Climate Change Adaptation, Disaster Risk Reduction Management (DRRM) and Resiliency of Secondary School Teachers: Basis for Integrated School Disaster Plan

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Abstract: Disaster risk reduction management has been integrated into all schools to ensure that students and teachers are prepared in the event of a disaster or hazard.This study aimed to determine the extent of climate change adaptation, disaster risk reduction management practices, and resiliency of secondary school teachers in Sto. Nio. The study utilized a descriptive and correlational design. The needed data were gathered using the survey questionnaire. The respondents were secondary school teachers. Mean and Pearson were used as statistical tools.

The findings revealed that secondary school teachers' level of climate change adaptation was very satisfactory. The disaster risk reduction management practices of secondary school teachers were also very satisfactory. Secondary school teachers' resiliency in terms of absorptive and anticipatory capacity was rated very satisfactory, while transformative capacity was rated satisfactory. There is a link between climate change adaptation and secondary school teachers' resilience. The disaster risk reduction management practices and the resiliency of secondary school teachers were significantly related. Teachers who are climate change adaptive minimize the negative effects of climate change while seizing any new opportunities that may arise. Moreover, teachers were focused on determining the areas of their schools that were at risk of or vulnerable to certain calamities. The secondary teachers engaged in an acceptable practice of eradicating disaster risk through mitigation. Teachers must provide adequate knowledge on the various types of disasters that are likely to occur and ways to protect against them by incorporating them into their curriculum.

Keywords: Climate Change Adaptation, Disaster Risk Reduction Management, Resiliency

1. Main text

Introduction

The Philippines is one of the countries around the world often experiencing disasters such as earthquake, volcanic eruption, typhoon, tsunami, drought, and flooding among others. Over the past two decades, the Philippines endured 274 natural calamities, making it the fourth most disaster-prone country in the world. The country is highly exposed to natural hazards because it lies along the Pacific Typhoon Belt and is within the Pacific Ring of Fire. The risk is compounded by uncontrolled settlement in hazard-prone areas, high poverty rate, failure to

implement building codes and construction standards, and the degradation of forests and coastal resources, among others.

In terms of disaster risk, Philippines ranked third among all of the countries with the highest risks worldwide according to the World Risk Report 2018, with index value of 25.14% (World Economic Forum, 2018). At least 60% of the country's total land area is exposed to multiple hazards, and 74% of the population is susceptible to their impact. This is largely due to the location and geographical context as the risk involving coastal hazards such as typhoons, storm surges and rising sea levels is high (OCHA, 2019).

Complex environmental conditions including the unfolding of diverse and widespread climatic changes, environmental degradation and increasing threats of disasters – pose formidable challenges to present and future generations of children and to the achievement of their rights. Climate change adaptation is the adjustment in natural or human systems to actual or expected climatic stimuli or their effects; it moderates harm or exploits beneficial opportunities. Climate change adaptation and disaster risk reduction seek to manage uncertainty, reduce vulnerabilities and build resilience for communities at risk.

Disaster risk reduction is a goal of every nation during a disaster/calamity. It is the analysis and practices of every country to reduce the casualties during calamity. These management procedures and practices aimed to lessen the amount of possible casualty whenever a disaster happens (Doroteo, 2015). The disaster risk reduction management has been integrated in all schools to ensure readiness of the learners and teachers in case of disasters and hazards. In school learners and teachers are able to engage in different activities to remind everyone of the importance of being prepared in all types of disasters.

The present situations on earthquake calamity that strike nearby provinces such as Cotabato and Davao are very alarming. Tremors are countless and risks are unpredictable. Vulnerability can be seen among affected individuals. School buildings, houses, roads and other structures were damaged and lots of life was lost. If people learn how to adapt with climate change such as buildings structures should designed to resist earthquakes, homes are built away from fault lines, then this kind of disasters could be lessen its damages (Balistoy, 2019).

In the case, disaster risk practices and preparedness as well as their resilience capacity need to be effectively evaluated and religiously practiced. During the early stricken of disasters in the locality, lots of lives were lost due to lack of preparedness and practice. As per observations, students' were directly went out of the building while tremors are ongoing. If they are equipped with disaster preparedness, this could be prevented. In times of disaster risk drill, there are students who are not seriously doing the drill. The awareness and preparedness as well as correct practices during disaster risk practices are very lax.

Through this study, the researcher will be able to determine the climate change adaptation, practices of the disaster risk and reduction management, as well as building resiliency among secondary schools. The researcher is investigating this study to strengthen the school practices and better prepared in times of disasters that will happen.

Conceptual Framework

This study was anchored to the concepts of climate change adaptation, disaster risk reduction management and resilience capacity. Climate change adaptation is practical steps to protect schools and communities from the likely disruption and damage that will result from effects of climate change. Climate change adaptation is an adjustment in natural or human systems to actual or expected climatic stimuli or their effects, in order to moderate harm or exploit beneficial opportunities (Moller, 2016).

Increasing disaster resilience is a domineering that requires the collective will of the local area and its communities. Although disasters will continue to occur, actions that move the locality from reactive approaches to disasters to a proactive stance where communities actively engage in enhancing resilience will reduce many of the broad societal and economic burdens that disasters can cause (Disaster Resilience: A National Imperative, 2012).

In the course of this study, the conceptual framework will focus on the climate change adaptation, disaster risk and reduction management practices and resilience capacity of secondary schools. The independent variables are climate change adaptation and disasters and risk reduction practices.

The climate change adaptation includes adaptive capacity integrating DRRM, and coping capacity. The disaster risk reduction management practices will be discussed through its vulnerability assessment, mitigation, and disaster response management, partnership with municipal government units and sustainability and training. The dependent variable presents through absorptive capacity, anticipatory capacity and transformative capacity. The paradigm is also discusses the interrelationship of these identified variables. The schematic diagram showing the conceptual framework employed in this study is shown in Figure 1.

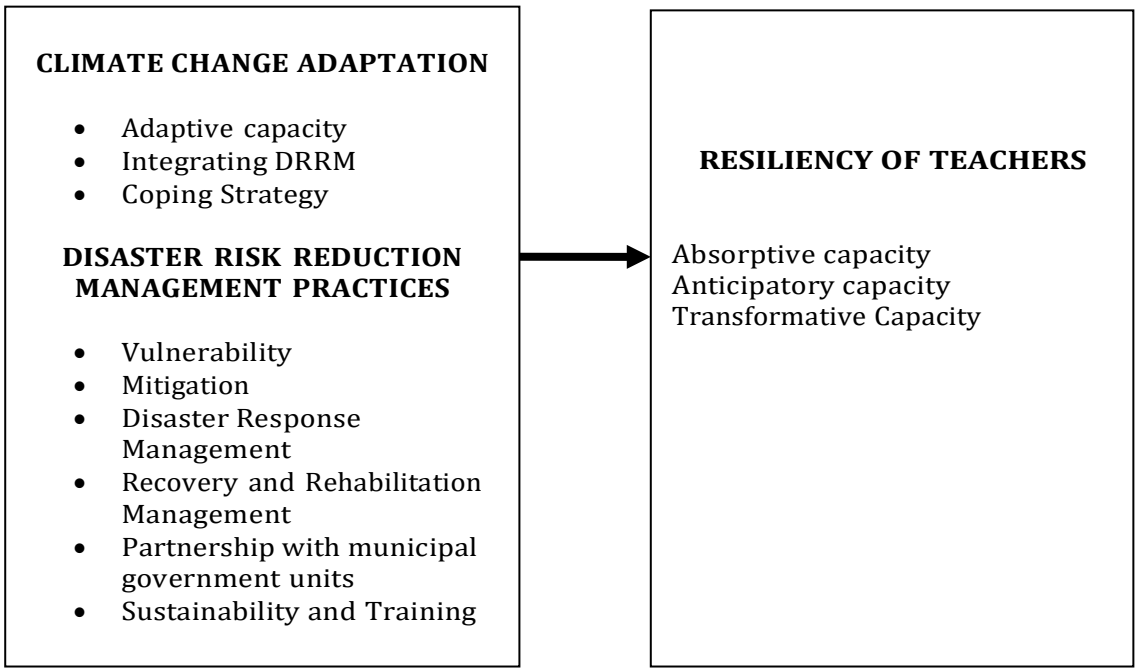

Figure 1. Research Paradig

Statement of the Problem

This study aimed to determine the extent of climate change adaptation, disaster risk reduction management practices and resiliency of secondary school teachers in Sto. Niño.

Specifically, it sought to answer the following questions.

1. What is the extent of climate change adaptation of secondary school teachers' terms of:
   1.1 Adaptive capacity
   1.2 Integrating DRRM, and
   1.3 Coping Strategy?
2. What is the extent of the disaster risk reduction management practices of the secondary school teachers in terms of:

2.1 Vulnerability;
2.2 Mitigation;
2.3 Disaster Response Management;
2.4 Recovery and Rehabilitation Management;
2.5 Partnership with municipal government units; and
2.6 Sustainability and Training?

3. What is the extent of resiliency of the secondary school teachers in terms of:
3.1 Absorptive capacity;
3.2 Anticipatory capacity and
3.3 Transformative Capacity?

4. Is there a significant relationship between the climate change adaptation and the resiliency of secondary school teachers?

5. Is there a significant relationship on the disaster risk reduction management practices and resiliency of secondary school teachers?

METHODOLOGY

Research Design

The study utilized the descriptive and correlational design. The needed data were gathered using the survey questionnaire. Eventually, the gathered data were organized in tabular form, analysed and was described according to appropriate scale. Possible relationships among variables were determined. This study was conducted in all secondary schools at Sto. Nino District, Province of South Cotabato. The biggest secondary school is situated at the Poblacion of the municipality. Other secondary schools are situated in some Barangays. The respondents of the study were teachers among the secondary schools of Sto. Niño. The researcher utilized 59 teachers that served as the respondents of the study.

This research study employed the total sampling technique to determine the sample respondents to participate in data gathering. Using the total sampling, the researcher included all teachers in SHS. Total population sampling is a type of purposive sampling technique that involves examining the entire population that have a particular set of characteristics.

The research questionnaire on the climate change adaptation was formulated by the researcher and undergone content validity and reliability test. It was validated by panel of experts in DRRM such as School Principal, DRRM Focal Persons and Master Teachers. Each sub indicator composed of six (6) statements. It used the following 5-Likert scale such as 5-Execellent, 4-Very Satisfactory, 3-Satisfactory, 2-Unsatisfactory and 1-Poor.

The research questionnaire was adapted from the study of Campilla (2016). Every sub indicator composed of eight (8) statements. It used the following 5-Likert scale such as 5-Excellent, 4-Very Satisfactory, 3- Satisfactory, 2-Unsatisfactory and 1-Poor.

The research questionnaire was adapted from the study of Castillo (2016) and Bahadur (2016). Every sub indicator composed of eight (8) statements. It used the following 5-Likert scale such as 5-Excellent, 4-Very Satisfactory, 3- Satisfactory, 2-Unsatisfactory and 1-Poor.

The data collected was summarized and tabulated. Mean was used to determine the level of climate change adaptation, practices on disaster risk reduction management and resiliency of secondary school teachers. Pearson r was utilized to find out the relationship between the climate change adaptation and resiliency as well as practices on disaster risk reduction management and resiliency.

RESULTS AND DISCUSSIONS

Level of Climate Change Adaptation of Secondary School Teachers

When taken as a whole, the overall mean of adaptive capacity was 3.51 describe as very satisfactory. This means that the teachers change adaptation to climate change was acceptable by probing enough capacities that was adaptive to the given situation. The result implies that the climate change adaptation was highly effective to mitigate vulnerabilities and disasters in the locality. Furthermore, being adaptive to the climate change minimize the negative effects of climate change while seizing any new possibilities that may arise. It entails modifying strategies and tactics in response to current or anticipated climatic changes. Effective knowledge management, along with the participation the public and private sectors, civil society, and other relevant stakeholders, are all necessary for successful adaptation. Governments alone cannot achieve this goal. Adaptation to the effects of climate change can be done at different levels, in different industries, and across different geographic areas.

The result of the teachers' change adaptation relative to integrating DRRM has the overall mean of 3.94 describe as very satisfactory. The consistent ratings for all indicators substantiate the overall result. This means that the teachers change adaptation to climate change was acceptable by integrating the DRRM in adopting certain climate change in the locality. The result implies that integrating DRRM could help improve the adaptation strategy and minimize the effect of climate change. Climate change adaptation and disaster risk reduction initiatives are effective vehicles for transformational change. Although there are numerous differences between the two domains, transformative processes have two things in common: vulnerability and the function of individuals and communities as agents of personal and societal change. Transformational techniques, which create a shared vision and routes to realize it, improve the integration of disaster risk reduction and climate change adaptation on the local level.

The teachers' climate change adaptation relative to coping strategy has the overall mean of 3.40 describe as very satisfactory. This means that teachers' climate change adaptation was acceptable by practicing the different coping strategy. The result implies that teachers were consistent and have adulate preparations to improve the climate change adaptations. Take environmentally friendly actions which is a powerful way to manage and reduce the anxiety; adopt a problem-solving attitude; cognitive re-structuring or reframing; seeking out social support; becoming more aware of the issue; and expressive coping are some examples of climate change coping strategies.

Disaster Risk Reduction Management Practices of Secondary School Teachers

The vulnerability of disaster as identified by the teachers was rated very satisfactory with mean of 3.50. This means that the teachers were focused in determining the areas with their schools that have risks or vulnerable to some calamities. This implies that schools were prepared by identifying and preparing for any hazards and disasters. The teachers integrated the practices to reduce vulnerability like putting hazard maps indicating areas vulnerable to earthquake, floods and landslides. The risks of vulnerabilities of disasters were thoroughly explained and contingences were identified.

The level of disaster risk reduction management practices of secondary school teachers in terms of mitigation was 3.61 describe as very satisfactory. This means that the secondary teachers engaged in acceptable practice of eradicating disaster risk through mitigation. Mitigation is persistent effort that lowers or eliminates long-term risk from natural hazards and their effects to people and property. The continual endeavor to decrease the effects of disasters on our families, homes, communities, and economy is described at the federal, state, local, and individual levels.

Moreover, the level of disaster risk reduction management practices of secondary school teachers in terms of disaster response management was 3.65 describe as very satisfactory. This means that the disaster response management of teachers was effective to reduce risk in times of disasters that may happen. Teachers are very important in the classroom, especially when it comes to disaster education. The function of human resources in educational planning is crucial. Teachers are valuable human resources in the planning of education, and it is vital to routinely assess their knowledge and abilities.

On the other hand, the level of disaster risk reduction management practices of secondary school teachers in terms of rehabilitation management. Taken as a whole, the mean of rehabilitation management was 3.43 describe as very satisfactory. The result indicates that teacher practices to lower the effect of disasters was effective however, it reflects that not all of them work on rehabilitation to help reduce the impact. The easiest areas to foster a disaster-resistant culture in society are in schools. As a result, teachers increase their degree of preparedness for crisis management and develop practices for preparation in times of disasters and crisis. Integration of resources generation to sustain the preparedness in terms of materials is important.

The disaster risk reduction management practices of secondary school teachers in terms of partnership with municipal government units has a mean of 3.81 describe as very satisfactory. The result indicates that the secondary school teachers initiated their practices to mitigate the disasters by tapping the support of the local government. This implies that school's disasters' management practices were communicated to the municipal disaster and management unit for proper program and projects implementation. It is possible to attain this goal by combining improved knowledge and capacities, mainstreaming into development plans and programs, and creating institutional processes through monitoring, evaluating, and improving the process.

The level of disaster risk reduction management practices of secondary school teachers in terms of sustainability and training has a mean of 3.61 describe as very satisfactory. This means that the secondary school teachers' practices to mitigate the risks of disasters was through sustainability of the programs and consistent training to the students and teachers as well in becoming a well-prepared and ready for whatever happens. Numerous teachers are impacted by the effects of natural disasters on the education sector since it disrupts their studies and drastically lowers educational quality. At the same time, education is being seen as being more crucial for risk reduction and enhancing people's ability to react to disasters.

Resiliency Level of Secondary School Teachers

The resiliency level of secondary school teachers in terms of absorptive capacity has mean of 3.44. This means that the secondary teachers have very satisfactory level of resiliency despite the natural and man-made disasters. They have identified intervention and coping ideas to be resilient and responded positively. Teachers that have a high potential for absorption have a mastery of prior knowledge about the subject matter, pedagogy, students, and the numerous artistic human relationships that are relevant to teaching the whole child. The potential of teachers must also include an openness to new knowledge, such as assessment data, tools, and techniques, as well as information on the daily issues influencing students' lives.

Likewise, the resiliency level of secondary school teachers in terms of anticipatory capacity was 3.40 as manifested in the result. The result indicates that the teachers involved in reducing mortality and the harmful social, economic, and physical repercussions of extreme weather and natural disasters. Teachers with strong anticipatory skills were involved in gathering and evaluating data to find new, emerging patterns, shifting situations, and underappreciated

developments that challenge preconceived notions and inspire fresh viewpoints, as well as new opportunities and disaster warnings.

The resiliency level of secondary school teachers in terms of transformative capacity was 3.37 as manifested in the result. The result indicates that the secondary teachers were satisfactorily developed their resiliency when it comes to transformative capacity. The capacity to work collaboratively together through processes of struggle transformation was acceptable ways to be resilient. Transformation entails significant adjustments to the underlying patterns that produce or amplify vulnerability and risk as well as the distribution of risk among societies and the global community. Another perspective is that transformation is about addressing the fundamental shortcomings in development or power disparities that create, maintain, or increase risk and poverty. Transformation involves addressing risk and vulnerability's structural or fundamental causes rather than its immediate or nearby sources.

Significant Relationship between the Climate Change Adaptation and the Resiliency Secondary School Teachers

The analysis of relationship between the climate change adaptation and the resiliency of secondary school teachers shows a significant relationship with t-computed value = 58.32 > t-critical value at 11.90 (p-value=0.018<0.05), thus null hypothesis was rejected. This means that the climate change adaption is dependent to the level of their resilience. Furthermore, the degree of climate change adaptation practiced by secondary school teachers depends to the factors of being resilient in times of disasters. The result implies that teachers were resilient while adapting the changes brought by climate change. Their practices were acceptable to mitigate climate change and vulnerabilities.

Significant Relationship on the Disaster Risk Reduction Management Practices and Resiliency of Secondary School Teachers

The analysis of relationship between the disaster risk reduction management practices and the resiliency of secondary school teachers shows a significant relationship with t-computed value = 40.19 > t-critical value at 15.00 (p-value=0.021<0.05), thus null hypothesis was rejected. This means that the disaster risk reduction management practices is dependent to the level of their resilience. Furthermore, the degree of disaster risk reduction management practices by secondary school teachers depends to the factors of being resilient in times of disasters. The result implies that when teachers foster resilience in times of calamities and disasters, they manifest evidences in practicing disaster risk reduction management. Thus, teachers possess the capacity to resist, absorb, accommodate, and recover from a hazard quickly and effectively, especially through the preservation and restoration of its fundamental structures and functions.

Conclusions

Teachers being adaptive to the climate change minimize the negative effects of climate change while seizing any new possibilities that may arise. Integrating DRRM could help improve the adaptation strategy and minimize the effect of climate change. Teachers were consistent and have adulate preparations to improve the climate change adaptations.

Moreover, teachers were focused in determining the areas with their schools that have risks or vulnerable to some calamities. The secondary teachers engaged in acceptable practice of eradicating disaster risk through mitigation. The disaster response management of teachers was effective to reduce risk in times of disasters that may happen. Teacher practices to lower the effect of disasters was effective however, it reflects that not all of them work on rehabilitation to help reduce the impact.

The secondary teachers have very satisfactory level of resiliency despite the natural and man-made disasters. They have identified intervention and coping ideas to be resilient and responded positively. They were also involved in reducing mortality and the harmful social, economic, and physical repercussions of extreme weather and natural disasters. They were satisfactorily developed their resiliency when it comes to transformative capacity. The capacity to work collaboratively together through processes of struggle transformation was acceptable ways to be resilient.

Recommendations

1. The school general must sustain the implementation of adaptations to mitigate climate change and create awareness for disasters and build a culture for resistance and resilience.
2. The teachers must provide adequate knowledge on various types of disasters likely to occur and the ways of protecting from them by mainstreaming the same in their curriculum.
3. The transformation capacity must be level up to design effective intervention and program implementation to ensure that school is ready for any types of disasters.

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