Webology (ISSN: 1735-188X)
Volume 18, Number 5, 2021

Differentiating The Disaster Risk Management Compliance Of State Universities And Colleges In Zamboanga Peninsula Region: Basis Technology-Integration Responses

Michael M. Cabiles*[1] , Victor B. Bernido[2]

[1]Zamboanga City State Polytechnic College Zamboanga City, Philippines.

[2]Jose Rizal Memorial State University Dapitan City, Zamboanga del Norte, Philippines.

ABSTRACT

The Philippines is frequently ranked as one of the countries most at risk from natural disasters. Human activities can create disasters, although natural phenomena happen the most frequently. In this study, the researchers examine whether there is a significant difference between State Universities and Colleges in Region IX regarding Disaster Risk Management compliance regarding Fire, Flood, Earthquake, and Biothreats. Universities and colleges in the Philippine,s province of Zamboanga took part in this. In order to respond to the study question, the School Emergency and Disaster Preparedness Level of Implementation Instrument was used. It is a pre-made survey tool that was standardized and based on the currently in-use CDRRMO and Philippine National Red Cross DRRM survey tools. The study finds that the state universities and colleges in Region IX do not significantly differ in their DRRM compliance concerning fire, flood, earthquake, and biothreat compliance, indicating that universities and colleges in the Zamboanga Peninsula region have DRRM that is remarkably similar. Due to the fact that the universities and colleges are located in the same area, these outcomes may be attributed to regional best practices for DRRM. Due to their geographical similarities, they also undergo practically identical calamities. Out of this finding, plans and responses through the aid of technology might be in place.

Keywords: Disaster Risk Reduction Management, flood, fire, earthquake, biothreat, technology-integration

INTRODUCTION

The Philippines is regularly listed as one of the nations with the highest disaster risk. Disasters can be caused by human activity, but natural occurrences are the ones that happen most frequently. The Philippines is listed as having the third highest risk exposure among the top 15 nations in the

2018 World Risk Report. The country is highly vulnerable to natural disasters due to its geographic location in Southeast Asia. Disasters can be caused by human activity, but natural occurrences are the ones that happen most frequently. Every Filipino is aware of the effects of typhoons, earthquakes, volcanic eruptions, and fires on daily life and national progress, even without scientific investigation. It is known as "The Ring of Fire" and is considered one of the most geologically active regions (Highland, Lyn 2017).

Since it is located in the most dangerous area of the country, disaster preparedness is the top concern of the people in the southernmost part of the Philippines, notably in Western Mindanao. Large segments of the people and the economy in the Zamboanga Peninsula are exposed to natural disasters because of the region's agricultural tradition and rapid development. Natural catastrophes pose severe dangers to the food security and economic sources of this population, which makes up around one-third of the entire population of the Zamboanga Peninsula.

Every State University and College has a Disaster Risk Reduction Management Program in place for schools to respond to calamities, such as by conducting drills that are a requirement of the Philippine government's mandatory national resiliency program (RA 10121). For bio-preparedness or accidents involving chemicals that, when burned, increase the volatility of the agents, firefighters from various cities collaborate with biosafety officers from schools. This requires a particular procedure or is carried out by firefighters with specialized knowledge of how to handle such products.

Fire, flood, earthquakes, and biothreats are a few of the disasters the Philippines has to deal with. Fire is a condition of combustion when heat and light are produced, according to the Office of Disaster Preparedness and Emergency Management (2019). The destructive burning of material that results in light, flame, heat, and smoke is what is referred to as a fire, in other words. Every day, we live with the threat of fire as a possible catastrophe. The majority of fire-related fatalities might have been prevented. Because they can kill and destroy in a matter of minutes, fires are becoming a threat to human life that must be taken seriously.

The same applies to floods, another type of water emergency. In a precise hydrological sense, a flood is described as a temporary increase in a stream's water level that reaches a peak before gradually declining (UNESCO-WMO 1974). The "flood event" (Linsley, 1942), which is defined as a flow of water in a stream producing a distinct progressive rise, culminating in a crest, along with the recession that follows the crest, is the episodic behavior of a river that may be regarded a flood (Linsley, 1942). Every time the Philippines receives heavy rains, numerous areas become flooded, damaging properties.

The Philippines is vulnerable to natural disasters in addition to the catastrophes mentioned above because it is situated on the tectonically active Pacific "Ring of Fire," a band of volcanoes and

fault lines that arcs around the edge of the Pacific Ocean and frequently causes earthquakes. A 40,000-kilometer horseshoe-shaped curve that partially encircles the Pacific Ocean may be seen on the map. The area is seismically active with earthquake epicenters, volcanoes, and tectonic plate borders. (Funakoshi, Bhandari, Kawoosa and Foo, 2022).

The biothreat has emerged in recent years as another factor that may also be regarded as a tragedy. The definition of a biothreat has expanded over time to encompass unauthorized access to biological data, natural, unintentional, and purposeful risks, and the social, economic, political, and security repercussions of each. The substantial developments in human and animal health, the biotechnology industry, the bioeconomy, and worldwide sample and data-sharing regulations are all reflected in this evolution. The biological and biotechnological sciences are becoming more globalized, facilities and information systems are becoming more connected to the Internet, there is an influx of new funders and practitioners, and more investments are being made in biodiversity and environmental scanning.

The Philippine government has reported numerous fatalities from these disasters and the destruction of property they caused, making them highly alarming. Because of this, the government investigates catastrophe mitigation strategies. Disaster risk management, which places a strong emphasis on risk mitigation and reduction, is the most recent and widely acknowledged method of disaster management. Researchers like Taheri-Azad examined how education may lessen the effects of natural disasters and found that it positively influenced the likelihood of disasters in schools (Alghaei, 2018). According to the Hyogo Framework for Action and Sendai Framework, education and training are top priorities and disaster risk reduction methods. Education has a good impact on community knowledge and attitudes toward risk reduction and is a process that must be incorporated at many levels of management and practice. Proper education and training could increase community understanding and knowledge to alter behavior.

The researchers were thus driven to investigate the variations in disaster risk management compliance between State Universities and Colleges in the Zamboanga Peninsula Region.

RELATED LITERATURE AND STUDIES

Fire

Fire has been a significant factor in both natural and man-made calamities. The extrinsic consequences of fire-related catastrophes have evolved, particularly in the twentieth century. As a result, there has been a significant change in the types and numbers of burn injuries due to economic, technological, and military progress and the rise in armed conflicts. For this reason, a report on fire disasters in the 20th century is offered, together with a chronological analysis of several global typologies. According to the statistics published in the literature, a fire disaster is

characterized from a classification perspective as an occurrence that results in more than 25 fatalities. However, there are differences in the number of injuries sustained in incidents (Cavallini, 2007).

Devastating fires continue to occur throughout the Philippines, frequently ranking among the worst in recorded history. In fires, structures can occasionally be destroyed or burned. It simply means that the victim will suffer a significant financial loss. In a matter of hours, significant investment will be lost, and those who were fortunate enough to flee and survive will experience the misery of losing their homes, employment, source of income, and means of subsistence. The Philippines is currently stuck fighting fires, if not trying to stop them from starting in the first place. As a result, Filipino firefighters are among the most courageous in putting out fires. They are known to surge at burning buildings while others flee for safety despite having no firefighting equipment. While performing their duties, firefighters might occasionally sustain life-threatening injuries or even pass away. With the proper instruction, this rarely occurs (Mayoga, 2018).

Floods

According to the aforementioned technical definition, a flood is simply a progressive abnormal rise in the elevation of streamflow's surface level up to a maximum height, after which the level gradually declines to what is considered normal. The events in the described sequence all occur within a specific time frame. Simply put, the definition only specifies a typical behavior. It does not contain the component of "flooding" or inundation that the term "flood" implies. The technical definition is short-sighted. Therefore, the Flood Forecasting Branch, the hydrological branch of PAGASA, has chosen a more comprehensive definition for operational purposes. Considering the aims and objectives of flood forecasting and warning, the definition thus seems quite limiting in its connotation for the public. (PAGASA, 2020)

Rivers carved out vast valleys and shaped the continents thousands of years ago before people established communities and produced crops. These rivers frequently spilled their banks, flooding the surrounding lands and depositing dirt and silt rich in minerals in the plains and valleys. Some of the earliest cities were constructed by rivers because floods improved the soil. The most significant ones were the Indus River in Pakistan, the Nile in Egypt, the Yellow River in China, and the Tigris and Euphrates in the Middle East. The "cradles of civilization" are these rivers' floodplains (Burgan & Oak, 2015).

Storms and torrential rain are two of the most frequent causes of floods. Storms can deliver significant amounts of precipitation, either gradually over days or quickly in the case of flash floods. Overflowing rivers, lakes, and seas – Water levels in rivers and lakes can rise due to external factors such as rain, snowmelt, or blockages, spilling over onto nearby land. A tsunami occurs when huge waves crash into the shore, usually as a result of underwater earthquakes. Floods

that inundate populated regions have both short-term and long-term effects. The immediate effect is disruption; flood water can close off access to rural settlements, isolate portions of cities, and impede transportation lines. Large amounts of water could destroy electrical infrastructure and delicate structures like bridges.

Earthquake

A significant shaking of the Earth's surface is known as an earthquake, and these events can be so powerful that they can demolish large structures and claim thousands of lives. The most damaging of all-natural disasters on Earth is thought to be an earthquake. The impacts of an earthquake can reach a vast area (hundreds of thousands of square kilometers), causing damage to infrastructure and buildings, the death or injury of many people, and even upsetting the social and economic order in the affected region. From barely perceptible to powerful enough to throw individuals around, the intensity of the trembling might vary. When energy is suddenly released from the Earth's crust, seismic waves are the outcome. The effects typically increase dramatically as a result of population growth and an increase in the number of structural or infrastructure facilities. The number, kind, and size of earthquakes experienced throughout time are referred to as an area's seismicity, seismic,, or seismic activity. An earthquake cannot be avoided entirely; all that can be done is to lessen its catastrophic impacts, which include fewer fatalities, property losses, and injuries. The most significant earthquake tragedy in recorded history reportedly occurred in North Sumatra at Banda Aceh. It is known as the Great Sumatran Earthquake, which occurred on December 26, 2004, and measured about 9.3 on the Reichter scale. It generated or triggered a massive tsunami, resulting in hundreds of thousands of deaths (approximately 283,100 people from the surrounding countries, including Malaysia, with 68 people dead). The Philippines may learn a lot from this incident because we need to be ready to deal with calamities of this nature, which not only come from foreign nations but could happen to us at any time due to our location inside the Pacific Ring of Fire. In addition to tsunamis, earthquakes can cause liquefaction, landslides, earth ruptures, and ground vibration. Vibrations in the Earth can cause fatalities, building collapses, and property damage. Even in the Philippines, there is still a need for earthquake study because so few academics have attempted to tackle this subject because of how challenging and expensive it is. An earthquake may teach us many things, like what happened in Mexico in 1985 and San Francisco in 1957. Due to the extended duration of the shear wave component, such occurrences have demonstrated that earthquakes can have enormous and devastating consequences at great distances. (Azlan Adnan, 2014).

Biothreats

In order to safeguard the students, the academic community, the learning environment, and its infrastructures, it is of utmost importance for higher educational institutions to maintain a safe working environment free from potential health and safety risks. The ability to undertake a full

assessment of all actions related to infectious materials and chemical spills will be provided through risk assessment to the academic stakeholders, enabling them to promote a safe and harmonious higher learning environment.

The critical component of risk assessment is the proper handling of lab equipment, disposal of hazardous chemical waste, and selection of the necessary Biosafety and Biosecurity measures to foster the safe and secure handling of biological agents in the laboratory. By definition, a biorisk is when the source of the harm is primarily a toxic agent or biological, paired with the likelihood that the harm would occur and the severity of it. The source could be an accident while conducting lab activities with students, an unintentional release or loss, misuse, improper handling of lab materials, theft, or intentional illegal release. A biological facility risk assessment will provide insight into how risk will be long-term minimized and prevented by concentrating all resources on the most significant risk.

Risk assessment is a crucial technique for allocating resources, which helps determine which risks need to be mitigated. While biosecurity guards against microbial agents being lost, stolen, diverted, or intentionally misused, biosafety uses knowledge, procedures, and equipment to prevent exposure to potentially infectious agents or biohazards in people, laboratories, and the environment. Therefore, decisions about laboratory operations must consider biosafety and biosecurity issues (Obra and Elago, et.al 2017).

RESEARCH QUESTION

1. Is there a significant difference in the in the Disaster Risk Management compliance of State Universities and Colleges in Region IX in terms of Fire, Flood, Earthquake and Biothreats?

METHODOLOGY

In order to address the research issues, the study used a descriptive research design that included quantitative research approaches. The study's quantitative data will be derived from the survey questionnaire which comprehend the theories, viewpoints, and insights of DRRMO policies in each State University and College in Region IX and to gather in-depth analysis of the issue in order to produce new research ideas. Some rights are reserved for the State Colleges and Universities participating in this study. Before taking part in any research, participants should be aware of the objectives of the study, how the findings will be used, and the possible social repercussions on their lives. Additionally, they have the freedom to withdraw at any time and to decline to take part in a study. The researcher ensures and protects their confidentiality when they participate and submit information. Individuals should not receive overly generous financial incentives to join a project. The "School Emergency and Disaster Preparedness Level of Implementation Instrument" was utilized. It is a pre-made survey instrument that was standardized and modeled after the

CDRRMO and the Philippine National Red Cross DRRM survey instruments that are now in use. In order to assure the accuracy and dependability of the data, the validation process was carried out and was certified by specialists.

RESULTS AND DISCUSSIONS

On the difference in the Disaster Risk Reduction Management compliance of State Universities and Colleges in Region IX in terms of Floods

Table 1. indicates that the type of state university and colleges SUCs achieved a mean of 3.82 with an SD of .72 are colleges while the university had a mean score of 3.80 with SD of .68. The mean difference is 0.22, and the p value is 0.61 thus, the p value is greater than alpha .05, This indicates that in terms of Flood, the table reveals that the null hypothesis which states, "There is no significant difference in the DRRM Compliance in terms of Flood when data are group according to the type of SUCs", is not rejected.

This indicates that the compliance rating of the stakeholders on Flood compliance is similar when they are grouped according to the type of SUCs where they belong. This further implies that the tertiary school's Disaster Risk Reduction compliance status when it comes to floods and threat assessment does not matter since the degree of preparedness is not based if a school is a university or not.

Table 1. Independent t – test Result of DRRM Compliance in terms of Flood according to Type of SUCs

Type of SUCs	Mean	SD	Mean Difference	t – value (df = 49)	p value	Decision on H_o
College	3.82	.72	0.02	0.061	.951 ^{ns}	Not Rejected
University	3.80	.68				

Note: ^{ns} p value is greater than alpha = .05.

On the difference in the Disaster Risk Reduction Management compliance of State Universities and Colleges in Region IX in terms of Earthquake

Table 2. indicates that the type of state university and colleges SUCs achieved a mean of 3.99 with SD of .63 are colleges while the university had a mean score of 3.96 with SD of .60. The mean difference is 0.03 and the p value is 0.842 thus, the p value is greater than alpha .05, In terms of Earthquake, the table reveals that the null hypothesis which states, "There is no significant difference in the DRRM Compliance in terms of Earthquake when data are group according to the type of SUCs", is not rejected. This indicates that the compliance rating of the stakeholders on

Earthquake compliance does not significantly differ when they are grouped according to the type of SUCs where they belong. This further implies that the Disaster Risk Reduction compliance status of the tertiary school when it comes to Earthquake and threat assessment does not really matter since the degree of preparedness is not based if a school is a university or not.

Table 2. Independent t – test Result of DRRM Compliance in terms of Earthquake according to Type of SUCs

Type of SUCs	Mean	SD	Mean Difference	t – value (df = 49)	p value	Decision on H_o
College	3.99	.63	0.03	0.201	.842 ^{ns}	Not Rejected
University	3.96	.60				

Note: ^{ns} p value is greater than alpha = .05.

On the difference in the Disaster Risk Reduction Management compliance of State Universities and Colleges in Region IX in terms of Biothreat

Table 3. indicates that the type of state university and colleges SUCs achieved a mean 3.90 with SD of 0.72 are colleges while the university had a mean score of 3.68 with SD of 0.75. The mean difference is 0.22 and the p value is 0.298 thus, the p value is greater than alpha .05, This indicates that In terms of Biothreats, the table reveals that the null hypothesis which states, "There is no significant difference in the Disaster Risk Reduction Management Compliance in terms of Biothreats when data are group according to the type of SUCs", is not rejected.

This indicates that the compliance rating of the state universities and colleges in region 9 on Biothreats compliance does not significantly differ when they are grouped according to the type of SUCs where they belong. This further implies that the Disaster Risk Reduction compliance status of the tertiary school when it comes to bio hazards and threat assessment does not really matter since the degree of preparedness is not based if a school is a university or not.

Table 3. Independent t-test Result of DRRM Compliance in terms of Biothreats according to the Type of SUCs

Type of SUCs	Mean	SD	Mean Difference	t – value (df = 49)	p value	Decision on H_o
College	3.90	.72	0.22	1.052	.298 ^{ns}	Not Rejected
University	3.68	.75				

Note: ^{ns} p value is greater than alpha = 0.05.

CONCLUSIONS

According to the World Risk Report 2018, with an index score of 25.14%, the Philippines is among the nations with the third-highest risk of disaster (World Economic Forum, 2018). 74% of the population is vulnerable to the effects of several hazards, which affect at least 60% of the country's total land area (GFDRR, 2017). This is primarily attributable to the location and geographical context since there is a significant danger of coastal hazards such as typhoons, storm surges, and rising sea levels. It can be concluded in this study that the DRRM Compliance in terms of fire, flood, earthquake, and biothreat compliances of the State Universities and Colleges in Region IX does not differ significantly, which means that Universities and Colleges in the Zamboanga Peninsula region have almost similar DRRM. This further implies that the tertiary school's Disaster Risk Reduction compliance status when it comes to bio floods and threat assessment does not matter since the degree of preparedness is not based if a school is a university or not. It was also noted that the tertiary school's Disaster Risk Reduction compliance status when it comes to floods and threat assessment does not matter since the degree of preparedness is not based if a school is a university or not. The Disaster Risk Reduction compliance status of the tertiary school regarding Earthquake and threat assessment does not really matter since the degree of preparedness is not based on whether a school is a university or not. This further implies that the tertiary school's Disaster Risk Reduction compliance status when it comes to biohazards and threat assessment does not matter since the degree of preparedness is not based if a school is a university or not. These results may be attributed to the universities' and colleges' standard DRRM practices since they belong to the same region. They also experience almost similar disasters due to the similarity of their geographical locations. With these findings, technology integration responses could still be improved to minimize the hazard and help in reduction of vulnerability. Technology can play a significant role in disasters by lowering risk and assisting in the decrease of susceptibility. The integrated approach to the problem of natural disasters has undergone considerable changes in recent years due to advancements in the technological and scientific understanding of natural hazards and associated coping strategies.

REFERENCES

Alghaei, A. (2018). Emergent phenomena and multiorganizational coordination in disasters: lessons from the research literature. International Journal of mas Emergencies and Disasters 20: 197-224

Adnan, A. (2014). Sand Samples' Preparation Using Mobile Pluviator. Arabian Journal for Science and Engineering volume 39, pages6825–6834

Burgan & Oak, (2015). Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. U.S. Forest Service.

Cabiles, M. Sebastian, E., Sebastian, R., Bayos, L., & Mojana, J. (2022). Disaster risk reduction management compliance: best practices and challenges of the State Universities and Colleges. Neuroquantology. Volume 20. Issue 6 Pages 10049-10062| Doi: 10.14704/Nq.2022.20.6.Nq22979

Cavallini, (2007). Fire Disasters in the Twentieth Century. Ann Burns Fire Disasters. 2007 Jun 30; 20(2): 101–103. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3188063/

Funakoshi, Bhandari, Kawoosa and Foo, (2022). Philippines Earthquake. Https://Www.Reuters.Com/Graphics/PHILIPPINES-QUAKE/Lbvgneegepq/

GFDRR, (2017). Philippines. Available At: Https://Www.Gfdrr.Org/En/ Philippines

Highland, L. (2017). Technology, structure, and culture in management. Internal Journal of Mass Emergencies and Disasters. 15:293-308

Linsley, (1942) Discussion of linsley on flood routing. Transactions of the American Society of Civil Engineers. ISSN (print): 0066-0604| ISSN (online): 2690-4071

Office of Disaster Preparedness and Emergency Management (2019). What Is A Fire? https://Www.Odpem.Org.Jm/Fires/

PAGASA (2020). Floods. Https://Www.Pagasa.Dost.Gov.Ph/Learning-Tools/Floods

Philippine Disaster Reduction and Management Act (RA 10121). Climate change laws of the world. https://climate-laws.org/geographies/philippines/laws/philippine-disaster-reduction-and-management-act-ra-10121

UNESCO-WMO (1974). Flash floods. Proceedings of the Paris Symposium, Publication no. 112.

World Economic Forum, (2018). The glolabl risks report 2018: 3th Edition , Geneva: World Economic Forum.