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Disaster Risk Reduction Management in the City of Mandaluyong: Focus on Earthquake Impact Reduction

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ABSTRACT
Disaster is an occurrence focused in space, in which a society or one of its subdivisions undergoes physical destruction and social disruptions, such that all or some essential functions of the society or subdivision are impaired. The study was undertaken to assess the current state of prepapredness of the City of Mandaluyong in the event of a major earthquake. Purposive sampling was used in selecting the respondents, 8 city heads and 21 barangay chairmen/representatives from the City. Descriptive survey research method and personal interview were utilized. The modified instrument used to gather data was drawn from the MMEIRS "Disaster Mitigation Capability Assessment Matrix". Results of the study reveal that the City of Mandaluyong is prepared for a major earthquake. Six, out of the eight (8) items of preparedness, were perceived to be the strengths namely: legal framework, vulnerability assessment, DRRM plans, institutional/organizational structures, community awareness, and disaster response. Results show that preparedness of the City of Mandaluyong is weak in terms of private-public partnership and recovery/rehabilitation. Statistical analysis shows no significant difference in the groups' perception on legal framework, DRRM plans, and disaster response. The study concludes that although a legal framework was provided for, the existing mandate is only an executive order issued by the mayor, and not an ordinance enacted by the City Council. Also, the reluctance of the private sector to participate in the research effort may be an indicative of a general inclination not to disclose any information. Thus, the study recommends that the city government should pass and ordinance complying with RA 10121. Public-Private Sector partnership can be strengthened. Further research on DRRM not limited to the likehood of an earthquake may be conducted, inviting the invovement of private business organization.
Key words: Disaster Risk Reduction Management (DRRM), Earthquake, and Impact Reduction

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INTRODUCTION

Global and local developments in the 21st century have influenced the undertaking of this study. Globally, almost all regions of the world have been increasingly at risk, or vulnerable to natural (and man-made) cataclysms. The Indian Ocean tsunami in December 2004 and the Fukushima earthquake and tsunami in 2011, Hurricane Katrina which ravaged the Mississippi delta in 2005 and more recently Hurricane Sandy which inundated the New York environs in 2012 are very well documented and by now common knowledge. The world is increasingly at risk due to the effects of climate change and extreme weather. Thus, global summits such as that at Hyogo, Japan and regional ASEAN meetings have emphasized the need for disaster risk reduction [7]. The Philippines, which is located in the so-called Pacific "ring of fire" is vulnerable to the occurrence of tropical cyclones (typhoons) and floods, earthquake and tsunami, volcanic eruptions, landslides and the like. Of all the natural disasters that the Philippines have experienced all through its history, earthquakes pose the greatest risk to the life, property, and economy. The earthquake that hit Bohol just this 2013 is a grim reminder of the great human suffering this disaster caused.

In the local scene, a JICA-funded project entitled "Metropolitan Manila Earthquake Impact Reduction Study" (MMEIRS) [13] was undertaken between 2002 and 2004 to assess Metro Manila's vulnerability to a major earthquake. Since Metro Manila is the frontline city of the Philippines, and the center of the government, financial, commercial, and social activities, the impact of a large earthquake will greatly affect the nation. The JICA funded project MMEIRS created a damage scenario in the event that the West Valley Fault (Marikina Fault) triggers a 7.2 intensity earthquake. The estimated results in damages are: 170,000 heavily damaged or collapsed (13% of total) residential buildings; 340,000 moderately damaged (26% of total) residential buildings; 10,000 liquefaction-affected buildings alongside Manila Bay; 8-10% heavily damaged or collapsed hospital, school, firefighting, police and government buildings; 34,000 dead from pressure of

collapsed buildings; 110,000 with non-life threatening injuries; and 500 fire outbreaks, among other statistics [13].

MMEIRS was a serious call for preparedness, exhortin g the local authorities to plan for any eventuality. The study provided for a period of eight years (2004 to 2012) for the Metropolitan Manila Development Authority (MMDA) and all concerned to come up with plans, in order to reduce the impact of a major earthquake. Since natural calamities are inevitable there is no choice but for governments to formulate policies and take action to reduce the impact of such calamities. Following the global trend, the Philippines has adopted two major legislations shifting the focus from conventional disaster management practice which used to emphasize disaster response (search, rescue and relief operations), to the new thrust on anticipatory risk reduction. These are the Climate Change Act of 2009 [23] and the Disaster Risk Reduction Management Act of 2010 [22]. The problem appears to be that despite the occurrence of catastrophic earthquakes in Haiti, Christchurch in New Zealand, and Fukushima Japan; and the above-mentioned legislation and the early warning served by the MMEIRS Project, there is a need to ascertain if, indeed, the MMDA and its component cities have forged the corresponding legislative and administrative action to prepare for the eventuality of an earthquake.

CONCEPTUAL FRAMEWORK

The variables adopted in the statement of the problem were derived from the MMEIRS particularly the "Disaster Mitigation Capability Assessment Matrix" (Annex B of MMEIRS). The matrix advanced such factors, criteria and indicators, as:

Key Factors	Criteria/Indicators
1. Legal Framework	Laws, implementing regulations and enforcement mechanisms in place
2. Institutional Framework	Degree of organizational development. Active inter-institutional mechanisms in place e.g. committees
3. Emergency Planning	Emergency response plans and SOPs at every level
4. Decision-making and Incident Command	Clarity as to who is in charge
5. Response and Recovery Capability	Capabilities of key institution at all levels

From this matrix, the survey questionnaire covered such variables as:

Critical Factors	Indicator of Preparedness
A. Legal Framework	- Passing a city ordinance in response to RA 10121[22], and MMEIRS[13]
B. Vulnerability/Risk Assessment with regard to hazard maps at 3 levels	- fire, earthquake - earthquake/fire vulnerability - city government and barangay - private business/community
C. DRRM Plans	- emergency response plans and SOPs in place - plans updated, tested in drills - linked with city development - response/recovery included - Training/capability included
D. Institutional Organization Structure	
E. Public -Private Sector Partnership	
F. Community Awareness	
G. Disaster Response	
H. Recovery/Rehabilitation	

Based on the MMEIRS Disaster Mitigation Capability Assessment Matrix, this study advanced the theory that the state of preparedness of the City of Mandaluyong City in the event of a 7.2 – magnitude earthquake triggered by the West Valley Fault is indicated by the identified key factors presented in the above table. Preparedness is related to the expected reduction in the impact of the earthquake in case the event occurs. Reduced earthquake impact may include less death and physical injuries resulting from collapsed building, fires, and other consequences. This aspect may be measured after the fact – i.e., after the event has transpired.

STATEMENT OF THE PROBLEM

This study was undertaken to assess the state of preparedness of the City of Mandaluyong in coping with a major earthquake. Specifically, the study attempted to provide answers to the following specific questions:

1. What is the current state of preparedness of the City of Mandaluyong on disaster risk reduction management in terms of:
   a. Legal framework (city ordinance legislated)
   b. Vulnerability assessment / Disaster risk reduction management plans
   c. DRRM plans
   d. Institutional organization and structures
   e. Public-private partnerships
   f. Commmunity awareness
   g. Disaster response
   h. Recovery/rehabilitation
2. What are the strengths and weaknesses of the current level of preparedness of the City of Mandaluyong in the event of a major earthquake?
3. What is the significant difference on the state of preparedness of the City of Mandaluyong on disaster risk reduction management as perceived by the City Heads and Barangay Chairmen/Representatives?

SIGNIFICANCE OF THE STUDY

The study would encourage the local government to look into its disaster management system, whether it addresses all phases of its disaster preparedness. The city, along with Manila, Makati, and Quezon City, is one of the leading local governments in Metropolitan Manila. Results of the study may encourage the aforementioned neighboring cities to strenghten their involvement and commitment in preparing for and reacting on large scale disasters. The national government may utilize Mandaluyong's DRRM system to create a culture of awareness, knowledge and learning regarding DRRM. Thus, minimizing the number of lives and properties that might be lost in the event of a disaster. More particularly, the study can be significant for Rizal Technical University for it can lead to research for the benefit of the community that hosts it. The value of the results may benefit stakeholders of the community and the "Tiger City".

MATERIALS AND METHODS

Respondents of the Study

The study used purposive sampling to draw respondents from city hall (heads of departments- 8 or 80% of 10), barangay officials (barangay captain/representatives- 21 or 78% of 27) and business establishments (chief of security/building maintenance-5). Inasmuch as the business sector can be very complicated, we identified the target respondents on the basis of high population density establishments, as well as high-rise structures where risks of fire or building collapse are high. Thus, we wanted to get big commercial areas like SM Megamall, Forum Robinsons, or Shangri-La Plaza; hotels like New Horizon or Richville Mansion: schools like Jose Rizal University, and hospitals like Victor Potenciano Medical Center. Fortunately, the respondents from the city government and the barangays were very supportive and cooperative. The research team was less fortunate in its encounter with the private sector.

Material

A self-survey questionnaire was used to detrmine the perceived preparedness of the respondents regarding DRRM in the City of Mandaluyong. The researchers took into consideration the following criteria in the formulation of the questions: the relevance of the items to be answered, their suitability to the research goals and objectives, the number and arrangement of questions, and the suitability of the time frame allocated to answer the questionnaires. The city heads' and the barangay chairmen/representatives' assessment were deemed to be the most accurate and reliable data needed to answer the specific problems raised in this study because they have the direct and personal knowledge on DRRM of the City.

Data Gathering Procedure

The distribution of the questionnaires was done personally by the researchers to the named respondents and explained to them the mechanics of the conduct of the study. Schedule of interview was made before distribution of the questionnaire. During the approved scheduled interview, a ten to fifteen minutes conversationwas conducted to obtain pertinent information from the respondents, if any. For those items included in the questionnaire, verification and validation were done during the interview. At the same time, the researchers requested for relevant documents from the respondents in order to gather firsthand information which they would need in to support their assessment of the state of preparedness of the city.

Statistical Interpretation

In the analysis of the data gathered, weighted mean was used to answer problems 1 and 2. To obtain the weighted average, the number of responses for each category was multiplied by the weight (1 to 5), the products of which were added and divided by the number of responses. T- test for Independent Sample Means was used to analyze the significant difference on the responses between the two groups of respondents regarding the preparedness of the City of Mandaluyong in the event of an earthquake. Equations for weighted mean and t-test for independent sample means were taken from the book of McClave and Sisich[12].

RESULTS AND DISCUSSIONS

1. Current State of Preparedness of the City of Mandaluyong in an Earthquake

Table 1 Preparedness in Terms of Legal Framework

A. LEGAL FRAMEWORK	City Heads		Barangays	
	Weighted Mean	Verbal Interpretation	Weighted Mean	Verbal Interpretation
1. The city council has passed a city ordinance in response to a) The Metro Manila Earthquake Impact Reduction Study of 2004	4.27	SA	4.79	SA
b) The Disaster Risk Reduction Management Act of 2010	4.45	SA	4.81	SA
Grand Mean	**4.36**	**SA**	**4.80**	**SA**

When analyzed through weighted means, 4.36 and 4.80 respectively, the data reveals that the city heads and the barangay chairmen/representatives strongly agreed on the existence of a city ordinance that would respond to the Metro Manila Earthquake Impact Reduction Study of 2004 and the Disaster Risk Reduction Management Act of 2010. Interview results and documents gathered from the respondents showed the issuance of Executive Order No. 001-S2011[6] in the Office of the Mayor of Mandaluyong. According to the respondents, this order aims to create a permanent disaster risk reduction and management council that will be known as the Mandaluyong City Disaster Risk Reduction and Management Council**,** replacing the Local Disaster Coordinating Council. The said order was also issued in line with Republic Act No. 10121[22] which mandates the creation of a Disaster Risk Reduction and Management Council on the national, regional, and local levels to oversee the development and implementation of disaster risk reduction, management, and response programs. Respondent city heads, when asked why they did not give a high rating of 5, explained that EO 001-S2011[6] was short of the requirement for a city ordinance passed by the city council and approved by the mayor.

Table 2 Preparedness in Terms of Vulnerability/Risk Assessment

B. VULNERABILITY/RISK ASSESSMENT	City Heads		Barangays	
	Weighted Mean	Verbal Interpretation	Weighted Mean	Verbal Interpretation
1. Vulnerable areas have been identified with regard to earthquake. Please list examples below	4.18	A	4.35	SA
2. Hazard maps are available indicating areas vulnerable to earthquake	4.55	SA	4.60	SA
3. Concerned sectors are informed whether a) city government ofice	5.00	SA	4.76	SA
b) barangay	5.00	SA	4.67	SA
c) private business	4.00	A	3.75	A
d) community	4.82	SA	4.47	SA
Grand Mean	**4.59**	**SA**	**4.43**	**SA**

The respondents' evaluation on the City's preparedness in terms of vulnerability/risk assessment showing grand means of 4.59 and 4.43 respectively shows that majority of the respondents from the city heads and the barangay chairmen/representatives strongly agreed that the City of Mandaluyong has hazard maps that could indicate areas at risk to earthquake. Respondent groups simply agreed that the private businesses

were just partly included in their dissemination campaign. This could be attributed to the weak involvement of the private sector on the affairs of the government, for the reason that they are not really that accommodating. In the interview, the respondents stated that the private business can stand on their own even without any financial assistance from the government. The results contradicts the findings in the study conducted by the International Bank for Reconstruction and Development/ the World Bank[9] in Japan wherein according to the report the government played a critical role in reducing the disaster's impact on businesses through various measures that would ensure financial system stability. Interestingly, the barangays offered ample proof that hazard maps were available, and that barangays situated within the hazard areas were required to come up with plans of action.

Figure 1 Barangay Barangka Ibaba Earthquake Prone Map

Table 3 Preparedness in Terms of DRRM Plans

C. DRRM PLANS	**City Heads**		**Barangays**	
	Weighted Mean	Verbal Interpretation	Weighted Mean	Verbal Interpretation
1. Plans for Disaster Risk Reduction Managemen are in place; i.e.: a) Emergency response plans and SOPs are in place	4.73	SA	4.53	SA
b) Plans are updated and tested in drills and exercises	4.73	SA	4.26	SA
c) DRRM plans are linked with city development plans	5.00	SA	4.65	SA
d) Response and recovery measures are included	4.82	SA	4.50	SA
e) Training and capacity building are covered	4.55	SA	4.26	SA
Grand Mean	**4.76**	**SA**	**4.44**	**SA**

The respondents strongly agreed that there is a visible solid plan of DRRM from the Municipality down to the different barangays. This result is supported by a document known as Executive Order No. 001-S2011[6] creating the Mandaluyong City Disaster Risk Reduction and Management Council**.** Then, **i**n the barangay level, organization of the Barangay DRRM Committee (BDRRMC) was made possible to determine the risk assessments of each barangay for any disaster. Data showagreed that the BDRRMC is linked to the city development plans. All items presented in this area are found in the printed copy of BDDRMP[3], which is regularly updated by the barangays since copy of this is submitted yearly to the DILG office. The printed copy of the BDRRMP includes the emergency plans, response and recovery measures, training and capacity building, and other dimensionsrelated to the DRRM plan[3]. These findings are in consonance with the studies on MMEIRS[13] and Porcil[18] wherein high priority action plans in the following areas are identified: legal framework, capacity for relief and recovery, community preparedness for the easrthquake, etc. As evident in the results, the threats posed by the 7.2 intensity earthquake if the West Valley Fault moves calls for a solid preparedness plan.

Table 4 Preparedness in Terms of Organization/Structures

D. INSTITUTIONAL ORGANIZATION/STRUCTURES	**City Heads**		**Barangays**	
	Weighted Mean	Verbal Interpretation	Weighted Mean	Verbal Interpretation
1. Decision-making and incident command are clear	5.00	SA	4.61	SA
2. Clear roles and responsibilities of local units/ofices involved are identified	5.00	SA	4.65	SA
3. Inter-institutional mechanisms e.g. Committees/taskforce are laid out	4.82	SA	4.56	SA
4. All relevant sectors are included:				
a) national agencies	5.00	SA	4.78	SA
b) city offices	5.00	SA	4.76	SA
c) private sector/business	3.91	A	3.89	A
d) NGOs and community groups	4.91	SA	4.44	SA
5. relevant sectors are familiar with respective roles	4.40	A	4.47	SA
Grand Mean	**4.75**	**SA**	**4.52**	**SA**

It can be gleaned from the data above that the respondents recognized the chain of command. Who is going to decide, clarifying roles and responsibilities among barangay officials[3]. However, results of this study is contrary to the findings of the study done by Scott, Z and Tarazona, M[23] who suggested that the roles and responsibilities of each level of the government do not ensure that the DRR activities are really undertaken. Although the results were confirmatory of the positive assessment on the DRRM plan in terms of organizational set-up, still, there were respondents who believe that the private sector does not involve themselves in activities related to DRRM, as reflected in item 4c. The engineering department head, when asked about this particular item, explained that the office monitors the private sector through their yearly fire prevention and building inspection. As cited in the work of International Bank for Reconstruction and Development/World Bank[9] DRM is everyones business. In Japan the central government encourages the participation of the local government and the community as a whole in planning and design for any event of disaster.

Table 5 Preparedness in Terms of Public-Private Sector Partnerships

E. PUBLIC-PRIVATE SECTOR PARTNERSHIPS	**City Heads**		**Barangays**	
	Weighted Mean	Verbal Interpretation	Weighted Mean	Verbal Interpretation
1. The city government has established partnership with the pivate sector involving earthquake	**3.91**	**A**	**3.41**	**A**

The weighted means of 3.91 and 3.41 interpreted as merely agree in the rating scale affirms the respondents view that there is a need to strengthen further the ties between the two sectors. When the researchers attempted to include the private sectors in the study, cold treatment was accorded to them by some while others were non-committal. This confirms that the private sector is less accommodating when compared to the government sector. Documents gathered from the respondents show no participation of the private sector in the DRRM planning of the barangays. However, according to interviews, there were some barangays, e.g.Wack-Wack, Malamig, and Ilaya, which get full support from their private constituents. Similarly, in the MMEIRS[13] results focus is given in certain frameworks where response capability by various sectors to institutional disaster is strengthened.

Table 6 Preparedness in Terms of Community Awareness

F. COMMUNITY AWARENESS	**City Heads**		**Barangays**	
	Weighted Mean	Verbal Interpretation	Weighted Mean	Verbal Interpretation
1. DRRM communication is disseminated to all barangays and community sector	4.91	SA	4.60	SA
2. Warning systems are in place	4.64	SA	4.10	A
Grand Mean	**4.77**	**SA**	**4.35**	**SA**

The weighted means of 4.91 and 4.60 respectively depicts that the majority of the respondents strongly agreed on the successful DDRM dissemination campaign to all barangays and community sectors. This may be due to the availability of warning systems in the areas. Interview results and then confirmed in the BDRRMP[3] show that each barangay has basic equipment like megaphones, sound systems, vehicles, and others which they can be used in any event of disaster. The barangays also conduct fora, seminars and orientations among its residents on matters pertaining to DRRM plans. In some affluent barangays, pamphlets and fliers regarding earthquake preparedness are produced and distributed to their constituents. The results of the study are parallel to the observations of Perry and Lindell[20] that emergency preparedness may include: community development of emergency operation plans, holding emergency response trainings, acquisition of facilities and equipment, performing emergency drills, exercises, and critiques.

Table 7 Preparedness in Terms of Disaster Response

G. DISASTER RESPONSE	**City Heads**		**Barangays**	
	Weighted Mean	Verbal Interpretation	Weighted Mean	Verbal Interpretation
1. SOPs are in place for				
a) relief	5.00	SA	4.56	SA
b) rescue	5.00	SA	4.63	SA
c) evacuation operations	4.91	SA	4.42	SA
Grand Mean	**4.97**	**SA**	**4.54**	**SA**

The data presented indicates strong agreement of the respondents on how well prepared the City of Mandaluyong in terms of disaster response. Data show that standard operating procedures (SOPs) are in place and procedures involving relief, rescue, and evacuation operations are organized. The barangays manifest their preparedness for effective response and early recovery through the following actions: 1. Establishment of barangay centers; 2. Activated and manned barangay halls in times of disaster; 3. Hotlines made available to receive emergency calls; 4. Available designated evacuation centers; 5. Providing evacuation centers that can accommodate population at risk. Shown in Figure 2 is a map of an evacuation area. Results of the study is akin to the findings of Prince[4] in which he stated that disaster management involves relief, rescue, and evacuation operations.

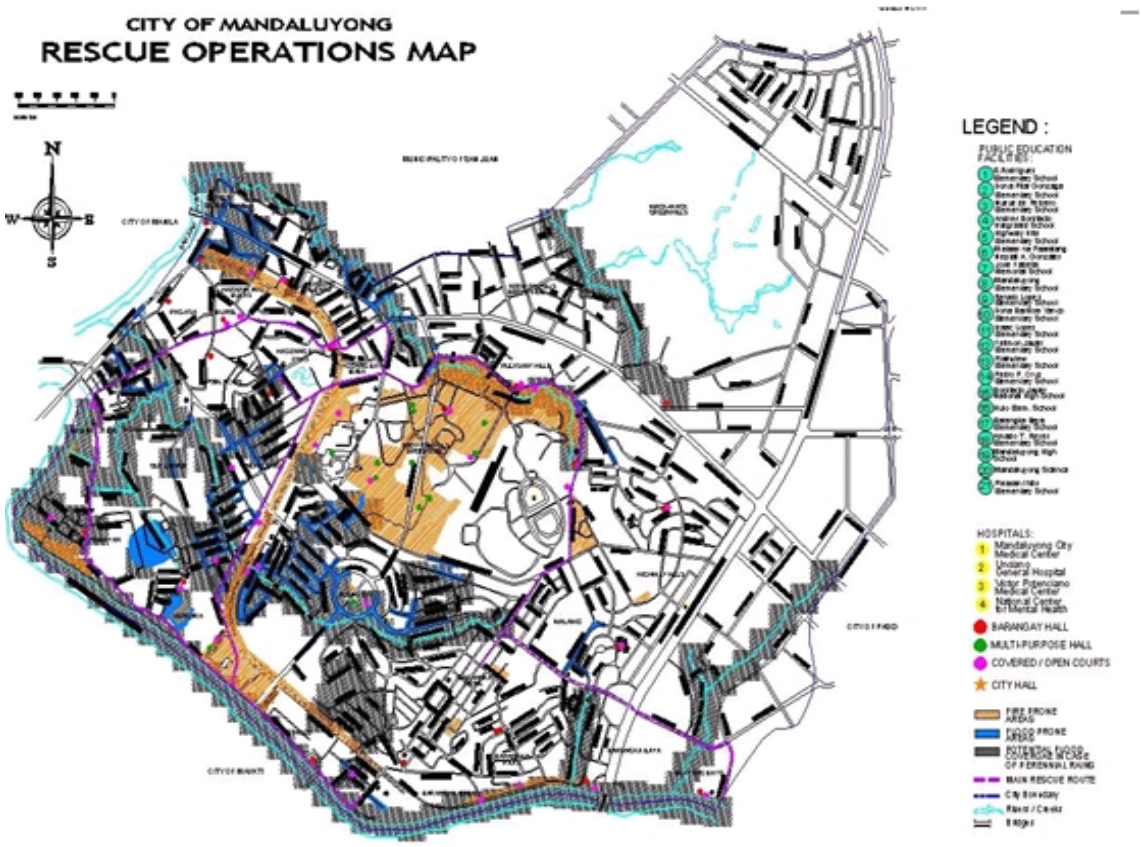

Figure 2 Evacuation map of Barangay Malamig

Table 8 Preparedness in Terms of Recovery/Response

H. RECOVERY/REHABILITATION	City Heads		Barangays	
	Weighted Mean	Verbal Interpretation	Weighted Mean	Verbal Interpretation
1. DRRMO has plans and programs for a) structural repair	4.73	SA	4.40	SA
b) assisstance to restore business losses	4.09	A	3.11	MA
c) assistance for medical/psychological rehabilitation	4.55	SA	4.37	SA
Grand Mean	**4.45**	**SA**	**3.96**	**A**

Data shown in the table disclose that both the city heads and the barangay representatives strongly agreed on the idea that the DRRMO has plans for structural repair and assistance for medical/psychological rehabilitation. Such provision is found in one of the sections of RA 10121, indicating the allotment of 5% from the national revenue for DRRM. Disbursement of the said fund is also stated in the created Executive Order No. 001-S2011[6], otherwise known as the Mandaluyong City Disaster Risk Reduction and Management Council. Further, analysis of the results reveals that disaster management is focused on emergency, relief, recovery and rehabilitation (cited by Neal[16] and Arceo[1]). The data reveal that inclusion of the private sector in the DRRMO recovery/rehabilitation planning was rated moderately agreed by the barangay and merely agreed by the city heads. This suggests that the private sector has a weak relationship with the local government as confirmed by the respondents during the interview. To quote, "Mas ang barangay ang nakakakuhang assistance sa mga private businesses and not the other way around". The overall mean ratings of 4.45 and 3.96 imply that the city heads have less exposure in response recovery activities as compared to the barangays represntatives who are the frontliners during disasters. The research team wanted a three-way comparison of perceptions by city heads, barangay representatives and private sector officers. However, the private sector respondents did not cooperate, thus only a two-way comparison has been achieved. The study seems to contradict the paper review by the World Bank

which stresses the roles and responsibilities of national and local government and enlistting the cooperation of stakeholders in both the public and private sectors. That DRRM is everyone's business, which is contrary to the results of the study. The city heads, representatives of the national government, supposedly should lead the role in mitigating the risks of disaster and the local government should provide financial assistance, produce technical guidelines and manuals, and conduct training for technical stfaff in planning, design, and operation. And that community participation is a key factor in minimizing damages to lives and properties[25].

Survey of Private Sector

Summit tower was accessed for the survey on account of a graduate student who facilitated the accomplishement of the questionnaire. The respondent gave the highest rating (5) only for vulnerability risk assessment. As to whether the private business is informed of such vulnerability, a score of 3 was given. As to DRRM Plans, scores of 3 were also given for DRRM Plans being in place, or plans updated and tested on drills and exercises. Disaster response got low scores: 2 for releif and 3 for rescue and evacuation operations. This was also true for recovery/rehabilitation. Plans for structural repairs for damaged public infrastructure and assistance to restore business losses were accorded scores of 2. Assistance for medical/physical rehabilitation was given a score of 3. While Summit Tower was the lone respondent from the private sector, the results of the consultation are herein represented merely to provide a private perspective, no matter how limited. The low perception scores tend to affirm the alienation of the private sector from DRRM efforts of the City of Mandaluyong as proven in the interview conducted by the researchers.

2 A. Strengths of the Current Level of Preparedness

Table 9 Strengths of the Current Preparedness

Criteria	Grand Mean (City Heads)	Verbal Interpretation	Grand Mean (Barangay)	Verbal Interpretation
A. Legal Framework	4.36	SA	4.80	SA
B. Vulnerability/Risk Assessment	4.59	SA	4.43	SA
C. DRRM Plans	4.76	SA	4.44	SA
D. Institutional Organizations/ Structures	4.75	SA	4.52	SA
F. Community Awareness	4.77	SA	4.35	SA
G. Disaster Response	4.97	SA	4.54	SA
Grand Mean	**4.7**	**SA**	**4.58**	**SA**

It appears that out of eight (8) items of preparedness, six (6) were perceived to be strengths, namely legal framework (highest score given by barangay representatives), vulnerability assessment, DRRM plans, institutional/organizational structures, community awareness, and disaster response (highest score given by city heads). In other words, respondents believe that these items are priority in mitigating disasters. Japan has the same thrusts towards disaster management system: Enhancement of legal framework; Building capacity for relief and operation; Strenthening community preparednessfor earhtquake; Reduce dangers of structures[9].

2 B. Weaknesses of the Current Level of Preparedness

Table 10 Weaknesses of the Current Preparedness

Criteria	Grand Mean (City Heads)	Verbal Interpetation	Grand Mean (Barangay	Verbal Interpretation
E. Public-Private Sector Partnership	3.91	A	3.41	A
H. Recovery/ Rehabilitation	4.45	SA	3.96	A
Grand Mean	**4.18**	**A**	**3.685**	**A**

On the other hand, only two variables appear to be rated as weaknesses. There was a consensus between city heads and barangay representatives that public-private partnership was weak. However, there was ambivalence about recovery/rehabilitation. The city heads gave it a high score (4.45) but the barangay representatives rated it much lower (3.96). The weakness in public-private collaboration on partnership is palpably supported by the reluctance of the private sector to participate in this research endeavor. This

idea is contrary to what the Japan practices. Accordingly, partnership with the private sector is critical. Rehabilitation may begin right after earthquake event occurs because agreements with the private sector are already in place.

3. Difference in the Perception between the City Heads and Barangays

Table 11 Difference in the Rating per Criteria by the City Heads and Barangays

Preparedness Indicator	t-computed	t-critical	Remarks
A. Legal framework	-9.48	6.31	S
B. Vulnerability/risk assessment	0.61	1.83	NS
C. Drrm plans	3.79	1.86	S
D. Institutional organizations/structures	1.20	1.78	NS
E. Public-private sector partnerships	-0.10	1.75	NS
F. Community awareness	2.01	6.31	NS
G. Disaster response	7.54	2.92	S
H. Recovery/rehabilitation	0.94	2.35	NS

The statistical results of the means on the eight items measuring the preparedness of the City of Mandaluyong for any event of disaster show the computed t-values of: -9.48 > 6.31 for legal framework, 3.79 >1.86 for DRRM plans, and 7.54> 2.92 for recovery and response. These results imply that the null hypothesis of no significant difference in the perception of the respondents regarding the aforementioned categories is rejected. This difference is explained by the fact that the barangay officials are at the forefront, and thus are the ones directly involve and first respondents in any disaster. The DRRM plans are prepared at the grassroots (barangay) level, which are directly submitted to the Department of Interior and Local Government (DILG).

On the other hand the statistical results of the remaining items show the computed t-values of: 0.61<1.83 for vulnerability/risk assessment, 1.20<1.78 for institutional organizations/structures,2.01<6.31 for community awareness, and 0.94<2.35 for recovery/rehabilitation. The results reveal that the perceptions of the respondents in terms of the aforementioned criteria do not significantly differ. This is analogous to the paper review written by Nishikawa[17] wherein he stated that the roles and responsibilites of the National, Municipal governments, and community as well as the citizens are clearly defined in making assessment for disaster reduction.

CONCLUSION

1. The government of the City of Mandaluyong is seen to be well-prepared in disaster risk reduction-management (DRRM) in six out of eight variables of preparedness: Legal Framework, Vulnerability/Risk Assessment, DRRM Plans, Institutional/Organizational Structures, Community Awareness and Disaster Response.

.The respondents agree that at present, the legal framework is not a city ordinance, but an executive order issued by the City Mayor.

The two variables not so highly rated are Public-private Partnership and Recovery/Rehabilitation. Assistance to restore business losses is seen to be relatively low or weak.

2. The same six variables which are seen as indicators of preparedness are considered to be the "strengths" in the current level of preparedness. The same two variables, Public-private Partnership and Recovery/Rehabilitation, not so highly rated, are considered as "weaknesses,"

3. The statistical results of the means on the eight variables measuring the preparedness of the City of Mandaluyong imply that there appeared to be significant difference in the groups' perception of Legal framework, DRRM Plans, and Disaster response.

RECOMMENDATIONS

1. The City government should pass an ordinance complying with RA 10121[22], establishing City Disaster Risk Reduction Management Council (CDRRMC), and creating the DRRM Office under the Office of the Mayor which serves as the secretariat of the CDRRMC).

2. The weakness in public-private partnership should be addressed. The collaboration of the private sector should be solicited not only in supporting the city government's plans, but also in creating its own capability to cope with disasters.
The DRRM plans may address the perceived weakness in the recovery/rehabilitation phase, particularly providing for means to assist the business sector in recovering business losses.
3. The National government may initiate to create and sustain enhancement programs that would improve the city heads' awareness on the legal framework, DRRM plans, ans disaster response regarding DRRM.
4. It is proposed that another research inquiry on the preparedness of the government of the City of Mandaluyong to deal with floods and fires be undertaken by this research team.

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