Compliance with the Disaster Risk Reduction and Management Act of 2010 of Local Government Units in the Province of Negros Occidental, Philippines

ISSN 2672-3107 (Print) • ISSN 2704-288X (Online)
PHILIPPINE SOCIAL SCIENCE JOURNAL
Advancing Social Science Research in the Philippines and Beyond

Jose T. Yusay III[1*] and Zeaphard Gerhart V. Caelian[2]
[1]Local Government Unit of Hinoba-an, Negros Occidental, Philippines
[2]University of Negros Occidental-Recoletos, Bacolod City, Philippines

Article history:
Submitted: 22 March 2022
Revised: 29 May 2022
Accepted: 09 June 2022

Keywords:
Disaster risk reduction
Risks management practices
Institutional arrangements
Descriptive
Negros Occidental
Philippines

Corresponding Author:
Jose T. Yusay III
joseyusay.28@gmail.com

ABSTRACT. Compliance with the provisions of the Philippine Disaster Risk Reduction and Management (PDRRM) Act strengthens the DRRM office in local government units resulting in effectual practices in reducing, minimizing, and mitigating risks and creating its disaster resiliency. This study assessed the compliance of local government units (LGUs) with the provisions of the PDRRM Act in the areas of risk management practices and institutional arrangements and capacities focused on the four thematic areas of disaster. Challenges encountered by DRRM officers and planning coordinators of 32 LGUs were investigated. Using descriptive analysis, the findings revealed a high level of compliance with risk management practices in prevention and mitigation, preparedness, and response and a moderate level of rehabilitation and recovery. As to institutional arrangements and capacities, LGUs also exhibited a high level of compliance with a lower mean on structural mechanisms. When income classification was used as a variable, 4th class LGUs rated moderate; as to location, results were varied. As to the number of hazards, LGUs with nine hazards and more are rated high. The study concluded that failure to provide personnel and financial resources to the DRRM office endangers the safety and general well-being of the population and poses great risks to lives and properties.

1.0. Introduction

Countries worldwide are devastated by natural and human-induced disasters, causing serious disruptions and casualties of lives and economic losses. Hence, to establish the resilience of nations, the 10 Year Hyogo Framework for Action (2005-2015) ensured that disaster risk reduction becomes a national and local priority with a strong institutional basis for implementation (United Nations International Strategy for Disaster Reduction [UNISDR], 2016), updated under the Sendai Framework for disaster risk reduction (2015-2030) and aligned with the Sustainable Development Goals (SDGs), emphasizing all dimensions of disaster: vulnerability, capacity, coverage, threats, and the location, among others (Aitsi-Selmi et al., 2016).

The ASEAN countries, as the most prone region to disasters in the world (Sawada & Oum, 2011), drafted the ASEAN Agreement on Disaster Management and Emergency Response (AADMER), the first Hyogo Framework for Action (HFA) related binding instrument (Sawada & Zen, 2014) that included the supervision, projections, precaution, and prevention rather than response.

The Philippines is vulnerable to disasters because it is located in the Pacific Ring of Fire (Symaco, 2013), aggravated by its weak adaptive capacity (Badajos & Caelian, 2019). In consonance with the Hyogo Framework, the government enacted RA 10121, otherwise known as An Act Strengthening the Philippine Disaster Risk Reduction and Management System, popularly known as the PDRRM Act of 2010. This aims to strengthen the country's institutional capacity for disaster risk reduction and management and build the resilience of local communities.

While the province of Negros Occidental was not spared from disasters, the dry spell in 2018 caused the 6.11 million pesos losses of Negros Occidental in its rice crop (Bayoran, 2019). The consolidated damage report of the Provincial Agriculture Office of the province was rice production losses amounting to more than Php123millions from January to May 2020. Tropical depression

Samuel caused flash floods. The flooding due to heavy rains caused millions of losses in LGUs of Northern Negros Occidental (Nicavera, 2021).

Several studies on disaster risk reduction and management were conducted over the years: Takanori (2018) explored the need for structural and non-structural measures; Matyas and Pelling (2015) and Loosemore et al. (2014) on the adaptive capacity of the population; and Petrosillo and Zurlini (2015) on the socio-ecological systems. Studies conducted in the Philippines include those of Fajardo (2013) and Asio (2020) on the participation and compliance of the LGUs in mitigating risks. In Negros Occidental, Badajos and Caelian (2019) determined the adaptive capacity, vulnerability, and risks of state universities; Caelian (2018) studied the disaster resiliency of LGUs; Panase and Doruelo (2020) and Cordevilla and Caelian (2020) on awareness and practices on disaster preparedness; Ventura and Madrigal (2020) on awareness and practices of high school students on disaster preparedness; and Sumbillo Jr. and Madrigal (2020) on risk reduction management. Limited studies investigated the levels of compliance to the provisions of RA 10121 in the aspect of risk management practices and institutional arrangements and capacities of LGUs in the four thematic areas of disaster management, hence a gap in the literature.

This study aimed to assess the level of compliance of local government units to the provisions of RA 10121 in risk management practices and institutional arrangements and capacities in the four thematic areas of disaster management. Other variables such as income classification based on the Department of Finance assignment, location such as coastal, upland, lowland, or combination, and the number of hazards/risks experienced by LGUs classified as "8 and below and 9 and above" lifted from Shi (2019) was utilized in the determination of compliance to the provisions of RA 10121. It also investigated the challenges encountered by DRRM offices in implementing RA 10121. The findings of the study were utilized as the basis of a policy brief that outlines recommendations to enhance the compliance of LGUs with the provisions of RA 10121.

2.0. Framework of the Study

The study theorized that compliance with the provisions of the law strengthens the DRRM implementation of LGUs. The success of LGUs in disaster risk reduction is directly linked to their compliance with the provisions of the law as influenced by the profile of the LGUs (income classification, location, and the number of hazards experienced). It is important to consider the income classification due to the Local Disaster Risk Reduction and Management Fund (LDRRMF), location because of differences in risk management, and the number of hazards due to the application of mechanisms for coordination, collaboration, and capacity development in the evaluation of compliance to institutional arrangements and capacities of LGUs.

The study is anchored on the Good Governance Theory of the World Bank (1992) adopted by the World Meteorological Organization (WMO, 2011), which includes adopting and promoting robust and sound policies, legislation, coordination mechanisms, regulatory frameworks, accountability, participation, and transparency are key features of good governance. Robust and sound policies represent the legal framework (executive orders), legislation (ordinances enacted), coordination mechanisms (creation of Barangay Risk Reduction and Management Council (BRRMC), Local Disaster Risk Reduction Management Committee (LDRRMC), and regulatory framework (DRRMO, plans, and programs). Accountability and transparency are measured in compliance with the domains of RA10121. The participation of stakeholders and the provision of adequate resources revealed the characteristics of an enabling environment, espoused in the Open Systems Theory of Katz and Kahn (1971).

The challenges encountered by implementers brought to light the deficiencies in implementing the provisions of the DRRM law at the local level.

3.0. Methodology

The study used a descriptive research design to describe the compliance of local government units to risk management practices in the four thematic areas of DRRM and the level of compliance to the institutional arrangements and capacities in structural and non-structural mechanisms. Other variables such as income classification, location of LGUs, and the number of hazards were included in the investigation.

A researcher-made survey questionnaire of four parts based on the implementing rules and regulations of RA 10121 was administered to the total enumeration of DRRM officers and planning

coordinators. Part 1 is on the profile of respondents' LGUs; Part 2 is on the compliance with risk management practices; Part 3 is on the compliance with institutional arrangements and capacities; Part 4 is a checklist of the challenges encountered by the respondents. Compliance with risk management practices and institutional arrangements and capacities was measured on a scale of 1 to 5, with 5 as very high, which means that all mandated practices/institutional arrangements and capacities are complied, 4 as high, meaning most risk management practices/institutional arrangements and capacities are complied, while 3 is moderate when only some of the mandated risk management practices/institutional arrangements and capacities are complied, 2 as low, meaning very few, and 1 as very low, which means very few of the mandated risk management practices/ institutional arrangements and capacities are complied.

The survey instruments were subjected to validity and reliability tests. Content validation was determined by five (5) jurors who are experts in disaster risk reduction and management using the criteria of Good and Scates (1972), yielding a score of 4.16, meaning these were valid questions. The reliability test was conducted by a pilot test on 30 randomly selected respondents who did not participate in the actual survey. The reliability score was 0.91, indicating a high level of reliability determined using the Cronbach Alpha coefficients.

Analyses for the level of compliance on risk management practices and institutional arrangements and capacities used the mean and standard deviation. The frequency count and percentage distribution were used for the challenges encountered by the respondents.

4.0. Results and Discussion

Level of compliance with risk management practices

The level of compliance of LGUs with disaster risk management practices in the four thematic areas of disaster risk reduction and management as a whole is high, which means that most mandated risk management practices are implemented. Tables 1A and 1B present the data.

The finding illustrates that local government units complied with their responsibilities in disaster risk reduction and management as the first responders in disaster cases. LGUs are mandated to

Table 1A. Level of Compliance with the Provisions of R.A. 10121 in the aspect of Risk Management Practices

Variables	Risk Management Practice			Disaster Prevention and Mitigation			Disaster Preparedness		
Classification	M	SD	Int	M	SD	Int	M	SD	Int
1st class	3.92	0.32	Hi	3.95	0.43	Hi	3.89	0.49	Hi
2nd class	3.87	0.76	Hi	3.97	0.74	Hi	3.92	0.84	Hi
3rd class	3.58	0.60	Hi	3.41	0.49	Hi	3.96	0.63	Hi
4th class	3.92	0.15	Hi	3.88	0.44	Hi	4.07	0.22	Hi
Highly Urbanized	3.43	0.00	Hi	2.92	0.00	Mo	3.73	0.00	Hi
Location									
Coastal	3.59	0.21	Hi	3.41	0.32	Hi	3.79	0.38	Hi
Upland	3.55	0.59	Hi	3.51	0.71	Hi	4.14	0.42	Hi
Lowland	3.06	0.52	Mo	3.08	0.22	Mo	3.09	0.90	Mo
Coastal/Upland	3.91	0.37	Hi	3.69	0.43	Hi	4.02	0.54	Hi
Coastal/Lowland	3.83	0.34	Hi	3.73	0.19	Hi	3.87	0.43	Hi
Upland/Lowland	4.24	0.04	VH	4.08	0.11	Hi	4.32	0.71	VH
All of the Above	3.97	0.54	Hi	4.11	0.66	Hi	4.03	0.53	Hi
Hazards									
8 and below	3.84	0.33	Hi	3.76	0.46	Hi	4.00	0.41	Hi
9 and above	3.80	0.60	Hi	3.81	0.65	Hi	3.91	0.65	Hi
Whole	3.82	0.49	Hi	3.79	0.56	Hi	3.95	0.54	Hi

Note: M=Mean, SD=Standard Deviation, Int=Interpretation, VH=Very High, Hi=High, Mo=Moderate

comply with the provisions of RA 10121 (the Disaster Risk Reduction and Management Act) and their responsibilities are provided under the general welfare clause of RA 7160, otherwise known as the Local Government Code of the Philippines.

Studies of the United Nations International Strategy for Disaster Reduction (UNISDR, 2016) and Aitsi-Selmi et al. (2016) substantiated that the country should establish priorities with a strong institutional basis and emphasize all dimensions of disaster. Findings of Corpuz (2019), Sawada and Oum (2011), and Jurilla (2016) affirmed that participation of the LGUs is necessary for reducing, minimizing, or mitigating risk.

In terms of the variables, the level of compliance of LGUs on disaster prevention and mitigation, preparedness, and response is high, while only moderate on disaster rehabilitation and recovery. The high level of compliance on disaster prevention and mitigation, preparedness, and response demonstrates that local government units are very actively engaged in mainstreaming DRR in the Comprehensive Land Use Plan and Development Plans, providing capability training such as on search and rescue operations, simulations and drills, implements the early warning system, are stockpiling supplies and medicines, providing assistance food and relief good to victims of disasters which are among the mandated risk management practices on disaster prevention and mitigation, preparedness, and response. While the finding of moderate disaster rehabilitation and recovery was revealed on the low ratings on implementation of the building code and practice of green technology, no designs for disaster-resilient houses, and inadequate training on social preparation.

Meanwhile, the moderate finding on the level of compliance of LGUs in disaster rehabilitation and recovery implies the weakness of LGUs attributed to the lack of financial resources because rehabilitation measures require a large appropriation. The lack of coordination and partnership with other local government units and non-government organizations contributed to the moderate extent of compliance in this domain of disaster management.

When income classification was considered as a whole, results revealed that LGUs were rated high, which implies that income cannot be associated with the compliance of LGUs to provisions of the law because compliance does not depend on the availability of funds but on how funds are prioritized and utilized. Some LGUs in the province, regardless of income classification, were awardees of the Seal of Good Local Governance (SGLG) of the Department of Interior and Local Government (DILG) in implementing the disaster program on risk reduction and management. This implies that it is how good governance principles are practiced that counts in implementation and compliance with the provisions of the law. This finding supports the study of the United Nations International Strategy for Disaster Reduction (UNISDR, 2016) and the Global Water Partnership (2018) that governance is a matter of accountability, efficiency, responsiveness, and sustainability. The study of Kellet et al. (2014) supports this finding that the lack of DRR financing and coordination or coherence of financing is not the issue of availability but prioritization.

In analyses using income classification as a variable, the compliance to disaster prevention and mitigation of LGUs is high except for the highly urbanized city, which was rated moderate because of uncontrolled and unplanned urbanization and development, which contributes to weak enforcement of disaster risk reduction activities confirmed in the report of the United Nations Office for Disaster Risk Reduction (UNDRR, 2019). While there are budgeting mechanisms for cities to allocate financing through the LDRRMF, they have difficulty accessing adequate resources supported by Domingo and Manejar (2018) and Symaco (2013) due to auditing restrictions and lack of coordination. In disaster response, compliance of all LGUs is high attributed to capacity development, which refers to the emergency acts of LGUs in times of disaster displayed by the majority of LGUs utilizing the quick response fund. This finding finds support in United Nations International Strategy for Disaster Reduction (UNISDR, 2016) and Tomas (2020), who found the excellent performance of LGUs in responding to victims of disasters.

While, in disaster rehabilitation and recovery, LGUs were rated moderate, implying that LGUs are not properly informed of the priorities of rehabilitation and recovery, which requires substantial funding underlined in the study by Mendoza et al. (2016). Despite the enactment of the DRRM law, there are limited DRRM initiatives on disaster rehabilitation and recovery due to funding and budgetary allocation of 70% for all other phases of disaster management. What is specific is the 30% for quick response fund for disaster response.

Considering location as a variable, the highest level of compliance on risk management practices as a whole is on LGUs located in upland/lowland combination, which is very high, affirming the study

of Beckman et al. (2015) that upland communities encountered flash floods and landslides due to top-down agriculture and forestry policies causing its vulnerability to natural hazards. Therefore, farmers adopt practices to reduce risk and forest protection policies leading to cultivation on the non-forest slope lands, which are disaster risk management practices. While compliance is lowest LGUs located in lowland areas rated moderate, considering that these areas are close to bodies of water that aggravate the flooding during high tides.

As to the thematic area, disaster prevention, and mitigation, all location classifications were rated high except lowlands, that was rated moderate, consistent with other thematic areas since the degree of exposure and coping capability of urban settlements is great because of unplanned urbanization and other forms of environmental degradation aligned with the study of the United Nations Office for Disaster Risk Reduction (UNDRR, 2019).

In the area of disaster preparedness, the highest-rated location is upland/lowland, interpreted as very high, while lowland is lowest and interpreted as moderate. The findings indicate that disaster preparedness should consider the geographical location in line with the study of Jha et al. (2018) that in the country, hydro-meteorological events, including typhoons and floods, account for over 80% of the natural disasters.

Table 1B. Level of Compliance with the Provisions of R.A. 10121 in the aspect of Risk Management Practices

Variables	Risk Management Practice			Disaster Response			Disaster Rehabilitation and Recovery		
Classification	M	SD	Int	M	SD	Int	M	SD	Int
1st class	3.92	0.32	Hi	4.33	0.47	VH	3.55	0.35	Hi
2nd class	3.87	0.76	Hi	4.17	0.67	Hi	3.46	0.88	Hi
3rd class	3.58	0.60	Hi	3.92	0.75	Hi	3.14	0.83	Mo
4th class	3.92	0.15	Hi	4.34	0.34	VH	3.44	0.52	Hi
Highly Urbanized	3.43	0.00	Hi	4.00	0.00	Hi	3.15	0.00	Mo
Location									
Coastal	3.59	0.21	Hi	4.00	0.48	Hi	3.21	0.24	Mo
Upland	3.55	0.59	Hi	4.14	0.49	Hi	2.56	0.90	Lo
Lowland	3.06	0.52	Mo	3.58	0.60	Hi	2.54	0.87	Lo
Coastal/Upland	3.91	0.37	Hi	4.30	0.49	VH	3.69	0.30	Hi
Coastal/Lowland	3.83	0.34	Hi	4.22	0.47	VH	3.52	0.40	Hi
Upland/Lowland	4.24	0.04	VH	4.84	0.00	VH	3.77	0.33	Hi
All of the Above	3.97	0.54	Hi	4.20	0.67	Hi	3.56	0.62	Hi
Hazards									
8 and below	3.84	0.33	Hi	4.28	0.45	VH	3.39	0.32	Mo
9 and above	3.80	0.60	Hi	4.13	0.64	Hi	3.41	0.83	Hi
Whole	3.82	0.49	Hi	*4.20*	*0.56*	*Hi*	*3.40*	*0.63*	*Mo*

Note: M=Mean, SD=Standard Deviation, Int=Interpretation, VH=Very High, Hi=High, Mo=Moderate

In disaster response, all locations were rated high (coastal/upland, coastal lowland, and upland/lowland), implying that all LGUs are implementing risk management practices, specifically on disaster response, due to a specific funding allocation of 30% from DRRM funds. This finding is supported by the study of Tomas (2020) on disaster response focused on emergency acts and corroborated Durand et al. (2018) on the management of coastal flood risk using the multi-disciplinary approach by analyzing the dimensions of hazards, impact, and vulnerability. It is also in consonance with the finding of Busayo and Kalumba (2021) that the practices should include integrated risk management, the use of green infrastructure, and resilient designs.

While in disaster rehabilitation and recovery, the highest-rated location is upland/lowland, which is high, while the lowest-rated location is lowlands, as low, which demonstrates that rehabilitation and recovery of most of the locations is not a priority. The lowest mean on lowlands conforms to the findings of Durand et al. (2018), which revealed the lack of awareness of crisis management systems and tools and the behavior to adopt in the event of disasters.

When the number of identified hazards was considered, compliance with risk management practices in prevention and mitigation, response, and rehabilitation and recovery were higher for LGUs with 9 hazards and above. It was only on disaster preparedness where LGUs with 8 hazards and below were rated higher, implying that with a higher number of hazards, more care on risk management practices and more funding to mitigate these hazard and practiced. Results of this study agree with the UN Office for Disaster Risk Reduction and the Asian Disaster Preparedness Center (ADPC, 2019), the World Risk Report (2014), and Badajos and Caelian (2019) that different locations faced different hazards since their level of vulnerability in terms of climate stimuli was found to be varied. The findings of Fajardo (2013) and Camdem et al. (2015) strengthened the findings of this study that stakeholders play a very important role in managing risks, especially in decision-making.

Level of compliance with institutional arrangements and capacities

As a whole, the level of compliance of LGUs on institutional arrangements and capacities is high, with non-structural mechanisms higher than structural mechanisms.

The finding indicates that LGUs understood the dimensions of disaster risk reduction and management framework to form mechanisms to implement and maintain disaster risk reduction actions at the local level. However, elements of this integrated framework lack support, hence are not equally strong for disaster risk reduction.

The finding strengthens the study of Mendoza et al. (2016) that LGUs have been practicing initiatives on DRRM and corroborate Domingo (2017). He pointed out the weakness of RA 10121 in terms of grounding and implementation and articulated the lack of high-level institutional

Table 2. Level of Compliance with the Provisions of R.A. 10121 in the aspect of Institutional Arrangements and Capacities

Variables	Institutional Arrangements and Capacities			Structural Mechanism			Non-Structural Mechanism		
Classification	M	SD	Int	M	SD	Int	M	SD	Int
1st class	3.92	0.38	Hi	3.75	0.57	Hi	4.03	0.56	Hi
2nd class	3.89	0.55	Hi	3.63	1.28	Hi	4.07	0.43	Hi
3rd class	3.73	0.59	Hi	3.71	1.03	Hi	3.76	0.68	Hi
4th class	3.61	0.47	Hi	3.26	0.88	Mo	3.88	0.66	Hi
Highly Urbanized	3.82		Hi	3.71		Hi	3.90		
Location									
Coastal	3.57	0.59	Hi	3.19	0.46	Mo	3.83	0.97	Hi
Upland	3.25	0.46	Mo	2.19	0.08	Lo	4.00	0.82	Hi
Lowland	3.50	0.46	Hi	2.43	1.82	Lo	4.25	0.49	VH
Coastal/Upland	3.83	0.52	Hi	3.93	0.66	Hi	3.77	0.50	Hi
Coastal/Lowland	3.77	0.42	Hi	3.80	0.51	Hi	3.76	0.58	Hi
Upland/Lowland	4.00	0.25	Hi	4.21	0.51	VH	3.85	0.07	Hi
All of the Above	4.00	0.44	Hi	3.90	0.80	Hi	4.09	0.55	Hi
Hazards									
8 and below	3.62	0.43	Hi	3.46	0.70	Hi	3.74	0.60	Hi
9 and above	3.94	0.48	Hi	3.71	1.06	Hi	4.12	0.49	Hi
Whole	*3.79*	*0.48*	*Hi*	*3.59*	*0.91*	*Hi*	*3.94*	*0.57*	*Hi*

Note: VH=Very High, Hi=High, Mo=Moderate, Lo=Low

leadership. Hence, it endorses creating a new department that will respond to the conclusiveness of institutional capacity and leadership and delineating responsibilities. Also, Dariagan et al. (2021) recommended the appointment of full-time disaster managers to take care of disaster risk reduction and management programs.

The level of compliance with the non-structural measures is higher than the structural mechanisms. This is strengthened in the studies of Saravanan (2016), United Nations Office for Disaster Risk Reduction (UNDRR, 2017), Takanori et al. (2018), and Xiao et al. (2018), whom all agreed that non-structural measures are aimed to strengthen the legal framework, structures and functions, and mechanisms for collaboration and coordination to implement DRRM law.

The finding of a lower mean on the compliance for structural measures substantiated the findings of Takanori (2018) and Chang and Shieh (2013) that traditional structural mitigation effectively responds to destruction or facility failure, improper human operation, and aging facilities. Further, to ensure the protection of lives and properties, the United Nations Office for Disaster Risk Reduction (UNDRR, 2017) recommends following the building code. Non-compliance with structural measures was revealed in the lack of evacuation sites, equipage, emergency operations centers, and other structures to prevent damage to lives and properties, as found by Saravanan (2016).

Challenges encountered in the compliance with the provisions of RA 10121

There are two major challenges identified in compliance with RA 10121: budget constraints on personnel services and limited technical personnel for research and planning. These findings are supported by the observation of the Asian Development Bank and the Asian Development Bank Institute (2013) that the government's capacity to manage disaster risks is critical and should be streamlined. The structure and quality of governance need to be improved at all levels.

Table 3. Challenges in Compliance with the Provisions of RA 10121

Challenges	f	%
Budget constraints and limitations on personal services	23	71.9
Limited technical personnel for research and planning	23	71.9
Limited resources for the construction of mitigating projects	22	68.8
Lack of a monitoring system by the national government	22	68.8
Lack of coordination between LGUs and the national government	20	62.5
Allocation and utilization of DRRM fund	19	59.4
Limitedallocation for the construction of Evacuation Center	19	59.4
Compliance with the organization and composition of the LDRRMO and BDRRMC	19	59.4
Lack of national policy for implementation of the guidelines issued	19	59.4
Lack of coordination with the private sector	19	59.4
Unavailability of a budget for the establishment of EOC	18	56.3
Filling up of mandated positions	18	56.3
Lack of coordination with other government agencies	17	53.1
Political intervention/Transition in the Local Government leadership.	17	53.1
Lack of management skills.	17	53.1
Compliance with the institutionalization of DRRM structures	16	50.0
Lack of coordination between the levels of government	16	50.0
Limited personnel	16	50.0
Land Banking	16	50.0
Lack of coordination among implementers	14	43.8
Minimal budget allocation for training	13	40.6
Insufficient capability enhancement training	13	40.6
No budget allocation for construction of flood control	12	37.5
Lack of support from some local officials	12	37.5
Compliance with the establishment of local DRRM offices	10	31.3
Priority of City/Municipal Officials/Members of DRRM Council	8	25.0
No Policies/Ordinance on the relocation of vulnerable sectors	5	15.6
No Policies/Ordinance on Forced Evacuation	2	6.3

Moreover, the findings are consistent with the study of Schwarz et al. (2014) that in the Philippines, a comprehensive regulative framework for DRRM is in place. However, structures and capacities are weak at the local level. Most LGUs do not have sufficient capacity to prepare, which points out the limited technical personnel that can be traced to budget constraints. Furthermore, the United Nations Office for Disaster Risk Reduction (UNDRR, 2019) pointed out that strengthening local institutional capacity for DRR is the highest priority identified, and funding is a critical issue other than the need to involve local communities.

The next set of challenges identified is parallel to the first two: limited resources and lack of monitoring from higher levels of the government. Closely related is the next challenge: the lack of coordination between LGUs and the national government. The challenge of lack of monitoring and coordination was identified by the Department of Interior and Local Government [DILG] (2012) as a governance and policy issue. Related to budget constraints is the challenge of the allocation and utilization of the LDRRMF, as confirmed in the studies of Domingo and Manejar (2018), Mendoza et al. (2016), and the Department of Interior and Local Government (DILG, 2012).

Other challenges are compliance with the organization and composition of the LDRRMO and the BDRRMO, lack of national policy for strict implementation of the guidelines issued, and lack of coordination with the private sector. These challenges affirm the study of Kanyasan et al. (2018) that barriers to implementation include unclear provisions in the national legislation, unclear mandates on leading the program, poor monitoring system, insufficient human resources, and lack of public-private partnerships.

Overall, local government units exhibited high compliance with risk management practices and institutional arrangements and capacities. However, there are challenges encountered in implementation, yet local government units managed to survive the effects of disasters by adopting and promoting robust and sound policies, legislation, coordination mechanisms, and regulatory frameworks, including their exercise of accountability, participation, and transparency validating the adoption of the good governance theory of the World Bank. Experience revealed that local officials' failure to provide for the needs of their constituents before, during, and after disasters became issues raised against the incumbents during local elections.

Institutional capacities at local levels supplemented by effective information espoused by the Good Governance Theory and mechanisms in coordination and networking espoused in the Open Systems Theory of Katz and Kahn (1971) are keys to effective disaster risk reduction.

5.0. Conclusion

The compliance of LGUs to the provisions of disaster risk reduction and management law on risk management practices is high, which means that most mandated risk management practices were implemented revealed on disaster prevention and mitigation, disaster preparedness, and disaster response. While capacity depends on disaster rehabilitation and recovery attributed to inadequate information on how LDRRMF shall be spent and the large amount for structural mechanisms. Results validated the good governance theory as applied by local government units.

Compliance with institutional arrangement and capacities is also high but must be reviewed and anchored on realities at the local level. Strengthening local institutional capacity for disaster risk reduction should be prioritized with technical support from national agencies, the academe, and international professional organizations on DRR. The issue of local financing is important; thus, the government should seek how financing flows from national to local levels work, paying special attention to articulating and removing key blockages such as legislative, bureaucratic, and political.

The challenges encountered are supported by robust evidence, yet LGUs survived, which justifies the practice of the good governance principles; otherwise, local officials are blamed by their constituents and will suffer in their bid for reelection. Notwithstanding weaknesses in grounding institutional arrangements, it is evident that compliance with disaster risk management practices has made a dent in development processes and DRR initiatives, implying that compliance with the provisions of the law strengthens the DRRM office of the LGUs, validating the theory of the researcher.

6.0. Declaration of Conflicting Interest

The authors have no conflicts of interest to declare. Both authors have seen and agree with the contents of this manuscript, and there is no financial interest to report. We certify that the submission is original work and is not under review at any other publication.

7.0. Funding

All funds for this study come from the researchers' personal savings.

REFERENCES

Aitsi-Selmi, A., Murray, V., Wannous, C., Dickinson, C., Johnston, D., Kawasaki, Stevance, A. S., A., & Yeung, T. (2016). Reflections on a science and technology agenda for 21st-century disaster risk reduction. *International Journal of Disaster Risk Science*, *7*(1), 1-29. https://doi.org/10.1007/s13753-016-0081-x

Asian Development Bank and the Asian Development Bank Institute. (2013 April). Disaster risk management in Asia and the pacific. https://www.adb.org/sites/default/files/publication/157232/adbi-rp75.pdf

Asian Disaster Preparedness Center (ADPC). (2019). Disaster risk reduction in the Philippines: Status report 2019. https://reliefweb.int/report/philippines/disaster-risk-reduction-philippines-status-report-july-2019

Asio, J. M. R. (2020). Disaster management program compliance and problems encountered in two provinces in Central Luzon, Philippines. *Asio, JMR (2020). Disaster management program compliance and problems encountered in two provinces in Central Luzon, Philippines. Interdisciplinary Research Review*, *15*(5), 24-31. https://ph02.tci-thaijo.org/index.php/jtir/article/view/240805

Badajos, M. A. C. B., & Caelian, M. V. (2019). Vulnerability and risk assessment of a state university in the Philippines. *Philippine Social Science Journal*, *2*(2), 9-22. https://doi.org/10.52006/main.v2i2.78

Bayoran, G. (2019, March 31). Damage due to drought in Negros hit P60.6 million. *The Philippine Star*. https://www.philstar.com/nation/2019/03/31/1905978/damage-due-drought-negros-hit-p606-million

Beckman, M., Mochizuki, J., & Naruchaikusol, S. (2015). Changing land use, disaster risk, and adaptive responses in upland communities in Thailand. *IDRiM Journal*, *5*(1), 1-20. https://doi.org/10.5595/idrim.2015.0083

Busayo, E. T., & Kalumba, A. M. (2021). Recommendations for linking climate change adaptation and disaster risk reduction in urban coastal zones: Lessons from East London, South Africa. *Ocean & Coastal Management*, *203*, 105454. https://doi.org/10.1016/j.ocecoaman.2020.105454

Camden, C., Shikako-Thomas, K., Nguyen, T., Graham, E., Thomas, A., Sprung, J., Morris, C. & Russell, D. J. (2015). Engaging stakeholders in rehabilitation research: A scoping review of strategies used in partnerships and evaluation of impacts. *Disability and Rehabilitation*, *37*(15), 1390-1400. https://doi.org/10.3109/09638288.2014.963705

Chang, H. S., & Hsieh, H. Y. (2013). An exploratory study on land use planning of disaster prevention: A case study of Kaohsiung new town. *Procedia Environmental Sciences*, *17*, 382-391. https://doi.org/10.1016/j.proenv.2013.02.051

Cordevilla, C. G., & Caelian, Z. G. V. (2020). Disaster risk reduction management awareness and practices of universal banks in Bacolod City. *Philippine Social Science Journal*, *3*(2), 133-134. https://philssj.org/index.php/main/article/view/135

Corpuz, C. R. (2019). The experience of selected typhoon Haiyan survivors on co-operative formation as part of their rebuilding and recovery strategy: Case study approach. *People*, *4*(3). https://dx.doi.org/10.20319/pijss.2019.43.16521674

Dariagan, J. D., Atando, R. B., & Asis, J. L. B. (2021). Disaster preparedness of local governments in Panay Island, Philippines. *Natural Hazards*, *105*(2), 1923-1944. https://doi.org/10.1007/s11069-020-04383-0

Department of Interior and Local Government (DILG). (2012). A voyage to disaster resilience in small islands a guide for local leaders. https://www.dilg.gov.ph/PDF_File/reports_resources/DILG-Resources-2012112-2a91abbcac.pdf

Domingo, S. N. (2017). Institutional issues on disaster risk reduction and management (No. 2017-50). *PIDS Discussion Paper Series*. http://hdl.handle.net/10419/211010

Domingo, S. N., & Manejar, A. J. A. (2018). Disaster preparedness and local governance in the Philippines. *PIDS Discussion Paper Series*. http://hdl.handle.net/10419/211072

Durand, P., Anselme, B., Defossez, S., Elineau, S., Gherardi, M., Goeldner-Gianella, L., Longepee, E., & Nicolae-Lerma, A. (2018). Coastal flood risk: Improving operational response, a case study on the municipality of Leucate, Languedoc, France. *Geoenvironmental Disasters*, *5*(1), 1-17. https://doi.org/10.1186/s40677-018-0109-1

Fajardo, J. P. M. (2013). Evidence-based disaster risk reduction and management: CBMS for local level DRRM? *Journal of Business, Education and Law*, *17*(1), 1-1. https://www.ejournals.ph/article.php?id=2947

Global Water Partnership. (2018, November 10). Looking back, looking forward: Evaluation of the Global Water Partnership. https://www.gwp.org/contentassets/8b2e3f7bb0fb4968b74cb519b1f9655b/looking-back-looking-forward---evaluation-of-gwp-2018.pdf

Good, C., & Scates, D. (1972). *Methods of research educational, psychological, and sociological.* Manila: Appleton-Century-Crafts.

Jha, S., Martinez Jr, A., Quising, P., Ardaniel, Z., & Wang, L. (2018). Natural disasters, public spending, and creative destruction: A case study of the Philippines. https://dx.doi.org/10.2139/ssrn.3204166

Jurilla, V. D. (2016). A case analysis of disaster risk reduction preparedness of Iloilo province: Basis for a comprehensive intervention program. *Asia Pacific Journal of Multidisciplinary Research*, *4*(3). https://www.academia.edu/41957754/A_Case_Analysis_of_Disaster_Risk_Reduction_Preparedness_of_Iloilo_Province_Basis_for_A_Comprehensive_Intervention

Kanyasan, K., Nonaka, D., Chatouphonexay, A., Hernandez, P. M., Kounnavong, S., & Kobayashi, J. (2018). Implementation of disaster risk reduction and management policies in a school setting in Lao PDR: A case study. *Tropical Medicine and Health*, *46*(1), 1-12. https://doi.org/10.1186/s41182-018-0124-7

Katz, D., & Kahn, R. (1971). Open systems theory. *Readings on Organization Theory: Open-Systems Approaches*, 13-32. https://www.researchgate.net/figure/Katz-and-Kahn-Open-System-Model_fig1_276294845
Kellett, J., Caravani, A., & Pichon, F. (2014). Financing disaster risk reduction: Towards. https://www.alnap.org/system/files/content/resource/files/main/9027.pdf
Loosemore, M., Chow, V., & McGeorge, D. (2014). Managing the health risks of extreme weather events by managing hospital infrastructure. *Engineering, Construction, and Architectural Management*. https://doi.org/10.1108/ECAM-10-2012-0060
Matyas, D., & Pelling, M. (2015). Positioning resilience for 2015: The role of resistance, incremental adjustment, and transformation in disaster risk management policy. *Disasters*, *39*(s1), s1-s18. https://doi.org/10.1111/disa.12107
Mendoza, E. N., Toledo-Bruno, A. G., & Olpenda, A. S. (2016). Local government unit capacity for disaster risk reduction and management: from disaster to resilience. *Advances in Environmental Sciences*, *8*(2), 148-156. http://www.aes.bioflux.com.ro/
Nicavera, E. (2021). Floods leave P20M in damage, losses to NegOcc Agri sector. *Sunstar Bacolod.* https://www.sunstar.com.ph/article/1882032/Bacolod/Business/Floods-leave-P20M-in-damage-losses-to-NegOcc-agri-sector
Panase, A. P., & Doruelo, M. E. Y. (2020). Awareness and practices on disaster risk preparedness of maritime students. *Philippine Social Science Journal*, *3*(2), 65-66. https://doi.org/10.52006/main.v3i2.189
Petrosillo, I., Aretano, R., & Zurlini, G. (2015). Socioecological systems. *Reference Module in Earth Systems and Environmental Sciences*, 1-7. https://doi.org/10.1016/B978-0-12-409548-9.09518-X.
Saravanan, D. (2016). Coastal hazard and resilience due to disaster: A survey. *International Journal of Oceans and Oceanography*, *10*(2), 133-140. https://www.ripublication.com/ijoo16/ijoov10n2_05.pdf
Sawada, Y., & Oum, S. (2011). Economic and welfare impacts of disasters in East Asia and policy responses. *Economic and Welfare Impacts of Disasters in East Asia and Policy Responses. ERIA Research Project Report*, *8*, 1-25.
Sawada, Y., & Zen, F. (2014). Disaster management in ASEAN. *ERIA-DP-2014-03*. https://www.eria.org/ERIA-DP-2014-03.pdf
Schwarz, A., Rothenberger, L., Schleicher, K., & Srugies, A. (2014). Purpose and relevance.
Shi, L., Han, L., Yang, F., & Gao, L. (2019). *The Evolution of Sustainable Development Theory: Types, Goals, and Research Prospects.* Sustainability, 11(24), 7158. https://doi.org/10.3390/su11247158.
Sumbillo, Jr, L. Z., & Madrigal, D. V. (2020). Disaster risk reduction management practices of Augustinian Recollect schools in Negros Island. *Philippine Social Science Journal*, *3*(2), 135-136. https://doi.org/10.52006/main.v3i2.220
Symaco, L. P. (2013). Geographies of social exclusion: Education access in the Philippines. *Comparative Education*, *49*(3), 361-373. https://doi.org/10.1080/03050068.2013.803784
Takanori, Z. (2018). Understanding Japan's best practices in disaster risk reduction and management. A Mabini Dialogue titled Japan vs. Nature. https://www.fsi.gov.ph/mabini-dialogue-spotlights-japans-best-practices-in-drrm/
Tomas, J. A. (2020). The citizen's perspective on emergency measures in times of natural disasters of the local government unit. *Journal of Critical Reviews*, *7*(11), 268-273. http://dx.doi.org/10.31838/jcr.07.11.43
United Nations International Strategy for Disaster Reduction (UNISDR). (2016). UNISDR annual report 2015. https://www.undrr.org/publication/unisdr-annual-report-2015
United Nations Office for Disaster Risk Reduction (UNDRR). (2017). UNISDR annual report 2017. https://www.undrr.org/publication/unisdr-annual-report-2017
United Nations Office for Disaster Risk Reduction (UNDRR). (2019). Global assessment report on disaster risk reduction 2019. https://www.undrr.org/publication/global-assessment-report-disaster-risk-reduction-2019
Ventura, G. L., & Madrigal, D. V. (2020). Awareness and Practices on Disaster Preparedness of Students of a Public High School in Antique. *Philippine Social Science Journal*, *3*(2), 45-46. https://doi.org/10.52006/main.v3i2.210
World Bank. (1992). Governance and development. *The World Bank*. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/604951468739447676/governance-and-development
World Meteorological Organization (WMO). (2011 March 24). WMO Statement on the status of the global climate in 2010. https://public.wmo.int/en/media/news/wmo-statement-status-of-global-climate-2010
World Risk Report (2014). United Nations University Institute for the environment and human security. https://i.unu.edu/media/ehs.unu.edu/news/4070/11895.pdf
Xiao, J., Lavia, L., & Kang, J. (2018). Towards an agile participatory urban soundscape planning framework. *Journal of Environmental Planning and Management*, *61*(4), 677-698. https://doi.org/10.1080/09640568.2017.1331843

Additional Author's Information:

JOSE T. YUSAY III
joseyusay.28@gmail.com
https://orcid.org/0000-0002-1367-2039

ZEAPHARD GERHART V. CAELIAN
zgv17caelian@gmail.com
https://orcid.org/0000-0003-0155-8826