

# KNOWLEDGE ON NATURAL AND ANTHROPOGENIC DISASTER OF THE VARIOUS SECTORS IN THE SECOND DISTRICT OF ZAMBOANGA DEL NORTE

Ma.Dulce C. Guillena and Jane T. Aquino  
JRMSU- Katipunan Campus

## *Abstract*

*Disaster knowledge can help communities in hazard-prone areas gain a better grasp of disaster risk prevention and management. This study was conducted to determine the knowledge of various sectors on natural-anthropogenic disasters and to determine the significant difference on disaster knowledge by the respondents in the second district of the province. The Descriptive Methods of research was utilized with the use of a questionnaire on disaster knowledge. Frequency counting and percent were used to determine the respondent's knowledge on disaster. Significant difference on the knowledge on disaster by the various sector was utilized using Chi-square. The study revealed that respondents possessed knowledge on disasters however there was significant difference on knowledge of farmers, business sectors, fisherfolks, professionals and other sectors on disasters like earthquake, landslide, human-induced hazard, floods, tropical cyclone, volcanic eruption and tsunami. Thus, improving the understanding of their knowledge enhances their level of education and preparedness in coping with risks.*

**Keyword and Phrases:** *disaster knowledge, various sectors, second district, Zamboanga del Norte*

## **Introduction**

The Philippines is subject to a diverse set of threats, be it natural or anthropogenic. With increases of natural disasters, dangerous geographic location of the country and man-made risk it is a known fact that the nation sees and experience disasters on a yearly basis. The country has been the unfortunate recipient of increased flooding from dangerous typhoons in the recent years. The continuous meltdown of iceberg and glaciers affect the nation's coastal areas. The marked increase in more powerful earthquake activity is painfully obvious. Volcanic eruption as well killed hundreds of people, mostly by roofs collapsing under the weight of accumulated and saturated wet ash.

The above mentioned disasters pose threats to a large number of population. People are unconscious of the fact that disaster may strike and change their life dramatically. It is imperative for people living in areas at risk from natural or man-made catastrophes, or an increased terrorist threat, to seriously consider what they would do if they were faced with a disaster. Preparedness of these massive natural and anthropogenic disasters will vary from location to location depending upon the local geography and the type of anticipated risk. In some places more than one type of disaster is possible thus requiring preparedness training and warning information that can quickly allow the population to perceive what problems they face so they can carry out the appropriate steps needed to reach safety.



However, awareness of the need for preparedness, combined with rehearsal on repeated training in evacuation procedures can only be potentially beneficial if people are knowledgeable on the natural and man-made disasters. It is necessary to clearly understand what real natural disasters can really occur in the given area and to know possibly more information about the disaster itself. It is extremely important to get prepared and know how to act and behave in different situations. Disaster awareness can reduce a population's vulnerability to a specific hazard. In a diverse population, people who are particularly vulnerable are those with disabilities, the elderly, the children and others who will be at a disadvantage when it comes to adequately aware and able to interpret and react to emergency notification.

Thus, this research has been carried out to determine the knowledge on natural and anthropogenic disasters of the various sectors such as the businessmen, farmers, fishers and professionals and to determine the significant difference on the knowledge on disaster by the respondents in the second district of Zamboanga del Norte. The results of the study could serve as baseline assessment of the disaster preparedness and vulnerability aspects in disaster risk reduction status in the target respondents.

## Methods

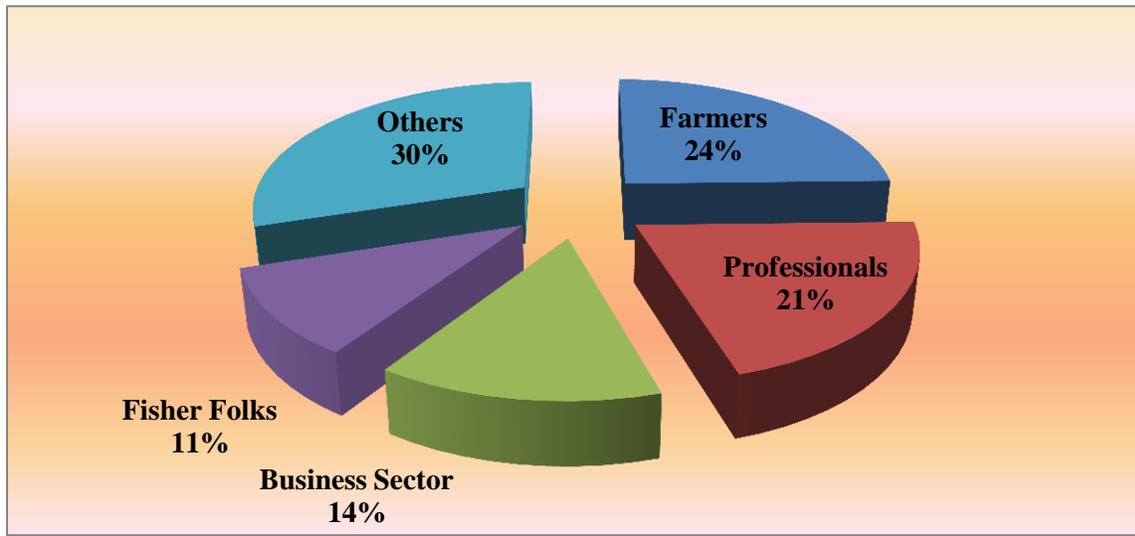
During the field survey, key informant like the key officials of the Municipalities and barangay officials as well as household were interviewed using the survey forms. A reconnaissance survey was conducted in the selected and identified vulnerable barangays. The survey enabled the team to have quick overview of the general condition of the identified vulnerable sectors. In addition, rapport was established with some local government officials and key community members. The topics included were the knowledge on natural and anthropogenic disasters as well as disaster readiness of respondents.

The study employed the Descriptive Research Design which described the current situation that serves as the context for the establishment of disaster knowledge. There were 338 respondents involved in the study of which 50 were from Dipolog City, 49 were from Katipunan, 56 were from Roxas, 26 were from Manukan, 52 from Jose Dalman, 58 were from Sindangn and 47 were from Siayan. Frequency counting and percent were used to determine the respondent's knowledge on disaster. Chi-square was utilized to determine the significant difference on the knowledge on disaster by the various sectors (fishermen, business sectors, professionals, farmers and others) in the second district of the province.

## Results and Discussion

**Respondents of the Study.** Figure 1 showed that the highest percent of respondents were from the other sectors (30%). These other sectors were the elected municipal and barangay officials, housewives, security guards, saleslady, "habal-habal" drivers, "labanderas" and the like. 24% were the farmers coming from low-lying areas and highlands. Most of the professionals group that comprise 21% of the respondents were the teachers, retired government employees, policemen and medical practitioners. The business sector (14%) were mostly the buyers of agricultural products, merchandisers,

sari-sari store owners, fishing boat operators and public utility vehicle operators. The fisherfolks, 11%, were those living near the shorelines who were most likely affected with storm surge. These group of respondents had their own knowledge types, beliefs and views about these natural and anthropogenic disasters. Dekens (2007) stressed that in order to identify local knowledge on disaster, people's ability to observe their local surroundings, people's anticipation of environmental indicators, people's adaptation strategies, and people's ability to communicate about natural hazards within the community and between generations should be taken into consideration.



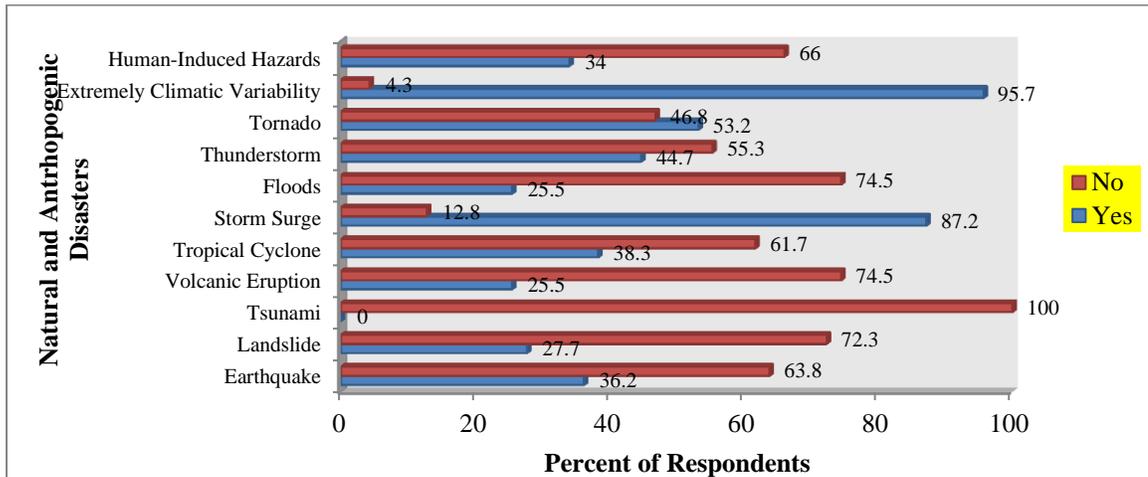
**Figure 1** The respondents of the study

*The knowledge on natural and anthropogenic disaster of the business sector in the second district of Zamboanga del Norte.* Figure 2 showed that among the business sectors more than 95% of them were knowledgeable about extreme climatic variability. Climatic variability alters the production of agricultural crops. The quality and quantity of crops grown in a particular place will most likely change. Climate change has a significant effect on most businesses, whether it is negative or slightly positive, even if they are not directly affected by environmental factors. They are indirectly affected in their supply chain, transportation or consumer market (<http://www.businesslobby.net/Blogs/GlobalWarmingEffectsonBusiness.aspx>). It can be seen further in the figure that 87% of the respondents of the business sectors knew about storm surge. Most fishing boat operators knew that storm surge affects the fishing industry thus disrupting the fish supply in the market.

However, greater percentage of the respondents in the business sectors lack knowledge on disasters like tsunami, volcanic eruption, earthquake, landslides, human-induced hazard, floods and tropical cyclones. Some respondents pointed out that they had experience earthquakes although they can not distinguish a tectonic and volcanic earthquake and they do not have idea about faults and trenches. Business sectors were particularly aware only to disasters that directly affect them not knowing that they were also vulnerable to the risks posed by climate change. Given their high level of exposure to extreme weather events they must recognize both vulnerability to these extremes and their role as critical participants in climate change



preparedness. (<http://www.smallbusinessmajority.org/small-businessresearch/downloads/072513-Climate-Change-Preparedness-and-the-Small-Business-Sector.pdf>). Knowledge on disasters and risk reduction management offers a triple return by ensuring business continuity, safeguarding long-term investments, and protecting employees, their families, communities and environments (<http://www.unisdr.org/partners/private-sector>).

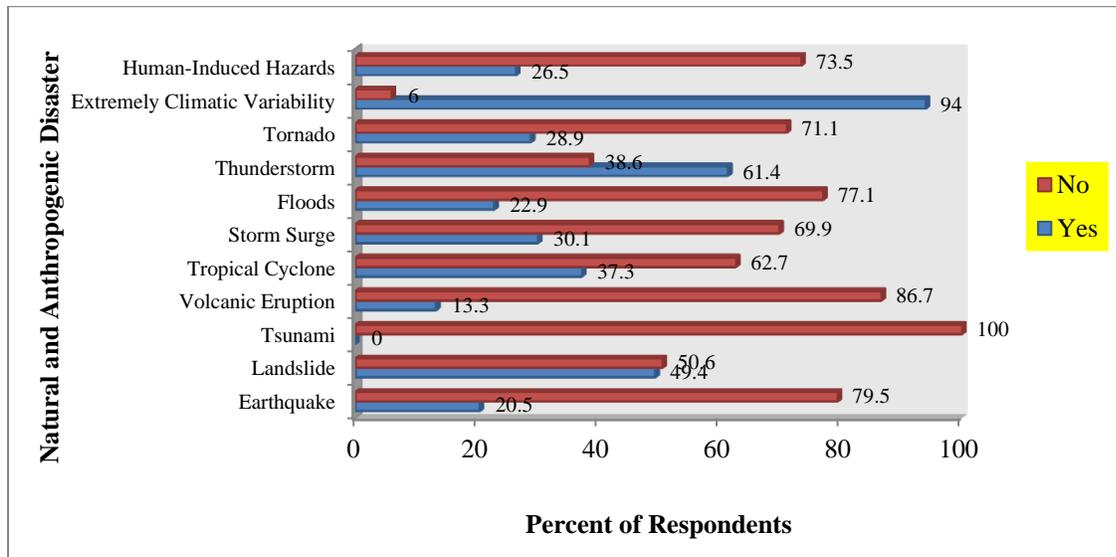


**Figure 2 Business Sector**

*The knowledge on natural and anthropogenic disaster of the farmers in the second district of Zamboanga del Norte.* Ninety-four percent of the farmers had knowledge on extreme climatic variability ( Fig. 3) particularly the occurrence of El Niño and La Niña phenomena. Farmers were aware that former brings dry weather and even droughts and the latter stands for rainy weather and flood thus these climate patterns affect their farming system. The widespread droughts of 1984–1985 were the most catastrophic: about 8 million people were affected, 1 million died, and large numbers of livestock were lost in the Horn of Africa (Webb et al., 1991). The 1997-98 El Niño marked the first time in human history that climate scientists were able to predict abnormal flooding and droughts months in advance, allowing time for threatened populations to prepare. The U.S. National Oceanic and Atmospheric Administration (NOAA) first announced a possible El Niño as early as April 1997; Australia and Japan and many others followed a month later (<http://agroclimate.org/climate/ENSO-Impacts-southeast.pdf>).

Moreover, 61.4% of the farmers are knowledgeable about thunderstorm but 38.6% of them do not have any idea of the causes of thunderstorm and the signs of impending thunderstorms. However, it is deemed necessary for farmers to acquire knowledge on the causes of thunderstorm to prevent damage to properties and human lives. The felling of million of trees, deaths due to electric discharged referred to as lightning hazard and wind shear are just some of the dissipation manifestations. In 2010 Harvard Medical School linked thunderstorms to some negative health effects from breathing disturbances to heart problems. ([http://www.health.harvard.edu/press\\_releases/health-hazards-of-thunderstorms](http://www.health.harvard.edu/press_releases/health-hazards-of-thunderstorms)).

Furthermore, Fig. 3 showed that 100% of the farmers had not experienced tsunami and they did not know the two kinds of tsunami. Similar with the business sector, greater percentage of the farmers were not knowledgeable on human-induced hazards, tornado, floods, storm surge, tropical cyclone, volcanic eruption and earthquake. Geographically, most farmers were found living in highland areas or in low-lying areas situated away from the shorelines but even so it is a challenge for the PDRRMC to educate the farmers for awareness and preparedness to these disasters. Farmers need to have training on First Aid in order for them to perform first aid treatment on emergency cases.



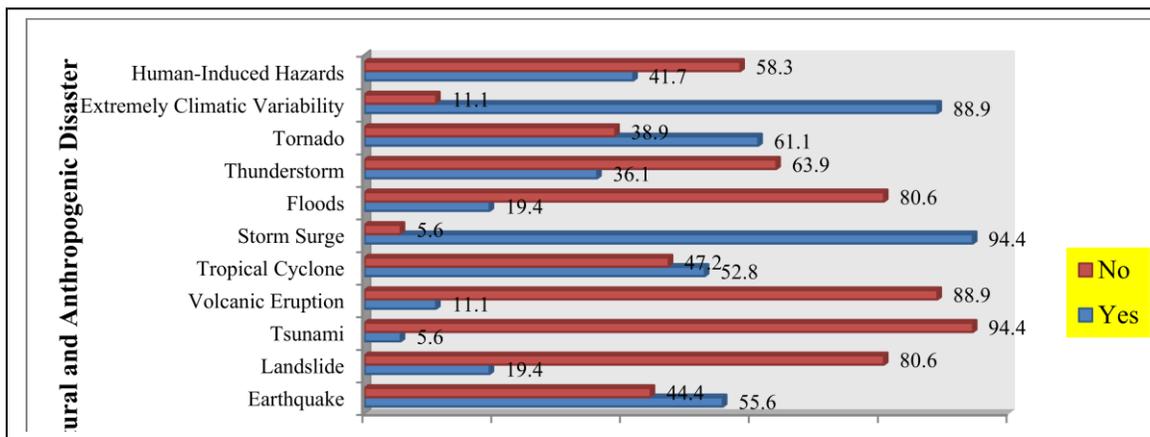
**Figure 3 Farmers**

*The knowledge on natural and anthropogenic disaster of the fisherfolks in the second district of Zamboanga del Norte.* Storm surges an abnormal rise of water generated by a storm, over and above the predicted astronomical tide. Storm surge is caused primarily by the strong winds in a tropical storm. This disaster is a concern to coastal residents thus Figure 4 showed that 94.4% of the fisherfolks knew what a storm surge is and 52.8 % were aware of the indications of a tropical cyclone. They stressed that when there is tropical cyclone they were always ready for immediate evacuation as per advised from proper authorities to keep safe of themselves from possible occurrence of storm surge. The figure further revealed that fisherfolks (88.9%) were knowledgeable as well on extreme climatic variability. The occurrence of El Niño causes for fisheries to collapse since it reduced upwelling with warmer water and less phytoplankton. Not only fish are impacted, but animals that depend upon them such as sea lions, seals and sea birds experience famine. Its opposite phase is called La Niña with more phytoplanktons than normal (<http://sphere.ssec.wisc.edu/20130315/>).

On the other hand, 61.1% of fisherfolks have seen a tornado and they had idea of what a tornado is made of. 55.6% of fishers experienced an earthquake with intensity not greater than 5. As depicted in figure 4 almost 80% of the fisherfolks lack knowledge on human-induced hazards, thunderstorm, floods, volcanic eruption, tsunami and landslides. Volcanic eruption never happened in the locality thus it is reasonable that respondents



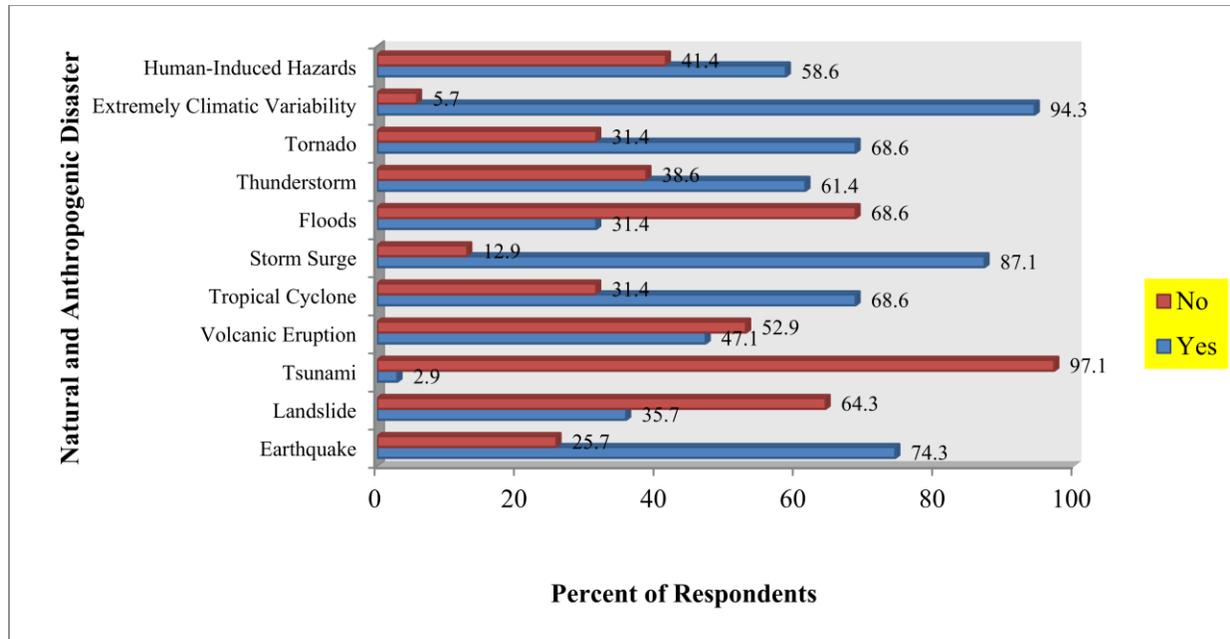
had not seen such disaster. Nevertheless, respondents are aware that our country have many volcanoes based on their knowledge gained from school.



**Figure 4 Fisherfolks**

*The knowledge on natural and anthropogenic disaster of professionals in the second district of Zamboanga del Norte.* Figure 5 revealed that in average 75% of the professionals were knowledgeable on the following disasters: human-induced hazards, extreme climatic variability, tornado, thunderstorm, storm surge, tropical cyclone and earthquake. Professional sectors are a part of any organizations that conduct trainings with the knowledge, skills and abilities needed to perform tasks required by specific capabilities particularly in the preparedness for possible hazards in the community. Despite these, there were professionals who were not knowledgeable on floods, tsunami and landslides. Considerable percentage of professionals may have not experienced flooding in their community although they knew how is flooding classified. Tsunami was less likely experienced by any of the respondents since there was no recent occurrence of tsunami in the province.

Landslides on the other hand, posed extensive damage and serious negative impacts to the community, society, and the environment. Professional sectors usually reside in landslide –free areas thus no household member experienced landslide. On February 17 2006, a massive landslide also occurred in Barangay Guinsaugon, St. Bernard, Southern Leyte where more than 1,000 people were buried alive. On January 2 2011, another landslide hit the town of St. Bernard claiming the lives of at least five people (Jadina 2012). Leyte and Southern Leyte are two provinces in the Philippines with the most catastrophic landslide history. The province of Zamboanga del Norte is not an exemption to this horrible disaster knowing the fact that most mountains are already denuded (Figure 6 ).



**Figure 5 Professionals**

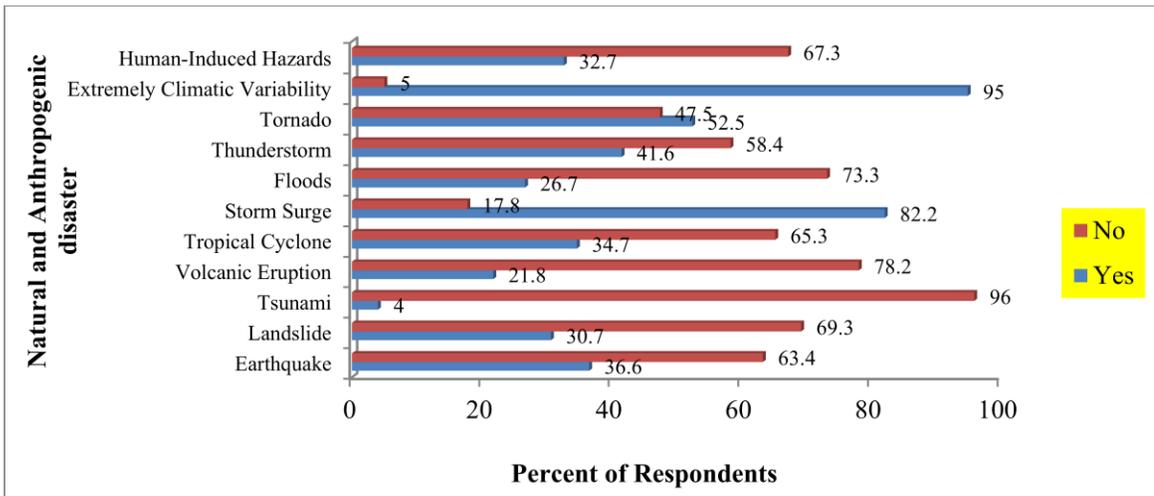


**Figure 6 Residential Houses in Barangay Pange constructed near the headgully of an ephemeralcreek. This is susceptible to landslide during, intense rainfall**

*The knowledge on natural and anthropogenic disaster of other sectors in the second district of Zamboanga del Norte.* Figure 6 revealed the responses from the other sectors which comprised the highest percent of respondents. These were the elected municipal and barangay officials who were much informed of the extreme climatic variability. This accounts for the massive media drive for the alarming recent news of El Niño. These local officials demonstrated more vigilant, quick and disciplined responses. Hence, this reflects a culture of profound knowledge inculcated in the minds of these sectors. Likewise, considering these sectors who are residing at the coastal areas, these underprivileged groups particularly the housewives, security guards, saleslady, “habal-habal” drivers, “labanderas” revealed the 82.2% knowledge on the storm surge and 34.7% tropical cyclone. These sectors assumed to be the masters of their fate deemed necessary to equip with basic knowledge as far as coping with changes in the weather and wind patterns. The study of Schilderman, 2004 emphasized



that due to a lack of knowledge, these socially marginalized sectors were assumed to live in vulnerable conditions. People are susceptible to hazards because of poverty and ignorance and lack of resources, and because these are the grass-roots sectors, these people are vulnerable. Moreover, there is a lack of knowledge on volcanic eruption, tsunamis, landslide and earthquake. It may be attributed to lack of personal experience, deprived of information from technologies and underprivilege of trainings.



**Figure 7 Other Sectors**

*Test of Difference in the Knowledge on Natural and Anthropogenic Disaster of Various Sectors in the Second District of Zamboanga del Norte.* As shown in table 1, there was a significant difference in the knowledge of the respondents on natural-anthropogenic disasters like earthquake, landslide, thunderstorms volcanic eruption, tropical cyclone, tornado, storm surge and human-induced hazards. This implies that their knowledge on these disasters are characterized by a high degree of variation. These variations could be due to their ability to have access to a wide range of real-time information. The respondent’s ability to communicate about these disasters within the community and their attitude and perception on environmental, social, technological, economic and political indicators are also contributing factors in their knowledge differences of the above mentioned natural-anthropogenic disasters. It is deemed necessary to educate residents of the district to fully comprehend real natural disasters occurring in their community and to enhance the culture of preparedness. According to Dekens (2007) the ability a community has to prepare itself for disaster preparedness needs to be understood within the broader context of livelihood security and sustainability and building up a community resilience in the long term. However, household preparedness and survival potential appear to be very much dictated by economic and social circumstances (Howell 2003).

In our country the government do not invest enough on infrastructure facilities. As a result, impact could be magnified if a disaster happens. It is necessary that long term reconstruction should focus on both recovering the damage and looking for alternatives rather than focusing on repairing existing facilities. On the other hand, people should make aware of potential disasters and their collective responsibility in preventing or minimizing the effects of disasters.

Moreover, the respondent's knowledge on tsunami does not significantly differ since this disaster was not yet experienced by the people of the province. Moreover, their knowledge on floods and extreme climatic variability does not differ significantly. Various sectors had been exposed to variation in climatic conditions as a result of the global climate change. Flooding on the other hand had been experienced by the various sectors in second district. In fact flooding is among the top 3 and most frequent hazards that had affected the municipalities with wide coverage in terms of affected barangays and purok (PDRRMC).

**Table 1 Test of Difference in the Knowledge on Natural and Anthropogenic Disaster of the Various Sectors in the Second District in Zamboanga del Norte**

Disasters	Computed F-Value	p-value	Interpretation
Earthquake	14.504	0.000	Significant
Landslide	3.432	0.009	Significant
Tsunami	1.479	0.208	Not Significant
Volcanic Eruption	7.928	0.000	Significant
Tropical Cyclone	6.305	0.000	Significant
Storm Surge	35.338	0.000	Significant
Floods	0.578	0.679	Not Significant
Thunderstorm	3.638	0.006	Significant
Tornado	7.083	0.000	Significant
Extremely Climatic Variability	0.532	0.712	Not Significant
Human-Induced Hazards	4.962	0.001	Significant
Overall	8.418	0.000	Significant

## Conclusion

Knowledge on natural and anthropogenic disasters of the various sectors in the second district of Zamboanga del Norte is an effective tool for reducing risk. Improving the understanding of their knowledge can help communities in hazard-prone areas to gain better grasp of the ways to cope with risks. Disaster can strike at anytime and it is the magnitude of the related impacts that will reflect the level of "education" and preparedness of the exposed community. Education for disaster reduction and human security must be a continuing process to respond to society's changing needs and focus on empowering individuals throughout their lives.

## Literature Cited

- Dekens, Julie (2007) Local Knowledge for Disaster Preparedness: A Literature Review. [http://www.preventionweb.net/files/2693\\_icimod8fc84ee621cad6e77e083486ba6f9cdb.pdf](http://www.preventionweb.net/files/2693_icimod8fc84ee621cad6e77e083486ba6f9cdb.pdf)
- Jadina, B. 2012. Landslide Occurrences in the Philippines: Contributing Factors and Implications to Local Governance. Downloads/pbseries-2012-2-Landslide%20occurrences%20in%20the%20Philippines.pdf



Webb P., Braun J., and Teklu T. (1991). “Drought and famine in Ethiopia and Sudan: An Ongoing Tragedy”, *Natural Hazards* 4(1), 85–86.

UNESCO, IFRC & UNICEF (2005) *Knowledge, Innovation and Education: Building a Culture of Safety and Resilience*, s.l.

*<http://sphere.ssec.wisc.edu/20130315/>*

*<http://www.unisdr.org/partners/private-sector>*