

Bicol University College of Science Computer Science and Information Technology Department



Pre-Disaster Preparedness

in Albay

BSIT-3A

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CASE INTRODUCTION

Albay, like the rest of Bicol, is very vulnerable to natural calamities due to its geographic location. It is particularly prone to tropical storms and cyclones, which bring damaging winds, torrential rain, and storm surges numerous times a year. These kinds of calamities have an impact on human life not only in the economic sector, but also in the social, cultural, and environmental sectors. Looking at the impact of natural disasters on hazard-prone locations necessitates a disaster-risk-reduction strategy. In this context, a study was conducted to assess and evaluate disaster preparedness in the province of Albay using data from the Humanitarian Data Exchange (HDX).

OBJECTIVES

This case study had two principle objectives:

- 1. To evaluate disaster preparedness for effective response.
- 2. To assess the various disaster stakeholders in Albay to perform disaster preparedness to reduce the effects of disasters.
 - Determine logistical readiness of each municipality and city to deal with disasters
 - Strengthened understanding and awareness of the need for disaster risk reduction in each municipality and city.

METHODOLOGY



Data Source

Our data is obtained from the Humanitarian Data Exchange (HDX). HDX is an open platform for sharing data across crises and organizations. The goal of HDX is to make humanitarian data easy to find and use for analysis. (HDX, 2014)

DATA PREPARATION

Data scraping

Data was scraped from the HDX website which contains a collection of Pre-Disaster Indicators for the Philippines. We have 10 datasets used for the analysis and it contains a total of 57, 504 rows. However, focusing solely on Albay resulted in only 2,160 datasets.

Data Processing

We connect the data as Microsoft Excel in Tableau Prep as the datasets are in excel files, and open each to add it to the flow. The clean step is added to the flow in order to apply cleaning operations to the fields, such as filtering the regions into Region V, specifically in the Province of Albay. Some of the unnecessary fields have been removed including Region Code, Province Code, Number of Households, Region PSGC, and Province PSGC, and the column headers have been renamed such as Region Name to Region and Province Name to Province. Lastly, the Province field's role is changed to Geographic (State/Province).

The Pivot is the next flow. The datasets Construction Materials, Vulnerable Groups by City/Municipality, Source of Water, Health Facility, and Health Personnel are used to perform the pivot in order to make the data easier to interpret and analyze. Construction Quality field was constructed by converting the 10 fields of materials in Construction Materials into rows and adding a Totals column to indicate the sum of each row. Vulnerable Groups, Source of Water, Health Facility and Health Personnel datasets go through the same procedure.

Finally, each dataset's output is the final step. It displays the final, cleaned, and filtered datasets, which have been reshaped for better evaluation.

Data Visualization

The significant and processed datasets were visualized by arranging it in an easier-to-understand format and evaluating the outcomes accordingly. To assess the different disaster stakeholders, we used treemaps, scatterplots, pie charts, maps, text tables, and bar graphs.

RESULTS AND VISUALIZATION





Figure 1 presents the total number of households in Albay and its municipalities/cities. As the capital city of Albay, Legazpi City has the most with 41,742 households. Followed by Tabaco City with 27,702 households, and closely followed by Daraga with 27,648 households. The municipality of Jovellar has the fewest with only 3,812 households.





Figure 2 shows the number of evacuation centers, health facilities, and barangays in the municipalities/cities of Albay. There are a total of 720 barangays, 350 evacuation centers, and 320 health facilities.

Breaking down the 720 barangays, we see that majority of the barangays belong to the capital city of Legazpi (with 70 barangays and 41,742 households), followed by Bacacay (with 56 barangays and 14,365 households), and closely followed by the Ligao City and Daraga (with 55 barangays, 22,552 households, and 54 barangays, 27,648 households respectively). Manito is the municipality with the fewest barangays (with only 15 barangays, 5,101 households).

When we look at the 350 evacuation centers, the municipality of Tiwi has the most (with 77 evacuation centers), despite a large disparity in the number of its barangays and health facilities. We can assume that the reason for this is due to the safety concerns raised by previous typhoons and floods that damaged residents' homes. Next to it is Bacacay (with 72 evacuation centers). With Daraga and Jovellar as the municipalities with the least evacuation center.

As for the 320 health facilities, Legazpi City holds the most health facilities in Albay (with 52 health facilities), followed by Tabaco City (with 32 health facilities), Jovellar and Manito with the least health facilities (7 health facilities).





Figure 3 shows the breakdown of these 320 health facilities by ownership major classification. We see that 254, the majority of the health facilities belong to the Government, with only 66 that belong to Private Entities.

Most of these government health facilities consist of mainly barangay health stations, followed by birthing homes and rural health units, and with hospitals, infirmaries, and rehabilitation centers as the minorities. As for the private sector, the majority belongs to birthing homes, followed by hospitals, infirmaries, and general clinic laboratories.

As shown in Figure 2, Legazpi City holds the most health facilities in Albay. Breaking down this 52 health facilities, 35 belong to the government wherein the remaining 17 belong to private. Followed by Tabaco City where there are 25 government and 7 private health facilities. The municipalities of Jovellar and Manito, which are all owned by the government, have the fewest health facilities.





(The bar chart shows the total number of health personnel by classification and area.)

Figure 4 aims to determine which municipality/city has the largest amount of health personnels in Albay. Albay has a total of 1,979 health personnels.

Results showed that Legazpi City has 1,040 health staff, making it the most in Albay. Breaking down this 1,040 health personnels, majority of them (614) are nurses, 252 are doctors, 58 midwives, 53 med techs, and so on. The municipality of Santo Domingo, on the other hand, has the fewest health staff, with only one nurse, one doctor, three midwives, one medical technician, and one dentist, for a total of seven health personnel.



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Figure 5 shows the different sources of drinking water of Municipality/City in Albay. We can see that most of the households in Albay use the *Own Use Faucet Community water system* as their source of drinking water with a total of 64,948 and the *City of Tabaco* has the most households that uses it with a total of 12,928. Shared faucet community water system is the second main source of drinking water with a total of 58,458 households and the City of Tabaco still has the most households that use it. The least source of water used is *Lake, river, rain and others* with only 1,128 households that use it.

As for the City of Legazpi, the main source of water is Bottled Water with 16,364 households that use it, followed by Shared Tubed/Piped Deep Well with 7,160 households, and Own Use Faucet Community Water System with 5,040 households.





Figure 6 shows the Housing Units in different Municipalities/Cities in Albay that totals to 275,601 and their different household construction materials or quality of the outer walls and roofs. The City of Legazpi (Capital) has the most housing units in Albay with a total of 41,437. And Jovellar has the fewest housing units in Albay with a total of 3,811.

Most of the household construction materials of the outer walls and roof of the housing units in Albay is Strong Roofs/Strong Wall with a total of 171,126, and the City of Legazpi has the most housing units that uses Strong Roof/Strong Wall household construction materials with a total of 31,319. On the other hand, Jovellar has the fewest housing units that uses Strong Roof/Strong Wall household construction materials.

The least used household construction materials of the outer walls and roof of housing units in Albay is Salvage Roof/Strong Wall with a total of 310, and the City of Tabaco has the most housing units that uses Salvage Roof/Strong Wall as the household construction materials with a total of 131 housing units. Bacacay, Pio Duran and Jovellar on the other hand have no housing units that use Salvage Roof/Strong Wall as their household construction materials.





Figure 7 shows the different Vulnerable Group of the Municipality City of Albay with a total of 28,409. The City of Legazpi (Capital) has the most number of vulnerable groups in Albay with a total of 3,003, and Jovellar has the fewest number of vulnerable groups with a total of 622.

Most of the vulnerable groups are the Older Female with a total of 6,686. The one with the most older females is in the City of Legazpi (Capital), and Jovellar has the fewest Older Females in Albay. The vulnerable groups with the fewest number are the Child Headed Female with a total of only nine.

Breaking down the 3,003 vulnerable groups in Legazpi City, the majority are Solo Parent Female, closely followed by Older Female. As for the 622 vulnerable groups in Jovellar, the majority are Older Female and Solo Parent Female.

CONCLUSION

According to the findings, Legazpi City has the most health facilities and evacuation centers, whereas Daraga ranks third in terms of the number of households but lacks the capacity to implement evacuation centers. The researchers also discovered that the municipality of Santo Domingo lacked health personnel, with only seven in total. Through this study, the researchers found out that the City of Legazpi (Capital) has the most households, barangays, health facilities, health workers, homes with strong roofs/strong walls, and the highest number of vulnerable groups. Therefore, it's crucial to keep track of municipalities that lack health facilities, personnel, or evacuation centers in order to develop and give a more effective response to any disaster that will affect the residents.

RECOMMENDATION

The goal of this study is to determine the effective disaster response/preparedness by assessing the various disaster stakeholders in Albay in order to reduce the effects of disasters through the Humanitarian Data Exchange (HDX) datasets. As a result, the following recommendations are made:

- According to the data acquired by the researchers, the City of Legazpi (Capital) has the most households in Albay, followed by Tabaco City, and then Daraga. Daraga, on the other hand, has the fewest evacuation centers in Albay, making it harder to plan and conduct protocols in the event of a disaster. In this case, the researchers recommend that the number of evacuation centers in Daraga be increased for the citizens' safety.
- 2. Despite the fact that Santo Domingos has a relatively small population, health personnel should be increased to guarantee that citizens have someone near to turn to in the event of a disaster.
- 3. The municipality of Jovellar and Manito has the fewest evacuation centers and health facilities, according to the data. The distance between Jovellar and Legazpi, as well as Manito and Legazpi, is considerable. More evacuation and health facilities should be built in these locations so that citizens do not have to go far and their safety is guaranteed during calamities.

REFERENCES

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