

Community Disaster Resiliency Management Programs of the Three Cities of the Province of Albay, Philippines

Cesar A. Arao

Department of Political Science, Bicol University
College of Social Sciences and Philosophy, Daraga, Albay
Correspondence: zhar_67@yahoo.com

Abstract

The study analyzed the community disaster resilience management programs of the cities of Legazpi, Tabaco, and Ligao in the province of Albay, Philippines with the following objectives: 1) examine the disaster risk reduction management (DRRM) project implemented by the three cities along governance, hazard and risk awareness, investment for resilience, and enhancing disaster preparedness for response; 2) determine the capability of the implementers in the implementation of the DRRM programs along institution and logistics; 3) identify the problems encountered; 4) describe the best practices employed; and 5) assess the impact of the programs along population and resources for community resiliency. The study employed a qualitative-quantitative approach that made use of descriptive survey and employed the use of questionnaire and focus group discussion (FGD). The findings show that the creation of the City Disaster Risk Reduction and Management Offices (CDRRMOs) enhanced the capacities of the three cities in responding to the effects of disasters and led to the attainment of a more disaster-resilient community. Meanwhile, its human resources and the programs implemented were rated very capable and their logistics were sufficient. On the other hand, the common problems encountered by the three cities were lack of permanent personnel, uncooperative barangay officials, and inhabitants who refuse to be evacuated during disasters. Their best practices were on disaster awareness, preparedness, response, recovery and environmental protection that benefit and protect their constituents. Hence, disaster-resilient communities of the three cities are achieved.

Keywords: *Capability, Governance, Programs, Resiliency*

Introduction

In the context of community disaster resilience, the relations between and among public, private, and nonprofit organizations can be extensive. A challenge in developing resilient communities is not only recognizing and anticipating the scope of damages, but on integrating multiple agencies, jurisdictions, and stakeholder groups in response to a disaster (Comfort, 2006; Pelling, 2003; Ronan & Johnson, 2005).

The 2015-2030 Sendai Framework for Disaster Risk Reduction (SFDRR) articulates the need to improve understanding of disaster risk in all its dimensions of exposure, vulnerability, and hazard characteristics; the strengthening of disaster risk governance, including national platforms. Further, SFDRR provides for the accountability for disaster risk management, preparedness to "Build Back Better,"

recognizes stakeholders and their roles, ensures mobilization of risk-sensitive investment to avoid the creation of new risk, resilience of health, infrastructure, cultural heritage and workplaces, and strengthening of international cooperation and global partnership, and risk-informed donor policies and programs, including financial support and loans from international financial institutions (Aitsi-Selmi, *et al.* 2015).

The province of Albay, including the three cities of Legazpi, Tabaco, and Ligao, show vulnerability to the adverse impacts of natural disasters. Republic Act 10121, otherwise known as the Philippine Disaster Risk Reduction and Management Act of 2010, established the National Disaster Risk Reduction and Management Council in order to develop appropriate risk transfer mechanisms that will ensure social and economic protection and increase resiliency in the midst of the disaster throughout the country. However, despite the

implementation of RA 10121 through the programs and projects of the different local governments, problems on disaster risk reduction and management still exist from national down to local level.

In terms of economic development, the three cities of Legazpi, Tabaco, and Ligao play a big role in continuing progress of the province of Albay. However, disasters can impede its local development. Fortunately, disaster risk reduction and management programs have been implemented by these cities in the past years helping sustain their growth and prevent the loss of lives and destruction to properties. Corollarily, if these programs are effective, this would lead to investment in the business sector, and consequently to economic expansion. More importantly, these programs would contribute to communities becoming more resilient to disasters. This study will benefit significantly the residents of the three cities, as well as the potential adoption to other local government units (LGUs) of the best practices in the formulation of policies and the implementation of disaster risk reduction and management programs toward more disaster resilient communities.

Previous researches conducted were concentrated on disaster preparedness, state of implementation of DRRM programs, and capability of LGUs in disaster management. However, none of these researches were able to present techniques or strategies applicable to the locale of the present study. It is also shown that given the broader scope and the local of the study presented, the implementation of certain programs were useful yet seemingly far-fetched and deficient in proper monitoring and observance, particularly in the barangay level where certain elements such as policy, human resource, funding, logistics, and practices are yet to be attained considering various constraints. These were the gaps identified which this study aimed to bridge.

Thus, this study aimed (1) to examine the disaster risk reduction and management programs implemented by the three cities of the province of Albay in terms of DRRM governance, hazard and risk awareness, investment for resilience, and enhancing disaster preparedness for response; (2) to determine the capability of the implementers in the implementation of the programs in terms of institution and logistics; (3) to identify the problems encountered in the implementation of the programs in terms of institution and logistics; (4) to describe the best practices employed by implementers to sustain the implementation of

DRRM programs, and (5) to assess the impact of the disaster risk management programs along population and resources for community resiliency.

Materials and Methods

This study was conducted in the three cities of the province of Albay covering the period 2013 to 2017. Each city was delimited to the five barangays within the hazard area as identified by the CDRRMO. The study was also limited to the programs that were covered by the LDRRM Fund. Other programs funded by other sources were excluded.

Research Design

The study employed both qualitative and quantitative methods of research. Using a qualitative approach, the researcher made use of interview and FGD to the key informants on the different areas of DRRM programs implemented in terms of (1) hazard and risk awareness, (2) DRRM governance, (3) investment for resiliency, and (4) enhancing disaster preparedness for response were examined. Moreover, the problems encountered along institution and logistics, the best practices employed, and partly the capability of the implementers in the implementation of DRRM programs from 2013 to 2017 were also reviewed using the qualitative approach.

Documentary analysis was the primary source of the information for this study. Additional data were collected from the CDRRMO, City Engineering Office, Budget Office, and the City Health Office to support the information gathered from documentary review and analysis. Further, interviews were conducted with some officials to validate the information gathered relevant to the study that were consequently used to measure the resilience of the communities.

This study used a descriptive survey to describe and assess the responses to the study. The descriptive research analyzed the data collected from the different respondents from the cities of Legazpi, Tabaco, and Ligao, and employed the use of questionnaire and FGD with the key informants to determine community disaster resilience management programs of the three cities.

On the other hand, frequency count was used for a quantitative approach to evaluate the areas covered including partly the capability of the implementers

in the implementation of the programs, as well as the impact of the programs along populations and resources for community resiliency.

Sampling Design

There were two (2) sets of respondents in this study. These were the key informants and the residents. The key informants were the officials of the CDRRMO and representatives from the City Engineering Office, Budget Office, and the City Health Office. The residents-respondents came from the barangays (villages) that were considered vulnerable to hazards, which were identified by the CDRRMO. In case the same hazard affected several barangays, the most populous barangay was chosen as the respondent considering the number of inhabitants exposed to this hazard compared to the

less populous barangay. Table 1 shows the respondents of the study.

Sample population of each respondent barangay was determined using the Slovin Formula with 5% margin of error. For the type of sampling used, the study employed stratified proportional random sampling under the probability sampling by dividing the population into smaller groups known as strata. In stratified random sampling, the strata are formed based on the numbers' shared characteristics. A total of 397 residents were chosen as respondents of this study represented by the head of the family per household. The researcher made groupings of the respondents based on their city of residence consisting of 187 from Legazpi, 119 from Tabaco, and 91 from Ligao.

Table 1. Distribution of Respondents of the Study by City and Types of Hazard

Places	Total Number of Populations	Number of Samples	Respondents of the Study
Legazpi City	25,601 *	394	187
Tabaco City	16,237 *	396	119
Ligao City	12,573 *	392	91
Total	53,885 *		397

*Total Number of Population of 5 barangays chosen as respondents of the study.

Statistical Analysis

The researcher used frequency count and weighted means quantitative tabulations, treatment, and interpretation of the data collected. Frequency count was used to show often a datum occurs in a frequency table. This involved the process of tabulating and counting all the answers of the respondents in the questionnaire. Hence, the higher the impact the lower is the probability of risk, thus increasing resiliency of the community. The impacts of the programs were categorized into three levels. The low impact level means that the programs were poorly implemented and did not fully benefit the respondents, hence, producing low results resulting in increased risk therefore lowering the resilience of the community. Next, the moderate impact means that the programs were implemented fairly but needs improvements – that the respondents somehow benefited, which in turn produced fair result. Lastly, the high impact means that the DRRM programs were well-implemented – that is the respondents somehow benefited, received interventions, and gained positive

effects from the activities, which in turn produced good results that lowered the probability of risks, thus increasing the resilience of the community.

Moreover, weighted mean was used to determine the capability of the institution and the implementation of the programs for community resiliency as well as the sufficiency of the logistics in carrying out the operation. This was made by rating it from 1 to 5, with 1 being the lowest and 5 being the highest.

Results and Discussion

DRRM Governance

In compliance with Republic Act No. 10121, otherwise known as the Philippine Disaster Risk Reduction and Management Act of 2010, which mandates all local government units to establish DRRMO and provide funds thereof for effective and efficient DRRM governance, the three cities of Legazpi Tabaco, and Ligao created its corresponding CDRRMO

through the passage of Ordinance No. 0008-2014, Ordinance No. 010-2014, and Ordinance No. 2011-005 respectively, including its composition, functions, organizational structures and providing funds for its operation. The office is composed of three (3) divisions - the administrative training division, the operation and warning division and the planning and research division. In addition to the three divisions, the CDRRMO of Legazpi created another division, which is the climate change division. The CDRRMOs in the three cities are being assisted by City Health Office, the Engineering Office, the Budget Office, and other departments of the local governments. Aside from these departments, the following line agencies of the national government assist the DRRM operation. These are: Bureau of Fire Protection (BFP), Philippine National Police (PNP), Philippine Coast Guard (PCG), Department of Public Works and Highways (DPWH), Department of Social Welfare and Development (DSWD), Department of Education (DepEd), Department of Science and Technology (DOST), National Economic and Development Authority (NEDA), Department of Health (DOH), Office of Civil Defense (OCD), Department of Agriculture (DA) and Mines and Geosciences Bureau (MGB) together with nongovernment organizations and people's organizations that serve as volunteers in disaster operations. In the context of community disaster resilience, the relations between and among public, private, and nonprofit organizations can be extensive. Integration or cooperation of multiple agencies in response to the disaster developed disaster-resilient communities. (Comfort, 2006; Pelling, 2003; Ronan & Johnson, 2005).

To carry out its disaster operations, the three cities

regularly allocate funds known as the Local Disaster Risk Reduction Management Fund (LDRRMF). Based on the data collected, there was a continued increase of the budget from the time of its implementation intended for disaster awareness, preparedness, response and recovery. Table 2 shows the LDRRMF of the three cities from 2013-2017. Aside from the budget allocated, the three cities also implement both national and local policies, to enhance the capacity of the CDRRMO.

According to Shi (2012), it is necessary to promote the general welfare of society to enhance DRRM governance by integrating organizations, resources, culture, and social management; establishing a catastrophic financial guarantee; strengthening education; and increasing the capacity of disaster relief. It is not only confined to one particular jurisdiction, thus, it should be the goal of local emergency management officers to coordinate between agencies for response and recovery efforts (Kapucu & Ozerden, 2013). It is also necessary that different stockholders collaborate in order to build a more resilient community through effective disaster management policies (Ahrens & Rudolph, 2006). Based from the following criteria: the presence of CDRRMO, the availability of funds, the implementation of national policies and local ordinances, and the participation of the different line agencies of the national government and other organizations, the capacities of the CDRRMOs of Legazpi, Tabaco, and Ligao to respond when disasters happen are enhanced while improving the awareness of the residents and their capacity to recover immediately from the negative impacts of calamities. With this, it can be implied that good DRRM governance in place helps build a resilient community.

Table 2. Program on Budgetary Allocation and Utilization (Php) of LDRRMF of the Three Cities

Fiscal Year	Legazpi City		Tabaco City		Ligao City	
	Funds Available	Funds Utilization	Funds Available	Funds Utilization	Funds Available	Funds Utilization
2013	58,228,524.03	32,852,817.91	41,676,370.83	24,739,072.44	-	-
2014	64,536,612.79	26,433,532.13	28,036,686.15	6,485,593.23	-	-
2015	74,634,708.38	16,371,019.91	26,184,464.87	208,900.00	21,955,873.64	3,905,605.84
2016	96,993,340.67	14,144,519.69	64,157,778.21	2,647,712.46	47,473,869.24	1,923,721.06
2017	126,043,933.47	13,243,193.81	110,689,762.53	14,042,490.12	57,705,872.03	20,830,787.58
UF	112,800,739.66	96,647,272.41	36,875,084.45			

UF – Unutilized Funds as of December 2017

Table 3. Programs of the three cities along Hazards and Risk Awareness

Legazpi City	Tabaco City	Ligao City
Training Program on Awareness and Capability Building through Intensive Information and Education Campaign on Hazard	Family Education and Preparedness Information Campaign	Disaster Preparedness, Readiness and Climate Change Awareness for New Philippines
Training Workshop for Emergency Management Team (EMT) Responders and Disaster Managers	Basic Emergency Responders Training	Restricted Level Mobile Radio Seminar
High Angle Rescue Training	Family Evacuation Preparedness, Camp Coordination and Camp Management	Leadership Development Program; Training on Water Search and Rescue for Disaster Volunteers
Water Search and Rescue Training	Building Earthquake Evacuation Planning, and MGB Geo Hazards Trainings.	Emergency First Aid and Basic Life Support
Water Survival Training for Coastal Barangays and Composite Team		Community-Based DRRM
Traffic Mishap Response Training		
Emergency Command System and Incident Command System		
5-Day Water Search and Rescue (WASAR) & Basic Life Support (BLS) Training		
Knowledge Management and Training of Key DRRM Personnel and Disaster Management		
Barangay River Bank Stabilization Program		

Programs Along Hazards & Risk Awareness

Table 3 summarizes the programs of the three cities along hazards and risk awareness. These trainings were participated by barangay officials and representatives of the Philippine National Police, Bureau of Fire Protection, Public Safety Office-Legazpi and City Health Office who serve the frontline group of the city in times of disasters and emergency situations. In addition, the CDRRMO also conducted training seminars on the Formulation of Local Climate Change Action Plans (LCCAPs) and Barangay Contingency and Recovery Plans (BCRPs), a DRRM advocacy program of the Department of the Interior and Local Government (DILG) to 117 delegates composed of municipal councilors, barangay chairpersons and

youth representatives from the municipality of General Mariano Alvarez, Cavite.

Through these trainings, the three cities enhanced their capacity in responding to disasters using their own resources. The provision of training to the responders and to the residents including those vulnerable (women and children) resulted in the achievement of community resilience because it educated and developed the awareness of the residents and responders on what to do before, during, and after disasters. Disaster resilience is the ability of a community not only to recover from a disaster, but also to adapt to the changes that the event may cause. This includes the ability of the community to learn from disaster and to improve its network, systems, and capabilities to confront future disasters. Further,

disaster resilience of communities could be developed through education, communication, and engagement (ECE) programs implemented by emergency agencies (Duffy, 2012).

Programs/Projects Along Investment for Resiliency

The study found that there were two (2) types of programs/projects implemented by the three cities along investment for resilience. These were the structural and the nonstructural measures. According to the key informants, structural measures are investments programs using physical construction or the use of engineering techniques to achieve hazard-resistance and resilience in structural system. On the other hand, nonstructural measures are investment programs not involving physical construction but use knowledge, practice, or agreement to reduce risk and impacts, in particular public awareness raising programs, training and education, supplies and materials, equipment, and financing insurance.

Along structural measures, there were three (3) major programs/projects implemented by the three cities, these were: early warning system, evacuation centers and the flood control system.

Early Warning System. The installation of early warning system was very important in strengthening DRRM capacities in reducing disaster risk to the community. These were: installation of information board and signage; installation of rain gauges and other early warning equipment; and upgrading of communication system. This must be sustained in order to strengthen the local capacity of the community that led to the resiliency of the community. By giving warning of the impending calamity to the community, the implementation of this project resulted in preventing the loss of lives and damages to property, hence, contributing to the attainment of community resilience.

Evacuation Centers. The construction of evacuation centers reduced or lessened the adverse effects of disasters and enhanced the capacity of the local government. This was guided by good governance principles within the context of poverty alleviation and protection (Domingo, 2016) which state that partnership toward effective delivery of service to the citizenry build a disaster-resilient community. The construction of evacuation centers were completed through the complementation of resources of the local government and the national government. This

partnership led to the promotion of good governance principle that led to the enhanced capacity of the local government for effective and efficient public service. As such, it is necessary for the three cities to allocate funds for the construction and maintenance of the evacuation centers to ensure its availability when needed for evacuation to strengthen local capacity in facing disaster.

Flood Control System. The completion of flood control system has reduced or mitigated the flooding problem in the three cities resulting in the improvement of the livelihood of its people. By providing direct access of these projects and resources, it has enhanced the adaptive capacity of the communities thus contributing in the improvement of quality of resource management, the productivity of local resources, and the equity with which benefits were shared within the community.

Along nonstructural measures, except for the Climate-Responsive Food Production System, which was implemented by Legazpi City, the following programs/projects were implemented by the three cities: modernization of rescue equipment and facilities; risk financing scheme; and environmental protection projects.

Based on the findings, all the projects were necessary to serve and protect the constituents and the environment. Because of these implemented projects, the CDRRMOs showed their dedication and commitment for their mandated function of protecting the people from any hazard as well as from manmade disruptions to the ecosystem. It can be implied that the implementation of these programs enhanced the adaptive capacity of the three cities for effective and efficient service delivery for the protection of the people and environment by facilitating direct access of the community to these programs necessary to build a resilient community.

Programs/Activities along Enhancing Preparedness for Response

All the three (3) cities implemented the same programs/activities along enhancing preparedness for response. These were: Awareness and Capability Building through Intensive Information Education Campaign; Simulation Exercises and Drills and Refresher Course; Training and Workshops for Emergency Management (EMT) Responders and Disaster Managers; Modernization of Rescue Equipment and Facilities; Knowledge Management

& Training of key DRRM Personnel and Disaster Managers; and Stockpiling and Prepositioning of Resources. All these activities were funded through the LDRRM Funds.

With this, it can be inferred that the more resources are allocated for disaster risk reduction and management such as evacuation centers, training and programs, the more the people and the community benefited in protecting themselves from the harm and damage of disasters. The abundance of evacuation routes, the capacities of shelters, and the capacities of hospitals provide positive impacts on disaster resilience (Cutter *et al.*, 2010) by enhancing the rapidity of the community – the “capacity to meet priorities and achieve goals in timely manner in order to contain losses and avoid future disruption” (Bruneau *et al.*, 2003). A community’s resilience is further strengthened by its resourcefulness – its ability to utilize human and physical resources to meet predetermined goals and priorities. A combination of these different attributes of resources provides the foundation for the attainment of community disaster resilience. Lastly, by continually providing capacity-building interventions and training, it would enrich the knowledge, skills, attitude, and professional competence of the workforce (Belardo, 2018).

Capability of the Implementers in the Implementation of Disaster Risk Reduction Management Programs along Institution and Logistics

Institution refers to the human resources that composed the CDRRMO and the implemented

programs of the three cities. Logistics refers to the sufficiency of supplies, materials, and equipment in carrying out disaster operations. Table 4 presents the capability of institution and logistics as perceived by the resident-respondents.

Based on the perceived performance of its human resources to undergo disaster operations, the CDRRMO of Legazpi City got a general weighted mean of 3.51, meaning its human resource is very capable to undergo disaster operations, while its implemented programs generated an overall weighted mean of 3.53, which is likewise very capable (Table 4). These are indications that DRRM programs of Legazpi City are very effective.

Meanwhile, the human resources and programs implemented by Tabaco got an overall rating of 3.96 and 3.86, respectively, meaning that both the human resources and the programs implemented were very capable.

Ligao CDRRMO got only a capable performance of 3.03. This means that they still need to undergo more training and seminars, especially those regularly performing disaster with a rating of 3.26. This also means that its programs need some improvement to fully satisfy the community and help establish capability in building resilience among its constituents and the community. It should be noted that there is a need for institutions to be equipped with qualified and licensed guidance personnel in order to respond more effectively to the varying psycho-emotional needs of its population and be able to develop intervention programs that will help establish capability in building resilience community (Roallos, 2016).

Table 4. Capability of the Institution and Logistics as Perceived by the Residents n = 397.

Indicators	Legazpi n=188		Tabaco n=120		Ligao n=89	
	WM Rating	Adjectival Rating	WM Rating	Adjectival Rating	WM Rating	Adjectival Rating
Capability of Human Resources	3.51	Very Capable	3.96	Very Capable	3.03	Capable
Capability of the Programs Implemented	3.53	Very Capable	3.86	Very Capable	3.26	Capable
Sufficiency of Logistics	3.02	Sufficient	3.82	Very Sufficient	2.95	Sufficient

Note: Excellently Capable/Sufficient 4.51-5:00; Very Capable/Sufficient 3.51 – 4.50; Capable/Sufficient 2.51 – 3.50; Moderately Capable/sufficient 1.51- 2.50; Slightly Capable 1:00 – 1.50 (WM – Weighted Mean)

Table 5. Impact of DRRM Programs for Community Resiliency n = 397

Impact of DRRM Programs	Legazpi City	Tabaco City	Ligao City	Total Frequency	Description
	Frequency	Frequency	Frequency		
Personal Responsibility	132	73	53	258	Moderate Impact
Social Responsibility	120	69	47	236	Moderate Impact
Resources	124	67	55	246	Moderate Impact

Frequency Ranging from 1 – 132 Poorly Implemented/Low Impact; 133 – 264 Fairly Implemented/Moderate Impact; and 265 – 397 Well Implemented/High Impact)

Problems Encountered by the Implementers in the Implementation of the Programs along Institution and Logistics

The CDRRM officials of the three cities encountered common problems in terms of program implementation along institution and logistics. These include insufficiency of personnel, a populace that refuses to evacuate in times of disasters; uncooperative barangay officials in participating in training and lack of transportation, rescue vehicles, and equipment. In terms of logistics, the most common problems encountered by the three cities were the insufficiency of transportation and equipment, lack of evacuation centers, and the delayed processing of documents for the purchase of rescue tools and equipment. This is because of a number of requirements that must be complied with before such implementation and purchase can be undertaken.

Best Practices Employed by the Implementers in the Implementation of Disaster Risk Reduction and Management Program

Throughout the operations of the disaster risk reduction and management programs, best practices were employed to sustain their implementation. For Legazpi City, among the best practices employed by its CDRRMO were the implementation of Mangrove Trees Growing in Coastal Barangay where it received the Climate Adaptive and Disaster-Resilient Award; another best practice was the implementation of Balangay Legazpi A Cloud-Based Information System, a mobile and web application for disaster information system that connects vulnerable communities and other sectors to information that can help save lives before and during disaster. The application was recognized as the Best in Customer Empowerment Award at the 2016 eGOV Awards of the National ICT Confederation of the Philippines. Similarly, the clean and green program of Ligao CDRRMO won the cleanest and Greenest

LGU of Albay award; its child-friendly programs establishing measures which promote children’s welfare was given the SCFLG Award; while its programs on environmental protection and conservation received the 17th Saringaya Award. On the contrary, the Tabaco-CDRRMO has yet to be recognized for any best practice.

Impact of Disaster Risk Reduction Management Programs for Community Resiliency along Population (Personal & Social Responsibility) and Resources

Disaster-resilient communities are achieved when the risk-reduction efforts have been successful and have made the people stronger and increasing their ability to bounce back better after a disaster. Table 5 shows the impact of DRRM programs.

This study shows that the impact of the programs along personal and social responsibility got an overall frequency of 258 and 236 respectively with resources generating an overall frequency of 246, all setting moderate impacts. These imply that although the programs were fairly implemented that residents somehow benefited from the programs, it still needs improvement. The result of the foregoing analysis is an indication that DRRM programs implemented in the three cities of the province of Albay were fairly responsive to the community. Hence, disaster-resilient communities were partially achieved and still need improvement in program implemented in order to increase the people’s ability to bounce back better from the effects of disaster.

Conclusion

Based on the foregoing findings, it can be concluded that the creation of CDRRMOs in the three

cities, its organizational structures, the implementation of LDRRM fund, and the implementation of various DRRM programs are indications of good governance. Moreover, their dedication to serve strengthened their local capacity for disaster risk reduction and management in building the resilience of the local communities, and although the logistics of CDRRMOs of the three cities did not meet the full satisfaction of the respondents, still the residents of the three cities were fairly satisfied with the performance and programs implementation. Finally, the implementation of best practices indicates the commitment of the three cities to disaster risk reduction and mitigation to ensure DRRM good governance resulting in the fairly perceived impact of the DRRM programs to its residents contributing to them becoming stronger and more resilient even before disaster strikes.

Recommendations

Based on the findings, the following are the recommendations: (1) hire additional personnel to support DRRM program implementation; (2) conduct more capacity building interventions, training and seminars both to CDRRMO staff and community members to enhance their capacity and develop their awareness toward achieving a resilient community; (3) hold regular consultation with the residents especially those in the hazard-prone barangays, and (4) evaluate regularly in order to know the strengths and weaknesses of the programs so that the gaps can be given immediate and proper attention. It is also necessary to install additional early warning systems especially in areas considered or identified as vulnerable to hazard, construct typhoon-proof evacuation centers outside the school premises so that classes will not be disrupted, acquire additional ambulances and rescue equipment and facilities that are being used for disaster operations by the local governments. All these are important to enhance the capacities of the three local governments to best serve its constituents to ensure DRRM good governance and disaster resilient communities.

Acknowledgment

The author wishes to acknowledge the respondents for their accommodation and participation for the accomplishment of this study. Above all, the Almighty God, for His continued enlightenment, divine guidance and blessings.

References

- Ahrens, J. & Rudolph, P. (2006). The importance of governance in risk reduction and disaster management. *Journal of Contingencies and Crisis Management*, 14(4), 207–20.
- Aitsi-Selmi, A., Egawa, S., Sasaki, H., Wannous, C., & Murray, V. (2015). The Sendai framework for disaster risk reduction: Renewing the global commitment to people's resilience, health, and well-being. *International Journal of Disaster Risk Science*, 6 (2), 164–176. doi:10.1007/s13753-015-0050-9
- Belardo, S. B. (2018). Awareness of vulnerability of communities on natural disaster & psychosocial services of the local government units in the province of Albay, Philippines. *BU R&D Journal*, 21(1), 22-32.
- Bruneau, M.; Chang, S.E., Eguchi, R.T., & Lee, G.C. (2003). A framework to quantitatively assess and enhance the seismic resilience of communities. *Earthquake Spectra*, 19 (4), 733–752. doi:10.1193/1.1623497
- Comfort, L. K. (2006). Cities at risk: Hurricane Katrina and the drowning of New Orleans. *Urban Affairs Review*, 41(4), 501–16.
- Cutter, S. L., Burton, C. G., & Emrich, C. T. (2010). Disaster resilience indicators for benchmarking baseline conditions. *Journal of Homeland Security and Emergency Management*, 7(1). doi: 10.2202/1547-7355.
- Domingo, S.N. (2016). An Assessment of the Sectoral and Institutional Implementation of the NDRRMP.
- Dufty, N. (2012). Learning for disaster resilience. A paper Presented at Earth: Fire and Rain. Australian and New Zealand Disaster and Emergency Management Conference. Brisbane, Australia.
- Kapucu, N. (2008). Collaborative emergency management: Better community organizing, better public preparedness and response. *Disasters: The Journal of Disaster Studies, Policy, and Management*, 32(2), 239–62.
- Kapucu, N. & Ozerdem, A. (2013). *Managing emergencies and crises*. Boston, MA: Jones & Bartlett Publishers.
- Philippine Statistics Authority. (2015). Census of the population. Total population of the province, cities, municipalities, and barangays. Retrieved from <https://psa.gov.ph/content/population-region-v-bicol-based-2015-census-population>,
- Shi, P. (2012). On the role of government in interpreting disaster risk governance-based practices in China. *International Journal on Disaster Risk Science*, 3(3), 139-146. doi:10.1007/s13753-012-0014-2
- Pelling, M. (2003). *The vulnerability of cities: Natural disasters*

and social resilience. London, UK: Earthscan.

Roallos, R. A. (2016). Building disaster-resilient schools through psychosocial intervention programs. *I J A B E R*, 14(5), 2877-2891.

Ronan, R. K. & Johnson, D.M. (2005). Promoting community resiliency in disasters: The role for schools, youth, and families. New York, NY: Springer.