

Social Media for Flood Risk Management: A Study on the Use of Facebook by the First Class Municipality of Cainta, Rizal, Philippines

Teresa S. Congjuico

*Department of Journalism, College of Mass Communication
University of the Philippines Diliman, Quezon City, Philippines*

Abstract. Facebook, being the favorite social medium of Filipinos, hosts millions of demassifiedFilipino online communities just waiting to be tapped by Philippine local governments for improved governance and public service. These online communities are “virtual gathering spaces” where members turn to for information seeking and sharing, to seek help and support, and to offer help where possible like what members of real-life communities do. This study looked into the use of Facebook for flood risk management by the first-class municipality of Cainta, Rizal during the onslaught of typhoon Mario on Sept. 19, 2014, which caused town-wide floods and displaced 5,300 families. The use of Facebook for flood risk management in Cainta is not institutionalized and the online community belongs to the town mayor. This, however, did not undermine the remarkable role Facebook played in the dissemination and crowdsourcing of hyperlocal yet high-value risk information within the week the town-wide flood. Facebook became the main communication platform used by the town for its dissemination of risk information such as advisories on rainfall, typhoon, floods, road conditions, class and office suspensions, as well as on emergency response updates. Acting as individual nodes of the online community, the residents also helped in the dissemination of risk messages by sharing to their respective online communities. Facebook became useful in gathering risk information from the ground as citizens were able to send flood reports which helped the town’s disaster team to create a clearer picture of the disaster. Citizens were also able to inform the government of the specific help they needed in real time such as cut power, boat for rescue, ambulance for sick person, cooked food, and emergency parking spaces. Social media feedback – posts, comments, shares, tags and likes – spiked significantly during the flood disaster indicating residents’ heightened interest and participation during a calamity in order to satisfy their social interaction/integration and surveillance needs. Facebook, being a multi-way communication platform, also enabled the residents to participate in conversations, transforming the online community into a modern day agora, a virtual town hall meeting place for the people of Cainta.

Keywords: Flood Risk Management; Risk Management for Local Governments, Facebook for Risk Management, Facebook for Local Government Units, Local Government and Online Communities.

INTRODUCTION

Disasters such as floods are serious development problems. Their effects permeate not only the financial wellbeing of people but also their physical and psychological wellbeing.

Disasters could also have adverse effects on the development programs of governments as more public funds which could very well be spent on development-oriented endeavors such as on education, health, social services and infrastructure in support of development projects get allocated for rescue, retrievals and rehabilitation activities.

In the first class Municipality of Cainta, Rizal where the people are annually faced with threats of massive flooding, the above could not be less real. In fact, the small yet bustling town has all the elements of a perfect flood disaster.

Cainta, dubbed as Metro Manila's gateway to the East, has only seven yet relatively large barangays namely: San Andres, San Juan, San Roque, Santa Rosa, San Isidro, Santo Domingo and Santo Nino. It is located directly south of flood-prone Marikina City and adjacent to the first class but also flood-prone city of Pasig in Metro Manila.



FIGURE 1. Political Map of Cainta, Rizal.

Due to its proximity to Metro Manila, widespread and uncontrolled urban growth developed in all of its seven barangays. The once agricultural village of vast rice fields had become a hub of industrial, commercial establishments, and residential subdivisions.

A 2010 census of the national government in Rizal reveals that Cainta is the second most populated town with 311,845 people (Philippine Statistics Authority, 2013) and has the highest density of 10,811 persons per square kilometer (Rizal Provincial Development and Physical Framework Plan, 2008-2013).

Today, as high as 30 percent of the town's total population are informal settlers, some of them occupying spaces for natural waterways or have settled along high flood risk

areas. Only 10 percent live in the barrios and a majority or 60 percent live in suburban villages or subdivisions.(J. Nieto, personal communication, November 19, 2014).

But urbanization is not all to blame for the town-wide flooding. Based on the geo-hazard map produced by the Mines and Geosciences Bureau of the Department of Environment and Natural Resources for Quezon City and surrounding areas, Cainta is naturally highly susceptible to flashfloods and flooding of as high as one meter for several hours during heavy rains due to its landforms of topographic lows which include active river channels, abandoned river channels and areas along river banks.

In 2009, the town's residents experienced the greatest scare of their lives as they watched their houses and vehicles submerged in waters brought about by typhoon Ondoy. This same scare happened again during the same season in 2011 with typhoon Sendong. In August 2013, five out of the seven barangays were again submerged due to tropical storm Maring, prompting the town to declare a state of calamity. Almost 80 percent of Cainta was submerged underwater forcing 2,717 families to seek shelter in evacuation centers. (Gappi e al., 2013).

What the local government of Cainta had learned about flood risk management over the past five years was once again put to the test only last September 19, 2014 when typhoon Mario which caused torrential rains in Rizal again caused town-wide floods which displaced some 5,300 families gathered in 26 evacuation centers.

This time however, the local government tapped Facebook as its main communication platform for flood risk management. This is a bold step for any local government unit for the fun and leisurely characteristics of Facebook and the serious business of public service and governance may seem an odd combination. But it was not a reckless move.

Unlike the traditional mass media, social media, specifically Facebook, allows for both real-time and asynchronous interactivity among users in a demassified environment such as the Internet.

Asynchronicity allows senders and receivers to interact at their own convenience through messages they can read or view and respond to at different times; interactivity is "the degree to which participants in the communication process have control over, and can exchange roles in their mutual discourse" (Williams et al., 1988, as cited in Ruggiero, 2000), and demassification is "a result of the increasing control users have over the medium enabling them to experience mediated interpersonal communication." (Williams et. al., 1988, as cited in Ruggiero, 2000).

What sets social media apart from all other forms of technology-based communication media is their being highly collaborative and participatory. Their salient feature is a multi-way model of communication which allows for interactivity among all communication participants while enabling them to single-handedly or collaboratively create and share content, blurring the line that separates the communication sender from the receiver.

Content creation and distribution have been democratized and are no longer a role confined to well-oiled institutions and business organizations but to ordinary individuals as well. Social media affords users a virtual landscape mirroring familiar elements of real-life communities; linking people together in ways that resemble traditional feelings of connection where exchange of feelings and ideas and the reporting of experiences and actions are facilitated. (Davis, 2013)

Unlike the traditional mass media, the Internet is now a “vehicle for the provision of very specific high-value information to very specific high-consumption audiences” as envisioned by Abrahamson (1998) , as cited in Ruggiero (2000) such as members of smaller communities bound together by similar motivations and needs.

Aside from all the gratifications traditional mass media could offer, social media afford users so much more. “They allow users to freely create their own communities or join existing communities of their choice where their needs and motivations are best gratified. Online communities are smaller in size, mirroring familiar elements of real life communities, and the members are bound together by personal needs and motivations which include the need to gratify social integration and surveillance needs.” (Congjuico, 2015)

Social media allow emergency management to utilize networked individuals to function as “refined node of information” (Grieb, 2012) of a bigger and more organized risk management communication program. Collectively, networked individuals are “a gold mine” or the greatest resource of untapped information for social media and emergency management. (White, 2012).

Users of social media provide information from the ground, the very critical information emergency managers or response teams need for situational awareness which help them establish clear operational picture. Lack of which “not only slows down the deployment of effective resources into the disaster area, but delays the overall recovery as well.” (Westbrook, 2012). Information from social media when juxtaposed with reports from trained first responders provides a much improved operating picture.

As tools for critical information delivery to and from the people, “the power of social media lies not only on their speed and cost-effectiveness but also on their power to amplify messages through sharing -- where each receiver, acting as “refined node of information,” could also act as message sender to his or her own online community.” (Congjuico, 2015)

When disaster strikes, a strong sense of community is awakened among online community members and they turn to their respective online communities or “virtual gathering spaces” (Palen et al., 2007) for information seeking and sharing. “They feel the need to communicate with one another not only to seek help and support but also to share updates, to share feelings and experiences, to check on the situation of family and other members of the community, and to offer help where and when possible like what real-life communities do.” (Congjuico, 2015).

In the local context, however, do all of the above hold true? Has the use of social media, particularly Facebook, in a local government setting done the general public good? This paper then sought to give light to the question: *How has the use of social media, particularly Facebook, by the local government of Cainta, Rizal, impacted its flood risk management?*

In particular, this study explored the extent to which the use of Facebook for flood risk management was institutionalized in the government of Cainta; the ways the use of Facebook by the local government of Cainta served the residents’ need for critical information; the extent to which the government of Cainta’s desire to gather critical information from the ground was satisfied by Facebook; and the ways, intended or unintended, the use of Facebook impacted critical information management during the onslaught of Typhoon Mario on September 19, 2014.

METHODOLOGY

This research used both qualitative and quantitative approaches, and used grounded theory method by Glaser and Strauss which views both data and analysis as social construction and takes into account the conditions of their production. In this method, data collection and analysis occur simultaneously, with each informing the other.(Thornberg & Charmaz, 2012).

Grounded theory method, According to Charmaz (2006) as cited in Thornberg & Charmaz (2012) is an inductive, iterative, interactive, and comparative process. It is particularly helpful for studying individual, social, and organizational processes as well as research participants' actions and meanings.

Textual analysis and quantitative content analysis were conducted on all recorded posts and comments. The duration covered is exactly one week: three days before, on the day, and three days after the onslaught of typhoon Mario on September 19, 2014 for a total of seven days.

Textual analysis is a research method used to describe and interpret the characteristics of recorded or visual messages. It seeks to describe the content, the structure and functions of the messages contained in texts. Content analysis, on the other hand, is used to identify, enumerate, and analyze occurrences of specific messages and message characteristics embedded in texts. (Botan & Kreps, 1999)

Qualitative content analysis helped give light to the contextual meanings of the Facebook messages studied, both posts and comments, while quantitative content analysis helped establish conclusive numeric findings in support of qualitative analysis

In analyzing the data collected from the rapid group appraisal conducted prior to this actual research, initial coding, which is also known as open coding, was conducted. This helped guide the design of the coding system for the textual and content analysis.

In analyzing data from textual and content analysis, constant comparative method was used. Here, data with data, data with codes, and codes with codes were compared and enabled the research to find similarities and differences. Findings helped guide the questions for the interview.

The interview with the town mayor, the Facebook account manager and disaster head, was conducted to cross check data gathered from the focus interview and to provide context on the findings of the textual and content analysis.

Items (posts and comments), typologies (risk and non-risk) and themes (topics: e.g. class suspension, weather update, flood alerts, etc.), frequency of posts, and media user feedback (comments, likes, tags, shares) were coded and analyzed.

RESULTS AND DISCUSSION

Facebook is the Philippines' most popular social medium with 21% and 20% of the total 44.2 million Internet users using Facebook and Facebook Messenger, respectively; followed by Skype with 17% and Google+ and Twitter as social networks with 13% each. (March, 2015)

Seeing the great potential of Facebook for governance, the government of Cainta, under the administration of the current town mayor Johnielle Keith "Kit" Nieto, tapped Facebook for its main communication platform. All departments, including the office of

the mayormaintain Facebook accounts which do not only provide and gather information to and from the people but also serve as their direct lines to those offices.

The local chief executive maintains four accounts: the Mayor Kit Nieto account with 4,993 friends and 23,860 followers, the Mayor Kit Nieto II account with 4,935 friends and 6,964 followers, the Mayor Kit Nieto III account with 3,605 friends and 3,644 followers, and the Kit Nieto account with 88 friends and no following, as of Nov. 21, 2014. All four accounts carry the same messages, which makes it unlikely for friends and followers to be hooked up to more than one account as this would be duplicitous, according to Nieto.

Information, including pronouncements from the office of the mayor as well as from other departments, are posted regularly on the mayor’s accounts, making them the de facto centralized accounts of the government of Cainta.

In all four accounts, the local chief executive has a total of 13,621 friends and 34,468 followers. Of the 311,845 people of Cainta (Philippine Statistics Authority, 2013), only 4.4% are his friends and 11.10% are his followers. However if only the total registered voters is to be considered, out of the 120,000 (Nieto, 2014), 11.40% and 28% of the voters of Cainta are his friends and followers, respectively -- assuming everyone was honest in declaring their age on Facebook and that all of them are residents of the Municipality of Cainta. (See Table 1)

TABLE (1). Friends and Followers of the Mayor’s Accounts

Facebook Accounts	Friends	Followers
Mayor Kit Nieto	4,993	23,860
Mayor Kit Nieto II	4935	6,964
Mayor Kit Nieto III	3,605	3,644
Kit Nieto	88	0
TOTAL	13,621	34,468

The local chief executive’s account reached this level of estimated Facebook penetration despite not having launched any formal program or campaign aimed at attracting more residents to be part of his online community. As people learned about his account, they sent friend requests and he would just accept them. “They (the residents) just opted to follow,” they mayor said. It is possible, however, that not all his friends and followers are registered voters or residents of Cainta.

What was clear, however, was that the increase in the following of the mayor was a direct result of the need of the residents of Cainta for hyper local and high value information such as on class suspensions and updates on calamities. A rapid appraisal conducted for the study showed that prior to the floods in previous years, many became aware of the social media accounts of the local government only when they were already at the height of the flood calamity because they received shares of posts from Facebook friends who are hooked up to the mayor’s accounts. (Congjuico, February 2014)

Why the mayor has four accounts instead of a single big account can be traced mainly to the mayor’s limited understanding of the features of Facebook when he first used it. (Facebook only allows a maximum of 5,000 friends per account.) He said: “It never occurred to me that you can just become a follower. I am not a techie guy. I am just on a need to know basis.” A follower need not be friend of the account owner but would still be receiving all information posted.

Judging on the nature of concerns and on the command of the English language of those who participated in the Facebook conversations, both in the form of posts and comments, many members of the town's online community on Facebook are well educated. The mayor himself believes most of them are middle class, specifically the working class.

This then gives credence to the claim of one informant for the rapid appraisal that it is possible that the residents of high risk areas, usually the informal settlers along creeks, do not have access to the mayor's Facebook account. However the mayor believes otherwise. He thinks even informal settlers do have Facebook account. "And sometimes, it only takes one in a family to have the account and the rest get informed," he said.

Today, Facebook is the office of the Mayor's official and personal communication tool. It is the main communication tool the mayor uses to move his people or getting them to participate in official activities. On Facebook, at his audiences' own convenient time, he said he is able to tell his people exactly what he wants them to know, "subtly, directly and indirectly." Subtly and indirectly, especially when the person on the other end is clearly displeased or upset.

However, the use of Facebook by the government of Cainta under the administration of Nieto is not part of a carefully-planned institutional communication program. The local government does not even have a team which carefully crafts and designs flood risk management-related content. The integration of Facebook into the government's daily activities was mainly incidental and spontaneous.

While he recognizes the value of eventually institutionalizing the use of Facebook in other local government contexts so that government leaders could bring themselves closer to their people, the local chief executive is not ready to do the same in Cainta. He has reservations on the idea of creating an office dedicated to managing the town's main Facebook account. Drawing lessons from the reported failure of PAGASA to attract more following for its Facebook account because it is perceived to be too scientific, too technical and too impersonal, Nieto said:

I reject institutions because when I started this, it came from the heart; not from a political analyst nor from a political adviser. It is something that I want very spontaneous. You cannot have a heart in there (Facebook conversations), if you use institutions. For me, being spontaneous is actually being sincere enough. You try to formalize things and your moves will become too politicized and calculated, inhibiting you from thinking outside the box.

He maintains his use of his personal account for flood risk management in Cainta does not however undermine the Facebook program of Cainta's disaster management because he remains supportive of their Facebook account. During the height of the onslaught of typhoon Mario, the local chief shared his post telling residents to post their emergency requests in the thread he opened (post #36) but none of the 253 friends of CDRRMO posted a comment on the latter's wall.

Explaining why he uses his personal accounts and not an official government account, Nieto said:

The culture of the Filipino is personality-oriented. They would rather appreciate getting information from you (their leader), from your personal account. So I follow that path. Second, this was accidental in

nature. I just wanted to have a medium that I can use to relate with the people for free and at a fast pace.

The mayor feels a strong sense of ownership of the online community. He refers to his use of Facebook as his “love affair” with the residents of Cainta. He said: “It is something that I want very spontaneous. Whether I rise or fall, I am with my people.”

As a leader, Facebook has served him well. Being a multi-way communication medium giving residents a chance to vent their sentiments with no less than the mayor as one of their audiences, Facebook has also exposed the mayor to many haters and bashers. But in the end, he says, he usually wins them over.

Cainta’s Risk Management

The government of Cainta has a separate Facebook account for disaster management, the “LdrrmoCainta” account managed by the Cainta Municipal Disaster Risk Reduction and Management Office (CDRRMO). However, the account which regularly provides flood risk-related advisories and pronouncements sourced from PAGASA and the province of Rizal, has not generated much interest from the people of Cainta so that as of November 21, 2014, it only has 253 friends and no following at all.

Big Facebook following is with the accounts of the mayor, who, being the chief executive, was also the overall head of the town’s disaster management team. Taking advantage of the wider reach of the mayor’s accounts, the LdrrmoCainta account regularly shares to the mayor’s accounts risk-related advisories and pronouncements posted on its wall. The mayor also shares to the Ldrrmo account as what he did during the Typhoon Mario floods. He shared his call for residents to post their emergencies in the same thread. (See Figure 3)

Aside from official pronouncements, the mayor’s Facebook accounts also carry flood risk information updates on creek dredging using the town’s two dredging equipment which the mayor playfully named Voltron and Voltes 5 for easier recall; drainage clean up, and garbage collection.

Majority or 60% of Cainta’s people live in suburban villages, 10% live in the barrios and 20% to 30% are informal settlers (Nieto, 2014). With this demographics, the local chief executive is confident he is able to reach a good majority of his people through Facebook. He validates this with his actual experience that every time he meets a Cainteno for the first time, 80% of the time he is informed, “Follower *nyopoakosa* Facebook (Sir, I am your follower on Facebook).

Aside from informal settlers in danger zones, Caintenos living in suburban villages with more properties such as motor vehicles and appliances at stake are often the hardest hit during town-wide floods. Cainta’s waterways and drainage systems traverse through villages exposing houses to floods after heavy rains. The most affected, according to Nieto, is Village East because all four creeks traverse through the village.

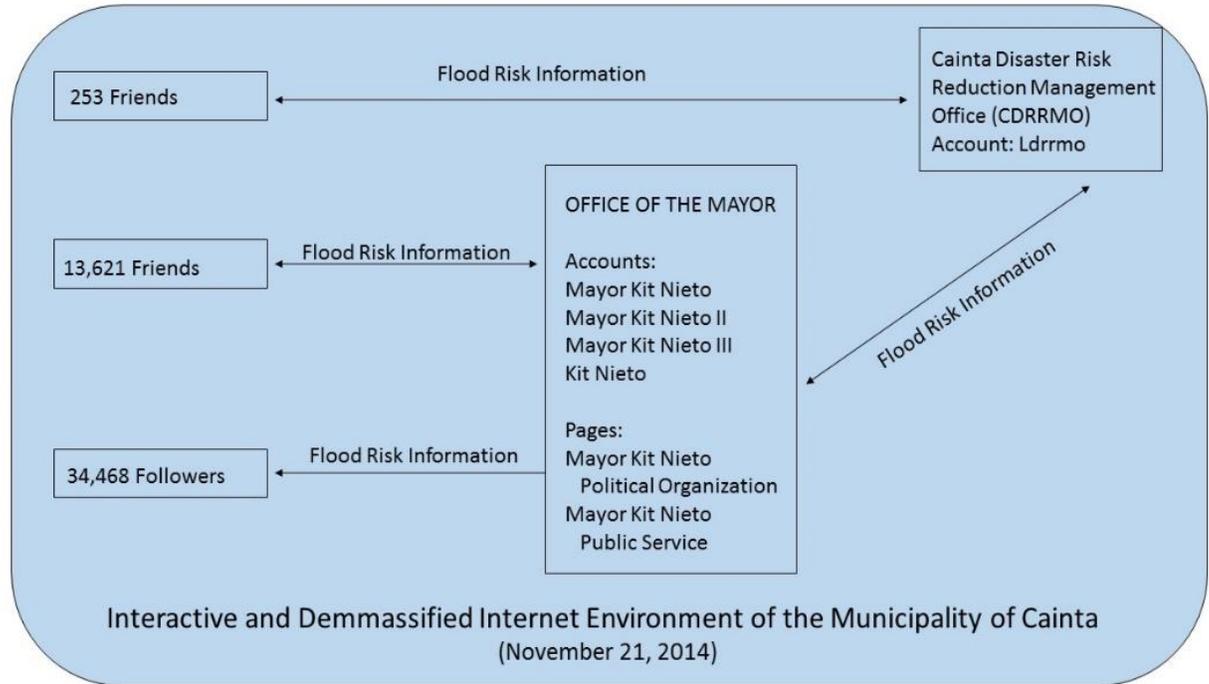


FIGURE 2.The Facebook community of Cainta, Rizal.

For the government of Cainta and its residents, the reality of town-wide flood is no longer a question of if but a question of when. And so on September 19, 2014, five years after the worst town-floods caused by typhoon Ondoy on September 26, 2009, the town was once again submerged in floodwaters due to torrential rains brought about by typhoon Mario. Some 5,300 families were affected by the flood and gathered in 26 evacuation centers while one died of drowning (Nieto, 2014).

While the disaster put all residents to the edge, it also brought many of them together on Facebook, on the walls of mayor's Facebook accounts. The most popular of these is "Mayor Kit Nieto" with 23,860 followers and 4,993 as of Nov. 21, 2014. It also has two support pages titled "Mayor Kit Nieto Political Organization" with 4,534 likes and "Mayor Kit Nieto Public Services" with 7,609 likes as of November 21, where people cannot make posts and comments but could only do likes and shares.

Within the week of the onslaught of typhoon Mario, a total of 118 posts and 2,763 comments, both risk and non-risk-related information appeared on the Facebook wall of the mayor. (See Table 2)

TABLE (2). Contents analyzed for this study.

Posts	Comments	Total
118	2,763	2,881
4.10%	95.90%	100.00%

A great majority or 103 (87.29%) posts were flood risk management-related and only 15 (12.71%) were not. Of the 103 flood risk management-related posts, 76 (73.79%) came from the government side while 27 (26.21%) came from the citizens.

Dissemination of Flood Risk Information

The mayor admits he is not technology savvy and discovered the power of Facebook for information dissemination only when he desperately needed an alternative platform to the traditional mass media in informing his people on class suspensions. In the early days of his term, he recalls that since he was not exactly a “very, very popular” mayor, it became difficult for him to access the traditional mass media for his town pronouncements.

Mass media, unlike Facebook which enables participation and hyper local information sharing, have information gatekeepers who decide on contents based on news values which include timeliness, impact, prominence, proximity, conflict, unusualness, currency and necessity. (Menchers, 2011). Hyper local information such as suspension of classes in a given town may not be picked up by national mass media.

Today, the local chief executive uses Facebook not only to announce class suspension but for so many other official reasons as well. One of them is flood risk management.

On the week of the disaster, Facebook was tapped by the government for the dissemination of flood risk management-related information to the residents of Cainta days before, during, and days after the town-wide flood in Cainta.

Of the 118 posts on the wall of the mayor, 72 (61.02%) came from the Mayor himself, 34 (28.81%) came from friends and followers referred here as “citizens”, and the remaining 12 (10.17%) are shared posts from the Local Disaster Risk Reduction Management Office of Cainta (LDRRM-Cainta). All the shared posts of LDRRM-Cainta were weather advisories, except for the post from the Lalawigan Ng Rizal which was an announcement of no classes in the entire province. (See Table 3)

TABLE (3). Distribution of Posts According to Source.

Nieto	LDRRMO	Citizens	Total
72	12	34	118
61.02%	10.17%	28.81%	100.00%

Posts came in various formats. Majority or 77 (65.25%) were pure text, while 31 (26.27%) were image and text, nine (7.63%) were image only, and one (.85) was a video. (See Table 5). The video posted was a link to a segment of GMA’s morning show, UnangHirit, which showed the Mayor being interviewed two days after the disaster.

The posts used two message formats, English and Taglish or Filipino mixed with English words or phrases or English mixed with Filipino words or phrases. Majority of the posts or 71 (65.14%) were in English while only 38 (34.86%) were in Taglish. (See Table 6) All of the posts written in English came from the mayor and the Ldrmo account, and all of the Taglish posts came from the residents. The residents’ language of choice even with the comments is a mix of English and Tagalog.

This study also checked for messages written in all capital letters (all caps) which is not a standard sentence structure and mostly associated with the writers’ state of mind and emotion. On the Internet, this means the writer is shouting and is generally regarded as unacceptable behavior on the Internet except when the message is a positive one.

Of the 109 posts with text, only four (3.67%) were in all capital letters. (See Table 7) The first two posts that used capital letters were post #3 (RESCUE 131- PATIENT CONDUCTION) and post #12 (CAINTA MUN DISASTER TEAM W/ DELTA Coy

CAINTA), both were photo albums and came from the LDRRMO of Cainta. Both posts should not have been written in all capital letters as they were only cutlines or captions of the albums they posted for information dissemination.

The third post in all capital letter, post #51 (MAYOR CAN YOU POST THE EMERGENCY HOTLINES OF CAINTA RIZAL FOR INCASE (sic) OF EMERGENCY AND TO SPREAD IT OUT TO ALL KABABAYAN), was posted by a citizen to which the mayor wasted no time to respond. He immediately created post #52, a hyper local yet high-value information where he announced the town's emergency mobile number.

The last post written in all capital letter, post #116 (MAYOR KIT SA UNANG HIRIT) with a link to the show, was again posted by a citizen on September 22, 2014. It can be recalled that the day before, the mayor vented on Facebook, in post #113 (Random thoughts on what we have been through), his dismay directed to the television show for having been "chastised" by the anchors for allegedly not monitoring the show while he was in his office managing the town's disaster teams.

TABLE (4). Top 10 posts with most number of shares.

Rank	Post #	Date	Time	Source	Shares	Category	Topic
1	113	9-21	3:26pm	Nieto	481	Non-Risk	Random thoughts on what we have been through...
2	114	9-21	8:00am	Nieto	378	Risk	Classes suspended tomorrow for all public schools to allow clean up
3	52	9-19	10:53am	Nieto	238	Risk	Cainta's hotline number, mobile number, posted
4	47	9-19	9:29am	Nieto	216	Risk	Robinson's & Sta. Lucia Malls tapped for emergency parking
5	59	9-19	12:38am	Nieto	174	Risk	Flood advisory: Strong current; backhoe to be replaced by pump boats
6	30	9-19	6:09am	Nieto	165	Risk	Residents told to stay home. Ortigas & Don Mariano Marcos Ave. flooded
7	97	9-20	9:58pm	Nieto	112	Risk	Flood Advisory: Imelda Ave. Phoenix Gas Station to Vista Verge main gate
8	56	9-19	12:20pm	Nieto	88	Risk	Areas where power was cut announced, residents asked to post request
9	61	9-19	1:25pm	Nieto	57	Risk	Update: Rescue help from military, red cross announced
10	85			Nieto	57	Risk	Major roads passable, abandoned vehicles to

Many comments prior to post above were alerts for the mayor to call the television network, which the mayor interprets as the residents' way of shielding him from further bad publicity on mass media. He said the residents, who were glued to his account, could have gotten mad at him but instead, they tried to protect him and urged him to air his side.

Acting as individual nodes of the government's Facebook account for flood risk management communication, the Facebook friends of the Mayor also helped in the information dissemination process by sharing the posts to their own online communities, thus further increasing the reach of messages.

Aside from sharing posts, the citizens also occasionally tagged select friends of comments inside a thread as a way of "poking" or alerting them of specific information inside a thread which they feel their tagged friends should know about.

Post #113 (Random Thoughts on What We Have Been Through), written by the Mayor and addressed to all the people of Cainta, which came out two days after the disaster, was the most shared post with 481 shares. (See Table 4)

This was followed by post #114, an announcement of suspension of classes to make way for clean-up, with 378 shares in second; post #52, an announcement of Cainta's mobile hotline number, with 238 shares in third, post #47 informing the residents of Cainta that Robinson's and Sta. Lucia malls had been tapped for emergency parking, with 216 shares in fourth; and post #59, a flood advisory informing the people that flood currents have become strong so backhoe would then be replaced by pump boats, with 174 shares in fifth.

If not for post #113 (Random Thoughts on What We Have been through) which stirred much interest, the class suspension post, a hyper-local information to which the mayor credits his discovery of Facebook, would have been the most shared.

Even in the absence of a formal research, the local chief executive believes even the 30 percent informal settlers should also have high access to Facebook. He said sometimes it only takes one member of the family to get hooked up and the information is shared among them.

On the day of the flood disaster, post # 52 (Cainta's mobile hotline number) which was requested by a resident was the most shared by citizens to their own online communities with 238 shares, followed by post #47 (Robinson's and Sta. Lucia Malls tapped for emergency parking) with 216 shares, post# 30 (Residents told to stay home; Ortigas and Don Mariano flooded) in third with 174, post #59 (Flood Advisory: Strong flood currents so backhoe to be replaced by pump boats) in fourth with 165, and post #56 (Areas where power was cut announced, residents asked to post request in the same thread) in fifth with 88. (See Table 5)

The fact that the availability of safe spaces for parking landed as the second most shared on the day of the disaster should not be surprising as 60 percent of the town's residents live comfortably in suburban villages, and many own vehicles. The above also shows a strong tendency of people to share in their own online community high-value information (i.e. emergency hotline, on which streets are flooded and update on flood conditions and electricity supply), thus further amplifying the reach of such messages from the mayor.

TABLE (5). Top 10 posts on disaster day with most number of shares.

Rank	Post #	Date	Time	Source	Shares	Category	Topic
1	52	9-19	10:53am	Nieto	238	Risk	Cainta's hotline number, mobile number, posted
2	47	9-19	9:29am	Nieto	216	Risk	Robinson's & Sta. Lucia Malls tapped for emergency parking
3	30	9-19	6:09am	Nieto	174	Risk	Residents told to stay home. Ortigas & Don Mariano Marcos Ave. flooded
4	59	9-19	12:38am	Nieto	165	Risk	Flood advisory: Strong current; backhoe to be replaced by pump boats
5	56	9-19	12:20pm	Nieto	88	Risk	Areas where power was cut announced, residents asked to post request
6	61	9-19	1:25pm	Nieto	57	Risk	Update: Just dispatched rescue help from military, red cross announced
7	34	9-19	6:20am	Nieto	56	Risk	Update: Rescue truck now in Caprice Village East; major streets knee deep
8	37	9-19	6:46am	Nieto	46	Risk	Update: Rescue truck now in DulongParola, Caprice; Imelda not passable
9	40	9-19	7:39am	Nieto	39	Risk	Dispatch Update: Guar, boat; Camden, fire truck; M. Javier, cargo truck
10	54	9-19	11:21am	Nieto	32	Risk	Advisory: Already sought help from NDRCC for more boats, trucks

The town mayor also uses Facebook to communicate with his disaster teams, with at least six posts addressed to them. His first post at 5:23 in the morning of September 19, which jumpstarted citizen participation, was an urgent call for his disaster teams to convene in the town office in 15 minutes.

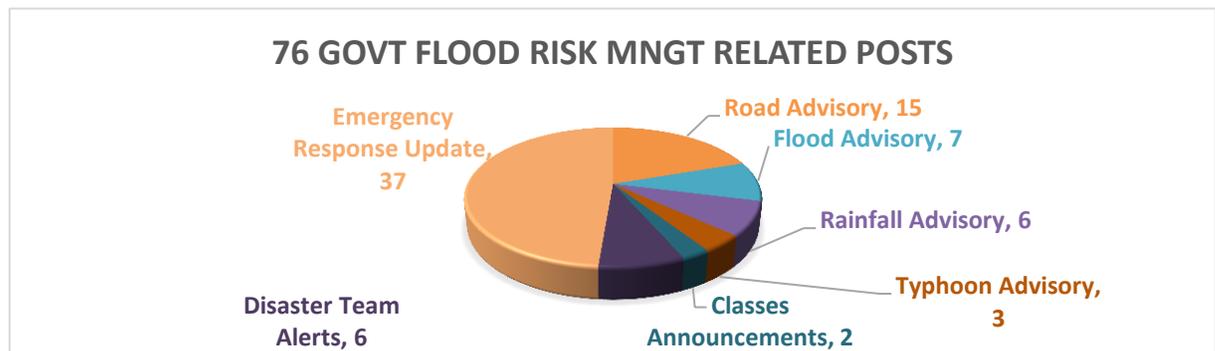


FIGURE 3.Cainta Flood Risk Management Related Posts.

The government posted 37 (49%) emergency response updates, 15 (20%) road advisories, seven (9%) flood advisories, six (8%) disaster team alerts, six (8%) rainfall advisories, three (4%) typhoon advisories and two (3%) class suspension announcements. (See Figure 3)

Days before the disaster, the mayor posted schedules of drainage de-clogging at some high risk areas of the town such as Youngstown Village, San Buena, Junction, Pag-ibig Homes, Daffodil St. of Greenland and river clean-up at Greenland Phase 4. The flood risk-related contents were posted as part of an announcement on the daily overall clean-up activities in the town which included specific tasks to be accomplished by workers, the areas to be covered, and the equipment to be used.

Except for the rainfall and typhoon advisories and one office/class suspension, all government posts came from the mayor who constantly kept his followers abreast in the entire duration of the disaster. He made sure he was able to tap to its fullest the use of Facebook for information dissemination. He said:

The only way that people can monitor (government) is through a medium that would constantly allow them to check where is the mayor right now, what is he doing, what are his priorities and how is he able to respond to the complaints or recommendations of people during a calamity.

The mayor likened his disaster response formula using Facebook to a telenovela, a drama series aired on television. He said:

There's a particular cry for help, there is a particular promise that government makes, there's a particular dispatch that the government makes, and there's a particular solution or resolution that government is able to effect. And the ending there is the token of gratitude coming from the recipient or a third party telling us that we were able to effect a solution.

Drama is a key element in the success of the mayor's Facebook accounts in terms of generating interest which translated into a huge following, thereby expanding its reach for information dissemination. He said:

When they are reading into the threads, they get entertained, they get informed, they get angry because of lack of response, and they empathize with victims. That's the only way you can generate so much interest in an account.

Today, the local chief executive even gives Facebook credit for his success as a public servant. "*Kung hindidahilsa Facebook, pataynaang(political)careerkongayon,*" he said. (If not for Facebook, my (political) career would have been done by now, he said).

Crowdsourcing of Flood Risk Information

Just as they took part in the spread of flood risk information, the citizens of Cainta also helped in crowdsourcing before and during the flood disaster through flood risk information reports both in their posts and comments.

Days before the floods, as part of its flood risk management and also acting on resident's requests on Facebook, the local government of Cainta embarked on drainage clean-up and river dredging.

Because the Facebook account of the mayor regularly posted flood-risk related information such as those on drainage clean-up and river and creek dredging, it resulted to more requests coming from the people: He said:

They got to realize, this creek at the back has many informal settlers. This creek here needs to be dredged. Our street drainage is now overflowing. So let's tell the mayor about it so he can send a team to clean it. Yes, (I get those requests on Facebook). That's how I dispatch my team every day. On top of the "thank you" for yesterday's work, there's a request for tomorrow's work. And this now includes requests on garbage collection, too. Send a Facebook request and in one hour, a garbage collection truck arrives to collect your garbage.

According to the mayor, Facebook, as a communication platform, became particularly helpful especially when it came to a point when cellular sites and their radios were down. At the height of the disaster, he said he "got the pulse of the people in need at any particular point in time."

How he got to the assessment of a town-wide flood disaster early in the morning of September 19, however, was not with the help of Facebook but through short messaging system (SMS) or texting. He woke up to flood SMS alerts sent to him by some of the 3,000 employees of Cainta who have standing instructions to text of flood situations in their areas. Shortly thereafter, he waded through flood waters just to get to the municipal hall.

At 5:23 in the morning, he put out his first post on Facebook convening his disaster team. A few minutes after, flood reports starting coming in on Facebook from all parts of Cainta. At 5:42 a citizen reported of widespread flood at St. Francis Village; a minute later a report came from the Floodway area; followed by reports from Balanti, San Isidro, Bayanihan, St. Joseph Subdivision, Karangalan, Don Mariano Ave., Midtown, Felix Ave. which prompted the mayor to declare on Facebook a town-wide flood disaster at exactly 6:12 in the morning, and announced to his people that rescue operation has already started.

Posts Made by Citizens

Of the total 27 posts citizens made, 12 (44.44%) were reports on floods which gave the disaster management a clearer picture of the floods in each area. (See Figure 4) Aside from posting images of floods in their areas, citizens described the depth of the flood in their areas using either their body parts or the structures around them, i.e. *hanggangtuhod* (knee level), *hanggangbairwang* (waste-level), *lubognaangtao* (the height of an average person), *abotnasa* second floor (up to the second floor) or *lubognaangbubong ng mgabahay* (roofs are already submerged).

Aside from inquiries on road safety and office/class suspensions, the citizens posted eight (29.63%) emergency calls even as the mayor already created a thread for emergency calls only.

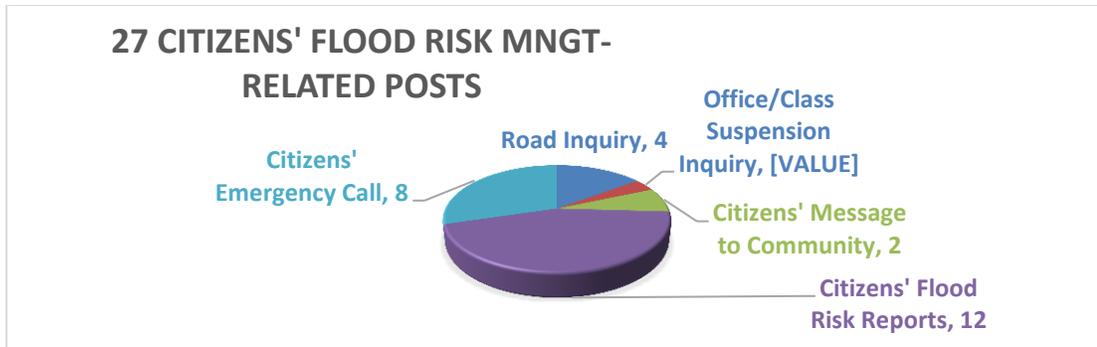


FIGURE 4. Citizens' Flood Risk Management-Related Posts.

Some emergencies specified were rescues at Parola at DuloBuli and Gruar for water had already reached the second floor of houses; a call for evacuation from DM6 of an elderly with cancer; rescue from fast-rising water at Gongora, Rodfer 2 and Nursery-Corinthian in San Roque; and the need for food at Tanglaw and Felix.

Sorting of emergencies and dispatch decisions are made by the Mayor. As soon as an emergency call pops up on his screen, he writes this on a white board. The call is quickly verified by a team outside his office. If the call is valid, he then quickly dispatches a team. And then the emergency caller is informed via Facebook that a dispatch had been made.

In two instances, citizens also posted messages meant to be shared with fellow citizens such as on the mayor's guesting in a television show and a class suspension announced by the provincial government of Rizal. However, there is a big chance they are also municipal employees who are only listening and jumped at the opportunity to be of help when needed. To this, the mayor said:

When they are respectful, chances are they are my employees. If I allow every Cainteno to be part of it (Facebook community), why should I not allow people who are actually in the team to be part of it?

Comments Made by Citizens

Of the total 2,763 comments, 2,216 (80.20%) are flood risk related. At least 11 (.40%) are comments with no messages while 29 (1.05%) comments are tags, a social media feedback mechanism that allows users to share a thread to another user by simply inputting the other's Facebook user accounts into a comment in the same thread. An empty comment appears when a user opens the comment button then presses the enter button without writing in the comment box. (See Table 6)

TABLE (6). Categories of Comments.

Risk	Non-Risk	Tags	No Content	Comments
2,216	507	29	11	2,763
80.20%	18.35%	1.05%	0.40%	100.00%

A great majority of the 2,723 comments are in text format (2,579 or 94.71%), followed by image with text (117 or 4.30%), image only (26 or 0.95%), and video (1 or .04%). In many of the reports from citizens on flooding in their areas, they sent images

accompanied by texts. In some instances, they failed to give descriptions of the images they sent. The video comment is not a video on the disaster but a shared YouTube link of local TV program where the Mayor was a guest. (See Table 7)

TABLE (7). Categories of Comments.

Text	Image with Text	Image Only	Video	TOTAL
2,579	117	26	1	2,723
94.71%	4.30%	0.95%	0.04%	100.00%

When it comes to writing structure, 2,659 (98.59%) of the comments were written in standard sentence structure while 38 (1.41%) used all capital letters. (See Table 8)

TABLE (8). Writing Structure of Messages in Comments.

Standard	All Caps	Total
2,659	38	2,697
98.59%	1.41%	100.00%

Of the 38 comments written in capital letters, 23 are words of support and commendations for the mayor for the service he was doing during the calamity, and seven were desperate calls for rescue which included a call to help people trapped at flooded 7/11 in Junction and two posts calling for assistance to bring home a patient trapped at Robinson's Mall after having hemodialysis.

Other posts in capital letters were reports of a need for clean-up of drainage in GreenparkCainta; a shout by a resident that floodwater has entered his house; and an unsolicited advice for the mayor to launch a fun run and fun plant at the denuded forests of Rizal activity. Another message were words of support for the mayor's call for barangay leaders to lead the clean-up in their barangays.

Based on what have been observed, it clear that some of the friends of the Mayor on Facebook do not observe Internet etiquette rules when it comes to using capital letters for they use capital letters even when a message is positive and the sender is obviously not in high emotional state.

On the day of the disaster, the top post in terms of number of comments from the residents is post #47 (Robinson's and Sta. Lucia tapped for emergency parking) with 121 comments. This is an indication that a significant number of the online community of the mayor own cars and may comprise the 60% of the town's population that live in subdivisions. (See Table 9)

TABLE (9). Posts with most comments on disaster day.

Rank	Post #	Date	Time	Source	Comments	Category	Topic
1	47	9-19	9:29am	Nieto	121	Risk	Robinson's & Sta. Lucia Malls tapped for emergency parking
2	36	9-19	6:25am	Nieto	78	Risk	Residents told to post emergency requests in the same, opened thread
3	29	9-19	5:23am	Nieto	76	Risk	All disaster units alerted to convene in the municipal hall in 15 minutes

4	30	9-19	6:09am	Nieto	70	Risk	Residents told to stay home. Ortigas& Don Mariano Marcos flooded
5	81	9-19	9:42pm	Nieto	70	Risk	Update regarding evacuation areas already been served with food
		9-19	8:41pm				Food delivery in Karangalan hampered; rescue trucks cannot penetrate
6	80			Nieto	66	Risk	Update: Rescue team in Youngstown now
7	68	9-19	3:29pm	Nieto	63	Risk	Flood advisory: Strong current; backhoe to be replaced by pump boats
8	59	9-19	12:38am	Nieto	57	Risk	Areas where power was cut announced, residents asked to post request
9	56	9-19	12:20pm	Nieto	57	Risk	Update: Just dispatched rescue help from military, red cross announced
0	61	9-19	1:25pm	Nieto	55	Risk	

Other posts with the most comments on disaster day are post # 36 (Residents told to post emergency request in the same, newly opened thread) in second with 78; in third is post #29 (All disaster units alerted to convene in the municipal hall in 15 minutes), the first emergency post of the local chief executive, with 76; in fourth with 70 comments each are post #30 (Residents told to stay home; Ortigas and Don Mariano flooded) and post #81 (Update regarding evacuation areas already been served with food); and in fifth is post #80 (Food delivery in Karangalan hampered; rescue trucks cannot penetrate) with 66. (See Table 10)

TABLE (10). Top 10 posts with most comments.

Rank	Post #	Date	Time	Source	Comments	Category	Topic
1	113	9-21	3:26pm	Nieto	468	Non-Risk	Random thoughts on what we have been through...
2	47	9-19	9-29am	Nieto	121	Risk	Robinson's & Sta. Lucia Malls tapped for emergency parking
3	108	9-21	6:28am	Nieto	115	Risk	Start of clean up, 30 trucks deployed to collect garbage
4	86	9-20	7:11am	Nieto	103	Risk	Working with Meralco on power restoration; post requests here
5	114	9-21	8:00am	Nieto	102	Risk	Classes suspended tomorrow for all public schools to allow clean up
6	85	9-20	7:02am	Nieto	83	Risk	Major roads passable, abandoned vehicles to be towed by 7:30 a.m.
7	36			Nieto	78	Risk	Residents told to post

		9-19	6:25am					emergency requests in the same, opened thread
8	29	9-19	5:23am	Nieto	76	Risk		All disaster units alerted to convene in the municipal hall in 15 minutes
9	30	9-19	6:09am	Nieto	70	Risk		Residents told to stay home; Ortigas& Don Mariano Marcos flooded
10	81	9-19	9:42pm	Nieto	70	Risk		Update regarding evacuation areas already been served with food

Of the 2,723 comments analyzed which include 26 images and a video, majority or 1,621 (59.53%) are citizen's flood risk related reports followed by messages of commendation for the Mayor, 329 (12.08%); citizens' messages to other citizens, 222 (8.15%); the mayor's in-thread replies, 157 (5.77%) and flood inquiry, 122 (4.48%). A total of 103 (3.78%) calls for help in the comments threads were recorded and 100 (3.67) were messages of gratitude addressed to the Mayor. (Figure 5)

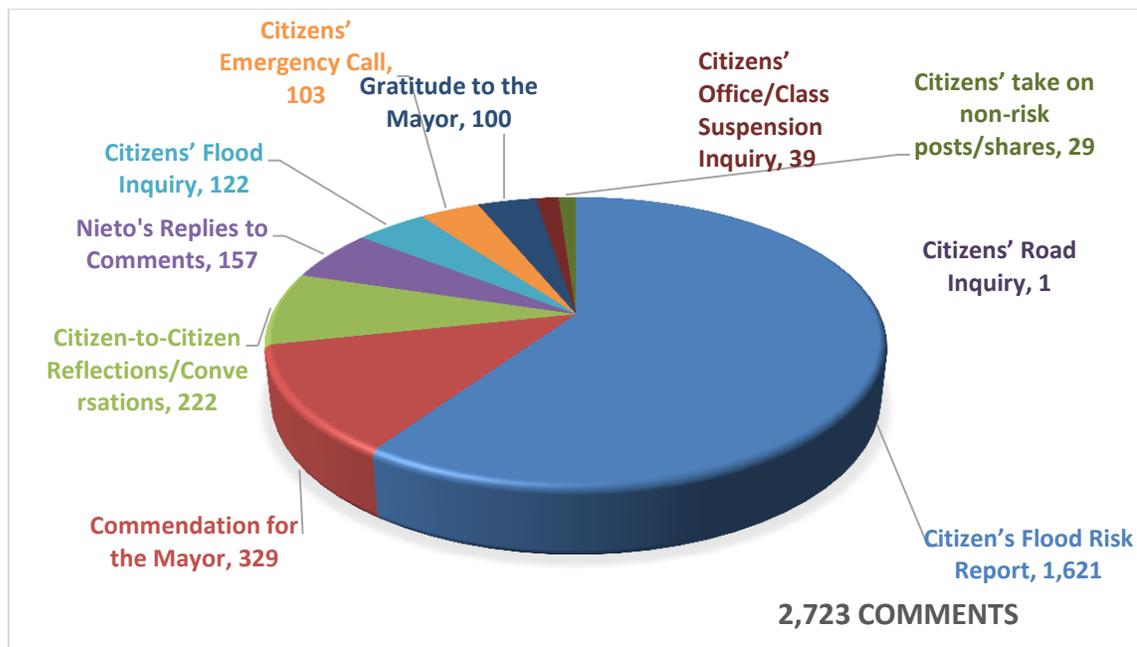


FIGURE 5. Categories of all Comments.

Citizens' Emergency Calls

A total of 111 emergency calls were received by the town executive via his Facebook account. A great majority of these, 103 (92.79%), were comments and eight (7.21%) were posts on his Facebook wall. (See Table 11)

TABLE (11). Breakdown of Citizen’s Flood Risk-Related Emergency Calls.

Comments	Posts	Total
103	8	111
92.79%	7.21%	100.00%

A great majority or 96 (86.49) of the emergency messages were calls for rescue from the rising flood waters. Other kinds of help specified by the residents are the need for food, five (4.5%), ambulance to evacuate the sick and elderly, four (3.60%), the urgent need to cut electricity supply to keep residents from getting electrocuted as the flood was rising so quickly, three (2.7%), the need for a higher ground for parking such as the Robinsons and Sta. Lucia mall, two (1.8%) and the need to urgently de-clog waterways to keep water from inundating houses, one (1.90%). (See Figure 6)

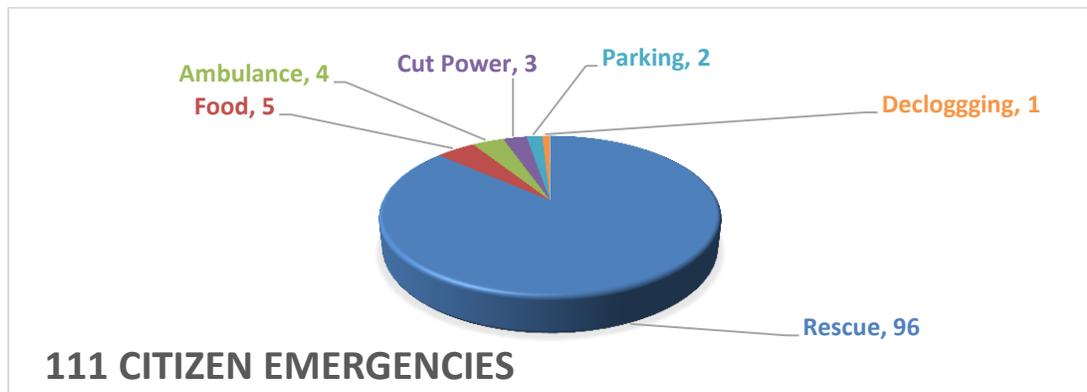


FIGURE 6.Categories of citizens’ emergency messages.

Some 13,000 residents were rescued by 26 town’s rescue teams. In his report to the people of Cainta on Facebook, the mayor said:

I communicated with all texters, Facebook posters, and landline callers. As we were able to respond to five calls, 10 more would come, virtually making it impossible to cover all at the same time. Just the same, I made sure they knew that the government was listening and will do what it can to address their needs. We did for the most; we attempted for the rest.

The mayor himself acknowledged that Facebook played an important role in gathering emergency calls but admitted that at the height of the floods, there came a time they had stopped giving hope of immediate rescue to the people as flood waters especially in places such as Olympia, Gruar and San Buena had become too deep even for their rescue trucks to get through.

It was at this point, at past 8:00 in the morning, that residents of Gruar called GMA 7 for rescue as the government became too overwhelmed and overall rescue operations were hampered and slowed down. Aside from rescue, the government also had to deliver food rations to areas affected, particularly at Karangalan area, which, as announced on Facebook at past 9:00, had also become impenetrable by trucks.

The mayor expressed challenges not much on the volume of requests on Facebook that he had to make decisions on but on deciphering which among those requests truly deserved to be addressed by their already overwhelmed disaster team. The mayor is aware that to many residents of Cainta, he is not just their leader, he is also a friend, a political ally, and a family member responding to their cries for help. He said:

Sometimes they just want to be fetched by a banca to get to work. Often, just to be able to see situations in other places. But when they say somebody needs oxygen, someone is about to give birth, someone is critical, or electricity supply has to be cut, then I make a judgment call. There lies the challenge. I should call it the way it should be called.

Combined with previous flood experiences, the Facebook flood reports helped the mayor create a flood map of the whole town of Cainta which his government needed in designing a P180 million proposed major underground waterways project. The said project has been presented with the Department of Public Works and Highways (DWH) and is awaiting approval and funding from the national government. Although Cainta is a municipality of Rizal, the project is being pushed in the national level. According to the mayor, the framework is that Cainta should be treated as if it were a part of Greater Metro Manila.

Drawing lessons from his experience with typhoon Mario, the local executive has realized the importance of getting more residents to get hooked up to his Facebook account including his disaster teams. He said:

I will have to make sure that most of my people, on top of the residents, will be able to hook up to my account at every point in time during the calamity while doing work. The task will become easier because if all disaster workers are hooked up to me, they will know exactly where to stand.

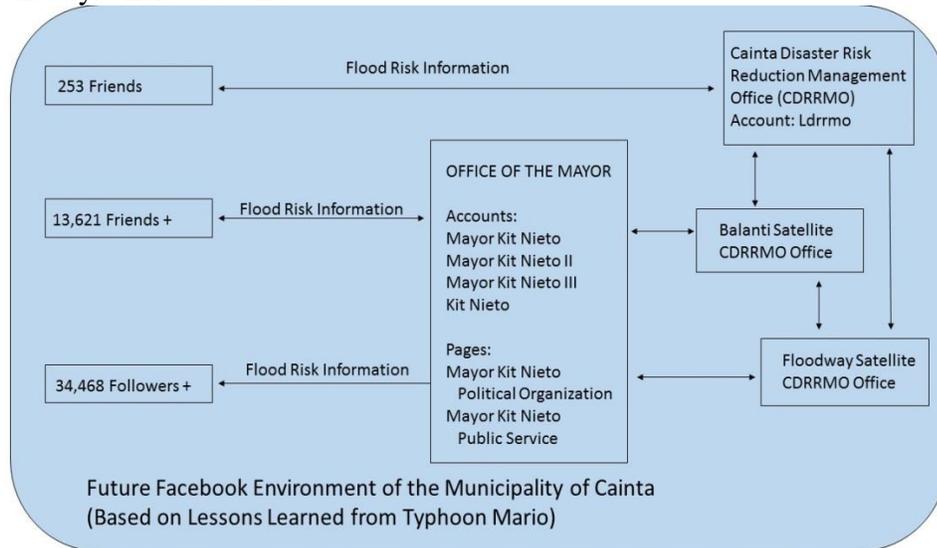


FIGURE 7.Categories of citizens' emergency messages.

The local executive also plans to set up two satellite disaster centers, one in Floodway and another in Balante so that equipment no longer have to be trapped in the municipal hall

whenever Don Mariano and Ortigas become flooded. (See Figure 7) The said centers will also have Facebook access. He said:

Yes (the proposed disaster centers will have Facebook access), definitely. Because even if we have 40 radios and we are able to exchange information, what about the people? What about the 120,000 registered voters to whom we are accountable? We cannot provide 120,000 radio equipment for them. And if our antennas fail, then we lost communication.

The local chief executive has made management of flood disaster risk reduction in Cainta his top priority and personal mission because of a personal tragedy that happened during the onslaught of typhoon Ondoy on September 26, 2009. While serving as a disaster officer of the town before he ran for public office, his father-in-law drowned while he was out in the villages rescuing people.

Today, he lives by the rule which goes: *“Pagangbayanmo’ybaha, dapatangnamumuno’ybasaangpaa.* (If you’re town is flooded, your leader’s feet should be wet.”)

Facebook as Cainta’s Modern Day Agora

In the entire duration of the calamity, the residents of Cainta turned to Facebook not just to help in the dissemination and crowdsourcing of information but also to engage in information exchange or conversation with the local chief executive as well as with one another.

Many conversations occurred in the non-risk posts and comments. The government posted six messages while the citizens posted nine. Three posts from the government were related to maintenance of public utilities, two were posts related to public health, and one was a post-disaster personal reflection of the town’s local chief executive.

On the citizen’s side, five posts were messages of gratitude addressed to the local chief executive, 3 were commendations and praises for him while 1 was a message informing the local chief executive that a feature on Cainta was aired on News TV. (See Figure 8)

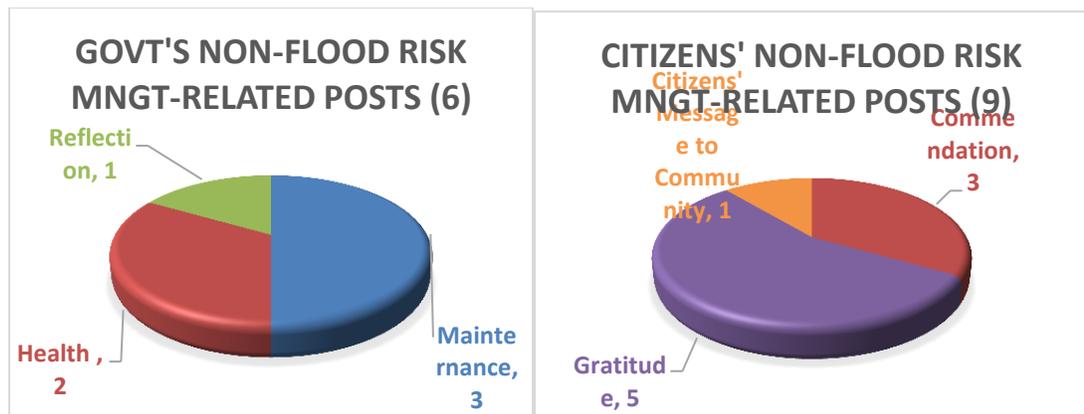


FIGURE 8. Non-Flood Risk Management Related Posts.

One notable post which garnered the most interest among friends and followers is the local chief executive’s post-disaster reflection and report to the people of Cainta, which he titled “Random Thoughts on What We Have Been Through.” In this single thread, the people of Cainta got together in virtual space for an impromptu town hall meeting.

Comments on the post reached 468. Majority of these or 329 (70.30%) are messages of commendations for him for a job well done during the flood disaster; 100 (21.3%) are messages of gratitude to him; and three are pieces of unsolicited advice.

TABLE (12). Categories of Comments in the mayor’s non-risk post #113.

Commendations for the Mayor	Gratitude to the Mayor	Message for Others	No Content	Citizen Advice	Tag	Total
329	100	29	6	3	1	468
70.30%	21.37%	6.20%	1.28%	0.64%	0.21%	100.0%

The residents, despite knowing they are on the wall of the Mayor, often could not help but strike conversations with one another. A total of 29 such messages were recorded on the mayor’s Random Thoughts thread. (See Table 12)

Including the comments on post #113, there was a total of 507 comments not related to the town’s flood risk management. A great majority or 487 (96.06%) of these were in text format, 15 (2.96%) were images with texts, 4 (0.79%) were images only and 1 (0.20%) was a video. (See Table 13)

TABLE (13). Formats of Comments.

Text	Image & Text	Image Only	Video	Total
487	15	4	1	507
96.05%	2.96%	0.79%	0.20%	100%

In all there was a total of 496 relevant non-risk comments, excluding the 4 image only and 1 video and including the six replies of the mayor. Majority of the non-flood risk-related comments or 336 (66.27%) were citizens’ commendations addressed to the mayor. This was followed by 107 (21.10) messages of gratitude to the mayor; 39 (7.86) post-disaster reflections of residents shared with their fellow Caintenos; six pieces of advice for the mayor to prepare for such calamities as well as on his political career; and two are offers of volunteer service for the disaster team. The mayor replied 6 times. (See Figure 9)

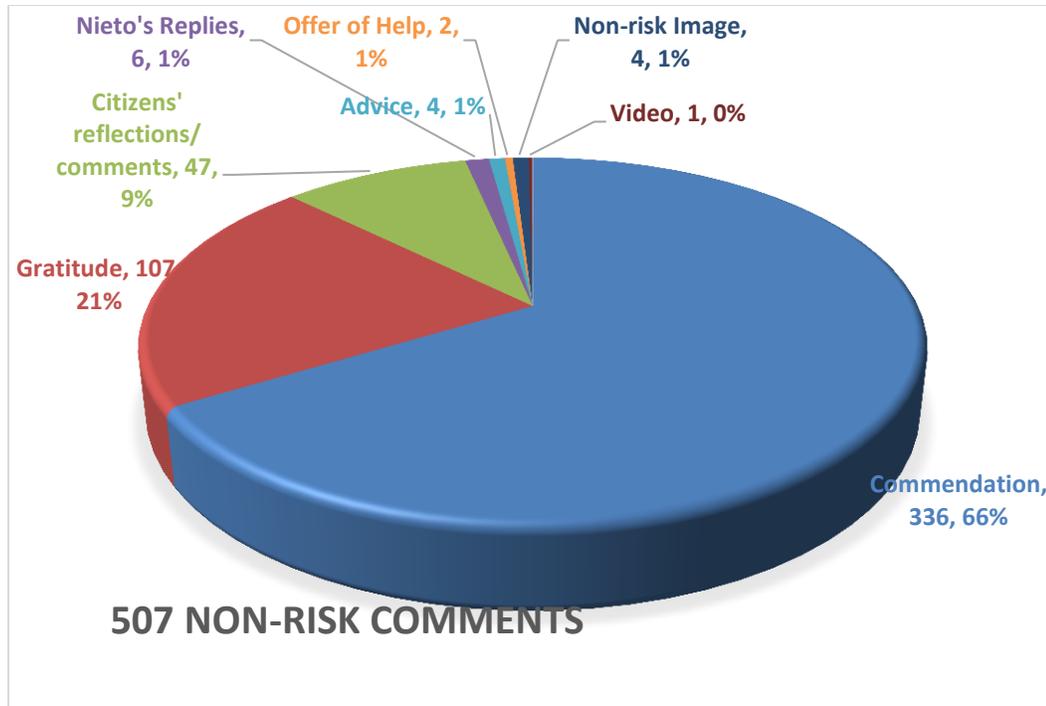


FIGURE 9.Residents' non-risk comments.

In all, the Facebook account of the mayor received a total traffic of 2,714 comments (98.23%). Citizens' posts, on the other hand, received only 49 comments (1.77%). Post from the LDRRM account did not receive any comment from the citizens at all, a clear indication that Facebook users prefer to interact only with the mayor and with each other. (See Table 14)

TABLE (14). Distribution of Social Media Feedback from Friends and Followers.

Source	Comments	%	Shares	%2	Likes	%3
Comments on LDRRM Posts	0	0.00%	16	0.53%	14	0.05%
Comments on Nieto's Posts	2,714	98.23%	2,955	98.24%	27,462	99.19%
Comments on Citizens' Post	49	1.77%	37	1.23%	210	0.76%
Total	2,763	100.00%	3,008	100.00%	27,686	100.00%

Likewise, the posts of the town's chief executive enjoyed most of the shares with 2,955 (98.24). Post from the citizens and LDRRM enjoyed only 37 (1.23%) and 16 (1.535), respectively. The town chief executive's posts also had the most likes with 27,462 (99.19%) while the posts of the citizens and LDRRM had 210 (0.76%) and 14 (0.05%), respectively.

Social media traffic started low on Sept. 16 to Sept. 17 and peaked on the day of the town-wide flood with total likes reaching 12,076; shares reaching 1,416 and comments reaching 1,313 in a day. (See Figure 10)

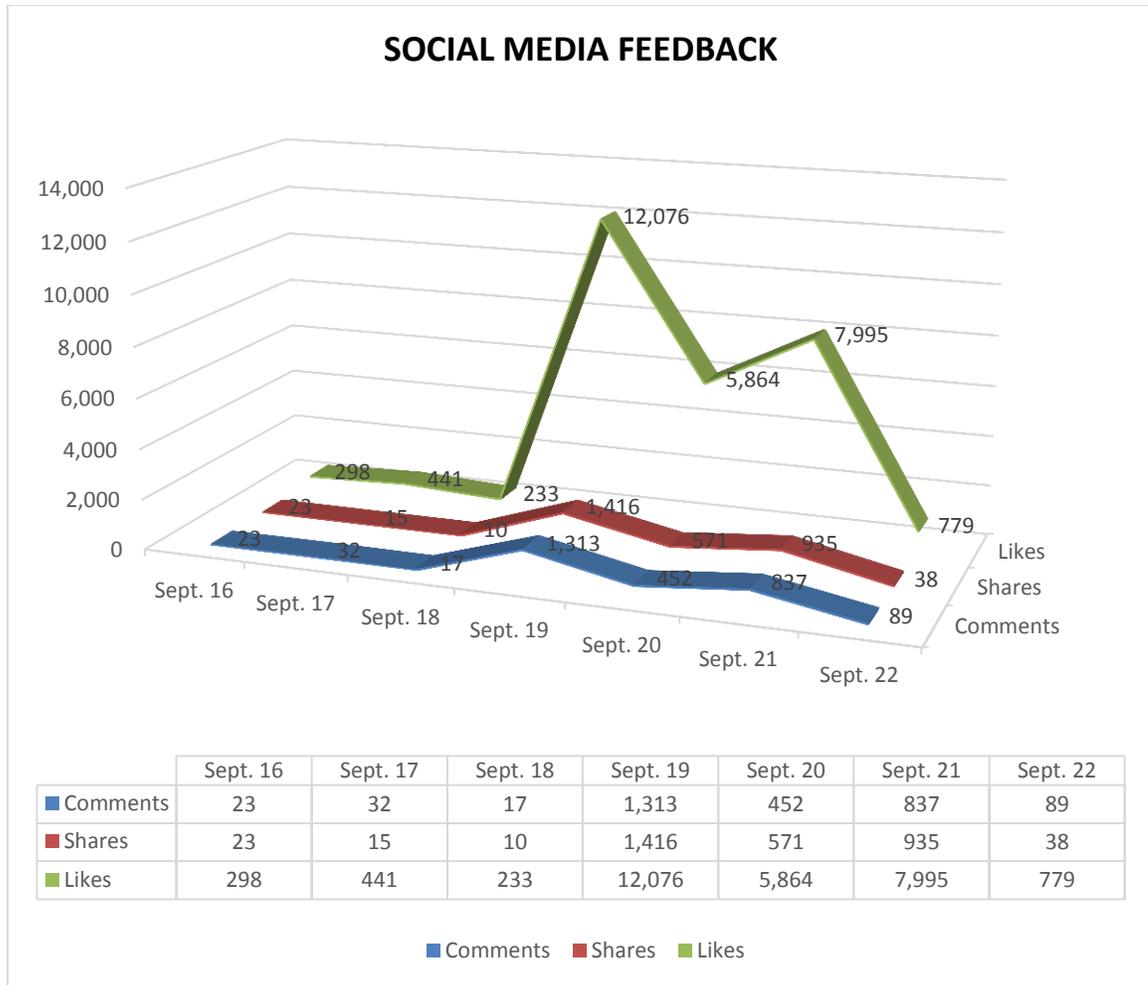


FIGURE 10.Daily Social Media Feedback from Friends/Followers.

On the week of the flood disaster, the most liked post is post #113 (Random thoughts on what we have been through) with 3,706 likes. But on the day of the disaster, the most liked posts is post # 47 (Robinson’s and Sta. Lucia malls tapped for emergency parking) with 1,690 likes. The later also became the second most liked post in the week of the disaster. (See Table 15)

TABLE (15). Top 10 posts with most likes.

Rank	Post #	Date	Time	Source	Likes	Category	Topic
1	113	9-21	3:26pm	Nieto	3,706	Non-Risk	Random thoughts on what we have been through...
2	47	9-19	9:29am	Nieto	1,690	Risk	Robinson’s & Sta. Lucia Malls tapped for emergency parking
3	108	9-21	6:28am	Nieto	1,580	Risk	Start of clean up, 30 trucks deployed to collect garbage
4	85			Nieto	1,121	Risk	Major roads passable, abandoned vehicles to be

		9-20	7:02am					towed by 7:30 a.m.
5	109	9-21	8:50pm	Nieto	927	Risk		First stop at clean up, Karangalan
6	61	9-19	1:25pm	Nieto	849	Risk		Update: Just dispatched rescue help from military, red cross announced
7	114	9-21	8:00am	Nieto	777	Risk		Classes suspended tomorrow for all public schools to allow clean up
8	81	9-19	9:42pm	Nieto	685	Risk		Update regarding evacuation areas already been served with food
9	29	9-19	5:23am	Nieto	621	Risk		All disaster units alerted to convene in the municipal hall in 15 minutes
10	110	9-21	10:30am	Nieto	618	Risk		Clean up at VillaricaSubd.; water pressure clean up

Other most liked posts on the week of the event are post #108 (Start of clean up, 30 trucks deployed to collect garbage) with 1,580 likes; post #85 (Major roads passable, abandoned vehicles to be towed by 7:30 a.m.) with 1,121; and post #109 (First stop at clean up, Karangalan) with 927 likes.

On the day of the disaster, the other most liked posts are post #61 (Update: Just dispatched rescue help from military, red cross) with 849 likes; post #81 (Update: Areas already been served with food) with 685 likes; #29 (All disaster units to convene in the municipal hall in 15 minutes) with 621 likes; and post #30 (Residents told to stay home; Ortigas & Don Mariano flooded) with 543 likes.

A day after the floods, on Sept. 20, 2014, social media feedback traffic dropped by more than half of likes, by almost a third for shares and roughly by a third for comments only to pick up the following day after the posting of the town Mayor's reflection. (See Table 16)

TABLE (16). Top 10 posts on disaster day with most likes.

Rank	Post #	Date	Time	Source	Likes	Category	Topic
1	47	9-19	9:29am	Nieto	1,690	Risk	Robinson's & Sta. Lucia Malls tapped for emergency parking
2	61	9-19	1:25pm	Nieto	849	Risk	Update: Just dispatched rescue help from military, red cross announced
3	81	9-19	9:42pm	Nieto	685	Risk	Update regarding evacuation areas already been served with food
4	29	9-19	5:23am	Nieto	621	Risk	All disaster units alerted to convene in the municipal hall in 15 minutes
5	30	9-19	6:09am	Nieto	543	Risk	Residents told to stay home. Ortigas & Don Mariano Marcos flooded
6	52	9-19	10:53am	Nieto	513	Risk	Cainta's hotline number (mobile number) posted
7	59			Nieto	509	Risk	Flood advisory: Strong current;

		9-19	12:38pm					backhoe to be replaced by pump boats
8	54	9-19	11:21am	Nieto	487	Risk		Advisory: Sought help from NDRCC for more boats, trucks
9	80	9-19	8:41pm	Nieto	468	Risk		Food delivery in Karangalan hampered; rescue trucks cannot penetrate
10	36	9-19	6:25am	Nieto	461	Risk		Residents told to post emergency requests in the same, opened thread

For the town executive, Facebook is his medium of choice because it allowed him to engage in conversations with his people, his friends on Facebook in particular, while making these conversations also visible to all of his followers. He said: You only need to write once and you're already talking to some 30,000 people.

While Facebook may be easy to use, it is not however easy when used for local governance, according to the mayor. In the one time that he delegated the task to a subordinate, it did not end too well. Recognizing how important social presence is in keeping a meaningful interaction on Facebook. He said:

If you (a local government leader) are a Facebook user and you want it to be your medium, make sure you write well. Make sure you can psyche people up. How can a message be written in such a way that you don't irritate your audiences, that they don't feel slighted, that they understand your message? It is not that simple.

Social presence refers to an individuals' awareness of the presence of other individuals with whom he could interact. (Short et a., 1976).

The local chief executive said conversations on Facebook is not something that can be delegated because the personal element to it cannot be taught.

"It's all in the heart. It's all in the heart," he said.

CONCLUSION

The use of Facebook for flood risk management in the Municipality of Cainta is not institutionalized. Its use is not the result of careful planning by risk managers nor communication experts. There is no communication program in place, no separate office nor a trained team dedicated to leveraging the potentials of Facebook for flood risk management.

Use of Facebook in the Municipality of Cainta is just a communication tool and an additional function assumed by the local chief executive to engage his people in the various affairs of his administration. The accounts are his personal accounts and he never actively campaigned to expand his online community.

The above however did not undermine the important role Facebook played in Cainta's flood risk management during the week of the onslaught of typhoon Mario.

As a platform for information dissemination of hyperlocal but high-value information, Facebook remarkably served its purpose as residents continuously received from the government important updates on the calamity and on emergency responses, both for community and personal emergencies. Residents were forewarned of impending risks. High value information from the government, i.e. class and office suspensions,

electricity or power supply, the availability of safe parking spaces, and the town's emergency hotline, were amplified to reach more audiences as residents helped in the dissemination process by sharing posts to their own respective online communities.

Facebook also became useful in gathering risk information from the ground. The idea of tapping the town's big malls for parking as well as the posting of the town's hotline number, for example, were requests from residents. Facebook also helped the government determine the kind of help needed by residents such as the need to immediately cut power supply in some areas and the need for safer parking spaces tapping the two big malls in the town. Distressed residents used Facebook not only to call for rescue but to send reports, both in text and images, of flood situations in their locations, providing the town's disaster team a clearer picture of the calamity. This also helped the Mayor in further refining the town's flood map.

Similar to a town hall meeting, Facebook provided a venue where the residents of Cainta converged and shared their own reflections on the calamity. Aside from flood reports and commendations, messages from residents responding to comments made by other residents also abound.

A great majority of their conversations occurred in the reflection post of the chief executive. In the spirit of communalism, residents shared their own reflections, feelings and experiences, unsolicited pieces of advice for the mayor, project suggestions for the mayor, admonishments for others, and offer of volunteer help.

Social media feedbacks – posts, comments, shares, tags and likes – spiked significantly during the flood disaster indicating the residents' heightened interest and participation as part of the online community of Cainta during a calamity.

The social medium became useful not only in the dissemination and crowdsourcing of flood risk information but also in providing a platform for citizens to satisfy their needs for both social interaction/integration and surveillance.

IMPLICATIONS AND RECOMMENDATIONS

The Philippines' geographic location combined with poor infrastructure and widespread incidence of poverty make it highly vulnerable to risks. Filipinos are exposed to risks related to volcanic eruptions, earthquakes, health hazards, forest fires, typhoons, floods and more.

While these do not happen every day, the reality is that they do happen. And when they do, governments, particularly LGUs, should be prepared.

The findings of this study can provide LGUs eyeing to use Facebook for flood risk management some research-based knowledge on the nature of social media, their affordances, and lessons drawn from its actual implementation for flood risk management in a local government setting.

The use of Facebook for flood risk management in Cainta is not institutionalized and the online community does not belong to the government of Cainta but to an elected public official. The implication of this is that once the mayor's term ends, he will take the account with him and Cainta will lose not only the online community but also valuable institutional memory on the use of Facebook for its flood risk management. In the meantime, not one body is committed to developing long term programs using the platform for effective flood risk management in the municipality.

There is a need for LGUs eyeing to use Facebook for flood risk management to study and understand the implications of such a set-up on their risk management program and come up with solutions if such set-up is viewed to be problematic.

They could start at investigating on the access to the medium (i.e. support for access to the communication medium for disaster workers, barangay officials, community leaders, and the vulnerable residents) and the penetration of the Facebook service to the people (e.g. the total number of households linked to the mayor's accounts).

For the dissemination and crowdsourcing of hyper local and high value information for flood risk management, Facebook played a significant role in the Municipality of Cainta during the onslaught of typhoon Mario. The implication of this is that such initiative can also be replicated in the barangay level with the barangay captain taking the lead. It can also be replicated in other municipalities in the same province or in other provinces of the Philippines.

Facebook, being a multi-way communication platform, also enabled the online community members of Cainta to participate in conversations, turning the local chief's Facebook account into a modern day agora or a meeting place of people with common interests. The implication of this is that, again, such can be replicated in other contexts and for other purposes related to the improvement of governance and public service.

Considering the findings of this study, Facebook, although not without its limitations, is highly recommended for LGUs looking for a medium that could bring public servants and the people they serve in a single communication environment, a multi-way online environment where hyper local and high value information, including risk and non-risk information, can be freely disseminated and shared.

This study, however, can be more helpful for other LGUs in Rizal and other provinces if studies on the following are also explored: a survey on the penetration of Facebook among the residents in Cainta as well as a thorough investigation on how the online community grew; an investigation as to why the town's disaster management office is not able to attract more Facebook following and friends; a survey on the demographics of the Facebook community of Cainta; and a thorough and overall evaluation of the implementation of Facebook for flood risk management by the local government of Cainta.

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