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**| RESEARCH ARTICLE**

## **Island Schools-Communities' Preparedness and Resiliency for Disaster Management**

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**| ABSTRACT**

The Philippines is the third most disaster prone country in the world, mainly due to its location and geographical context (Jha, 2018). This descriptive study ascertained the level of preparedness and resiliency in disaster management among the twenty - three (23) island schools-communities in the Municipality of Concepcion, Province of Iloilo, Philippines. Likewise, it determined the gaps and needs in disaster preparedness and resiliency building among the local residents. Results revealed that as an entire group and whether classified as to the type of school, school population, and school location, island schools-communities were "highly prepared" for disasters. Further, findings indicated that they also have a "high level of resiliency". These were validated by the participants' claim that the values of "self-reliance" and "sense of community" enabled them to survive, thrive, and recover from disaster situations. The study has further shown the need to put up food and water supply shelters or storage facilities among the different island schools-communities.

**| KEYWORDS**

Disaster preparedness, Island schools-communities, resiliency, risk reduction, disaster management

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### **1. Introduction**

The Philippines ranked third out of 174 countries in terms of disaster risk. Lying at 21 degrees North Latitude, the Philippines is also susceptible to typhoons and tsunamis. Geographically, it is located in the Pacific Ring of Fire. The western rim of the Pacific Ocean is the most seismically active part of the earth (United Nations Risk Reduction, 2020).

The World Bank Study of 89 countries, published in the Global Assessment Report for Disaster Risk Reduction 2019, has predicted that if all disasters were to be prevented in one year, the number of people living in extreme poverty--those living on less than USD 1.90 a day--would fall by 26 million.

Disaster affects all peoples and ages from all walks of life. The United Nations (UN) defines a *disaster* as a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

In the Philippines, the life-threatening impact of disaster paved the way for the creation and integration of Disaster Risk Reduction Management which was clearly elucidated and emphasized in Republic Act 10121, known as the Philippine Disaster Risk Reduction Management Act. Specifically, Section 2 of this Republic Act elaborated the adoption of the Disaster Risk Reduction and Management approach that is holistic, comprehensive, integrated, and proactive in lessening the economic and environmental impacts of disasters, including climate change, and promotes the involvement and participation of all sectors and all stakeholders concerned, at all levels, especially the local community.

Ament to this, the Philippine government, in response to the prevailing condition, employed a multi-agency program involving the Department of Education (DepEd) as a lead agency. It initiated the institutionalization of risk reduction, which has long been

emphasizing the need to strengthen the capacity of schools to enable them to respond in the event of disasters and emergencies to save more lives and ensure resilience.

The Department of Education (DepEd), which is structurally mandated to mainstream disaster preparedness, management, and resilience in every school system (R.A. 10121), recognized Disaster Risk Reduction Management (DRRM) and Education as an iterative process of mutual learning between people and institutions. Thus, DepEd created the School-Based Disaster Risk Reduction and Management (SBDRRM) as the focal point in planning, implementing, coordinating, and monitoring activities related to disaster risk reduction, education in emergencies, and climate change adaptation. With the creation of the School-Based Disaster Risk Reduction Management Office (SBDRRMO) by DepEd and the creation of the Regional Disaster Risk Reduction and Management Office (RDRRMO) stipulated in the Philippine Disaster Risk Reduction Management (PDRRM), a Focal Point for each region and division was established. Cognizant of this, every school is recognized as the community arm of DepEd, and every school is considered a leading local actor in disaster risk management, partnering with the community sectors.

Although each school is viewed to be equally situated when it comes to disaster issues, there is a presumption that schools established in the island communities are generally and uniquely predisposed to climate-related disasters. Also, it is believed that central to disaster risk reduction management and education is the productive sharing of knowledge on the collaborative activity systems so that people can make informed decisions to improve their resilience.

The unique setup of these twenty-three (23) island schools in the Municipality of Concepcion, located in the Province of Iloilo as the study sites, is that their experiences include an average of eight (8) typhoons every three (3) years which potentially caused storm surge, squall or gale, and rain-induced landslides. In this kind of situation, the researcher would like to explore how these institutions would respond to climate-related hazards and ascertain their partnership with their immediate communities. This includes their shared activity systems and initiatives in line with the government program in community disaster management and resilience building.

So far, there are no known studies conducted to look into this particular concern. In these areas, the researcher is a native of the aforementioned Municipality and has served several years in the DepEd-Concepcion as a classroom teacher. She had experienced hardships and challenges each time a typhoon struck the area and had witnessed how collaborative shared activity systems among the island schools and their immediate community sectors and stakeholders played a pivotal role in the implementation of R.A. 10121 in strengthening their partnership by means of institutionalizing a basic community-based disaster risk reduction training program.

As DepEd Secretary Leonor Briones aptly articulated: Saving lives and property is a challenge accepted by all stakeholders in private and governmental entities. As such, aside from the business of providing basic education, the Department of Education (DepEd) is responsible for providing safe teaching-learning facilities and a hazard-free environment for the school children. In its continued campaign, aside from bolstering partnerships, DepEd is strengthening the capacity of schools, therefore, their communities, to help minimize and efficiently respond to the impact of disasters (Manila Bulletin July 21, 2018).

As of now, a total picture of who is doing what, how, where, and when concerning resilience and disaster preparedness may be very well considered vague or, to the very least, non-existent.

Hence, this study aimed to map out the different preparedness measures and activities relating thereto and to possibly determine the results of such efforts towards disaster resilience. In a nutshell, the results were logically collated to be utilized as the primary bases and inputs in tailoring a strong and practical training program as an intervention mechanism in pushing collaborative endeavors towards school-community disaster preparedness and resilience-building.

As an offshoot, a training program on disaster-preparedness measures for schools was ultimately designed. The same was based on the results of this study and on the school disaster risk reduction management manual, which integrated the island school-community DRRM shared activity systems with an emphasis on food and water supply preparation and timely access during a calamity. Also, partnership benefits or outputs, like social infrastructures that formed committees to handle specific projects and sustainability, were tapped. The above-mentioned aspects were highlighted as inputs in the formulation of the disaster preparedness training program.

## **2, Literature Review**

### **2.1 Climate Change and Natural Disaster**

The mean global surface temperature has risen by approximately 1.1°C since the beginning of the Industrial Revolution. In a press communiqué published on 18 January 2017, the World Meteorological Organization (WMO) confirmed that 2016 was the warmest

year since instrumental weather measurements began in 1880—directly following the previous record years 2014 and 2015 (WMO 2016). Indeed, 16 of the 17 warmest years registered in modern times have occurred since 2001. As pointed out by the Intergovernmental Panel on Climate Change (IPCC), this warming is largely the result of greenhouse gas emissions from human activities into the atmosphere (IPCC 2014). Ice caps are melting, oceans are acidifying, and the steadily rising sea level together with ever stronger typhoons are posing existential threats to the coastal regions of Asia and the Pacific (IPCC 2014).

The 2017 research study supported by the Asian Development Bank (ADB) entitled “A Region at Risk: The Human Dimensions of Climate Change in Asia and the Pacific” has acknowledged that the global climate crisis is arguably the greatest challenge human civilization faces in the 21<sup>st</sup> century. In this context, the authors and contributors of the study infer that the role of the Asia and the Pacific region is characterized by a double dichotomy that simultaneously entails high risks and significant opportunities. Experts further predict that proper analysis guided by adequate information can result in investment and policy choices that will continue to promote sustainable economic development and eradicate poverty in the region.

In this study, the authors point out that the *first* dichotomy relates to the region accounting for an increasing overall share of global emissions of greenhouse gases (GHGs), harming not only the world but the region itself. Data shows that the rapidly decreasing costs of wind and solar power generation mean that consumption and production of the future could be driven by renewable energy sources, though the *when* and *where* of this great transition remain uncertain.

Also, this study underscores the *second* dichotomy, which pertains to the already observed and anticipated future impacts of anthropogenic global warming. According to van Aalst (2006), anthropogenic climate change, or ‘global warming’, is caused by increasing concentrations of greenhouse gases. These gases trap the heat in our atmosphere by preventing radiation from escaping into space. The main greenhouse gas, carbon dioxide (CO<sub>2</sub>), is emitted when fossil fuels, like coal and oil, are burned. Climate change experts believe that the other side of the rapid economic and human development of the region renders societies less vulnerable to the familiar vagaries of the environment—such as heat waves, heavy precipitation, or tropical cyclones. Data reveals that, in particular, the shift away from agriculture as the core sector guaranteeing livelihoods and the associated economic diversification of the countries of the region help to increase resilience to weather extremes such as those experienced historically. Simultaneously, however, the same developments have opened up new avenues of exposure and vulnerability. Data further reveals that the following situations and scenarios are most likely to occur in the future such as: a) coastal populations and assets are highly at risk from projected rises in sea level and the intensification of extreme weather events; b) urbanized populations are exposed to heat stress hazards; c) national and increasingly integrated regional economic systems are vulnerable to disruptions in supply chain networks; and d) populations are migrating away from areas where climate change impacts represent an increasing threat.

Furthermore, this report aims to inform developing member countries of the most recent regional climate change projections and to assess these changes for human systems. It also highlights gaps in the existing knowledge pertaining to the impacts of climate change and identifies avenues where research continues to be needed. Thus, the information and insights presented in this report will contribute to scaling up the efforts of the Asian Development Bank (ADB) in building climate resilience in its developing member countries in the years and decades to come.

Also, this report sheds light on the regional implications of the latest projections of changes in climate conditions over Asia and the Pacific. The assessment concludes that, even under the Paris consensus scenario in which global warming is limited to 1.5°C to 2°C above preindustrial levels, some of the land area, ecosystems, and socioeconomic sectors will be significantly affected by climate change impacts, which policy makers and the investment community need to adapt to. However, under a Business-As-Usual (BAU) scenario, which will cause a global mean temperature rise of over 4°C by the end of this century, the possibilities for adaptation are drastically reduced. Among others, climate change impacts such as the deterioration of the Asian “water towers”, prolonged heat waves, coastal sea-level rise, and changes in rainfall patterns could disrupt ecosystem services and lead to severe effects on livelihoods which in turn would affect human health, migration dynamics and the potential for conflicts. This assessment also underlines that, for many areas vital to the region’s economy, research on the effects of climate change is still lacking in the following areas such as: a) temperature change; b) heat extremes; c) precipitation; d) sea-level rise; e) glaciers and rivers; f) tropical cyclones; g) agriculture; h) fisheries and reef ecosystems; i) security; j) migration; k) cities; and l) health.

In summary, the findings of this report highlight the severity of the consequences of unabated climate change in Asia. Results show that while the climate impacts under the Paris consensus scenario of a temperature increase between 1.5°C and 2°C will pose significant challenges to the region, it is clear that the Business-As-Usual (BAU) scenario would render efforts to adapt Asia’s population and economy to this new climatic regime ineffective. Results show further that since the coming decade is crucial for implementing adequate mitigation measures to deliver on the Paris Agreement, investments leading to rapid decarbonization of the Asian economy have to receive high priority. Thus, adaptation measures to protect the most vulnerable populations of the region need to be implemented. Also, the result shows that while pilot projects of renewable energy and technological innovation

in urban infrastructure and transport need to spearhead this transformation, the consideration of mitigation and adaptation has to be mainstreamed into macro-level regional development strategies and micro-level project planning in all sectors. The attempt would not only contribute to managing climate change risks for Asia and the Pacific but also provide opportunities for directing regional economies toward a low-carbon and climate-resilient pathway.

Meanwhile, S. Jorgenson, J. Stephens, and B. White (2019), in their recent study on climate change and energy education, heed an urgent call for a radical transformation in energy systems throughout the world in the next two decades. This study was highlighted during the recent special report of the Intergovernmental Panel on Climate Change (IPCC, 2018). The study cites that burning fossil fuels for energy is the human activity contributing most to climate change (IPCC, 2018, 2014), and the urgent need to reduce the risks of climate change has motivated a sociotechnical transition away from fossil fuels toward more renewable-based energy systems (Friedman, 2008; Princen, Manno, & Martin, 2015). Furthermore, the study emphasizes that the renewable energy transition represents a transformative societal shift from a society based on fierce competition for a scarce resource (fossil fuels) to a society based on abundant and perpetual sources of energy (renewables) (Burke & Stephens, 2017).

Environmental experts believe that beyond mitigating climate change, justifications for an energy transition include reducing the public health risks of fossil fuels, creating local and regional jobs, and reducing the political and economic power that is centralized in large fossil fuel companies (Burke & Stephens, 2018). The complex social, technological, and ecological changes involved in this global transition provide a potentially invaluable lens for environmental educators and researchers to advance EE goals during this time of rapid climate disruption and energy system change.

According to S. Jorgenson, J. Stephens, and B. White (2019), the existing frameworks for energy environment (EE) offer insufficient guidelines for how to prepare students for the rapidly changing realities of climate change and the renewable energy transition. Although the conceptual and methodological foundations of EE were developed in the 1970s and 1990's when it was assumed that energy and environmental problems could be adequately addressed through resource conservation and incremental changes to technology and human behavior (Palmer, 1998; Sauvé, 2005). Further to this study, the authors acknowledge the idea that climate change is a new and different kind of problem. It is a systemic problem of such scale and complexity that fundamental and transformative changes to society's energy systems are required (Geels, 2010; IPCC, 2018). This implies fundamental and transformative changes to environmental energy (EE) as well (Sterling, 2001).

Moreover, S. Jorgenson, J. Stephens, and B. White's (2019) findings show that 54 of the 70 studies in their reviewed sample literature (77%) focused primarily on climate change education and communication, whereas 16 studies (23%) focused primarily on energy education and literacy. This result suggests that Environment Energy (EE) is significantly more engaged with climate change than energy issues presently. The climate change articles that referenced energy most often in the text were quantitative studies that used individual energy behavior categories as a dependent variable (Bofferding & Kloser, 2015; Fusco, Snider, & Luo, 2012; Ojala, 2012; Walker & Redmond, 2014) and climate science studies that conceptualized energy as part of Earth's climate system (Shepardson, Niyogi, Roychoudhury, & Hirsch, 2012; Shepardson, Roychoudhury, Hirsch, Niyogi, & Top, 2014). Also, data shows that the energy education studies that referenced climate change in the text typically used global concerns about climate change and energy insecurity as a background context and/or rationale for research on promoting energy conservation in the private sector (Aguirre-Bielschowsky, Lawson, Stephenson, & Todd, 2017; Petrova, Garcia, & Bouzarovski, 2017; Schelly, Cross, Franzen, Hall, & Reeve, 2012).

The result further shows that three (3) of the 70 articles were identified as transition studies (Gress & Shin, 2017; Mélard & Stassart, 2018). Significantly, Adlong (2012) argued that environmental energy (EE) should focus on "a vision of a society powered 100% by renewables" due to promising developments in renewable energy technologies and that a byproduct of these technical developments was "hope" that an adequate response to climate change was possible (p. 127).

Furthermore, the authors concluded that the common rationale for these conceptualizations was that children and youth would be the generation most affected by climate change and would be responsible- as future leaders, citizens, and policy makers for making difficult energy-related decisions in response to climate change. In like manner, focusing on everyday contexts and actions was also conceptualized as a way to empower children and youth, increase their understanding and engagement, and avoid the despondency and helplessness that climate change can foster.

In summary, S. Jorgenson, J. Stephens, and B. White (2019) recommend the following based on the result of their study: a) Environmental educators and researchers move beyond pro-environmental behavior as a conceptual basis for action and change in this context; b) Environmental educators and researchers reconceptualize children and youth as actors and innovators within a much broader social network; c) Environmental educators and researchers reconsider Adlong's (2012) recommendation to expand the current conception of energy literacy (DeWaters & Powers, 2013) to include knowledge about both technical and social innovation occurring as communities, organizations, and regions of the world transition to renewable-based societies.

One of the most significant studies on climate change and natural disasters was conducted by Maarten K. van Aalst in 2006. His study predicts that human emissions of greenhouse gases are already changing our climate. In this study, the author presents an overview of current knowledge of climate change and its effects on climate variability and extreme weather that could lead to natural disasters, paying particular attention to the potential to apply the information to disaster risk reduction.

The study of van Aalst (2006) was probably one of the significant models in the Intergovernmental Panel on Climate Change (IPCC) which emphasized the examples of projected impacts during the twenty-first century such as: a) increased incidence of death and serious illness in older age groups and urban poor; b) increased heat stress in livestock and wildlife; c) shift in tourist destinations; d) increased risk of damage to a number of crops; e) increased electric cooling demand and reduced energy supply reliability; f) decreased cold-related human morbidity and mortality; g) increased flood, landslide, avalanche and mudslide damage; h) increased soil erosion; i) increased pressure on government and private flood insurance systems and disaster relief; j) increased damage to building foundations caused ground shrinkage; k) decreased water resource quality and quantity; l) increased risks to human life, risk of infectious disease, epidemics and many other risks; m) increased damage to coastal ecosystems, such as coral reefs and mangroves; n) decreased agricultural productivity in drought and flood-prone regions; o) decreased hydro-power potential in drought-prone regions.

Also, utilizing the observational evidence and modelling theory, van Aalst (2006) infers the abnormal occurrence of the following five (5) weather phenomena for the last 30 years has brought climate change to the forefront: a) Heat Waves; b) Floods; c) Tropical Cyclones; d) El Nino and other Variability; e) and Abrupt Climate Changes where in most cases have been experienced by almost all nations in the world for the past fifty (50) years (International Federation of Red Cross, 2004).

Overall, van Aalst's (2006) investigation was drawn from the most recent assessment of the Intergovernmental Panel on Climate Change (IPCC), The World Meteorological Organization (WMO), and the United Nations Environmental Program (UNEP) established in 1988 to respond to policymakers' requests for an objective assessment of the best scientific, technical and socio-economic information on climate change, primarily in peer-reviewed scientific literature. That vast knowledge base is summarized by hundreds of top experts from all regions of the world in a way that offers a balanced synopsis of the main viewpoints, and that is policy-relevant but not policy-prescriptive. Governments review these scientific assessments and, along with the lead authors, approve the 'summaries for policymakers' line by line. As such, the reports provide the most comprehensive overview of the scientific and offer a balanced synopsis of the main viewpoints that are policy-relevant but not policy-prescriptive (United Nations Federation of Climate Change Convention (UNFCCC).

## ***2.2 Legal Basis for Disaster Risk Reduction Management System and Preparedness***

In the Philippines, the legal bases of the disaster management system are Presidential Decree No. 1, s.1872, as implemented by Presidential Letter of Implementation No. 19 s. 1972, and Presidential Decree No. 1566 dated June 11, 1978. PD No. 1 was the Integrated Reorganization Plan of 1972, which was implemented through LOI No. 19. The LOI defined, among others, the organization, mission, and function of the Office of Civil Defense. PD No. 1566, on the other hand, provided for the strengthening of the Philippine disaster control capability and establishing the community disaster preparedness program nationwide.

State policy on self-reliance among local officials and their constituents in responding to disaster emergencies; organization of disaster coordinating councils from the national down to the municipal level; statement of duties and responsibilities of the National Disaster Coordinating Council (NDCC), Regional Disaster Coordinating Council (RDCC) and Local Disaster Coordinating Councils; preparation of the National Calamities and Disaster Preparedness Plan (NCDPP) by Office of Civil Defense (OCD) and implementing plans by National Disaster Coordinating Council (NDCC) member agencies; conduct of periodic drills and exercises; the authority for government units to program their funds for disaster preparedness activities in addition to the 2% calamity fund as provided for in PD 474 (as amended by RA 8185).

Moreover, Presidential Decree No. 1566, which was promulgated on 11 June 1978, is the overarching law on disaster management in the Philippines. This law established eight (8) state policies; one of these policies is that government, departments, bureaus, and agencies must have documented plans of emergency functions and activities.

Based on PD 1566, the city or municipality must be prepared for disasters. In August 2004, Philippine Report on Disaster Reduction stated that preparedness involves activities such as community organizing, training, planning, equipping, stockpiling, hazard mapping, and public information and education initiatives.

## ***2.3 Hyogo Framework for Action (HFA) 2005-2015***

The second World Conference on Disaster Risk Reduction convened from 18-22 January 2005 in Kobe, Japan. The aim of the conference was to increase the international profile of disaster risk reduction (DRR), promote its integration into development planning and practice, and strengthen local and national capacities to address the causes of disasters that hamper development. The 168 states attending the conference adopted the Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of

Nations and Communities to Disasters (HFA) and the Hyogo Declaration. Its overarching goal is to build the resilience of nations and communities to disasters by achieving a substantive reduction of disaster losses by 2015. The HFA was endorsed by the United Nations General Assembly (UNGA) in Resolution 60/195 and committed governments to five priorities for action to: (1) ensure that the DRR is a national and local priority with a strong institutional basis for implementation; (2) identify, assess, and monitor disaster risks and enhance early warning; (3) use knowledge, innovation, and education to build a culture of safety and resilience at all levels; (4) reduce the underlying risk factors; (5) strengthen disaster preparedness for effective response at all levels. Moreover, the Hyogo framework was one of the most important international documents on Disaster Risk Reduction and capacity building of affected communities used for prevention and preparedness.

#### **2.4 Sendai Framework for Disaster Risk Reduction 2015-2030.**

The Sendai Framework for Disaster Risk Reduction, the most recent global blueprint for DRR, was adopted on 18 March 2015 during the Third UN World Conference held in Sendai, Miyagi, Japan. The Sendai Framework is the succeeding instrument to the 10-year Hyogo Framework for Action (HFA) 2005-2015: Building Resilience of Nations and Communities to Disaster. This Framework underlines the strengthening of disaster risk governance for prevention, mitigation, preparedness, response, recovery, and rehabilitation. Thus, it draws on principles contained in the Yokohama Strategy for a Safer World: Guidelines for Natural Disaster Prevention, Preparedness, and Mitigation, Its Plan of Action, and the Hyogo Framework for Action in formulating principles to guide its implementation, taking into account national circumstances and consistency with domestic laws as well as international obligations and commitments.

On the global and regional level, the Framework notes the importance of promoting and enhancing through international cooperation, including technology transfer, access to and sharing, and use of non-sensitive data, information, and appropriate communications, and geospatial and space-based technologies and related services.

On a national and local level, the Framework highlights that it is important to promote real-time access to reliable data; periodically assess disaster risks, including existing, emerging, and new sources of disaster risks, and promote national strategies to strengthen public education and awareness in DRR.

The adoption of the Hyogo Framework for Action in 2005, as reported in the United Nations International Strategy for Disaster Reduction (UNISDR), has been achieved progressively in reducing disaster risks at the local, regional, national, and global levels. However, disasters still continue to occur and affect the well-being and safety of people, communities, and countries as a whole; hence, there is a need to adopt this more people-focused, forward-looking, and action-oriented post-2015 Framework for Disaster Risk Reduction. This framework articulates the role of the public in disaster risk reduction, and the responsibility should be shared by all stakeholders in facing specific disaster risk challenges. This means that the overall responsibility for reducing disaster risk is a shared responsibility between governments and relevant stakeholders. It states to encourage action by *inter alia*: civil society, voluntary and community-based organizations, academia, business and financial sector, philanthropic, institutions, and the media. It also encourages stakeholders to identify and publicize their commitments in support of the DRR through the United Nations International Strategy Disaster Reduction (UNISDR) website. One stakeholder that would be given more emphasis is the local community because it is taken as the primary focus of attention (in disaster reduction) since that is the common unit that is affected by disasters and, more importantly, responds to deal with the event (Russel Dynes, in Victoria, 2012).

#### **2.5 Disaster Risk Profile of the Philippines**

The Center of Research and Epidemiology of Disaster Center Headquarters in Belgium recorded a total of 701 disaster incidents all over the world from 2005-2012, or almost eight (8) disasters a year. For the period 1987-2000, the National Disaster Coordinating Council (NDCC) recorded 523 disasters with a total cost of damage of Php. 150.071 billion, or some 37 disasters on average annually. This data was presented in Community Based Disaster Management of the Philippines: Making a Difference in People's Lives, Victoria (Director for Disaster Preparedness Study, 2002).

The Philippines shares with several Asian countries the distinction of being one of the world's most disaster-prone countries. According to the Philippine Disaster Risk Reduction Management (PDRRM) (2016), the Philippines is an archipelagic nation composed of 7,107 islands, spanning 1 850 kilometers from north to south. Its total land area measures around 299,764 square kilometers, and its coastline is about 36,000 kilometers, the longest coastline in the world. It is bounded by three large bodies of water: on the west and north by the South China Sea; on the east by the Pacific Ocean; and on the south by the Celebes Sea and the coastal waters of Borneo. Due to the country's location along two major tectonic plates of the world- the Eurasian and Pacific Plates – it experiences an average of 20 earthquakes per day or 100 to 200 earthquakes every year. There have been 90 destructive earthquakes in the country in the past 400 years. There are also 300 volcanoes in the country, 22 of these are active, and 36,028 kilometers of its coastline are vulnerable to tsunamis and typhoons.

Disaster is a serious disruption of the functioning community or even society, causing devastations on human, material, economic or environmental losses which exceed the ability of the affected community/society to cope using its own resources (ISDR, 2012:

24). Paton and Johnston (2012: 270) and Alexander (2013: 289) identified disasters as those events that disrupt the structural, economic, organizational, cultural and well-being of people and things in the communities by destroying their means of existence. Disaster could either be human-induced or natural occurrences. Disasters are natural; they just happen without being induced by humans like tsunamis, volcanoes, earthquakes, storms, and floods.

In 2015, the data from the Disaster Response Operations Monitoring and Information Center (DROMIC) shows that there were 313 disaster incidents in the country, up from only 199 incidents in 2014. In particular, there were 120 fire incidents that affected 15,430 households in 2002, 63 deportations or relocation incidents, 22 armed conflicts that distressed 8,891 families, 22 bombing incidents or explosions, and 22 flashfloods that affected 234, 414 families. Other types of disasters that happened in 2002 were vehicular incidents, sea mishaps, tornadoes, massacres, plane crashes, and earthquakes.

In the study of Esteban and Fabian (2014), it was explained that the Philippines is located at the Pacific Ring of Fire. The western rim of the Pacific Ocean is the most seismically active part of the earth, typified by a belt of active volcanoes and earthquake generators. Lying at 21 degrees North latitude, the Philippines is also susceptible to typhoons and tsunamis. An average of 22 tropical cyclones hit the Philippines every year, five (5) of which are destructive. The archipelagic nature of the coastal areas makes the country prone to storm surges and tidal waves, while high-intensity earthquakes occur every six (6) years.

According to the International Red Cross and Red Crescent Societies (ICRCS, 2015), the Philippines is the fourth most accident-prone country in the world. The two institutions arrived at this conclusion after finding out that some 5 809 986 Filipinos were killed or injured as a result of disasters or man-made calamities over a ten-year period (2004-2014).

## **2.6 Risk Profile of the Municipality of Concepcion, Province of Iloilo**

The Municipality of Concepcion lies in the northeastern part of the Panay, spared from any fault zones but severely prone to hazards and disasters such as: tsunamis, storm surges, earthquakes, and squalls. Typhoons are evidently destructive, especially in the coastal regions of the town based on the Philippine Disaster Risk Reduction Management Council (PDRRMC) ocular inspection in 2000. The Municipal Disaster Risk Reduction Management Office (DRRMO) record in the year 2018 shows an average of five (5) typhoons in every three (3) years abashing the coastal island communities. (See Appendix I)

### **2.6.1 Liquefaction Prone Areas**

Based on the map provided by the Philippine Institute of Volcanology and Seismology (PHIVOLCS), areas susceptible to liquefaction are concentrated in the low-lying areas of central alluvial plains near the hilly plains and the coral reefs underneath. The PHIVOLCS cited and warned the people, especially residents of the island of Malangabang and Baliguian, which are geographically found to be lying above the coral reefs (Mines and Geosciences Bureau or MGB). Most of the island barangays in the town of Concepcion are highly susceptible to liquefaction and are greatly affected due to the rising sea level brought about by climate change.

### **2.6.2 Earthquake-induced Landslide-Prone Areas**

The majority of the high elevation steep slope areas along the Mountain Range and the mountainous areas hovering over the island barangays are susceptible to the earthquake. As a matter of fact, Mount Manaphag, which is the highest peak found in Northern Panay, is basically a dormant volcano and, according to the Philippine Institute of Volcanology and Seismology (PHIVOLCS), the whole island of Tambaliza is susceptible to earthquake-induced landslides (Appendix I).

### **2.6.3 Tsunami-prone Areas**

A tsunami refers to a great sea wave produced especially by an earthquake or volcano eruption under the sea. It is otherwise known as a "tidal wave" (Corona, 2018). These giant waves can occur when the earthquake is shallow seated and strong enough to displace the seabed and disturb the mass of water over it. According to the Philippine Institute of Volcanology and Seismology (PHIVOLCS) tsunami wave modelling study, in the event of the worst situation earthquake evolving from a major offshore fault, the whole western coastline of island barangays in Concepcion is susceptible to a tsunami with a hypothetical wave height of 12-15 meters along the coast with the gradual decrease in wave height further inland. Inundation zones are expected to occur with the existing Concepcion Bay to Barangay Poblacion Zone and the relatively flat to low-lying areas along the western coast. Most of the island schools and communities are approximately situated six (6) to eight (8) meters away from the shoreline, which hypothetically makes them tsunami-prone.

According to the Community-Based Disaster Risk Reduction Management Council (CBDRRMC), when Typhoon Yolanda (Haiyan) hit the place in 2013, gigantic waves of 12 to 14 meters in height or tsunamis lashed out the western coastline of Barangay Tambaliza and other neighboring barangays and devoured everything it could take which scared the people. They seek refuge through the elevated part of the land, particularly in the Hampangan Hills. According to the Tambalisanons (residents of Barangay Tambaliza), they named the place "Holy Hill" since island dwellers believe that the Almighty God was with them during the times

when all the people were running for their lives, and they realized someone guided them to climb up to seek refuge. From that time on, the Hampangan Hills were developed and converted into a local tourism site which is presently known as the “Holy Hill”.

Data reveals that, in general, Northern Panay recorded an average of eight (8) typhoons every three years and which could potentially cause associated hazards such as rain-induced landslides and flooding apart from its impacts to crop production levels and property damage.

Based on the Philippine Astronomical Geophysical Atmospheric Services Administration (PAGASA) La Nina and El Nino vulnerability maps, the town of Concepcion has a low vulnerability to extreme low water conditions. However, the island communities were vulnerable to moderate to extreme water conditions.

#### **2.6.4 Flood Prone**

Studies show that the major cause of flooding in the low-lying portions of the mainland barangays in the town of Concepcion is due to the overflowing of Mt. Apitong. It is expected that due to the quarrying activities and the continuous Coal Power Plant activities at the mountainous part of Barangay Puntalis due to the ongoing construction of a port, flooding will frequently occur, especially when heavy rain falls come in the months of August to December. Mines and Geosciences Bureau (MGB), on the other hand, predicts that island barangays will be most likely to experience flooding in the future due to the frequent kaingin farming system in the mountainous parts and the unpredictable rising of sea level due to climate change (Appendix I).

#### **2.7 Disaster Preparedness as a Shared Responsibility Among Different Agencies**

UN Secretary General Antonio Gutierrez, during the 2020 Sustainable Development Goals (SDG) Conference, delivered his speech promoting partnerships and shared responsibility claiming that “No country can overcome a pandemic, disaster or crisis alone. Gutierrez (2020) stressed that global solidarity is not only a moral imperative, but it is also in everyone’s interest”.

Saving lives and livelihoods requires urgent action to address both the pandemic and the climate emergency (Sustainable Development Goals, 2016-2030, Appendix M).

One of the international agendas stipulated in the United Nation’s Sustainable Development Goals (2016-2030) is to combat climate change. Based on the report presented during the international SDG Convention, the year 2019 was the second warmest year on record and the end of the warmest decade (2010- 2019) ever recorded. Carbon dioxide (CO<sub>2</sub>) levels and other greenhouse gases in the atmosphere rose to new records in 2019.

Moreover, education is fundamental to development and growth. It can make possible all development achievements, from health advances and agricultural innovations to efficient public administration and private sector growth. Over the years, government officials and development partners met to affirm the importance of education in development—on economic development and broadly on improving people’s lives—and together, declared Education for All as a goal. As a fundamental human right, education is a core principle applicable to all in any situation, and those affected by emergencies are no exception, even during conflicts and disasters of natural origin. It supports knowledge-based practices on prevention, preparedness, and mitigation in response to the deleterious impacts of climate change and environmental degradation (ASEAN Safe Schools Initiative, 2015).

The twenty-first century is confronted with various environmental challenges and hazard threats such as global warming, climate change, and natural disaster, to name a few.

Although greenhouse gas emissions are projected to drop about 6 percent in 2020 due to travel bans and economic slowdowns resulting from the COVID-19 pandemic, this improvement is only temporary. Climate change is not on pause. Once the global economy begins to recover from the pandemic, emissions are expected to return to higher levels.

Climate change is affecting every country on every continent. It is disrupting national economies and affecting lives. Weather patterns are changing, sea levels are rising, and weather events are becoming more extreme, SDG (2016-2030).

The Paris Agreement, adopted in 2015, aims to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels. The agreement also aims to strengthen the ability of countries to deal with the impacts of climate change through appropriate financial flows, a new technology framework, and an enhanced capacity-building framework.

Disaster Reduction (United Nations International Strategy for Disaster Reduction or UNISDR) system builds on partnerships and takes a global approach to disaster reduction, seeking to involve every individual and community in moving towards the goals of reducing loss of lives, socio-economic setbacks, and environmental damage caused by natural hazards.



An increase in human casualties and property damage caused by disasters in the 1980s motivated the United Nations General Assembly (UNGA) in 1989 to declare the 1990s the International Decade for Natural Disaster Reduction (IDNDR) (Resolution 44/236). The aim of this resolution was to address disaster prevention in the context of a range of hazards, including: earthquakes, windstorms, tsunamis, floods, landslides, volcanic eruptions, wildfires, grasshopper and locust infestations, and drought and desertification.

Disasters are a concern of almost all countries and are growing in terms of people affected and economic losses. The number, scale, and cost of disasters are increasing mainly as a consequence of growing populations, environmental degradation, unplanned settlements, expanding and ageing infrastructure, growing assets at risk, and more complex societies (UN, 2009). Thus, in this scenario, to avoid and prevent the increasing impacts of a disaster, proper implementation of precautionary measures must be done to avoid hazards and mitigate the potential impacts by reducing vulnerabilities and exposure and enhancing the capacities of communities, as elaborated in the National Disaster Risk Reduction Management Plan (NDRRMP).

Sustainable Development Goals (2016-2030) mandates that a successful development agenda requires inclusive partnerships — at the global, regional, national, and local levels — built upon principles and values and upon a shared vision and shared goals placing people and the planet at the center.

In the time of a pandemic or a disaster, evidence revealed that strong international cooperation is needed to ensure that countries have the means to recover from the pandemic or a disaster, build back better and achieve the Sustainable Development Goals (SDG). From a global and international perspective down to the regional and local level, strong partnerships are evidence of helping a better and more resilient community.

In 2013, Typhoon Haiyan (locally known as Typhoon Yolanda), one of the deadliest disasters to strike the Philippines, affected 26 million people and claimed at least 8,000 lives. Rising sea levels are also a direct threat to approximately 70 percent of the Philippine population, which has forced many to relocate as a result. In addition, climate change has also increased the severity and frequency of natural disasters in the country.

In October 2015, the Disaster Risk Reduction Management Office (DRRMO) was elevated to a Disaster Risk Reduction Management Service, which is granted equal authority with other offices in DepEd, i.e., hiring full-time regular staff to carry out its roles and functions. With the elevation of the DRRMO to a Service, the post of a designated Focal Point in the regions and divisions has been replaced with a regular-hired DRRM Coordinator. The process of hiring regular staff (17 Coordinators for the regions and 221 for the divisions) has been ongoing at all levels.

Along with its program to narrow down the general disaster preparedness management endeavors DepEd initiated the institutionalization of the Disaster Risk Reduction and Management Coordination and Information Management Protocol system (DO. No. 21 s.2015) with R.A. no. 10121 and DepEd Order no. 50, s. 2011 as its legal framework.

Pursuant to Republic Act (R.A.) No. 10121, entitled The Philippine Disaster Risk Reduction and Management Act of 2010, mandates all national government agencies to institutionalize policies, structures, coordination mechanisms, and programs with continuing budget appropriation on Disaster Risk Reduction and Management (DRRM) from national to local levels and DepEd Order No. 50, s. 2011, entitled Creation of Disaster Risk Reduction and Management Office (DRRMO). The creation of DRRMO mandates the said office to initiate and spearhead the establishment of mechanisms that prepare, guarantee protection, and increase resiliency of the Department of Education (DepEd) constituents in the face of disaster. The DepEd issues the Coordination and Information Management Protocols for the schools, Schools Divisions Offices (SDOs), and Regional Offices (ROs) and coordinators to establish the system of coordination and information management and provide guidance to DepEd Field Offices, Schools, and DRRM coordinators on their respective roles and functions relative to DRRM implementation.

This Protocol, as well as the roles and responsibilities of the DepEd Regions, School Divisions, and Schools, including the DRRM coordinators, are being articulated by the following objectives: 1) provide guidance to regions and schools divisions, including DRRM coordinators, on how to act before, during and after disasters; 2) capacitate the DRRMO coordinators and other DepEd constituents to disasters and emergencies; and, 3) facilitate immediate and efficient information flow during disasters and emergencies.

The Coordination Protocol provides the basis for and directs which office should respond depending on the extent of a disaster/emergency. On the other hand, the Information Management Protocol (IMP) demonstrates the proper flow of data from schools to the central office and vice versa. The roles and responsibilities of Regional Offices (RO) and Schools Division Offices

(SDO) in DRRM are guided by the provisions from the National Disaster Risk Reduction and Management (NDRRM) Plan 2011-2028 and RA No. 9155 or Governance of Basic Education Act of 2011.

To further supplement the guidelines in properly carrying out the DRRM framework, DepEd issued Department of Education (DepEd) Order 37, s. 2015, known as the Comprehensive Disaster Risk Reduction and Management (DRRM) in Basic Education Framework to guide DRRM efforts in the basic education sector towards resilience-building in offices and schools and to ensure that quality education is continuously provided and prioritized even during disasters and/or emergencies. This Framework shall institutionalize DRRM structures, systems, protocols, and practices in DepEd offices and schools. Further, this shall provide a common understanding and language in the implementation of DRRM in basic education at all levels.

Since 2007, the Philippines Department of Education (DepEd) has started to mainstream disaster risk reduction into the education sector. DepEd issued a policy, DepEd Order no. 55, that prioritizes the mainstreaming of disaster risk reduction in the school system. A Disaster Risk Reduction Resource Manual was developed for school administrators, principals, supervisors, and teachers on the implementation of disaster risk reduction projects. To make coordination easy, every school designated its DRRM coordinator to assess, plan, carry out and coordinate with the community partners and the higher offices regarding concerns relating to disaster and risk reduction.

The following are other key policies related to school safety that have been issued: 1) Disaster Preparedness Measures for Schools Department Order (DO) 83, s. 2011; 2) Guidelines on the Use of the Quick Response Fund Department Memorandum (DM) 104, s. 2011 – that can be used by disaster-affected schools; 3) Enforcement of support to implement grant calamity loans to teaching and non-teaching staff in areas affected by calamities Department Order (DO) 10, s. 2011; 4) Quarterly conduct of the National School-based Earthquake and Fire Drills Department Order (DO) 48, s. 2012; 5) Continuing Fire Safety and Awareness Program (FSAP) in Schools Department Order (DO) 72, s. 2012; 6) Integration of disaster risk reduction in the data collection forms incorporated in the Enhanced Basic Education Information System (EBEIS) Department Order (DO) 23, s. 2014; 7) Guidelines on Student-Led School Watching and Hazard Mapping Department Order (DO) 23, s. 2015; 8) Promoting Family Earthquake Preparedness to all elementary and secondary schools with instruction and guidance Department Order (DO) 27, s. 2015; and 9) Comprehensive Disaster Risk Reduction and Management in Basic Education Framework Department Order (DO) 37, s. 2015.

Schools are mandated to form a School Disaster Risk Reduction Management team, which is headed by a designated coordinator. The Disaster Risk Reduction Management (DRRM) Team and Coordinator are expected to: ensure the establishment of an early warning system for the school, conduct annual student-led risk identification and mapping within and around the school premises, plan and implement disaster preparedness measures, maintain the safekeeping of vital school records and learning materials, track all school personnel during disasters, conduct damage assessments, facilitate the immediate resumption of classes, and monitor recovery and rehabilitation interventions being implemented in the school, among other roles and responsibilities.

The School Improvement Plan (SIP), formulated in collaboration with the community, is a roadmap that lays down the school's specific solutions to corresponding identified priority improvement areas covering a period of three years. The SIP is the basis for the school's Annual Implementation Plan. United Nations Children's Fund (UNICEF) worked with DepEd to enhance the disaster risk reduction component in the school improvement planning process. Over 200 schools in Asia were trained. The revised SIP guidelines embrace child-centered and child-friendly approaches as its core planning principles and encourage schools to conduct evidence-based planning through more comprehensive data collection and analysis of children's and communities' situations and needs (ASEAN Safe School Initiative).

The Philippine Government, International Non-government Organizations (INGOs), and local NGOs are all making attempts to address the impact of disasters and climate change at various levels. The Philippine Government has made significant strides in the implementation of disaster risk reduction (DRR) planning and activities through the development of the National Disaster Risk Reduction and Management Council (NDRRMC), which acts as the lead agency for DRR in the Philippines. The disaster focal points are the NDRRMC and the Office of Civil Defense (OCD). The Department of Social Welfare and Development (DSWD) is responsible for leading immediate disaster relief efforts.

The Armed Forces of the Philippines (AFP) is a primary responder in disasters and have been deployed frequently to several disaster relief operations in the country in recent years. The Philippines has endured disasters that involve national and international assistance. There is increased awareness of disaster risk reduction in the Philippines, but proper integration with climate change adaptation and sustainable development policies can be improved. Disaster risk reduction management and climate change adaptation have been integrated into various plans and frameworks; however, multiple plans can be overwhelming for local government units. The Philippine Government has learned from Typhoon Haiyan that risk communication is essential and through

the NDRRMC has issued very specific warnings regarding potential storm impacts as a result (Philippines: Disaster Management Reference Handbook, March 2018).

### **2.8 Disaster Risk Reduction Programs**

The United Nations Disaster Risk Reduction (UNISDRR), 2009 was created in response to the calling of the Hyogo Framework of Actions (HFA) 2005-2015: "Building the Resilience for Nations and Communities to Disasters". This international framework on disaster risk reduction was established to facilitate the implementation of the International Strategy for Disaster Reduction (ISDR). The International Strategy for Disaster Reduction (ISDR) is a system partnership with the overall objective to generate and support a global disaster risk reduction movement to implement Hyogo Framework for Actions (HFA) which was endorsed by the World Conference on Disaster Risk Reduction in 2004 and by UN-General Assembly. The ISDR functioned as the focal point in the United Nations system for the coordination of disaster risk reduction and ensured the synergies being the overall framework for implementing disaster risk reduction policies and programs. The goal of the Office of the UNISDRR (2009) is to put emphasis on the strengthening of the United Nations system to assist disaster-prone developing countries with disaster risk reduction initiatives as well as to support States' own efforts with technical assistance and capacity development.

Meanwhile, along with the creation of ISDR is the establishment of The Food and Agricultural Organizations (FAO) of the United Nations endorsed by the UNISDRR (2009) Secretariat. The FAO acts as a neutral forum where all nations meet as equals to negotiate agreements and debate policies concerning disaster risk reduction policies and programs of member countries.

The goals of the UNISDR (2009) include the following: a) to lead the international efforts to defeat hunger by serving both the developed and developing countries in the world; and b) to help countries prevent, mitigate, prepare for and respond to food and agricultural threats and emergencies.

The UNISDR (2009) has the following targets and programs for disaster risk reduction such as: a) strengthening disaster preparedness and the ability to mitigate the impact of emergencies that affect food security and the productive capacities of rural populations; b) forecasting and providing early warning of adverse conditions in the food and agricultural sectors, and of impending food emergencies including monitoring of plant and animal pests and diseases; c) assessing needs and formulating programs for agricultural relief and rehabilitation, facilitating the transition and linkages between emergency relief, recovery, and development intervention of food and agriculture; d) reducing vulnerability and enhancing resilience by strengthening local capacities and coping mechanisms for disaster risk reduction by guiding the choice of agricultural practices, technologies and support services.

Furthermore, the UNISDR (2009) has formulated the following international policies and programs in risk reduction such as: a) identifies outcomes related to disaster preparedness, prevention and mitigation, emergency response and rehabilitation, and transition and linkages to development as the focus for results and interdisciplinary action; b) mainstream risk reduction emergency, rehabilitation and development projects and programs; and c) provide the technical and operational support system on risk reduction projects and programs.

In summary, the following are the key functions of the UNISDR (2009) corresponding to the Hyogo Framework for Actions (HFA) such as: a) Making disaster risk reduction a policy, priority institutional strengthening; b) Risk assessment and early warning; c) Education, Information and Public Awareness; d) Reducing underlying factors in the food, agricultural, fisheries, and forestry sectors; and e) Preparedness for effective response.

In response to the Hyogo Declaration and the implementation of the Hyogo Framework for Actions (HFA), the Association of Southeast Asian Nations Agreement on Disaster Management and Emergency Response (AADMER) was revitalized. The global call on disaster risk reduction emphasizes the Asia-Pacific region, specifically the Philippines, as the most disaster-prone country in the world.

The endorsement of the United Nations General Assembly (UNGA) through Resolution 59/279 on January 19, 2005, revitalized the Association of Southeast Asian Nations Agreement on Disaster Management and Emergency Response (AADMER) which was created in 1967. The AADMER has its primary goal such as to strengthen emergency relief, rehabilitation, reconstruction, and prevention in the aftermath of the Indian Ocean tsunami disaster. Through the United Nations General Assembly (UNGA) Resolution 57/578 on December 10, 2002, which, *inter alia*, encourages the strengthening of cooperation among States at the regional and sub-regional levels in the field of disaster preparedness and response with particular respect to capacity building at all levels.

Furthermore, The Association of Southeast Asian Nations Agreement on Disaster Management and Emergency Response (AADMER) was determined to give effect to the ASEAN Regional Program on Disaster Management 2004-2010 which calls for the implementation of various project proposals and priority project proposals, including the establishment of an ASEAN Response

Action Plan. Data reveals that AADMER is one of the most ambitious and comprehensive regional DRM treaties in the world due to the fact that the treaty has to deal with the diverse region such as Southeast Asia, which is mostly characterized by a multi-layered and complex process of disaster reduction management capacity building such as: ASEAN and member states have the opportunity to build a unique regional DRM system that is tailored to the needs of ASEAN member states and the people of Southeast Asia and to significantly reduce disaster losses.

In the Philippines, the legal bases of disaster risk reduction and management system are the Presidential Decree (PD) No. 1, s.1872, as implemented by Presidential Letter of Implementation No. 19 s. 1972, and Presidential Decree No. 1566 dated June 11, 1978. PD No. 1 was the Integrated Reorganization Plan of 1972, which was implemented through Letter of Instruction (LOI) No. 19. The LOI defined, among others, the organization, mission, and function of the Office of Civil Defense. PD No. 1566, on the other hand, provided for the strengthening of the Philippine disaster control capability and establishing the community disaster preparedness program nationwide.

Pursuant to Republic Act (R.A.) No. 10121, entitled The Philippine Disaster Risk Reduction and Management Act of 2010, mandates all national government agencies to institutionalize policies, structures, coordination mechanisms, and programs with continuing budget appropriation on Disaster Risk Reduction and Management (DRRM) from national to local levels and DepEd Order No. 50, s. 2011, entitled Creation of Disaster Risk Reduction and Management Office (DRRMO), which mandates the said office to initiate and spearhead the establishment of mechanisms that prepare, guarantee protection, and increase resiliency of the Department of Education (DepEd) constituents in the face of disaster, the DepEd issues the enclosed Coordination and Information Management Protocols for the schools, schools divisions offices (SDOs) and regional offices (ROs) and coordinators to establish the system of coordination and information management and provide guidance to DepEd field offices, schools and DRRM coordinators on their respective roles and functions relative to DRRM implementation.

The National Disaster Risk Reduction Management Council (NDRRMC), formerly known as the National Disaster Coordinating Council (NDCC), was created. This particular agency is tasked with overseeing the concerted efforts of national and local governments in relation to man-made disasters. The National Disaster Risk Reduction and Management Plan (NDRRMP) fulfills the requirement of RA No. 10121 of 2010, which provides the legal basis for policies, plans, and programs to deal with disasters. The NDRRMP covers four (4) thematic areas, namely; 1) *Disaster Prevention and Mitigation*. Prevention refers to the outright avoidance of adverse impacts of hazards and related disasters. It expresses the concept and intention to completely avoid potential adverse impacts through action taken in advances such as the construction of dams or embankments that eliminate flood risks, land-use regulations that do not permit any settlement in high-risk zones, and seismic engineering designs that ensure the survival and function of a critical building in any likely earthquake; while *mitigation* means the lessening or limitation of the adverse impacts of hazards and related disasters. Under the Philippine law, mitigation measures encompass engineering techniques and hazard-resistant construction as well as improved environmental policies and public awareness; 2) *Disaster Preparedness*. This pertains to the knowledge and capacities developed by governments, professional response and recovery organizations, communities, and individuals to effectively anticipate, respond to, and recover from the impacts of likely, imminent, or current hazard events or conditions. Preparedness action is carried out within the context of disaster risk reduction and management, which aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response to sustained recovery. Preparedness shall be based on a sound analysis of disaster risk and good linkages with early warning systems and includes such activities as contingency planning, stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation, and public information and associated training and field exercises. These must be supported by formal institutional, legal, and budgetary capacities; 3) *Disaster Response*. It means the provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected. Disaster response is predominantly focused on immediate and short-term needs and is sometimes called "disaster relief"; and (4) *Disaster Rehabilitation and Recovery*, which correspond to the structure of the National Disaster Risk Reduction and Management Council.

Furthermore, The Municipal Disaster Risk Reduction and Management Council (MDRRMC) was created pursuant to the Republic Act (RA) 10121, which is otherwise known as an "Act Strengthening the Philippine Disaster Risk Reduction and Management System, Providing for the National Disaster Risk Reduction and Management Framework and Institutionalizing the National Disaster Risk Reduction and Management Plan, Appropriating Funds Therefore and for Other Purposes". Section 3. Declaration of Policy states to: uphold the people's constitutional rights to life and property by addressing the root causes of vulnerabilities to disasters, strengthening the country's institutional capacity for disaster risk reduction and management, and building the resilience of local communities to disasters including climate change impacts.

Reflective further, in the Section 3 Declaration of Policy, the MDRRMC shall adopt and implement a coherent, comprehensive, integrated, efficient, and responsive disaster risk reduction program incorporated in the development plan at various levels of

government, adhering to the principles of good governance such as transparency and accountability within the context of poverty alleviation and environmental protection. In Section 4 -Scope of Application. The MDRRMC is mandated to create and coordinate with the Community-Based Disaster Risk Reduction and Management or CBDRRM. The CBDRRM is a process of disaster risk reduction and management in which at-risk communities are actively engaged in the identification, analysis, treatment, monitoring, and evaluation of disaster risks in order to reduce their vulnerabilities and enhance their capacities where the people are at the heart of decision-making and implementation of disaster risk reduction and management activities.

Moreover, Section 3. Powers and Functions. The MDRRM is mandated to develop a Municipal Disaster Risk Reduction and Management Framework, which shall provide for a comprehensive, all-hazards, multi-sectoral, inter-agency, and community-based approach to disaster risk reduction and management. The Framework shall serve as the principal guide to disaster risk reduction and management efforts in the country and shall be reviewed on a five (5) year interval, or as may be deemed necessary, in order to ensure its relevance to the times.

### **3. Methodology**

The study aimed to determine the disaster preparedness and resiliency among island schools-communities in the Municipality of Concepcion, Province of Iloilo, Philippines, with the end goal of developing a disaster preparedness training program.

The study involved 151 respondents from the twenty-three (23) island schools in the Municipality of Concepcion, Iloilo. The respondents were residents of the eleven (11) island barangays as the home of the twenty-three island schools as the study sites. They were identified through quota sampling. Quota sampling means taking a very tailored sample that's in proportion to some characteristic or trait of a population (Creswell, 2002). The quota sampling technique employed in the study aimed to make the research population of all age groups represented.

In this study, the quota sampling sample includes the following: One (1) School Administrator, One (1) Punong Barangay, One (1) Community-Based DRRM officer, One (1) student, One (1) School's DRRM coordinator, One (1) PTA President (if absent, Barangay Tanod or Barangay Health Worker), One (1) Barangay Official, and One (1) Parent from each of the island school community.

For every school community, there were seven (7) participants coming from the aforementioned groups. However, in the case of primary schools, there were only six (6) respondents as primary pupils may not be able to intelligently answer the questions.

This investigation employed a descriptive research design. Creswell (2005) states that descriptive research involves the identification of attributes of a particular phenomenon based on an observational basis or the exploration of the correlation between two or more phenomena. Descriptive research is a non-experimental research design. Non-experimental research designs embody a group of techniques used to conduct quantitative research where there is no manipulation done to any variable in the study. In other words, variables are measured as they occur naturally, without the interference of any kind by the researcher (Mertler, 2014). The descriptive results of the study were made as the bases of the training program, and also some ideas adopted from the Dep Ed Disaster Risk Reduction Manual (2018) helped in assisting and interpreting the findings of a primary quantitative study.

Further, in descriptive research, the investigator is simply studying the phenomenon of interest as it exists naturally; no attempt is made to manipulate the individuals, conditions, or events. Thus, descriptive research can answer what, where, when, and how questions, but not the why questions (Mertler, 2014).

Specifically, the survey method was used in the study. Fraenkel et al. (2012) state that the central purpose of a survey method is to describe the characteristics of a group or population. It is primarily a quantitative research technique in which the researcher administers some sort of survey or questionnaire. In this study, the researcher-made questionnaire was utilized to collect and analyze data and information about the respondent's profile, shared activity systems, level of disaster preparedness, level of resiliency, and priority initiatives for a disaster training program of the island schools-communities in the Municipality of Concepcion, Iloilo. Further, an interview with the participants using the semi-structured interview guide (McNamara, 2010) was conducted to supplement and validate the quantitative data of the study.

A validated instrument, composed of five parts, was used to gather the data. Part One is on the personal information of the respondent. Part Two is a checklist of the DRRM and DepEd shared activity systems. Part Three is Disaster Preparedness Checklist. Part Four is Resiliency Questionnaire, and Part Five is the DRRM Priority Initiatives for a Disaster Training Program.

Permission to conduct the study was sought from the Office of the Municipal Disaster Risk Reduction Management (MDRRMO), Office of the Municipal Mayor, Office of the District Supervisor, District of Concepcion (DepEd), and the Office of the ABC President (Punong Barangay) in the Municipality of Concepcion, Province of Iloilo, Philippines.

Accomplished data-gathering instruments were collected and checked for completeness of data. The questionnaires were scored, statistically computed, analyzed, and processed using the Statistical Package for Social Sciences (SPSS).

The One-way Analysis of variance was used to compare three or more groups of sample data. The one-way analysis of variance is a useful tool that helps the user to identify sources of variability from one or more potential sources. It is a parametric test that allows the researcher to test the effect of various variables such as type of school, school population, and school location. While the Kolmogorov-Smirnov was used to test the normality of the responses, and the result shows that there is a normal distribution among the responses of the respondents.

The data were subjected to appropriate descriptive and inferential statistics. All Statistical computations were computer-processed through the Statistical Package for Social Sciences (SPSS) software. The .05 alpha was set as a criterion for the acceptance or rejection of the null hypothesis.

#### 4. Results and Discussion

The level of disaster preparedness among island schools-communities taken as a whole is *highly prepared* ( $M = 4.03$ ,  $SD = .53$ ); By categories: a) Type of School: Primary ( $M = 3.83$ ,  $SD = .56$ ); Elementary ( $M = 4.16$ ,  $SD = .42$ ); Secondary School with Senior High School ( $M = 4.12$ ,  $SD = .69$ ); School Population: Big School ( $M = 4.12$ ,  $SD = .49$ ); Small School ( $M = 3.94$ ,  $SD = .56$ ); and School Location: Coastal ( $M = 4.07$ ,  $SD = .57$ ); Upland ( $M = 3.97$ ,  $SD = .46$ ). All these schools were described as *highly prepared*

The level of resiliency among island school-communities when taken as a whole, is *High* ( $M = 1.90$ ,  $SD = .60$ ). By categories: Primary ( $M = 1.92$ ,  $SD = .58$ ); Elementary ( $M = 1.88$ ,  $SD = .57$ ); Secondary with Senior High School ( $M = 1.93$ ,  $SD = .81$ ); School Population: Big School ( $M = 1.87$ ,  $SD = .60$ ); Small School ( $M = 1.94$ ,  $SD = .61$ ); and School Location: Coastal ( $M = 1.80$ ,  $SD = .52$ ); Upland ( $M = 2.10$ ,  $SD = .71$ ) were described as *High*.

Type of School (MC) = Significant difference existed ( $p = .001$ ). Post Hoc Analysis shows that a significant difference existed between Elementary and Primary schools ( $p = .002$ )

School population (D) = Significant difference in favor of Big Schools ( $p = .030$ ).

School Location (D) = No significant difference existed in the disaster preparedness of Upland and Coastal schools-communities ( $p = .274$ ).

Based on the findings, the following are the DRRM Priority Initiatives: Training on Awareness and Preparedness Measures for Schools; Awareness and Preparedness Training on Storm Surge (Daluyong), Tsunami and Typhoon; and Prepare Disaster/Survival Kits

#### 5. Conclusion

The study focused on ascertaining the island schools-communities shared activity systems on risk reduction management and determining the gaps and needs in disaster preparedness and resiliency building among the local residents. Results indicated that disaster risk reduction efforts and initiatives are widely mainstreamed and disseminated among the local government units, including island schools-communities. The existence of an organized community-based Disaster Risk Reduction Management (DRRM), as well as the school DRRM team, are clear manifestations of the presence of collaborative activities and undertakings among the different key agencies in charge of disaster preparedness in the area.

Moreover, the high level of preparedness and resiliency among island schools-communities are noteworthy. People are prepared and can readily recover from disaster situations and live normally despite the damages brought about by disasters. Likewise, it has been observed that island dwellers have the ability to translate ideas into commitments and commitments into actions alongside their application of indigenous knowledge in order to survive on the islands. Their coping and survival skills are probably well-developed more so that their environmental and climatic conditions basically determine their day-to-day activities.

However, with the dynamic and unpredictable nature of natural disasters, individuals and communities must continually strive to develop and improve preparedness in order to meet future challenges. Thus, as an output of the study, a disaster preparedness training program was developed even as this highlights the significant role of island schools in building partnerships with the community in relation to disaster preparedness and risk reduction. This includes initiatives for a collaborative effort on the part of concerned agencies and entities to ensure sustainable and adequate food and water supply in times of disasters.

Consequently, as this paper attempted to cover a comprehensive social infrastructure community map in relation to disaster risk preparedness, it did not delve into gender differences and sectoral aspects of the population such as women groups, youth, and

senior citizens, which may be included for future research. Also, a mapping of the island-school community social supports to exploit the contributions of other moving social arms as variables of the study may lead to a better understanding of community life as the basis for more evidence-based programs and interventions.

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**Conflicts of Interest:** The author would like to declare that there is no conflict of interest in the study.

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