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Disaster Risk Reduction and Management Plan Assessment for e-Route Mobile Application Development

(Barangay Malanday, Marikina City)

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Summary

Three members of the academe specializing in computer technology from different higher education institutions teamed up to develop a mobile application geared towards the reduction of the impact of an earthquake in areas identified as high risk. The initial activity of the project is the assessment of the Disaster Risk Reduction and Management Plan of Barangay Malanday, Marikina City. The key learnings from this assessment will be the basis for designing the mobile application. The team aims to capture the needs of the community in the context of disaster preparedness.

Plans to meet up with key barangay officials have been set and carried out for the discussion of the disaster preparedness of the community. Meetings and interviews were conducted in the community's barangay hall and attended by key personnel involved in the Disaster Risk Reduction and Management (DRRM) of Barangay Malanday. A guided tour of the community was conducted to ensure that the team members will understand the geography of the location and structural make-up of the buildings.

Barangay Malanday is an area close to the West Valley Fault, which is believed to cause earthquakes of high magnitude should the plates move. A river exists near the locality, which also contributes to the area being considered disaster-prone. The population of the barangay is close to 60,000 households residing in closely rowed houses. With the country experiencing the worst disasters in the past decades, the gathering of data from the community helps in developing programs and toolkits, which aim to prepare them in times of emergency situations.

Based on the interviews and assessment of the DRRM Plan, it is evident that the community needs help in the capacity building and awareness raising of its residents. The barangay councilors (locally referred to as kagawad) who were interviewed stressed out that the main challenge they face in their efforts to prepare the barangay for disasters is community engagement. Many of their constituents do not actively participate in the various activities conducted to build the community's capacity to prepare for and respond to disasters..

Based on the research plan, the team had to interview community members. However, the said activity was not carried out. As mentioned by the barangay councilors, the community members do not actively participate in activities pertaining to disaster preparedness. The barangay officials further shared that their case is not isolated and that their situation is mirrored in thousands of communities across the Philippines, especially in high risk areas.

Although the barangay may be lacking in capacity building initiatives at the community level, the officials mentioned that the efforts of the local government in disaster preparedness and response are evident and commendable.

This initial activity is critical in the future initiatives planned out for the barangay. One of these initiatives is the development of a mobile application with web administration panel which aims to mitigate the effects of disasters that may hit the locality.

Introduction

In the National Disaster Risk Reduction and Management Plan (NDRRMP) document released in 2011, the identification of hazard-prone areas and the factors contributing to the disaster exposure of people were emphasized. In the previous years, disaster preparedness and response were given focus. Considering the proactive shift of the country's approach to disaster management, more efforts on vulnerability reduction and resilience building have been initiated.

Barangay Malanday lies above the West Valley Fault which runs through the city of Marikina. This puts the barangay directly in the path of a shifting earth should the plates below move causing an earthquake. The locality is also situated in an area which was once used as farmlands, hence the softness of the land. Moreover, the barangay is also close to the Marikina River which further contributes to its vulnerability.

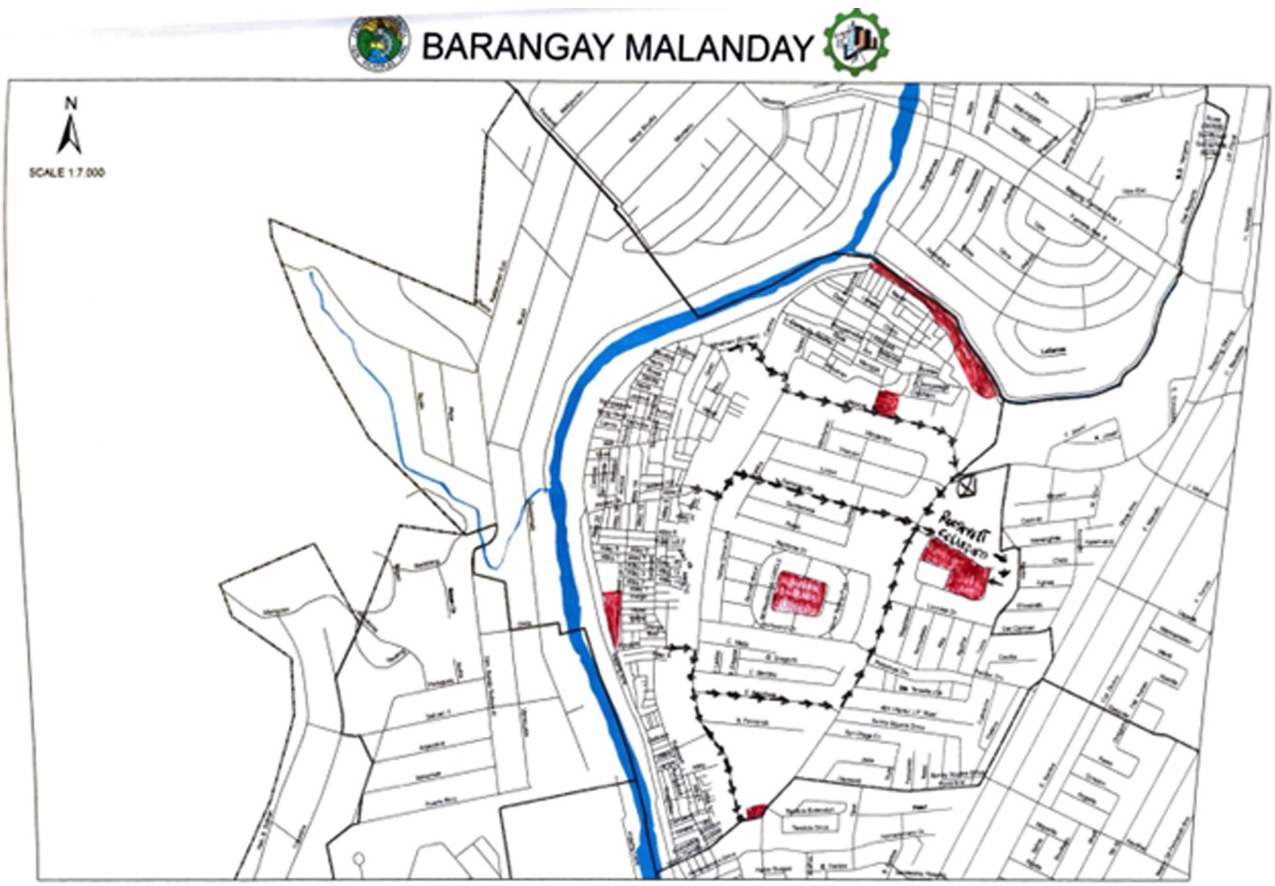

Figure 1. Evacuation Map of Barangay Malanday

The barangay is composed of thirty-one (31) neighborhoods and the ones situated near the river are considered the most at-risk. These areas are also the most populated since the houses are smaller and built higher. The highest dwelling in the area is four (4) floors.

In order to develop an application that will address the requirements of the community, the team needed to conduct several meetings with key personnel in the barangay hall. As this involves coordination with the local government unit, the team needed initial approval in writing to have the project approved by the barangay. The team submitted a written proposal to the barangay and requested for an audience with the barangay captain, Hon. Mark James Alfonso.

After the initial meeting to request the conduct of a study in the community, the team has requested again for an interview with Barangay Councilor Rodel Bayhon, the coordinator for the barangay's disaster risk reduction and management unit,. The DRRM plan of the barangay was shown to the team for initial assessment.

Another meeting was set to interview other barangay councilors, namely, Cherry Bautista, Rodel Bayhon, Owel Bonita, Jasper So, Ferdie Felipe, and Gina Vargas. The meeting with them provided a venue for the team to get their perspective on the disaster preparedness of the community

All the team members are from the academic community and are involved in developing technological tools in various disciplines. The team has already conceptualized and implemented projects related to education, transportation, scientific research, and emergency response. The initial activities carried out aimed to assess the needs of the community for their DRRM planning. This assessment will also be the basis for the design of the web and mobile application that will be developed for the community. The mobile application will be a tool that the community members can use before, during, and immediately after a disaster. On the other hand, the web application,will serve as the administration panel where data could be updated.

Activity Implementation

The activities outlined in this case story are the initial steps required to develop a web and mobile application that will help in mitigating the effects of a disaster to the community.

After the submission of the initial proposal to the office of the barangay captain, the approval was given immediately. The community officers are always willing to collaborate with different stakeholders for projects that will benefit their locality. The barangay captain met with a member of the team to express his commitment to the collaboration. He endorsed the team to the key personnel who will be coordinating closely with the team for this project.

Photos taken during the interview with Hon. Mark James Alfonso, Punong Barangay of Malanday

The meeting with the coordinator of the DRMM Planning unit of the barangay provided the team with initial data,on their response plans. A map of the area with identified evacuation routes was also given to the group.

Photos taken during the meeting with Kagawad Rodel Bayhon, DRMM Coordinator of Barangay Malanday

The meeting with the barangay councilors explored more on the projects and plans of the community to further enhance their DRRM plan.

Photos taken during the consultative meeting with the barangay councilors and the research team

The tour of the area was also conducted with leading the way. The team followed the Kagawad Bayhon as they went through the small streets until they came to the open area intended for the evacuees. The first on the list of areas to visit is the Roosevelt South area, followed by the Road Dike. The Parkland Park was not toured in as it belongs to a private subdivision.

Photos taken during the tour in the evacuation sites of Barangay Malanday: Roosevelt South (left) and Road Dike (right)

Results / Outcomes

Barangay Malanday has identified two (2) major evacuation centers for the community. They have a big open space called Roosevelt South. The area is free from residential or commercial structures that may collapse in the event of an earthquake. The community may also use the newly widened road called Road Dike. Although the Road Dike is a main road, it can be used by the residents to distance themselves from concrete structures that are likely to collapse when the ground shakes.

Another open space identified is the Parkland park area. However, this lot is within a private subdivision which does not give available access to the residents living outside the area. Currently, the barangays officials are in dialogue with the officers of the homeowners' association of the said private subdivision to discuss access to the open space should the need arises.

The barangay officials mentioned that they have already started with awareness and capacity building programs for the community. Earthquake drills and disaster preparedness seminars are constantly being conducted where members of the community are invited to attend and participate.

The community has already conducted earthquake drills to teach the residents what they need to do in case of an emergency. An evacuation drill was also conducted to familiarize the residents on the routes that they can take to reach their designated evacuation centers. However, the number of participants, is not as the officials hoped it would be. As shared by Kagawad Bautista, "Masakit man pero yung totoo karamihan sa mga tao sa laylayan hindi nakiki-cooperate (The painful truth is that people in the hem of society do not cooperate). Kagawad Bayhon agreed to what Kagawad Bautista mentioned. He said, "Hindi lang sa atin ganyan, nationwide ito. (It is not only in our community (that people do not cooperate), this is (happening) nationwide)."

The barangay officials made mention of the office's initiative to organize first responders within the community. The first group of responders group will be from volunteers who will undergo training for the skills needed to conduct rescue operations and evacuation. Moreover, the barangay has also set aside budget for the procurement of necessary equipment to ensure that the first responders would be able to perform their duties and responsibilities

Conclusions and Recommendations

Upon the conclusion of the initial data gathering, the team observed the following: (1) every barangay allots a portion of their budget for the DRRM agenda; (2) the local government unit is actively involved in the DRRM plan of the community; (3) development of programs and toolkits are needed to prepare the community in times of disaster; and (4) community engagement is a key factor for a successful capacity building program.

The conducted interviews and consultative meetings with the key personnel of the barangay played an essential role in capturing vital information about the community. These activities have been carried out through the active participation and involvement of the barangay officials. Most importantly, the team was able to assess the needs of the community in disaster preparedness and be able to address them using appropriate technology.

Therefore, the involvement of the community is highly important in the development of the web and mobile application which will serve as a tool for community members before, during, and immediately after a disaster strikes.

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Handa na ba tayo?

An assessment of MDM preparedness in selected cities of Metro Manila

Summary

Metro Manila is gearing itself for "The Big One," a massive earthquake that could potentially hit and cause wide-scale damage to the region. In the past years, the government has heightened efforts to prepare the public and disaster response officers for the quake's possible onslaught. Despite this, there is still much to be done to improve disaster response in the country. One of its most over-looked aspects is management of the dead and missing (MDM), which tends to take a backseat in a post-disaster scenario.

Just as important as ensuring the welfare of the living is protecting the rights of the deceased and the missing calamity victims. Failure to properly identify or bury the deceased can delay the grieving process for the families of the departed; the sudden death of a loved one can also have legal implications. Following gaps in MDM after the onslaught of Yolanda in 2016, the government has boosted efforts to institutionalize and strengthen MDM responses in the Philippines. This case study tackles efforts of three Metro Manila Disaster Risk Reduction and Management Offices (DRRMOs) to increase their capacities to render MDM response. By assessing the status of MDM in these three DRRMOs along with the barriers hindering its implementation, this study hopes to provide insight on what the government and other civil society organizations can do to help further forward and mainstream MDM throughout the country.

In 2013, supertyphoon Yolanda (international name: Haiyan) struck the Philippines, devastating much of Eastern Visayas Region. The storm—then the strongest to make landfall in the Philippines—battered areas in its path, sowing destruction and death everywhere it went.

In a flash, it left a staggering 6,300 dead, 28,689 injured and 1,062 missing persons in the Philippines[1]. The government—most notably in Leyte, the hardest hit by the supertyphoon – scrambled to fix the disaster, but the damage was too great.

Supertyphoon Yolanda, which was the deadliest natural disaster to strike the Philippines in recent history, exposed gaps in the country's disaster risk reduction (DRR). It also highlighted an aspect of disaster response that had been overlooked before: MDMmanagement of the dead and missing (MDM). For days, bodies littered the streets of Tacloban, Leyte, as an overwhelmed government tried to balance both catering to the missing. Some of the deceased were never found; others were buried without being properly identified.

Years later, the ghost of Yolanda still lingers for many families. Aside from the pain of their loved ones passing away, some families of the dead and missing have had difficulty accessing claims and reparations due them, further hampering the grieving process. The incident was a sobering lesson for the stakeholders, especially as friction developed among already agitated victims and overwhelmed first responders, who at the time had limited knowledge and/or little training on MDM. It was also an eye opener for the local and national government to improve the MDM Response in the Philippines.

[1] https://www.gmanetwork.com/news/news/nation/357322/ndrrmc-yolanda-death-toll-hits-6-300-mark-nearly-6-months-after-typhoon/story/

Figure 1: Years after the onslaught of Supertyphoon Yolanda, many families have yet to gain closure over the deaths of their loved ones. In this photo, relatives of Taclobanons killed or missing from the Supertyphoon offered their candles at Anibong, Tacloban City.

Metro Manila: Ticking time bomb

Metro Manila, more than 550 kilometers away from Leyte, is the most densely populated region in the Philippines. Like Leyte and other provinces in the Philippines, it also experiences its fair share of typhoons and other risks that come with living in one of the most disaster-prone countries in the world.

However, what ha concerned the region as of late is a different kind of hazard: earthquakes. Metro Manila sits atop the West Valley Fault, which spans several of its cities. Experts say if the fault line moves, it may trigger a massive magnitude-7.2 earthquake that could kill as many as 37,000 and injure 605,000 people.[2] The fault line moves roughly every 400 to 500 years. Its last known movement was 361 years ago.[3]

The threat of this impending earthquake, dubbed "The Big One", has been marked with efforts to educate and train responders and the public on what to do if a disaster strike. Due to the possible effects that the Big One can cause to the residents in Metro Manila, various stakeholders have come together, either to introduce innovations or scale up existing DRRM Programs, to prepare and mitigate the impacts of the Big One. Yearly, the Metro Manila Development Authority (MMDA) holds a shake drill where schools, government offices, and some private agencies participate to strengthen and test disaster response.[4]

These are done preventively, in order to ensure the least number of fatalities possible, but based on studies such as the Greater Metro-Manila Area – Risk Analysis Project (GMMA- RAP), the deaths are inevitable if a massive earthquake strikes Manila.

Thus, this begs the question: If the local government units (LGUs) are equipping themselves to rescue the living, are they also prepared enough to handle the dead?

[2] https://www1.pagasa.dost.gov.ph/index.php/73-risk-analysis-project
[3] https://www.govtech.com/em/disaster/The-Big-One-Could-Kill-34000-in-the-Philippines.html
[4] https://www.rappler.com/move-ph/207735-mmda-earthquake-drill-2018-operations

Lessons from Yolanda

Yolanda set the stage for MDM in the Philippines. Following its onslaught, measures were put in place to improve disaster risk reduction and management (DRRM) in the country, especially MDM. This is most manifested by the adoption of National DRRM Council Memorandum Circular No. 19 Series of 2016, which institutionalized the establishment of MDM response in the country. It also assigned the Department of the Interior and Local Government (DILG) as the head of the MDM cluster, instead of the Department of Health (DOH), which was previously responsible for MDM.

Despite this, MDM still has a long way to go. While recently enacted policies have set the stage for better MDM, interviews with different LGUs prove much guidance is needed before it truly becomes established in the country. Just as important as organizing trainings and setting policies for MDM is checking if they were truly helpful, and what further interventions may better help them adopt it.

MDM: A budding concept in Metro Manila

When the Resorts World incident struck Pasay in 2017, its City Disaster Risk Reduction and Management Office (CDRRMO) was caught off guard. The attack, where a lone gunman rained bullets in the hotel and casino and killed 38 people[5], was not only complex due to the simultaneous disasters (fire and shooting) that occurred; it was also the first of its kind to happen in the city.

Disasters in Pasay were mostly zero casualty and limited to floods before. —RW, as they call it, however, was so bad that they had to borrow body bags from other LGUs. —"*Gusto na naming magtago sa ilalim ng mesa kasi wala kaming cadaver bag* [We wanted to hide under the table because we were out of cadaver bags]," an officer says of the experience. Following that, the city bought 150 body bags in a span of two years.

Pasay's experience is not isolated. As was the case in Yolanda, MDM often takes a backseat to other aspects of disaster preparedness. While the public and local offices are well aware of the importance of disaster preparedness, recognition of MDM's importance often only arises once massive disasters strike and responders are left to handle mass casualties without sufficient training. This is why there have been efforts from the DILG and its partner agencies to mainstream MDM, although there is still no steady pool of technical training and information on the subject to continuously guide responders in implementing this knowledge.

Thankfully, roughly half a year after the incident, DILG was able to hold MDM sensitization sessions for LGUs to help strengthen their responders' knowledge of the said topic. Pasay has since included MDM in its contingency plan. While it is still a—baby," according to the disaster office, they have been working on integrating it into their protocols. —*Paunti-unti naka acquire kami ng additional resources, na include na rin sa plan and protocols. Kulang lang sa ibang equipment* [We've acquired additional resources little by little; we've also included MDM in our plans and protocols. We're just missing some equipment.]," an officer said.

Figure 2 The Pasay City Disaster Risk Reduction and Management Office has worked on building up its MDM plans, with the help of knowledge from MDM trainings. The office calls the project a "baby" for now, but expresses optimism it will continue to improve in the future.

5 https://news.abs-cbn.com/news/06/02/17/38-dead-in-chilling-resorts-world-manila-attack

State of MDM: What do we have so far?

MDM training is still in its germinal stages in the country, as responders and organizations build up knowledge and equipment to better implement this type of response. Based on IDEALS' interview with the cities of Pasay, Marikina, and Mandaluyong, different cities are in different stages of establishing an MDM plan.

In Pasay, for example, MDM is a new addition to its contingency plan. Mandaluyong has also integrated MDM into its city disaster response. Marikina, meanwhile, had already established an MDM cluster even before MDM had been mainstreamed and headed by the DILG.

Figure 3 The City of Marikina established its own MDM plan even before the onslaught of Supertyphoon Yolanda in 2013, and Typhoon Ondoy in 2009. Its operations supervisor says the plan is due for updating, as it was made when the DOH, not DILG headed MDM efforts in the country.

Marikina's handbook, crafted even before the deadly typhoon Ondoy in 2009, includes a full-fledged MDM cluster, with a chain of command that instructs rescuers to hand dead bodies to the Police, and then to the Scene of the Crime Operatives (SOCO) for identification. However, this also needs to be updated, as it is still based on when the DOH was tasked with leading MDM in the country and ensure that MDM information will be cascaded to the appropriate stakeholders in the LGUs.

Based on the GMMA-RAP, Pasay has a projected fatality count of 1,117 if "The Big One" strikes. On the other hand, Marikina has 1,617, while Mandaluyong will have 874.[6]

[6] http://ndrrmc.gov.ph/attachments/article/1509/Component_5_Earthquake_Risk_Analysis_Technical%20Report_ - _Final_Draft_by_GA_and_PHIVOLCS.pdf

Aside from integrating it in disaster plans however, a key component in ensuring proper MDM interventions are made is training and capacitatin responders. This is where the local DRRMOs have expressed the need for more help on acquiring MDM information and integration of the MDM Response in their respective jurisdiction.

In Marikina, only one out of more than 70 employees had attended training on MDM that was organized by the DILG. In Pasay meanwhile, DRRM officers said that while some officers had attended MDM trainings, it has not been established yet as the limited number of people in the office are focused on search and rescue. Mandaluyong, on the other hand, was fortunate enough to have training on Disaster Victim Identification (DVI) from the Philippine National Police-Crime Laboratory Group (PNP-CLG). This event was attended by barangays, the city health officer, and responders of Mandaluyong City.

The same goes for cascading these learnings to the community through trainings. In Pasay, barangays are currently being taught MDM, however the CDRRMO said these are not technical but more of general information as to give a snapshot of the process. It added, there are insufficient funds allotted for large-scale sensitization initiatives at this point.

As mentioned earlier, barangays in Mandaluyong were able to attend DVI training where they were taught basic information on tagging, triaging, offices, and where the body will be held. The city also plans to integrate MDM response in its Rescue Challenge--a city initiative to simulate responses should disaster strike, but maintains it still needs more assistance on the technical side of MDM.

For equipment, all three are compliant with DILG Memorandum Circular No. 2016-139, instructing LGUs to have at least 50 cadaver bags. Pasay currently has 148, which it is building up; Marikina has 250, which it plans to replenish, while Mandaluyong has 1000 to cover the number of projected deaths should an earthquake strike, in addition to those who will be seriously injured.

Figure 4 Marikina has ambulances at its disposal for emergency situations. However, the City, along with Pasay and Mandaluyong, has not yet purchased vehicles specifically assigned to transport dead bodies if disaster strikes.

A difficult point, however, is securing vehicles for transportation of the deceased. None of the LGUs have vehicles specifically for transport of the human remains. Pasay said this is particularly difficult at the moment as it will be hard to justify funding for a vehicle that can no longer be used for other purposes once it has stored dead bodies.

Marikina, on the other hand, is studying a proposal where refrigerated container vans may be used to house bodies of the deceased to delay the decomposition of cadavers before they are identified. One of its best practices includes a temporary burial scheme for times of disaster, where unclaimed bodies and bodies of victims whose families have consented to their burial will be interred in a container van. This van will have shelves to separate the bodies, and will be buried in the City Sports Center in the event of a mass casualty.

Mandaluyong, meanwhile, has signed agreements with transport groups that could allow it to utilize vehicles during times of disaster, if needed. In addition to this, it has allotted a burial site for the deceased, in addition to partnering up with a funeral parlor.

Lastly, there are both formal and informal partnerships for MDM in these cities. In Marikina barangay LGUs spanning the Marikina River are routinely contacted during search operations to watch out for bodies potentially carried by the current. Mandaluyong, meanwhile has entered into the aforementioned agreement for transport and funeral services. It also partners with Rescue 911, an organization geared towards disaster preparedness.

Challenges and Difficulties

As with any project or intervention that has just started, MDM has its share of challenges for those implementing it. DRRM officers in Pasay have stated their desire for **more detailed instructions and protocols for MDM**, with the DILG possibly giving clearer instructions and training for them. —*Di pa masyadong established ang mechanisms and protocol... Kailangan ng guidance from the lead agency, kasi diba work in progress pa. Pilot testing pa lang siya* [The mechanisms and protocols haven't been clearly established... We need guidance from the lead agency since it's still a work in progress.], —one of its officers said.

Resources—either human or in the form of funds— are also a challenge for local DRRM offices, especially as responses and funds geared towards the living will almost always be prioritized over MDM. DRRM officers from Pasay suggested official memos or documentation from the DILG in order to make it easier to justify the budget and purchases, if city officials oppose it.

Aside from funds, however, there is an issue of workers being —overwhelmed—or spread thin due to the number of responsibilities they must juggle. Marikina Rescue 161's operations supervisor said that even with volunteers, there are not enough people for sufficient disaster response during calamities.

The Pasay DRRMO only has 47 employees to cater to a population of 460,000, Marikina has 77 for a population of 450,000, and Mandaluyong has 70 for 386,000 to 1.4 million, depending on the time of day and the flow of workers in and out of the city. Due to the limited number of people, most of these staff will likely be directed towards search and rescue operations.

Another difficulty pointed out by the offices is **coordination with agencies**. For Pasay and Marikina, which have experienced conducting MDM responses firsthand in their own cities, there is a need to ensure that MDM is given a clear structure and that all agencies are well aware of their roles. Marikina's Rescue 161, for example also cited conflicting protocols as one of the issues when working with agencies, such as the PNP. —*Minsan kung ano yung nakakasanayan nilang practice, yun yung nangyayari* [Sometimes they end up doing what they're used to].

Rescue 161 also said there are points for improvement with regard to tracking the status of missing people or dead bodies once they are turned over to other agencies. Aside from this, it also sees the need to improve its paperwork/ forms in order to formalize parts of the MDM process and improve the collaboration and coordination of response among first-line responders.

The most prominent of all these however, is **the need for further capacity building and technical training**. All three LGUs have expressed their willingness or desire for further guidance with regards to MDM.

Right now, what the offices have are more general interventions. In the case of Mandaluyong and Pasay, both stated the need for more detailed help from experts. Pasay, having just developed its MDM plan, also suggested DILG be more hands on when giving instructions. However, the difficulty here is there are only a few MDM experts nationwide and the DILG's MDM team likewise has a limited number of people. This may then be a window for other civil society organizations and non-government organizations to assist the government.

Mandaluyong, for example, partners with Rescue 911, which allows it to have more information and trainings on disaster preparedness as a whole.

What we can do: Prospects for improving MDM

Given these sentiments from the three LGUs, one of the most crucial interventions needed is to develop a method to better cascade existing laws and information to educate and promote awareness on the importance of MDM. This includes developing Information, Education and Communication (IEC) materials on its importance and dialogues with the appropriate government authorities and citizens to understand the need on MDM

"Importante na sila ang mismong makarining. Kailangan magkaroon ng isang way para maparating sa tamang tao ang message tungkol sa MDM... Dapat ang ordinaryong tao ay may alam din tungkol sa MDM, para sa ganoon ay malaman nila ang standards or protocols on MDM [It's important that they themselves hear about it. We need to find a way to ensure MDM reaches the right people... The public should also know about MDM so that they can learn proper standards and protocols.]," Mandaluyong's CDRRMO told IDEALS.

To do this, however, it is equally important that city officials themselves know about MDM and why it must be prioritized. Being one of the more novel aspects of DRRM, there is a need for information dissemination on the importance of MDM so that the appropriate stakeholders would be aware of it and allot the appropriate resources for the formulation, adaptation, and implementation of the MDM Response Program.

—Dahil marami ang hindi aware, walang naka-allocate na support... Kasi hindi nila alam na meron. So, kapag nasimulan natin ang awareness at naintindihan nila ito, magkakaroon na ng domino effect [There's little support allocated to MDM since people aren't aware of it... They don't know it's there. Once we've started raising awareness and they understand it, it could start a domino effect." the Mandaluyong CDRRMO mentioned.

The Pasay CDRRMO also echoes this, and it is optimistic that once their MDM program overcomes growing pains and the city starts to recognize its importance, it will be easier to streamline MDM responses. —Sa tingin ko, pag di na baby, di na limited. Pag naupuan na po yan, yung budget malalagyan na po yan [I think it won't be so limited once the project isn't a baby anymore. Once we've settled the budget, it'll be there.],— one of its officers said.

These awareness efforts must be supplemented by more training sessions, especially for the LGUs that are still establishing their MDM plans, and need more guidance. Due to the technical nature of MDM and the extremely high death toll predicted if —The Big One— strikes, it is important to capacitate as many responders as possible.

Member organizations of the MDM Cluster must also monitor the ongoing efforts of the stakeholders to adopt, in their respective jurisdiction, the latter's MDM Plan. Lastly, it would be helpful to establish definite protocols for when different agencies and offices work together, to prevent miscommunication or conflict between them.

Integration and complementation of works must be observed so that the stakeholders can effectively and efficiently carry out their respective response programs after the onslaught of the catastrophe. This may also be resolved through training sessions that will invite all stakeholders and possible participants in MDM response.

Overall, there is an awareness and desire to improve MDM within local government units. What government agencies and NGOs have to do is to help these agencies flesh them out and further develop them. To do this, stakeholders in DRRM must work hand in hand, collaborating, training and communicating with each other in order to ensure that efforts to mainstream MDM will be sustained.

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Housing Structures Assessment for Retrofitting Demonstration in an Urban Poor Community

(Tinig at Lakas ng Naninirahan sa Talanay HOA
Talanay Street, Barangay Batasan Hills,
Quezon City)

Case Story

Urban poor communities are considered to be vulnerable to different types of disaster especially that of an earthquake because they have non-engineered housing structures. Paramount to disaster preparedness is the goal to ensure the zero or minimal loss of lives, and to do so, the housing structures need to be evaluated to minimize the vulnerability of the communities. The Quezon City Government implemented the "Building a Disaster Resilient Quezon City Project" in 2014: and developed the Quezon City Risk Atlas with EMI. The Quezon City Risk Atlas is a compilation of physical and socioeconomic profiles, built environment, hazards, vulnerability and risks information, and maps of the respective barangays in Quezon City. In the Quezon City Risk Atlas it identified Barangay Batasan Hills as one of the vulnerable barangays for the Big One; the barangay alone has an estimate of 449 buildings that have been assessed as may collapse, 1,348 buildings assessed as may sustain heavy damages, 5,741 buildings that may be partially damaged, and an estimate of 1,557 fatalities or loss of lives.

Last year, a convening initiative on Earthquake Resilience and Response was jointly hosted by the Asian Disaster Reduction and Response Network (ADRRN), Humanitarian Innovation Fund (HIF), and Center for Disaster Preparedness (CDP). Eight project teams underwent a two-part workshop series to explore unsolved problems in earthquake resilience and response in the Greater Metro Manila area. Under the mentorship of ADRRN, HIF and CDP, each team came up with an innovation idea that improves humanitarian action; and developed a project proposal to address identified problems in earthquake resilience and response.

Tinig at Lakas ng Naninirahan sa Talanay Homeowners Association (Talanay HOA), an urban poor community in Barangay Batasan Hills, Quezon City has a membership of ninety-three (93) families. The community lies very near the West Valley Fault. Because of its location, it was identified by the Project Team as a possible seismic retrofit demonstration area. The housing structures are non-engineered and self-built, and the families have limited access to technical experts that can conduct structural assessment.

Focus group discussions with members of Talanay HOA were conducted as an initial research activity. The FGD tackled earthquake awareness and existing practices on house construction in the community. Community representatives shared the results of their group discussions; a community participant recalled that majority of the members of their group have been residing in their community for twenty (20) years, and she has also shared the physical changes of their community, "Ang aming lugar noong 1990 ay maraming talahiban at walang byahe ng tricycle papunta sa komunidad kung kaya't kinakailangan namin maglakad pauwi." The residents chose their area because their relatives invited them to stay in the community and considered the area because it is accessible to their place of work and not a flood prone area.

When asked on their experience with earthquakes, a participant shared: "Dito sa aming komunidad, kahit matagal na kaming naninirahan dito ay hindi pa naming nararanasan ang lindol, may kaunting kaalaman kami patungkol sa "The Big One" pero limitado ang impormasyon na alam naming patungkol dito." The community representatives also reflected that their community would not be able to respond if they will experience "The Big One"; the community perceives that they are at least 25 meters away from the fault line. The community expressed its willingness to work with their Barangay to better understand its plan in terms of preparedness and response in relation to the "Big One."

In terms of recalling how the housing structures in the community were built, the residents shared that the barangay provides them permit for construction regardless of the number of storeys of their houses. The community resident also shared: "Ang mga nagtatayo ng aming struktura ay ang mga kapitbahay na may kaalaman sa konstruksyon at ito ay paunti-unti (incremental) lang namin isinasagawa, kapag may badyet ang pamilya ay tsaka pinagpapatuloy ang konstruksyon; ang ilan sa mga nakaka-aangat sa amin ay nakakapag-konsulta sa mga inhinyero at contractor." The participants shared that not all of their structures were built sturdily that is why they welcome the presence of experts in helping them assess the strength of their respective housing units to aid them in developing a community-response strategy for earthquakes.

For the community to further understand the disaster that they potentially face (aside from earthquakes) and assist them in formulating their community-based disaster risk reduction and management plan, the Community Development students from the University of the Philippines conducted a PCVA (participatory capacities and vulnerabilities assessment). The students conducted a two-part PCVA workshop last February 17 and March 18, 2019. Major challenges that the students encountered in the implementation of the workshop is the levelling off in terms of understanding the hazards and vulnerabilities experienced in the community. To address this, the students recommended that the officers of the community undergo a basic orientation on Disaster Risk Reduction focusing on the vulnerabilities and capacities of the community to respond or adapt in their identified vulnerabilities.

There is an on-going discussion on the need to look into the integrity of housing structures in the community as a key feature of preparedness plan of the community – majority of the residents in the community do not see this as an urgent concern since they consider the occurrence of "The Big One" unlikely despite reference materials shared to the community about earthquakes. The students also recommended that the community identify safe evacuation sites in their area as well as update the number of members per household at the community level. There is also a need to identify vulnerable family members (children and the elderly) who will be the priority for evacuation. The community agreed to work on their assignments as well as coordinate with their barangay officials for a disaster preparedness orientation in their community.

To assess the integrity of structures, the Project Team is reviewing existing tools for structural assessment, identifying possible support from relevant government agencies for a pilot test on seismic retrofit in an urban poor community, and exploring feasible financing windows for the seismic retrofitting of houses.

Round Table Discussion on Housing Structures Assessment and Retrofitting Demonstration

On May 23, 2019 the Project Team conducted a round table discussion (RTD) attended by 24 participants. These representatives were from the Department of Science and Technology - Philippine Institute of Volcanology and Seismology (DOST-PHIVOLCS); the Social Housing Finance Corporation (SHFC), the government agency that provided financing assistance to the community to obtain security of tenure; six representatives from Non-Government Organizations to include a micro-financing institution, and representatives from the community association.

The Project Team presented the project background and opportunities it aims to address which were: 1) development of a structural? assessment tool applicable to housing conditions and typology in urban poor communities, (2) provision of technical assistance in coming up with practical and affordable seismic retrofit measures, (3) linking urban poor communities with technical experts, and (4) ensuring community participation in technical processes.

The issues/clarifications raised and responses provided by the RTD participants were as follows:

Comments/Issues Raised	Responses Provided
Ms. Sarah Redoblado of ALTERPLAN ▪ It is important to clarify/lay out the scope and limitations and context of the project, e.g. the community should already have security of land tenure (like CMP) ▪ The initial research was limited to the context or situation of Talanay HOA.	
Mr. Ishmael Narag of DOST-PHIVOLCS ▪ Our institution welcomes this kind of initiative. ▪ It is important to know the elements that make up the houses especially since those are non-engineered. ▪ Aside from the 12 point questionnaire of DOST-PHILVOLCS, he shared that there is also a software tool designed for engineers' use to assess housing structure. It is a free software and the office can guide/teach interested individuals on how to use it.	
Ms. Maricris Valte of KCDI ▪ We have a similar project in partnership with Build Change, but the scope is on a larger scale (whole community instead of a few structures). The security of tenure is also a requirement, and they should be updated with their amortizations. We also have savings program. ▪ She narrated that for some communities: "*Kung hindi pa lumindol ay hindi pa sasagi sa kanilang isip ang disaster. Hindi na pwede ang "hindi naman siguro" at "bahala na ang Diyos". Mahalaga rin na may parallel education. Kapag pinapakita ang 1991 or Bohol earthquake sa seminars ay natatakot na sila at gusto na nilang malaman ang dapat gawin.*"	
Ms. Kim Acupan of Build Change ▪ In our projects: We're trying to develop a digital documentation of the cost so we can monitor the cost of retrofitting, but it is still in the pilot testing stage. ▪ In terms of government subsidies, we have a partnership with the City of Makati. But these are all pilot projects, the challenge is how we can do this on a bigger scale. ▪ There are 3 points of concerns in these types of projects: accessibility of building permits, capacity to pay of the homeowners and savings mobilization, and marketability.	

Engr. Elsa Calimlim of SHFC ▪ "We are interested in the project, but I am not sure on what we can do. Maybe it can be applied into the house construction and site development loan". ▪ "So, what is expected on SHFC is financial assistance. What the group can do is write a proposal so we can discuss it with management. Submit proposals/plans, what is the project stage, and indicate what you want from SHFC". Mr. Christopher Salise ▪ "Beside the loans, we can also conduct capacity building activities and drills. Aside from the retrofitting issue, another concern is the community's lack of knowledge [when it comes to disaster preparedness], that's where we can help. We can tap competent government agencies [as resource speakers for trainings], and we can shoulder the cost of the trainings"	Ms. Maricel Genzola of FDUP -The project team can pilot-test retrofitting loan or assistance through the site development and house construction loan. We invited SHFC because we are considering/targeting you as a possible source of fund.
Mr. Ishmael of PHIVOLCS ▪ How will you validate if the structure was strengthened because of the retrofitting? It is important for those who will invest on the projects to see on how you will measure the strength of the structure. Arch. Arlene Lusterio of TAO Pilipinas ▪ The challenge for this is that the houses are non-engineered. There are no technical plans, we do not know exactly what the structure is made of. The challenge is to recall what are the materials used and how it was built. ▪ Because the way the structures were built might be different from one another, the retrofitting strategy/design for one structure may not be applicable to another structure. Mr. Benedict Balderrama of PHILSSA ▪ Although we are focused on the housing structures, we should consider a wholistic intervention, like financing schemes to complement the structural intervention, gathering the socio-economic data [of the households].	
Ms. Angelus Sales of TAO-Pilipinas ▪ It's difficult to get engineers to help in this project. That is why we invited Build Change because their engineering expertise for this kind of project is much needed. ▪ To the community: Some of the carpenters you hired to build your house may have drawings of your house. Retrieving those drawings will be helpful for the project.	

Next Steps from the RTD

- The community association will start to gather data on how the structures were built specially if there are still available drawings on how their structures were constructed.

- The representative from DOST- PHIVOLCS immediately right after the workshop conducted a visit to the community to do an initial assessment; he also welcomed the Project Team to visit the DOST- PHIVOLCS office to share with them the software assessment tool of structures that can be used by engineers and architects.

- The Project Team will also assist the community association in coordinating with SHFC to access the capacity building interventions for the conduct of earthquake drills at the community level.

- The community will also explore possible partnership with KASAGANA-KA, a micro-finance institution to assist the community members save up and eventually provide loans for the retrofitting of their structures.

- There is also a need for the Project Team to present this undertaking with the officials of Barangay Batasan Hills (specifically the Disaster Risk Reduction and Management Committee) and with the Disaster Risk Reduction and Management Office of Quezon City (DRRMO-QC).

Photos

Photo 1 Focus Group Discussion with the residents of Tinig at Lakas ng Naninirahan sa Talanay HOA

Photo 2 PCVA conducted by the Community Development students with the community residents

Photo 3 The participants for the roundtable discussion last May 2019

Integrating Disability-Inclusive Disaster Risk Reduction and Management in the Province of Cavite

Cavite State University (CvSU)

Brief Summary

The province of Cavite is generally susceptible to ground shaking. As the province prepares for the occurrence of "The Big One", a 7.2-magnitude earthquake which can result from the movement of the West Valley Fault, a hundred-kilometer fault that runs through Metro Manila and including some of the municipalities in Cavite, numerous efforts are being done by the province to prepare for the said earthquake. However, the involvement of vulnerable groups such as persons with disabilities in disaster risk reduction and management (DRRM) planning in the province remains weak.

Cavite State University (CvSU), through its College of Criminal Justice (CCJ), has initiated an extension project to integrate a disability-inclusive and gender-responsive DRRM in the province of Cavite. The conduct of consultative meetings, community needs assessment (CNA), and interviews were some of the initial steps taken to determine the extent of participation of vulnerable groups in DRRM planning and to assess their level of disaster preparedness. More than 200 persons were involved in the conduct of consultative meetings, CNA, and personal interviews, participated in by representatives from local and provincial government units of Cavite as well as representatives from the vulnerable groups.

The series of consultative meetings with the different sectors in the community led to public awareness on the importance of having a DRRM program which enables the participation of vulnerable populations. Results of CNA revealed that 77% of the persons with disabilities responded that they were not consulted by their local government units (LGUs) during DRRM planning. Likewise, 64% said that they are not part of their Barangay DRRM Committee. Personal interviews with DRRM officers also supported the fact that the involvement of vulnerable groups in DRRM planning in the province remains weak.

The conduct of consultative meetings, CNA, and personal interviews provided a clear picture on the presence of sectors at risk to disasters and their role in DRRM in Cavite. It opened the minds of LGU officials on the importance of a community-based and disability-inclusive DRRM.

The next steps to be taken will be to design a toolkit that will be used to train LGUs and first responders in responding to the needs of vulnerable groups, including persons with disabilities, elderly, children, and women, at the onset of disaster. In addition, modules will be developed to train LGUs in conducting disaster preparedness training specific to members of vulnerable sectors. Inclusive information, education, and communication (IEC) materials will also be developed to enable persons with disabilities (e.g. persons with visual impairment) to better access information and increase their awareness on disaster preparedness.

To ensure the sustainability of this intervention, the project team will strengthen community support, not only for the members of the vulnerable sectors, but to all members of the community. Additionally, policy briefs will be prepared to influence policy makers to support disability-inclusive DRRM, not only in Cavite but for the whole country.

Introduction

The Philippines ranks third in the 2017 World Risk Index of most disaster-prone countries in the world[1]. Annually, the country experiences different forms of natural and human-induced hazards such as typhoon, earthquakes, volcanic eruptions, flooding, landslides, fires and armed conflict. In 2013 alone, 16 disasters struck the Philippines. Two of the most destructive are the Bohol Earthquake and Typhoon Yolanda (International Name: Haiyan), which affected millions of people and claimed at least 8,000 lives.

While disasters threaten the life, health, and well-being of all people, some are disproportionately affected by the immediate and long-term effects of such events, especially persons with disabilities, elderly, children, and women. A 2013 survey by the United Nations Office for Disaster Risk Reduction (UNISDR) among 5,000 persons with disabilities in 137 countries revealed that, if a disaster occurs, 80% among them think that they would be unable to evacuate immediately without difficulty, while six percent (6%) said that they would not be able to evacuate at all[2]. However, despite an increasing worldwide focus on disaster risk reduction, most government agencies still fail to adequately include persons with disabilities, and other vulnerable groups in DRRM activities.

Disability inclusion has gained additional attention, especially since the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) has been signed and ratified by many countries in 2007. The Convention supports a "paradigm shift" in attitude and approaches, from viewing persons with disabilities as "objects" of charity, medical treatment, and social protection, towards recognizing them as "subjects" with rights, and who are capable of claiming those rights and making decisions for their lives, based on their free and informed consent, as well as being active members of society[3]. It is therefore vital to ensure that persons with disabilities are empowered to be active in all phases of community planning, most importantly in DRRM.

In the Philippines, about 16 per thousand of the country's population has disability[4]. Among the 17 regions of the country, Region IV-A has the highest recorded number of persons with disabilities at 193,000 in 2010. Cavite, one of the provinces that comprised Region IV-A, and the most populous province in the Philippines, has a total number of 29,521 persons with disabilities and 170,287 senior citizens in 2017[5].

The province of Cavite (Figure 1) has eight identified hydrometeorological and geological hazards: flooding, storm surge, rainfall-induced landslide, earthquake-induced landslide, ground shaking, liquefaction, tsunami, and ground rupture. The entire province, with a total of 125,756 hectares land area, is generally susceptible to ground shaking. The province is also preparing for the occurrence of "The Big One", a 7.2-magnitude earthquake which can result from the movement of the West Valley Fault, a hundred-kilometer fault that runs through six cities in Metro Manila and nearby provinces, including some of the municipalities in Cavite.

According to the Metropolitan Manila Earthquake Impact Reduction Study (MMEIRS), the said earthquake may result in the collapse of 170,000 residential houses and the death of 34,000 people. However, despite the numerous efforts done by the province to prepare for the said earthquake, the involvement of vulnerable sectors, such as persons with disabilities, in DRRM planning, remains weak.

In view of this, CvSU, through its College of Criminal Justice (CCJ), has initiated an extension project to integrate a disability-inclusive and gender-responsive DRRM in the province of Cavite. The conduct of consultative meetings, CNA, and interviews were some of the initial steps taken to determine the extent of participation of vulnerable sectors in DRRM planning, and to assess their level of disaster preparedness. Representatives from local and provincial government units of Cavite, including the Provincial Disaster Risk Reduction and Management Office (PDRRMO) and the League of Barangay Captains were involved in the said activities. Likewise, representatives from the vulnerable sectors such as Indang Association of Persons with Disabilities, Inc. (IAPWDI) and the Federation of Persons with Disability Associations-Cavite also took part in the series of consultations, assessments, and interviews.

Figure 1. Map of Cavite Province (Source: Wikipedia, April 2019)

Activity Implementation

In order to orient the community about the University's initiative to integrate disability-inclusive and gender-responsive DRRM in the province, a total of six consultative meetings with different stakeholders in the community were done from November 2017 to March 2019. The details of the extension project were presented to officers of various persons with disability associations and barangay officials (Figure 2-3). The importance of integrating a community-based, disability-inclusive, and gender-responsive disaster brigade in each barangay was also emphasized during the meeting. Project background, objectives, and target activities were discussed to the group. The group was also oriented on the project training modules which include: (1) Gender and Disaster Risk Reduction; (2) Personal and Safety Measures During Disasters; (3) Empowerment of the Community; (4) Community Disaster Committee Capacity Building; (5) Understanding Vulnerabilities and Capacity; and (6) Gender Sensitive Community Action Plan. Lastly, the roles and responsibilities of each member of the community in promoting inclusive DRRM were also given emphasis during the meeting.

To fully understand the needs and the level of disaster preparedness of those belonging to vulnerable sectors, a CNA was conducted among 75 respondents, consisting of persons with disabilities, elderly, and women (Figure 4). The Washington Group Short Set of Questions on Disability as well as Disaster Preparedness Questionnaire were included in the survey tool used. Respondents were also asked about their involvement in the DRRM programs of their barangay and their willingness to attend training and/or seminar on disaster preparedness.

Aside from the conduct of consultative meetings and CNA, personal interviews were also done. A total of six persons were interviewed to determine their perception on disability-inclusive and gender-responsive DRRM. Ms. Dianne Trinidad of the Cavite Office of Public Safety (PG-COPS) and Mr. Sherwin R. Ligoy, the Local Disaster Risk Reduction and Management Officer (LDRRMO) of the municipality of Indang were asked about their initiatives on DRRM and their opinion on inclusive DRRM. On the other hand, Mr. Raji M. Nicol, Mr. Florian H. De Borja, and Ms. Edna R. Masigla, officers of persons with disability groups were, asked about their level of inclusion in DRRM processes and structures in their respective barangays or town. Ms. Precyl T. Ramos, Social Welfare Officer III of the Provincial Social Welfare and Development Office-Cavite, was also interviewed about the province's initiatives to address the needs of vulnerable sectors in times of disaster.

Figure 2. Consultative meeting with the League of Barangay Captains in Indang, Cavite.

Figure 3. Consultative meeting with the League of Barangay Secretaries.

ngs with different sectors of the community resulted to public awareness
M program which promotes and enables the participation of vulnerable
the project team was able to solicit the commitment of LGUs and
ness to be part of the program to integrate a disability-inclusive and
spective barangays and town. The meeting also served as a platform to
regarding the implementation of the extension project.

The series of consultative meeti
on the importance of having a DRR
populations. During the meeting,
barangay officials on their willing
gender-responsive DRRM in their re
get feedback from the stakeholder

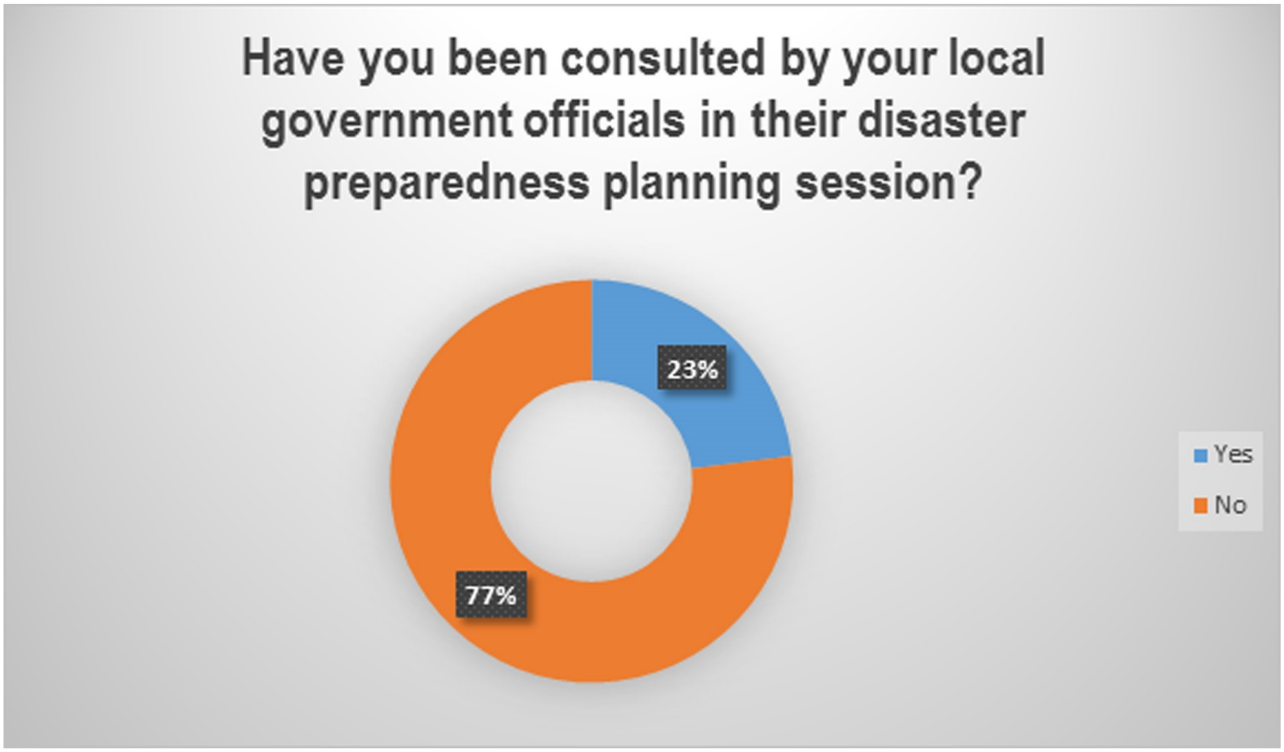

Figure 5. Responses (in percentage) on persons with disabilities' involvement in DRRM Planning

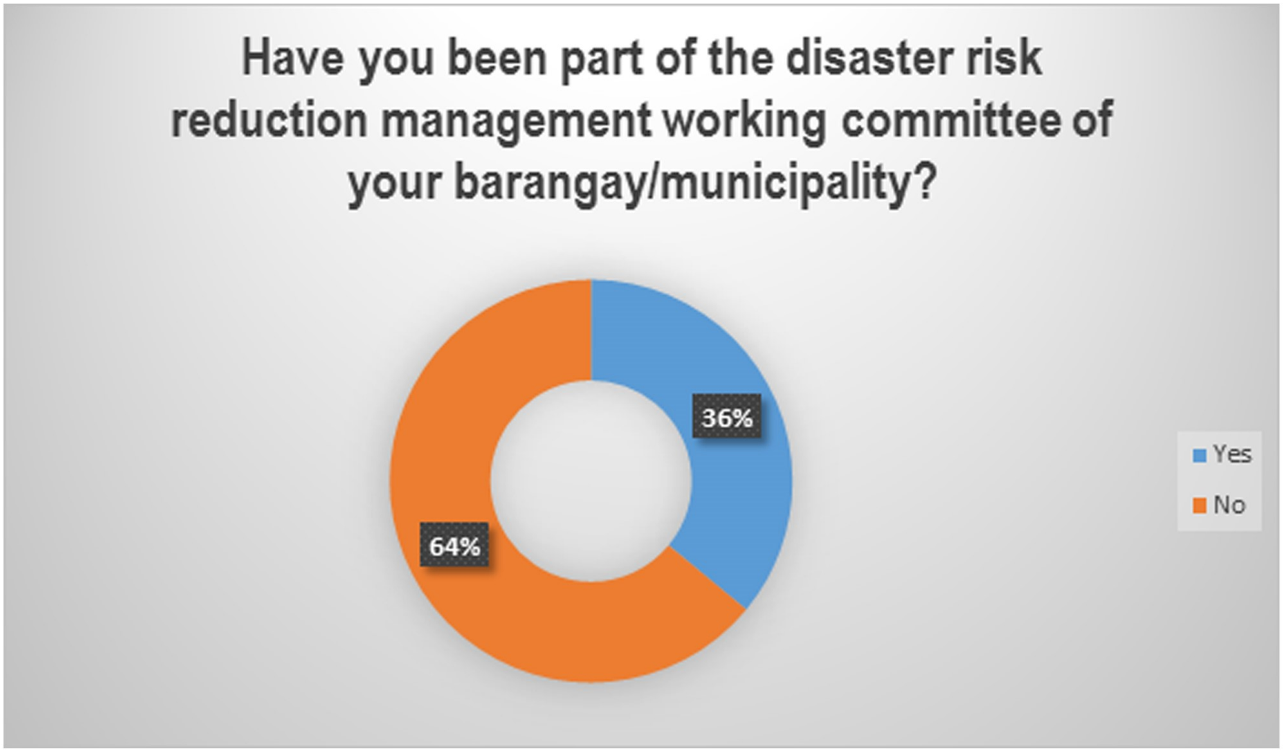

Figure 6. Responses (in percentage) on persons with disabilities' involvement in Barangay DRRM Committee

On the other hand, Mr. De Borja, president of Indang Persons with Disability Association, recounted a time when he was invited in a province-wide orientation on disaster preparedness for "The Big One". In this event, he noted that he was not consulted regarding the needs and challenges of persons with disabilities at the onset of a disaster. He remarked, *"No, in fact the closest thing I got to being consulted was to be asked about the total number of persons with disabilities in each barangay".*

Mr. De Borja also signified his willingness to be trained in disaster preparedness and to be part of a working committee, should their services be required.

Another sad story was heard from Ms. Masigla, a member of a persons with disability association and a wheelchair user. She shared an instance when while at work, she suddenly heard a fire alarm.

"I got so scared because I don't know how to evacuate myself from that building since I am in a wheelchair. My officemates were also rattled as they don't know how to help me. Luckily, it was just a false alarm."

The experience served as an eye opener for Ms. Masigla and her officemates to be better prepared in emergency situations, especially in ensuring the safety of persons with disabilities.

The conduct of consultative meetings, CNA, and personal interviews provided a clear picture on the presence of sectors who are at risk to disasters and their role in DRRM. It opened the minds of LGU officials on the importance of a community-based and disability-inclusive DRRM. All participants and respondents of the said activities, while only part of the initial phase, contributed significantly in the process of integrating a disability-inclusive DRRM in the Province of Cavite.

Conclusions and Recommendations

The result of the consultative meetings, CNA, and personal interviews emphasized the need to address the inadequate participation of vulnerable sectors in DRRM in the Province of Cavite. The results of these processes will serve as basis for the next steps towards fully integrating a disability-inclusive and gender-responsive DRRM in the province. Government officials and LGUs have signified their commitment to be part of the CvSU's initiative to address the needs and uphold the rights of the vulnerable population in DRRM. Similarly, those belonging to the vulnerable sectors: persons with disabilities, elderly, and women have also expressed their willingness to be trained in DRRM and have the opportunity to take part in the planning process.

The next steps shall assess the readiness and capacity of Cavite's first responders in disability-inclusive disaster response. This will be followed by the development of a toolkit which will help train LGUs and first responders in addressing the needs of persons with disabilities during emergency or disaster situations. Modules will also be developed to train LGUs in conducting disaster preparedness training specific to members of vulnerable sectors, including IEC materials that will enable persons with disabilities (e.g. persons with visual impairment, etc.) to better access information and increase their awareness on disaster preparedness. The project team will also take the next steps to strengthen the integration of gender-responsive DRRM in the province.

CvSU shall also collaborate with various institutions to develop innovative platforms to engage both first responders and vulnerable groups in DRRM activities. One of the proposed projects is to develop a mobile application intended to provide a step-by-step disaster preparedness guideline and simulation exercise platform for persons with disabilities. Another proposed project is the development of educational card games or board games that will promote awareness on disaster preparedness.

To ensure the sustainability of this intervention, the project team will strengthen community support, not only for the members of the vulnerable sectors, but to all members of the community. Additionally, policy briefs will be prepared to influence policy makers to support disability-inclusive DRRM, not only in Cavite, but in the whole country as well.

A regular project monitoring will also be done to ensure effectiveness of the strategies used in the project. Flexibility in the project implementation strategies will be maintained to adapt to the needs and challenges of the target stakeholders. Additional funding support will be acquired to continue the initiatives taken by the project.

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KAMALAYAN SA LINDOL plus KAHANDAAN (KASALI + HANDA)

Earthquake Awareness Towards Safety

(Sitio South Libis and North Libis, Brgy Banaba, San Mateo, Rizal)

Brief Summary of the Case Story

Social Work Intern, Sr. Clarynse of St. Joseph's College of Quezon City, interviews a mother in North Libis, Barabgay Banaba.

Amparo Doblada, one-time President of Buklod Tao, Inc. answers questions posed by Enumerator Rose Ann Marfil.

Rhomel Yale Frontuna, a seminarian from St. Vincent School of Theology, interviews a resident in North Libis, Barangay Banaba.

Philip Reducto interviews a respondent in North Libis, Barangay Banaba.

Initial formulation of questionnaire, Ka Noli and Sr.Clarynse.

The team, comprised of Buklod Tao and the Provincial Disaster Risk Reduction and Management Office (PDRRMO), has arrived to this realization - the need to divert a little from the original morbid concept of three thousand families will be injured in the event of a 7.2 magnitude earthquake. Such approach will only be reactive in nature. Therefore, it is necessary to educate and enlighten some three thousand families on the risk of earthquake and liquefaction, and ensure the safety of families in the communities of Banaba, Ampid 1, and Ampid 2 as well as similar areas with high vulnerability to liquefaction like the municipality of Daet in Camarines Norte. Our rationale and description of the current practice is that there are 3,000 families (and more families in Daet, Camarines Norte) now residing in areas that are highly susceptible to liquefaction which may be induced by strong earthquake, and people are not aware of that particular risk and have not undertaken any major mitigation measures in response to the risk.

In response to abovementioned, the team came up with an innovation measure relevant to participatory and community - based education package for liquefaction awareness and action. The team we envisions this potential impact: families in barangays Banaba, Ampid 1, and Ampid 2 as well as in Daet, Camarines Norte understand the risk, and mitigation measures are included in their disaster risk reduction and management (DRRM) planning processes. Among the key activities under this initiative are assessment, profiling, awareness raising seminars and trainings, risk identification, town watching, and participatory DRRM planning.

The awareness raising will go through the following process: (1) identify specific areas; (2) determine liquefaction hazard of identified areas; (3) research on historical earthquake with documented occurrence of liquefaction; (4) formulate a questionnaire relevant to the level of awareness of target audience based on the gathered information; and (5) design an awareness initiative based on their level of awareness. Some examples of awareness raising initiatives include developing a list of earthquakes accompanied by liquefaction, videos and pictures and practical demonstration. Additional interventions may include the type of houses or miniature house architecture, and determination of soil composition.

The value proposition is the assurance of families' safety through a community- driven measure. At the end of the undertaking, a communication channel in the local community for enhanced earthquake and liquefaction awareness is established.

In November 2018, a three-day workshop on Earthquake Preparedness and Resilience was organized by the Asian Disaster Reduction and Response Network (ADRRN), the Humanitarian Innovation Fund (HIF)-ERLHA[1] and the Center for Disaster Preparedness in Quezon City. Buklod Tao and the PDRRMO of Camarines Norte were among the participants and belonged to one of the eight (8) groups that presented their respective problem statement relevant to the 7.2 magnitude earthquake preparedness and resilience.

The problem statement of Buklod Tao and Camarines Norte PDRRMO representatives, namely, Noli Abinales and Joey Totanes, was, " 3,000 families, more or less, are highly exposed to large-scale damage to life and properties when a 7.2 Magnitude earthquake strike (also known as The Big One) because their houses are erected on an area that is at risk to liquefaction."

After a series of workshops on problem statement development and design, the dilemma metamorphosed to, "earthquake and liquefaction awareness is deemed necessary for 3,000 families, more or less, whose houses are located on top of a big swath of land that is identified as high potential to liquefaction."

Another workshop was conducted by the organizations mentioned earlier to identify solutions to the problem. Buklod Tao and Camarines Norte PDRRMO had two outputs, which include: (1) the **Social Business Model Canvass** of the proposed solution; and (2) a tool that maps out key points to develop early-stage ideas. The Social Business Model Canvass delineates on key resources, key activities, type of intervention, segments, value proposition, stakeholders, channels, beneficiary, customer, impact measures, customer value proposition, cost structures, surplus, and revenue.

Buklod Tao has coordinated with Ms. Joan Salcedo, Supervising Science Research Specialist of the Philippine Institute of Volcanology and Seismology (PHIVOLCS), to seek advice and guidance in relation to the conduct of an earthquake and liquefaction awareness initiative. The following recommendations were shared by the said expert: (1) identify specific area; (2) determine the potentiality to liquefaction hazard of identified area; (3) conduct research on historical earthquakes with documented occurrences of liquefaction; (4) based on the gathered information, formulate a questionnaire related to the level of awareness of target residents; and (5) based on the level of awareness, formulate awareness initiatives (e.g. list of earthquake accompanied by liquefaction; videos and pictures, and practical demonstrations).

The solution-seeking exercises led Buklod Tao and Camarines Norte PDRRMO to initially come up with a solution that is non-structural mitigation. Eventually the said solution evolved into structural mitigation to explore unsolved problems in earthquake resilience and response.

Thus, KAMALAYAN SA LINDOL plus KAHANDAAN (KASALI + HANDA) "EARTHQUAKE AWARENESS TOWARDS SAFETY" was thought of as the title of this case story. The group has identified a target area; determined liquefaction hazard of the same area; researched on historical earthquakes with documented occurrences of liquefaction; formulated a set of questionnaires (delving on knowledge, experiences, and beliefs of respondents); and interviewed 150 respondents and tabulated their answers. One of the key learnings is that PHIVOLCS maps are available and are already farmed out to the local government units (LGUs). Existing initiatives on earthquake and liquefaction awareness are very limited, therefore, module development is deemed necessary.

Introduction

The project area is at the juncture of a major river, the Marikina River, and a tributary, Nangka River. Nestled at the embankments are two *sitios*[2] – South Libis and North Libis. These two sitios have an estimated population of 5,000, comprising of 1,100 families who are mostly informal settlers living along the river banks. In addition to the said figure, there are 2,000 families, more or less, that extend to the areas of barangays Ampid 1 and 2.

These two rivers are highly silted, and therefore are easily swollen during continuous heavy downpour of rain. Residents along the aforementioned riverbanks are vulnerable to flood, and some houses are still semi-concrete. In the past, there were instances of soil erosion, which resulted in houses being swept away by the strong currents of the rivers. Congestion of houses is also a factor that contributes to the community's vulnerability to fire.

[1] ERLHA is the funding institution associated with the humanitarian innovation fund.
[2] Sitio refers to the smallest territorial subdivision of a community in the Philippines

Based on the information gathered from the Geology Geophysics Research and Development Division (GGRDD) of PHIVOLCS , Barangay Banaba, specifically sitios South Libis and North Libis and portions of barangays Ampid 1 and Ampid 2 are areas of high liquefaction potential per Red Code of PHIVOLCS' Liquefaction Potentiality Map. The annotation of this map says: 1.The map was based on the geology, earthquake source zone faults, historical accounts of liquefaction, geomorphology, and hydrology of the area. Preliminary micro tremor survey data was utilized to validate type of underlying materials...; 2. This map is semi-detailed and may be used for land use, emergency response and mitigation planning...; 3. Earthquake occurrences are characterized with Depth, Magnitude and Energy; 4. Features for liquefaction susceptibility of an area are: open space, flat, with shallow water table and soft soil.

Using an indigenous way of determining soil liquefaction through digging a hole to erect a bamboo pole, Buklod Tao has observed that sitios South Libis and North Libis are open space and have flat terrain characteristics with shallow water table measuring three (3) feet. Furthermore, the type of soil in the target area is soft.

To date, the activities carried out to successfully implement the initiative include: coordination with PHIVOLCS; risk profiling; focus group discussion with residence of North Libis; formulation of questionnaire for data gathering ; conduct of survey with residence of North and South Libis utilizing the formulated questionnaire; and tabulation of the respondents' answers. Among the organizations involved in the aforementioned activities are PHIVOLCS, Buklod Tao, St. Joseph's College of Quezon City, St. Vincent School of Theology, and Ateneo de Manila University. The implemented activities are intended to benefit families who are currently residing in areas that are highly susceptible to liquefaction in the event of a 7.2 magnitude earthquake.

Activity Implementation

On the matter of non-structural mitigation for earthquake-induced liquefaction, determining the level of awareness of the people inhabiting the at-risk area is paramount. Hence, a set of questionnaire was developed. Buklod Tao, together with two social work student interns from St. Joseph's College of Quezon City, initially formulated a set of thirteen questions dealing with knowledge, experiences, and beliefs of prospective respondents relative to earthquake and liquefaction. The output was presented to the Board of Trustees of Buklod Tao during its regular weekly Board meeting.

As agreed upon during the board meeting, the said set of questions was presented for editing and revision to PHIVOLCS. Subsequently, editing task resulted in revisions, like West Fault Line was changed to Valley Fault System. This was recommended for the questionnaire to be relevant and applicable in other parts of the country. Buklod Tao's translation of liquefaction in Filipino, "paglusaw ng lupa" was also changed to "pag-aastang mala-tubig ng lupa" and dovetailed "liquefaction" for an apt introduction of the English word to the interviewee; earthquake experiences of prospective respondent were given emphasis. In addition, Question #11, "Ako ay naniniwala sa sinasabing "The Big One" (I believe in "The Big One") was reformed to: "Narinig ko na ang "The Big One" (I have heard about "The Big One").

The revised set of questions was shared to seminarians from St. Vincent School of Theology in Quezon City. They offered to modify the set of questions, from three pages to a one-page interview tool. The tool was administered to 150 respondents comprised of men, women, youth, and older persons residing in sitios South Libis and North Libis. Buklod Tao officers and members led the interview sessions which lasted for two days. For tabulation purposes, the accomplished interview questionnaires were brought by Buklod Tao to Ateneo de Manila University. The postgraduate class of Dr. Emma Estenzo Porio for Disaster Risk and Resilience undertook the task of tabulating the responses gathered through risk profiling. Further activities were: focus group discussion; regular community visit; general assembly of Maligaya Neighborhood Association; and conduct of survey. The Camarines Norte PDRRMO contributed inputs to the formulation of the questionnaire while the Asian Preparedness Partnership and the Center for Disaster Preparedness provided funding and technical support.

Results/Outcome of the Activities

To succeed in the proposed initiative, Buklod Tao has engaged in various activities such as link aging with PHIVOLCS; coordinating with Soil Philippines Index Testing, Inc. (Soil Philippines) regarding soil analysis; risk profiling and focus group discussion; liaising with Coast Cities at Risk in the Philippines; and engaging two social work interns. Through coordination with PHIVOLCS, specifically the Earthquake Awareness Communications Division, Buklod Tao was able to talk with a Geologist from the, Geohazard Research Development Division; gain advice about key activities for awareness raising; and seek assistance in the revision of data gathering questionnaire. Moreover, relevant data on historical earthquakes with documented liquefaction occurrences were provided by the Seismology and Earthquake Prediction Division. Buklod Tao also attempted to collaborate with Soil Philippines for the purpose of soil investigation in the target areas in Barangay Banaba. Unfortunately, this did not materialize because of stringent steps and requirements, like project details.

The target area is a community prone to hazards such as floods, earthquakes, and even liquefaction due to its geographical location and the presence of rivers. It is composed of 345 families who belong to the Maligaya North Libis Neighborhood Association. To generate a risk profile, the interns interviewed 66 families. The risk profile was specifically used in the community of Maligaya North Libis to draw out meaning from the knowledge and experiences of people from the different disasters they have encountered. The risk profiling tool was patterned from Buklod Tao's tool. After the identification of threats, Buklod Tao gave comments on liquefaction, another threat that the community is exposed to. Buklod Tao emphasized the importance of preparedness but few stakeholders are aware of the danger, therefore, it was proposed to conduct a survey that will determine the level of awareness. The participants responded positively and expressed their willingness to help and assist in the endeavor. All were looking forward to the next activity related to disaster preparedness and safety.

Coastal Cities at Risk in the Philippines (CCaR) Investing in Climate Disaster Resilience is a non-government organization (NGO) based in Ateneo de Manila University. Buklod Tao became a member of this NGO through the invitation of Dr. Emma Estenzo Porio, CCaR Project Director. The overview states that "many low lying coastal , river-delta mega-cities are already stressed by rapid population growth, social, health and cultural challenges." Dr. Porio committed to Buklod Tao one session of her postgraduate class in Disaster Risk and Resilience to tabulate survey answers. Ten students did the tabulation efficiently.

Table 1. Summary of Survey Results on Earthquake and Liquefaction Awareness

Questions	Hindi	Oo
Q1 ang lindol ay isang bantang panganib (earthquake is a hazard)	0.7%	99.0%
Q2 alam ko kung ano ang Valley fault System (I know what Valley Fault System is)	16.2%	83.9%
Q3 Alam ko na may kaugnayan ang Valley fault System sa lindol(I know there is a link between Valley Fault System and earthquake)	16.2%	83.9%

Q4 Ang aming lugar ay malapit sa Valley fault System (Our area is near the Valley Fault System)	17.4%	82.6%
Q5 Umabot na sa aking kaalaman ang ulat….(The report has already reached my awareness)…	20.3%	79.7%
Q6 Alam ko na ang aking lugar ay mataas…(I know that our area is high risk to liquefaction)	18.9%	81.1%
Q7 Nakaranas na ako ng lindol (I already experienced an earthquake occurrence)	6.0%	94%
Q8		
Q9 May kamag-anak ako sa lalawigan na …. (I have relatives in the provinces that…)	26.8%	73.2%
Q10 Narinig ko na ang sinasabing "the Big One" (I have heard about "The Big One")	22.8%	77.2%
Q11 Ako ay naniniwala….. (I believe in the advisories of PHIVOLCS)	6.0%	94%
Q12 Naniniwala ka ba na maaaring mabawasan ang epekto ng lindol? (Do you believe that the effects /impacts of earthquakes could be reduced/mitigated?)	43.6%	56.4%

Several respondents have also shared their experiences on earthquake as follows:

Josephina Verbo: "Apektado ang flooring ng kabahayan" (The flooring of our house was affected by earthquake)
Viea Abanes: "Ako po ay nagpanic nang lumindol" (I panicked when an earthquake occurred)
Aida Sapine: "Sa Davao Oriental, ako ay nakaranas ng malakas na uga ng lupa" (In Davao Oriental, I experienced strong ground shaking)
Melanie Manlangit: "Hindi ako nakatrabaho agad"(I was not able get back to work I immediately)
Leon Gacrama: "Ako ay may pangamba at takot, at nag-aalala s mga mahal sa buhay" (I had fears and apprehensions, and I am worried about my loved ones)

Buklod Tao wishes to cite the overwhelming willingness of all stakeholders from the government, academe, and civil society organizations to do their part despite the short notice. Going very well beyond expectations were the social preparations at the grassroots in the form of risk profiling, focus group discussions, and the actual survey involving 150 respondents. What did not go well was the attempt to bolster evidence-based liquefaction awareness through soil analysis. Corporate requirements and high cost of soil boring and analysis prevented this pursuit. The attempt to undertake indigenous practice for liquefaction determination did not merit applause nor commendation from experts.

Conclusions & Recommendations

Sufficient evidences were gathered from the exercise that vulnerable people are willing to cooperate and be informed for their family's safety. Publications about risks remain in the shelves of offices. Papers do not speak and do not reach out to the warm bodies of vulnerable people. Disaster preparedness is not the sole responsibility of technocrats. Community workers have a fundamental role to play as well in preparing communities for any hazards and threats. Resources should be made available at the grassroots. The vulnerable sectors remain exposed to disaster risks. Complacency is the name of the game. It is necessary to break the temptation to complacency and support the culture of *bayanihan*[3] at the grassroots even without government accreditation. Awareness raising on earthquake and liquefaction should lead towards the safety of vulnerable families in terms of structures. Buklod Tao is eager to work with groups pushing for structural mitigation (e.g. reinforcement of foundation of houses, installation of metal braces of post houses) in preparation for 'The Big One'.

Soil analysis done at the very eyes of liquefaction – prone area residents is an excellent eye-opener for the vulnerable people. It would be helpful if corporations simplify their requirements and practice corporate social responsibility effectively. Buklod Tao has observed an on-going work in the Marikina River, fronting the red coded liquefaction-prone area in sitios South and North Libis, per PHIVOLCS liquefaction potentiality map. The flow of Marikina River is being diverted to the center portion; concreting of the river embankments is currently done; steel poles are being erected; and a large volume of top soil is dumped to make the remaining water disappear from everyone's sight. As noticed by Buklod Tao, a signboard showing the information of the on-going project was not installed. Buklod Tao is curious to know whether construction authorities of the said initiative have taken into consideration the liquefaction hazard map of PHIVOLCS. It is also keen to know whether appropriate engineering considerations are being applied by the construction authorities to prevent river collapse from happening when 'The Big One' strikes.

Indeed "The Big One" lurks in the offing, yet there are human-made initiatives going on in the community like the aforementioned which could aggravate disaster risks. There ought to be a counter-balancing between risk taking and ethical considerations like social preparations, non-structural /structural mitigation, DRRM planning, and advocacy to government agencies and local government units. This case story brings to the fore the safety dictum and customer value proposition: "Communication channel to local communities for enhanced liquefaction awareness.

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Result of Tabulation of Survey Results (HTTP://tinyURL.com/BTsurvey)
Social Work Internship Report of Sr. Claryns about Risk Profiling in North Libis, Banaba
Social Work Internship Report of Crismelia Ann Abines about focused group discussion in North Libis, Baragay Banaba

[3] Bayanihan refers to spirit of volunteerism and community cooperation

Maps & Cards for Humanity

Philippine Geographical Society (PGS)

Summary

"Maps&Cards for Humanity" is the product of a collaboration between the Philippine Geographical Society (PGS) and the Prodjx Artist Community (Prod Jx). It is a series of community-based activities that attempts to bridge the gap between vulnerable sectors of society and disaster risk reduction (DRR) planning, incorporating an element of fun and games while ensuring that the voices of the most marginalized are heard and recognized by duty-bearers. This case story focuses on the conceptualization, development, and pilot testing of one specific component of "Maps&Cards for Humanity", which is an interactive card game designed to instill knowledge and awareness about DRR, to facilitate meaningful discussion, to foster camaraderie and unity, and to provide valuable input to disaster risk reduction and management (DRRM) planning in communities.

For more information about this project, please contact Dr. Jake Rom Cadag via jdcadag@up.edu.ph.

The Convening Initiative on "Innovation for Earthquake Resilience and Response" aims to bring together actors from civil society, academe, government, and private sector to explore innovations to address problems in earthquake resilience and response in the Greater Metro Manila Area. Organized by the Enhancing Learning and Research for Humanitarian Assistance's (ELHRA) Humanitarian Innovation Fund (HIF) in partnership with the Asian Disaster Reduction and Response Network (ADRRN) and the Center for Disaster Preparedness (CDP), workshops were held in November 2018 and February and March 2019 to help partners conceptualize, develop, and pilot their innovations.

"Maps&Cards for Humanity" is a unique product of this initiative, pooling together the expertise of geographers from PGS and artists from Prod Jx. Its primary aim is to increase the resilience of earthquake-prone communities through a participatory, inclusive, and community-based card game and mapping activity that will result in effective, relevant, and timely disaster risk reduction and management (DRRM) planning. At the same time, it will serve as an appealing medium to transfer and level-off on knowledge and understanding on disaster preparedness and response while building a sense of ownership and camaraderie among community members.

Context and Rationale

According to an assessment of PGS and Prod Jx, hazard and risk information are not socially inclusive as they do not cater to the needs of the most vulnerable sectors in the community. Hence, many vulnerable sectors such as women, children, persons with disabilities, and senior citizens become invisible and are not able to participate in the planning and implementation process. In fact, the hazard and risk maps used do not sufficiently reflect their situations because they are too generic, one-size-fits-all, and not localized at the community level. In general, hazard and risk mapping becomes a tedious and technical process for communities, delegated to technical experts and planning officials who often are not able to capture the

[1] https://www.gmanetwork.com/news/news/nation/357322/ndrrmc-yolanda-death-toll-hits-6-300-mark-nearly-6-months-after-typhoon/story/

the realities and needs of vulnerable sectors in the communities. Therefore, one of the feasible solutions to these problems is to engage the marginalized sectors in the planning process through participatory and community-based risk assessment and mapping (e.g. participatory three-dimensional/ two-dimensional (3D/ 2D) that is gamified and more interactive. Hence, Maps&Cards for Humanity was born.

What's New?

Research has shown that game-initiated learning is recognized as a teaching method with great potential in teaching disaster management and in raising awareness among various audiences . It has been particularly useful in engaging and motivating people to facilitate the transfer of knowledge . Inherently, experiential games allow participants to experience complex situations, test strategies without real consequences, and bring together people who otherwise do not interact with one another . As a group of authors posit, "gaming, as a learning approach, seems particularly relevant in the context of understanding the challenges and complexities involved in coping with natural hazards and increasing resilience ."

The creation and use of interactive games to spark interest and to educate the general public about disaster preparedness, response, and mitigation is not a new idea in the Philippine setting. Francis Gasgonia developed the "Civil Defense: The Strategic Humanitarian Crisis Board Game and CRU Survival Deck" as educational materials for team-building exercises and youth/adults . For Local Government Units (LGUs) and the academe, there is the University of the Philippines' Marine Science Institute (UP-MSI) and Balangay Entertainment's "Resilience: Survive and Thrive." In addition, there have been many government and civil society initiatives in engaging the youth and children through this medium, including the following:

- Asia Society for Social Improvement and Sustainable Transformation's (ASSIST) "Master of Disaster" board game[9];
- Tulong Kabataan Volunteers Network-Ilocos' "Disaster Preparedness and Response Interactive Game App";
- Plot and Play's 3D board game called "Foresight"[10] ; and
- National Anti-Poverty Commission Youth and Students Council's "Disaster Risk Reduction Board Game."[11]

What sets "Maps&Cards for Humanity" apart from these similar efforts is that it integrates social inclusion and community ownership in the process of DRRM planning. Unlike traditional games that end without much impact, "Maps&Cards for Humanity" brings it further by providing valuable input from marginalized sectors while educating them and translating them into actual plans and action.

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Key Components

In the original concept development, "Maps&Cards for Humanity" consists of four major components:

Figure 1. Steps in Maps&Cards For Humanity

This case story focuses on the conceptualization, development, and pilot testing of Step 2 (Maps&Cards for Humanity). The guidelines for Step 1, 3, and 4 are available in separate publications online.

Step 1. Conduct Participatory 3D Mapping (P3DM) or any community-based mapping

Designed to take around two to three days, the Participatory 3D Mapping (P3DM) enlists the participation of people from vulnerable sectors and other stakeholders of DRR. It is led and facilitated by an expert on mapping and the output is a three-dimensional map of the community. Participatory three-dimensional modelling (P3DM) is a participatory mapping method that integrates local spatial knowledge with data on land and sea elevation to produce stand-alone and scaled community maps made of local materials[12].

According to Gaillard and Cadag (2013)[13], "P3DM fosters the participation of a large array of stakeholders and the integration of local and scientific knowledge as well as bottom-up and top-down actions in DRR". It is built upon the principle that sustainable disaster risk reduction (DRR) should be a process that integrates local and scientific knowledge and collaboration between community stakeholders. Communities and different sectors, including the vulnerable sectors, become an important resource in the process as they are the most affected by disasters and are often at the frontline. Their knowledge and perception of natural hazards and their own vulnerabilities and capacities become useful when integrated with maps. Maps can serve as powerful instruments to emphasize this knowledge and increase DRR awareness because they are able to give visual expression to realities on the ground. Yet unlike highly detailed and scientifically-accurate hazard maps produced by scientists, P3DM is devoid of technical jargon and is culturally embedded while reflecting local needs and resources. Depending on the capacities and needs of the community, P3DM can take on different forms from ground or stone mapping to GIS mapping.

[12] Barrot, J. (2016). Participatory 3-Dimensional Modelling: Guiding Principles and Applications. Retrieved from https://www.weadapt.org/knowledge-base/community-based-adaptation/participatory-3-dimensional-modelling

Figure 1. Children participate in a P3DM session last September 2018 (PGS, 2018)

Step 2. Develop a card game

A group of artists brainstormed and conceptualized a card game that would build upon the concept and gameplay of Cards Against Humanity and Jenga. Ideally, the game is estimated to last about one hour and is designed to be self-guided and community-led. A DRR expert or authority from the community will serve two purposes: as a facilitator of the game and as a facilitator of the discussion/dialogue afterwards that will help deepen the participants understanding of disaster. As of this time of writing, the content of the game is based on resources from Handicap International (2014) and the International Federation of Red Cross and Red Crescent Societies (2015) and is limited with issues and concerns regarding Persons with Disabilities (PWDs) within the DRR context. Literature and guidelines on other sectors have yet to be integrated.

Gameplay. The goal of the game is for the group to build a resilient structure through collaborative work. Before the game, there must be an identified person in the group who will serve as a facilitator. Preferably, he/she should be part of the community/LGU that has some knowledge and authority about DRR so that he/she can maintain objectivity and neutrality in the game. Once he/she is identified, it is his/her role to read a question or fill-in-the-blank phrases on the question deck of cards and will not join the other players in dealing out answers to the questions.

To start the game, each player randomly draws a set of five (5) white cards from the answer deck that can contain phrases or words from any of the following categories: nouns (people or objects), verbs, and adjectives. They are also given a few blocks. The facilitator draws a yellow card from the question deck and reads the question out loud. The other players answer the question or fill-in-the-blanks by passing one answer card to the Facilitator. Once all cards are in, the facilitator reads aloud the answers and each player must justify their answer. All the players whose answers are deemed acceptable to the facilitator are allowed to use one (1) jenga block to create a structure in the middle of the table, one by one. All players whose answers are not accepted by the facilitator are not allowed to add to the building and should remove any one (1) piece from the structure being built. After one round, the facilitator sets aside the question and the given answers for later discussion and processing. There are a few questions that will allow players to directly interact with their local/community map and to generate ideas on specific interventions based on the questions and their answers.

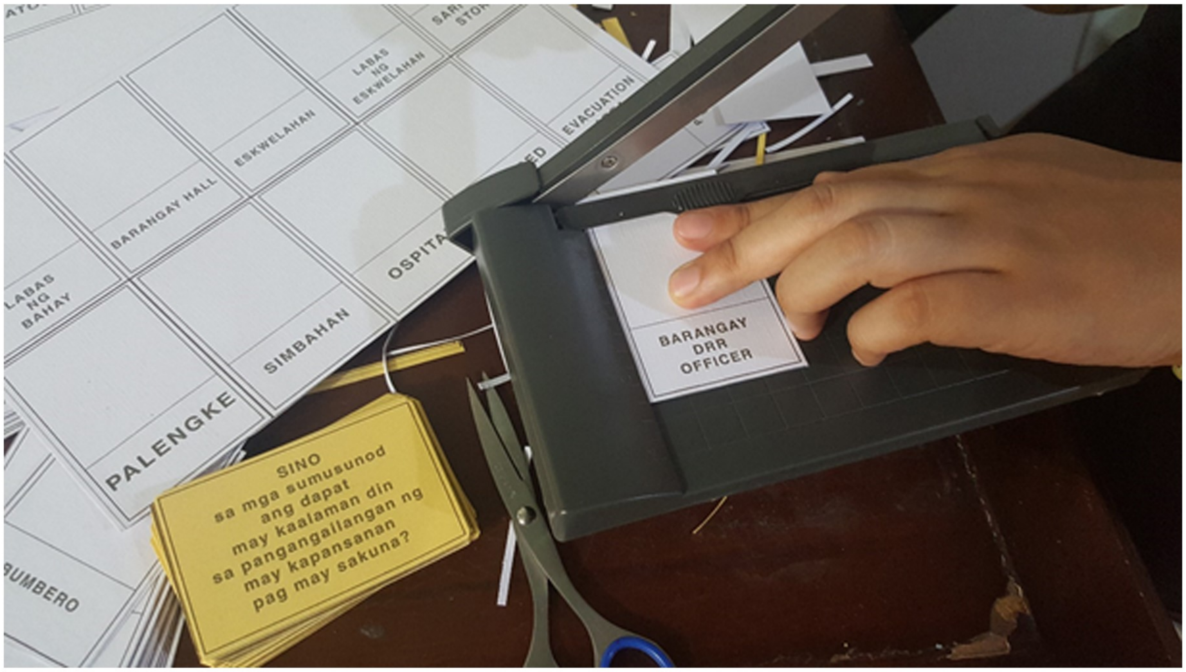

Figure 2. Sample question and answer cards in production (PRODJX, 2019)

All active players have the flexibility to decide on how they will build their community structure. There are no specific rules on how it will look like and how they will build it as long as it follows the following criteria: (i) it has reached a certain height (e.g. ten inches) and (ii) it must be resilient and can withstand any "disaster" that may befall it.

After time is up and the community structure is in place, the facilitator will then process key concepts, ideas, and observations based on the answers and reactions of all the players. The aim of the dialogue is to level off on the understanding and knowledge of the participants on DRR and to draw out unique insights about themselves and the community in relation to disaster.

The outputs are a needs and situational analysis and a script for performance activities for the next component. The overall objective of the game is to help players survive and help others to survive by building a resilient structure through collaborative work and to foster a conducive environment for dialogue between vulnerable sectors and other community members.

Step 3. Perform a theater play

The fifteen to thirty-minute theater play will take the form of a "Playback performance", a combination of rehearsed and improvised scenes. This activity aims to draw out, tell, share, and perform the stories from the community based on their discussion during the mapping and card game, and also re-create possible scenarios and actions to be taken when an earthquake happens. It also allows the connection between the individual and the collective in different ways[14]: it connects the personal stories to the collective narrative while reinforcing community cohesiveness and ownership. The actors of the theater play will depend on the context of the community. They can be led and performed by community theater members, students, and/or youth or facilitated and interpreted by a theater group outside of the community.

Step 4. DRRM Planning

This activity will include local officials and other stakeholders who are directly involved in planning. The input and results from the previous activities will feed into the local DRRM plan with a focus on vulnerable sectors.

[14] Ramos, I.R. (2014). Storytelling, Agency and Community-building through Playback Theatre in Palestine. Retrieved from https://www.researchgate.net/publication/268213954

The figure below illustrates the process and outputs of the activities:

Figure 2. Process and Outputs

P3DM Mapping	Cards For Humanity	Theater Performance	DRRM Planning
• 3D Map	• Situational Needs Analysis • Script	• Theater play	• DRRM Plan

Timeline and Development

The PGS/PRODJX team attended the three-part workshop of the Convening Initiative on "Innovation for Earthquake Resilience and Response". The first two workshops, held from November 27 to 29, 2018 and from February 19 to 21, 2019 in Quezon City, were designed to lead the team through a process of understanding the problem and developing "Maps&Cards for Humanity" as a potential solution. After the third workshop held from March 19 to 21, 2019, the mechanics of the gameplay, card development, and polishing of the process and components were conducted and finalized in the last week of March and in the first week of April 2019.

Figure 3. The team tries out a prototype of the Cards for Humanity game before pilot testing it in the community (PGS-PRODJX, 2019)

Pilot Testing in the Community

The objective of the pilot testing of the map and card game is to gather baseline data from the target community with a focus on how community members, particularly those from vulnerable sectors, accepted and owned the process and products intended by "Maps&Cards For Humanity."

The pilot testing was conducted in Barangay Sto. Nino, located in San Mateo, Rizal. A total of eight (8) participants tested the gameplay and mechanics of the Cards for Humanity game, including one (1) Person with Disability /Senior Citizen, one (1) youth, and one (1) pregnant and lactating mother. It is important to note the lack of male representation, particularly among fathers in the community, mainly due to work, and the absence of senior citizens in the activity.

Figure 3. The team tries out a prototype of the Cards for Humanity game before pilot testing it in the community (PGSFigure 4. Community members from Barangay Sto. Nino test the Cards For Humanity game (PGS-PRODJX, 2019)-PRODJX, 2019)

The total running time for the pilot test was forty nine (49) minutes and fifty five (55) seconds, with around thirty (30) minutes for the game proper and fifteen (15) minutes for feedbacking and processing from the participants. The component of players' justifying their answers during gameplay was removed to test its feasibility and impact on the gameplay. In addition, the interactive questions related to the P3DM map were set aside for piloting at another time because of the unavailability of a local map during pilot testing.

Sample Gameplay

Sample questions and answers that came out during the game are as follows:

A. *Ano ang pwedeng maitulong ng isang may kapansanan sa panahon ng emergency* (What can a person with disability do to help in times of emergency)?

The participants laid down the following cards:
- *Magte-text sa mga kamag anak* (Cellphone texting/messaging relatives)
- *Tumawag ng pulis* (Call the police)
- *Makipagkwentuhan sa iba* (Talking to others)
- *Siguraduhing kayang puntahan ng lahat ang evacuation area* (Make sure everyone goes to the evacuation center)
- *Lubid* (Rope)
- *Ruta papunta sa evacuation center* (Routes going to the evacuation center)

Each player tried to explain the rationale behind his/her answer, with some being able to convince the facilitator that it is relevant and valid. For example, the player who answered "Route going to the evacuation center" justified that persons with disabilities can inform others where the evacuation centers are. Some answers elicited laughter from the group, such as "Talking to others" because it culturally meant gossip, but the player who answered it was able to justify that it can be part of information dissemination in the community.

B. *Ano ang mahalaga para sa mga taong may kapansanan* (What is important for persons with disabilities)?

Answers from the group were:
- *Pagkakaroon ng tamang impormasyon* (Having the right kind of information)
- *Alamin ang kakayanan ng mga persons with disabilities* (Knowing the capacities of persons with disabilities)
- *Alamin ang pangangailangan ng mga persons with disabilities sa panahon ng emergency* (Knowing the needs of persons with disabilities during emergencies)
- *Pera* (Money)
- *Hanapin ang mga kamag-anak* (Finding their relatives)
- *Magti-text* (Texting)
- *Partisipasyon* (Participation)
- *Doktor* (Doctor)

C. Sino ang mga dapat bahagi ng DRR planning (Who should be part of DRR planning)?

Persons identified were the following:
- Barangay DRR Officer
- DRR Officer
- Mayor
- Barangay Kagawad (Councilor)
- Barangay Kapitan (Captain)

One participant appeared to understand that her answer, "DRR Officer", is directly-related to the question but softly said, "Ano ito (What's this)?," pertaining to the term "DRR".

Feedback and Key Observations

Recommendations and Insights from Community Members

When asked how they felt about the game, a participant suggested that the game allow each player to explain and justify their answers, which is consistent with the team's observation that it is inherently natural for the participants to defend the answers they choose even if the initial rule was that they should not. Other participants agreed, adding that the discussion will help add to their knowledge and understanding of what to do during disasters.

The element of physically building a structure also fostered a sense of appreciation of collaboration among the group, with one participant saying that its strength and resilience lies in how they help one another: *"Ang pinaka-matibay kung nagtutulungan. Pag nagtatayo ng building, nagtutulungan tayo kaya matibay yung building* (It is strong if we help one another. If we build, we help each other that's why its foundation is strong)." The youth participant was open to the idea of using blocks of different shapes versus blocks of one size to add to the challenge of building the structure. He also added that it may be a good idea to allow two groups to play simultaneously to introduce some competition to the equation, as he felt that it would add even more excitement and meaning to an otherwise boring educational activity on DRR. *"Sa pagtatayo ng blocks, meron pong connection sa isa't isa parang meron tayong pagkakaisa.* (In building up the blocks, there is a connection with one another so that we have unity)." Lastly, one participant also shared that the method is more effective than traditional teaching because concepts and ideas are better absorbed.

Figure 5. Mothers enjoy the game as they contemplate which answer to give (PGS-PRODJX, 2019)

The content is also something that increased the participants' awareness on the needs and concerns of the persons with disabilities, which were the main focus of the game. One participant – who is a person with disability herself and is the head of the Person With Disabilities Association in the barangay – expressed her gratefulness that the game highlighted their capacities: *"Dapat naka-ready na ang lahat ng tao, tapos hindi katuwiran yung may kapansanan siya na hindi niya kaya tumulong sa kapwa. May mga paraan kasi kung anong dapat niyang gawin...para nare-realize nila na di porke't may kapansanan ay di siya makakatulong.* (All people should be ready, and disability is not a reason to not help other people. There are ways of doing...so they realize that their disability is not a hindrance to helping others)."

Other suggestions from the participants to further improve the game are the following:
- A physical demonstration of what to do during disasters;
- Inclusion of children with adults in the game for collaborative learning and sharing; and
- Inclusion of senior citizens.

Key Observations

One important observation to note is that the designated facilitator may have the tendency to dominate the discussion and/or decide for other players (e.g. removing a jenga block when it should be the player's prerogative, saying where to put the jenga blocks). An emphasis and a reminder on allowing other community members to decide on their own and to speak their mind throughout the game may reduce this tendency. It is also important to encourage participants to speak up if there are terminologies or phrases that they do not understand (e.g. "DRR") so as to deepen their understanding while fostering trust and camaraderie through sharing. Lastly, the use of both illustrations and texts are helpful; illustrations can help participants who are non-literate understand the answer although the assumption is that participants with disability have no visual impairments. The feasibility and gameplay among other persons with disabilities with different needs and capabilities have yet to be tested.

Figure 6. A child tests the "resilience" of the structure at the end of the game through an "earthquake" or a simple shaking of the table (PGS-PRODJX, 2019)

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"BIG ONE" Handa Ka Na Ba?

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Summary

The purpose of this study is to develop a case story highlighting community consultation to address the key gap in a post-earthquake contingency plan. Specifically, to determine the level of earthquake preparedness of family, school officials, teachers, students, and community. The Makati educators for humanitarian innovations used a descriptive research technique and approved validation to get the optimum result, the questionnaire used in this study was adapted from Enclosure No.4 to DepEd Order No.7, s. 2015.

The study was conducted in order to address the key gap in the earthquake preparedness of the existing contingency plan among schools and community. It was observed during earthquake drill conducted specifically in Pitogo High School that after the drill the students are advised to go back to their room and continue their lesson in the classroom, neither the school disaster coordinator nor the teachers discussed what to be done in case real earthquake happens. What was discussed to the students was the time they spent in evacuating and some observations in the duck, cover and hold.

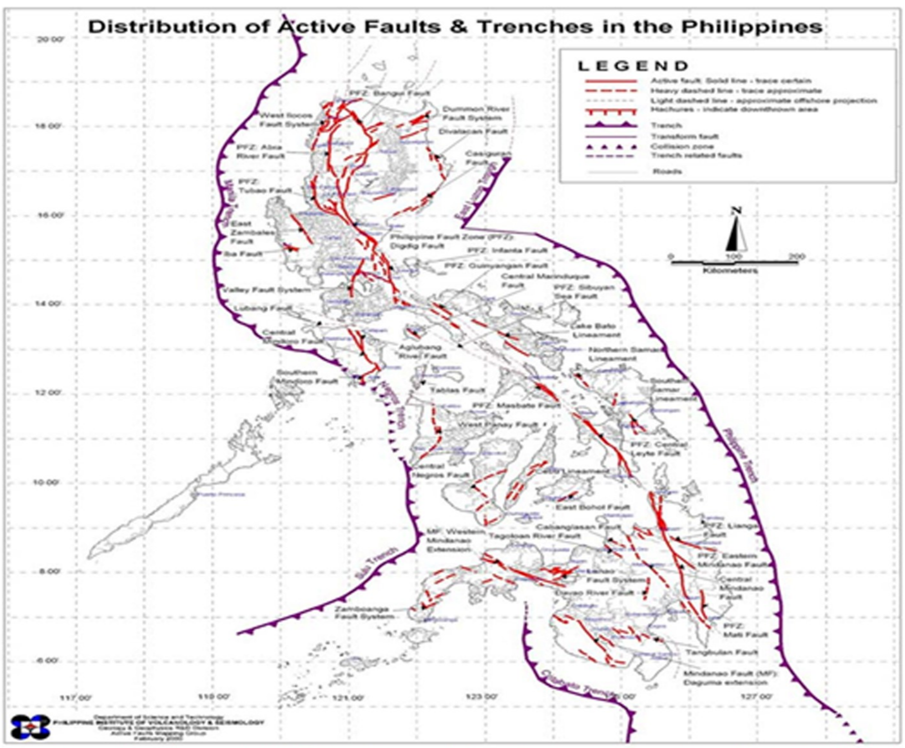
There were things not included in the earthquake drill, like what to do during and after an earthquake. Based on the result of the survey as well as the response in the interview conducted to the school disaster risk reduction coordinator of Pitogo High School, Division of Makati disaster risk reduction coordinator and barangay Captain of Pitogo, Makati City, It was learned that there was no linkage between the school and the community's contingency plan. Most of the respondent in the survey are not ready before, during and after an occurrence of an earthquake, some are confused and others had no idea. This random survey showed the reality that most of the people are not ready, and some are not so much concerned about what would happen if an earthquake occurs. This became a problem and the school is so much vulnerable to confusion and chaos most especially when a real earthquake happen. The problem on parents in panic to fetch their children, or someone will fetch the children who are not familiar to the teachers. No other mechanism that the school would use to identify those individuals showing up to get particular students. If it is not possible that parents or their relatives would get the children, and it is not safe for the children to go home due to debris and other potential risk and had to keep them in the school evacuation area. School contingency plan on this event should be given emphasis and make the school ready to accommodate them for at least three days.

The study achieved a notable result, bringing the school and community to work together towards a common goal of saving lives through educating parents, students, teachers and the local government official identifying their own preparation and sync it with all the plans of the school and the local government units. It is very interesting to note that the barangay officials were very happy and showed a positive outlook on the effort of the researchers. Based on the percentage of the responses that most of the respondents showed a not ready outlook on earthquake preparedness. This is one thing that this research would like to address. To reach out more if not all people in the community to be very ready for an earthquake. Capacity building on earthquake preparedness to parents, teachers and students is recommended. Stronger partnership among school, parents, and local government unit must be established for more effective implementation of earthquake preparedness plan.

Introduction

Earthquake is one of the most devastating natural calamities here on earth. It usually occurs where the fault line is located. Philippines is very prone to earthquakes because it is located in the Pacific Ring of Fire. On July 16, 1990, the Luzon was striked by a 7.8 magnitude earthquakes with the Intensity IX experienced by the people in Baguio City, Dagupan City, and some parts of Rizal. The Epicenter of the said earthquake was in the Philippine Fault-Digdig Fault system. Another Magnitude 7.2 earthquake strikes Bohol in October 2013 The quake's depth of focus was 33 kilometers, and was of tectonic origin, the Philippine Institute of Volcanology and Seismology (Phivolcs) said in its initial report. The quake was followed by 110 aftershocks, Phivolcs director Renato Solidum said in a press conference at the NDRRMC. Solidum said more damage can be expected in the areas closest to the quake's epicenter, specifically in Bohol and Cebu (rapler.com, 2013).

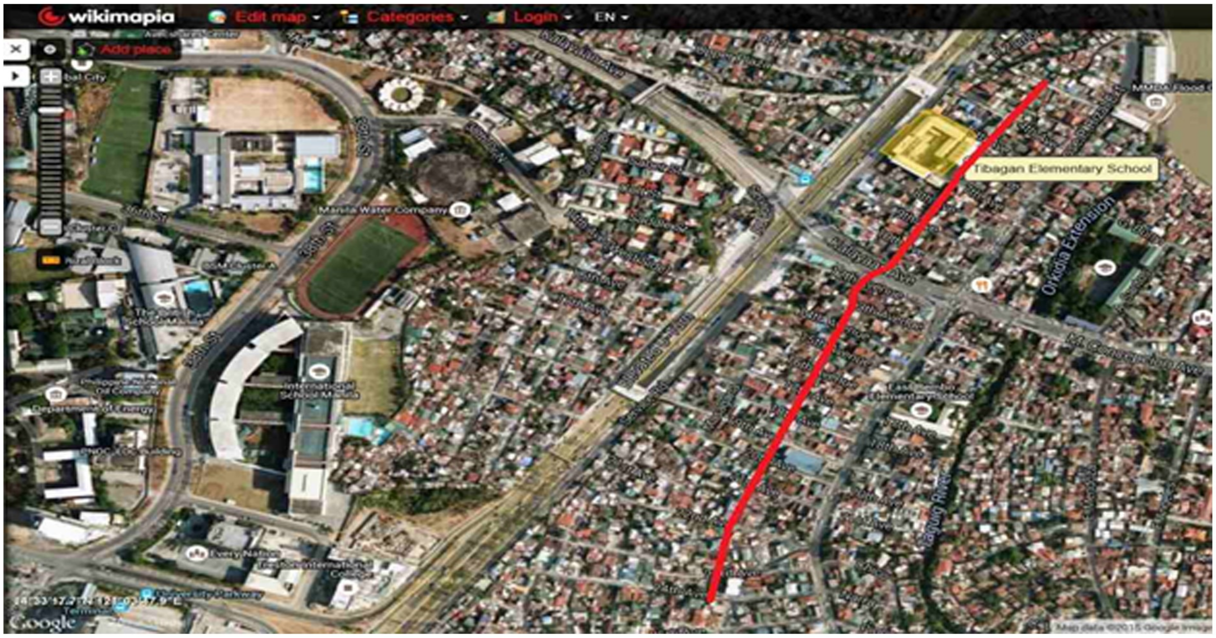
Recently a magnitude 5.6 quake first struck at 3:07 pm, off Mabini, Batangas. The first quake was then followed by a magnitude of 6.0 tremor at 3:09 pm, also in the same area. It was triggered by an unnamed fault in the Mabini. In Metro Manila, the West Valley fault is also an active fault line which extends to Makati City.



https://newsbits.mb.com.ph/2017/05/21/map-of-the-philippine-fault-lines/May 22, 2017, 2:44 PM

Figure 1. The Distribution of Fault line in the Philippines

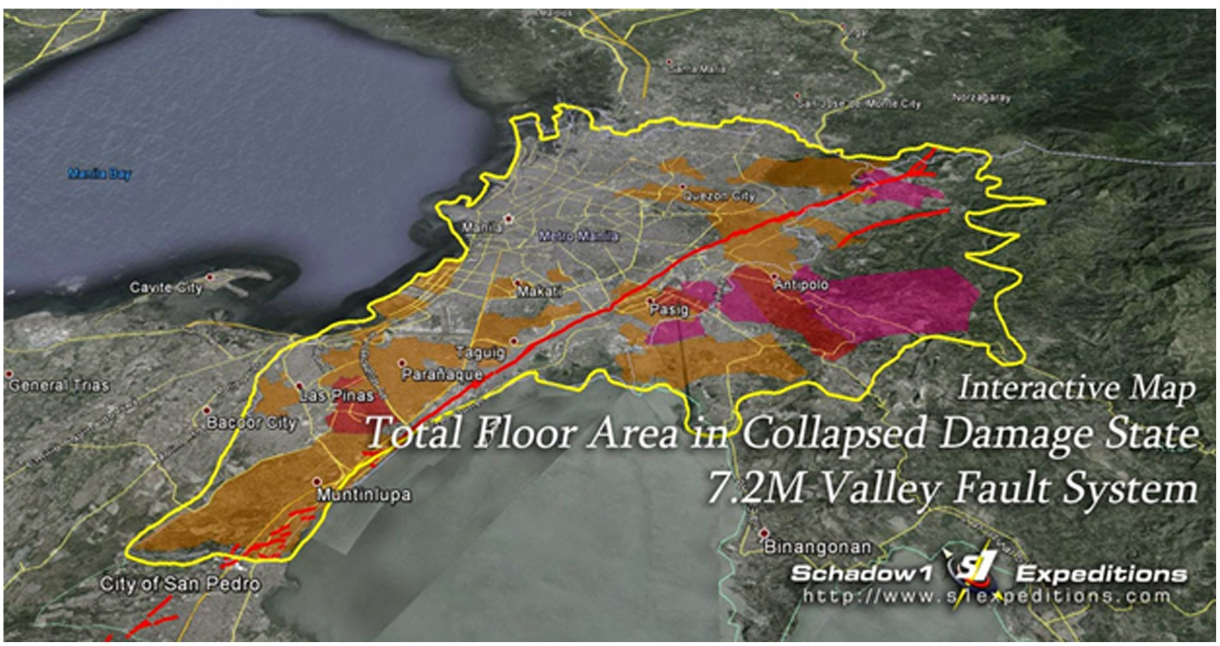
An approximated 3.63 kilometers segment of the West Valley Fault (WVF) is traversing the six barangays of Makati City namely, West Rembo, East Rembo, Comembo, Pembo, Rizal and Post Proper Southside. Among these barangays, East Rembo has the longest fault with approximately 1.07 kilometers while Comembo obtained the shortest fault trace of 0.16 kilometer. All barangays that are located along the fault are likely to experience landslide during the earthquake and heavy rains.



http://www.iweb.ph/west-valley-fault-in-makati-city-part-6 June 13, 2015

Figure 2. Active West Valley Fault line intersecting the different barangay of Makati City.

The data on ground shaking hazard in Makati is based on the assumption that the West Valley Fault will generate a 7.2 magnitude earthquake, the worst case scenario as presented in the MMEIRS (2004). When this scenario happens, the whole Makati will experience a very high level of ground shaking with Intensity VII to Intensity VIII based on the Philippine Institute of Volcanology and Seismology (PHIVOLCS) Earthquake Intensity Scale (PEIS).



https://www.s1expeditions.com/2015/05/192-valley-fault-system-risk-map.html May 20, 2015

Figure 3. Shows the total floor area in collapsed damage state during BIG ONE.

Earthquakes can cause fires by damaging electrical power or gas lines. In the event of gas pipes rupturing and loss of pressure, it may also become difficult to stop the spread of a fire once it has started. In Makati, the possible fire spread will occur in heavily built-up areas (e.g. residential area). It could start from a spark in power and gas line or other flammable facilities that are damaged during the earthquake like what happened in Kobe, Japan during the 1995 Great Hanshin earthquakes.

Known as the Financial Center of the Philippines, Makati houses many financial institutions, corporate headquarters, and shopping complexes. However, Commercial use is not the major land use in the City. Based on the Comprehensive Land Use Plan 2000 to 2010 adopted in 2001, almost one third (34.97 percent) of the total land area of Makati is Residential use, making it the major land use of the City. Makati has 51,367 structures with a building density of 19 structures per hectare. These buildings are predominantly residential hence, more lives are at stake when earthquakes occur.
Makati has around 38 public schools distributed in different barangays. There are about ten public high schools, one of which is the Pitogo High School. Pitogo High School is one the school which is near a fault line.

The Republic Act (RA) 10121 otherwise known as the Philippine Disaster Risk Reduction and Management Act of 2010, mandated all government agencies to institutionalize policies, structures, coordination mechanisms and programs with continuing budget appropriation on Disaster Risk Reduction and Management (DRRM) from the national to local levels. Moreover, RA 9155 known as Governance of Basic Education Act of 2001 vested the Department of Education (DepEd) with the authority, accountability, and responsibility to ensure access to basic education which is often disrupted by emergencies and disaster. The Department of Education implemented the Disaster Risk Reduction Management program to all schools in the Philippines. (DO.37,s2015)

In the DepEd order No. 27,s 2015 also known as Promoting Family Earthquake Preparedness instruct all elementary and secondary schools to conduct family preparedness homework. The result will be presented to the Parents-Teachers Association (PTA) and barangay officials for consideration in the school and community preparedness planning. The guidelines support the DepEd Order No. 21, s. 2015 otherwise known as Disaster Risk Reduction and Management Coordination and information Management Protocol, which seek to engage different education stakeholders, especially learners and their families in disaster prevention and preparedness.
All these DepEd Order were cascade from the DepEd Central to the different Division Office of the City/Municipality down to the different schools for implementation. But unfortunately, there were no written guidelines or protocols about School and Family Earthquake Preparedness Plan as mentioned by our School DRRM Coordinator which was confirmed by the Division DRRM Coordinator.

The main purpose of this study was to develop a case story highlighting community consultation to address the key gap in the post-earthquake contingency plan. Specifically, it aims to determine the earthquake preparedness of the parents, students, and teachers using a survey questionnaire and to conduct an interview with the different stakeholders for their earthquake contingency plan.

Activity Implementation

The study was conducted at Pitogo High School, located at Negros Street, Barangay Pitogo, Makati City. Pitogo High School is one of the ten (10) secondary schools and one of the biggest secondary schools in the Division of Makati with a population of approximately 4 100 enrollees for the School Year 2018-2019. Currently, there are a total of 150 employees (teaching and non-teaching staff).

https://en.wikipedia.org/wiki/Makati April 23, 2019

Figure 4. Map of Makati City

This study will use purposive sampling which is based on the easy availability and accessibility of the participants. A sampling technique used was random sampling composed of 100 students, 40 teachers, and 50 parents of Pitogo High School available to the researcher. An interview was also conducted to the Barangay Captain of Pitogo, the School Disaster Risk Reduction Management Coordinator and the Division Disaster Risk Reduction Management Coordinator.

There were two (2) materials used to gather information from the community. The first group of respondents are the 40 teachers, 50 parents, and 100 students who answered the Earthquake Family Preparedness Questionnaire adapted from Enclosure No.4 to DepEd Order No.7, s. 2015.

The questionnaire aims to determine the level of Family Earthquake Preparedness of the different stakeholders, especially learners and their families in disaster prevention and preparedness. Using a scale of 1 – 5 with 1 being the lowest and 5 being the highest, the respondents will describe their level of preparedness before, during, and after earthquake & initial shaking.

The second group of the respondent is Engineer Nemesio Alvior, Pitogo Barangay Captain; Mr. Darren James T. Baylosis, Division Disaster Risk Reduction Management Coordinator and Mr. Ramonito Sambo, School Disaster Risk Reduction Management Coordinator were interviewed by the researchers to know the different guidelines and protocols implemented in their respective area. The community is engaged in an informal interview to gauge their understanding and preparedness before, during, and post-earthquake readiness. All the valuable information gathered in the survey and interviews will be used in developing a more progressive and proactive approach and protocols that the community will use to strengthen existing policies and disaster preparedness programs of the local and national government. Likewise, empowering everyone in the community as well as educating them with the right mindset in earthquake preparation will surely give them a better chance to survive and maybe at one point will help rescuers help other victims that need immediate attention and help. Cascading a capacity building to the community is one way that could help them face the challenge and threat of a disastrous earthquake. This is in partnership with the different government agencies, local government units, Dep-Ed, academe, and CSOs.

According to chapter II section 16 of Republic Act 7160 known as the Local Government Act of 1991 which states that; "Every local government unit shall exercise the powers necessary, appropriate, or incidental for its efficient and effective governance, and those which are essential to the promotion of the general welfare. Within their respective territorial jurisdictions, local government units shall ensure and support, among other things, the preservation and enrichment of culture, promote health and safety, enhance the right of the people to a balanced ecology, encourage and support development of appropriate and self-reliant scientific and technological capabilities, improve public morals, enhance economic prosperity and social justice, promote full employment among their residents, maintain peace and order, and preserve the comfort and convenience of their inhabitants. The responsibility of making people in the community safe during calamities like earthquake lies heavily on the mandate of the local government officials together with CSOs who will provide an additional contribution to disaster preparedness thru different activities.

Figure 5. Interview with Darren James T. Baylosis, Division Disaster Risk Reduction Management Coordinator; Marvin Ragasa and Erma A. Ragasa, Humanitarian Innovators March 27, 2019.

Figure 6. Engineer Nemesio Alvior, Barangay Captain Pitogo, Makati City March 28, 2019

Figure 7. Interview with Barangay Captain Engineer Nemesio Alvior March 28, 2019

Figure 8. Teacher participants in the survey with the Principal and School Disaster Risk Reduction Management Coordinator Pitogo High School March 29, 2019.

Figure 9 .100 student's respondents were taken from this grade 10 completers.

Results/Outcomes of the Activities

The researchers started the study by identifying the problems after an earthquake. It seems that there is a gap between the school's earthquake preparedness plan, and every family's earthquake preparedness plan that should be in conjunction with the barangay/community disaster risk reduction management plan. According to some volunteer students rescue team of Makati, when the Big One occurs, they are going to rescue other people 24 hours after the earthquake strikes because they also are considered victims of earthquake and they need to secure firsts their family.

While, The National Civil Defense (implementing arm of National Risk Reduction Management Council) mentioned in one of the Seminar of the Center for Disaster Preparedness that the rescuer will be mobilized three days after the occurrence of an earthquake. So what will happen to students and other people from 10 minutes to 72 hours without help from rescuers and other government uniform personnel? Who will help them? Is there any contingency plan of the school and the family in times like this?

According to Mr. Ramonito Sambo, School's Disaster Risk Reduction Management Coordinator of Pitogo High School, there were no written guidelines or protocols on how to bring the students back to their parents safely after an earthquake. This was confirmed by the Division Disaster Risk Reduction Management Coordinator. Although they floated all DepEd Order and Memos for school implementation. Such memo was the DepEd Order No.7, s. 2015

Earthquake Family Preparedness was not implemented at the school level. But the school implemented and participated in the Earthquake Drill, this will make students aware with what to do during an earthquake. After an earthquake drill, students are instructed to go back to the classroom and continue with their lesson. What is missing in the drill was the proper guidelines of identifying parents/guardian's identity in fetching their child to the school especially, when everyone is in panic. So a School and Family earthquake preparedness plan is important.

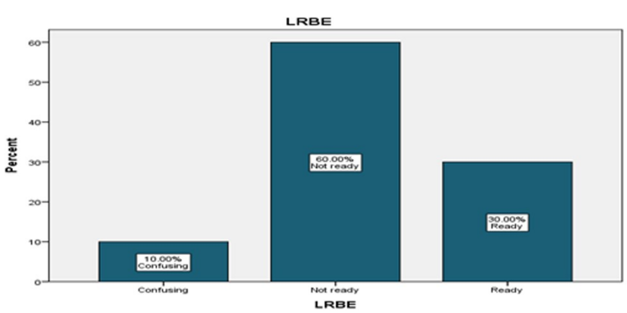
The researchers conducted a survey on Family Earthquake Preparedness before, during and after an earthquake. The study identifies the degree of preparedness using five-point Likert scale ranging from very ready, ready, not ready, confusing and no idea.

An interview conducted to the Barangay Captain of Pitogo Engineer Nemesio Alvior, discussed the contingency plan of barangay Pitogo. According to him when the Big one comes, the private vacant lot beside the school will serve as the evacuation area since the barangay do not have vacant space for the evacuation. They also cascaded community earthquake and evacuation drill that remind the stakeholders within the barangay of what to do in an emergency situation. This is also one of the key agenda discussed during Ugnayan (meeting with the Barangay Officials). He also tapped the help of all Tricycle Operators and Drivers Association (TricycleToda) within the barangay to serve as an alternative ambulance in case government ambulance is not accessible during earthquake and other calamity related emergency.

The Following are the results of Family Earthquake Preparedness of Parents

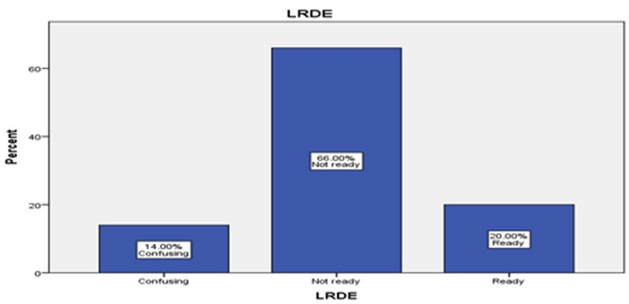
Legend:

*LRBE = Level of Readiness BEFORE Earthquake *LRDE = Level of Readiness DURING Earthquake
*LRPE = Level of Readiness AFTER Earthquake



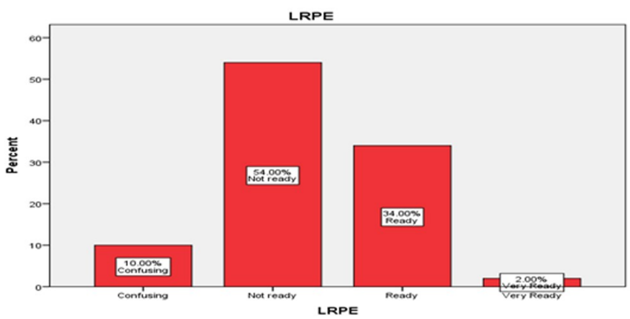
Graph 1. Parents Level of Family Earthquake Preparedness

Graph 1 shows the frequency and percentage distribution of the of the parents respondents on Family Preparedness before an Earthquake. Sixty (60%) among them are not ready while ten (10%) are confuse. Only thirty (30%) of the parents respondents are ready before an earthquake.



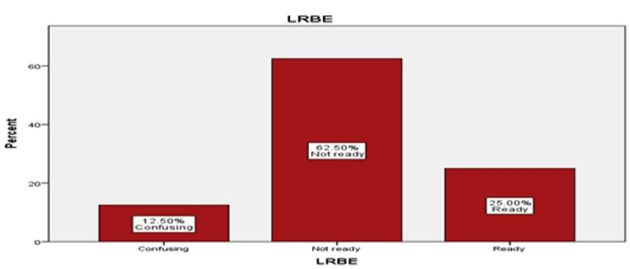
Graph 2. Parent's Family Preparedness During Earthquake

Graph 2 presents the family preparedness during an earthquake. It showed that the 66% of the parents are not ready during an earthquake. Fourteen (14%) are confused while the number of parents who are ready decrease to 20%.



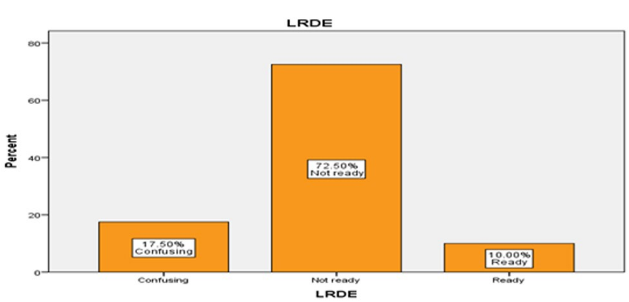
Graph 3. Parent's Family Preparedness on Post-Earthquake

Graph 3 shows parents family preparedness after an earthquake. It can be said that the number of parents not ready after an earthquake decreases to 54% while the number of parents ready after an earthquake increases to 34% while 2% are very ready after an earthquake.



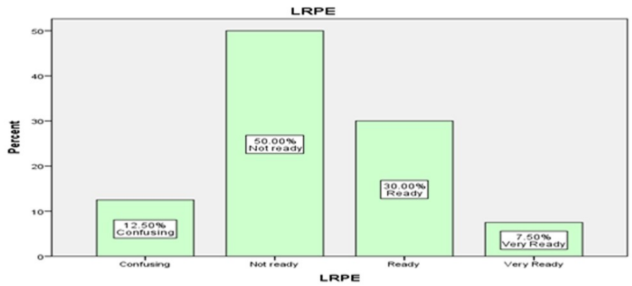
Graph 4. Teachers' Level of Family Preparedness before Earthquake

Graph 4 presents Teachers' Family Preparedness before Earthquake. It appeared that 62% of the teachers' respondents are not ready before an earthquake. Twelve (12%) are confused and 26% considered ready before an earthquake.



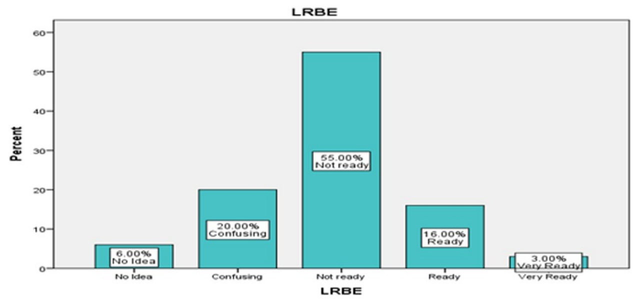
Graph 5. Teachers' Level of Family Preparedness during Earthquake

Graph 5 illustrates the teachers' level of family preparedness during an earthquake. It shows that 72.5% are not ready while 17.5% are confused. The no. of parents ready during an earthquake is only 10%.



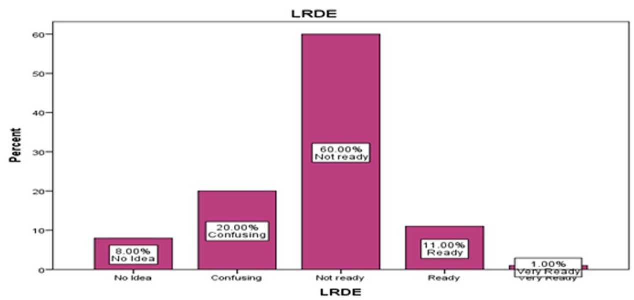
Graph 6. Teachers' Level Family Preparedness on Post-Earthquake

Graph 6 shows that 50% of the parents are not yet ready after an earthquake while 12.5% are confused. On the other hand 30% are ready and 7.5% are very ready after an earthquake.



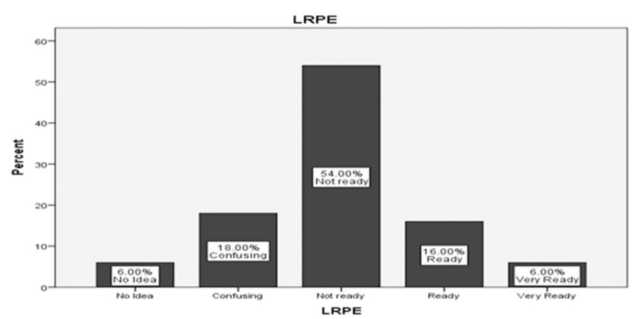
Graph 7. Students Level of Family Preparedness Before Earthquake

The graph 7 shows the students' response to family preparedness before an earthquake. Fifty five (55%) are not ready, 20% are confused and there are 6% who do not have idea of what to do before an earthquake. Only sixteen (16%) of the students are ready and 3% of the student respondents are very ready in terms of family earthquake preparedness before an earthquake.



Graph 8. Students' Level of Family Preparedness During Earthquake

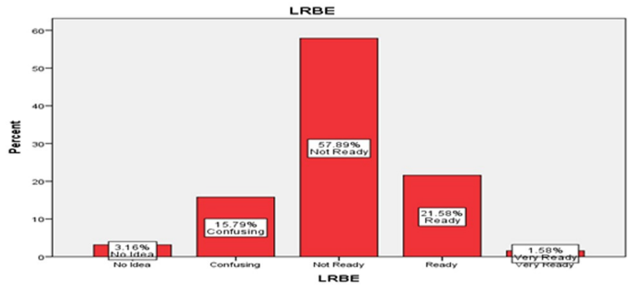
Graph 8 shows that 60% of the student respondents is not ready. Followed by 20% confused and 8% with no idea. Only 1% is very ready and 11% ready.



Graph 9. Students' Level of Preparedness in Post – Earthquake

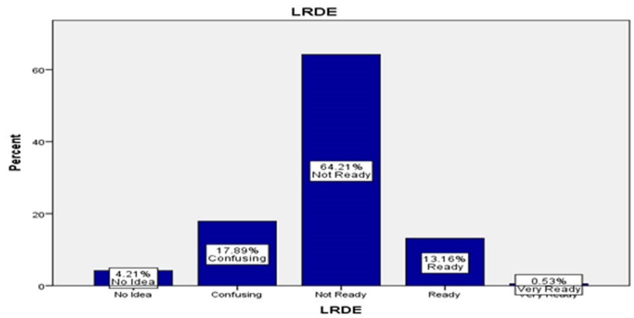
Graph 9 shows 6% of the students have no idea about their family preparedness after an earthquake, while 18% are confused and most of them are not yet ready with 54%. The very ready increases to 6% and 16% are ready.

Level of Earthquake Preparedness Combined (students, parents and teachers)



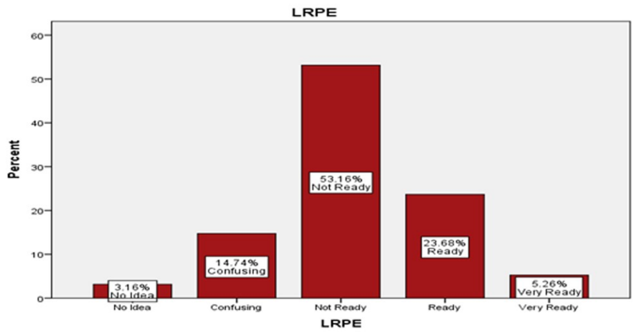
Graph 10. Level of Family Preparedness Before Earthquake combined

Based on the combined responses of the selected parents, teachers and student respondents, the result of the survey in the readiness before earthquake in which 57.89 percent of the total respondents think that they are not ready for an earthquake. 21.5 percent of them think they are ready. 1.58 percent are very ready for an earthquake. While 15.79 percent think, they are confused on what to do before earthquake and 3.16 percent say that they do not have any idea on what to do before earthquake occurs.



Graph 11. Level of Family Preparedness during Earthquake combined

Graph 11 shows the level of readiness during earthquake the result states that 64.21 percent think that they are not ready during earthquake occurrence. 13.16 percent think that they are ready. 0.53 percent think they are very ready. While 17.89 percent think that they are, confuse to what to do during earthquake, and 4.21 percent had no idea on what to do during earthquake.



Graph 12: Level of Family Preparedness during Earthquake ombined

Graph 12 shows the post-earthquake readiness of the respondents 53.16 percent think they are not ready on what to do in post-earthquake occurrence, 23.68 percent think that they are ready for a post-earthquake, 5.26 percent very ready on a post-earthquake, 14.74 percent still confuse on what to do a post-earthquake, while 3.16 percent had still no idea on what to do on a post-earthquake

Conclusion & Recommendation

Conclusion

Earthquake Family Preparedness is a very important consideration in the school and community preparedness planning. Different DepEd Orders were cascaded from the DepEd Central to the different Division Offices down to the schools to ensure safety and engage different education stakeholders, especially learners and their families in disaster prevention and preparedness (DO No. 21, s. 2015).

Based on the above-mentioned findings the following conclusions are provided. The Department of Education provided the Comprehensive Disaster Risk Reduction and Management (DRRM) in Education Framework (DepEd Order No.37 s. 2015) to institutionalize DRRM structures, system, protocols and practices in DepEd offices and schools.

The Division Disaster Risk Reduction Management Coordinator implemented the different DepEd Orders and provided different activities to ensure disaster preparedness of all schools in Makati. But there were no written guidelines and protocols in terms of Family Earthquake Preparedness which was confirmed by our School Disaster Risk Reduction Management Coordinator. The school's contingency plan for reuniting students and parents after the 7.2 earthquakes were not properly addressed, or there are no guidelines for family reunification. The problem on parents in a panic to fetch their children, or someone will fetch the children who are not familiar to the teachers, and there was no other mechanism that the school uses to identify those individuals showing up to get particular students. If it is not possible that parents or their relatives would get the children, then it is not safe for the children to go home due to debris and other potential risk and had to keep them in the school evacuation area.

The result of the family earthquake preparedness survey among teachers, parents, and students are very alarming because most of them are not ready when the BIG ONE comes, while there are still respondents who do not have any idea of their family earthquake plan. Less than 5% are very ready despite the effort of the Local Government Unit and Barangay officials to educate people and other stakeholders within the community about earthquake preparedness.

Recommendation

The findings of this study may help contribute to the development of a protocol that will be used in Pitogo High School, the community, and later to all schools in the entire Division of Makati. A strong partnership between the school, local government agencies, and the community will greatly improve earthquake preparedness among all stakeholders. Provide an opportunity for all community to actively participate in the planning and designing policies and even protocols that is universal and understood by all.

Practice the proposed protocol for deeper evaluation and to find out potential weaknesses and to give room for improvement. Cascade activities like capacity building among the stakeholder in full partnership with the main actors. Share the best practices that were developed with other cities to give them a better option or to use it as an augmentation to their existing policies and protocols and even learn from each other's experiences. The more data and information that you could get, the better the preparations are, for the expected "Big One". As Benjamin Franklin once said,"By failing to prepare, you are preparing to fail". Another quote by Randy Pausch "Another way to be prepared is to think negatively. Yes, I'm a great optimist. But, when trying to make a decision, I often think of the worst case scenario. I call it 'the eaten by wolves factor'. If I do something, what's the most terrible thing that could happen? Would I be eaten by wolves? One thing that makes it possible to be an optimist, is if you have a contingency plan for when all breaks lose. There are a lot of things I don't worry about because I have a plan in place if they do.

References

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