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Disaster Resilience and Capability in the Maintenance of Public Order During Disaster of Calamity-Prone Municipalities in Oriental Mindoro, Philippines

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ABSTRACT

This study examined the level of disaster resilience and extent of the capability of calamity-prone areas to maintain public order during disaster, among the respondents, the barangay officials and the residents in the disaster-prone municipalities in Oriental Mindoro. This study employed a descriptive-quantitative research design in which the level of disaster resilience and extent of the capability of calamity-prone areas in the maintenance of public order during disaster, among the respondents, the barangay officials (n=180) and the residents (n=379) in the disaster-prone municipalities in Oriental Mindoro. A structure questionnaire was crafted based on study questions. In this study, stratified proportional random sampling was carried out for the selection of resident respondents. In contrast, total enumeration was used for barangay officials, including the chief of the barangay tanods in each barangay of the calamity-prone areas of the province under study. The weighted mean was used to evaluate the respondents' level of disaster resilience and the extent of capability of calamity-prone areas in the maintenance of public order during disaster. Results showed the high extent of capability in the maintenance of public order during disaster in disaster-prone municipalities is indicative of the effective implementation of policies on disaster preparedness and the management of disaster risk reduction. The local government units may adopt the comprehensive resilience program based on the findings of this study to further enhance disaster resilience and disaster risk reduction management.

INTRODUCTION

Disaster Risk Reduction (DRR) projects have been widely deployed to improve community resilience and decrease vulnerabilities in the case of catastrophes. The literature has defined different approaches and frameworks for DRR, including detection and monitoring systems, effective communication, support in facility reconstruction, and reaction and recovery measures. Existing frameworks, however, frequently fall short of taking into account antecedent socioeconomic elements at the local level, as well as the vulnerability or resilience of the natural environment (UNISDR Global Assessment Report, 2015). According to Norris *et al.* (2008), understanding how survivors function during and after disasters is critical, as is putting this knowledge into practice tactics that encourage resilience. While climate change is a global concern, it can only be effectively addressed locally (Ostrom, 2010). Many international climate change adaptation plans emphasize the increased danger of extreme events and disasters, as well as the importance of local communities in disaster risk reduction. Despite multiple endeavors, it is unclear whether these efforts are effectively aligned with community expectations for disaster resilience. Understanding community attitudes and resilience characteristics is thus critical, as it can inform enhanced resilience-building processes and assist communities in catastrophe preparedness.

The Council of Australian Governments (COAG) approved a national resilience-based disaster management approach in December 2009, emphasizing cooperation to improve local capacity and empower communities (Weichselgartner & Kelman, 2015)). Community resilience, according to Ramsey *et al.* (2016), is a continual engagement process that prepares communities for disasters and supports in their recovery. In recent years, a number of disaster resilience measurement frameworks have been developed, but few are intended for community use (Cai *et al.*, 2018).

In the Philippines, Republic Act (RA) 10121, an act highlighting the role of local government units (LGUs) in disaster management, institutionalizes the participation of civil society organizations (CSOs) and the corporate sector in building community resilience (Official Gazette (2010). RA 10121 emphasizes the importance of assessing and improving the performance and organizational structure of implementing agencies in order to ensure catastrophe preparedness. It also emphasizes the significance of raising risk and hazard awareness and knowledge, as well as preparedness for effective reaction and recovery.

Following the devastation caused by Typhoon Yolanda in 2013, efforts were undertaken to construct safer, physically sound, and hazard-adaptive evacuation shelters that catered to the requirements of vulnerable groups (Nakamura *et al.*, 2015). For instance, the local administration collaborated with the Philippine Disaster Resilience Foundation to construct and improve a disaster-resilient evacuation facility. This effort emphasizes the relevance of infrastructure resilience and community capacity-building in disaster response.

Furthermore, the Federal Emergency Management

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Agency (FEMA) in the United States recognizes the critical role of law enforcement in disaster response, particularly their existing relationships and trust throughout communities (Koch *et al*, 2017). However, according to Llosa and Zodrow (2011), a research conducted in the Philippines, local officials prioritize short-term disaster risk management measures in order to obtain credit during their term, thus jeopardizing disaster management efficacy. This discovery gives light on the dynamics of local calamity management, particularly the impact of political factors.

While multiple studies have investigated disaster resilience and response skills in a variety of situations, there is a significant study deficit regarding the specific disaster-prone towns in Oriental Mindoro, Philippines. Despite the fact that disaster-prone areas are subject to repeating disasters, there is little empirical research that completely examines disaster resilience levels and the range of capabilities, with a special emphasis on the maintenance of public order during disasters. Despite the vital relevance of understanding the dynamics, strengths, and vulnerabilities of these communities in the event of disasters, this study vacuum persists. Thus, this study examined the level of disaster resilience and extent of capability of calamity-prone areas in the maintenance of public order during disaster, among the respondents, the barangay officials and the residents in the disaster-prone municipalities in Oriental Mindoro.

METHODOLOGY

This study employed a descriptive-quantitative research design in which the level of disaster resilience and extent of capability of calamity-prone areas in the maintenance of public order during disaster, among the respondents, the barangay officials (n=180) and the residents (n=379) in the disaster-prone municipalities in Oriental Mindoro. A structure questionnaire was crafted based on study questions. In this study, stratified proportional random sampling was carried out for the selection of resident respondents, whereas total enumeration was used for barangay officials, including the chief of the barangay tanods in each barangay of the calamity-prone areas of the province under study. The evaluation and ethics committees were supplied with a draft questionnaire for content validation and approval. The questionnaire was reproduced with all of the comments, suggestions, and recommendations included. The researcher requested authorization from the relevant authorities, such as the barangay chairman, via a letter request for the distribution of questionnaires and the collection of extra data for this study. After the request was granted, the researcher floated the questionnaire and collected additional data. The weighted mean was used to evaluate the respondents' level of disaster resilience and extent of capability of calamity-prone areas in the maintenance of public order during disaster.

RESULTS AND DISCUSSIONS

Level of Disaster Resilience of Residents and Barangay Officials in the Disaster-Prone Municipalities of Oriental Mindoro

Table 1 shows the level of disaster resilience among the respondents, the barangay officials and the residents in the disaster-prone municipalities in Oriental Mindoro.

Table 1: Level of Disaster Resilience of Residents and Barangay Officials in the Disaster-prone Municipalities of Oriental Mindoro

Indicators	Barangay Officials		Residents		Overall	
	Weighted Mean	Verbal Interpretation	Weighted Mean	Verbal Interpretation	Weighted Mean	Verbal Interpretation
1. Damage to property as a result of disaster is reduced to negligible level.	3.59	Often	3.57	Often	3.58	Often
2. There are enough evacuation centers to accommodate victims of disasters.	3.92	Often	3.77	Often	3.85	Often
3. Damage to infrastructures like roads, bridges and buildings are restored immediately after the disaster.	3.32	Sometimes	3.36	Sometimes	3.34	Sometimes
4. Medical aid arrives immediately to treat injuries and contain the possible spread of diseases that might have resulted from the disaster.	3.65	Often	3.52	Often	3.59	Often

5. The families have enough capability to repair or rebuild their houses that were damaged by disaster like skills in carpentry and masonry.	3.59	Often	3.45	Sometimes	3.52	Often
6. The victims immediately go back to their jobs or restore their livelihood through extensive livelihood program like training, job posting and giving of financial support for their capital by the government.	3.35	Sometimes	3.38	Sometimes	3.37	Sometimes
7. The victims immediately recover from the loss of property by means of sufficient financial support from the government.	3.07	Sometimes	3.16	Sometimes	3.12	Sometimes
8. The victims immediately recover from the loss of a family member by means of extensive psychological counselling given by experts from the local government.	3.14	Sometimes	3.11	Sometimes	3.13	Sometimes
9. Victims do not experience much the shortage of basic needs like food, water, shelter and clothing as a result of disaster because of the aid and donations brought by the government.	3.55	Often	3.39	Sometimes	3.47	Sometimes
10. Damage to properties of the residents like houses is minimal because of timely action to mitigate damages like placing temporarily flood control, immediate transfer of valuables to safer locations, and immediate repair to prevent the damages from getting worse.	3.47	Sometimes	3.44	Sometimes	3.46	Sometimes

11. The residents go back to their normal life within a month after the disaster because of the effective rehabilitation program of the government.	3.39	Sometimes	3.52	Often	3.46	Sometimes
Composite Mean	**3.46**	**Sometimes**	**3.42**	**Sometimes**	**3.44**	**Sometimes**

Legend: 4.50 – 5.00 = Always (A); 3.50 – 4.49 = Often (O); 2.50 – 3.49 = Sometimes (So); 1.50 – 2.49 = Seldom (Se); 1.00 – 1.49 = Never (N)

The overall composite mean of 3.44, described as Sometimes, signifies that the respondents have moderate level of disaster resilience. The small difference on the composite mean of the responses from the barangay officials, which is 3.46, from the composite mean of 3.42 from the resident-respondents reveals that both groups struggle with moving forward after experiencing disasters. Also, it can be gleaned from the table that both groups of respondents rated the second item on the questionnaire with the highest weighted mean. The barangay officials rated the item with 3.92 while the resident-respondents rated it with 3.77 mean, which are both described as Often. The item indicates the sufficient number of evacuation centers that shall accommodate the victims of disasters. The responses indicate that the municipalities are able to provide adequate facilities for evacuation. The respondents further added that such evacuation centers can be the schools or churches in the community. Some barangay officials likewise mentioned that the municipal government has allocated funds for the construction of evacuation centers which are already readily available for use during disasters.

Since the evacuation centers serve as temporary shelters to the victims of calamities and disasters, the provision of help and support can be made conveniently. As the victims are gathered in particular locations, assistance from the government and private sectors can be easily utilized and sent to them. Through this, the victims are able to feel secured and protected despite the disaster that they are facing. Such psychological relief has been found to enhance their resiliency. The availability of evacuation centers in the community does not only ensure the safety and security of the citizens but likewise serve as venues for the conduct of counseling and support groups to enhance resilience. In such cases, designated personnel from the government are invited to encourage the people who struggled in the midst of disasters. Thus, evacuation centers do not only cater the biological needs of the victims but also their psychological stability which is vital in moving towards disaster resilience.

On the other hand, the barangay officials ranked item number 7 with the lowest weighted mean of 3.07, which is described as Sometimes. In this item, the recovery over the loss of property through financial support from the government was stated. The barangay officials may have felt that the financial support from the government is not sufficient for disaster resilience (Usamah *et al.*, 2014). This perception may be attributed to the limited funding of the government which is distributed to all communities that are affected by the calamities. The budg*et al*location may depend on the severity of damage, thus some barangays may have not been funded with enough support that will help the citizens in their pursuit to recovery. Ultimately, bigger amounts will be allocated to communities with severe damages and their recovery will be the topmost priority. Meanwhile, small communities may not receive the sufficient financial support. Some respondents also mentioned that there were also instances when the assessment of damages were not fully justified, thus the funding does not suffice to the needs of the community. Being in the position, the barangay officials are the first persons to identify this challenge.

Responses from the residents ranked item number 8, out of the total 11 items, with the lowest weighted mean of 3.11, described as Sometimes. The items include the immediate recovery over the loss of a family member through psychological counseling. This implies that the residents struggle with recovering from the loss of a loved one due to calamities. A loss of life is surely one of the biggest struggles that the victims of calamities have to face. While properties and livelihood may be replaced, a lost loved one cannot. In such cases, psychological counseling initiated by the government may not be at all times able to address the problem. Although most bereaved persons do not need professional help in coping well after loss of a loved one, recovering from such loss requires time. Thus, bereavement affects the level of resilience of the resident-respondents.

The relationship between bereavement and disaster is confirmed in the findings of Walsh (2007) which revealed that death of a loved one, specifically parents, have long lasting effects on the individuals' resiliency. In their studies, parental death has been considered to result into various problems such as decreased competency, depressive symptoms, low psychological well-being, and other related symptoms among the individuals. In such cases, the study also revealed that support from other family members is more applicable than the professional assistance of psychology experts. This may be the reason why the residents felt that the initiative of the government to provide counseling to the bereaved families is not enhancing their resiliency. Thus, the government may

implement different strategies to support bereaved families in their way of coping through a loss of family member.

Extent of Capability in the Maintenance of Public Order During Disaster of Calamity-Prone Municipalities as Assessed by Residents and Barangay Officials

Table 2 shows the residents' and barangay officials' responses on the extent of capability of calamity-prone areas in the maintenance of public order during disaster. The general composite mean points out that the residents and officials have a high capability in maintaining public order in times of disaster especially in calamity-prone areas. The residents earned an overall mean of 3.61 while the officials earned an average mean of 3.75, both described as High. This shows that the officials are well-trained and oriented on the proper protocols and procedures implemented during calamities. As officials, identifying the high-risk areas in the community is one of their primary concerns. Their experience in handling calamities strengthens their capability as they are able to evaluate the success of previous actions. The table also shows how the presence of law enforcement in maintaining order encourage cooperation of residents in affected areas. Significantly, the residents demonstrate high confidence in their capability to maintain public order. Since high-risk areas are repeatedly vulnerable to calamities, residents are also familiar with how local officials respond to various catastrophes. Thus, residents may have also developed their system of responding to calamities.

From the results shown in the table, it can be observed that item 9 earned the highest mean with 4.11 for the officials and 3.83 from the residents. The item illustrates the sufficient number of force multipliers that helps the law enforcers in maintaining public safety. The result reveals that both officials and residents have received help from other forces aside from the law enforcement during calamities. Various force multipliers such as local

Table 2: Extent of Capability in the Maintenance of Public Order During Disaster of Calamity-prone Municipalities as Assessed by Residents and Barangay Officials

Indicators	Barangay Officials		Residents		Overall	
	Weighted Mean	Verbal Interpretation	Weighted Mean	Verbal Interpretation	Weighted Mean	Verbal Interpretation
1. There are police officers who guard the place where calamity took place to prevent people from taking advantage of the situation by committing crimes like theft.	3.44	Moderately High	3.38	Moderately High	3.41	Moderately High
2. Peace and order in the community is restored immediately after the disaster by delegating more police officers and soldiers to guard the place.	3.33	Moderately High	3.44	Moderately High	3.39	Moderately High
3. There is orderly and fair distribution of relief goods due to the assistance of law enforcers.	3.84	High	3.64	High	3.74	High
4. There is enforcement of rules to prevent people who take advantage of the situation to commit crime or gain profit during disaster.	3.67	High	3.54	High	3.61	High
5. There are law enforcers deployed to patrol in the affected areas during calamity.	3.73	High	3.56	High	3.65	High

6. Evacuation policies are well enforced with the aid of law enforcers to ensure that disturbances like quarrel will be avoided at the evacuation center.	3.78	High	3.64	High	3.71	High
7. There are enough law enforcers deployed in evacuation centers to ensure the safety of the evacuees.	3.86	High	3.70	High	3.78	High
8. There is full cooperation of the affected communities in cases of mandatory evacuation if with the aid of law enforcers.	3.76	High	3.65	High	3.71	High
9. There are sufficient force multipliers like barangay tanods to aid the law enforcers in maintaining public safety during disasters.	4.11	High	3.83	High	3.97	High
10. Violence is avoided in the evacuation center due to the presence of law enforcers.	3.93	High	3.70	High	3.82	High
Composite Mean	**3.75**	**High**	**3.61**	**High**	**3.68**	**High**

Legend: 4.50 – 5.00 = Very High (VH); 3.50 – 4.49 = High (H); 2.50 – 3.49 = Moderately High (MH); 1.50 – 2.49 = Low (L); 1.00 – 1.49 = Very Low (VL)

government officials and employees, disaster-related agencies, private organizations, and public volunteers extend their services during calamities. It is then easier for law enforcers to prevent theft and provide security as other forces take charge of their tasks. The role of distributing relief goods and assistance are acted out by force multipliers. The Local government supports in patrolling the affected areas to prevent crime while other force multipliers help maintain order in evacuation areas to avoid strife and violence.

Significantly, item 1 garnered the lowest overall mean with 3.44 in the case of the officials and 3.41 in the case of the residents. The result reveals that both officials and residents acknowledge that there is a moderately high involvement of police officers in the calamity areas. Though lowest among all the indicators, the general composite mean still shows that there is moderate presence of law enforcement. The result does not necessarily mean that the law enforcers lack action or lack priority in addressing calamities but it may be attributed to the number of police officers in a city and the number of affected areas. As the number of calamity-prone areas and the number of affected residents increases, the number of police officers decreases as they are divided to respond to all areas. Thus, the police officers recognize the need to increase the number of police officers in affected areas to prevent other individuals taking advantage of the disaster. The increase in number of police officers would significantly lower the number of thefts.

This can also address headstrong residents who refuse to evacuate from their homes with the fear of losing their valuables. Ensuring that there are the sufficient number of police officers to guard the resident's home would increase evacuation compliance. In general, the table reveals the important role that law enforcers play in maintaining peace and order in evacuation and calamity-prone areas (Brillantes, 1993). The presence of law enforcers helps minimize the number of crimes and violence, thus maintaining public order in times of calamity.

CONCLUSIONS

The high extent of capability in the maintenance of public order during disaster in disaster-prone municipalities is indicative of the effective implementation of policies on disaster preparedness and the management of disaster risk reduction. The local government units may adopt the comprehensive resilience program based on the findings of this study to further enhance disaster resilience and disaster risk reduction management.

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