

Asian Conference on Disaster Reduction 2019 PHILIPPINE INITIATIVES ON EARTHQUAKE RISK REDUCTION



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SCOPE OF PRESENTATION

1

**Earthquake Risk
Profile**

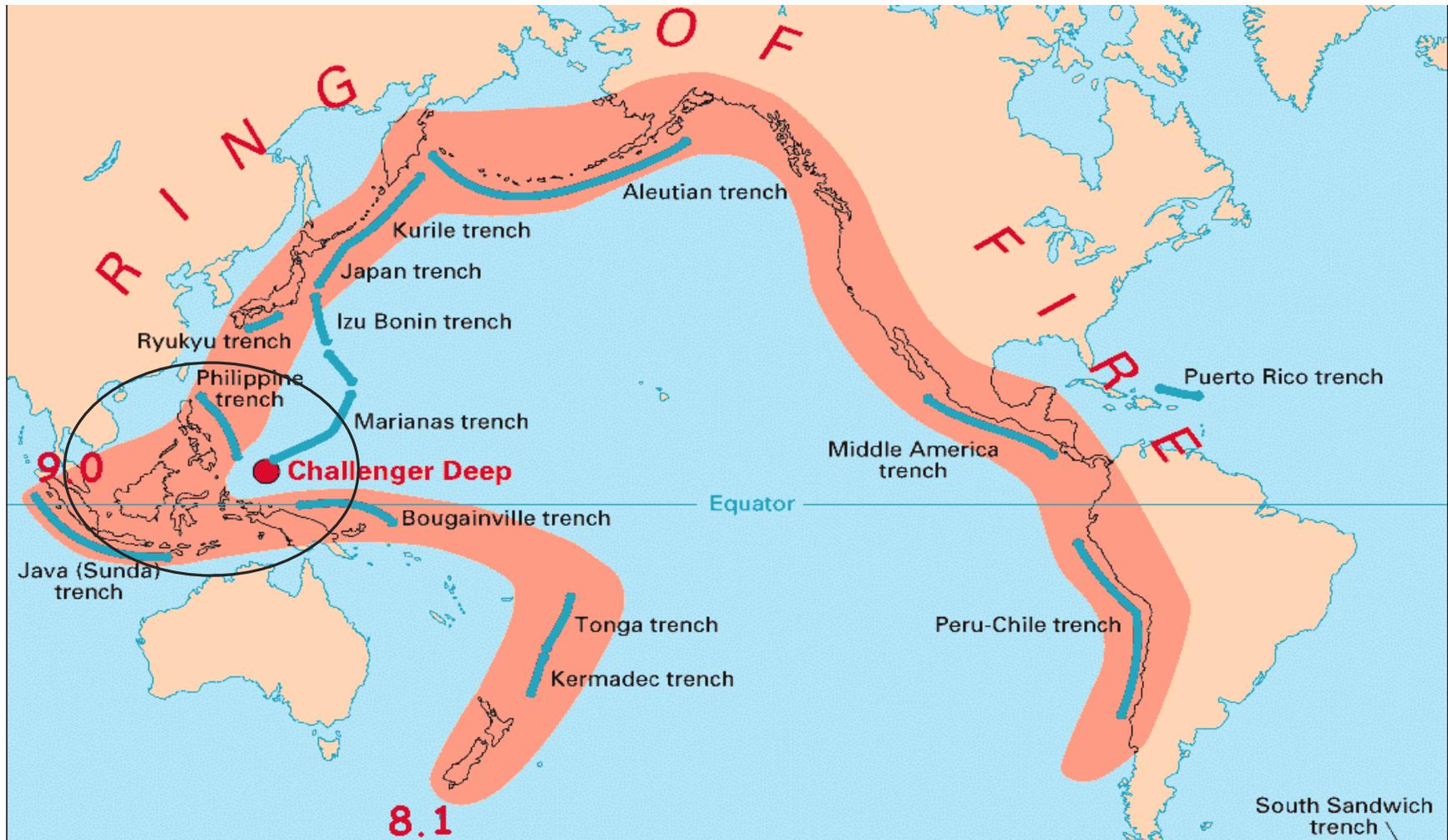
2

**National Government
Initiatives**

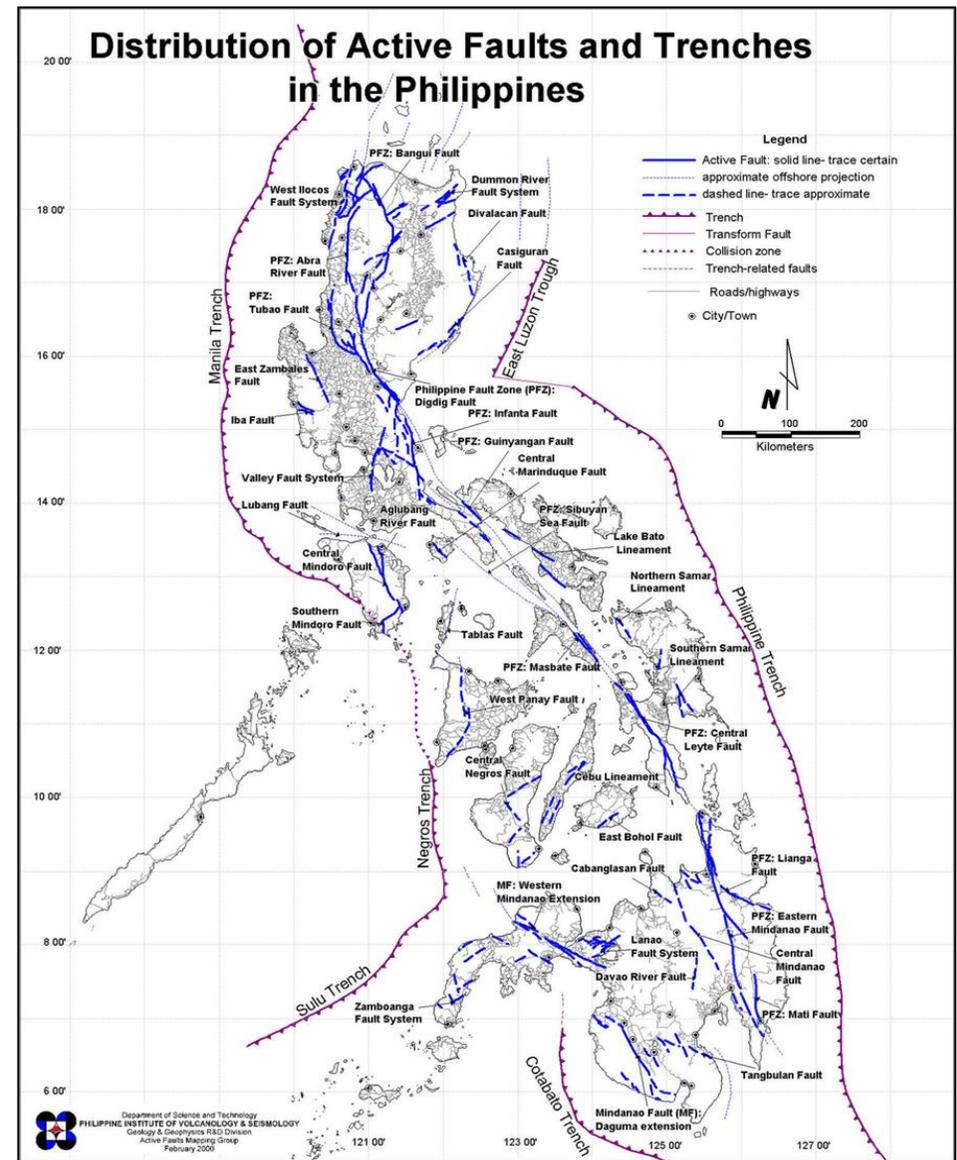
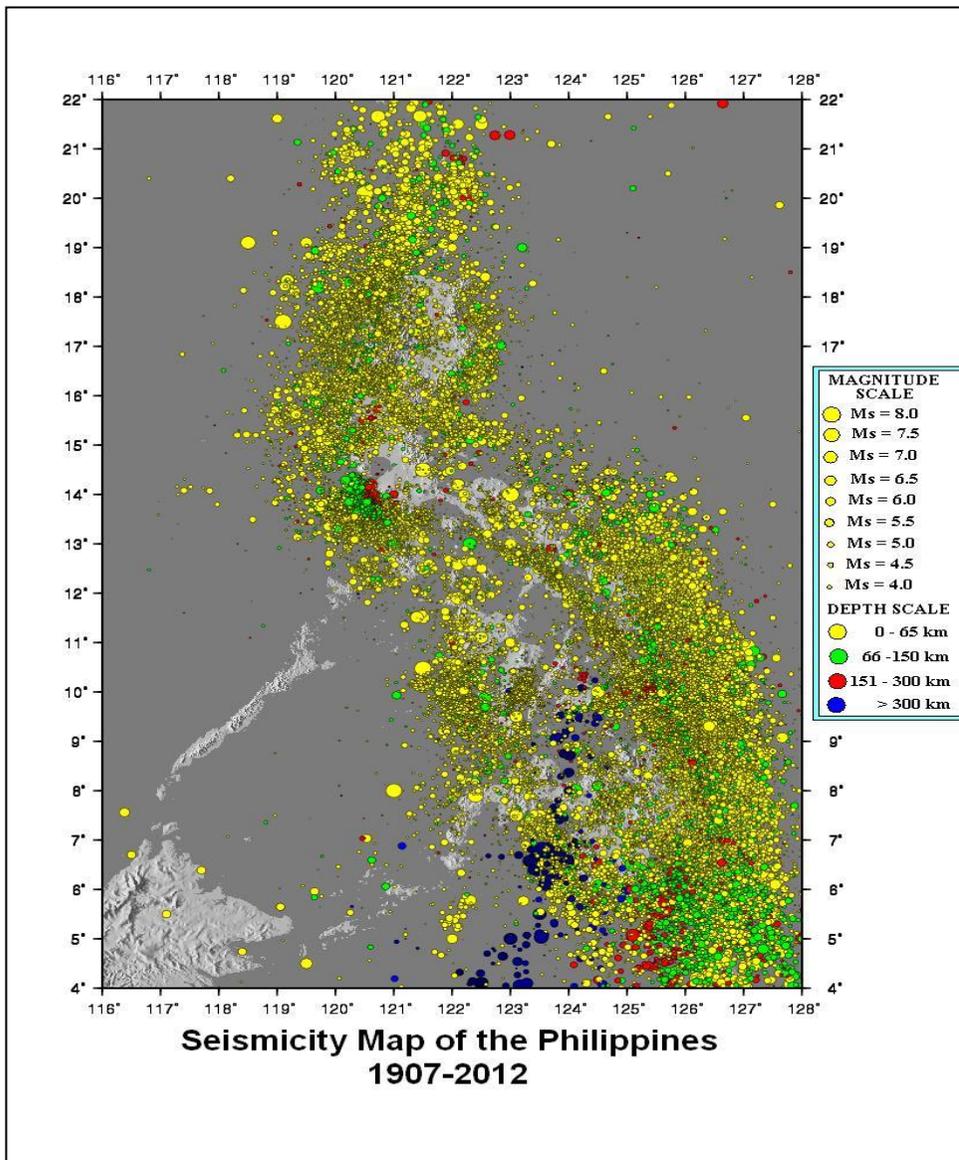
Earthquake Risk Profile



Pacific Ring of Fire



Credit: Google Images



Average of 20 Earthquakes Daily

1968 Casiguran Earthquake (M 7.3)



Credit: Google Images



National Disaster Risk Reduction and Management Council



Office of Civil Defense

1976 Moro Gulf Tsunami (M 8.1)



Credit: Google Images



National Disaster Risk Reduction and Management Council



Office of Civil Defense

1990 Luzon Earthquake (M 7.7)



Credit: Google Images



National Disaster Risk Reduction and Management Council



Office of Civil Defense

2013 Bohol Earthquake (M 7.2)



Credit: Google Images



National Disaster Risk Reduction and Management Council



Office of Civil Defense

2018 Davao Oriental Earthquake (M 6.4)



Credit: Google Images



National Disaster Risk Reduction and Management Council



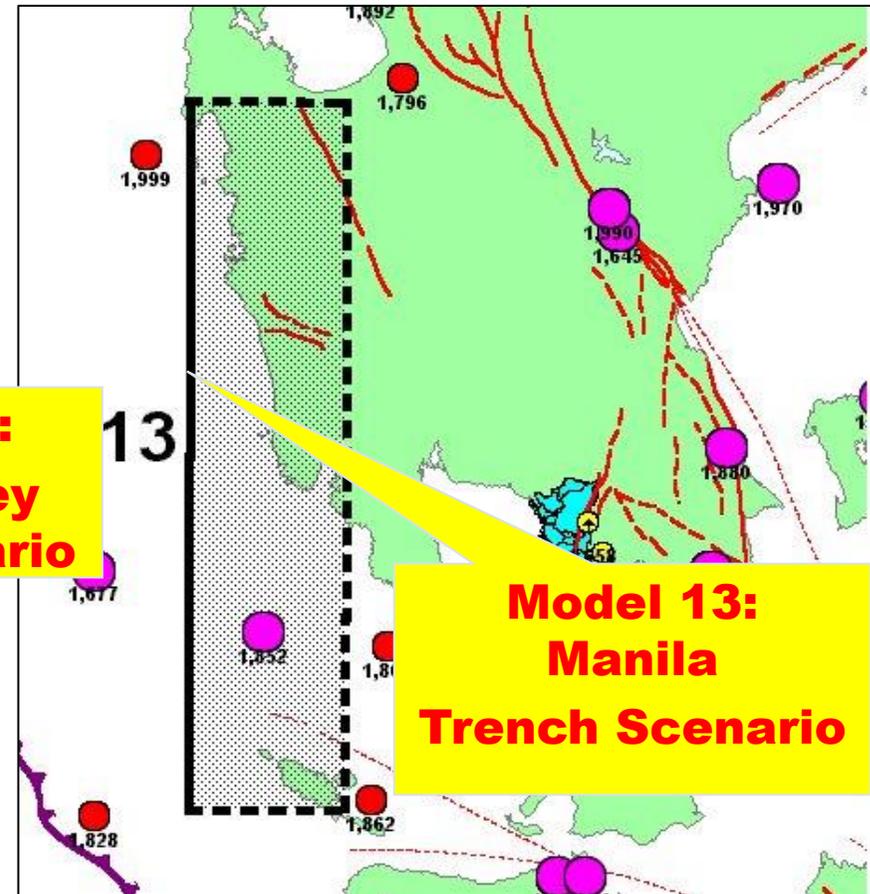
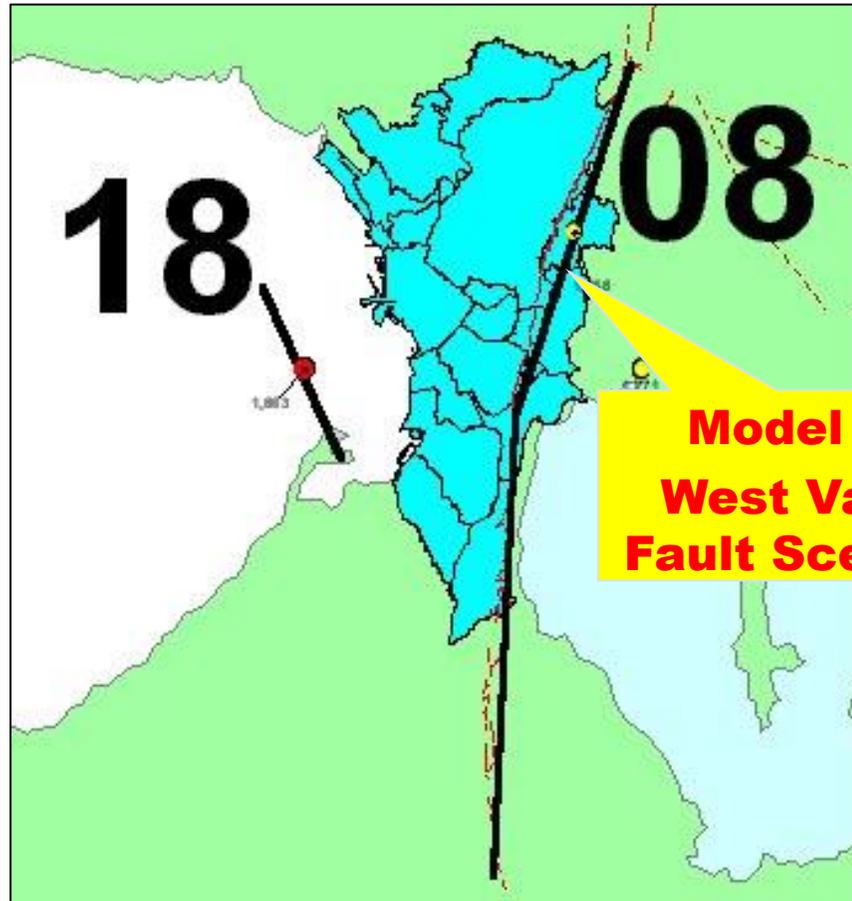
Office of Civil Defense

2019 Earthquakes

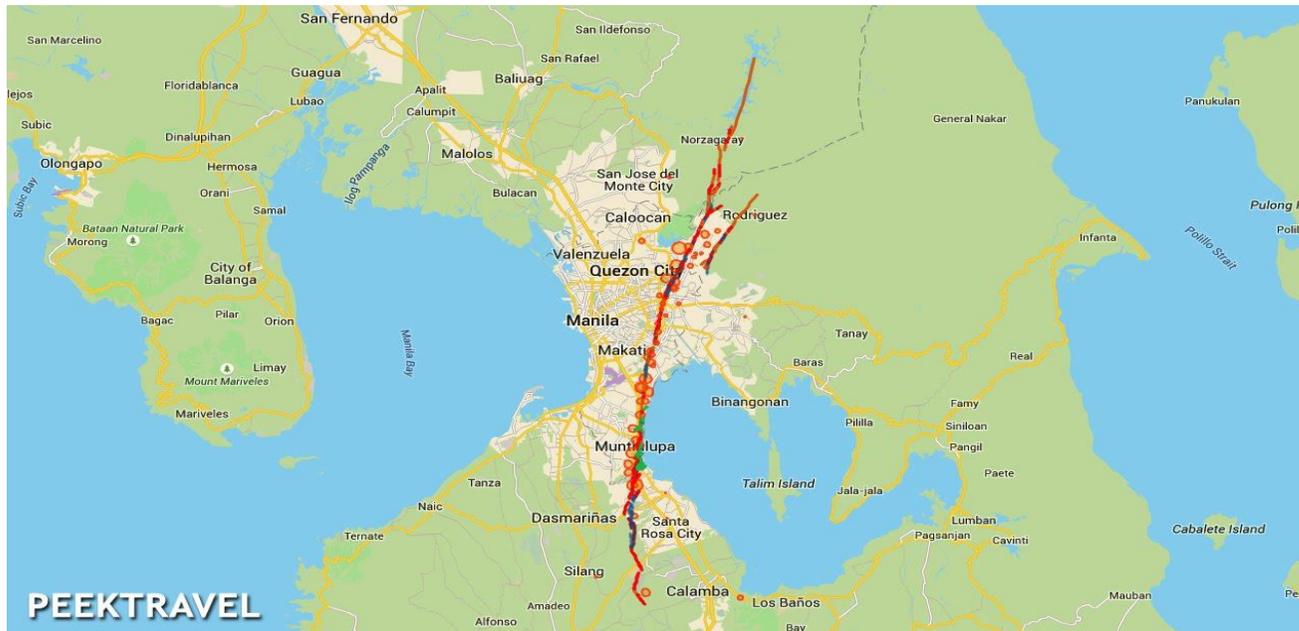


Credit: Google Images

Worst-Earthquake Scenarios in Metro Manila

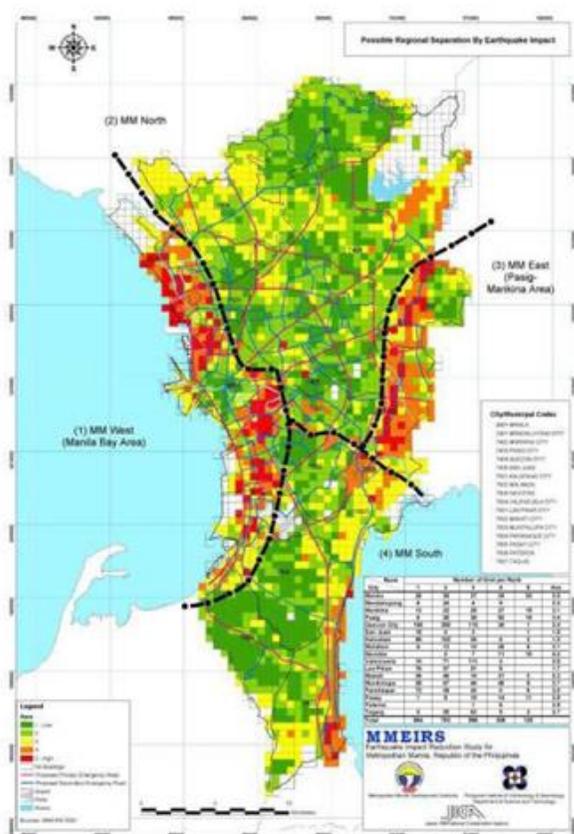


West Valley Fault: Magnitude 7.2 Earthquake



Moved 4 times in the past 1,400 years (around 400 years interval)
Last major earthquake recorded was in 1658

Anticipated Regional Separation of Metro Manila



SECTORS	EXPECTED REGIONAL SEPARATION
East	Pasig, Marikina
West	Manila, San Juan, Mandaluyong
North	North 1: Caloocan, Malabon, Navotas, Valenzuela North 2: Quezon City
South	South 1: Las Pinas, Muntinlupa, Paranaque, Pasay South 2: Taguig, Makati, Pateros

Other Areas to be Heavily Affected by the Earthquake

REGION	LOCAL GOVERNMENT UNITS
Central Luzon	<p>Bulacan (Doña Remedios Trinidad, Norzagaray and San Jose Del Monte City)</p> <p>Pampanga</p>
CALABARZON	<p>Rizal (Rodriguez)</p> <p>Laguna (San Pedro City, Biñan City, Sta. Rosa City, Cabuyao City, and Calamba City)</p> <p>Cavite (Carmona, General Mariano Alvarez, and Silang)</p>

Estimated Impacts in Three Regions (Consolidated Working Data)



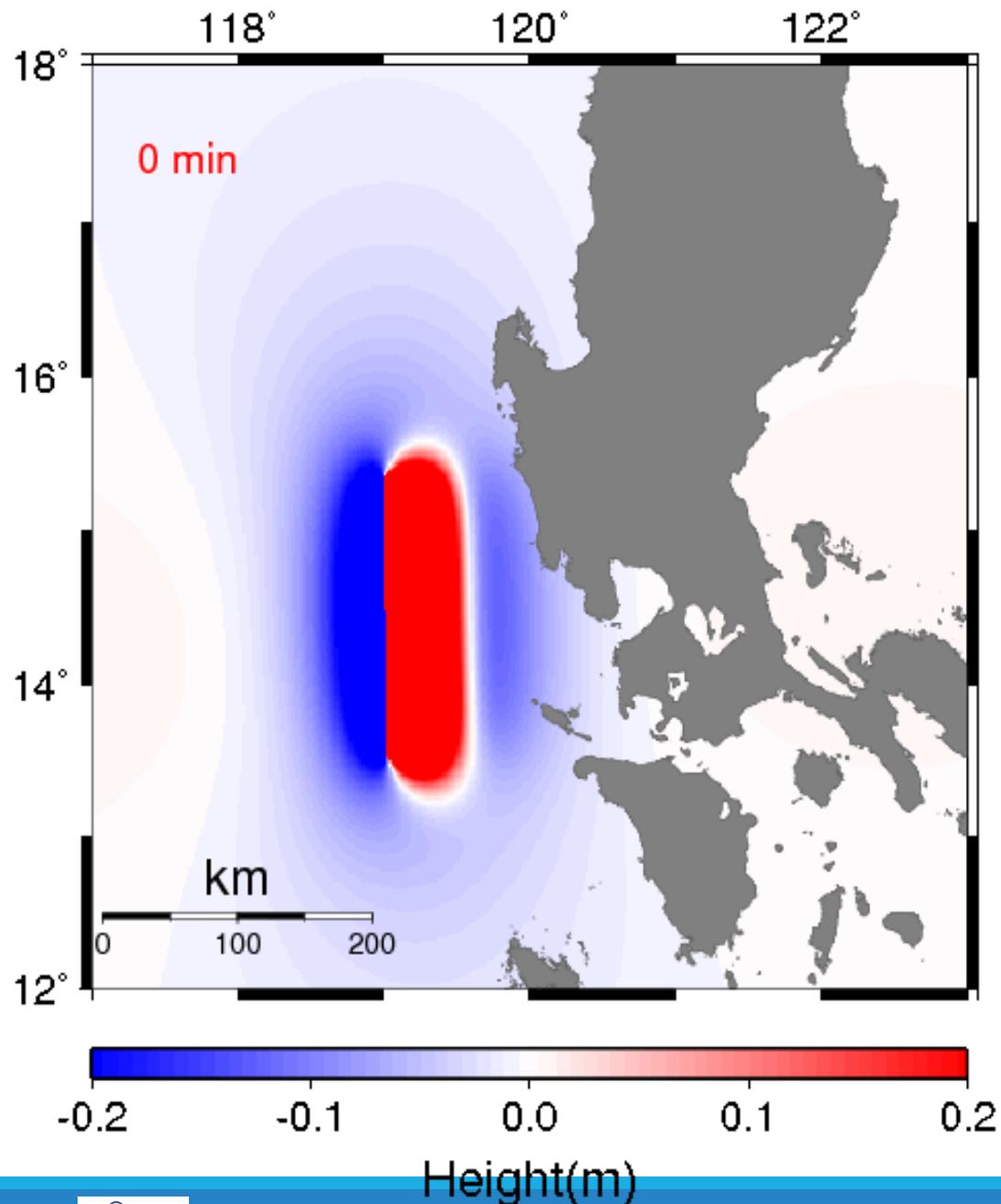
53k dead
145k missing
700k injured
5.3mil displaced



*Reference for Dead and Injured (consolidated): RAP 2014, RDRRMC III, Rizal, Cavite and Laguna CPs

*Reference for Missing: INSARAG ERE 2018

*Reference for Displaced: INSARAG ERE 2018



Manila Trench: Magnitude 8.3 Earthquake and Tsunami

Tsunami Height and Inundation

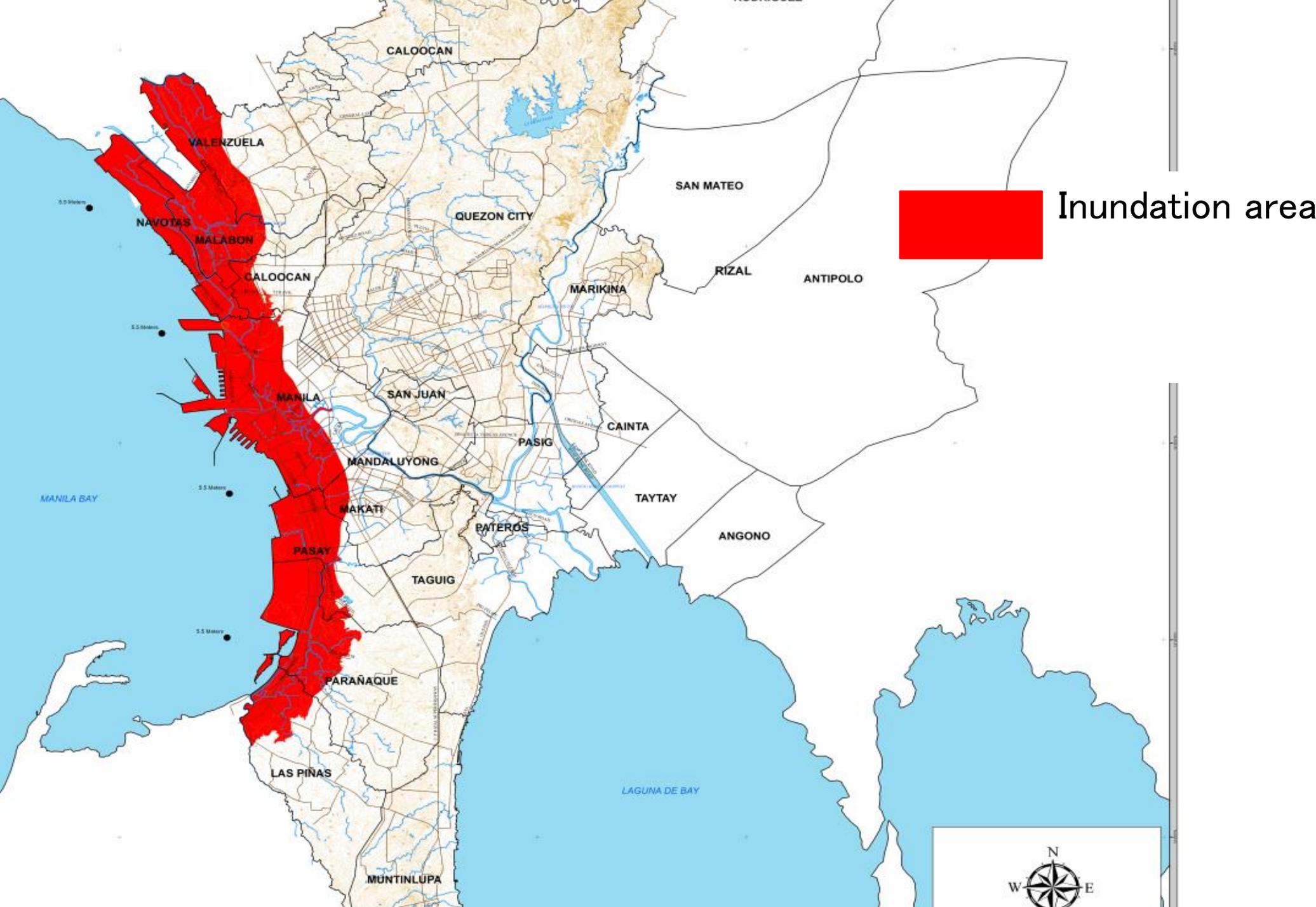
Table 1 : Modeled Tsunami Height in the coast of Manila Bay

Maximum Tsunami Run-up Height	Maximum Tsunami Run-up Height (w/ tide)
3.5 m	5.5 m*

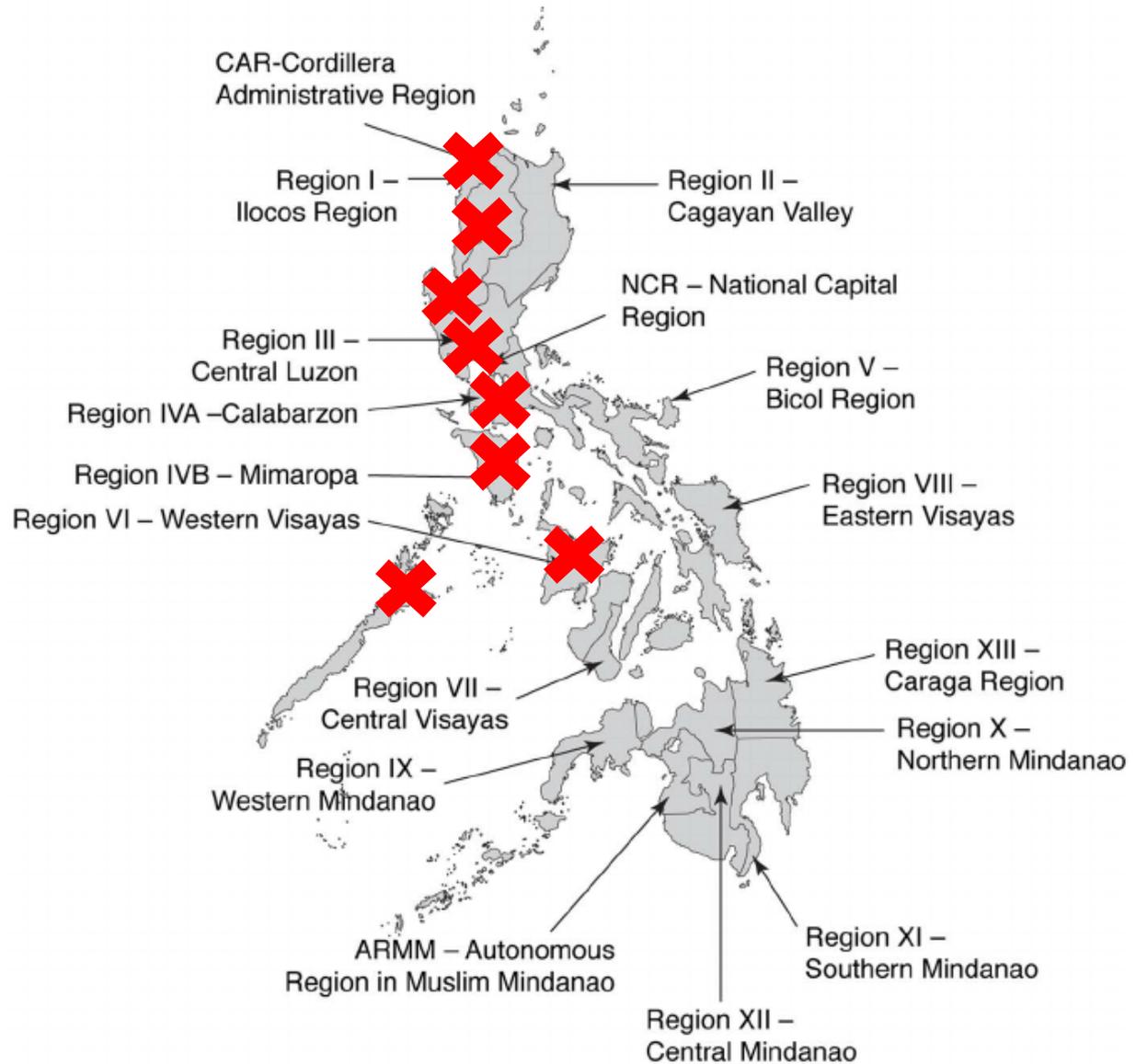
Table 2 : Modeled Tsunami Inundation distance considering different types of land surface

Land Surface (roughness coefficient)	Maximum Tsunami Distance (m)	Maximum Tsunami Distance – w/ tide (m)
Grassland (0.015)*	1411	2574*
areas covered with buildings (0.03)	353	644
areas densely covered with forest	65	118

* are values considered as worst case scenario



Regions to be Affected by M 8.3 EQ and Tsunami



National Government Initiatives



National Resiliency Team Meetings



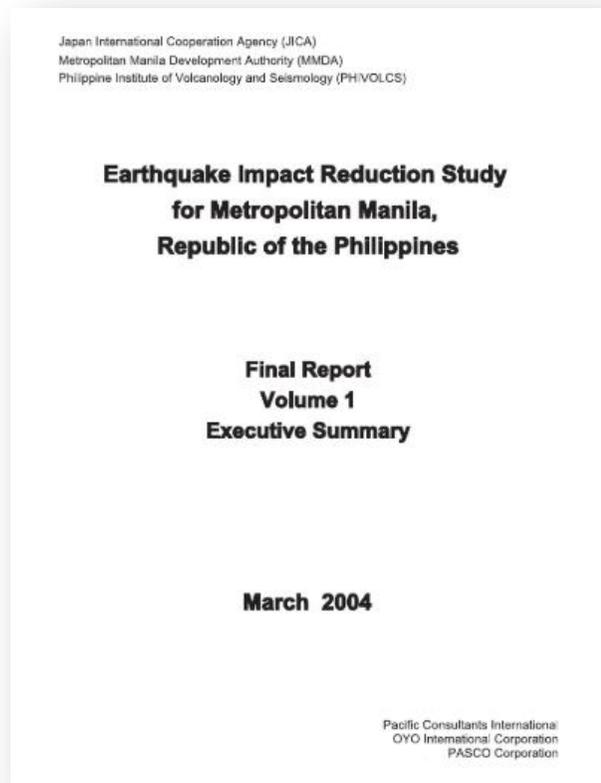
- Regular high-level meetings being conducted by the national government led by the Presidential Management Staff
- Venue for discussing earthquake risk reduction strategies

NRT 10 Key Result Areas for Earthquake Risk Reduction

KEY RESULT AREAS	AGENCIES RESPONSIBLE
Water	MWSS, MWSI, MWCI, LWUA, DPWH, NWRB, NIA, DILG
Food	DA, DTI, NFA, DSWD
Shelter	NHA, DSWD, HUDCC, DPWH
Power	DOE, TRANSCO, NGCP, NPC, MERALCO, NEA, ERC
Medical, Health, and Psychosocial services	DOH, DILG, PRC, PHILHEALTH, PH HOSPITAL ASSOCIATION, PH MEDICAL ASSOCIATION, AFP, PNP, DILG-BFP
Command, Control and Communications	OCD, DICT, MMDA, NTC, KBP, PCOO, PIA
Search and Rescue	AFP, DILG-BFP, PNP, PCG, MMDA
Fire Protection	DILG-BFP, AFP, Fire Volunteers
Law and Order	DILG-PNP, AFP, DOJ, DILG-BJMP
Transport and Mobility	DPWH, DOTr, PPA, CAAP, PCG, MARINA



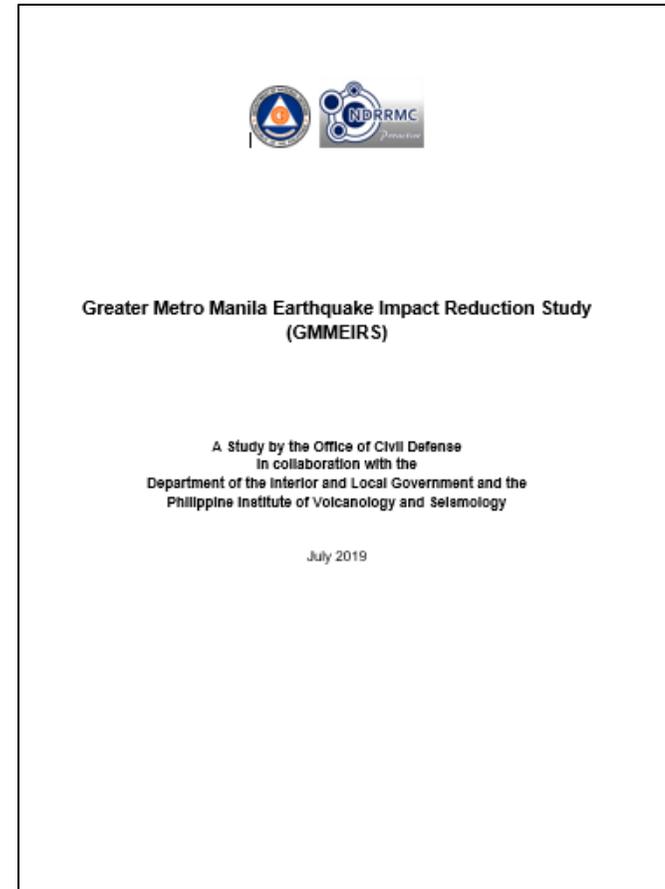
Metro Manila Earthquake Impact Study (MMEIRS)



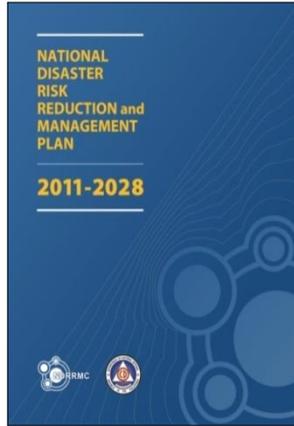
**6 Priority
Goals
and
105 Action
Plans**
for Earthquake Risk
Reduction

Greater Metro Manila Earthquake Impact Study (GMMEIRS)

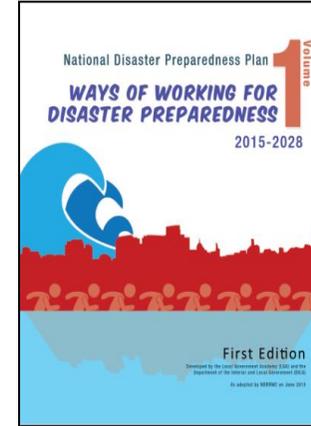
An ongoing comprehensive study on earthquake risk reduction to update the original MMEIRS published in 2014



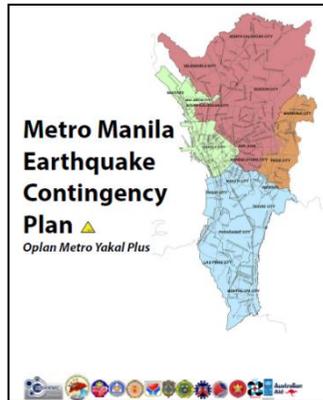
National Plans Formulated



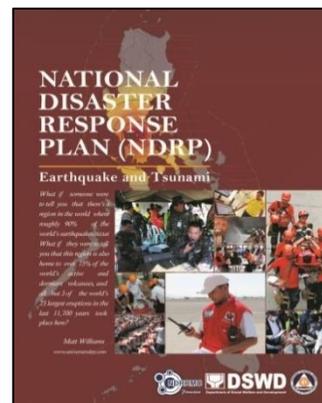
**National DRRM Plan
(approved on 2011)**



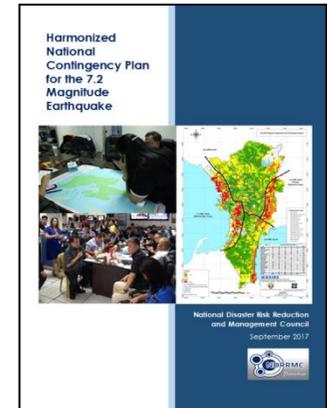
**National Disaster Preparedness Plan
(approved on 2015)**



**Oplan Metro Yakal Plus
(approved on 2015)**

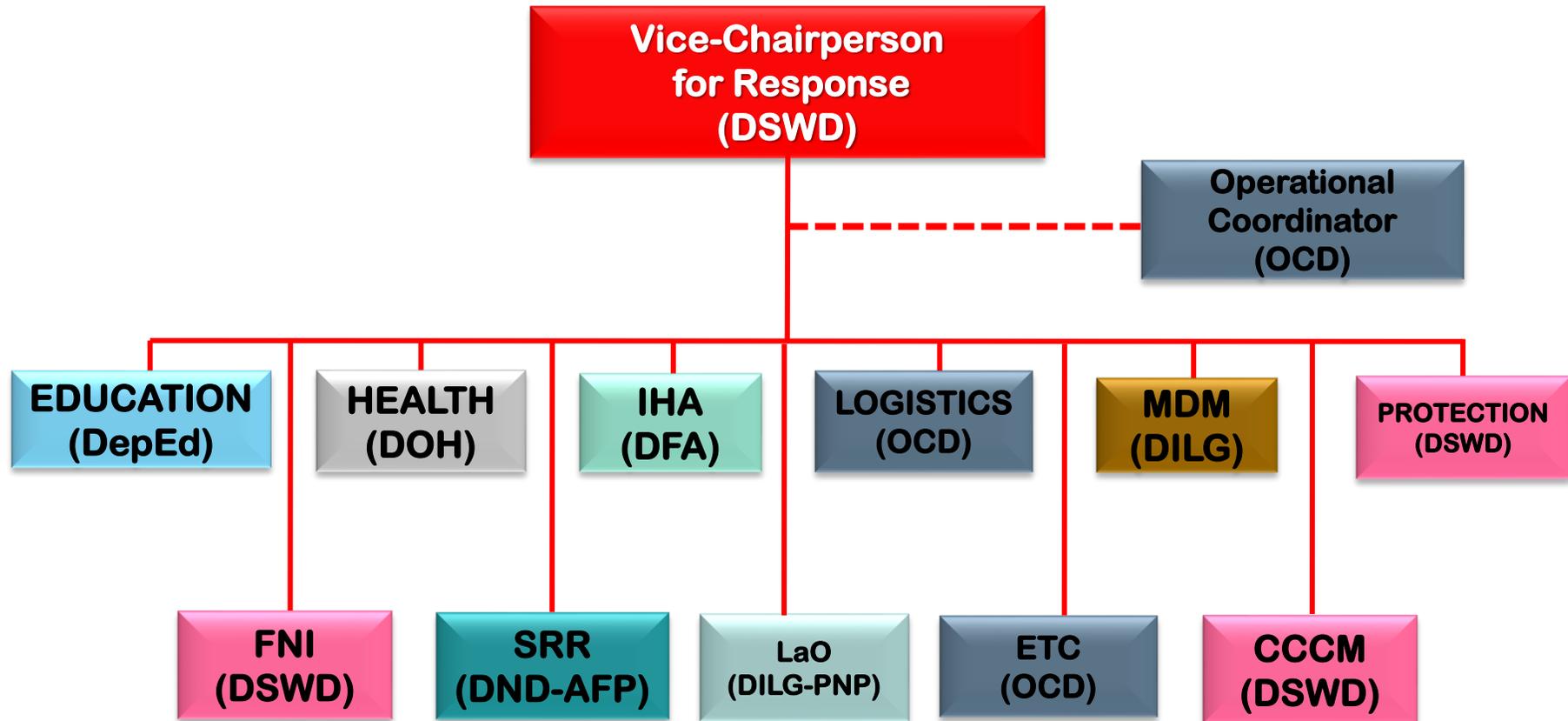


**National Disaster Response
Plan for EQ and Tsunami
(approved on 2017)**



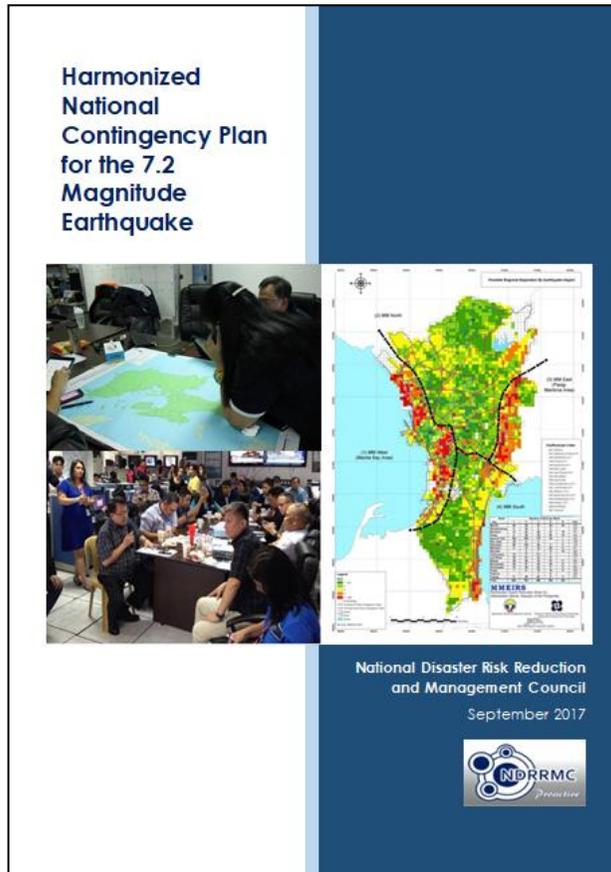
**Harmonized National
Contingency Plan
(updated on 2019)**

National Disaster Response Plan for Earthquake and Tsunami



Harmonized National Contingency Plan

- NDRRMC's contingency plan for the magnitude 7.2 earthquake scenario
- Pre-arranges response actions of regions in Luzon, Visayas and Mindanao to provide assistance in earthquake-affected areas



Assisting Regions in case of M 7.2 Earthquake

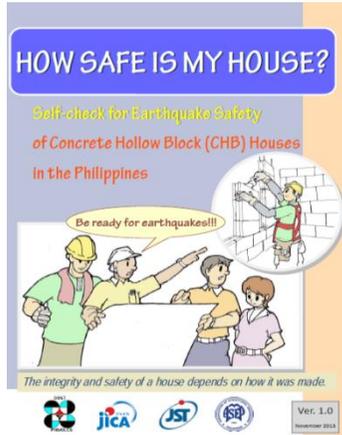
Areas to be Affected by Earthquake	Assisting RDRRMCs		
	1 st Wave	2 nd Wave	3 rd Wave
Central Luzon	Region I	Region VII	Region VIII
Metro Manila – North Sector	Region I	Region VII	Region VIII
Metro Manila – East Sector	Region II	Region XI	Region XII
Metro Manila – West Sector	CAR	Region X	CARAGA
Metro Manila – South Sector	Region V	Region VI	Region IX, MIMAROPA ARMM
CALABARZON	Region V	Region VI	Region IX, MIMAROPA ARMM

NDRRMC Issuances on Earthquake Preparedness

 <p>MEMORANDUM No. <u>29</u>, s. 2017</p> <p>TO :</p> <p>SUBJECT :</p>	 <p>MEMORANDUM No. <u>43</u>, s-2017</p> <p>TO :</p> <p>SUBJECT :</p>	 <p>MEMORANDUM No. <u>44</u>, s-2017</p> <p>TO : All All</p> <p>SUBJECT : Ass and Ear</p>	 <p>MEMORANDUM No. <u>50</u>, s-2017</p> <p>TO :</p> <p>SUBJECT : CH Pr</p>	 <p>REPUBLIC OF THE PHILIPPINES NATIONAL DISASTER RISK REDUCTION AND MANAGEMENT COUNCIL National Disaster Risk Reduction and Management Center, Camp Aguinaldo, Quezon City, Philippines</p> <p>MAR 29 2019</p> <p>MEMORANDUM No. <u>31</u>, s. 2019</p> <p>TO : DISASTER RISK REDUCTION AND MANAGEMENT COUNCILS AT ALL LEVELS, GOVERNMENT DEPARTMENTS, BUREAUS, AGENCIES, UNITS, INSTRUMENTALITIES, AND OTHER STAKEHOLDERS</p> <p>SUBJECT : Updates on the Harmonized National Contingency Plan for the Magnitude 7.2 Earthquake</p>
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Memo No. 29 s 2017	Inventory of Emergency Response Assets in Preparation for Contingency Planning for the Big One
Memo No. 43 s 2017	Designation of Assisting RDRRMCs to Augment the NDRRMC in Preparation for the 7.2 Magnitude Earthquake in Metro Manila
Memo No. 44 s 2017	Assessment of Structural Integrity of Buildings, Facilities and Infrastructures in Preparation for the 7.2 Magnitude Earthquake in Metro Manila and in Other Region
Memo No. 50 s 2017	Checklist of Milestones and Actions for Earthquake Preparedness
Memo No. 31 s 2019	Provides for the approval of the latest version of the Harmonized National Contingency Plan

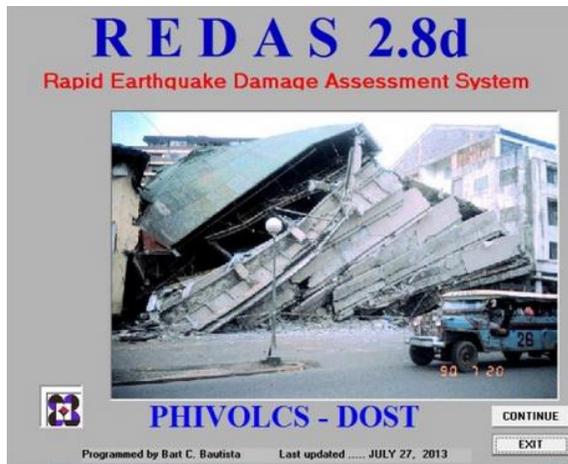
Earthquake Risk Assessment Tools



How Safe is my House – Self-check Simulator



Valley Fault System Atlas



Rapid Earthquake Damage Assessment System



Fault Finder

SOURCE: DOST-PHIVOLCS

Hazard Hunter



Photo credit: UNTV

Structural Retrofitting



10 FLYOVERS ALONG
EDSA AND OTHER
MAJOR
THOROUGHFARES IN
METRO MANILA
RETROFITTED

Manila North Diversion Road –
Camachile Flyover

EDSA – Santolan Flyover

EDSA – Ortigas Interchange

Roxas Blvd. – Gil Puyat Ave. Flyover

EDSA - Roxas Blvd. Flyover

EDSA – Kamias Flyover

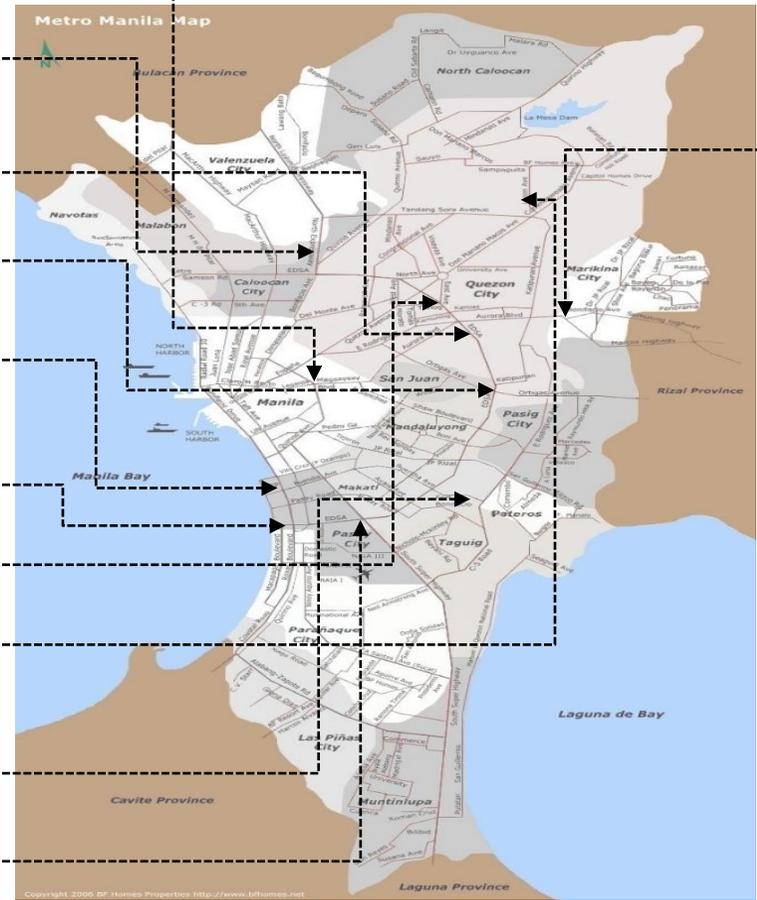
Tandang Sora – Commonwealth Flyover

EDSA – Gil Puyat Ave. Flyover

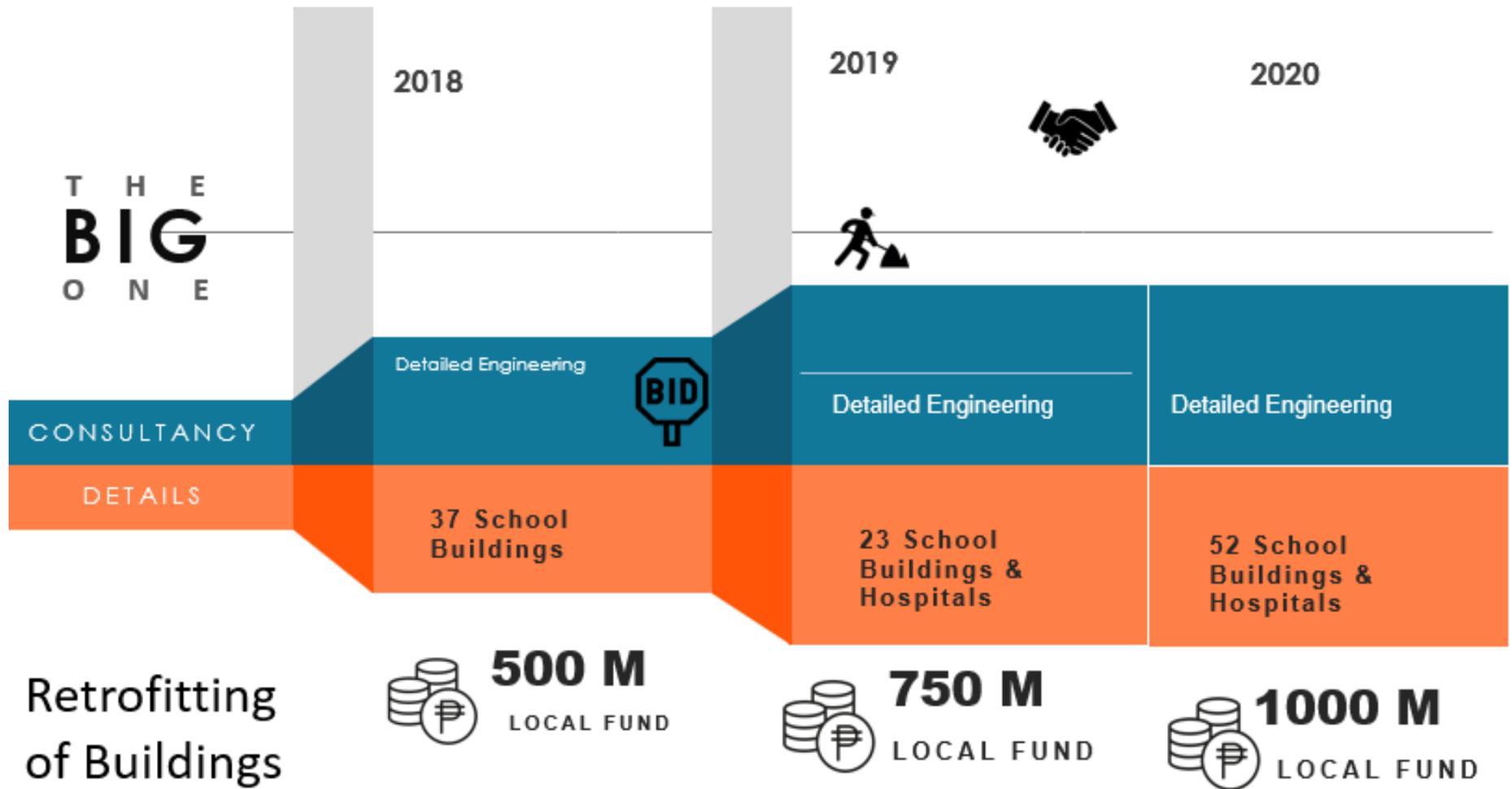
EDSA –Magallanes Flyover

Nagtahan Interchange

Barangka Viaduct Flyover



Structural Retrofitting



Information, Education, and Communication Campaigns

IEC Materials

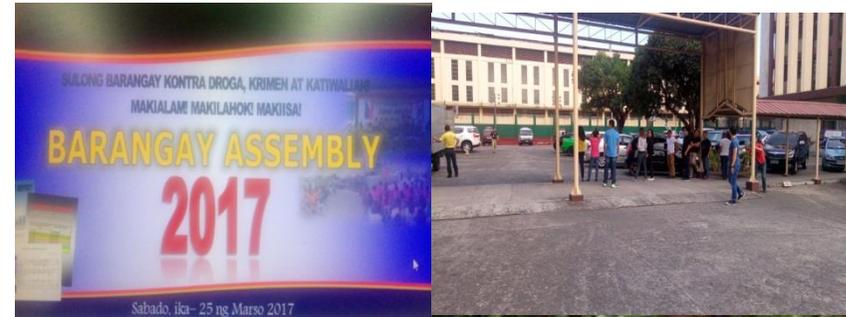
PHILIPPINE INSTITUTE OF VOLCANOLOGY AND SEISMOLOGY
Department of Science and Technology

PHIVOLCS EARTHQUAKE INTENSITY SCALE

A measure of how an earthquake was felt in a certain locality or area. It is based on relative effect to people, structures, and objects in the surroundings. It is represented by Roman Numerals, with intensity I being the weakest and intensity X the strongest. It is used since 1996, replacing the Rossi-Forrel scale.

BEFORE	DURING	AFTER
<p>KNOW THE HAZARDS IN YOUR AREA:</p> <ul style="list-style-type: none"> • Evacuation routes • High buildings • Medical aid • Exit routes • Evacuation Plan <p>Check your house for weak points and have earthquake-resistant structures. (Downloading and/or installing seismic retrofits may help improve the seismic resistance of your house or building.)</p> <p>Store heavier objects and flammable materials properly. (Always use proper stacking and stacking method at your house to ensure the seismic safety and no injury.)</p> <p>Secure heavy furniture and hanging objects. (Downloading, tying and unfastening may help mitigate or prevent falling objects.)</p> <p>Prepare your family's GO BAG containing items needed for survival. (Always use GO BAG as emergency kit for evacuation.)</p> <p>Participate in office and community earthquake drills. (MAGSAs as emergency and drills.)</p>	<p>WHEN INSIDE A BUILDING, STAY CALM AND:</p> <ul style="list-style-type: none"> DUCK (Cover your head and neck) COVER (Cover your head and neck) HOLD (Hold on to something sturdy) <p>DO NOT ATTEMPT TO RUN: Duck under a sturdy table and hold on to it. Stay alert for aftershocks or more tremors. Do not use the elevators as they may be damaged or not working properly.</p> <p>Stay away from glass windows, shelves and heavy objects. (Always use proper stacking and stacking method at your house to ensure the seismic safety and no injury.)</p> <p>After the shaking stops, stop the building and go to the designated evacuation area. (Always use proper stacking and stacking method at your house to ensure the seismic safety and no injury.)</p> <p>WHEN YOU ARE OUTSIDE, MOVE TO AN OPEN AREA:</p> <p>Stay away from buildings, trees, electric poles and towers, power lines, chimneys on roofs, utility poles at your house or your workplace or adjacent to roads.</p> <p>If you're in a moving vehicle, stop and exit the vehicle that you're in. (Always use proper stacking and stacking method at your house to ensure the seismic safety and no injury.)</p>	<p>STAY ALERT FOR AFTERSHOCKS!</p> <p>Always prepared and aware for aftershocks. (Always use proper stacking and stacking method at your house to ensure the seismic safety and no injury.)</p> <p>Evacuate immediately. (Always use proper stacking and stacking method at your house to ensure the seismic safety and no injury.)</p> <p>Check for injuries of self and family members. (Always use proper stacking and stacking method at your house to ensure the seismic safety and no injury.)</p> <p>Stay outside of the building until advised that it is safe to return. (Always use proper stacking and stacking method at your house to ensure the seismic safety and no injury.)</p> <p>Check for damages in water and electrical lines, and gas or LPG tanks. (Always use proper stacking and stacking method at your house to ensure the seismic safety and no injury.)</p>

Community-based DRRM Initiatives



Project Disaster Information for Nationwide Awareness

www.ocd.gov.ph/index.php/project-dina

PROJECT DINA
Hits: 12343

Earthquake

LINDOL

Disaster Information for Nationwide Awareness Project

Quarterly Nationwide Simultaneous Earthquake Drill



Simulation Exercise for Cabinet Members for M 7.2 Earthquake



High-Level Exercise involving Top Government Officials
First in the ASEAN Region

For a safer, adaptive, disaster resilient Filipino Communities!

