Social Media as Communication System for Disaster Risk Reduction and Mitigation in the Philippines

Arvin ChristianP. De Los Reyes, RN
Dr. John Michael M. Dela Cruz, LPT

ABSTRACT

In the advent of modern technology, social media became part of modern culture as it weave the daily communications means of all individuals in the community. This study described and examined the use of social media as communication system for disaster risk reduction and mitigation in selected barangays in Central Luzon, Philippines. The study utilized descriptive correlational research design which was participated by 68 respondents who were barangay officials, workers and employees. Thus, the study utilized a researcher-made survey questionnaire to measure the use of social media as communication system. Results of the study showed that Facebook and messenger accounts were being utilized to deliver and disseminate proper information in times of the occurrence of disaster and calamities. Consequently, social media became one of the effective mechanisms that helped the barangay administration to involve their constituents to become vigilant and responsible in time of disaster, responsible of sharing critical and vital information about disaster and calamity concerns, provide safe spaces of sharing insights and suggestions to mitigate the danger as the disaster or calamity occurred and served as spaces for various dialogue that help the community to actively respond during disaster and calamity.

Keywords: social media, communication system, disaster risk reduction, mitigation, Facebook, messenger, barangay

INTRODUCTION

At the dawn of modern technology, different technological applications, software systems, devices, gadgets among others are developed on the basis of convenience and speedy transactions from trade to normal interactions between individuals. The general public has recently show active engagement in using different medial platforms which are found to be a modern communication tool for every Filipino. In fact, around 89.5 percent of the total current population has been using different social media platforms as their primary avenue to communicate with their families, operate government offices for speedy transactions, run a business and simply, interacting with friends and love ones. Common social media platforms which utilize by Filipinos are Facebook, Twitter, Instagram and Snapchat. Pursuant to RA 10121 otherwise known as "Philippine Disaster Risk Reduction and Management Act of 2010" which provides safer, adaptive and disaster-resilient Filipino communities toward sustainable development. Accordingly, it is also created areas such as disaster prevention and mitigation, disaster preparedness, disaster response and disaster rehabilitation and recovery. Thus, central focus of this law pertains to the prevention, preparation and response to any possible danger which may be brought by disasters calamities.

While Filipinos are strongly attached with the use of social media as their communication platforms, it is observed that they still find social media less functional in responding to disasters and danger. In fact, based from the recent study conducted by Statista (2019), Filipinos utilized their social media accounts for an average of four (4) hours a day. This includes their private communication, online business, job applications and government transactions. It is comprehensively drawn that Filipino are active in using their social media accounts on their daily encounters.

This condition arises the interests of the researchers to describe and examine the use of social media among barangay personnel for disaster risk reduction and mitigation in the Philippines. The study aimed to examine the use of social media as a communication system for Disaster Risk Reduction and Mitigation in the Philippines. Specifically, it determined the profile of the respondents who were barangay personnel and who were working among selected barangays in Central Luzon regions in the Philippines, identified the current tool used for disaster risk reduction and mitigation, discussed the implications of the current social media tool used, described social

media platforms used for disaster risk reduction and mitigation, and examined the relationship between the profile of the respondents and their use of social media accounts for disaster risk reduction.

The study would be beneficial to the Filipino citizens in which the study may provide significant findings that would lead them to comprehensively understand the communication process through the use of social media for disaster risk reduction and mitigation. As an emergency situation unfolds, the Emergency Management System (EMS) is activated and goes through four phases: readiness, mitigation, response, and recovery. Preparedness refers to the amount of preparation to respond to an emergency that has been achieved via planning, training, and drills. When we talk about mitigation, we're talking about taking consistent steps to reduce and restrict the risk to people and infrastructure. The third phase, reaction, consists of efforts that satisfy human fundamental requirements, such as the distribution of relief commodities and the establishment of evacuation facilities. The last phase is concerned with the restoration of the economy and the restoration of livelihood.

Despite the fact that these four stages do not always occur sequentially, they do so more frequently than not in overlapping time frames in the aftermath of disasters (Col, 2017).When disasters strike, local governments play a critical role in the preparation, response, and recovery efforts. This is because they not only have direct control over their constituency, but they are also expected to understand the needs of their citizens. As stipulated by the Local Government Code of 1991, the local government units (LGUs) in the Philippines are at the forefront of disaster risk reduction and management. The LGU must have the authority to act decisively and issue proactive decisions that are appropriate for their constituents' circumstances, with the cooperation of the higher levels of government. Numerous studies have emphasized the need for decentralization of duties (eliminating top-down approaches), stakeholder engagement in all phases of disaster risk reduction and management (DRRM), and openness of crucial information flows (Col, 2017).

When it comes to assisting the community following a disaster, Solway (2004) outlines the fundamental tasks of the local government. The local government unit (LGU) must be able to (1) assess the vulnerabilities of the area and its constituents, (2) instill fundamental knowledge of natural disasters and their potential consequences, (3) conduct an information and education campaign (IEC) on disaster mitigation, (4) coordinate with officials in charge of planning, construction, health, and welfare, (5) conduct first-aid trainings, (6) partner with educational institutions to broaden awareness and support existing knowledge, and (7) develop e-learning resources.

Institutions at the local level are critical in determining community responses to disasters and climate-related risks. They assist in determining the impact of the impacts, developing the ability of families to respond and modify activities, and mediating various external interventions, among other things. It was discovered that climate adaptation involves informal institutions in 118 cases across 46 countries, with five categories of local responses: mobility in response to risks and scarcities; storage of surpluses, including sturdy infrastructure for storing seeds and harvested crops; diversification of employment opportunities, assets, and consumption strategies; communal pooling of resources among families; and market exchange (Domingo and Manejar, 2018). The majority of them originated from rural communities controlled by indigenous people, which had been subjected to different calamities and had later evolved adaptive responses to environmental threats (Agrawal Singh ,2008). When considering adaptation tactics, it is essential to do a thorough analysis of distinct social groupings. There might be underlying causes for their higher risk and vulnerability, and these factors could have an impact on the interventions that are provided to them.

It would be necessary to carefully consider how social media applications can be incorporated into an integrated disaster risk reduction and mitigation management platform in order to ensure effective risk reduction and mitigation management in light of the increasing number of people using their mobile phones to go online around the world, which is surpassing time spent on traditional media such as television, radio, and print, as time spent on traditional media increases (Shtern et al. 2019). The use of social media technology for crisis management allows individuals to play a more active part in the preparation for and management of crises, which will aid in the development of more resilient communities. It is ultimately the best course of action to urge individuals to take the activities necessary to aid themselves and others during times of crisis by embracing resilience as a civic value and a social standard, as opposed to the alternative.

The word *"social media"* refers to Internet-based apps that allow individuals to connect with one another as well as exchange resources and information with one another. The introduction of these new communication channels gives a chance to extend emergency alerts to a broader proportion of the public in times of crisis (Robbins et al., 2019). These technologies have the ability to minimize communication breakdowns caused by reliance on a single platform and, as a result, to increase the dissemination of warning signals; nevertheless, they also bring new obstacles to policymakers. It is possible to classify the use of social media for crises and catastrophes on an organizational level into two major groups. First and foremost, social media may be utilized rather passively to spread information and solicit user opinion through inbound messages, wall postings, and polls, among other methods. The systematic use of social media as an emergency management tool is a second option that has been proposed. Systematic use could include, among other things, the following: 1) using social media to conduct emergency communications and issue warnings; 2) using social media to receive victim requests for assistance; 3) monitoring user activities and postings to establish situational awareness; and 4) using uploaded images to create damage estimates.

Research Objectives

The study examined the use of social media as communication system for Disaster Risk Reduction and Mitigation among selected barangays in Central Luzon. It specifically aimed to identify the profile of the respondents in terms of age, sex, highest educational attainment, present position, years in government service, special trainings or short courses completed, years in living within the barangay and social media platform used. The study also identified the current tool used by the barangay for Disaster Risk Reduction and Mitigation. On the other hand, the study also described the administration of social media for Disaster Risk Reduction and Mitigation as to citizen engagement, share in critical information, use of useful insights and appreciation of public sentiment. Further, the study also aimed to examine if there would be significant relationship between the profile of the respondents and their use of social media accounts in the administration of Disaster Risk Reduction and Mitigation.

Theoretical Framework of the Study

The study was anchored Use and Gratification Theory and Emergency Management Theory. As proposed by Katz, Blumber and Gurevitch (1974) as cited in the study of Ruggiero (2000) Use and Gratification Theory states that people actively seeks out specific media content for particular purposes and intentional goals. UTG enshrined the functional shift of communication in which examination lies on the use of media by people as inversely associated with the implication of media to people. Further, this theory grounded the premises that it provided a framework of understanding and active participation of people as users of media as well as the implication of the same to the users. Meanwhile, Emergency Management Theory as proposed by Jenzen (2013) states how human and their institutions interact and cope with hazards vulnerabilities and resulting events. In particular, it focuses on activities related to preparedness, response, recovery and mitigation. Thus, it serves a managerial function charged with creating the framework within which communities reduce vulnerability. These theories cited and drawn within the premises of the study establish that use of social media for disaster risk reduction and mitigation come from different distinct effects and manner of utilization.

Figure 1. Theoretical Framework of the Study
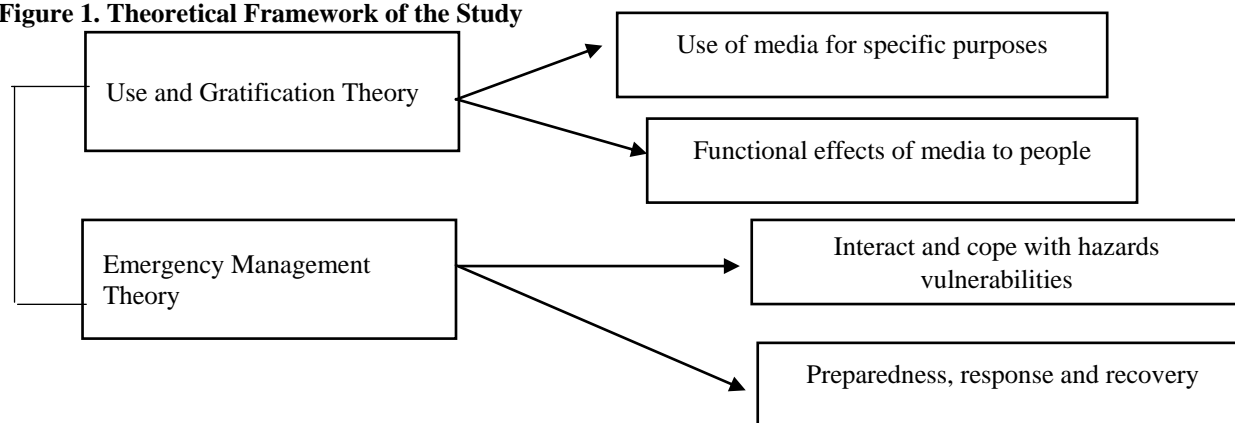
METHODOLOGY

The study utilized a descriptive correlational research. As defined by Cameron and Bentahar(2015), descriptive correlational research involves collection, analysis and interpretation of quantifiable data gathered. Thus, the present study falls on the premises in the identification of the respondents' profile, description on the respondents' use of social media for disaster risk reduction and mitigation as well as the correlation of the profile of the respondents and determination of use of social media in terms of citizens engagement, share of critical information, use of useful insights and appreciation of public sentiments.

Meanwhile, survey-questionnaire was utilized as the primary tool. The questionnaire contained the profile information of the respondents as well as items relating to the administration of social media for disaster risk reduction and mitigation in terms of citizen engagement, share of critical information, use of useful insights and appreciation of public sentiment. Further, unstructured interview was utilized to substantiate the responses of the respondents in survey-questionnaire. Thus, the survey-questionnaire was tested among non-included respondents which obtained a Cronbach alpha reliability result of .903 which signified that the instrument was excellently crafted and highly reliable to measure the variables of the study. The questionnaire utilized a 5-Likert Scale with corresponding verbal description.

The respondents were purposively selected from twenty (20) selected barangays in Central Luzon. There were 68barangay officials, workers and employees who participated in the study based on the inclusion criteria established by the research such as: (1) bona fide resident of the selected barangays, (2) those barangay residents who were 18 years old to 60 years old, (3) those who were concurrent employees and workers in barangay administration unit and (4) those who were willing to participate in the study.

The letter of request to administer the study was sent among the barangay captains in selected barangay within Central Luzon. Upon the receipt of the approval letter, the researcher floated his questionnaire and attached thereto was the informed consent. The respondents were requested to answer the survey-questionnaire based on their free and deliberate responses. Once all the respondents answered the survey-questionnaire, the researcher then collected the data and organized the same through a digital document facility. Thus, the data gathering phase of the study covered 3 weeks to 5 weeks of administration. After all the data have been encoded and organized, appropriate statistical tools were employed. Use of frequency, percentage, mean, overall weighted mean and Pearson R were utilized to measure the quantitative aspect of the study while thematic analysis was used for the qualitative aspect of the study.

RESULTS AND DISCUSSION

1. **Profile of the Respondents**

   Table 1 presents the profile of the respondents in terms of age, sex, highest educational attainment, years in government service, present position, special trainings or courses completed, years in living within the barangay and the social media platforms used

   Table 1. Profile of the Respondents

Profile of the Respondents	Frequency	Percentage
Age		
18-25 years old	8	11.76
26-30 years old	10	14.71
31-35 years old	6	8.82
36-40 years old	8	11.76

	Frequency	Percentage
41-44 years old	19	27.94
above 45 years old	17	25.00
Total	**68**	**100.00**
Sex	**Frequency**	**Percentage**
Male	39	57.35
Female	29	42.65
Total	**68**	**100.00**
Highest Educational Attainment	**Frequency**	**Percentage**
BS Degree Holder	20	29.41
MA Academic Units Completed	41	60.29
MA Graduate	7	10.29
Doctorate Academic Units Completed	0	0.00
Doctorate Graduate	0	0.00
Post-Graduate Completed	0	0.00
Total	**68**	**100.00**
Years in Government Service	**Frequency**	**Percentage**
below 5 years	21	30.88
6-10 years	7	10.29
11-15 years	13	19.12
16-20 years	16	23.53
above 21 years	11	16.18
Total	**68**	**100.00**
Present Position	**Frequency**	**Percentage**
Assistant	2	2.94
Brgy. Kagawad	34	10.29
Tanod	7	50.00
Not Applicable	25	36.76
Total	**68**	**100.00**
Speacial Trainings or Courses Completed	**Frequency**	**Percentage**
Emergency Response	38	55.88
Emergengy Response and other Barangay Relevant Training	7	10.29
Not Applicable	23	33.82
Total	**68**	**100.00**
Years living within the Barangay	**Frequency**	**Percentage**
below 3 years	7	10.29
4-10 years	12	17.65
11-17 years	16	23.53
17-24 years	22	32.35
above 24 years	11	16.18
Total	**68**	**100.00**
Social Media Platforms Used	**Frequency**	**Percentage**
Facebook	68	100.00

Twitter	0	0.00
Instagram	0	0.00
TikTok	0	0.00
Pinterest	0	0.00
Snapchat	0	0.00
Total	**68**	**100.00**

Age. There were 19 or 27.94% of the respondents whose age range from 41-44 years old while 17 or 25% of the respondents' age were above 45 years old. Majority of the respondents' age are 41-44 years old.

Sex. Majority of the respondents are female with 39 or 57.35% while 29 or 42.65% are male.

Highest Educational Attainment. Majority of the respondents obtained their MA academic units with 41 or 60.29% as they act as administrators in their barangays while 20 or 29.41% of them obtained their college degree.

Years in Government Service. Majority of the respondents are serving their barangays for not less than 5 years with 21 or 30.88%.

Present Position. Majority of the participants are barangay Kagawad or Barangay councilors who are responsible for the creation and passage of local barangay ordinances with 34 or 10.29%.

Special Trainings or CoursesCompleted. Majority of the respondents attended trainings and seminars relative to emergency response with 38 or 55.88%.

Years Living within the Barangay. Majority of the respondents live in their respective barangays for 17-24 years already with 22 or 32.35%.

Social Media Platforms Used. Facebook was totally utilized by the respondents as the primary social media platform for disaster risk reduction and mitigation in their barangays.

2. **Used of Social Media in the Administration of Disaster Risk Reduction and Mitigation**

Table 2 presents the respondents' used of social media in the administration of disaster risk reduction and mitigation in terms of citizen engagement, share of critical information, use of useful insights and appreciation of public sentiment.

Table 2. Used of Social Media in the Administration of Disaster Risk Reduction and Mitigation

Used of Social Media in the Administration of Disaster Risk Reduction and Mitigation	Mean	Verbal Interpretation
Citizen Engagement		
1. Social media account is created for disaster risk reduction and response	3.01	Agree
2. Social media account of the barangay are disseminated among residents	2.96	Agree
3. Social media account of the barangay is responsive in times of risks, danger or potential calamities	3.07	Agree
4. Constituents are actively engaged in the use of barangay social media account	3.04	Agree
5. Constituents posed concerns relating to disaster response and readiness through the barangay social media account	3.05	Agree
Overall Mean	**3.02**	**Agree**
Share of Critical Information		

1.	Barangay social media accounts share valid information on disaster risk reduction and mitigation	3.10	Agree
2.	Barangay social media accounts share reliable program and project information relative to disaster risk reduction and mitigation	3.01	Agree
3.	Competent barangay personnel were assigned to monitor, evaluate and share vital information using barangay social media account	3.03	Agree
4.	Posted information on barangay social media account are understood by all age groups	3.02	Agree
5.	Posted information on barangay social media account are directed with total accountability	3.00	Agree
Overall Mean		**3.03**	**Agree**
Use of Useful Insights			
1.	Draw communication lines in the spaces of our barangay's social media accounts during risk reduction and mitigation	3.09	Agree
2.	Maximize our social media accounts to facilitate meaningful inputs of our constituents	3.04	Agree
3.	Allow constituents to share their comments and suggestions	3.03	Agree
4.	**F**ill any similar concerns on risk reduction and mitigation when barangay social media has been mentioned	3.04	Agree
5.	Apply methodical process in using all impressions and insights manifested by our constituents which found in the barangay's social media accoun**ts**	3.07	Agree
Overall Mean		**3.05**	**Agree**
Appreciation of Public Sentiment			
1.	Acknowledge the power of good observation and expression on risk reduction and mitigation found in the barangay' social media accounts	3.07	Agree
2.	Pinned down all insignificant information expressed in the barangay social media accounts	3.03	Agree
3.	Acknowledge factual sentiments over hypothetical ones to prevent misleading contentions on risk reduction and mitigation	3.09	Agree
4.	Firmly show that expression and appreciation to public sentiments among constituents	3.01	Agree
5.	Understand and appreciate that use of barangay's social media accounts serve as collective mechanism to identify our constituents needs and demands in relation to risk reduction and mitigation	3.16	Agree
Overall Mean		**3.07**	**Agree**

Used of Social Media in the Administration of Disaster Risk Reduction and Mitigation. The findings showed that the respondents agreed on the active citizen engagement by means of using the official barangay social media account. The findings implied that through active engagement of residents using such social media account established a strong mean of communication as they consistently received proper information, updates and trends circulating the conditions faced by the barangay in relation to disaster risk reduction and mitigation. The result is supported by the study of Saroj and Pal (2014) which he concluded that the ethics and active use of social media in crisis situations balanced the potential negative developments such as disseminating rumors, undermining authority and promoting negative impressions that led to improper emergency response. On the other hand, the findings also showed that the respondents agreed that through the use of social media specifically the official Facebook account of their barangays enabled them to share critical and vital information which contained sensitive facts and announcements about disaster risk reduction and mitigation. In addition, the result showed that social media account of the barangay helped them to carefully select vital information which filtered irrelevant updates and facts on

disaster response especially when disaster or calamities were surfacing. Further, the result revealed that social media account drew a strong communication line which enabled the residents to comprehensively monitor the current conditions of their barangay and its people when disaster or calamity has occurred. It is also showed that through social media account, several concerns on risk reduction including preparedness and readiness were significantly emphasized by means of clear instructions posted on official social media account of the barangays. The findings are supported by the study of Lu and Martinez (2019) showed that use of social media for disaster management was helpful as it informed the disaster victims about the aid distribution and helped posted actionable information that aided the government and private sectors to respond immediately.

3. **Significant Relationship Between the Profile of the Respondents and Their Use of Social Media Accounts in the Administration of Disaster Risk Reduction and Mitigation**
    Table 3 presents the significant relationship between the profile of the respondents and their use of social media accounts in the administration of Disaster Risk Reduction and Mitigation
    Table 3. Significant Relationship Between the Profile of the Respondents and Their Use of Social Media Accounts in the Administration of Disaster Risk Reduction and Mitigation

		CitEngage	ShareofCrit	UseOfUse	AppPubSent
Age	Correlation Coefficient	.305*	.338**	.240*	.248*
	Sig. (2-tailed)	0.012	0.005	0.049	0.042
	N	68	68	68	68
Sex	Correlation Coefficient	0.143	0.107	0.132	0.126
	Sig. (2-tailed)	0.243	0.386	0.285	0.305
	N	68	68	68	68
Educational Attainment	Correlation Coefficient	0.007	-0.07	-0.017	0.014
	Sig. (2-tailed)	0.958	0.57	0.889	0.91
	N	68	68	68	68
Years in Government	Correlation Coefficient	.313**	.378**	.280*	.299*
	Sig. (2-tailed)	0.009	0.001	0.021	0.013
	N	68	68	68	68
Position	Correlation Coefficient	.502**	.503**	.481**	.479**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000
	N	68	68	68	68
Year in Living	Correlation Coefficient	.215**	-0.12	.179*	0.037
	Sig. (2-tailed)	0.006	0.129	0.023	0.642
	N	68	68	68	68
Special Training Attended	Correlation Coefficient	.	.	.	.
	Sig. (2-tailed)	.	.	.	.
	N	68	68	68	68
Social Media Used	Correlation Coefficient	.	.	.	.
	Sig. (2-tailed)	.	.	.	.
	N	68	68	68	68

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

Findings showed that profile of the respondents in terms of age, years in government, position are significantly correlated with the use of social media accounts in the administration of disaster risk reduction and mitigation (age; r=.305, .338, .240 and .248), (years in government; r=.313, .378, .280 and .299), (position; r=.502, .503, .481 and .479). As to age, it signifies that the older the residents, the more likely they are engaged in using and accessing barangay social media account for disaster risk reduction and mitigation updates and trends. This implies that barangay officials, workers and employees with older ages are more inclined to using the barangay social media account for active responses and immediate resolution of concerns with respect to disaster readiness and mitigation. Meanwhile, in terms of years in government, it signifies that the longer the years in government service which the barangay officials and workers rendered, the more likely they actively used their barangay social media primarily for disaster risk reduction and mitigation which also meant that they utilized social media to address the impending disaster or calamity concerns. On the other hand, the findings also revealed that the higher the position, the more accountable and responsible use of social media is seen. This meant that respondents who held higher positions in their barangay units are more accountable and responsible in the use of social media as they put premium emphasis on disaster response and crisis management. Also, years in living is significantly correlated with citizens engagement and use of useful insights (r=.215 and r=.179) which meant that the longer the years they live in their barangays the more likely they became active in participating, accessing and sharing information through the use of barangay social media with respect to disaster response and risk reduction concerns in times of potential danger, calamity and other unprecedented events which pose danger to the barangay as community.

CONCLUSION

In the advent of modern technology, social media became part of modern culture as it weave the daily communications means of all individuals in the community. Social media it is pure intention as communicative means also became a system for disaster risk reduction and mitigation as barangay officials, workers and employees created their official social media accounts most dominantly in creation Facebook and messenger accounts that being utilized to deliver and disseminate proper information in times of the occurrence of disaster and calamities. Consequently, social media became one of the effective mechanisms that helped the barangay administration to involve their constituents to become vigilant and responsible in time of disaster, responsible of sharing critical and vital information about disaster and calamity concerns, provide safe spaces of sharing insights and suggestions to mitigate the danger as the disaster or calamity occurred and served as spaces for various dialogue that help the community to actively respond during disaster and calamity.

RECOMMENDATION

Consistent use of social media and establishment of credible information center within the barangay as spearheaded by the barangay units are recommended in order to continually provide active and credible information to deliver accurate data and facts with respect to disaster risk reduction and mitigation. Also, formulation of intervention plans which contains the use of social media should also be prioritized.

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