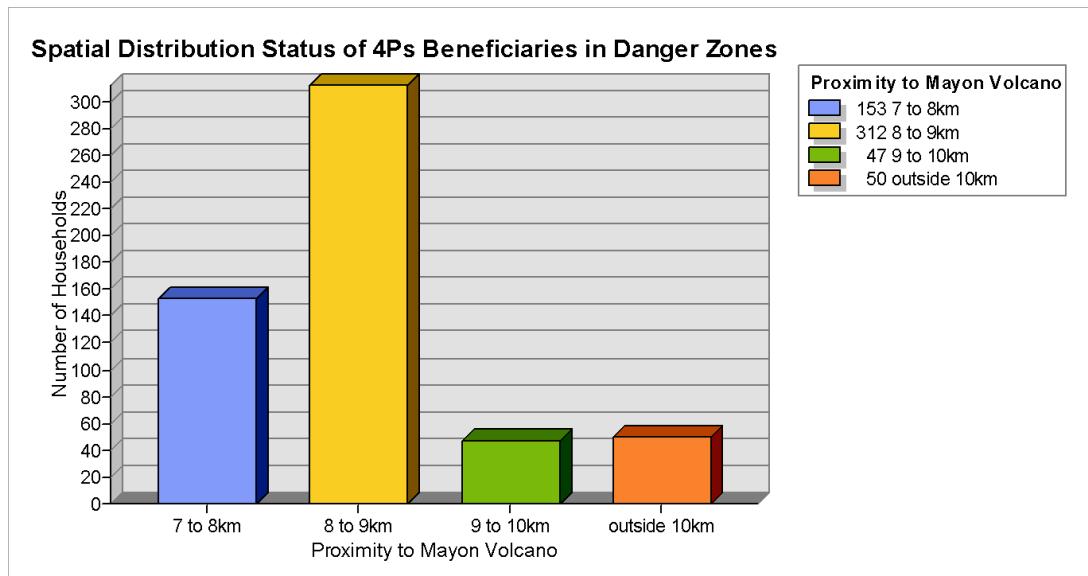


Figure 4.5 Spatial Distribution Status of 4Ps Beneficiaries in Danger Zones

The number of houses that are located in the 7 to 8km, 8 to 9km, 9 to 10km and outside the 10km radius are 153, 312, 47 and 50 respectively. Most of the households that are located in 8 to 9km danger zone are from the barangays of Muladbucad Grande, Muladbucad Pequeño, and Doña Tomasa.

Analysis of Data

The household headed by LINA Justiniano MONTERO of Doña Tomasa travelled the farthest to the evacuation center, the Mauraro High School. 49 out of 78 households of Doña Tomasa travelled more than 9km to evacuate to Mauraro Elementary and High School. They travelled by means of truck and tricycle commute. From the interviews conducted by the researchers, the beneficiaries needed to go back and forth to their houses for several reasons like for sanitation, water, and for cooking. This means that they spend more for fare. In addition to this, their safety is also at risk. On the other hand, the 44 households who did not evacuate are mostly from Maipon, 43 of them. According to them, the evacuation center assigned to them is too far and the situation there and their houses is the same: surrounded by ashes.

The beneficiaries from Maninila evacuated Guinobatan East Central School (Building 1) by means of truck and only few commuted tricycle. They were easily gathered and brought by the military truck to the evacuation. On the other hand, the beneficiaries from Muladbucad Grande encountered difficulty in finding available evacuation site. Some went to Inascan, Lower Binogsacan, San Jose, Bubulusan, Elementary School, and Lower Binogsacan High School. Some decided to look for a place to stay in different schools and if there is available space, they stay there.

Truck has the highest number and the second is the tricycule. 231 out of 562 (41.10%) households used truck as means of transportation and 181 households (32.21%) commuted tricycle. Those who used tricycle spent money for fare. According to some, they commuted tricycle before the truck arrived to find a place to stay or because of fear when they are surrounded by ashes but the truck has not yet arrived.

The percentage of households that are in 7 to 8km, 8 to 9km, 9 to 10km and outside the 10km danger zones are 27%, 56%, 8% and 9% respectively. The beneficiaries situated inside the 7 to 8km danger zone consider their livelihood specially quarrying in the barangays of Muladbucad Grande, Masarawag, and Maninila.

Implication of Data

The data imply that there is a need to for strict assignment of evacuation center to each barangay. This benefits a lot not just the residents but also the local government. Like what the beneficiaries in Muladbucad Grande experienced, they looked for safe place before the advisory of where they will evacuate. Having designated evacuation center, the residents may decide whether they have to evacuate sooner because they are the ones facing the dangers of eruption. The local government will also benefit from this specially during the distribution of goods and for records of the safety of the residents.

The data also imply that those beneficiaries residing nearer the Mayon Volcano needs to be evacuated immediately and be prohibited of going back and forth to their houses in times of eruption. This may cost them a lot. Their reason can be addressed in different aspects like immediate procurements of materials for cooking, comfort rooms, water and alternative livelihood to support their personal needs.

CHAPTER 5

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary of Findings and Results Obtained

The maximum distance from a household to evacuation center is 9.551580124 km and the average distance between is 4.690054255 km. The table below shows the summary of number of beneficiaries (households) who travel a certain distance that are categorized in different ranges.

Distance to Evacuation Center	4Ps Beneficiaries Count
Did Not Evacuate	44
1km to 2km	2
2km to 3km	57
3km to 4km	187
4km to 5km	82
5km to 6km	58
6km to 7km	15
7km to 8km	6
8km to 9km	62
9km to 10km	49

Figure 5.1 Summary of Number of Households to Evacuation Centers

Below is Spatial Distribution Status of 4Ps Beneficiaries in Danger Zones. The percentage of households that are in 7 to 8km, 8 to 9km, 9 to 10km and outside the 10km danger zones are 27%, 56%, 8% and 9% respectively.

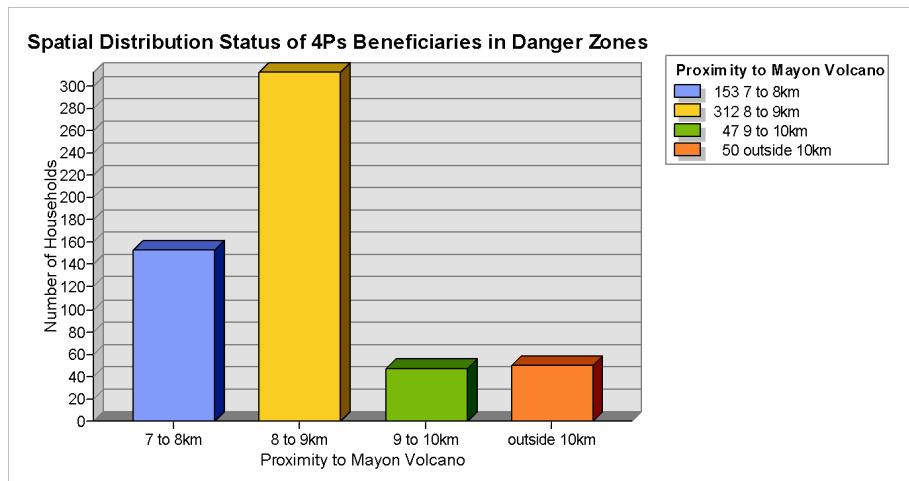


Figure 4.5 Spatial Distribution Status of 4Ps Beneficiaries in Danger Zones

Conclusions

The Network Based Location of 4Ps Beneficiaries Affected by 2018 Mayon Volcano Eruption successfully produced graphs using the program ArcMap 4.5 in an easy way. On the other hand, analysis of the distance was made in a straight way not considering the road they might actually taken. It can still be made possible though tedious with the right amount of time. Visualization through maps is effective in decision making. The researchers concluded that those beneficiaries situated nearer the Mayon Volcano need immediate evacuation and became more vulnerable in times of eruption.

Recommendations

The researchers recommend that the methods used in this study be developed to be applied to related studies. This study can be enhanced to be used as a tool to guide and help the agencies concerned to monitor the 4Ps beneficiaries.

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APPENDIX A

Table 1. Mayon Volcano Alert Levels

Source:http://www.philvocs.dost.gov.ph/index.php?option=com_content&view=article&id=816&Itemid=500045

Mayon Volcano Alert Levels		
Alert Level	Main Criteria	Interpretation/ Recommendations
0 No Alert	Quiet. All monitored parameters within background levels.	No eruption in foreseeable future. Entry in the 6-km radius Permanent Danger Zone (PDZ) is not advised because phreatic explosions and ash puffs may occur without precursors.
1 Abnormal	Low level unrest. Slight increase in seismicity. Slight increase in SO ₂ gas output above the background level. Very faint glow of the crater may occur but no conclusive evidence of magma ascent. Phreatic explosion or ash puffs may occur.	No eruption imminent. Activity may be hydrothermal, magmatic or tectonic in origin. No entry in the 6-km radius PDZ.
2 Increasing Unrest	Moderate unrest. Low to moderate level of seismic activity. Increasing SO ₂ flux. Faint/intermittent crater glow. Swelling of edifice may be detected. Confirmed reports of decrease in flow of wells and springs during rainy season.	Unrest probably of magmatic origin; could eventually lead to eruption. 6-km radius Danger Zone may be extended to 7 km in the sector where the crater rim is low.
3 Increased Tendency Towards Hazardous Eruption	Relatively high unrest. Volcanic quakes and tremor may become more frequent. Further increase in SO ₂ flux. Occurrence of rockfalls in summit area. Vigorous steaming / sustained crater glow. Persistent swelling of edifice.	Magma is close to the crater. If trend is one of increasing unrest, eruption is possible within weeks. Extension of Danger Zone in the sector where the crater rim is low will be considered.
4 Hazardous Eruption Imminent	Intense unrest. Persistent tremor, many "low frequency"-type earthquakes. SO ₂ emission level may show sustained increase or abrupt decrease. Intense crater glow. Incandescent lava dome, lava fountain, lava flow in the summit area.	Hazardous eruption is possible within days. Extension of Danger zone to 8 km or more in the sector where the crater rim is low will be recommended.
5 Hazardous Eruption	Hazardous eruption ongoing. Occurrence of pyroclastic flows, tall eruption columns and extensive ashfall.	Pyroclastic flows may sweep down along gullies and channels, especially along those fronting the low part(s) of the crater rim. Additional danger areas may be identified as eruption progresses. Danger to aircraft, by way of ash cloud encounter, depending on height of eruption column and/or wind drift.

Revised 14 January 2018

3. Camalig	Anoling	6 - 7 km		413	1,779	Anoling ES	14
	Salugen	7 - 8 km		320	1,199	Balgang ES	15
	Quirangesay	6 - 8 km		600	1,818	Beruw National HS	21
				134	450	Beruw ES	6
	Tumpa	6 - 8 km		345	1,246	Teladong ES	12
	Sua	6 - 8 km		458	1,630	Comun ES	16
	Upper Cabanga	7 - 8 km		266	1,071	Colmon HS	24
							7 108
	Sub-Total	6		2,436	9,232		
4. Guinobatan	Maninila	8 - 9 km		484	1,658	Guinobatan East Elementary School	31
	Masarawag	6 - 9 km		389	1,364	Guinobatan West Central S	29
	Masaron			64	216		
				23	75		
	Muladbucad Pequeno			7	29		
	Muladbucad Grande			88	338		
				1	2	Lower Binogsacan ES	
				5	21		
				10	33		
	Muladbucad Gr	6 - 9 km		69	292	Inascan ES	6
				154	500	Bubulusan ES	11
				27	91	Bubulusan Brgy. Hall	
				14	50	Bubulusan Health Center	
				73	227	San Jose ES	
	Muladbucad Pequeno			2	4		
	Dona Tomasa	6 - 9 km		3	15	Private Residence	
	Muladbucad Pequeno			2	8	Private Residence	

APPENDIX B

List of Evacuation Centers in Guinobatan Albay

APPENDIX C

Muladbucad Grande			3	12		Private Residence	
Muladbucad Pequeno			142	442		Libas ES	
Muladbucad Peq	6 - 9 km		38	123		Brgy. Hall (Libas)	
Muladbucad Pequeno			12	33		Brgy. Health Center	
			19	62		Farm	
			10	28		Libas DCC	
			6	22		Private Residence	
			212	741		Don Juan ES (Quitago)	11
Dona Tomasa			41	146		BUCAF Extension	5
Masarawag			8	31			2
Dona Tomasa			1	3		Private Residence	
Masarawag			6	16			
Masarawag			54	143			

Request Form

 <p>DEPARTMENT OF SOCIAL WELFARE AND DEVELOPMENT Field Office V Magnolia St., PBN-Buragus, Legazpi City</p>																					
RESEARCH REQUEST FORM Date:																					
Family Name RANOLA	Given Name RACEL CLAIRE	Middle Name ALMOSARA	Office/Company & Address BICOL UNIVERSITY COLLEGE OF ENGINEERING																		
Home/Mailing Address BRGY 1, EM'S BARRIO (BRGY) LEGAZPI CITY		Mobile # * 0907 513 1444 E-mail * racelclaire.ranola@bicol-u.edu.ph	E-mail																		
School/School Address BICOL UNIVERSITY / EM'S BARRIO LEGAZPI CITY		Mobile #/ Telephone	E-mail																		
Researcher's Adviser ENGR. ANA MARIE ABANTE		Mobile #/ Telephone	E-mail anamarie.abante@bicol-u.edu.ph																		
PROPOSED RESEARCH PROJECT																					
Title/Poposed Title of Research Project NETWORK BASED LOCATION ANALYSIS OF AP'S BENEFICIARIES AFFECTED BY 2018 MAYON ERUPTION																					
What theory convinced you to pursue this topic? (Theoretical Framework) $\text{AP's beneficiaries socioeconomics situation} + \text{Proximity to Mayon Volcano} = \text{VULNERABILITY} \cdot \begin{matrix} \text{need for} \\ \text{immediate} \\ \text{evacuation} \end{matrix}$																					
What new contribution to DSWD's social welfare and social protection does this study hope to generate? <p>This study hopes to generate a map of the AP's beneficiaries location for the local government and DSWD to serve as a guide and as a monitoring instrument for the AP's beneficiaries in Guinobatan Albay.</p>																					
What is the Main Research Question that your study intends to answer? (Statement of the Problem) <ol style="list-style-type: none"> 1.) What is the average distance (in kilometers) between the AP's beneficiaries houses and of the evacuation centers safe from ash fall? 2.) How sparsely these AP's beneficiaries distributed inside the 6 to 8 km extended danger zone, 8-9 km extended danger zone and 9 to 10 km danger zone? 3.) What are the factors that contribute to the AP's beneficiaries vulnerability are most common during the 2018 Mayon eruption? 																					
Outline the key aspects of the Resarch Design, Methods and Materials to be utilized for the research.(pls specify the target area/s,respondents and data gathering tools) <p>Target areas: Guinobatan, Albay Respondents: AP's beneficiaries Data gathering Tools: GPS / RTK (real-time kinematic)</p>																					
Needed Data from DSWD AP'S BENEFICIARIES PROFILE IN GUINOBATAN, ALBAY CONTAINING THE NAMES OF THE BENEFICIARIES, THEIR INCOME, HEAD OF THE FAMILY EMPLOYMENT, NUMBER OF HOUSEHOLD MEMBERS AND THEIR AGES.		Timelines of Activities <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">From (m/d/y)</th> <th style="text-align: center;">To (m/d/y)</th> </tr> </thead> <tbody> <tr> <td>Data Gathering</td> <td style="text-align: center;">08-13-2018</td> <td style="text-align: center;">08-14-2018</td> </tr> <tr> <td>Pre-Oral Defense</td> <td></td> <td></td> </tr> <tr> <td>Final Defense</td> <td></td> <td></td> </tr> <tr> <td>Exit Conference</td> <td></td> <td></td> </tr> <tr> <td>Hard Bound</td> <td></td> <td></td> </tr> </tbody> </table>			From (m/d/y)	To (m/d/y)	Data Gathering	08-13-2018	08-14-2018	Pre-Oral Defense			Final Defense			Exit Conference			Hard Bound		
	From (m/d/y)	To (m/d/y)																			
Data Gathering	08-13-2018	08-14-2018																			
Pre-Oral Defense																					
Final Defense																					
Exit Conference																					
Hard Bound																					
Places to be Visited GUINOBATAN		Date and Time of Visit																			
<p>We have read the TERMS AND CONDITIONS printed at the back of this Form as set in Administrative Order No. 10, Series of 2006, and hereby agree on and guarantee compliance thereof.</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"> <u>RACEL CLAIRE A. RANOLA</u> Printed Name and Signature Researcher </td> <td style="width: 50%; text-align: center;"> <u>ANA MARIE R. ABANTE</u> Printed Name and Signature Researcher's Adviser </td> </tr> </table>				<u>RACEL CLAIRE A. RANOLA</u> Printed Name and Signature Researcher	<u>ANA MARIE R. ABANTE</u> Printed Name and Signature Researcher's Adviser																
<u>RACEL CLAIRE A. RANOLA</u> Printed Name and Signature Researcher	<u>ANA MARIE R. ABANTE</u> Printed Name and Signature Researcher's Adviser																				
<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved		ARNEL B. GARCIA, CESO II Regional Director																			

**ADMINISTRATIVE ORDER (AO) NO. 19, SERIES OF 2011
Policy Guidelines for the Conduct of Studies/Researches
in DSWD Offices, Centers and Institutions**

TERMS AND CONDITIONS

Hereunder are the terms and conditions to be agreed on and complied with by students and other researchers who intend to conduct studies/researches in the DSWD offices, centers and institutions:

Prior to the Conduct of the Study

- I. To submit a formal request to the Office of the Secretary or the Undersecretary for Policy and Programs at the DSWD Central Office or to the Regional Director at the DSWD Field Office with an endorsement from the research adviser, supporting the same request;
- II. To fill out the Research Request Form (with these terms and conditions printed at the backside);
- III. To submit initial chapters of the manuscript of the study detailing its background, statement of the problem, objectives and significance of the study, theoretical and/or conceptual frameworks (if any), review of related literature (foreign and/or local) and research methodology or design (sampling technique, procedures, samples, size and site); and
- IV. To submit copies of the research instruments e.g. survey or interview questionnaires, observation or test guides, etc.

The documents indicated above will be used in the review/assessment of the study and its significance, before it can be recommended for approval by the DSWD Secretary or the Regional Director using the criteria set.

During the Conduct of the Study using Relevant Data-Gathering Methods/Procedures

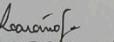
- I. To respect the right to privacy of all persons involved (i.e. respondents or samples of the study) and obtain informed consent as appropriate;
- II. To observe proper decorum and comply with the policies of the office, center or institution where the study is being conducted;
- III. To ask permission from the head of office, center or institution before reading-through, borrowing or bringing out documents or other materials; and
- IV. To take full responsibility of any personal or material harm or loss resulting from the conduct of the study.

The DSWD Secretary or Regional Director reserves the right to revoke permission to conduct the study at any time and to waive any or all the provisions set in AO. No. 19, when need arises.

After the Conduct of the Study and Upon Completion of its Manuscript

- I. To avert from putting the Department or its personnel in any derogatory situation without affording the chance to refute any unfavorable observation;
- II. To give attribution or appropriate credit to the DSWD as the source of the data if written documents, audio visual or oral presentations are produced;
- III. To submit a terminal report consisting of information on the data generated, data analysis, findings or conclusion and recommendations or to submit a copy of the thesis manuscript, ready for publication.

We hereby agree to all the aforesaid terms and conditions and guarantee compliance thereof, otherwise, we shall be blacklisted including the college or department of the university/school or organization, where we are currently working or had been enrolled at or connected with. Moreover, we hereby authorize the DSWD to publish the results of these study in its official journal - the Social Welfare and Development Journal, if or when intended.


RACEL CLAIRE A. RAJOLA

Printed Name and Signature of Researcher


ANA MARIE R. PBANTE

Printed Name and Signature of the Professor