

# Disaster Preparedness Knowledge and Action: Population Development Perspective

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**Abstract** – *Effects of disasters on population are crucial under global climate change. One area that is usually gravely affected by disasters in the Philippines is Marikina City, a fluvial area situated above a major fault line with a high number of residents to be affected. The local government engages residents with regular information dissemination and trainings based on national guidelines, focusing on programs for students. This study aims to appraise such program on university students regarding self-perceived knowledge of disaster preparedness, confidence on actual preparedness, and engaging performing knowledge to action.*

*A survey implemented in this study is adapted from instrument used in studies of crisis preparation assessment and preparedness. Involved in the survey are 133 students of a public university in Marikina City. Ordered logit regression is used to test if there are differences between responses to the items. Subsequently, ten respondents were randomly selected to participate in group discussion to substantiate responses to the survey. Results show that belief in being prepared and knowing what to do is significantly different for hypothetical earthquake scenario but is not observed for typhoon scenario. Result from the discussion indicate that complacency is absent regarding typhoons because people in their age group residing in Marikina City, as well as those living in adjacent areas, have experienced it in recent years but earthquakes bring uncertainty. The findings in this study are vital toward determining methods to lessen the gap between knowledge and action to improve safety and well-being among youth population.*

**Keywords** - *Disaster preparedness, Disaster behaviour, Youth behaviour*

## INTRODUCTION

In recent years, there had been an increase in events of cataclysm across countries. Typhoons, diseases, man-made catastrophes are among these disasters that have occurred in states with varying income levels as the United States [1]. The Philippines is particularly vulnerable regarding disasters manifested by the transience of about twenty typhoons, some evidently destructive, and being situated in the Pacific with its earthquake prevalence. One city in the National Capital Region to which City of Manila belongs is known to bear these indicated disasters. Marikina City is a fluvial area with high number of residents; and it is coincidentally the location above a major fault line traversing several other provinces and cities. The local government acknowledges this and displays a high level of

engagement with regular and numerous information drives and training to the communities.

There are efforts such as the one mentioned above, there are still cases whereby efficacy may be uncertain. Continuing with the example of the US, a report indicates that about a quarter of the sample from two metropolitan cities mentions that they are unprepared for emergencies in general[2]. The Federal Emergency Management Agency, FEMA, also conducts campaigns over media but there is criticism that such campaigns revolves on fear and away from practical information[3]. It further notes in the research that even large scale studies on preparedness are undergone by FEMA but the results are non-evident in public service announcements [3].

One of the highlighted components of the trainings and information campaigns on disaster preparedness in the Philippines as Marikina City promulgates is vigilance regarding government announcements. The agencies

concerned with these are the Philippine Atmospheric Geophysical and Astronomical Services Administration, PAGASA, and the Philippine Institute of Volcanology and Seismology, PHIVOLCS, storms and tectonic activity respectively. The people are encouraged to listen regularly and intently to what these agencies are announcing and heed the forecasts. Although the Philippine government had developed these agencies' scientists and forecasting technology over the years, risks are still very much present [4]. This is due to the nature of forecasts and warning whereby there are lingering questions on how quickly is the message disseminated, which segment of the people actually receives it, and subsequently what is the most optimal course of action for each location at a given time.

The final point in the previous statement on what to do in disaster events is crucial. The people tend to weigh risks in accordance with how much they will trust the government forecasts or simply rely on personal experience [5]. There are scenarios that people are wary on information they receive because the language of disaster science becomes foreign to them and this is correlated with their actions as evidenced by studies internationally and in the context of the Philippines [4], [6], [7] Risk perception then becomes a daunting task especially for younger populations and they are more exposed to these education campaigns [8]. It is surmised that there are gaps albeit disconnections between communication and disaster preparedness or risk reduction management even though it had been identified as a crucial scheme that dampens disaster risks [9]. To wit, information on preparedness is available, accessible even, but imparting them may pose as challenging. When communication is framed as the symbolic transmission of meaning in a differing contexts, some studies cite the need for examining individual decisions, state policies, and socioeconomic structures [10].

#### **OBJECTIVES OF THE STUDY**

With regard to the previous discussion on communication, the general objective of the present study is to provide contextualisation for the purposes of planning is the demographic perspective whereby the age of intended audience would have to be put to consideration. This can also be the avenue to which the communication can take place which for the young adults is the education system. This is a key field to disaster mitigation and recuperation because it through education that population development is fortified [11].

This study's specific aims revolve on measuring and relating university students on their self-perceived knowledge of disaster preparedness, involvement, or confidence on actually being prepared, and engaging themselves into performing knowledge to action as it becomes necessary. Within the sphere of communicating safety and well-being, knowledge may increase and improve but translating this to action is a different matter. The present study is keen on identifying the perspective of the youth on disaster events and the institutions and actors that they associate with it regarding, among others, where they ascertain warning as well as where they may receive assistance from when such events happen.

#### **MATERIALS AND METHOD**

The study intended to have 150 respondents who are students at a local university in Marikina City in the portents of the local government. This higher education institution was chosen because of the availability and the public knowledge whereby the university actively participates in state-sponsored training for its students and personnel. This occurs because as it is said above, Marikina City is a site whereby it is greatly affected by various disaster events. The local government invests heavily in upgrading monitoring and communication systems and even trainings and seminars for disaster risk reduction and management, DRRM.

133 respondents out of the 150 that was intended figure provided feedback to the survey. The instrument is adapted from Groves' instrumentation [3] in a university in the United States. The way which the said survey was based is that of the Federal Emergency Management Agency's Personal Preparedness in America: Findings from the 2009 Citizen Corps National Survey [2]. Also, the said survey was adapted because it is the aim of the current study to be succinct with regard to the time taken for the respondents to answer the surveys therefore it only includes fewer disaster scenarios. In Groves' questionnaire, the disaster scenarios include 'Natural disaster', 'Terrorism', 'Hazardous materials', and 'Disease Outbreak'. For the purpose of the current study, these are changed and collapsed to include the following: 'Typhoon' and 'Earthquake'. This was done because these are the ones deliberately discussed during trainings sponsored by the state due to perceived necessity.

The measures for knowledge, confidence, and preparedness are measured based on self-assessment

within a 7-point scale, one being highest. The results are analysed through an ordered logistic regression model with the proactivity scale as the outcomes and the knowledge on preparation and confidence on prospective actions as predictors. The ordered logit model is appropriate here to determine the significance of the relation without foregoing the ordinal-scale nature of the measures because the data permits the assumptions of this statistical treatment [12]. Also, supplementary information is provided as comparison between groups is presented as they become necessary.

Subsequently, discussion was done for selected groups among the survey respondents. Two separate groups of five members were asked to participate if they consent. Participants in the discussions were selected at random with one to two persons who are non-Marikina City residents to be able to cover the characteristics that may influence the responses. The respondents are asked in an unstructured manner the following themes: (a) What are your thoughts on typhoons? On earthquakes? (b) Do they have similarities? How are they similar? (c) If not, how so? Why is this difference present? What does it signify? (d) How can this be addressed and what general insights can be drawn from this observation from students in Marikina? This is done to qualify their thoughts as they may have responded to a written survey.

The participants for the survey and subsequent discussion were limited to those who may provide their consent based on age. They were briefed about the process of data collection and what the intentions and limitations are for the use of data. Participants who gave consent at the beginning but may have changed their mind were assured that they can opt out at any moment during the data collection process and notable here is that none had chosen to discontinue.

## RESULTS AND DISCUSSION

The respondents are composed of about 29 per cent of the sample is male. Around 85 per cent of the entire sample is a resident of Marikina City itself. Those who are non-residents are from immediate neighbouring cities and municipalities.

### Results

Because of the efforts of the national and the local government units, all students in school in Marikina City whether private or public has to undergo some training with regard to DRRM. Table 1 shows the type of training students have received in the past.

**Table 1. Type of training in practical skills utilised during emergency events undergone by student-respondents**

Type	Number of respondents
CPR training	5
First aid skills	18
Disaster preparation	112
All three training types	22
Total	133

It should be noted that for the question in the survey, the respondents were allowed for multiple remarks depending on what they have indeed received. Many among the students have received training in disaster preparation which consists of how to evacuate accordingly in the event of an earthquake and in general, the supplies that a person would be optimal to have in his person all the time and the supplies that should be present in their respective homes such as water bottles, food rations and the like. Fewer students were able to attend first aid training and fewer still for CPR training only. 22 among the respondents were able to attend three types of DRRM training.

**Table 2: Association of background in volunteer work and the availability of household plan during disaster events among the respondent**

	Availability of plan household during disaster events	Total
Background in volunteer work	Yes	37
	None	96
	$\chi^2$	$p < 0.118$

Almost three-quarters of the respondents have yet to volunteer at any capacity in relation to DRRM; and those who did, they had experience in fund drives, relief-good packaging among others. It is also enquired of them if their respective households have an evacuation plan whereby 55 per cent of them indicated that there is no plan in cases of emergencies of any nature. It is tested as shown in Table 2 that there is lack of association between having volunteered in the past and having their households possess a plan.

Among those who have had experience in DRRM-related volunteer work, 21 of 37 or about 56 per cent have a household plan during disasters. For those who do not have experience in volunteer work, about 41 per cent have such a plan. In the subsequent table, the availability of a household plan in such events is classified according to education background of the head of household.

The highest count of households with plans during prospective disaster incidences is for those whose heads have a college degree with 29 of 50 respondents indicating so or about 58 per cent of them. Respondents belonging to households with heads that have high school or lower qualification and even college undergraduates have about the same proportions at around 40 per cent. Between these two variables, it is observed that there is no association between measures.

**Table 3: Association of education background of respective household heads and the availability of household plan during disaster events**

		Availability of plan household plan during disaster events		Total
Background in volunteer work	HS and lower	29		71
	College graduate	29		50
	Postgraduate	3		12
	$\chi^2$	5.8		$p < 0.05$

The following results show the means in the responses in a 7-point scale with '1' being highest regarding belief in preparedness, confidence in said preparedness, and assessment of prospective functioning or being action-oriented during a variety of disasters. In Table 4, it is observed that an increase in belief in levels of preparation for typhoons relates to an increase of 2.3 toward improved perception with regard to being proactive or knowing what to do during such a scenario. This positive association is found in having in confidence level as well.

An entirely different observation is made for responses on earthquake scenario. There is an opposing outcome on knowledge of preparation and confidence toward self-application. Knowledge of preparation is observed to be non-significant statistically and even has a negative odd toward proactivity. Confidence on the other hand is found to be positive resulting to an increase

of 2.8 odds in being more proactive during an earthquake scenario.

**Table 4: Odds ratio of self-perceived level of prospective proactivity during disaster scenarios among respondents**

Disaster scenarios	Odds ratio
<b>Typhoon</b>	
Knowledge of preparation	2.3***
Confidence of self-application during disasters	3.4***
<b>Earthquake</b>	
Knowledge of preparation	0.8
Confidence of self-application during disasters	2.8***

\*\*\* $p < .05$

### Discussion

A feature of the survey is to gauge the self-perceived preparedness and confidence for specific disaster events. For the typhoon-related scenario, there is no statistical discrepancy between self-perceived and confidence in preparedness. On the other hand, for earthquakes, students signified they think they are prepared but their confidence in preparedness is significantly lower. Furthermore, they feel they will not know what to actually do once it happens unlike what they signified for typhoons.

The competing result with regard to knowledge of preparation and confidence toward proactivity during earthquake scenario has been noted by Basolo and her colleagues [13] with their study on the Los Angeles County. They expounded that there is a differentiation between scenarios of disasters and there is an inherent nature to earthquakes that goes against the rational behaviour of people to know in terms of preparing in a limited manner and be confident on what they may do but would be unable to perform proactively in a prospective event. The perception of hazards is varied between disaster events as it would be expounded later.

One of the prominent points they made is on the nature of preparedness. The participants mentioned that during trainings and seminars, it is highlighted by authorities to have a constant supply of necessities including food and materials as flashlights and clothes. These things should be stowed and not be part of the supply for daily living. They said that although they want to comply with this, it is rather difficult because of their socioeconomic status. What their households earn is

either enough for the day or they only have a little more to spare but it would be impractical to spend for items that they will simply store. This is one of the points raised in the literature that it may be unreasonable to depend on the people for this specific preparation because of circumstances [7], [13], [14].

The participants indicated the notion regarding forecasting on this matter. There is dissimilarity on how students perceive such scenarios because typhoons and earthquakes are different from each other for the former can be predicted by government administrations through weather bulletins or advisories. Reliance is attributed to the PAGASA and PHIVOLCS for these hazard prospects or events. As it is, people put their trust in such agencies because they are viewed as having expertise in respective scientific fields therefore they are the authorities [7], [8]. Matters such as these are externalised because there is too much information to be handled at the personal level for the people therefore, trust has to be given to authorities. But as mentioned above, the respondents know full well to listen to these agencies through the media but being able to act is their responsibility.

Trust is crucial because the people can select which information they can utilise for themselves. As in the current context, institutional trust is affected by externalities. The PAGASA has come under harsh criticism after major events as Typhoon Ketsana in the year 2009 and more so after Typhoon Haiyan hit Central Philippines in 2013. Many had lost their lives in both but there was more during the latter. Due to all the mortalities, people blamed PAGASA and the local government because they were viewed as inadequate and that they let politics rule instead of humanitarian concerns [16]. And this is what the participants criticised as well to some degree. They know that the PAGASA was entangled with politics and is ought to be spared of blame but they still became wary. And even though the PHIVOLCS had not suffered the same criticism thus far, they had the contention that it will be the same.

Aside from the dichotomy regarding ability, or inability, of institutions to predict of the two disaster events, it is found that confidence-complacency is indistinct regarding typhoons because their cohort has experienced destructive ones in recent years but earthquakes bring uncertainty regarding prospective actions.

During typhoons, the PAGASA notifies the public through traditional and social media every three to five hours depending on the situation. Marikina City residents are also keen on the local government's announcement

on the rise of the river system. Regardless of people having the information available to them, they tend to be disregarded because they know what they should do. They disregard all the flooding because they are used to it. It has become normal that they are confident with their experience especially with what happened during Typhoon Ketsana when it is still considered to be catastrophic and none has hit the area again. Earthquake scenario on the other hand, is yet to be experienced by any of the respondents and interviewees. It is difficult to predict and vigilance may be said to be the most reliable way to protect oneself according to them. It implies that students are yet to be fully-prepared if ever an earthquake occurs because none of them has experienced it.

What these accounts suggest is that social cognition is a factor for risk perception [7], [15]. Risk perception accounts for the process of collecting and interpreting the information one receives regarding hazard events [5] It is indicated that even if the message is understood uniformly, subsequent actions are different because the level of risks for each person or community varies. This study observes this as well. It is taken most often that actions toward disasters are to be set and followed by everyone but because personal experience mediates risk perception, it is not guaranteed that people will follow the guidelines. Even if the students answered in the survey that majority knows what to do during and after disaster events, they indicated that they will still do what they know works. They will listen to the warnings of authorities but their response is their own and may not necessarily reflect what they learned. For one, some of them mentioned that they will still not evacuate even if it is encouraged. What they did in their *barangay* or village community is they purchased some boats. When they are flooded, they can stay in their houses and still have a means of transport. This is highlighted by some studies in the Philippines that communities tend to value their personal coping mechanisms and this is the reason why disaster risk management studies would have to work with them to truly know their values and priorities [6], [16].

## CONCLUSION AND RECOMMENDATION

The students who participated in the study expressed their views on specific disaster events. They treat such prospects to be very different and the skills and knowledge on preparedness that they possess lack transference. Whatever actions are needed during typhoons they are aware and have confidence but for earthquake situations, they lose this confidence which

magnifies the risk to vulnerabilities. They shared their views as well on the sources of information that they have and that they have issues specially with government institutions due to probable mismanaged communication pathways.

Amidst all these issues and reasoning that students possess which in turn is also shared by their respective households and to some extent their communities, they think that some ways can be used to teach their cohorts of how to be better prepared for disasters. Vulnerability presents itself in sub-populations such as youths when they have difficulty integrating their experience and the knowledge they attain through various sources whether they are at schools, the media, or the government. Developing critical risk assessment then becomes crucial in population development. Shortcomings in disaster preparedness can be addressed by educational and local institutions thru provisions or implementations reinforcing the students' and locals' disaster-preparedness by conducting simultaneous or surprise earthquake drills, installing safety signage and providing survival emergency kits, creating evacuation plans, and continuously discussing with the people what to do during and after such calamity happens. They want to work with the authorities rather than continue to be instructed because they view that their communities' methods work as well.

It could be said that the disaster-preparedness of a student varies from one to another. However, with regard to the local government and educational institutions conducting safety drills in schools and the surrounding communities, their practices are beneficial. Conducting these tasks not only boosts the students' confidence and preparedness, but it also conditions them on how to act and what to do if ever such an unfortunate event strikes, and it is highly perceptible in schools and colleges situated in Marikina City.

As mentioned along this study, there had been efforts by various actors and researchers to consider the epistemology of individual communities within the Philippines as they emphasise local knowledge and prospective development of disaster mitigation. The present study contributes to this aim but it also directs to the importance of developing the youth who can transfer their knowledge to their respective households. Also, the education system has to be able to address the issues raised here as to how the youth may be processing multitudes of information without the guarantee that all are reliable and verifiable. This study only concerned itself with Marikina City along with some from

neighbouring municipalities and cities; as such studying a wider area, preferably across the Philippines, may be necessary to guide development. Based on the trends of disasters that have occurred in the country, the people have to be armed with necessary knowledge and skill to mitigate risks.

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