

Disaster Preparedness among the Residents of Bustos, Bulacan, Philippines

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Abstract: This is a cross-sectional descriptive study where the researchers attempted to establish the respondents' disaster preparedness. An interview schedule was devised in order to survey the information needed in this research undertaking. Four hundred twelve (412) individuals aged 18 to 65 years participated in this study.

The researchers administered the interview to the randomly selected individuals who conformed to the informed consent required from each barangay. The head of the household was preferred to be the interviewee. Data collected were recorded in a spreadsheet and uploaded in Stata MP version 14. Descriptive statistics were generated and survey data analysis module was used in estimating the proportions required.

The researchers were able to establish that only seventeen per cent (17%) of families in Bustos, Bulacan are not prepared for disasters as perceived by the head of the family. Furthermore, an estimated 70% or 7 for every 10 families in Bustos, Bulacan do not have available "go bag". Out of the 41 families with at least 1 available "go-bag", only 37 families updated their "go-bags" on a regular basis. About 99% (95% CI: 96.80% - 99.35%) of the respondents do not have any available fire extinguisher at home. Lastly, only 30% or 3 in very 10 respondents claim that at least one member in their family was able to participate in a fire drill.

Keywords: disaster preparedness, risk reduction, "go-bag" and Bustos, Bulacan.

1. INTRODUCTION

Prudence will always be the greatest motivation to encourage vigilance, pro-action and preparation. History and experience dictate that human lives are always exposed to natural and man-made disasters. The toll of each catastrophic eventuality in recent years would usually be enormous and devastatingly tragic. That is why it is always best to be on the side of caution. No amount of reason and logic can stop these from happening. Proactivity leads the torch to safety and welfare. Especially now that the danger of the "Big One" taking place any moment lurks imminently at our backdrop.

Suffice it to say, the Philippines is a country that is located in the so-called Pacific Ring of Fire where natural calamities such as earthquakes, soil erosion and volcanic eruptions are inevitable to happen. And true to its location of being prone to disasters, the country has doubled her risks with the advent of global warming and climate change. Super typhoon Haiyan (local name Yolanda) which devastated the country a couple of years back minced no words in making the people experience the wrath of our negatively changing environment. This is not to include the challenges of man-made disasters such as insurgency, terrorism, fire, deforestation, pollution and etc.

Hence, legislation passed into law the Republic Act 10121 or the Philippine Disaster Reduction and Management Act. Significantly, this act requires every Filipinos to make a paradigm shift in the manner they react to disasters, which is from mere *response* to *preparedness*. RA 10121 provides a comprehensive, all-hazard, multi-sectoral, inter-agency, and community-based approach to disaster risk management through the formulation of the National Disaster Risk Management Framework.

With this being said, this paper aims to check the level of disaster preparedness of the people in Bustos, Bulacan. There is already a law that is in effect that mandates every Filipinos to diligently prepare for the occurrence of emergencies and hazards, natural or man-made. Government agencies such as the National Disaster Risk Reduction and Management Council spearheads the preparation for disaster response and the system for the mitigation of destruction.

Therefore, it must be incumbent among all Filipinos to prepare for disasters. Surreal though that it may appear, the law clearly states to prepare for the onslaughts of disasters. Non-compliance to the stipulation of preparedness is a blatant disregard of the law. But on top of this, non-compliance to the stipulation of preparedness is an utter disregard for safety and human lives.

Research Objectives. The main objective of this study is: To determine the disaster preparedness of the residents of Bustos, Bulacan, Philippines as perceived by the head of the family. Specifically, this study aimed to (1) determine the proportion of households relatively well-prepared as perceived by the head of the household, (2) determine the proportion of households with functional "go bag", (3) determine the proportion of households with fire extinguishers, (4) determine the proportion of households with at least one member knowledgeable about first aid, and (5) to include other questions in the tool.

Significance of the Study. This undertaking wished to establish the disaster preparedness of the people in Bustos, Bulacan. Being able to establish the level of preparedness for disasters, either natural or man-made, may very well spell the difference between risk reduction and the toll the malady is capable of bringing to humanity. Hence, this study will guide local government units, non-government units, schools and churches, heads of the families and health workers on the proper initiatives to take on whatever the result of this study would yield. This study is also deemed significant to curriculum planners, school administrators, teachers and parents. In their hands lies the greatest motivation to encourage vigilance and preparation. It is always best to be in the side of caution. Proactivity leads the torch to safety and welfare. This study is also for benchmarking purposes, sources of inspiration, documentation, reference and catharsis to other researchers who may be involved in the same realm of aspiration.

Methods and Techniques of the Study. The researchers used the cross-sectional descriptive design. This study attempted to establish disaster preparedness among the residents of Bustos, Bulacan, Philippines. The researchers prepared a 11-item interview schedule that would generate the needed information from the respondents.

Sample Size Determination. Out of the 14 barangay under the township of Bustos, three were randomly selected and chosen to be the focal study areas. These are Poblacion, Malamig and Talampas.

Table 1: Population of Bustos, Bulacan

(pls indicate the source)

Barangay	No of HH's
Bonga Mayor	1011
Bonga Menor	1112
Buisan	474
Camachilhan	602
Cambaog	1354
Catacte	1585
Liciada	1079
Malamig	1443
Malawak	625
San Pedro	1565
Poblacion	1291
Talampas	892
Tanawan	716
Tibagan	2196
Total	15945

Sample Size for Frequency in a Population

Population size(for finite population correction factor or fpc)(N): 15945
 Hypothesized % frequency of outcome factor in the population (p): 50%+/-5
 Confidence limits as % of 100(absolute +/- %)(d): 5%
 Design effect (for cluster surveys-DEFF): 1

Sample Size(n) for Various Confidence Levels

ConfidenceLevel(%)	Sample Size
95%	376
80%	163
90%	267
97%	458
99%	638
99.9%	1014
99.99%	1383

Equation

Sample size $n = [DEFF * Np(1-p)] / [(d^2/Z^2_{1-\alpha/2} * (N-1) + p*(1-p))]$

The computed sample size based on a hypothesized proportion of 50%, confidence level of 95%, and maximum tolerable error of 5% is 376. An overage of 10% will be incorporated to account for possible attrition. This will make the finale sample size to 412. The estimated sample size is then proportionally allocated to the three barangay.

Table 2: Estimated Sample Size of the Focal Areas

Barangay	Total No of HH's	Per cent Allocation	No of HH to be sampled
Poblacion	1291	35.60	147
Malamig	1443	39.80	163
Talampas	892	24.60	102
Total	3626	100.00	412

Data Gathering Procedure. The researchers administered the interview to the randomly selected individuals who conformed to the informed consent required from each barangay. The head of the household was preferred to be the interviewee. However, in the absence of the same, any individual 18 years old or over and is willing to provide consent may be interviewed. After clarification for questions regarding the respondents' participation, each was asked to sign the interviewee's informed consent form.

Statistical Analysis. Data collected were recorded in a spread sheet and uploaded in Stata MP version 14. Descriptive statistics were generated and survey data analysis module was used in estimating the proportions required. Mean, frequencies and 90% confidence interval estimates were reported.

2. RESULTS AND DISCUSSION

A total of 412 individuals participated in the study selected systematically from the three biggest barangays of Bustos, Bulacan, Philippines. The table below shows that majority of the respondents are Roman Catholic and have five members or less in the family. It is a toss-up between families who earns five thousand pesos (10 US Dollars) a month and families who earn more than that on a monthly basis

Table 3: Profile of Respondents

Characteristics	Count (n=412)	Relative Frequency (Percentage)
Barangay		
a. Poblacion	146	35.75
b. Talampas	101	24.40
c. Malamig	165	39.86
Religious Affiliation		
a. Roman Catholic	356	85.99
b. Born-again Christian	23	6.04
c. Protestant	3	0.72
d. Iglesia ni Cristo	27	6.52
e. Others	3	0.72

Size of Family		
a. 5 members or less	250	60.39
b. More than 5 members	164	39.61
Average Family Income		
a. PhP 5000 or less	213	51.45
b. More than PhP 5000	201	48.55

Specific research objectives:

1. To determine the proportion of families in Bustos, Bulacan which are already prepared for disasters as perceived by the head of the family

Disaster Preparedness	Proportion	Standard error	95% Confidence Interval
Not prepared	0.1695	0.018	0.1362-0.2090
Prepared	0.7530	0.021	0.7089-0.7924
Very much prepared	0.0775	0.013	0.0552-0.1077

Roughly 17% (95% CI: 13.62%-20.90%) of families in Bustos, Bulacan are not prepared for disasters as perceived by the head of the family. This is quite impressive to note that only a little less than one-third of the residents in the area are not ready for the onslaught of a disaster. This means that Municipal Disaster Risk Reduction and Management Unit (MDRRMU) of the municipality is up to its task of preparing the residents for disasters. Moreover, campaigns for disaster information and preparation in social media, print and mass communication have been intensified by the government as a resolution for tragedies in the past. Garcia (2015) of the Business Mirror reports that NDRRMC has laid down its plan to heighten the consciousness of the Filipinos for the coming of disasters. Prominent of which is making the month of July as the Disaster Consciousness Month in the Philippines

2. To determine the proportion of families in Bustos, Bulacan that have discussed their preparations for disasters among their members

Discussion on Disaster Preparedness	Proportion	Standard error	95% Confidence Interval
Yes	0.8527	0.017	0.8150-0.8838
No	0.1473	0.017	0.1162-0.1850

Almost 15% (95% CI: 11.62% - 18.50%) or 1 in every 15 families in Bustos, Bulacan have not yet discussed any preparation for disaster among its members. Again, this shows that the all the members of the families residing in the area have a very positive approach to its preparation for disasters. Filipinos are very dedicated to disaster preparation as a spin-off of the national character of the nation which is resilience. Frequent by many strong typhoons and devastating earthquakes in the past, it's quite expected that the people displays pro-action and caution.

3. To determine the proportion of families in Bustos, Bulacan with available disaster supplies sufficient for three days

Availability of disaster supplies sufficient For 3 days	Proportion	Standard error	95% Confidence Interval
Yes	0.7005	0.023	0.6544-0.7428
No	0.2995	0.023	0.2572-0.3456

About 30% (95% CI: 25.72% - 34.56%) or 3 for every 10 families in Bustos, Bulacan do not have disaster supplies sufficient for 3 days. Although the families in the area have a strong background on disaster preparation, supplies sufficient for three days may be the weakest link in the picture. Since half of the respondents belong the marginalized sector of the society, it will be quite understandable if preparing enough supplies for a disaster may posse to be a struggle. A mouth to hand subsistence imposes a supply that lasts only on a daily basis.

4. To determine the proportion of families in Bustos, Bulacan with available "go-bag"

Availability of go bag	Proportion	Standard error	95% Confidence Interval
Yes	0.2923	0.022	0.2503-0.3381
No	0.7077	0.022	0.6619-0.7497

A "Go-Bag", according to Wikipedia, is an emergency-preparedness bag that an individual packs in advance, but hopes he/she never gets to use it. These bags are useful in situations that require a hasty evacuation. An emergency kit should be self-contained in one small or medium-sized bag and should contain enough non-perishable food and potable water to last for several days.

Macas (2015) recommends that a "go-bag" or survival kit be always on ready in every household for whenever disaster strikes. A bug out bag or a "go-bag" functions as a portable kit which is meant to help an individual or a family survive the next 72 hours after they evacuate their homes in case of a storm, an earthquake, and other kinds of disasters.

In the same thread, this essential bag as stated by Pickering (2018), could also be referred to various terms like disaster preparedness kit, disaster kit, emergency kit, disaster emergency supply kit, grab bag, and go bag. Regardless of terms used, this go bag is recognized as one of the best indicator of disaster preparedness strategy that specifically deals with precautionary principles. However, it is reiterated that the public should be encourage to actively engage in this disaster preparedness practices and support the community resilience processes.

In view of this, an estimated 70% (95% CI: 66.19% - 74.97%) or 7 for every 10 families in Bustos do not have available "go bag". Out of the 41 families with at least 1 available "go-bag, only 37 families updated their "go-bags" on a regular basis. Again, this can be attributed to the fact that half of the respondents belong to the marginalized sector of the society.

5. To determine the proportion of families in Bustos, Bulacan with at least a member knowledgeable of providing first aid

Knowledgeable of First aid	Proportion	Standard error	95% Confidence Interval
Yes	0.8261	0.019	0.7863-0.8598
No	0.1739	0.019	0.1402-0.2137

Roughly 17% of the families in Bustos, Bulacan do not have at least a member who is knowledgeable of providing first aid. First aid, according to Wikipedia, is the assistance given to any person suffering a sudden illness or injury with care provided to preserve life, prevent the condition from worsening, or to promote recovery. It includes initial intervention in a serious condition prior to professional medical help being available, such as performing CPR while awaiting an ambulance, as well as the complete treatment of minor conditions, such as applying a plaster to a cut. Significantly, many residents in the area are knowledgeable to apply first aid to disaster victims or whenever the need arises.

6. To determine the proportion of families in Bustos, Bulacan with available fire extinguisher

Availability of fire extinguisher	Proportion	Standard error	95% Confidence Interval
Yes	0.0145	0.006	0.0065-0.0320
No	0.9855	0.006	0.9680-0.9935

About 99% (95% CI: 96.80% - 99.35%) of families in Bustos, Bulacan do not have any available fire extinguisher. Only six out of 414 responded that they have available fire extinguisher. Five out of six of those families with fire extinguisher have them charged and checked on a regular basis. This is quite understandable since most of the families have overlooked the importance of a go-bag, the less will they give importance to a fire extinguisher. Again, this can be attributed to the fact that half of the respondents belong to the marginalized sector of the society.

7. To determine the proportion of families in Bustos, Bulacan with at least a member knowledgeable of operating the fire extinguisher

Knowledgeable of using fire extinguisher	Proportion	Standard error	95% Confidence Interval
Yes	0.2560	0.021	0.2161-0.3005
No	0.7440	0.021	0.6995-0.7839

About 75% or 3 for every 4 families in Bustos, Bulacan do not have at least a member who is knowledgeable of operating the fire extinguisher. Again, this can be attributed to the fact that half of the respondents belong to the marginalized sector of the society. The fact remains that having a fire extinguisher, or knowledge of manipulation thereof, is not a priority among the residents in the area.

8. To determine the proportion of families in Bustos, Bulacan that practice unplugging of electrical appliances when not in use

Practice unplugging of electric appliances not in use	Proportion	Standard error	95% Confidence Interval
Yes	0.9614	0.009	0.9377-0.9762
No	0.0386	0.009	0.0238-0.0622

Almost 96% of the families in Bustos, Bulacan practice unplugging of electrical appliances when not in use. This is a very wise practice among the residents in so as to avoid overheating of appliances that may result to fires. Such a practice will also save static electricity. Due diligence is thus being exercised when appliances are unplugged when not in use.

9. To determine the proportion of families in Bustos, Bulacan that are using gas stove

Type of stove used for cooking	Proportion	Standard error	95% Confidence Interval
Gas stove	0.9710	0.008	0.9495-0.9835
Non-gas stove	0.0290	0.008	0.0165-0.0505

Roughly 97% of families in Bustos, Bulacan are using gas stove. All of them do close the gas cylinder after using. However it is quite ironic that the respondents of this study, after declaring that they belong to the marginalized sector of the society can afford to use modern methods of cooking than the traditional Filipino style of pot and firewood. Perhaps, there is already a scarcity of firewood to use for cooking. Or the hassle this method entails prompts Filipino families to avail of the efficiency of stoves fuelled by liquefied petroleum gas or kerosene.

10. To determine the proportion of families in Bustos, Bulacan that have safeguarded their important documents

Safeguarding documents	Proportion	Standard error	95% Confidence Interval
Yes	0.9396	0.012	0.9120-0.9589
No	0.0603	0.012	0.0411-0.0880

About 94% of families in Bustos, Bulacan have safeguarded their important documents. And such is a very wise practice so as to safeguard the documents which may easily be exposed to the elements, considering that tediousness, frustration and hassle of securing duplicate copies of certificates of births and marriages from administering government agencies.

11. To determine the proportion of families in Bustos, Bulacan with at least one member able to participate in a fire drill

Participation in Fire drill	Proportion	Standard error	95% Confidence Interval
Yes	0.2971	0.022	0.2549-0.3431
No	0.7029	0.022	0.6569-0.7451

Only 30% or 3 in very 10 families in Bustos, Bulacan with at least one member was able to participate in a fire drill. Of the 123 who responded positively, 74 attended the fire drill in the barangay, 44 in the school while 5 attended the fire drill in their offices. It is quite obvious that this is an area where residents need to be trained with so as to respond quickly, calmly and safely whenever a fire erupts.

12. To determine the proportion of families in Bustos, Bulacan that have designated a meeting place for the members during or after the disaster

Designated meeting place	Proportion	Standard error	95% Confidence Interval
Yes	0.7488	0.021	0.7046-0.7884
No	0.2512	0.021	0.2116-0.2954

About 75% or 3 for every 4 families in Bustos, Bulacan have a designated meeting place for the members during or after the disaster. It is very important to have an evacuation plan whenever a disaster strikes because it can make a dramatic difference in the damage that the emergency or hazard may bring to human lives and properties. To be familiar with a certain place for meet-ups during or after the tragedy gives a sense of security to the residents of the area.

3. CONCLUSIONS

In view of the foregoing, the following are concluded:

1. Only seventeen per cent (17%) of families in Bustos, Bulacan are not prepared for disasters as perceived by the head of the family.
2. One in every 15 families in Bustos, Bulacan has not yet discussed any preparation for disaster among the members.
3. Three in every 10 families in Bustos, Bulacan do not have disaster supplies sufficient for 3 days.
4. An estimated 70% or 7 for every 10 families in Bustos, Bulacan do not have available "go bag". Out of the 41 families with at least 1 available "go bag, only 37 families updated their "go bags" on a regular basis.
5. About 17% of the families in Bustos, Bulacan do not have at least a member who is knowledgeable of providing first aid.
6. About 99% (95% CI: 96.80% - 99.35%) of families in Bustos, Bulacan do not have any available fire extinguisher. Only 6 among the 414 respondents responded that they have available fire extinguisher. Only 5 among 6 families with fire extinguisher have them charged and checked on a regular basis.
7. About 75% or 3 for every 4 families in Bustos, Bulacan do not have at least a member who is knowledgeable of operating the fire extinguisher.
8. Almost 96% of the families in Bustos, Bulacan practice unplugging of electrical appliances when not in use.
9. About 94% of families in Bustos, Bulacan have safeguarded their important documents.
10. Only 30% or 3 in very 10 families in Bustos, Bulacan with at least one member was able to participate in a fire drill. Of the 123 who responded positively, 74 attended the fire drill in the barangay, 44 in the school while 5 attended the fire drill in their offices.
11. About 75% or 3 for every 4 families in Bustos, Bulacan have a designated meeting place for the members during or after the disaster.

4. RECOMMENDATIONS

In view of the foregoing, the following are recommended:

1. Disaster preparation campaign programs should be intensified in order to heighten the residents' drive to produce a go-bag and fire extinguisher in their homes.
2. Effective information dissemination, targeting school children, about the importance of disaster preparation equipping them with the knowledge on first-aid and making them be experience fire drills.
3. An evacuation plan for each family and barangay should be explained diligently to the residents in Bustos, Bulacan.
4. Similar study may be undertaken to verify the veracity of the results of the present study.

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