

Assessment of Disaster Preparedness as Evacuation Center of Tuguegarao City Schools

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Abstract

Original Research Article

The purpose of this study was to assess the preparedness of the school as an evacuation center during disasters specifically Annafunan Elementary School, Atulayan Elementary School, Tuguegarao East Central and Balzain Elementary School of Tuguegarao City. This study adopted a descriptive correlation research design and inferential statistics to answer the questions concerning the preparedness of school as an evacuation center. Using Slovin's formula with 0.05 as the margin of error to compute size, 44 respondents were selected. Majority of the administrator's said that the school was highly prepared but the evacuees said that the school was not prepared. Results of the study when comparing the preparedness of the school in disasters as assessed by school administrators and community resident respondents is positive. This means that there is a significant difference in the preparedness of school in disasters. This is being confirmed with the p-value which is equal to 0.026. Results of the concerns and issues of the respondents shows that majority of the respondents said that lack of fund of the DRRMC is number one issue of the respondents.

Keywords: Disaster; Preparedness; Evacuation Center; Descriptive correlational; Philippines.

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INTRODUCTION

Disaster preparedness is an area of study in public health that instructs the public on how to prepare for disasters both manmade and natural. This can work on a local, state, national or even global scale, with different organizations working together to ensure public safety and well-being. Safety of persons is a matter of concern to all and sundry in every part of the world. All organizations and institutions of learning are viewed as havens of peace worldwide [1].

The Philippines is one of the world's most disaster-prone countries. Tuguegarao City, located at the top-most part of the country, is regularly impacted by floods and typhoons [2]. In cases like these, schools are often used as evacuation centers. Every school is unique by its design, location, and students, and each has its history and culture. Some schools are relatively open and safe while others are highly protected yet unsafe. That is why disaster preparedness in school and the facilities should be planned and implemented. Good disaster preparedness and resilience-building measures are essential to saving lives and property [3].

According to the Disaster Risk Reduction and Management (DRRM) there are some disaster

preparedness which are the conduct of DRR researches, multi-stakeholder dialogues, various capacity building activities, development and regular review of contingency plans, development of IEC materials, development of information and database generation, development of school curricula to include DRR and existence of procedures on disaster communication. Disaster response established an institutional mechanism for disaster response operation and improved skills in search, rescue and retrieval operation.

This research aims to assess the preparedness of the school as an evacuation center during disasters specifically Annafunan Elementary School, Atulayan Elementary School, Tuguegarao East Central and Balzain Elementary School of Tuguegarao City.

MATERIALS AND METHODS

Research Design

The study used a descriptive research design following a correlational method. The descriptive research design is used through a questionnaire survey in assessing the level of preparedness of the schools as an evacuation center during a disaster.

Locale and Duration of the Study

The study focused on the schools that serve as an evacuation center in case of emergency and disasters in Tuguegarao City specifically Annafunan Elementary school, Balzain Elementary school, Atulayan Elementary school, and Tuguegarao East Central from January until May 2017.

Respondents

Four (4) school heads and forty (40) previous evacuees who are present upon the distribution of the questionnaires are selected as the respondents of the study.

Sampling Technique

Cluster sampling was used in this study which required a selection of respondents from a specific group and area. The respondents are informed about the general objectives of the research and were guided that not writing their names in the questionnaire is optimal in order to ensure the confidentiality of the information provided.

Data Gathering

Permission to conduct the study from the selected schools in Tuguegarao City was sought from the Barangay captain and the School Head of every school. The questionnaires were administered to the respondents upon approval.

Data analysis

Descriptive statistics, such as means and frequency were used in the analysis. In analyzing the state of preparedness of the school in responding to disasters weighted mean was calculated and verbally interpreted. The t-test was used in determining the difference in the preparedness of school in disaster assessed by the school administration and community respondents. In analyzing the qualitative data mainly, the issues and concerns in responding to disasters thematic analysis were employed.

RESULTS AND DISCUSSION

The Survey Questionnaire was administered to 4 School Administrators and 40 previous evacuees of Tuguegarao City. The findings are as follows:

Table-1.1 Profile of the evacuation center school according to location

	Frequency	Percentage
Deposit of garbage or other pollutants	0	0
Hospital buildings	0	0
Unstable, unfinished building sites	0	0
Unstable slopes or mountain/hill slides	0	0
Farming area	0	0
Main roads or railroads	4	100
Total	4	100

Table 1.1 shows that according to profile evacuation center school location majority of the respondents may prefer main roads or railroad which

has a frequency of 4 and a percentage of 100 although the road to the school is passing low land area which is prone to floods during typhoons.

Table-1.2: Frequency and Percentage of None-structural building

	Frequency	Percentage
Earthquake-prone	0	0
Wind hazard area	0	0
Flood-prone	0	0
Adequately secured against falling	4	100
Total	4	100

Table 1.2 shows that the school is adequately secured against falling when in times of earthquake, typhoon and wind hazard. The school is capable of catering to evacuees because it is a safe place for

relocation. Since the non-structural safety from hazards building needs to be assessed with regards to its safety from hazards as floods and fire.

Table-1.3: Frequency and Percentage of Classroom Structure

	Frequency	Percentage
Adequate Space	2	50.0
Inadequate space	0	0
Well ventilated	2	50.0
Non ventilated	0	0
Total	4	100

Table 1.3 shows that the school has adequate space and ventilated. The school can cater to a large population, and it is a comfortable place for the

evacuees. According to 21st-century overcrowded classroom and schools are associated with decreased safety and comfort to the evacuees.

Table-1.4: Frequency and Percentage of the power system

	Frequency	Percentage
Generator	0	0
Solar	0	0
Electrical	4	100

Table 1.4 shows that the school prefers to use electricity as a source of power system but an electrician should regularly check the electrical wiring and replace any that is weak, broken or worn out and students should not carry or play with matches as they can result in clothing or other items catching fire.

Although during typhoon and flood in Tuguegarao City no electricity lasts even for months, administrators still prefer electricity as a source of a power system.

Table-1.5 Frequency and Percentage of Communication sources

	Frequency	Percentage
Radio	0	0
TV	2	50
Cellphone	1	25
Friends, family	1	25
Army/Police	0	0
Total	4	100

Table 1.5 shows most of the communication sources of the school is a television with a percentage of 50 while other sources such as friends, family, and

cellphone with a percentage of 25, respectively. Respondents are aware and active in communicating when in case of disasters.

Table-1.6: Frequency and Percentage of Garbage Disposal

	Frequency	Percentage
Composting	0	0
Open burning	0	0
Collected	0	0
Segregation	4	100
Total	4	100

Table 1.6 shows that school practiced segregation of garbage with a percentage of 100. According to Kay [4], all kinds of trash should be

appropriately discarded as they tend to catch fire quickly.

Table-1.7: Frequency and Percentage Source of Water

	Frequency	Percentage
Tuguegarao Water District (TWD)	4	100
Deep Well	0	0
Pump Well	0	0
Bottled	0	0
Total	4	100

Table 1.7 shows that TWD is the only source of water in the school with a frequency of 4 and a

percentage of 100 which means that this is used for bathing, washing, and cooking in cases of disaster.

Table-1.8: Frequency and Percentage of Medical Services

	Frequency	Percentage
A physician has approved first aid kit supplies	3	75
Emergency phone numbers are posted	0	0
Medical personnel are available for consultation matters	1	25
Clinic or infirmary are present for medical care	0	0
Total	4	100

Table 1.8 shows that first aid kit supplies been approved by a physician has a percentage of 75

followed by 25% who said medical personnel is available for consultation matters.

Table-1.9: Frequency and Percentage of Sanitary Toilets

	Frequency	Percentage
Pit latrine	0	0
Water sealed	4	100
Total	4	100

Table 1.9 shows that the schools have only water sealed sanitary toilets with a frequency of 4 and a percentage of 100. It is recommended therefore since

proper hygiene and properly disposing of waste is necessary especially in cases of flooding.

Table-1.10: Frequency and Percentage of Ventilation

	Frequency	Percentage
Natural	0	0
Mechanical	4	100
Total	4	100

Table 1.10 shows that the school uses mechanical ventilation with a percentage of 100. Schools need proper ventilation to dilute this indoor air

pollution; otherwise, rooms will be stuffy and smelly, and the air may be unhealthy and polluted.

Table-2.1 Frequency and Percentage distribution of the respondents in terms of Barangay

Barangay	Frequency	Percentage
Annafunan East	10	25
Balzain	10	25
Centro 10	10	25
Atulayan	10	25
Total	40	100

Table 2.1 shows that frequency and percentage distribution of the respondents in terms of barangay of residence. Twenty-five percent each of the respondents

are from Annafunan East, Balzain, Centro 10 and Atulayan. The said barangay experiences relocation in times of typhoon and floods.

Table-2.3: Frequency and percentage distribution of the respondents in terms of a total member of the family

	Frequency	Percentage
Less than 3	20	50
3 to 5	5	12.5
6 to 8	4	10
9 and above	11	27.5
Total	40	100

Table 2.3 shows the frequency and percentage distribution of the respondents in terms of a total member of the family. Majority of 6-8 members of the

family are experiencing relocation. It reveals that a large population on the said barangays is affected when in times of disasters.

Table- 2.4: Frequency and Percentage distribution of the respondents in terms of the number of times being able to experience relocation

	Frequency	Percentage
Less than 3	20	50
3 to 5	5	12.5
6 to 8	4	10
9 and above	11	27.5
Total	40	100

Table 2.4 shows the frequency and percentage distribution of the respondents in terms of the number of times being able to experience relocation. Fifty

percent of the respondents experienced relocation less than three times. It shows that the barangays are flood prone area based on the times of relocation.

Table-3.1: Mean and Verbal Interpretation of the assessment of respondents as to the State or Preparedness of school in responding to disasters in terms of Early Warning System

Early Warning System	Mean of administrators	Interpretation	Mean of barangay respondents	Interpretation
The early warning system is functioning.	5.00	Highly prepared	3.125	Prepared
There are many kinds of early warning system like drums, loudspeaker, buzzer, and whistle.	5.00	Highly prepared	3.75	Moderately prepared
There are emergency hotlines posted in the walls and visible for evacuees.	5.00	Highly prepared	2.5	Not prepared
There is much manners disseminating the disaster before the occurrence of the event like TV, friends, village, alarm, and radio.	5.00	Highly prepared	2.75	Not prepared
Category Mean	5.00	Highly prepared	3.031	Prepared

Table 3.1 shows that when it comes to the assessment of respondents to the state of preparedness of school in responding to disasters in terms of early warning system, majority of the administrators said that the school was highly prepared which means that the school is capable to respond for any disasters while the evacuees said that the school emergency hotlines posted in the walls and visible for evacuees was not prepared

and as to the early warning system are functioning and manner the disaster before the occurrence of the event like TV, friends, village, alarm and radio evacuees said that the school was prepared. In terms of the kinds of early warning system like drums, loudspeaker, buzzer, and whistle evacuees said that it was moderately prepared.

Table-3.2: Mean and Verbal Interpretation of the assessment of respondents as to the State of Preparedness of school in responding to disasters in terms of Fire Disaster management capability

	Mean Administrators	Verbal Interpretation	Mean Barangay respondents	Interpretation
Fire drills are held to practice and improve disaster mitigation and preparedness skills and plans.	5.00	Highly prepared	3.00	Prepared
The school is wide enough for evacuation drills in the event of fire drills scheduled at least once per year.	5.00	Highly prepared	3.65	Moderately prepared
The school staff, students and families, are aware of the location of portable firefighting equipment and its use.	5.00	Highly prepared	2.375	Not prepared
Flammable and hazardous material sources are limited, isolated, eliminated or secured. This includes electrical lines and appliances, heater, stoves, natural gas, pipes, and flammable or combustible liquids.	5.00	Highly prepared	2.125	Not prepared
Exit routes are clear to facilitate safe evacuation in case of fire and other emergencies.	5.00	Highly prepared	3.375	Prepared
There is fire equipment available for fire suppression like the fire extinguisher, and water access.	5.00	Highly prepared	2.5	Not prepared
Category Mean	5.00	Highly prepared	2.837	Prepared

Therefore, in the assessment of the preparedness of schools in disaster, the category mean

of the administrators 5.00 means highly prepared respectively to the evacuees with a category mean of

3.031 means prepared regarding the assessment of the preparedness of school in terms of the early warning system.

Table 3.2 shows that when it comes to the assessment of respondents as to the state of the preparedness of school in responding to disasters in terms of fire, all of the administrators said that the school was highly prepared in the state of preparedness of schools in terms of fire disaster management capability which means that the school is capable of

responding for any disaster while the evacuees the school are not prepared in terms of the awareness of the school staff, students and families on the fire facilities same with the flammable hazardous material sources and the availability of fire equipment fire suppression like fire extinguisher, , and water access are not also prepared. In the category mean of the administrators 5.00 means highly prepared while the category mean 2.125 of the evacuees means that school is not prepared in the fire disaster capability management.

Table-3.3: Mean and Verbal Interpretation of the assessment of respondents as to the state of preparedness of school in responding to disasters in terms of Flood Disaster management capability

Flood Disaster Management Capability	Mean of administrators	Interpretation	Mean of barangay respondents	Interpretation
There is a water supply that is potable during flood condition.	5.00	Highly prepared	2.125	Not prepared
The school is preferably high lying area.	5.00	Highly prepared	2.625	Prepared
Limit, isolate, eliminate or secure hazardous material above flood level.	5.00	Highly prepared	2.375	Not prepared
Prepare an emergency kit in case of evacuation.	5.00	Highly prepared	2.00	Not prepared
There is available emergency kit in case of evacuation like drinking water, flashlight, first aid kit, and prescription medicine.	5.00	Highly prepared	1.875	Not prepared
Raise essential items above possible flood level.	4.20	Highly prepared	3.25	Prepared
Category Mean	5.00	Highly prepared	2.375	Not prepared

Table 3.3 shows that the assessment of respondents as to the state of preparedness of school in responding to disasters in terms of flood, all of the administrators said that the school was highly prepared in the state of preparedness of schools in terms of flood disaster management capability which means that the school is capable of responding for any disasters, while the evacuees said that the preparedness of school in terms of water supply that are potable during flood condition, prepare emergency kit in case of evacuation, there are available emergency kit in case of evacuation like drinking water, flashlight , first aid kit, and

prescription medicine and limit, isolate, eliminate, or source hazardous material above flood level are not prepared. Based on the evacuees, the schools are ideal in terms of its height compared to the sea level.

Therefore, the category mean of the administrator based on the table 5.00 means they are highly prepared while the evacuees' category mean 2.375 means that the preparedness of school in responding to disasters in terms of flood disaster management capability is not prepared.

Table-3.4: Mean and verbal interpretation of the assessment respondents as to the state of preparedness of school in responding to disasters in terms of earthquake disaster management capability

Earthquake Disaster Management Capability	Mean	Verbal Interpretation	Mean	Verbal Interpretation
The school building met the standard for earthquake safety.	5.00	Highly prepared	1.875	Not prepared
The exit routes are marked and are kept clear.	5.00	Highly prepared	3.375	Prepared
Tightly secure tall and heavy furniture and appliance to walls, floors, and ceilings.	5.00	Highly prepared	2.0	Not prepared
The furnishing and equipment are secured that could slide during an earthquake shaking.	5.00	Highly prepared	1.25	Very unprepared
Earthquake drills are held to practice and improve upon disaster mitigation preparedness skills and plans.	5.00	Highly prepared	3.25	Prepared
Category Mean	5.00	Highly prepared	2.35	Not prepared

Table 3.4 shows that when it comes to the assessment of respondents as to the state preparedness of school in responding to disasters in terms of earthquake disaster management capability, the school building met the standard for earthquake safety the exit routes are marked and are kept clear, tightly secure tall and heavy furniture and appliance to walls, floors, and ceilings, the furnishing, and equipment are secured that could slide during earthquake shaking, while they answered neutrally that earthquake drills are held to practice and improve upon disaster mitigation and preparedness skills and plans. As the evacuees assessed the state of preparedness of school in responding to disasters in terms of earthquake disaster management capability that the school building met the standard for

earthquake safety and tightly secure tall and heavy furniture and appliance to walls, floors, and ceilings are not prepared. The furnishing and equipment are secured that could slide during earthquake shaking are very unprepared while the exit routes are marked and are kept clear and earthquake drills are held to practice and improve upon disaster mitigation, and preparedness skills and plans are prepared.

Therefore, the category mean of the administrator based on the table means they are highly prepared in while the evacuees' category mean 2.35 means that the preparedness of school in responding to disasters in terms of earthquake disaster management capability is not prepared.

Table-3.5: Mean and Verbal Interpretation of the assessment of respondents as to the state of preparedness of school in responding to disasters in terms of disaster committee management capability

Disaster Committee management capability	Mean	Verbal Interpretation	Mean	Verbal Interpretation
There are committee on medical services	3.96	Highly prepared	1.66	Very unprepared
There are committee on information	4.29	Highly prepared	3.00	Prepared
There are committee on water sanitation and hygiene	3.56	Highly prepared	2.375	Not Prepared
There are committee on water peace order and security	3.71	Highly prepared	1.625	Very Unprepared
There are committee on the relief operation	3.76	Highly Prepared	2.5	Not prepared
Category mean	3.85	Highly prepared	2.232	Not prepared

Table 3.5 shows that when it comes to the assessment of the respondents as to the state of preparedness of school in responding to disasters, all of the school administrators said that the school was highly prepared in terms of disaster committee management capability while the evacuees said that committee on information was prepared, both

committee on medical services and committee on peace order and security were not prepared and as well to committee on peace order and security and committee on medical services that were very unprepared. Hence the category mean of the administrator is 3.85 means highly prepared while the evacuees' category mean 2.232 means not prepared.

Table-4: Independent samples t-test of the comparison of the preparedness of school in disasters as assessed by school administrators and community resident respondents

Group of Respondents	Mean	Standard Deviation	Df	t-ratio	Probability Value
School administrators	4.701	0.521	4	3.416*	0.026
Community	3.771	0.498			

*Significant at 0.05

Table 4 shows the difference in the preparedness of school in disasters as assessed by school administrators and community resident respondents. Results showed that the p-value is equal to

0.026 which is less than 0.05. This means that there is a significant difference in the preparedness of school in disasters as assessed by the school administrators and the community resident respondents.

Table-5: Frequency and Percentage of concerns and issues

	Frequency	Rank
People are not aware of the disaster evacuation plan	24	2
No funds for the purchase of NDRRMC facilities	38	1
Equipment for rescue search operation are inadequate	13	4
Infrastructure system to cater to disaster are inadequate	13	4
There is no coordination between Barangay Official and School Administrator	13	4
Communities are not interested in the advisory to the disaster prevention plan	7	5
Lack of communication method to prepare for disaster occurrence	20	3
Others	4	6

The table shows that majority of the issues and concern of the respondents said there is no fund for the purchase of NDRRMC facilities which is ranked number 1 with a frequency of 38, followed by ranked number 2 with a frequency of 24 who said that people are not aware of the disaster evacuation plan. Lack of communication method to prepare for disaster occurrence ranked number 3 while infrastructure system to cater disaster is inadequate with a frequency of 13 same no coordination between Barangay Official and School Administrator and equipment for rescue search operation are inadequate ranked number 4 and for the last issue, communities are not interested in advisory to the disaster prevention plan with a frequency of 7.

CONCLUSION

Overall, the study focuses on the effectiveness of school in preparation and response on emergency and disasters as an evacuation center in Tuguegarao City. Majority of the administrators said that the school was highly prepared on the assessment of respondents as to the state of preparedness of school in responding to disasters in terms of the early warning system, disaster capability management, and disaster committee. When it comes to the assessment of the evacuees as to the state of preparedness of school in responding to disasters in terms of the early warning system, disaster

capability management and disaster committee majority of the evacuees said that the school was not prepared.

Results of the study when comparing the preparedness of the school in disasters as assessed by school administrators and community resident respondents is positive. This means that there is a significant difference in the preparedness of school in disasters. This is being confirmed with the p-value which is equal to 0.026.

Results of the concerns and issues of the respondents show that majority of the respondents said that lack of fund of the DRRMC is number one issue of the respondents while the least issue is that the communities are not interested in the advisory to the disaster prevention plan.

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