Disclaimer

This report was compiled by an ADRC visiting researcher (VR) from ADRC member countries.

The views expressed in the report do not necessarily reflect the views of the ADRC. The boundaries and names shown and the designations used on the maps in the report also do not imply official endorsement or acceptance by the ADRC.

ASIAN DISASTER REDUCTION CENTER VISITING RESEARCHER PROGRAM FINAL REPORT

ANNA-LISA D. ORALLO
OFFICE OF CIVIL DEFENSE
PHILIPPINES
VISITING RESEARCHER 2011A
October 25, 2011

ADRC
Asian Disaster Reduction Center (ADRC)

Scope of Presentation

I. General Information
- Republic of the Philippines
- Japan

II. Philippine Disaster Management System

III. Japan Disaster Management System

IV. Research Study on Earthquake
- Japan Earthquake
  - Nankai and Tonankai Earthquake
  - Preparedness Measures
- Philippine Earthquake
  - Metro Manila Earthquake
  - Preparedness Measures
- Conclusion

REPUBLIC OF THE PHILLIPINES

TOPOGRAPHY: Large mountainous terrain, narrow coastal plains and interior valleys and plains

TOTAL AREA: 300,000 sq km
7,107 islands
Coast line: 36,289 (5th longest)

THREE (3) MAJOR ISLAND GROUPS:
LUZON - largest island group with 141,000 sq. kms.
MINDANAO - with 102,000 sq. kms.
VISAYAS - with 57,000 sq.kms.

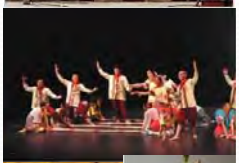
CONSISTING OF:
17 Regions
80 Provinces
1,613 City/Municipality
42,025 Barangays

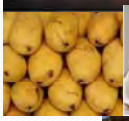
REPUBLIC OF THE PHILLIPINES

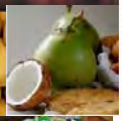
ESTIMATED POPULATION : **94.01MILLION**

CAPITAL : **MANILA**

RELIGION: 90% CHRISTIAN
83% ROMAN CATHOLIC







CLIMATE
Tropical marine climate (hot and humid)
Dominated by two major seasons: wet and dry seasons
- "Habagat" (Southwest monsoon) May to October
- "Amihan (Northeast monsoon) November - April

- "Tag - init" summer (Hot and dry season) March to May
- "Tag - ulan" (rainy season) June to November
- "Tag - lamig" (cool dry season) December - February

JAPAN

Government Seal of Japan

五七桐 (Go-Shichi no Kiri)

LAND AREA: 378,000 sq.kms.

MAJOR ISLANDS:

Honshu Shikoku
Hokkaido Kyushu

CONSISTING OF:

Prefectures: 47
Municipalities: 1,800

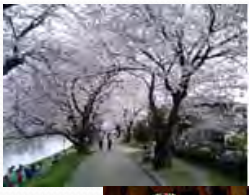
JAPAN

ESTIMATED POPULATION : 127.77 MILLION

CAPITAL: **TOKYO**

CLIMATE: Clear-cut temperature changes between the four seasons

RELIGIONS: BUDDHISM
SHINTOISM
CHRISTIANS



THE PHILIPPINE DISASTER MANAGEMENT SYSTEM

NATURAL HAZARDS IN THE PHILIPPINES

- Earthquake
- Volcanic Eruption
- Landslide
- Typhoon
- Flooding
- Storm Surge
- Drought

NATURAL AND HUMAN INDUCED INCIDENTS
SUMMARY OF DISASTERS IN THE PHILIPPINES COVERING THE PERIOD 1970 - 2010

KIND OF INCIDENTS	CASUALTIES			AFFECTED		DAMAGED HOUSES		DAMAGES TO PROPERTIES (P MILLION)			
	DEAD	INJ	MIS	FAMILIES	PERSONS	TOTALLY	PARTIALLY	INFRA	AGRI	PVT/COM	TOTAL
GRAND TOTAL	**39,128**	**62,809**	**14,948**	**30,976,212**	**156,397,487**	**3,004,455**	**7,563,833**	**182,563.473**	**97,172.323**	**20,102.607**	**299,838.403**
A. NATURAL INCIDENTS											
Typhoons (1970 - 2010)	23,892	32,641	8,645	26,978,106	136,543,259	2,854,006	7,293,082	178,396.737	76,770.002	10,292.882	265,459.621
Earthquakes (1968 - 2010)	5,576	12,859	2,266	322,898	1,808,889	27,201	85,749	43.837	1.530	24.376	69.743
Volcanic Eruptions (1991-2010)	959	201	23	355,282	1,697,450	44,247	68,451	7.880	14.608	0.957	23.445
Flashflood/Floodings (1981 - 2010)	919	735	1,527	1,883,185	9,212,959	20,387	101,437	953.917	2,186.935	24.212	3,165.064
Landslides (1981 - 2010)	1,121	807	113	22,382	86,130	887	1,616	73.732	10.144	1.199	85.075
Tornado (1990 - 2010)	48	182	59	9,794	52,008	1,538	1,948	0.344	54.537	2.389	57.270
Drought/El Niño Phenomenon (1990 - 2010)	0	0	0	1,133,042	5,671,679	0	3	0.000	18,132.209	106.221	18,238.430
Sub-Total	**32,515**	**47,425**	**12,633**	**30,704,689**	**155,072,374**	**2,948,266**	**7,552,286**	**179,476.447**	**97,169.965**	**10,452.236**	**287,098.648**

LEGAL AUTHORITY

RA 10121

Philippine Disaster Risk Reduction and Management

(PDRRM) Act of 2010

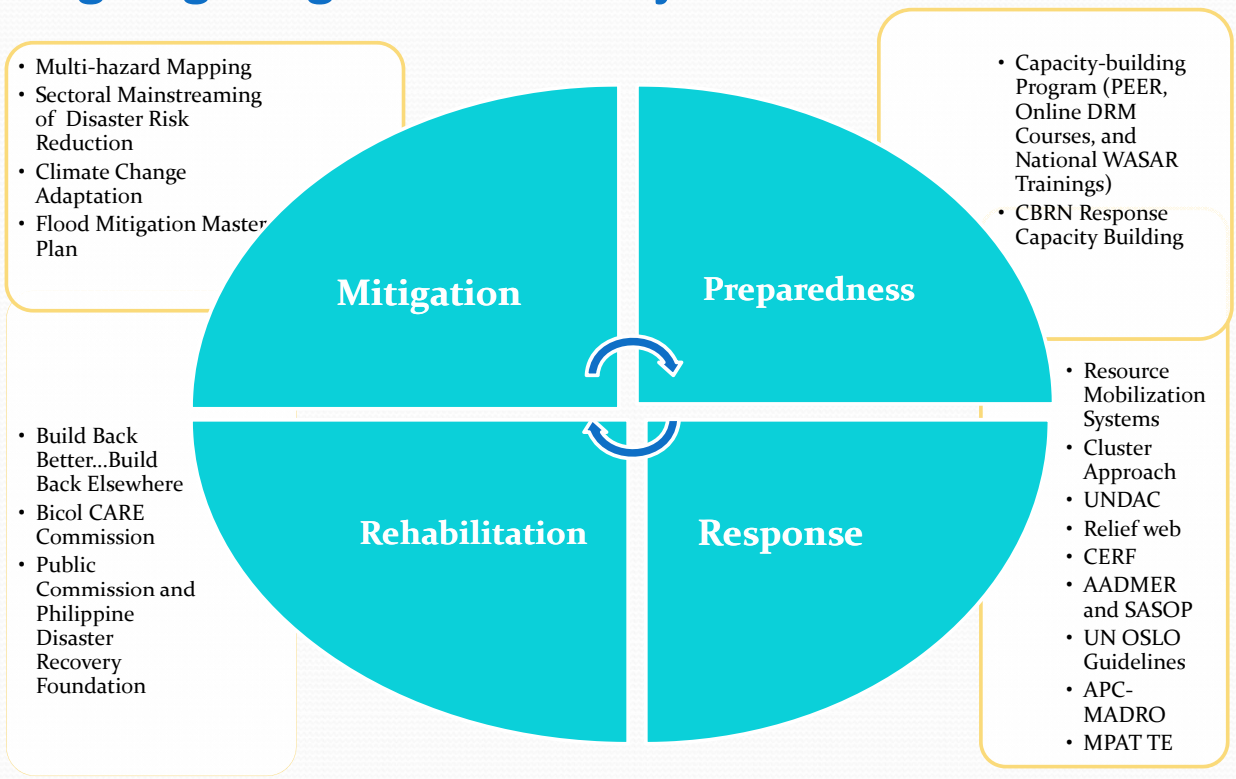
Signed on May 27, 2010

"AN ACT STRENGTHENING THE PHILIPPINE DISASTER RISK REDUCTION AND MANAGEMENT SYSTEM, PROVIDING FOR THE NATIONAL DISASTER RISK REDUCTION AND MANAGEMENT FRAMEWORK AND INSTITUTIONALIZING THE NATIONAL DISASTER RISK REDUCTION AND MANAGEMENT PLAN, APPROPRIATING FUNDS THEREFORE AND FOR OTHER PURPOSES"

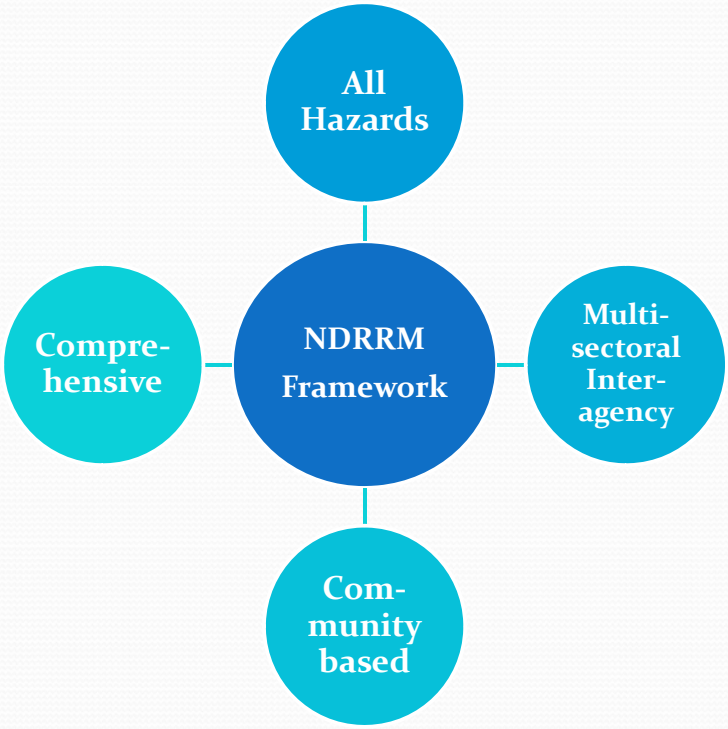
RA 10121 is about....

- Constitutional rights to life and property by **addressing the root causes of vulnerability to disasters**
- Adherence to and adoption of **universal norms, principles and standards**
- Adoption and implementation of a **holistic, comprehensive, integrated, and responsive DRRM agenda** to lessen the socio-economic and environmental impacts of disasters, including climate change
- **Mainstreaming DRR and CCA and mitigation in development processes, peace process and conflict resolution**
- Ensuring that **DRR and CCA measures are gender responsive, sensitive to indigenous knowledge systems and cultures and rights-based**
- **Recognizing local risk patterns and strengthen LGU capacity** through decentralized powers
- **Participation of all sectors and stakeholders (CSOs, private sector, volunteers) and local communities** towards complementation of resources and effective service delivery

Ongoing Programs and Projects

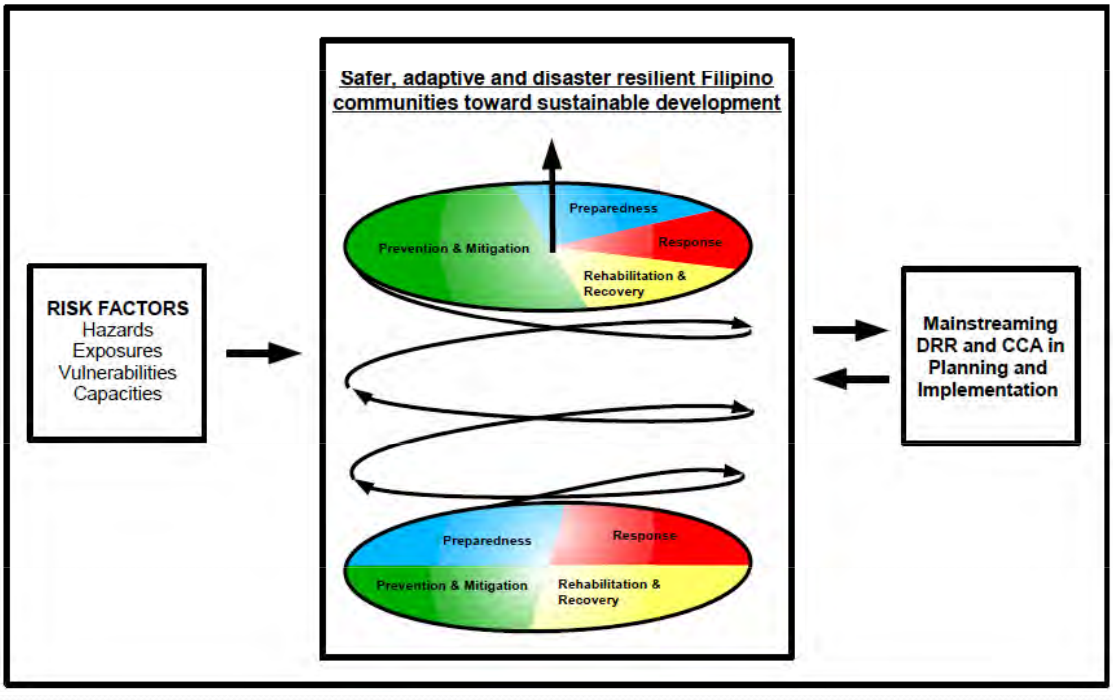


RA 10121 states that...



To be reviewed every 5 years, or as necessary, to ensure relevance.

National Disaster Risk Reduction and Management Framework



Vision: **Safer, adaptive and disaster-resilient Filipino communities towards sustainable development**

The National DRRM Framework

Because the country is challenged by increasing disaster and climate risks caused by dynamic combinations of natural and human-induced hazards, exposure, and people's vulnerabilities and capacities…

There is an urgent need for the country to work together through multi-stakeholder partnerships and robust institutional mechanisms and processes so that Filipinos will be able to live in safer, adaptive and disaster resilient communities on the path to developing sustainably.

This DRRM framework indicates the paradigm shift towards a proactive and preventive approach to disaster management.

- It emphasizes that resources invested in disaster prevention, mitigation, preparedness and climate change adaptation will be more effective towards attaining the goal of adaptive, disaster resilient communities and sustainable development.
- The Framework shows that mitigating the potential impacts of existing disaster and climate risks, preventing hazards and small emergencies from becoming disasters, and being prepared for disasters, will substantially reduce loss of life and damage to social, economic and environmental assets.

The National DRRM Framework

It also highlights the need for effective and coordinated humanitarian assistance and disaster response to save lives and protect the more vulnerable groups during and immediately after a disaster.

Building back better after a disaster will lead to sustainable development after the recovery and reconstruction process.

The upward motion indicated by the spiraling arrows represents a bottom-up participatory process, enhanced level of awareness, strengthened multi-stakeholder partnerships, and pooling of resources.

- Mainstreaming DRR is a means towards:
  - Refocusing the development goals, objectives and targets to be able to adequately respond to disaster risks; and
  - Identifying and implementing appropriate interventions to address the impacts of disaster risks.
- Mainstreaming DRR is an important step towards avoiding huge losses from disasters.
- These processes will synergize efforts and create rippling positive changes toward addressing the underlying causes of vulnerabilities and mainstreaming DRRM in national and local policy-making, planning, investment programming and in the policy/plan implementation.

Principles of the NDRRMF

- Address the underlying causes of vulnerability
- A national responsibility within and towards a sustainable development approach
- Need for community empowerment and shared responsibilities
- Good responsive goverenance
- Mutually reinforcing partnerships
- Strong and responsive political will, commitment and leadership
- Best done through local and customized adoption and adaptation

National Disaster Risk Reduction and Management Council (NDRRMC)

DND
Chair

DILG
Vice-Chair
Preparedness

DSWD
Vice-Chair
Response

DOST
Vice-Chair
Prevention &
Mitigation

NEDA
Vice-Chair
Rehabilitation
& Recovery

MEMBERS:

AFP | DA | DBM | DENR

DOJ | DOLE | DepEd

DOH | DOE | DOT | DOTC

DTI | PNRC | OCD

Executive Secretary

NEW MEMBERS:

CHED | CCC | DPWH | DFA

HUDCC | GSIS | NCRFW | OPAPP

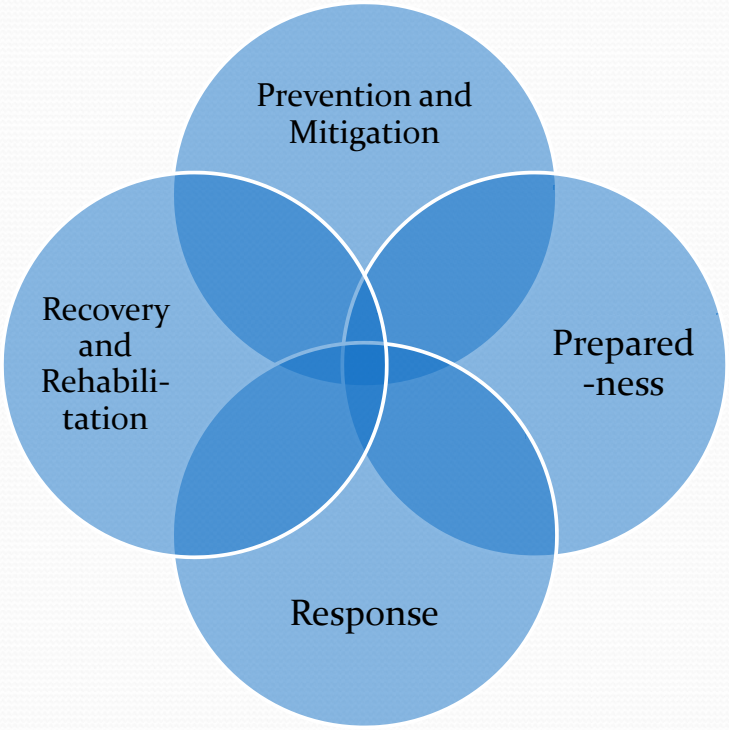
PHIC | PNP | SSS | LCP

LPP | LMP | LMB | ULAP

NAPC-VDC | Press Secretary | Private Sector

CSO | CSO | CSO | CSO

DRRM Aspects



- These aspects coincide with the 4 vice chairpersons of the NDRRMC.
- They are not phases and can happen at different stages or even alongside each other.
- They mutually reinforce each other.

Prevention and Mitigation

- Lead: Department of Science and Technology (DOST)
- Outcome: Avoid hazards and mitigate their potential impacts by reducing vulnerabilities and exposure and enhancing capacities of communities
- Key Result Areas
  1. Mainstreamed and integrated DRR & CCA in national, sectoral, regional and local development, policies, plans and budget.
  2. DRRM/CCA sensitive environmental management.
  3. Increased disaster resiliency of infrastructure systems.
  4. Community based and scientific DRR/CCA assessment, mapping, analysis and monitoring.
  5. Risk transfer mechanisms

Preparedness

- Lead: Department of the Interior and Local Government (DILG)
- Outcome: Establish and strengthen capacities of communities to anticipate, cope and recover from the negative impacts of emergency occurrences & disasters
- Key Result Areas
  1. Community Awareness and understanding of the Risk Factors
  2. Contingency Planning at the local level (to include Incident Command System, Early Warning Systems, Pre-emptive evacuation, stockpiling and equipping)
  3. Local drills and simulation exercises
  4. National disaster response planning

Response

- Lead: Department of Social Welfare and Development (DSWD)
- Outcome: Provide life preservation and meet the basic subsistence needs of affected population based on acceptable standards during or immediately after a disaster
- Key Result Areas
  1. Damage and needs assessment
  2. Relief Operations
  3. Search, Rescue, Retrieval
  4. Dissemination/Information sharing of disaster-related information
  5. WATSAN and Health
  6. Development/provision of temporary shelter
  7. Psycho social support
  8. Early Recovery Mechanism
  9. Management of Dead and Missing
  10. Evacuation Management
  11. Social Protection Intervention
  12. Civil and uniformed services coordination

Rehabilitation and Recovery

- Lead: National Economic and Development Authority (NEDA)
- Outcome: Restore and improve facilities, livelihood and living conditions and organizational capacities of affected communities, and reduced disaster risks in accordance with the "building back better" principle
- Key Result Areas
  1. Livelihood
  2. Shelter
  3. Infrastructure

Cross-Cutting Concerns

1. Health
2. Human-induced disasters
3. Gender mainstreaming
4. Environmental protection
5. Cultural sensitivity / indigenous practices
6. Rights-based

Strategies

1. Advocacy and IEC
2. Competency-based capability building
3. Contingency planning
4. Education on DRRM and CCA for all
5. Institutionalization of DRRMCs and LDRRMOs
6. Mainstreaming of DRR in ALL plans
7. Research, Technology Development and Knowledge Management
8. Monitoring, Evaluation and Learning
9. Networking and Partnership-building

OFFICE OF CIVIL DEFENSE

Vision:

A service-oriented organization
A prepared nation
A safe population

The OCD serves as Operating Arm and Secretariat of the NDRRMC.

Mission: **To administer a comprehensive national civil defense and civil assistance program by providing leadership in the continuous development of measures to reduce risk to communities and manage the consequence of disasters.**

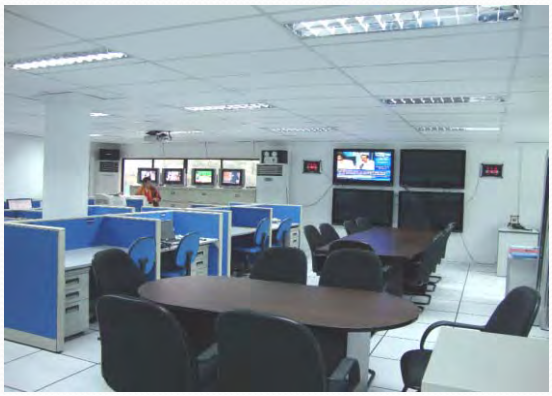
DRM Section 8. and IRR Rule 7 Section 1

Mandate –The Office of Civil Defense (OCD)
as the implementing arm of the National Council, shall have the primary mission of administering a comprehensive national civil defense and disaster risk reduction and management program by providing leadership in the continuous development of strategic and systematic approaches as well as measures to reduce the vulnerabilities and risks to hazards and manage the consequences of disasters.

OFFICE OF CIVIL DEFENSE

NATIONAL DISASTER RISK REDUCTION AND MANAGEMENT CENTER

. . . the nerve center for alert and monitoring, resource mobilization, response coordination and information management

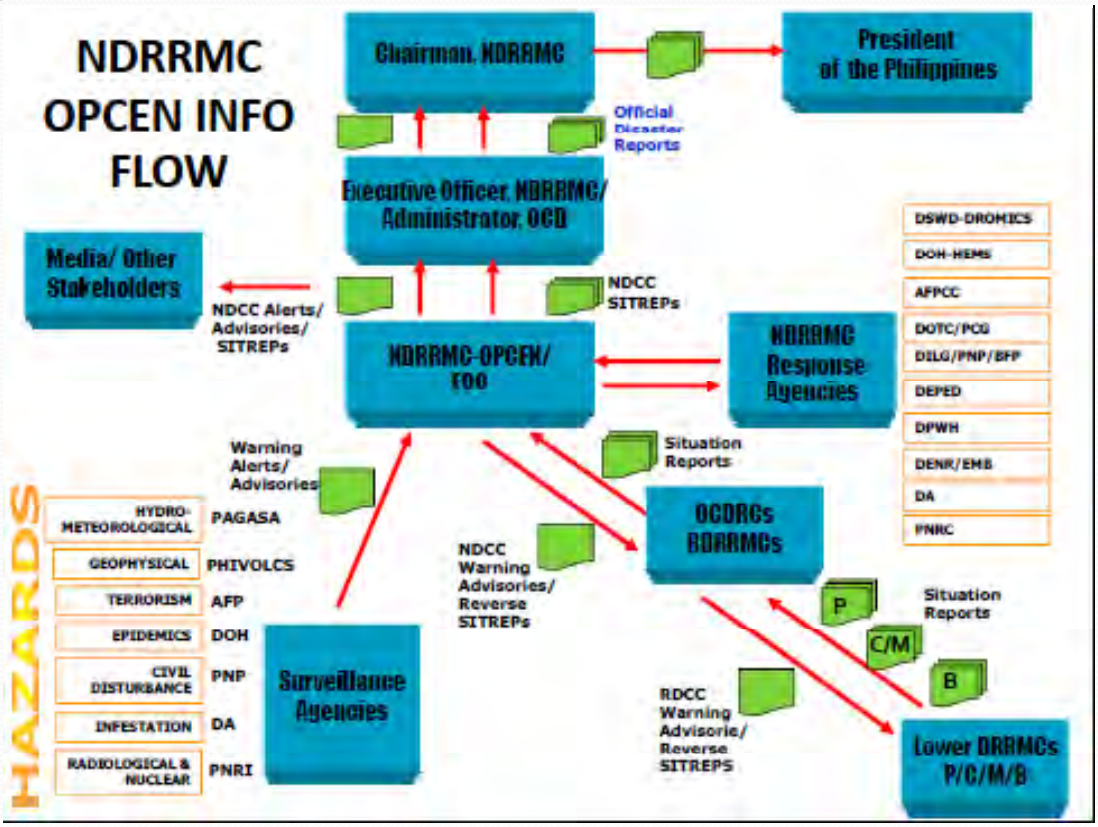


Operates on a **24/7 basis**

Manned by OCD personnel round-the-clock, with complementation from selected NDRRMC member-agencies such as DSWD, DOH, AFP, DPWH, PNRC during emergency situations

Core Functions

- **Alert and Monitoring**
- **Multi-agency Operational Coordination**
- **Response Resource Mobilization**
- **Information Management, and**
- **Program Coordination for Operations Capability Upgrade**



NDRRMC OpCen during RED ALERT ACTIVATION EMERGENCY OPERATION CENTER (EOC)

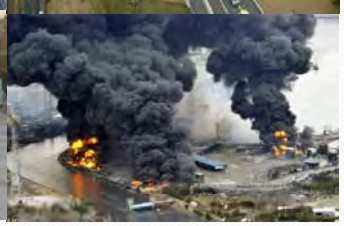
JAPAN'S DISASTER MANAGEMENT SYSTEM

NATURAL HAZARDS IN JAPAN









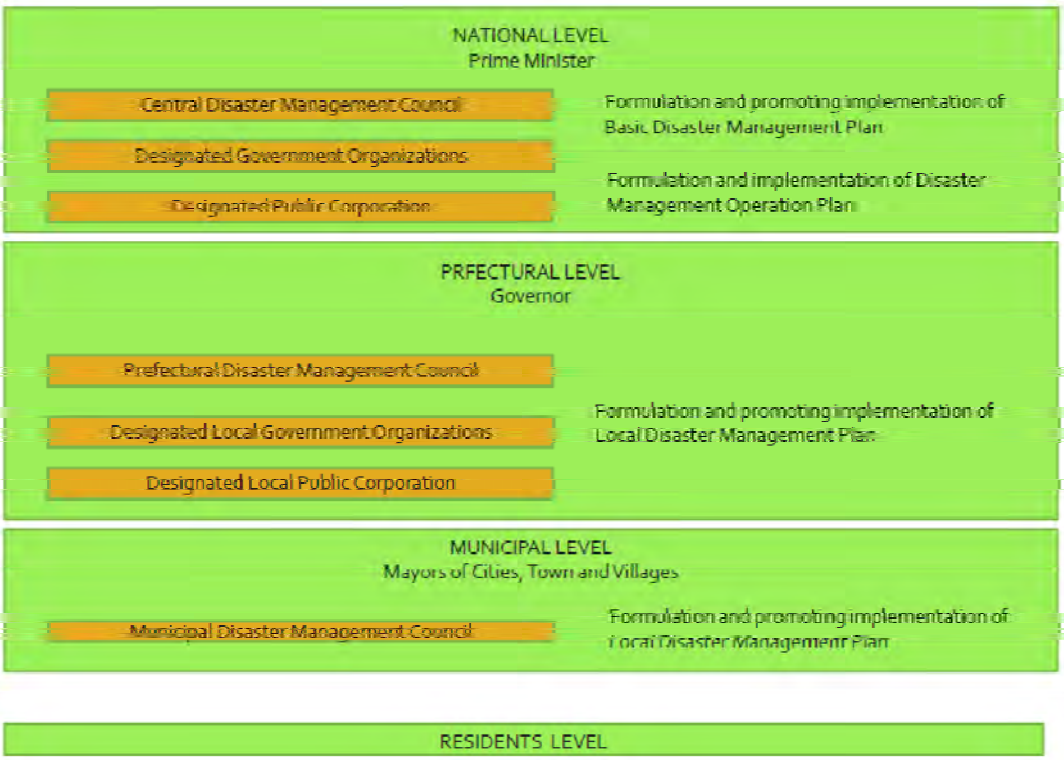
- Earthquake
- Volcanic Eruption
- Typhoon
- Flooding
- Landslide

Top 10 Natural Disasters in Japan
for the period 1900 to 2011
sorted by economic damage costs:

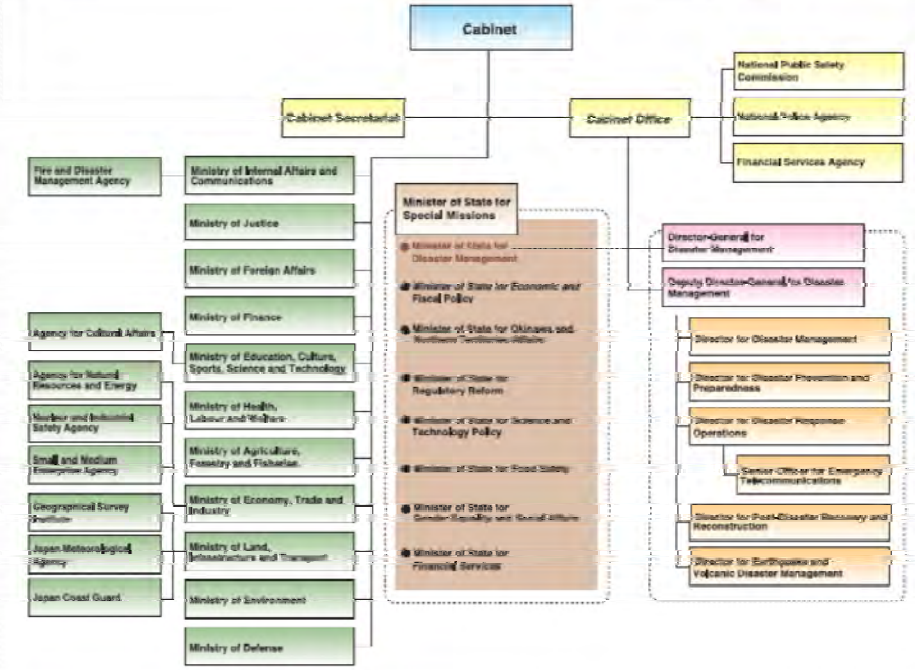
Disaster	Date	Damage (000 US$)
Earthquake (seismic activity)	11-Mar-2011	210,000,000
Earthquake (seismic activity)	17-Jan-1995	100,000,000
Earthquake (seismic activity)	23-Oct-2004	28,000,000
Earthquake (seismic activity)	16-Jul-2007	12,500,000
Storm	27-Sep-1991	10,000,000
Storm	3-Sep-2004	9,000,000
Flood	10-Sep-2000	7,440,000
Storm	22-Sep-1999	5,000,000
Storm	17-Sep-1990	4,000,000
Storm	22-Sep-1998	3,000,000

Source:"EM-DAT: The OFDA/CRED International Disaster Database, www.emdat.be - Université catholique de Louvain - Brussels - Belgium"

DISASTER MANAGEMENT ORGANIZATION



Organization of National Government and Cabinet Office (Disaster Management)



Mission of the Cabinet Office

- To integrate and coordinate disaster reduction policies and measures of ministries and agencies.
- To secure cooperation and collaboration among related government organization
- To undertake planning of basic disaster management policies and response to large - scale disasters
- To strengthen risk management function to address emergencies such as large - scale disasters and serious accidents

Organization of Central Disaster Management Council

Prime Minister
Minister of State for Disaster Management

Inquiry ↑ Report ↑ Offer Opinion

Central Disaster Management Council

Chair	Prime Minister		
Members of the Council	Minister of State for Disaster Management and all Cabinet Ministers	Heads of Designated Public Corporations (4) - Governor of the Bank of Japan - President of the Japanese Red Cross Society - President of NHK - President of NTT	Academic experts (4)

Committees for Technical Investigation
- Nationwide movement for DM
- Tonankai & Nankai Earthquake
- Tokyo Inland Earthquakes

etc.

Secretary Organization

Chair	Parliamentary Secretary of the Cabinet Office
Adviser	Deputy Chief Cabinet Secretary for Crisis Management
Vice-Chair	Director-General for Disaster Management, Cabinet Office Deputy Manager of Fire and Disaster Management Agency
Secretary	Relevant director-generals of each ministry and agency

Central Disaster Management Council

Chairperson – Prime Minister

Members

- 17 Head of all ministers
- Head of all Designated Public Corporations
- Governor of the Bank of Japan
- President of Japanese Red Cross Society
- President of Nippin - Hoso Kyokai (Japan Broadcasting Corporation)
- NTT
- President of Nippon Telegraph and Telephone Corporation
- Experts

Duties

- Formulate and promote implementation of the Basic Disaster Management Plan and Earthquake Countermeasures Plans.
- Formulate and promote implementation of the urgent measures plan for major disasters
- Deliberate important issues on disaster reduction according to request from the Prime Minister or Minister of State for Disaster Management (basic disaster management policies)
- Other opinions regarding important issues on disaster reduction to the Minister and Minister of State for Disaster Management

Basic Disaster Management Plan

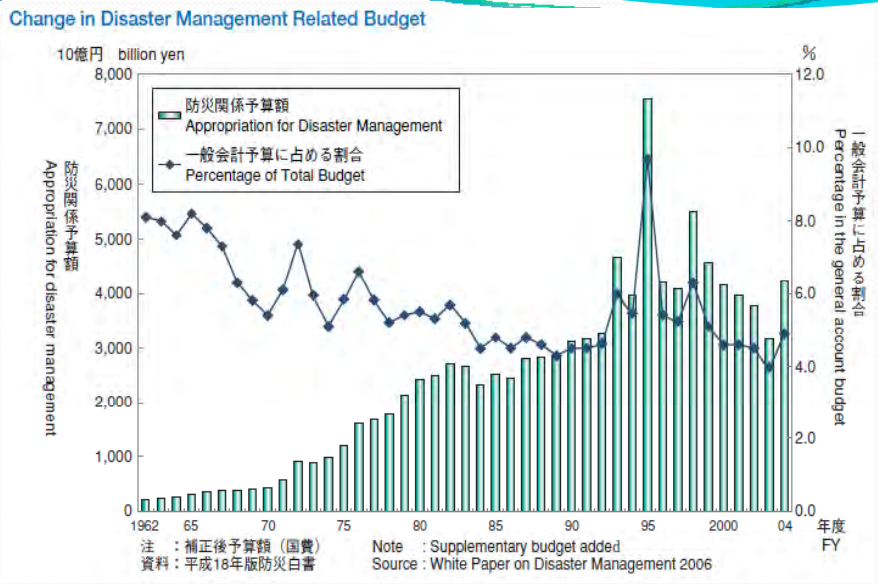
This plan is a basis for disaster reduction activities and is prepared by the Central Disaster Management Council based on the Disaster Countermeasures Basic Act.

Disaster Management Operation Plan

This plan is made by each designated government organization and designated public corporations based on the Basic Disaster Management Plan.

Local Disaster Management Plan

This plan is made by each prefectural and municipal disaster management council, subject to local circumstances and based on the Basic Disaster Management Plan.

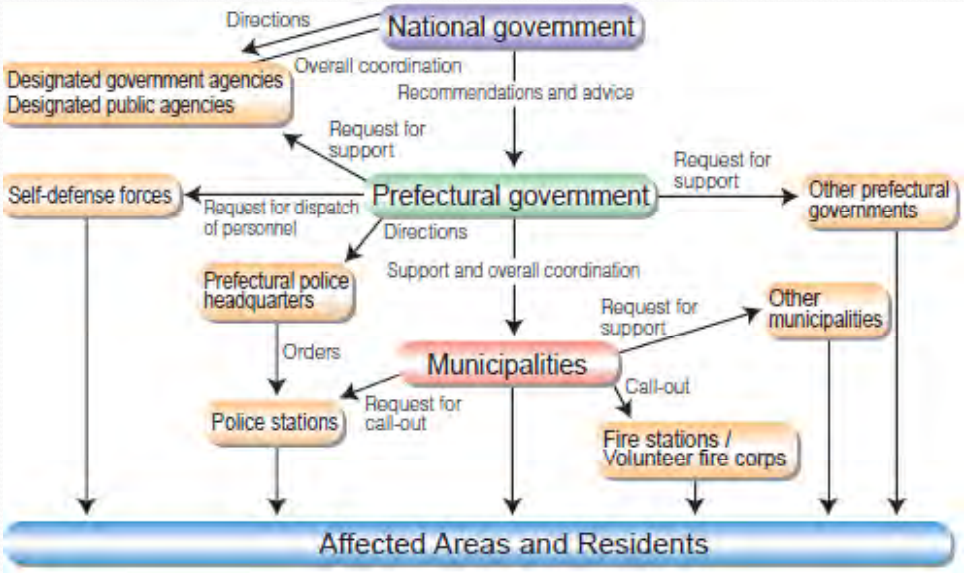


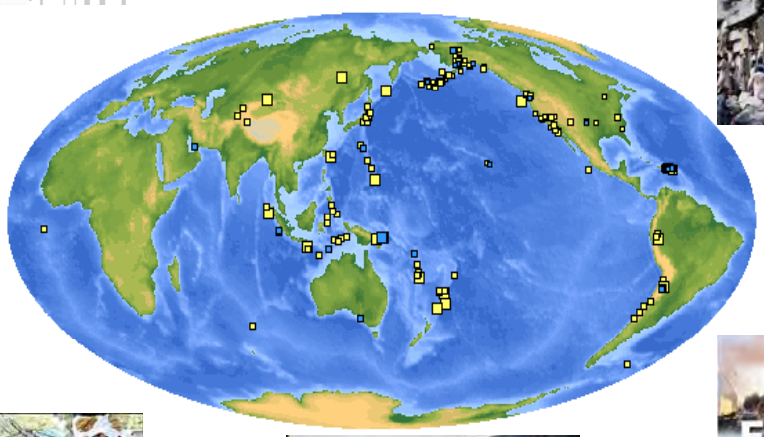
Disaster Management Budget

The national budget for disaster management is approximately 4.5 trillion yen which is approximately 5% of the budget for general accounts

Scientific and Technology Research	-	1.3%
Disaster Prevention and Preparedness	-	23.6%
National Land Conservation	-	48.7%
Disaster Recovery and Rehabilitation	-	26.4%

DISASTER RESPONSE MECHANISM





Earthquakes may cause significant impact to life, property and economy

HAZARDS POSED BY EARTHQUAKE

Ground Shaking

Ground Rupture

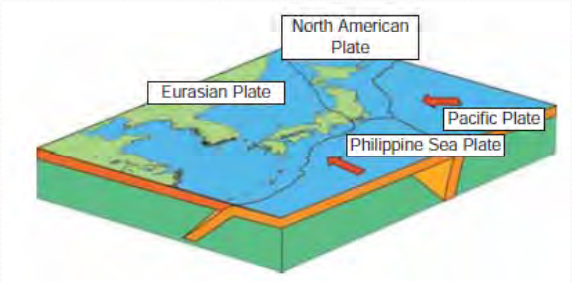
Liquefaction

Landslide

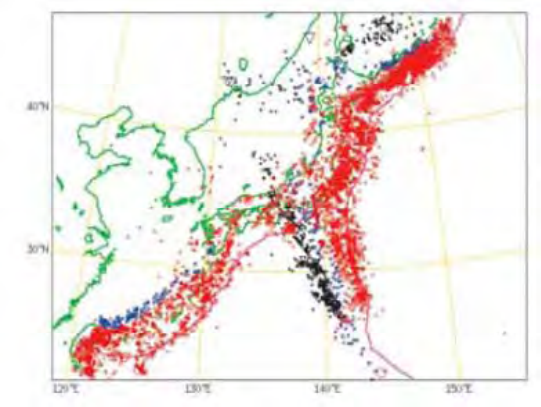
Tsunami

Fire

Earthquake Occurrences in JAPAN

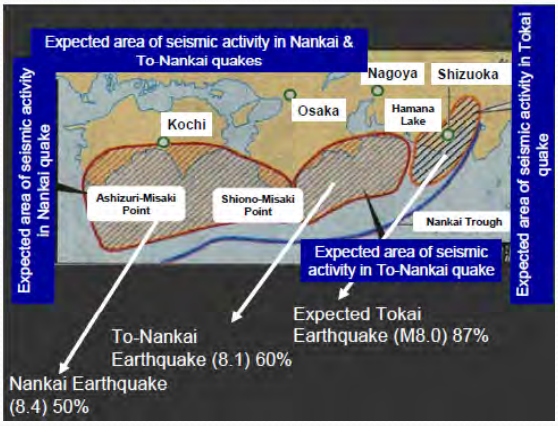


Around Japan, the Pacific Plate and the Philippine Sea Plate are subducting beneath the continental plates (Eurasian Plate and North American Plate) from east and south, respectively and earthquakes often occur along the boundaries.



Earthquakes around Japan Crustal Plates
around Japan (M4.0 or greater in 1995-2004, JMA)

Estimation of damage caused by possible EQs



Tokai, To-Nankai and Nankai earthquakes and their characteristics

(Maximum cases)	Tokai EQ	Tonankai Nankai EQ	Kobe EQ 1995
Victims (persons)	**9,200** (7,900 by strong tremors)	**18,000** (8,600 by tsunamis)	6,436
Houses destroyed	**260,000**	**360,000**	105,000
Economic loss (billion yen)	**37,000**	**57,000**	10,000

Earthquake Disaster Risk Reduction Strategy

(formulated by Central Disaster Management Council on 30 March 2005)

Setting an overarching goal
for disaster risk reduction in the next decade

To halve the estimated death toll and economic loss

Tokai EQ

- Death toll : 9,200 persons → 4,500
- Economic Loss : 37 trillion yen → 19 trillion yen

☆Strategic goal (ex.)

- Increase the ratio of retrofitted houses : 75% (2003) → 90% (2015)

Tonankai & Nankai EQ

- Death toll : 17,800 (8,600 by tsunamis) → 9,100
- Economic Loss : 57 trillion yen → 31 trillion yen

☆Strategic goal (ex.)

- Every municipality at risk is expected to develop hazard maps in 2015

DISASTER PREVENTION AND PREPAREDNESS

- National land conservation
- Observing, forecasting and warning of disaster risk
- Information and communication system
- Integrated disaster management information system
- Development of disaster management bases
- Issuing of evacuation orders and instruction
- Measures for people requiring assistance during disasters
- Disaster reduction drills and exercises

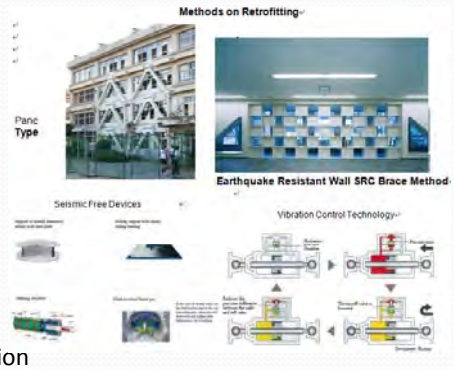
EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES

JMA Seismic Station

Communication Facilities in Shelter

Seismometer and Seismic Intensity Meter in Box

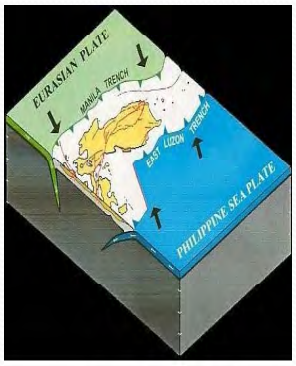
JAMSTEC DONET PROJECT



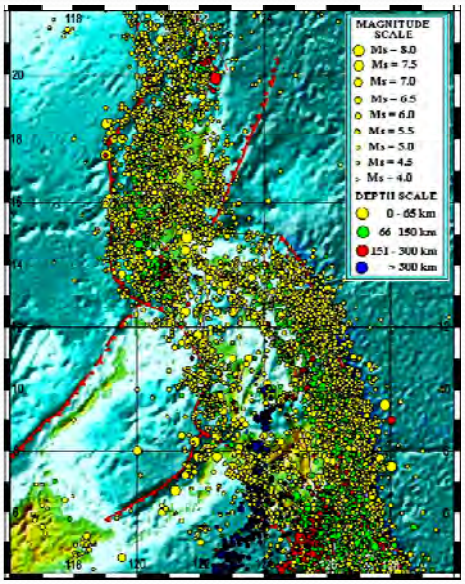
- Observation system
  a. Japan Meteorological Agency
  b. JAMSTEC Dense Oceanfloor Network system for Earthquakes and Tsunamis (DONET)
- Earthquake Proofing of Houses and Buildings
- Coastline Projects
- Disaster Awareness Enhancement and Disaster Knowledge Dissemination
- Improvement of Environment for Disaster Reduction Volunteer Activities
- Promotion of the Recovery Plan

Earthquake Occurrences in the PHILIPPINES

Active Faults & Trenches in the Philippines



Subducting Plates under Luzon Island



- *20 earthquakes recorded per day*
- *~ 200 felt per year*
- *~ 90 destructive earthquakes in past 400 years*
- *~ 40 tsunamis in past 400 years*

PROFILE OF METRO MANILA

COMPOSITION:

- **14 Cities & 3 Municipalities**
- **1,690 Barangays**

LAND AREA - 636 sq. km. (0.2% of Philippines)

POPULATION - 9.8 million (2000)

DENSITY - 16,490 persons/km2

HOUSEHOLDS - 2.0 million (average of 5/household)
approx. 3.5 million are informal dwellers

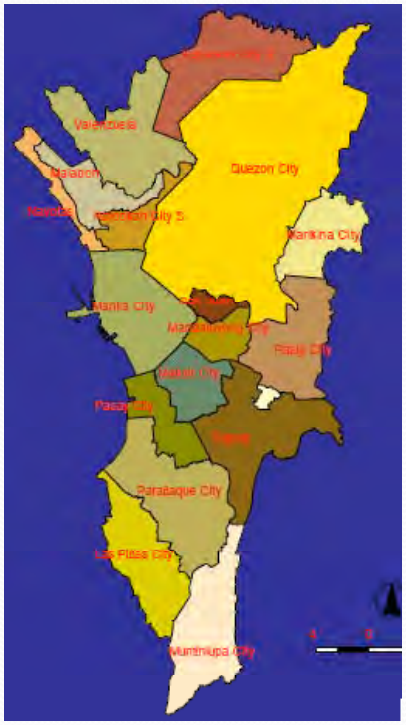
GDP -~ $25.5 Billion

BUILDINGS -~1,300,000 (Residential)

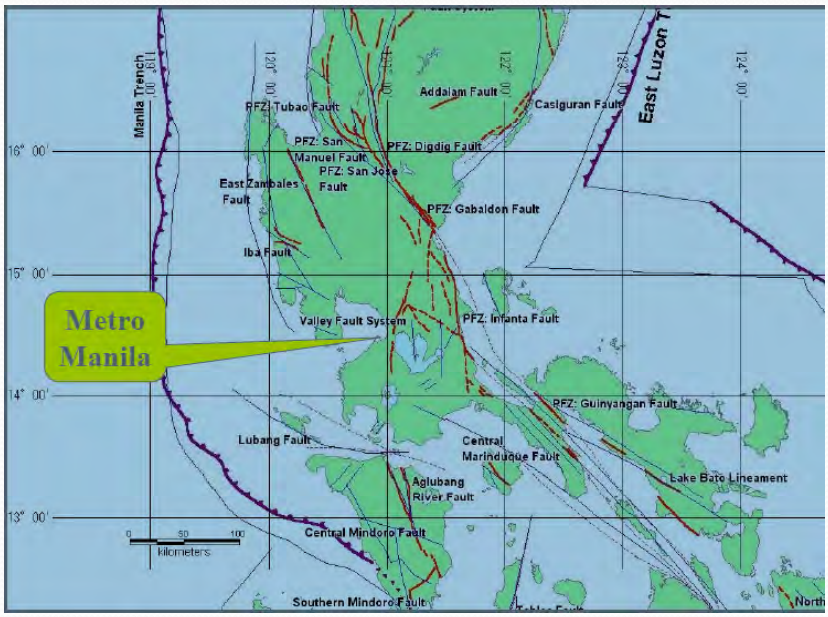
INFRA & TRANSPORT
- **domestic and international seaports**
- **domestic and international airports**
- **3 elevated mass transport system**
- **elevated hi-way and flyovers**

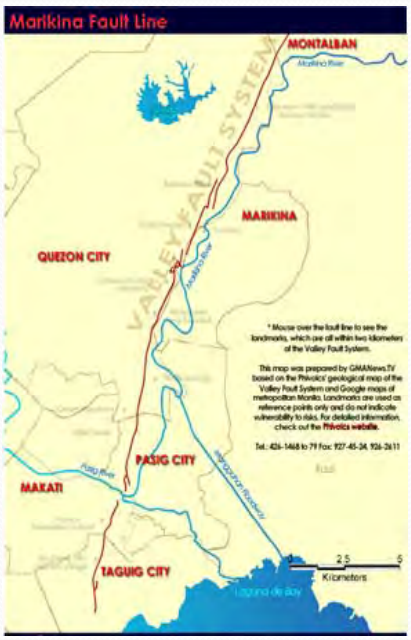
HOSPITALS -177 (26,400-bed capacity)

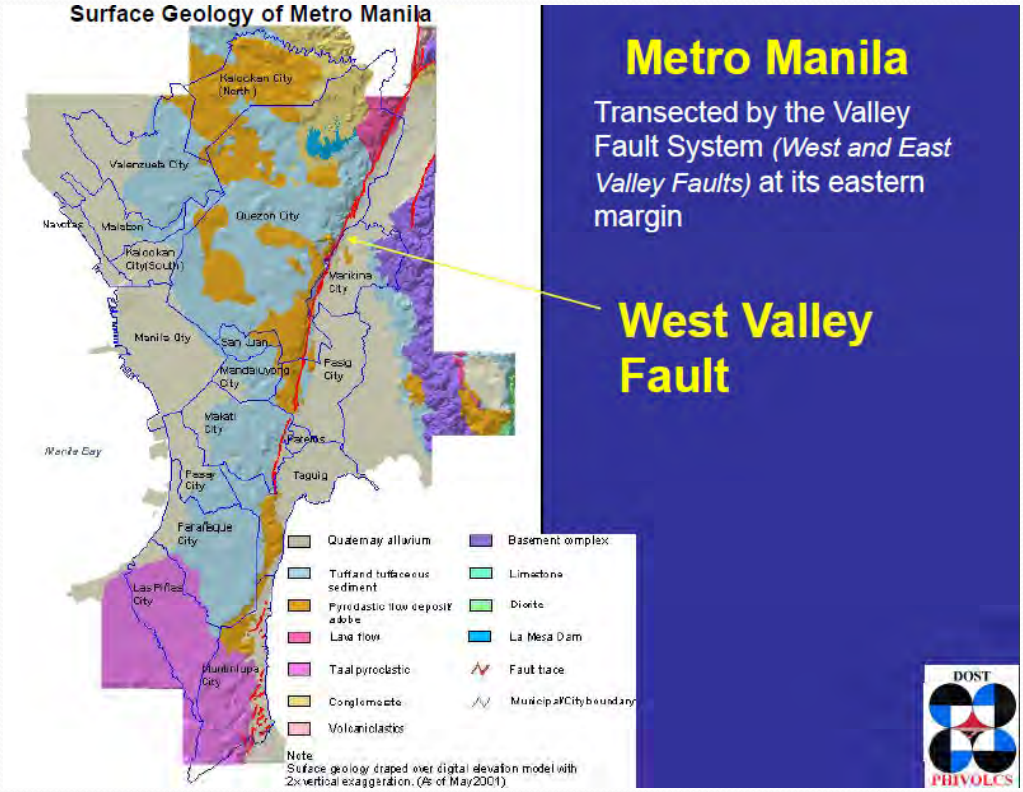
SCHOOLS -1,410



ACTIVE FAULT AND TRENCHES AROUND METRO MANILA







Metro Manila Earthquake Impact Reduction Study (MMEIRS)

Objective:

1) **Evaluate seismic hazards, damages and vulnerability of Metro Manila**
2) **Prepare framework of master plan for earthquake disaster management**

Goal:

- Development of a National System Resistant to Earthquake Impact
- Improvement of Metro Manila's Urban Structure
- Enhance Current Risk Management
- Enhancement of Community Disaster Management Capacities
- Formulation of Reconstruction System
- Promotion of Research and Technology Development

Metro Manila Earthquake Impact Reduction Study (MMEIRS)

Earthquake Impact Scenario

Magnitude 7.2 Earthquake from the West Valley Fault will cause:

- Could damage approximately 38% of the residential buildings (total 1.3 M), 38% of the 10-30 story buildings (total 981), 14% of the 30-60 story buildings (total 119), 30-35% of public buildings
- Estimated 33,500 deaths and 114,000 injuries
- Additional 18,000 deaths from fire
- 9 bridges might be affected; 4000 water pipes or joint breaks, 30 km electrical cables cut, 95 km communication cables cut

Possible Regional Separation

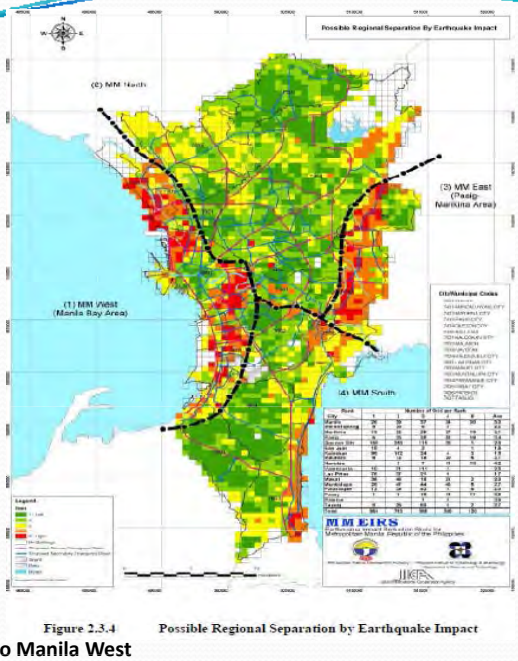


Figure 2.3.4 Possible Regional Separation by Earthquake Impact

Metro Manila West

Western part of Metropolitan Manila will be isolated from other part of Metropolitan Manila by fire and building collapse

Metro Manila North and Metro Manila South

Northern and Southern part of Metropolitan Manila will be separated by the building collapse and the geographical condition. The area between Mandaluyong and Makati has a high possibility of building collapse; Moreover, Pasig River is running east-west which is naturally disadvantageous in terms of separation.

Metro Manila East

All road networks running east-west, which are on the fault will be broken due to the movement. Other roads running north-south near in fault areas will be difficult to use, due to the high number of building collapse.

EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES

Office of Civil Defense – NDRRMC Activities

- Implementation and conduct of the following:
  - Quarterly Nationwide Earthquake Drills for Schools
  - Project BEEP (Building Earthquake Evacuation Plan)
  - Contingency Planning Formulation for Earthquake Hazards
  - "Safe Ka Ba?" Slogan
- Inclusion of Earthquake Preparedness in all disaster management training programs
- Development of Video Manual
- Conduct of Community Drills
- Conduct of Incident Command System Training to all response groups
- Media Advocacy …… Emergency Preparedness on Air
- Conduct of Simulation Exercises on Earthquake Preparedness
- Forging of Memorandum of Agreement with Volunteer Response Groups
- Capacity Building of LGUs and other response groups
- Launching of Task Force Urban Search and Rescue NCR and Region 3
- Development of Information, Education and Communication Materials

Disaster Preparedness of Metro Manila Municipalities and Cities

The Metro Manila Mayors (Marikina City, Makati City, Quezon City, Pasig City Taguig City, Pateros, Pasay City and Muntinlupa) together with their respective disaster preparedness partners are continuously studying and revisiting their respective national framework for disaster risk management. They provide programs, projects and activities on preparedness, mitigation, operational response and recovery in emergency situations. They also ensure effective coordination of resources and operatives to, during and after disasters.

EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES

METROPOLITAN MANILA DEVELOPMENT AUTHORITY

the lead agency of disaster management efforts in Metro Manila

Disaster Management activities that have been undertaken

- Structural Inspections and retrofitting – annual activity of the Department of Public Works and Highways (DPWH) to all bridges and fly-overs
- Drainage systems clearing, reconstruction, and flood Control facilities maintenance – the MMDA in collaboration with DPWH work on clearing and dredging of canals, rivers and others waterways
- Removal, relocation and evacuation of settlers from risk areas

- Hazards Awareness and Disaster Consciousness projects – July 1-7 of every years declared as Disaster Consciousness Week; demonstration on Rescue and Evacuation, First Aid and Pre-emergency Care; giving awards to personnel that do heroic acts in cases of emergencies.
- Capacity-building to improve emergency response-emergency response personnel undergo rigid training on rescue and evacuation, helicopter and high-rise building rappels, first aid, underwater rescue operation, etc.

- Emergency Preparedness Training and Disaster Management Seminars
- Enforcement of Standards and Rules on Structures, Land Use, and Zoning – e.g. national Building Code; Metro Manila Zoning Ordinance 81-01
- Review and update of current laws and codes with safety implications – Fire Codes of the Philippines and National Building Code
- Preparedness and Response Plans Formulation, Review and Updating

EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES

METROPOLITAN MANILA DEVELOPMENT AUTHORITY

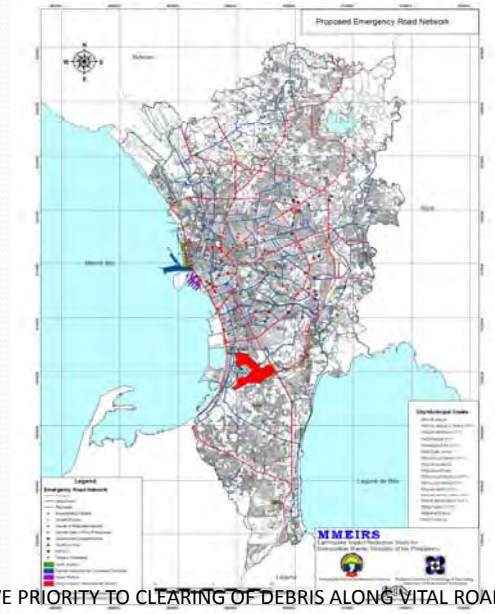
the lead agency of disaster management efforts in Metro Manila

- Instituted a 24-hour Emergency Response System and upgrade the existing Metro Manila Emergency Operations Control and Coordinating Center (upgraded in terms of equipment and vehicle support)
- Developed and implementation emergency response training modules (eight modules for LGUs, NGOs, MMDA and students)

- Conducted emergency drills and training of around 4,000 students, educators, traffic enforcement officers, armed forces reservists, drivers, and others
- Evacuated people from flood-risk areas during height of tropical cyclones and rains
- Provided the public with the information, warnings and advisories prior to and during times when there were hazards and emergency incidents
- Responded the calls for non-emergency medical assistance
- Complemented others agencies` efforts in drainage systems clearing

- **The Metro Manila Development Authority (MMDA)** and the 17 mayors of Metro Manila have agreed to tie up with the **Philippine Institute of Civil Engineers (PICE)** to address earthquake preparedness and risk reduction in the National Capital Region.
- Engineers from PICE, a non-government organization, have volunteered to conduct metro-wide inspections of various buildings and structures to assess their structural soundness and safety.

EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES



- GIVE PRIORITY TO CLEARING OF DEBRIS ALONG VITAL ROAD NETWORK TO FACILITATE MOVEMENT OF EMERGENCY SERVICES AND EVACUATION
- ENSURE LINK BETWEEN PORTS AND EOCS OR FROM HIGH-IMPACT AREAS TO MEDICAL FACILITIES
- OPTIMIZE UTILIZATION OF PNR, MRT AND LRT TRACKS FOR MOVEMENT OF SUPPLIES EVEN IF THERE IS NO POWER MAKING USE OF MAKESHIFT DIESEL OPERATED ENGINES OR HUMAN-OPERATED TROLLEYS

OPEN SPACES FOR MASS EVACUATION

- GOLF COURSES
- OPEN SUBDIVISIONS
- SPORTS ARENAS
- SAFE SCHOOL GROUNDS
- CEMETERIES

EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES

◆ **"Hazards Mapping and Assessment for Effective Community-based Disaster Risk Management" or READY Project**

READY Project Objective:

• To address the problem of Disaster Risk Management (DRM) at the local level

Key Problems:

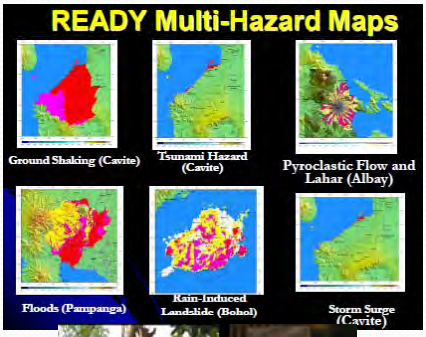
- Lack of appropriate hazards maps
- Lack of community based hazard monitoring and warning systems
- Need to increase capabilities of communities in implementing activities and measures for disaster reduction such awareness and preparedness; contingency and development planning

STRATEGIES TO ACHIEVE OBJECTIVE

- National Level: institutionalize and standardize DRM measures and processes
- Community Level: empower the most vulnerable municipalities and cities in the country

EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES

"Hazards Mapping and Assessment for Effective Community-based Disaster Risk Management" or READY Project



- **Covers 27 Provinces**

COMPONENTS:

1.Multi-hazard identification and assessment

2.Community-Based Disaster Preparedness
- Community-Based Early Warning System (CBEWS) for Floods
- Community-Based Early Warning System (CBEWS) for tsunami
- Information, Education and Communication (IEC)

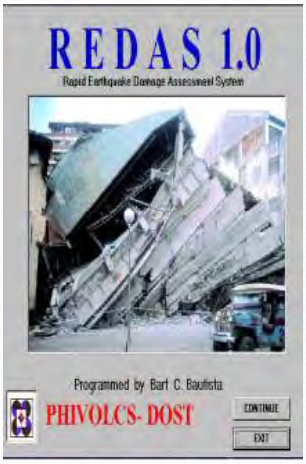
3. Initiate the mainstreaming of risk reduction into the local development planning process through the provision and training on the use of REDAS software

EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES

Community-based Early Warning System (CBEWS)

Empower individuals & communities threatened by hazards to act in sufficient time & in an appropriate manner

EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES



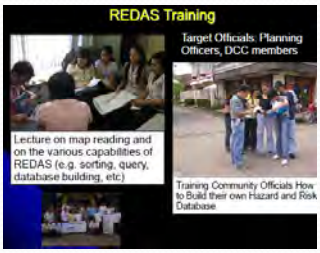
◆ **REDAS** (Rapid Earthquake Damage Assessment System)

A simple and user-friendly simulation tool or software that can give a rapid estimate of the possible seismic hazards which can be used for inferring the severity of impacts to various elements-at-risk.

REDAS aims

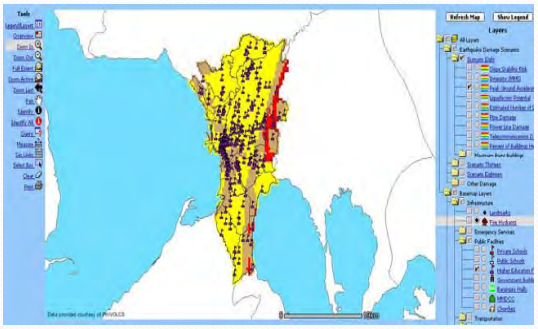
➢ to provide quick and near real-time simulated earthquake hazard information to disaster managers which will help them in assessing the distribution and extent of the impacts of a strong earthquake. This could help them to decide and prioritize the deployment of timely rescue and relief operations.

➢ The second objective is for the software to serve as a tool in convincing land use planners, policy makers, city and town development planners and even local government executives to consider earthquake hazards in their planning and development efforts so as to ensure long-term mitigation of seismic risks.



EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES

◆ **Manila Map Viewer**



A GIS-based Internet tool and is currently being implemented as a prototype for earthquakes in Metro Manila, Philippines. The Metro Manila Map Viewer allows users to retrieve useful information and maps from datasets including hazards, transportation, public facilities, emergency services, elevation, land use/zoning, and high-resolution imagery.

The Metro Manila Map Viewer is part of the **risk communication tools** that are jointly being developed and endorsed by the **Pacific Disaster Center** (PDC), and the **Earthquakes and Megacities Initiative** (EMI) to facilitate information sharing, and to promote city stakeholders participation, ownership transfer, and a better understanding of the linkages between disaster risk reduction and development progress.

◆ **Installation of Earthquake Intensity Meters**

It contains a tiny monitor and equipped with data communication capabilities. The sensors in the meters will instantly calculate the intensity of the tremor felt and then transmit data to the database

The quake meters would allow seismologists to spread alerts for tsunamis and landslides faster and, ultimately, save more lives. Several of these meters are to be placed in Metro Manila and neighboring provinces, populated areas that lie along fault lines. The rest will be installed throughout the archipelago.

EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES

◆ Program for Enhancement of Emergency Response (PEER)

- is a regional **training program** initiated in 1998 by the U.S. Agency for International Development Office of Foreign Disaster Assistance (USAID/OFDA) and managed by National Society for Earthquake (NSET) to strengthen disaster response capacities in four Asian countries: India, Indonesia, Nepal, and the **Philippines**.

Program Objectives:

- Establish and strengthen the capability of PEER countries to provide collapsed structure, search and rescue support, as well as basic and advanced life support, beginning with first responder agencies and continuing with personnel in medical facilities.
- Develop a training system that continually provides disaster response with qualified personnel for search and rescue and medical first response and medical facilities prepared to receive victims. Establish a coordinating network of emergency and medical response and training institutions and individuals in PEER countries that ensure the continuation of the PEER process and further promote its evolution

PEER curriculum includes four interrelated courses:

- Medical First Responder (MFR)
- Collapsed Structure Search and Rescue (CSSR)
- Hospital Preparedness for Emergencies (HOPE)
- Training for Instructor (TFI)

EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES

Department of Education (DepEd)
Commission of Higher Education (CHED)

◆ *Section 14 of RA 10121*: "Integration of Disaster Risk Reduction into the School Curricula and Sangguniang Kabataan (SK) Program and mandatory training for the Public Sector Employees"
- Building Safe Learning Environment – **SAFE SCHOOL PROJECTS**

◆ Issued Memo No. 300 dated August 23, 2006 to all DepEd Regional and Division Offices for widest dissemination the **Conduct of Quarterly Earthquake Drills in Schools**.

NATIONWIDE SIMULTANEOUS EARTHQUAKE DRILLS
REGION-WIDE (YEAR 2006 to 2010)

YEAR	SCHOOLS/GAs/OFFICES/ESTABLISHMENTS/PARTICIPANTS								TOTAL	
	SCHOOLS (Public and Private)	Number of Participants	PUBLIC/ GOVT. AGENCIES / OFFICES	Number of Participants	BUSINESS COMMERCIAL ESTABLISHMENTS/ NGOs	Number of Participants	OTHERS	Number of Participants	Schools/ Public GAs/ Business's/ Commercial/ NGOs	Number of Participants
Region I	470	388,082	6	1,105	4	110	-	-	480	389,297
Region II	2,329	832,453	-	-	-	-	-	-	2,329	832,453
Region III	8,897	4,414,000	306	11,900	111	11,400	32	1,800	9,346	4,439,100
Region IV-A	89	14,490	19	1,820	6	1,260	-	-	114	17,570
Region IV-B	2,385	804,682	9	540	-	-	-	-	2,394	805,222
Region V	159	183,230	111	25,097	4	533	-	-	274	208,860
Region VI	113	144,434	1	500	-	-	-	-	114	144,934
Region VII	596	205,862	37	1,397	13	13,432	-	-	646	220,691
Region VIII	340	26,350	9	1,185	2	600	1	100	361	28,235
Region IX	500	283,510	-	-	-	-	-	-	500	283,510
Region X	294	249,731	17	2,477	2	712	3	166	316	253,086
Region XI	1,731	1,214,192	21	3,210	5	1,378	-	-	1,757	1,218,780
Region XII	145	132,586	29	8,626	10	364	-	-	184	141,576
CAR	143	210,228	16	3,760	7	2,157	-	-	166	216,145
CARAGA	169	120,422	56	14,792	-	-	1	72	226	135,296
NCR	4,560	6,299,850	60	38,300	100	34,120	-	-	4,720	6,872,270
TOTAL	22,932	16,026,461	697	114,709	264	66,066	37	2,143	23,930	16,209,379

NOTE: BASED ON ACTUAL REPORTS SUBMITTED BY PARTICIPATING SCHOOLS/AGENCIES/OFFICES/ESTABLISHMENTS

EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES

◆ **Smart Wireless Engineering Education Program (SWEEP) Schools**

The partnership of schools and PHIVOLCS to research on low-cost remote monitoring systems for seismic data transmission and to use the selected prototype to detect ground movement.

◆ **Forging of Memorandum of Agreements** (MOA)/Memorandum of Understanding (MOU) with various agencies and stakeholders to access various resources (relief, equipment and manpower) that could be tapped in times of emergency situations

a. Department of Foreign Affairs and International Trade (DFAIT) Canada

- Canada is contributing PhP 18-million worth of Chemical, Biological, Radiological and Nuclear (CBRN) Event Preparedness Equipment to the National Disaster Coordinating Council (NDCC).
- In addition to the contribution of CBRN Event Preparedness equipment, Canada has been providing First Responder training in the Philippines since 2005. More than 500 Filipino firefighters, police personnel, soldiers, and other first responders have benefitted from this training program. The course is currently being handed over to the Philippines and will soon be completely delivered by Filipino trainers, providing participants with a locally-tailored program.

b. Association of Carriers and Equipment Leasers Inc. (ACEL)

- ACEL was organized in May of 1966 as a logical step in addressing the problems associated with the procurement and utilization of equipment needed to pursue national initiatives.

EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES

◆ **Forging of Memorandum of Agreements** (MOA)/Memorandum of Understanding (MOU) with various agencies and stakeholders to access various resources (relief, equipment and manpower) that could be tapped in times of emergency situations

c. Civil Defense Action Group Inc. (CDAG)

- CDAG train young men and women in the basic solutions that will help you to respond and attend to any troubles. We teach them how to save lives and properties, test their agility, perseverance, their efficiency, honesty and above all their dedication to volunteerism. As of today, CDAG was appointed to head the Asia-Pacific Maritime Search and Rescue Advisory Group (AMSARAG) of the Asia Pacific Network in order to create maritime emergency responders throughout the Asia Pacific Region.

d. Task Force Disaster Mitigation, Adaptation & Preparedness Strategies (DMAPS)

- It is the task force's goal to set a mechanism to realize a common goal in developing and applying science-based maps and models of natural hazards; model of vulnerable infrastructure and environment; and engineering-based technologies to reduce the associated natural risks to any infrastructure development.

e. Office on Muslim Affairs (OMA)

- Having been tasked to address various issues of the Filipino Muslim in their participation in nation-building, OMA shall collaborate with NDCC in terms of disaster preparedness and capacity building for local disaster management mindful of social-cultural sensitivities.

EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES

- **Forging of Memorandum of Agreements** (MOA)/Memorandum of Understanding (MOU) with various agencies and stakeholders to access various resources (relief, equipment and manpower) that could be tapped in times of emergency situations

f. Private Sector Disaster Management Network (PSDMN)

- As a consortium of private sector organizations' corporate social responsibility initiatives, PSDMN pledges to provide voluntary disaster management and relief services to affected communities. PSDMN hopes to further its cause of providing effective disaster response as a corporate advocacy

g. Regional Emergency Assistance Communications Team (REACT)

- As its name implies, the main objective of REACT is to provide emergency assistance in every region of the country. To achieve this, the volunteer members are required to be equipped with two way radios.
- REACT membership represents cross sections of the society, diverse in their vocations, unified by a common goal to render humanitarian service. With 73 groups in 14 regions, REACT now is considered as the largest civic communications organization in the country. Its capability is supported with 6 ambulances, 5 fire trucks and 11 radio repeaters

h. Center For Global Practices Foundation

- an agreement to develop and implement Regional Disaster Assessment and Coordination (RDC) System Program of Instruction (POI)
- development of RDAC Handbook and Development of Five Disaster Management Case Studies

EARTHQUAKE / TSUNAMI DISASTER COUNTERMEASURES

- **Forging of Memorandum of Agreements** (MOA)/Memorandum of Understanding (MOU) with various agencies and stakeholders to access various resources (relief, equipment and manpower) that could be tapped in times of emergency situations

i. Phil. Mine Safety and Environment Association and Chamber of Mines of the Philippines

- to contribute their technical skills and expertise, through the setting up of Safety Networking Action Program-Emergency Response Teams (SNAP-ERTs) to OCD-NDCC in times of emergencies and national disasters

j. DHL Asia Pacific

- providing the NDCC a DHL DRT for technical advice free of charge on airport logistics management to ensure uninterrupted and effective supply chain at the disaster site airport

k. PHAPSCARES Foundation Inc.

- a public and private partnerships as a strategy to better respond to the medical needs of disaster victims (Service and medicines free of charge)

l. Philippine Disaster Recovery Foundation (PDRF)

- Cooperation Agreement with the Special National Public Reconstruction Commission
- (23 October 2009)
- Objectives:
  - Formulate and implement the reconstruction strategy and master plan.
  - Identify the projects to be jointly undertaken by the Government and the Private Sector
  - Set out the procedure under which each party will monitor and coordinate the implementation status of recovery projects.
- Programs: *Reforestation, Early Warning, Civil Works, Resettlement, Microfinance, and Solid Waste*

CONCLUSION:

- It is very important to revisit the priority plan of action of the Metro Manila Earthquake Impact Reduction Study Report.
- The Local Government Units need to strictly adopt land-use planning/zoning and adherence to the latest National Building Code of the Philippines.
- There must be continuous efforts among the government and various stakeholders on public awareness and preparedness
- Capacity building and resource management in anticipation of potentially strong earthquakes
- Strengthen partnership of Government and Private Sector – focus on Recovery Plan

MARAMING SALAMAT PO AT MABUHAY!

Basta alerto, malayo sa peligro!

National Disaster Risk Reduction and Management Council