The Philippine Disaster Risk Profile

(B.E.E.P on Earthquake Scenario)

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Office of Civil Defense-DND

Definition of Terms

DISASTER is a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

HAZARD – a dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihood and services, social and economic disruption, or environmental damage.

VULNERABILITY – the characteristics and circumstances of community, system or asset that make it susceptible to the damaging effects of a hazard.

VULNERABLE AND MARGINALIZED GROUPS – those that face higher exposure to disaster risk and poverty including, but not limited to, women, children, elderly, differently-abled people and ethnic minorities.

The Philippine Situation:

Hydro-Meteorological Hazards

The Philippines lies east of the pacific typhoon belt. The typhoons originating from the western north pacific generally moves easterly or north easterly and most often enters the **Philippine Area of Responsibility (PAR).** This explains why an average of 20 typhoons enter the Philippine Archipelago every year of which five (5) are said to be destructive.

The Geographic Location

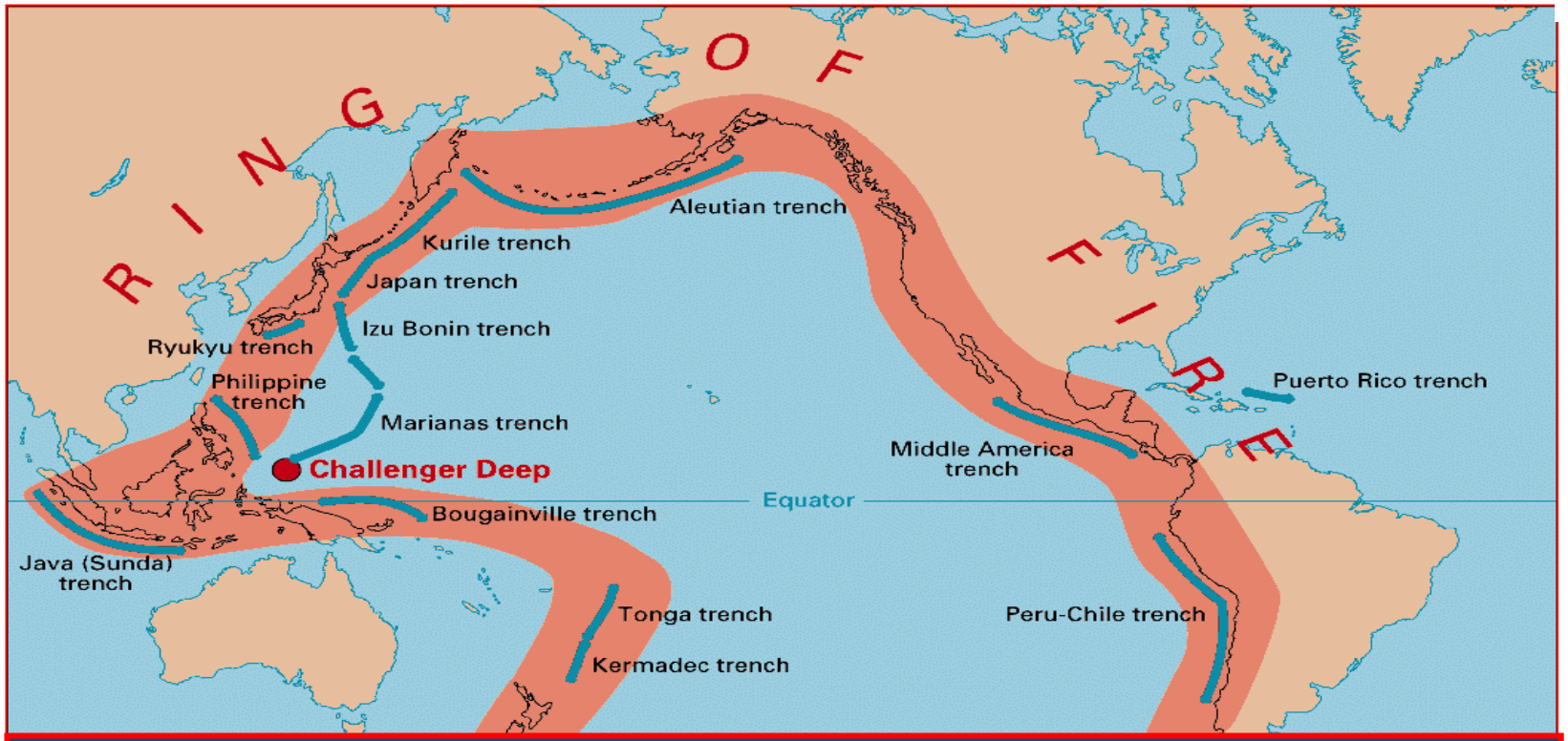
The Philippines is vulnerable to almost all types of natural hazards because of its geographic location.

Photo-credit: <engwell.wikispaces.com> Last retrieved on 07 February 2014

Pacific Ring of Fire

Area where two major tectonic plates (Philippine Sea and Eurasian) meet and is highly-prone to earthquakes and volanic eruptions.

Photo-credit: <Philippines-private-discovery.com> Last retrieved on 07 February 2014



The Philippine Archipelago occupies the western rim of the Pacific Ocean (Western Segment of the Pacific Ring of Fire), a most active part of the earth that is characterized by an ocean-encircling belt of active volcanoes and earthquake generators (fault lines).

Pacific Ring of Fire

This explains the existence of earthquakes, tsunamis and around 300 volcanoes (22 are active) in the country.

Photo-credit: <examiner.com, <csmonitor.com> Last retrieved on 07 February 2014

Pacific Typhoon Belt

Explains the existence of an average of 20 typhoons visiting the country every year (5 of which are said to be destructive)

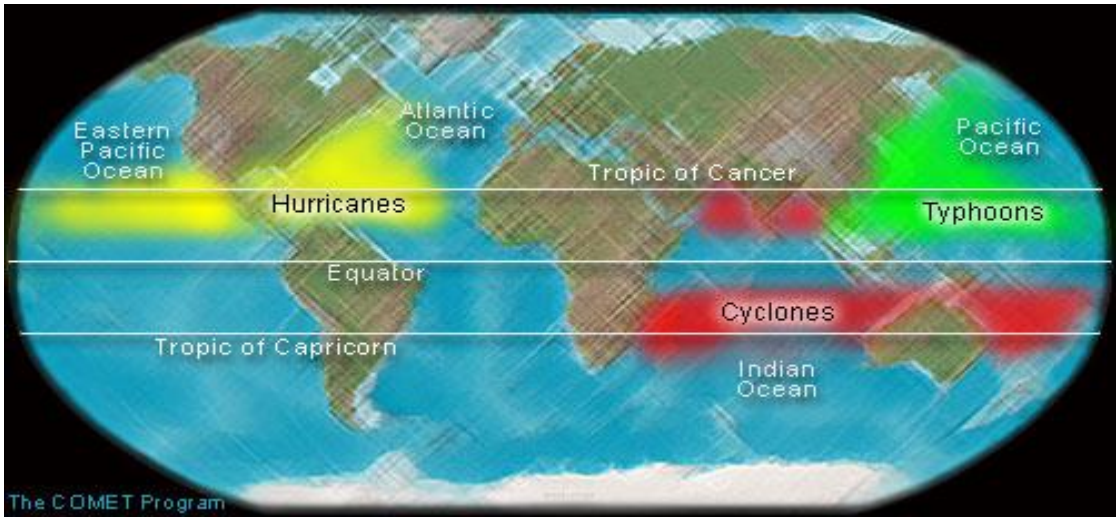
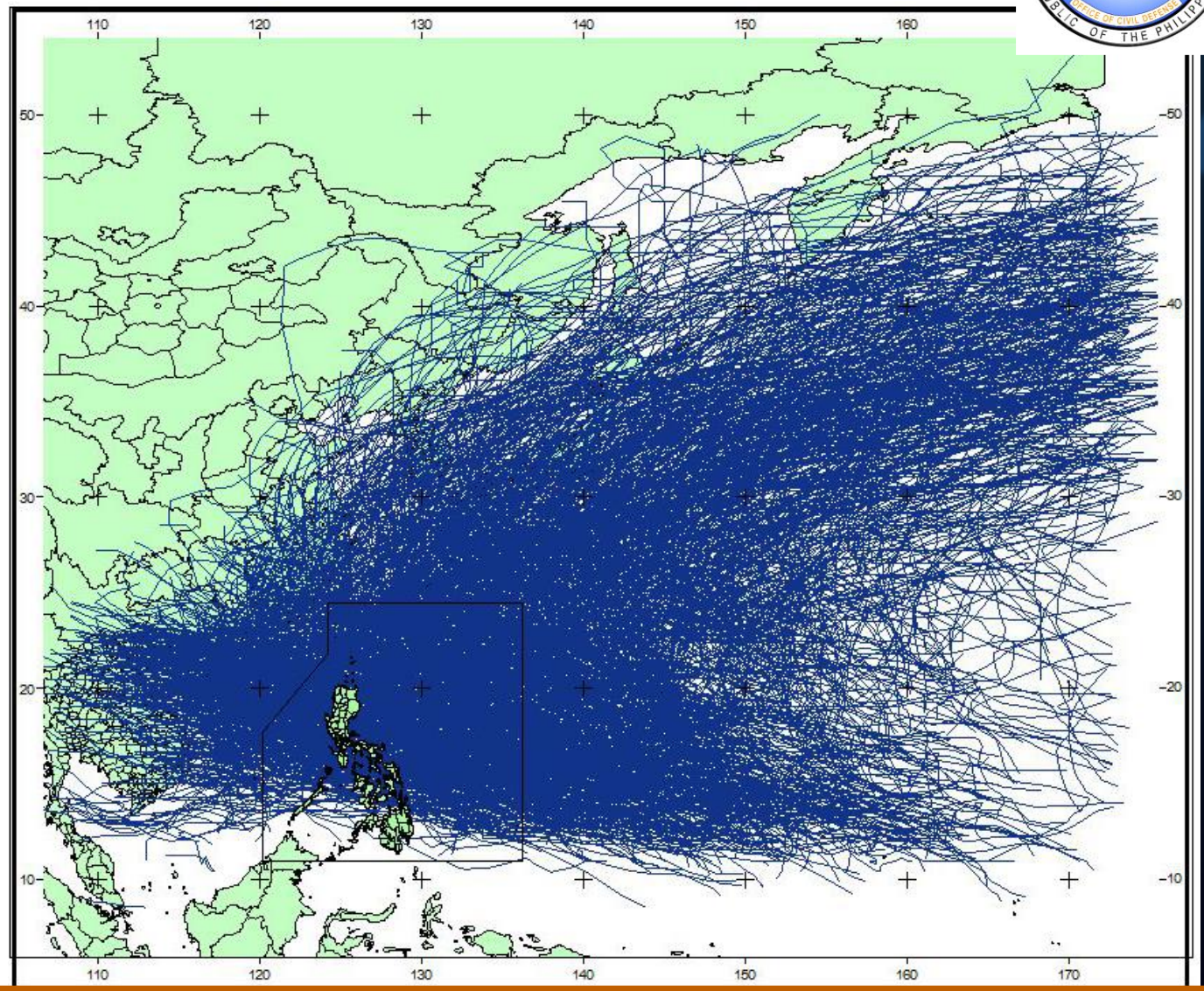


Photo-credit: <ucar.edu> Last retrieved on 07 February 2014

The Philippines: Exporter of Typhoons

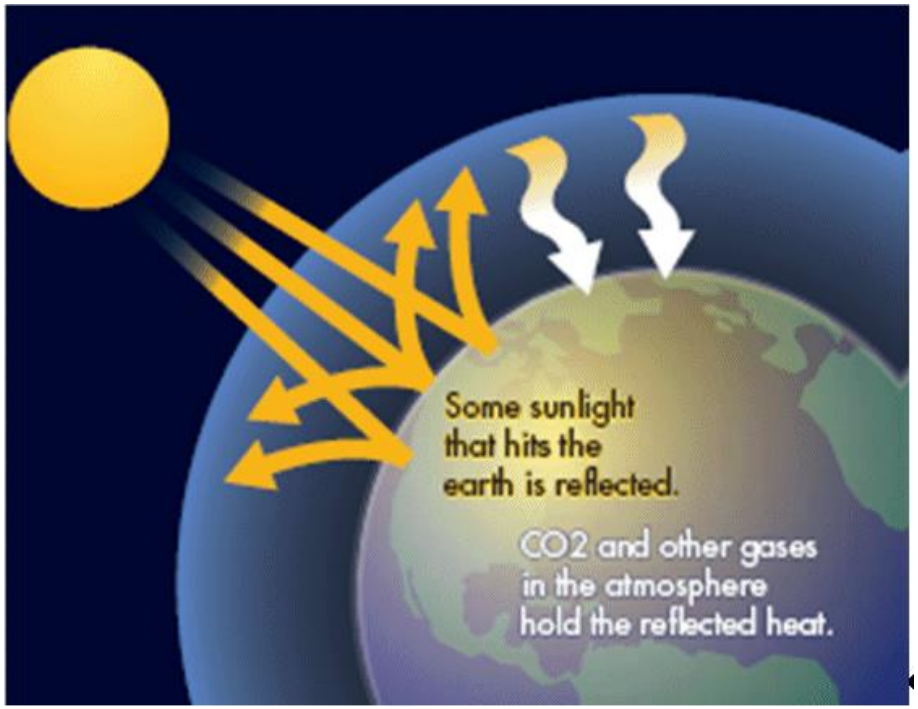
Tracks of Tropical Cyclones in the Western North Pacific Period from 1948 to 2010.

(Source: Japan Meteorological Agency).



Reference: Japan Meteorological Agency (n.d.) as cited by Godillano (2014)

Climate Change



Increasing global temperatures and rising sea levels further leads to worsening occurrences and impacts of disasters.

Photo-credit: <onicirculation.com> Last retrieved on 09 February 2014

Global Warming

Human-Induced Disasters

Since time in memorial, the Philippines is affected by wars, civil strife, internal conflict and terrorism.

Photo-credits: <philstar.com>, <englishsina.com>, <cnn.com> Last retrieved on 09 February 2014

Hazard

Hazards, whether natural hazards or human-induced incidents, abound in the Philippines. The impacts of natural hazards are further aggravated by climate change.

Human-Induced Disasters

Examples:

- SARS outbreak in 2006
- Stampede (Wowowee incident, 2006)
- Hostage taking (Quirino Grandstand Hostage Taking Crisis, 2010)
- Terrorism (Zambaonga Crisis, 2013)
- Different fire incidents around the country

Natural Hazards

FLOODS

TYPHOONS AND STORM SURGES

EARTHQUAKES

VOLCANIC ERUPTIONS

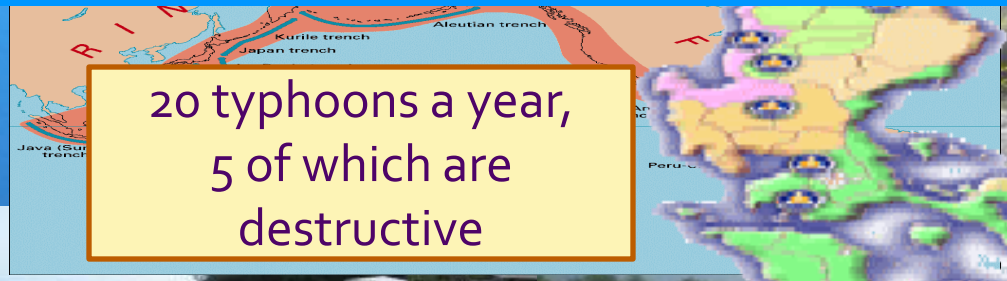
CLIMATIC VARIABILITIES (LA NIÑA/EL NIÑO)

LANDSLIDES

TSUNAMI

GROUND SUBSIDENCE

THE PHILIPPINE HAZARD SCAPE



20 typhoons a year, 5 of which are destructive

around 300 volcanoes of which 22 are active

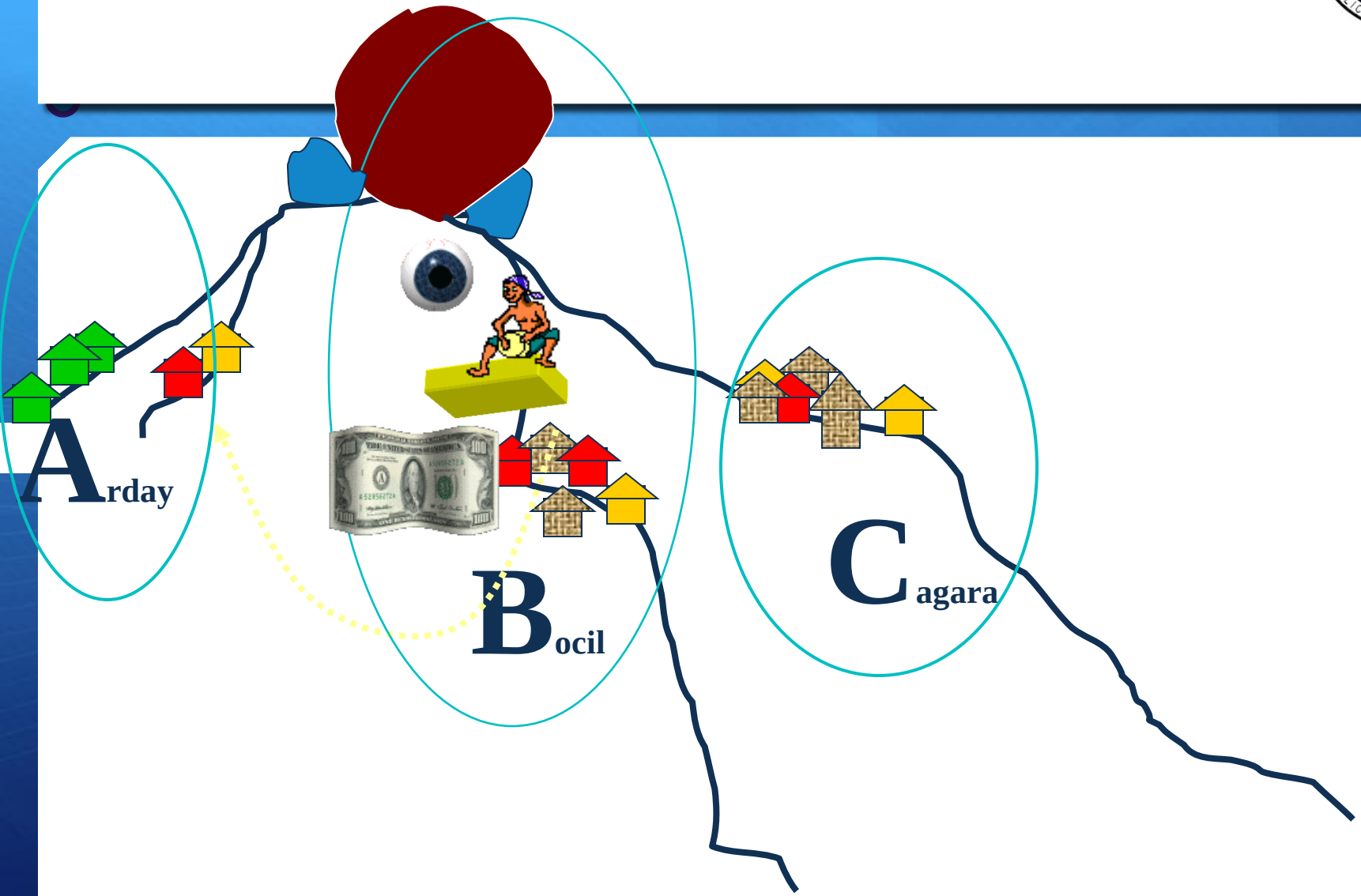
prone to earthquakes because its lying along the Pacific Ring of Fire

36,289 kms. of coastline that makes it vulnerable to tsunamis

In the past 20 years, at least 31,835 people have been killed and 94,369,462 have been affected by natural disasters

Capacity

Disasters, especially those caused by natural hazards, cannot ultimately be controlled and avoided. However, the underlying vulnerabilities can be managed by increasing capacities.


Arday
Bocil
Cagara

Applying the DRR Formula

$$R = H \times \frac{V}{C}$$

Risk = **Hazard** x $\frac{\textbf{Vulnerability}}{\textbf{Capacity}}$

Vulnerability

There are also the evident problems brought about by the vulnerabilities which increase disaster risks.

- Poor construction of houses
- Non-compliance with the building code
- Inappropriate location of houses along the coastlines, fault lines and landslide-prone areas

Vulnerability

- Fast growing population
- Urbanization/ Environmental degradation
- Pollution
- Poor enforcement of DRRM and CCA policies and regulations
- Unwillingness of some people to cooperate

Risk

To reduce disaster risk, we need to invest on increasing capacities of the communities using structural and non-structural approaches

STRUCTURAL	NON-STRUCTURAL
• Relocation of informal settlers • Fortification of buildings, houses and other infrastructures • Construction and installation of localized early warning systems • Increased access to critical facilities such as hospitals and medical centers • Establishment of evacuation centers and warehouses for relief goods	• Mainstreaming of DRRM and CCA into all national and local development plans and programs • Training of disaster managers and responders • Regular conduct of drills and exercises • Enforcement of DRRM policies and ordinances • Promoting DRRM awareness and education at the community level

Disaster risk reduction is about helping people become less vulnerable to disasters

Our Challenges . . .

- Disasters remain a major challenge to achieve a disaster-resilient & safer community in the Philippines by 2015
- Natural hazards abound: typhoon, flood, landslide, earthquake, tsunami, volcanic eruption, drought, etc.
- Climate change remains a potential risk to the country
- Poverty, a vulnerability condition, prevails
- Fast growing population, increasing population densities, urbanization, environmental degradation and pollution increase disaster risks

Legal Basis

PD 1566
June 11, 1978

- *Strengthens the Philippine Disaster Control Capability*
- *Establishes the National Program on Community Disaster Preparedness*

RA 10121
May 27, 2010

- *Strengthens the PDRRM System*
- *Provides for the NDRRM Framework*
- *Institutionalizes the NDRRM Plan*
- *Appropriates Funds*

Paradigm Shift

Disaster Relief & Response	→	Disaster Risk Reduction & Management
Top-down & centralized disaster management		*Bottom-up & participatory disaster risk reduction process*
Disasters as merely a function of physical hazards		*Disasters mainly a reflection of people's vulnerability*
Focus on disaster response & anticipation		*Integrated approach to social & human development to reduce disaster risks*
REACTIVE	→	**PROACTIVE**

Expanded Membership

Old NDCC: 19 Members

Chairman: Secretary, DND
Members:
Secretary, DILG
Secretary, DPWH
Secretary, DOH
Secretary, DSWD
Secretary, DA
Secretary, DepEd
Secretary, DOF
Secretary, DOLE
Secretary, DTI
Secretary, DOTC
Secretary, DOST
Secretary, DBM
Secretary, DOJ
Secretary, DENR
Director, PIA
Sec-Gen - PNRC
Chief of Staff, AFP
A,OCD: Exec Offr/Member

New NDRRMC: 44 Members

Chairperson: Secretary, DND
Vice-Chairpersons:
Sec, DOST – Prevention & Mitigation
Sec, DILG –Preparedness
Sec, DSWD – Disaster Response
DG, NEDA – Rehab & Recovery
Exec Dir: OCD Administrator

Members: 39

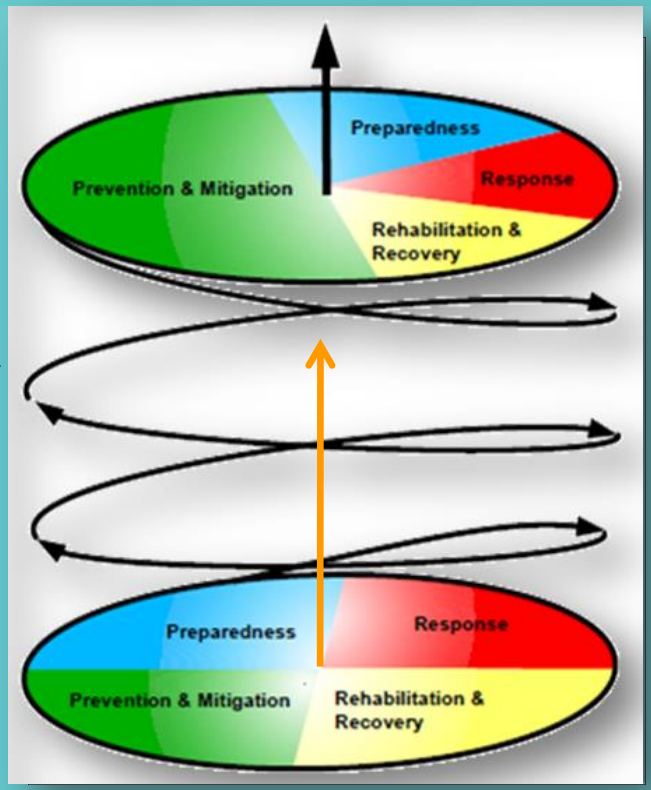
- 14 Depts: DOH, DENR, DA, DepEd, DOE, DOF, DTI, DOTC, DBM, DPWH, DFA, DOJ, DOLE & DOT
- 12 gov't agencies: OES OPAPP, CHED AFP, PNP, OPS, NAPC, PCW, HUDCC, CCC, PHILHEALTH & OCD
- 2 Gov Financial Inst (GSIS & SSS)
- 1 Quasi-government agency (PRC)
- 5 LGU Leagues
- 4 Civil Society Organizations
- 1 Private Sector Organization

DRRM Framework

Safer, adaptive and resilient Filipino communities toward sustainable development

RISK FACTORS

Hazards
Exposures
Vulnerabilities
Capacities



DRR and CCA in Planning & Implementation

Prevention & Mitigation
Preparedness
Response
Rehabilitation & Recovery

NDRRM Plan 2011-2028

Preparedness

Response

Prevention & Mitigation

safer, adaptive & resilient

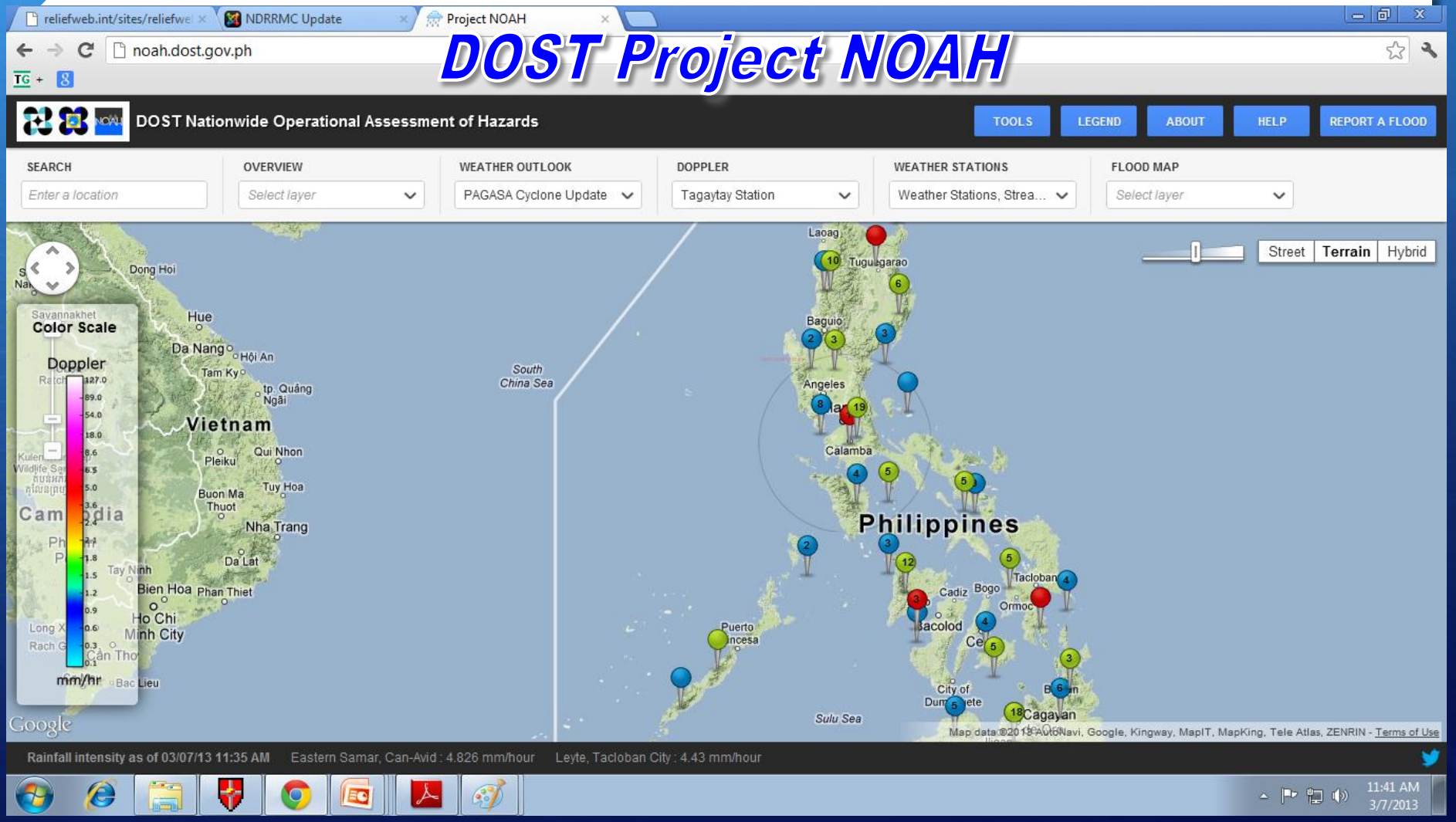
sustainable development

Rehabilitation & Recovery

DRRM Efforts: Prevention & Mitigation

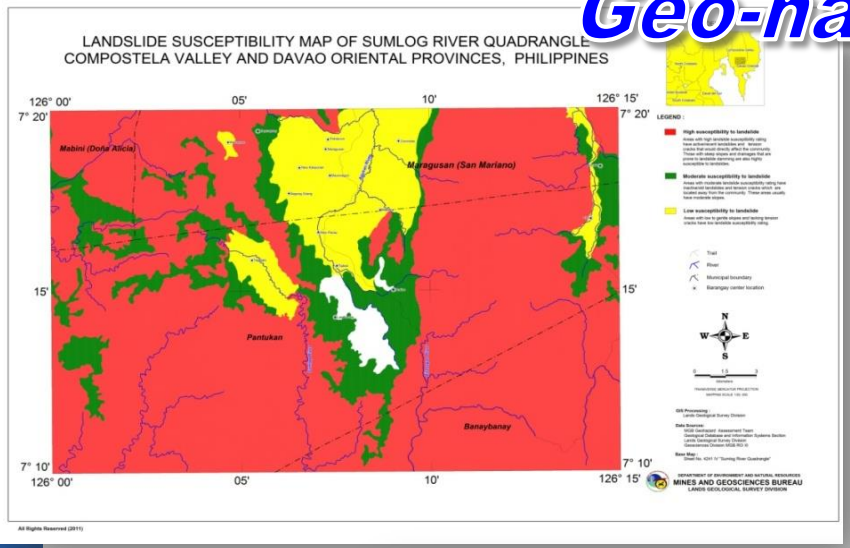
- Development of alarm & early warning systems
- Nationwide flood forecasting & monitoring
- Geo-hazard mappings
- Comprehensive land use planning, building & safety standards
- Engineering interventions
- Flood control structures

DRRM Efforts:
Prevention & Mitigation

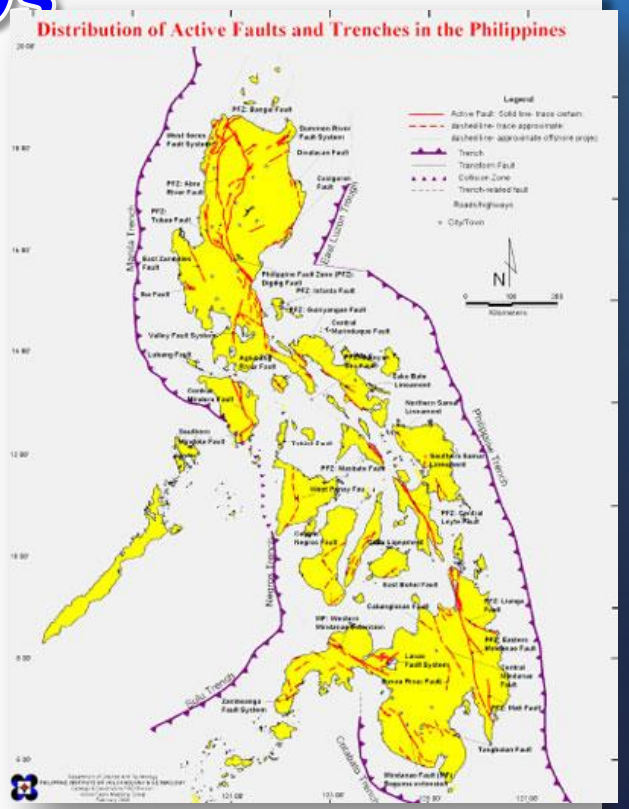


DRRM Efforts: Prevention & Mitigation

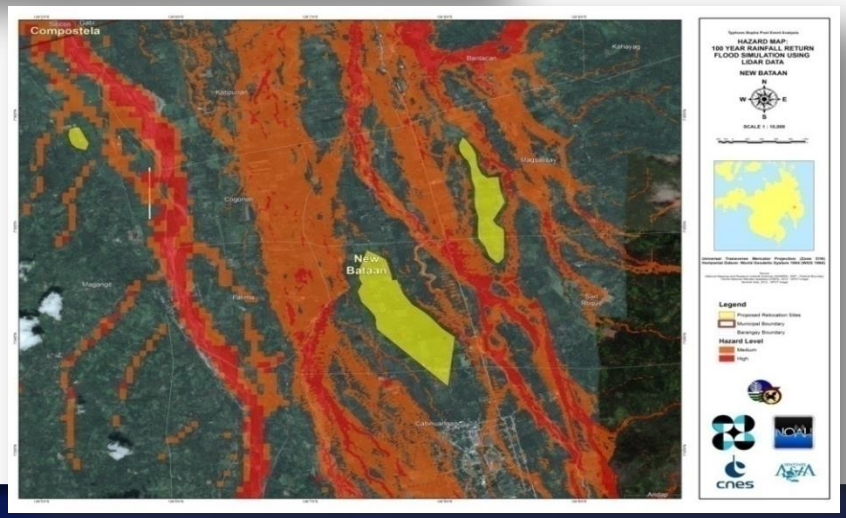
Geo-hazards Maps



Landslide Susceptibility Map *(MGB-DENR)*



Active Faults & Trenches *(PHIVOLCS)*



Rainfall Return Flood Simulation *(PAGASA)*

DRRM Efforts: Preparedness

- Contingency planning
- Prepositioning of equipment & supplies
- Enhancement of operation & coordination centers
- Organizing, training & equipping responders
- Organizing & mobilizing community volunteers
- Conduct of disaster trainings & drills

DRRM Efforts: Response

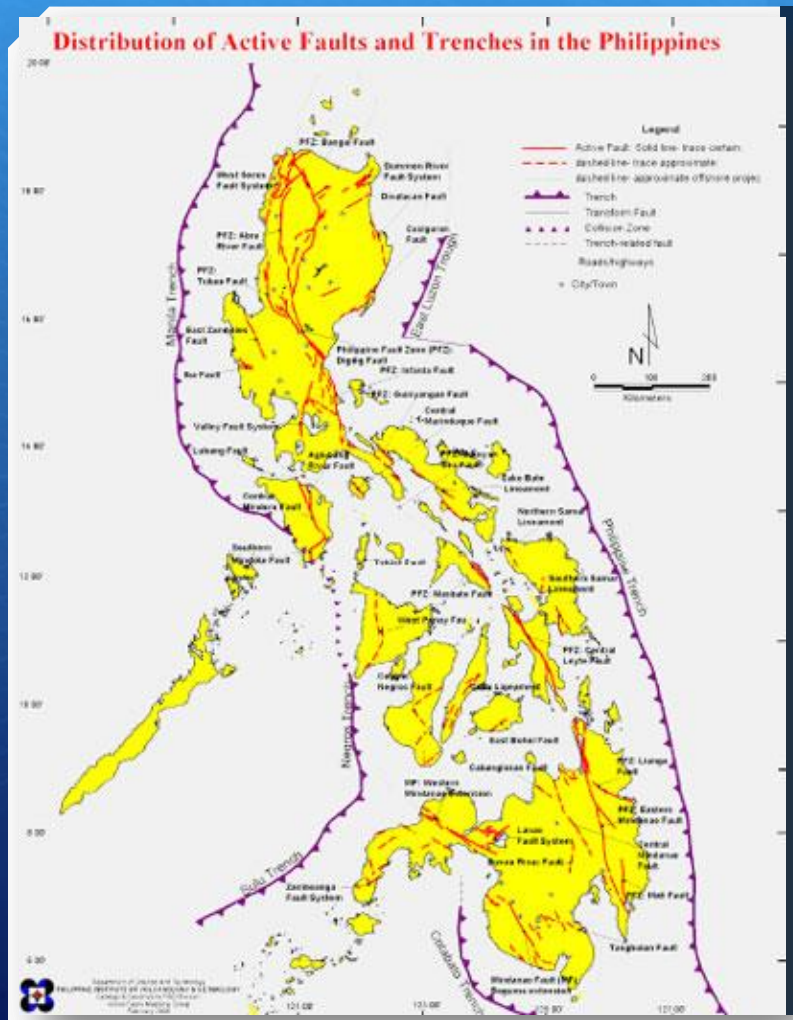
- Search, rescue & retrieval operations
- Humanitarian aid, relief and health services
- Provision for temporary shelter, water, sanitation & hygiene
- Financial assistance to calamity victims
- Management of evacuation centers

DRRM Efforts: Recovery & Rehabilitation

- Early recovery & rehabilitation
- Reconstruction of damaged houses & buildings
- Resettlement
- Provision for livelihood
- Restoration & improvement of destroyed facilities

Objective: "Build Back Better"

Challenges: Prevention & Mitigation



- Nationwide identification & assessment of hazards
- Common understanding of forecasting terminologies & systems
- Appreciation of risk factors at the local level
- Strict adherence to building codes
- Construction of flood control structures

Challenges: Preparedness

- Integration of hazards assessment into the Comprehensive Land Use Plan
- Completion of Local DRRM Plans
- Organization of community volunteers
- Training & equipage of responders
- Enhancement of coordination centers

Challenges: Response

- Immediate establishment of ICS
- Deployment of trained & equipped responders
- Rationalization of humanitarian assistance & Rapid Needs Assessments among NGAs, LGUs & Int'l Donor Agencies

Challenges:
Recovery & Rehabilitation

- **Rationalization of access to Calamity Funds**

Challenges: Policy Considerations

- Creation of Local Disaster Risk Reduction Management (DRRM) Offices
- Plantilla positions for Local DRRM Officers & Personnel
- Clarify provisions of Sec. 22 of RA 10121 vis-à-vis GAA re utilization of NDRRM Fund
- Completion of standard Local DRRM Plans
- "Laymanizing" DRRM terminologies
- Rationalization of Geo-hazard Map scales

Republic of the Philippines
REGIONAL DISASTER RISK REDUCTION AND MANAGEMENT COUNCIL
Region VII, Cebu City

MEMORANDUM

FOR : RDRRMC Members
Chairpersons, PDRRMCs, MDRRMCs, CDRRMCs

FROM : Chairperson, RDRRMC7

SUBJECT : Conduct of 2nd Quarter – CY 2012 Nationwide School-Based Simultaneous Earthquake/Fire Drills and Corresponding Information and Education Drive

DATE : June 11, 2012

In line with the Memorandum Order dated June 4, 2012 signed by Usec. Benito Ramos, NDRRMC Executive Director and OCD Administrator, we enjoin you to conduct Earthquake/Fire Drills and information dissemination in your respective offices for the second quarter of CY 2012.

In addition, a simultaneous earthquake drill will be conducted on June 29, 2012, 9:00 A.M. as a culminating activity.

Post-activity reports are to be submitted to RDRRMC Operations Centers **not later than July 6** for consolidation and submission to the NDRRMC.

Let us live safely with natural hazards and risks. *"Ligtas na Bayan, Maunlad na Pamayanan".*

Please see attached Earthquake Drill Evaluation Form for your information and guidance.

MINDA C. MORANTE
Chairperson, RDRRMC7
Regional Director OCD7

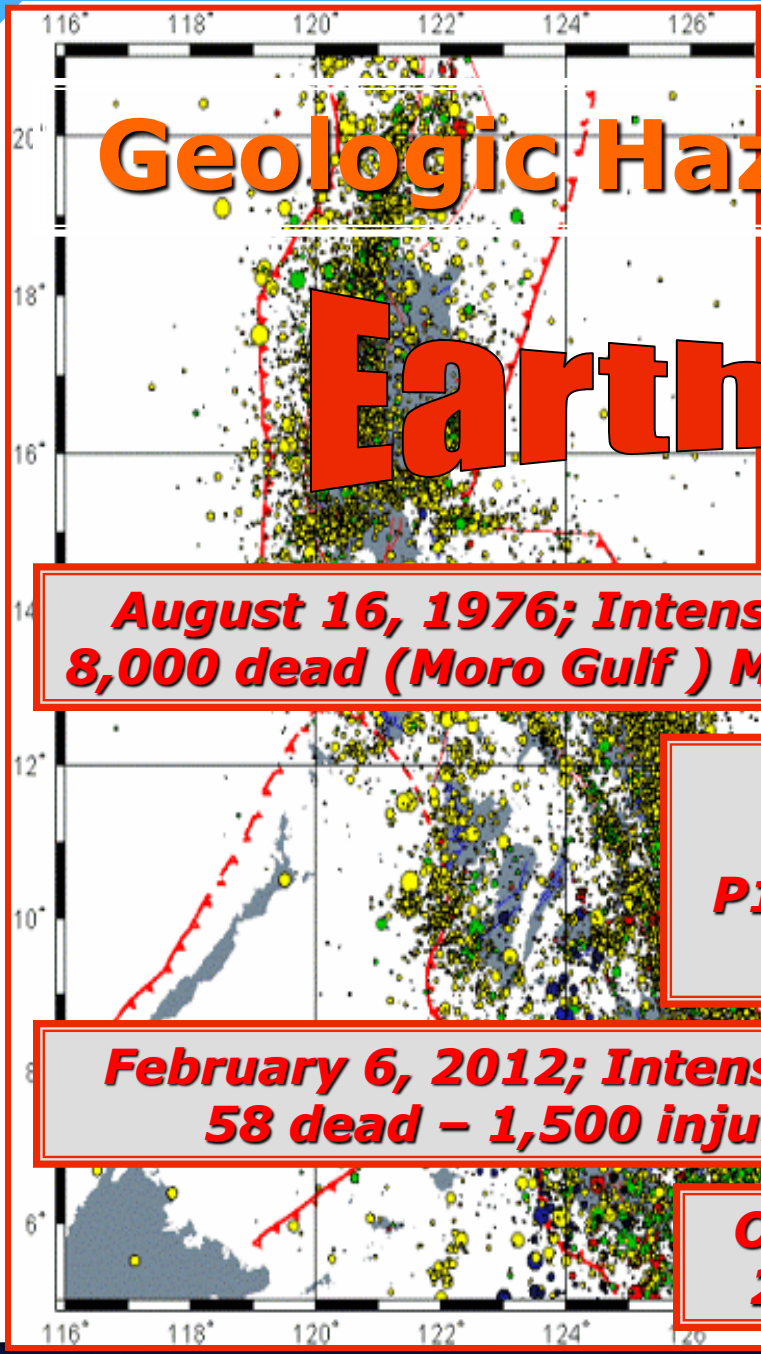
BUILDING EMERGENCY EVACUATION PLAN (B.E.E.P.)

OFFICE OF CIVIL DEFENSE

REGIONAL DISASTER RISK REDUCTION & MANAGEMENT COUNCIL

Geologic Hazards

Earthquakes



August 16, 1976; Intensity 7.9
8,000 dead (Moro Gulf) Mindanao

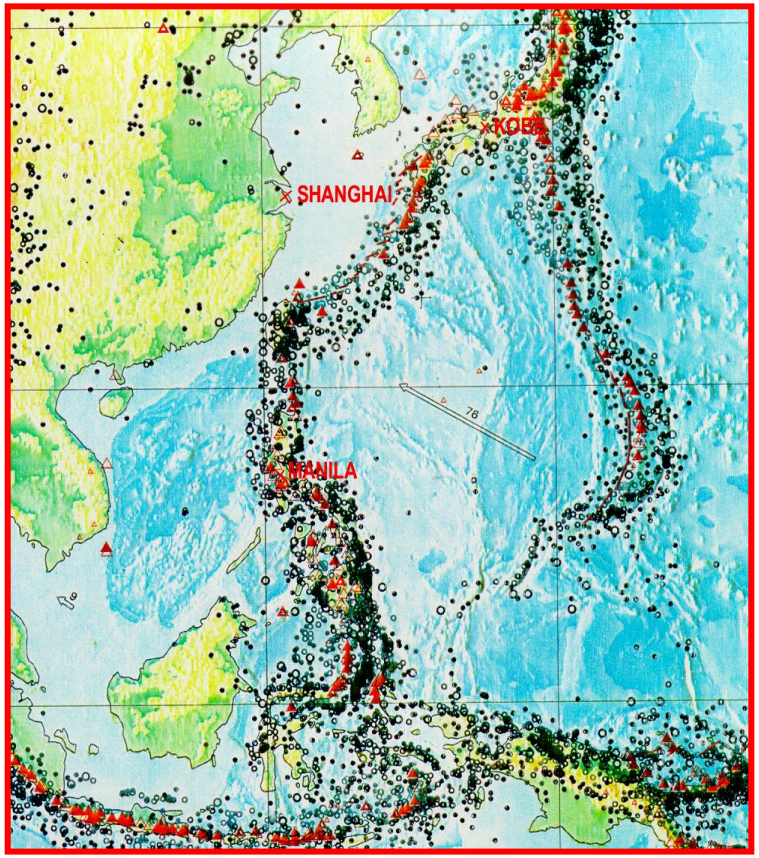
July 16, 1990; Intensity 8
1,666 dead – 3,500 injured
P11B cost of damage in property
P1.2B in agriculture

February 6, 2012; Intensity 6.9
58 dead – 1,500 injured

October 15, 2013; Intensity 7.2
208 dead and 5,000 + injured


EARTHQUAKE:
A Reason To Prepare

Why we experience earthquakes:

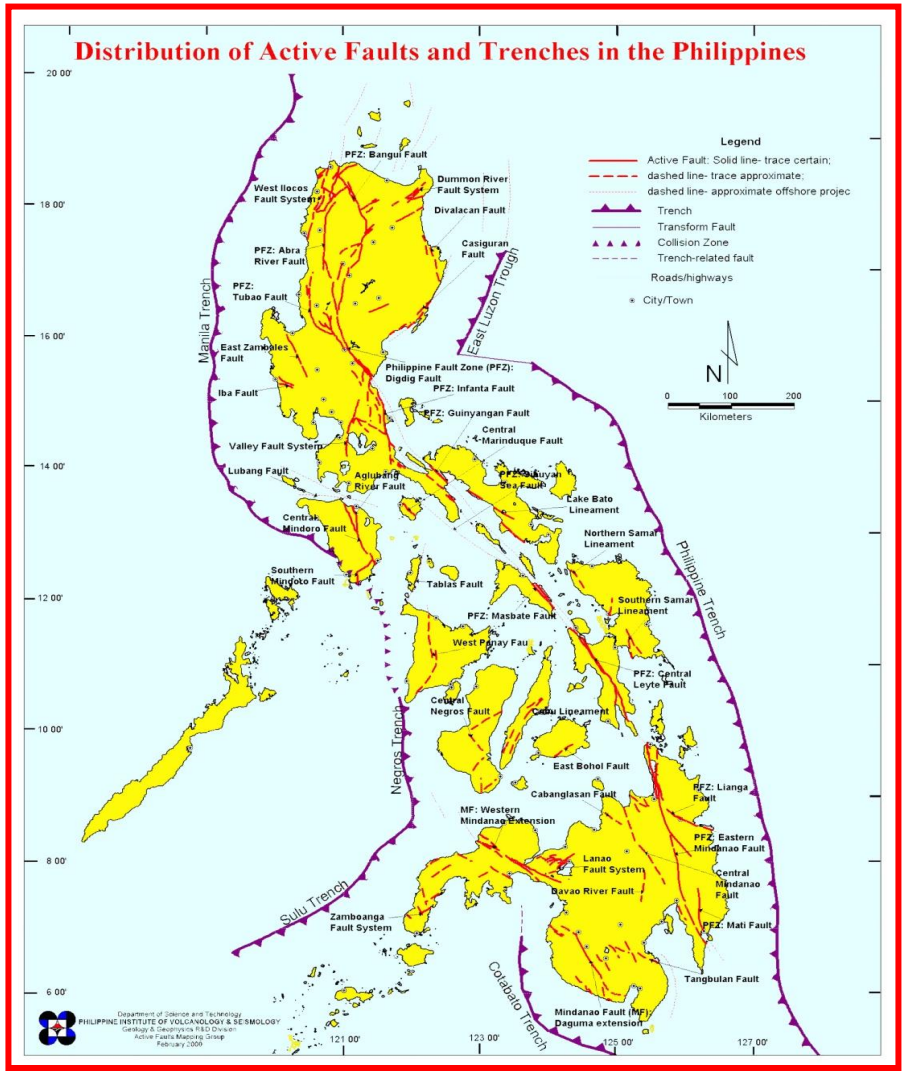


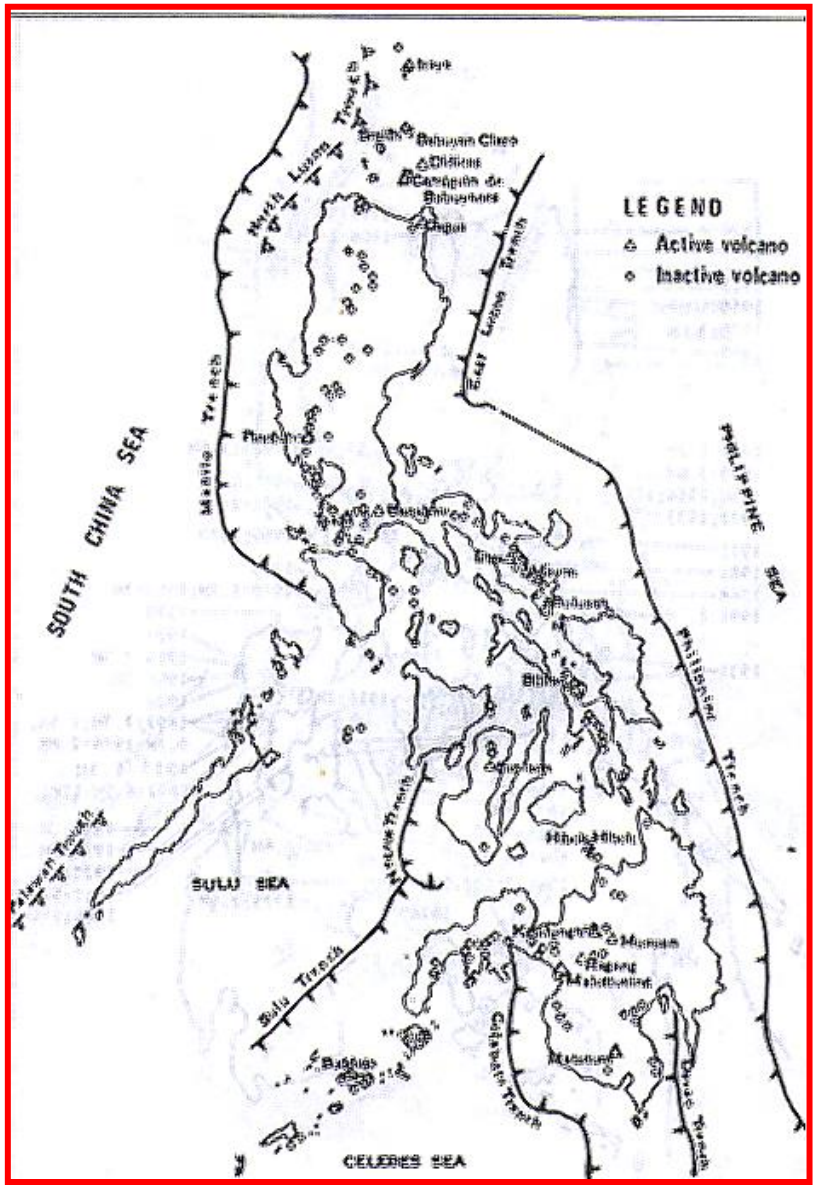
The Philippines is located west of the Pacific Ring of Fire. This area is very much famous for its very active volcanoes and very active faults.

Earthquakes occur within the Philippine Archipelago every now and then mainly because our country is situated along two major tectonic plates of the world – the **PACIFIC PLATES** and the **EURASIAN PLATES**.

Earthquake Generators:

Active Faults and Trenches

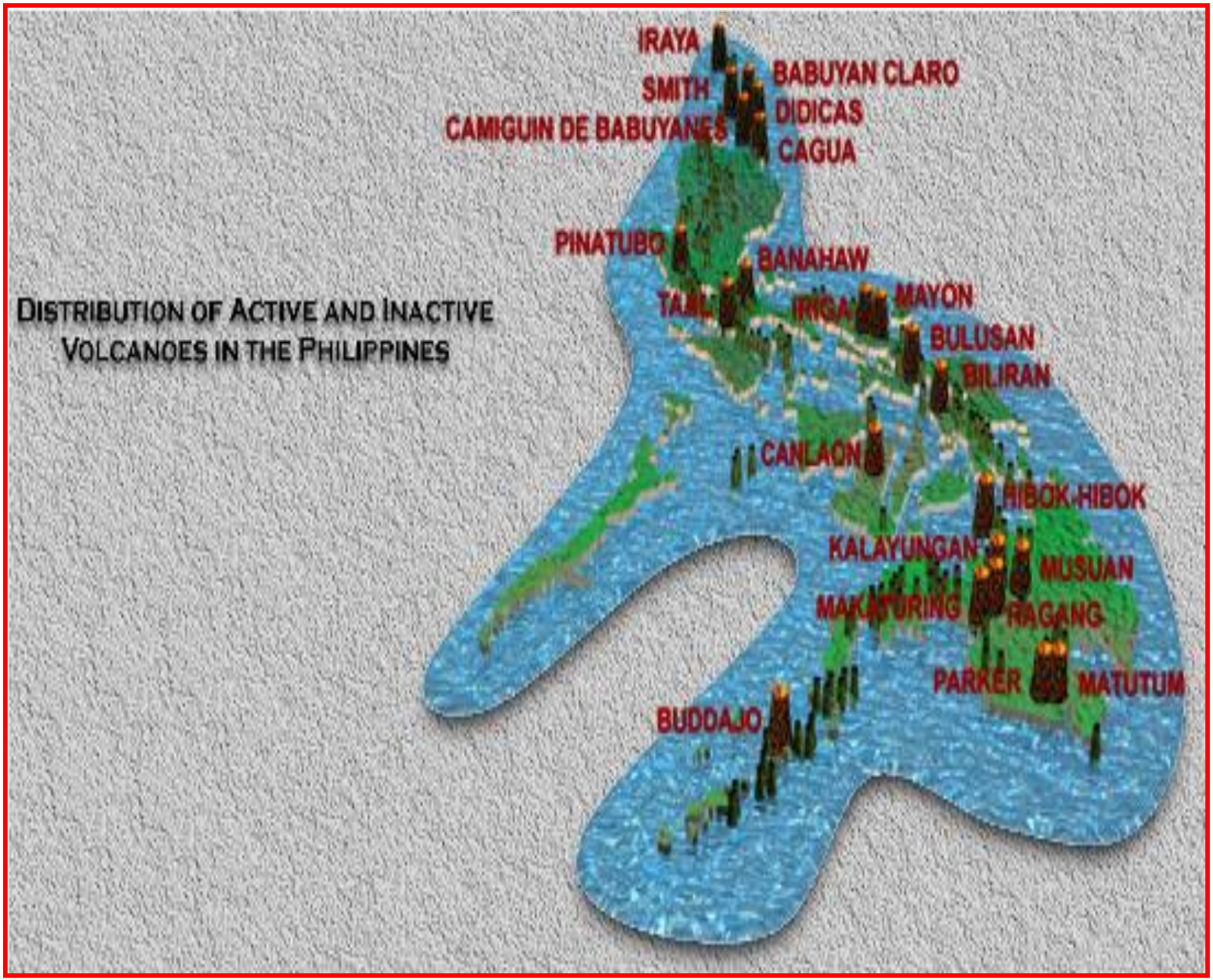




300 VOLCANOES

22 POTENTIALLY ACTIVE

Volcanoes that are not active are further classified as either potentially active or inactive.

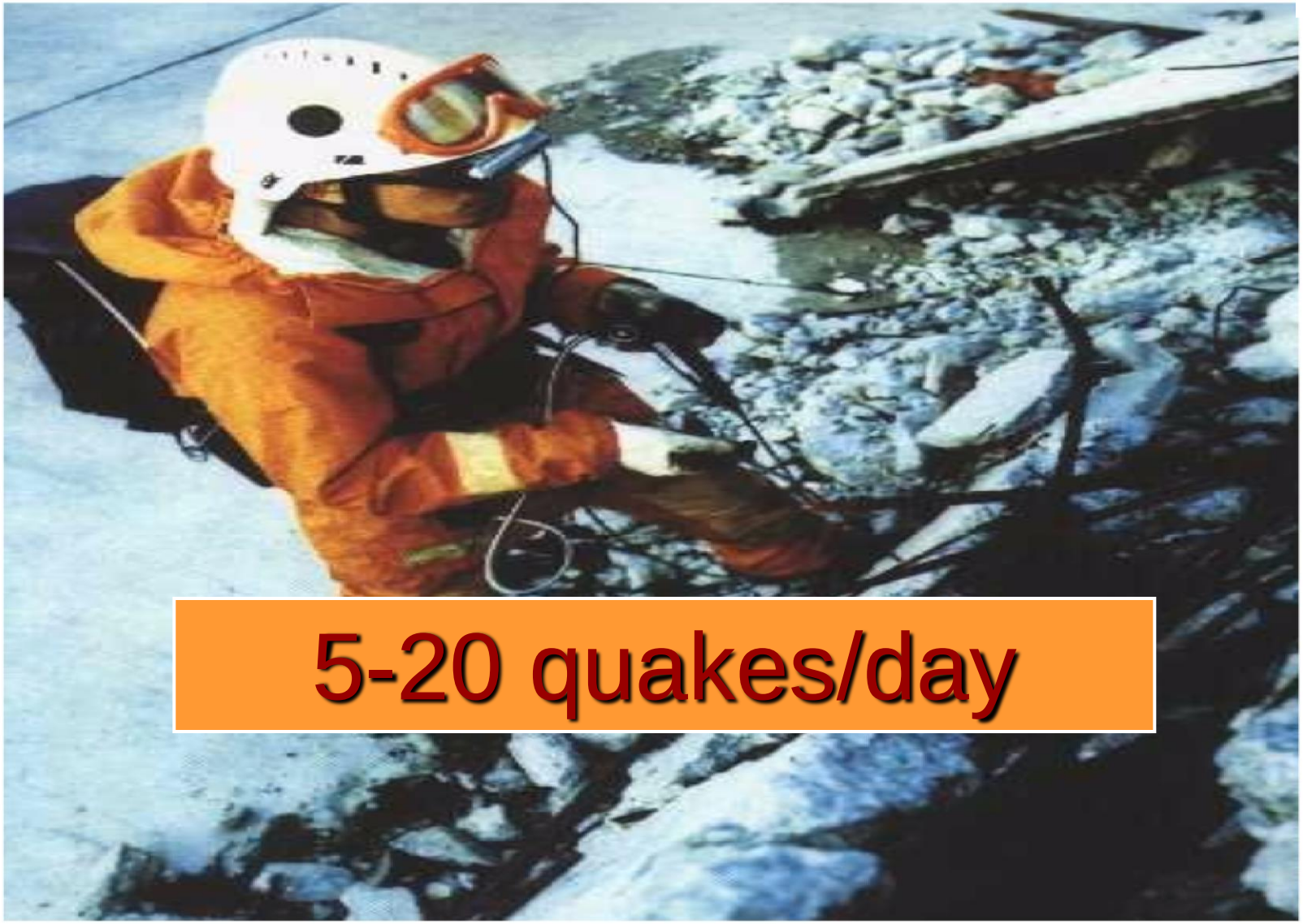

DISTRIBUTION OF ACTIVE AND INACTIVE VOLCANOES IN THE PHILIPPINES
IRAYA
SMITH
CAMIGUIN DE BABUYANES
BABUYAN CLARO
DIDICAS
CAGUA
PINATUBO
BANAHAW
TAAL
IRIGA
MAYON
BULUSAN
BILIRAN
CANLAON
HIBOK-HIBOK
KALAYUNGAN
MUSUAN
MAKATURING
RAGANG
PARKER
MATUTUM
BUDDAJO

Recent Earthquake events:

All within the Asian Region (Pacific Ring of Fire)

- Japan, Fukushima
- New Zealand, Christchurch
- Sumatra - Dec. 26, 2004
- Chile
- Haite
- Philippines: July 16, 1990 Northern Luzon
- Philippines: February 6, 2012 Negros Or
- Philippines: October 15, 2013 Bohol

In our country alone:



Earthquakes recur….

THOUSANDS of Earthquakes

January 1990 – January 2014

Earthquake Prone Areas:

Metro Manila

Region 1
- Ilocos Norte
- Ilocos Sur
- Pangasinan
- La Union

Region 2
- Batanes
- Cagayan

Region 3
- Bataan
- Bulacan
- Zambales
- Nueva Ecija

Region 4
- Mindoro
- Marinduque

Region 5
- Albay
- Catanduanes

Region 6
- Antique
- West Panay
- Negros Occidental
- Iloilo

Region 7
- Cebu
- Bohol
- Negros Oriental

Region 8
- Eastern Samar
- Leyte
- Northern Samar

Region 9
- Zamboanga Provinces

Region 10
- Bukidnon

Region 12
- South Cotobato

ARMM
- Maguindanao
- Sultan Kudarat

CARAGA
- Surigao Del Sur
- Surigao Del Norte

CAR
- Benguet
- Baguio City

Shall we wait for these events to happen again before we ever learn?

"DEFINITELY NOT"

PLANNING

Form a Disaster Management Committee (DMC), composed of several teams with specific tasks (e.g., First Aid Team, Site Security Team, Fire Safety Team, Evacuation Team, Communications Team and Damage Control Team) and designate an overall coordinator.

Members of the DMC should evaluate the community by following these steps:

- Have the ff. information available yearly: total number of occupants. residents; occupants/residents with special needs (sick, old, disabled) and their locations.

Acquire the most recent ground or building layouts/plan or map. Use these to identify open spaces:

- determine the total area of available spaces that can be used for each house/building.
- determine how many persons can occupy this open space.

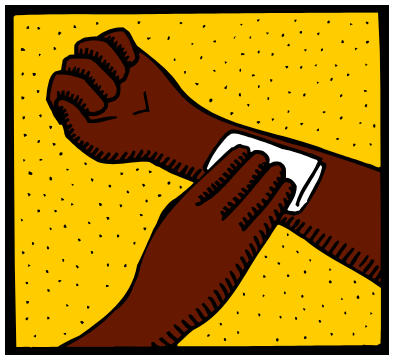
Obtain a building layout/ floor plan for each house/building that shows rooms, corridors, staircases and exit points.

GET ORGANIZED

" Proper Planning and Organization is the key to an effective Disaster Prevention Program "

Disaster Management Committee

tasking with designated over-all coordinator.



First Aid Team

Over-all coordinator

Evacuation team

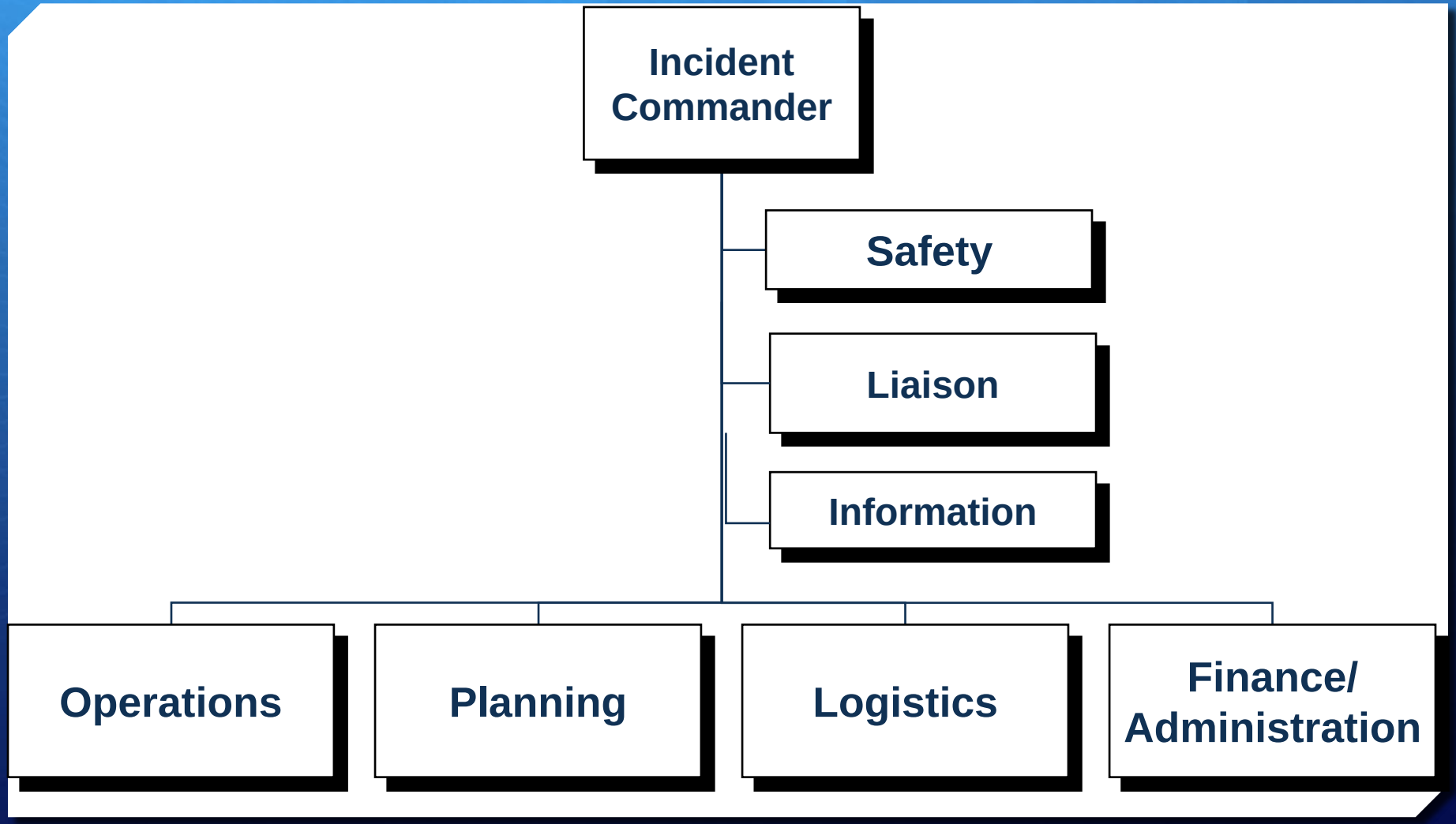
Fire – Safety Team

Communication Team

Security Team

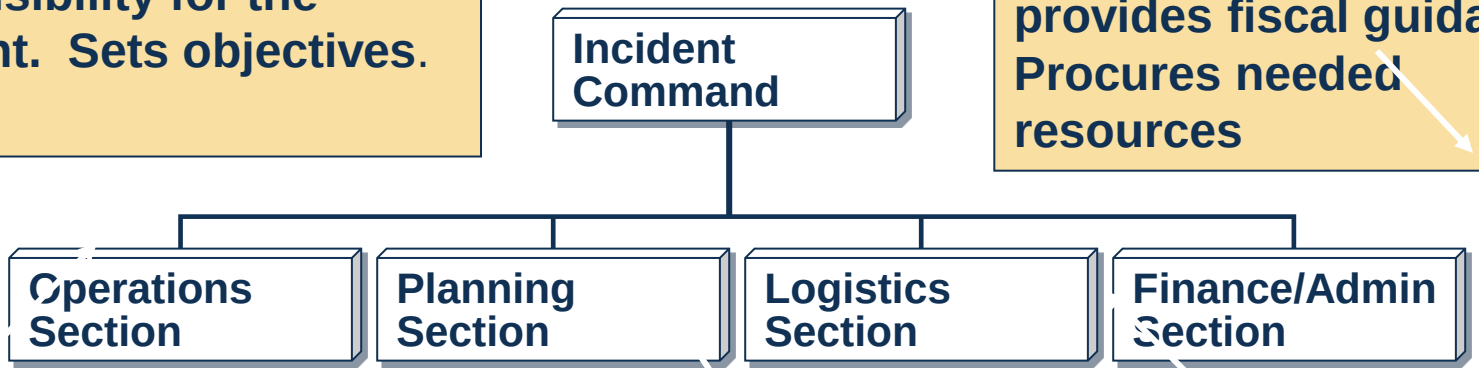
The ICS Organization

ICS – Primary Organization Functions



ICS Functions: Who Does What?

Command: Overall responsibility for the incident. Sets objectives.



Finance/Admin: Monitors incident costs and provides fiscal guidance. Procures needed resources

Operations: Develops tactical organization and directs all resources to carry out the Incident Action Plan

Planning: Develops Incident Action Plan to accomplish objectives. Maintains resource & situation status

Logistics: Provides resources and all other services needed to support the incident

INCIDENT COMMAND SYSTEM

INCIDENT COMMANDER

Safety Officer

Liaison Officer

Information Officer

STAFF ELEMENTS

Planning

Operations

Finance and Administration

Logistics

TASKS ELEMENTS

WARNING/COMMO TEAM

SECURITY TEAM

FIRE SUPPRESION TEAM

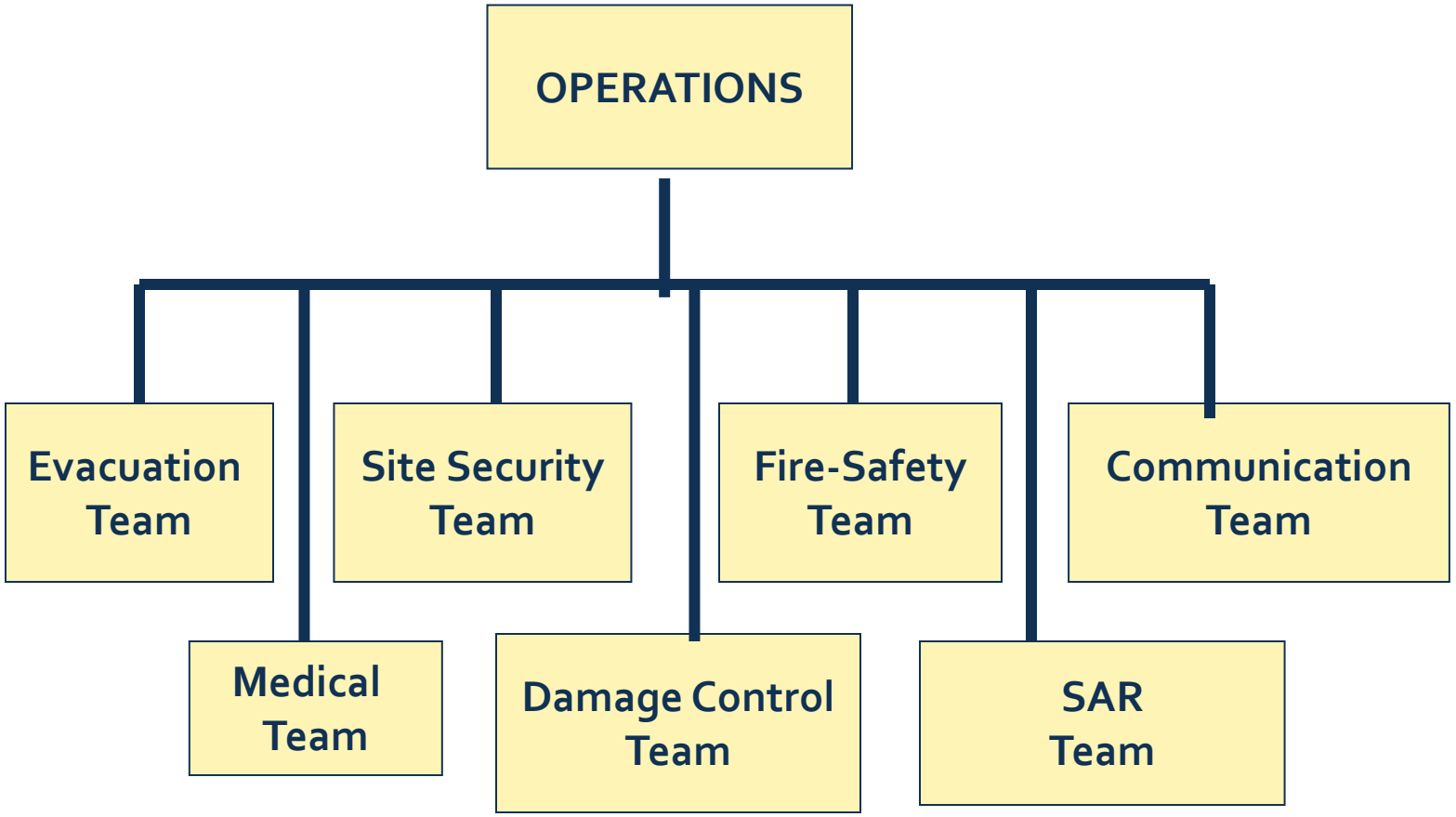
EVACUATION TEAM

SEARCH AND RESCUE TEAM

MEDICAL TEAM

DAMAGE CONTROL TEAM

BEEP ORGANIZATIONAL CHART



NOTE:

"Teams must be integrated or in place per floor and backup must be organized also".

Members of the Disaster Control should conduct building watching exercise to identify safe and unsafe spots inside the building

Building Watching Exercise

✓Swing out door

Shelf near entrance

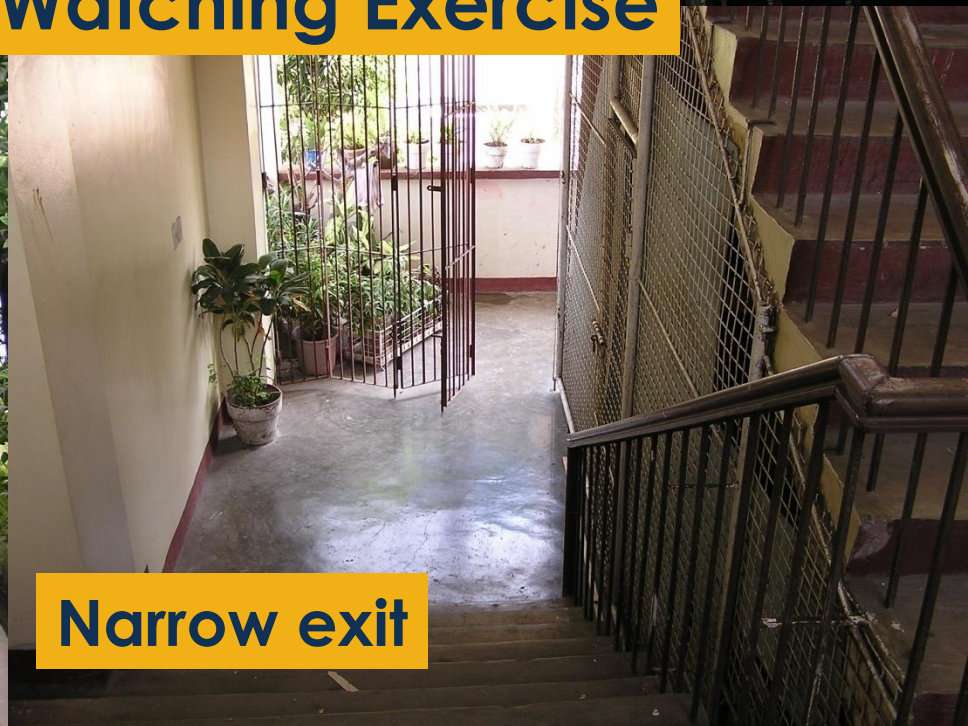
Building Watching Exercise

Good practice

Water tank

Building Watching Exercise

Flower pots



Narrow exit

Gate shade

Electric post and wirings

Building watching exercise

Danger zones:

DEVELOPING THE (B.E.E.P.)

1. The Earthquake Evacuation Area for buildings should have provision to utilize all available open spaces nearest the building.



vacant lot / open parking area / park / playground

"Safe from falling debris and other earthquake related hazards".

2. Determine if there is sufficient open space for all building occupants for the evacuation.

Assumption: 3 persons per sq m

3. Consider the number of persons in each building.

Designate a specific open area as their area of temporary refuge.

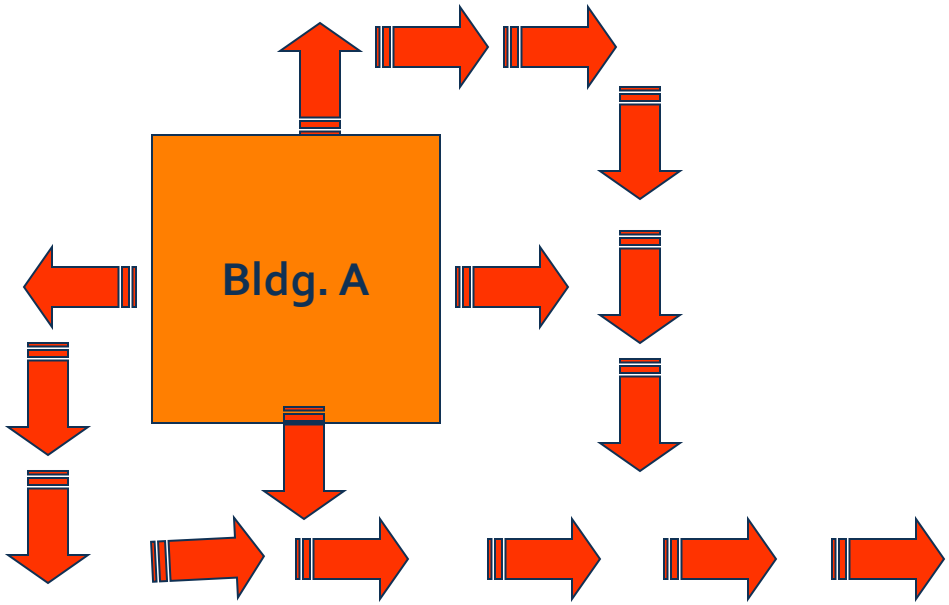
Ex. 200 buildings

Assuming 1500 person per building

= 300,000 persons

Area needed= 100,000 sq.m

4. Once an earthquake evacuation area has been identified and assigned to a specific group, the building administrator should then come up with an evacuation procedure using the available map or site development plan.



Evacuation area

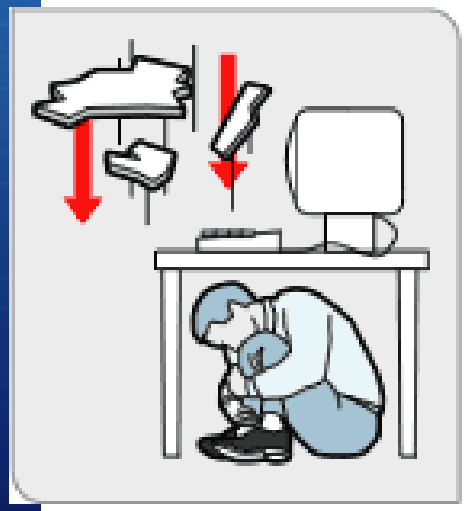
Take the safest / nearest route to the designated evacuation area.

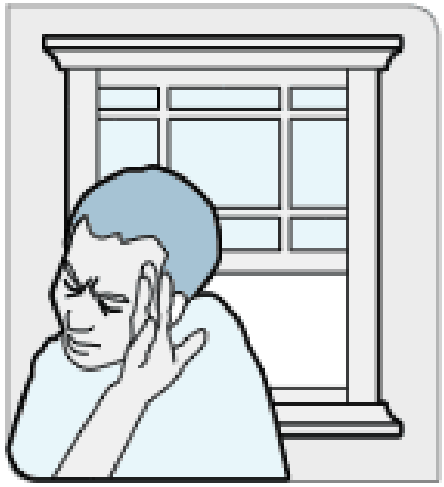
Marshalls / Floor Leader shall be assigned.

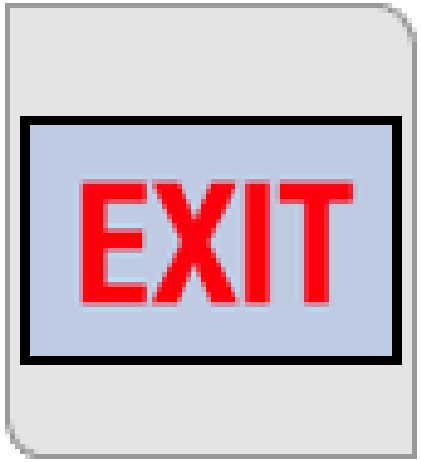
Work area

EMERGENCY ASSEMBLY POINT

- ❑ identify safe /unsafe area.
- ❑ number of persons on the area.
- ❑ identify possible nearest exit point.
- ❑ Time to take a person from the farthest point of the work area to exit.

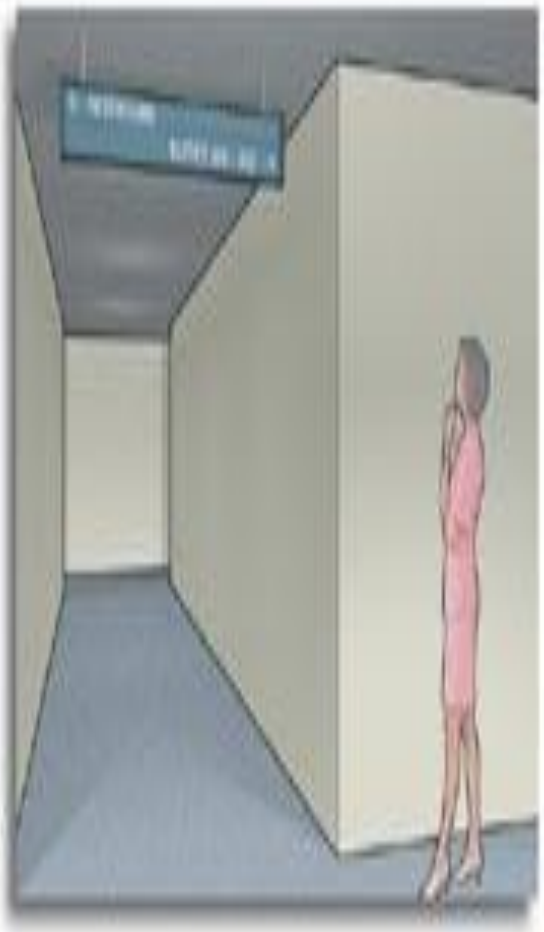






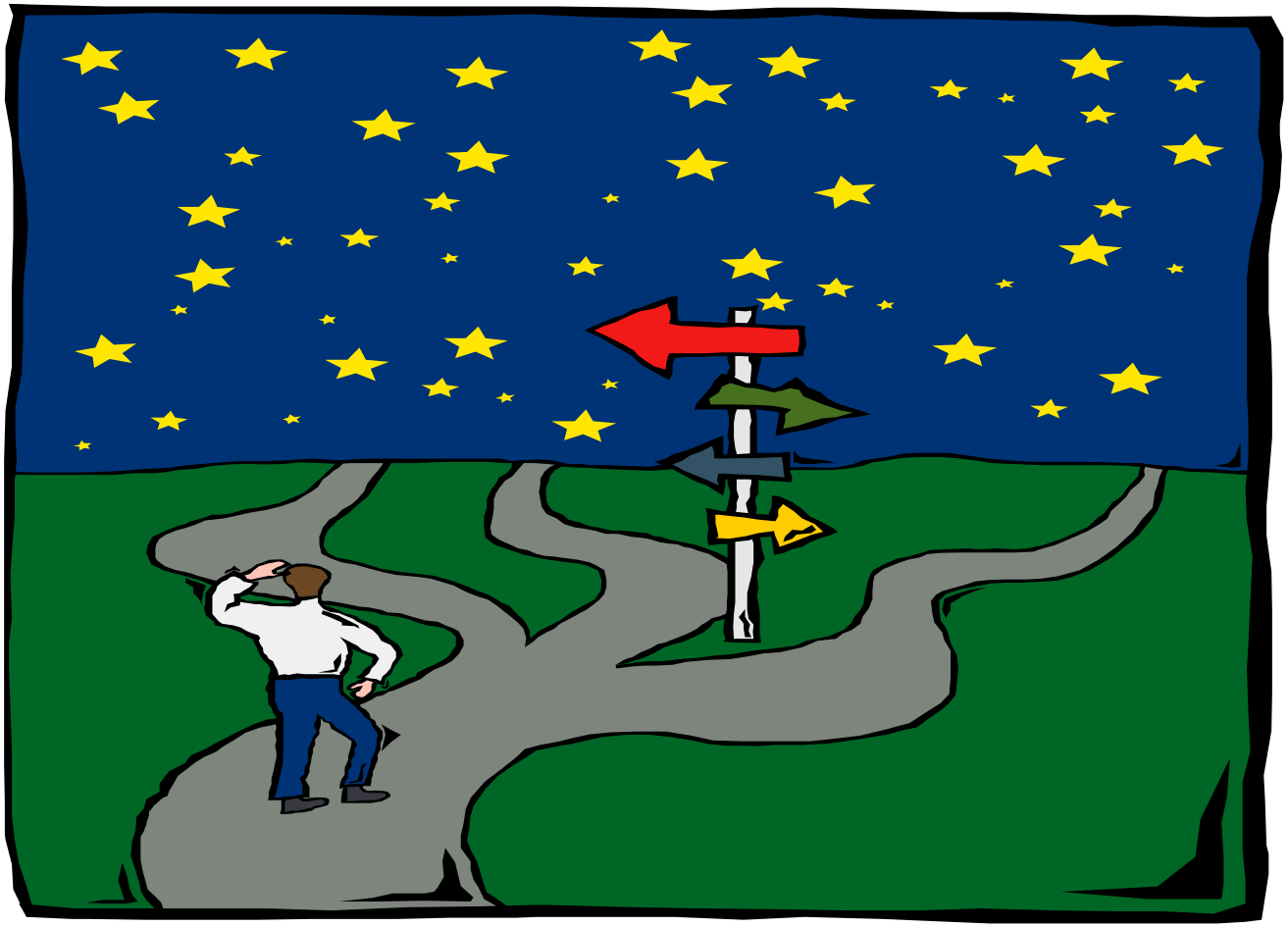
Door/ Alleys/ Corridors

- ❑ Check how many persons can pass the door or alleys and corridors at the same time.
- ❑ Check for alternate route.
- ❑ Check possible hazards that may block the area during evacuation.



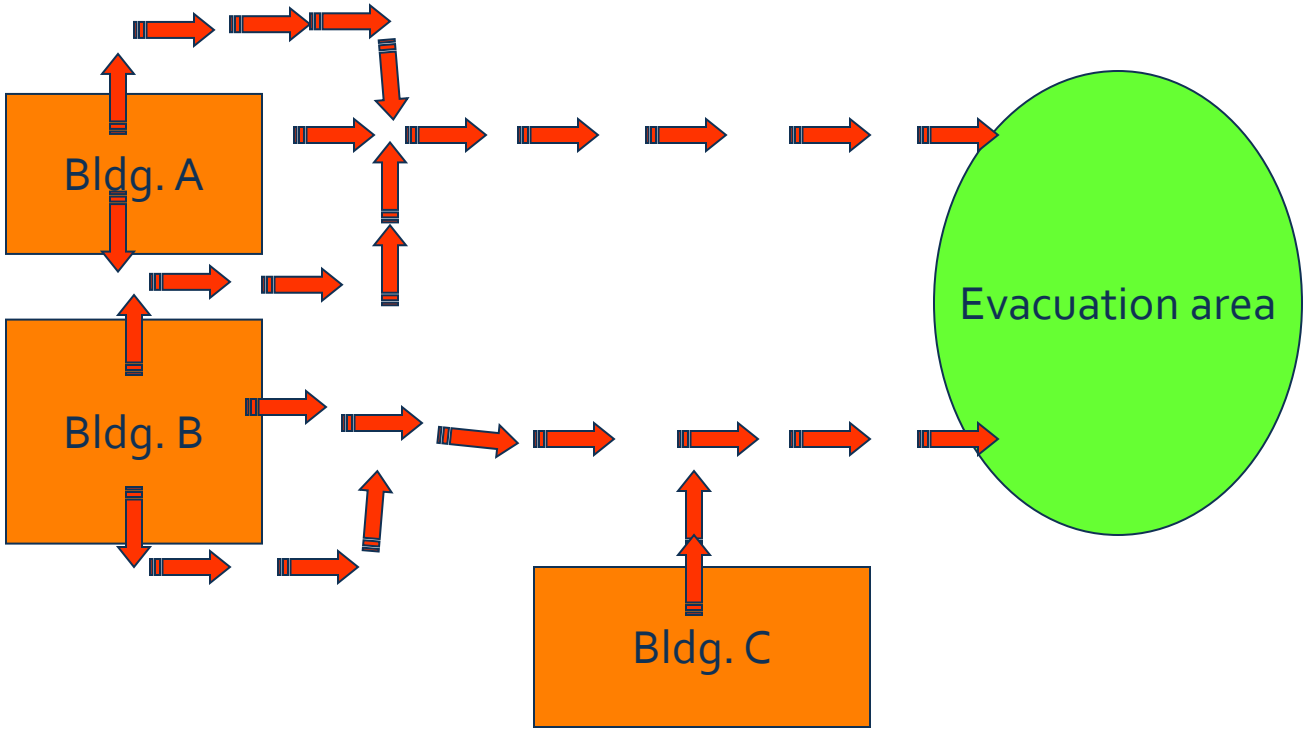
Self-illuminating pathway systems offer glow-in-the-dark luminescence when electrical systems fail in an emergency.

5. Determine the flow of traffic from each building.



One way traffic: persons shall walk in one direction

6. Indicates by arrows, the flow of evacuation coming out of each building cluster up to their designated evacuation site. This will be the suggested earthquake evacuation route for the building occupants.

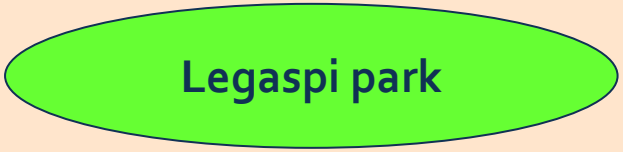


7. Prepare the final evacuation route and orient all the employees / tenants and nearby buildings administrator about it.

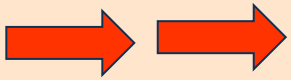
Legend:

Building: **Sample Bldg.**

Evacuation Area:



Evacuation Route:



Finally the BFP, local DRRMCs and the PNP in the area should be furnished of the evacuation plan so they will know their corresponding contingency plan if event arises.

8. Prepare Earthquake Survival Kits

72-HOUR SURVIVAL KIT

EMERGENCY CASH

PERSONAL HYGIENE KIT

FIRST AID KIT

CLOTHING

WATER

IMPORTANT DOCUMENTS

READY-TO-EAT FOOD

FLASHLIGHT

COMMUNICATION DEVICES

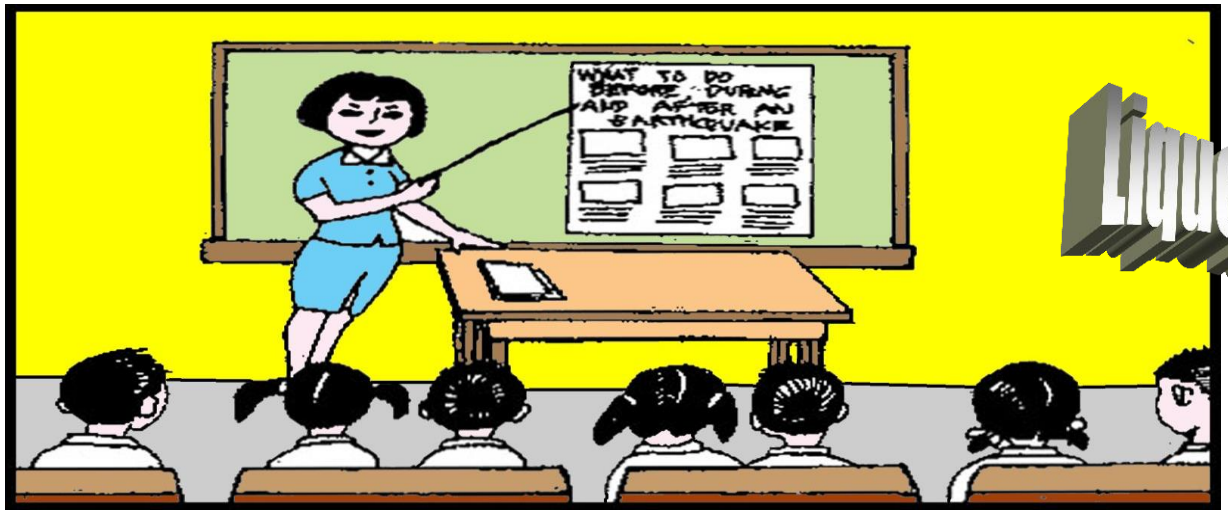
SIGNALING DEVICE

ORIENTATION PRIOR TO THE CONDUCT OF EARTHQUAKE DRILL

EARTHQUAKE

TSUNAMI

magnitude



Liquefaction

Earthquake

What to do's and dont's

Give specific instructions about what to do as soon as the shaking stops.

Be alert.

Listen to the Marshal's instructions

Walk out of the house/building in an orderly manner.

Be watchful/alert for falling debris while walking in alleys or streets.

DON'T RUN, DON'T PUSH, DON'T TALK, DON'T RETURN and DON'T BRING YOUR THINGS!

Quietly but quickly proceed to the designated evacuation area and wait for further instructions from the marshals.

NEVER go back to the house/building once outside. Building should be inspected by engineers for possible damage.

BEFORE

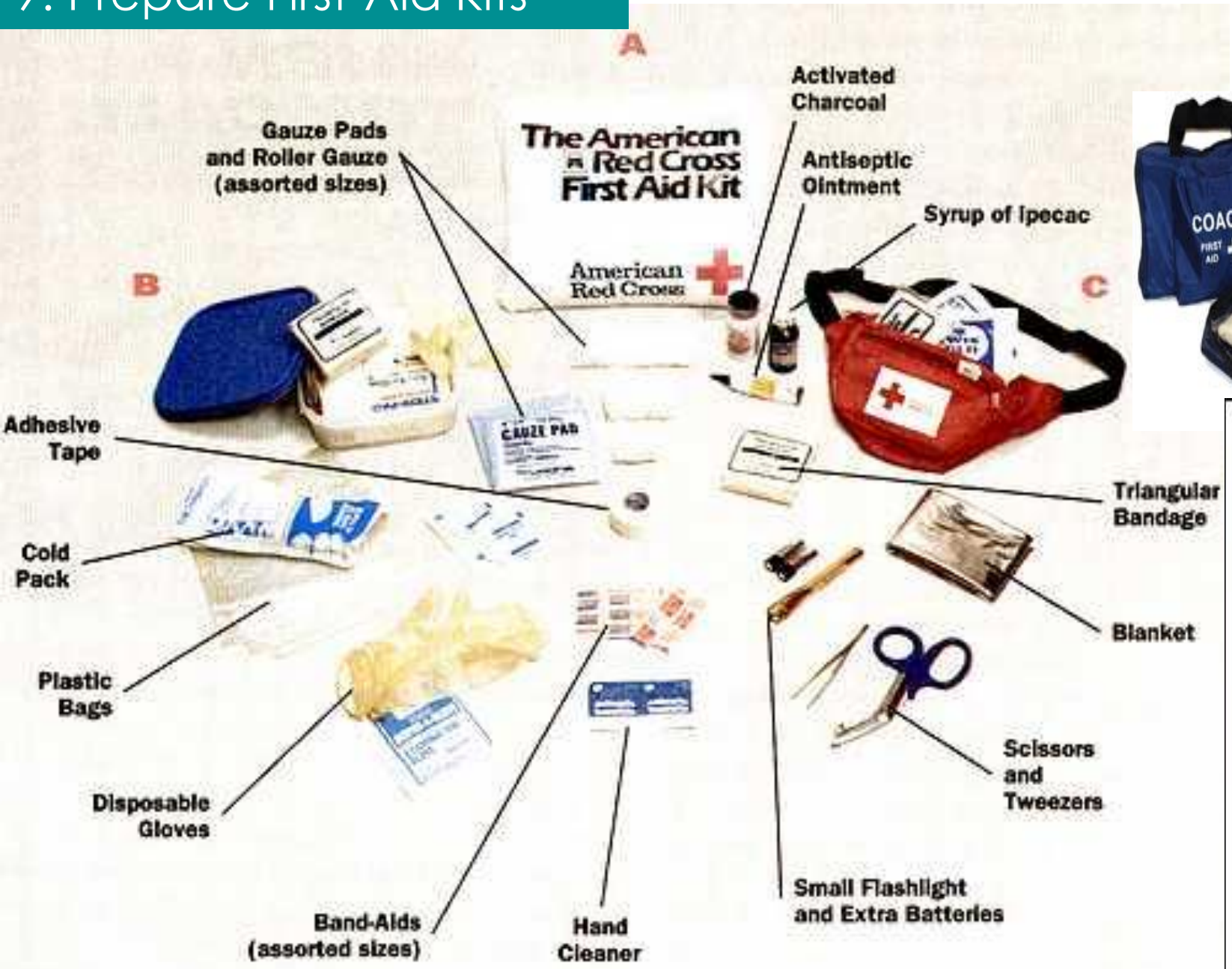
Determine if site is along an active fault and/or prone to liquefaction or landslide.

Use proper structural design and engineering practice

Evaluate structural soundness of buildings and important infrastructures

The key to effective disaster prevention is planning.

9. Prepare First-Aid Kits



Identify relatively strong parts of the building

- ❑ door jambs
- ❑ elevator shafts
- ❑ sturdy tables

Learn to use fire extinguishers, first aid kits, alarms and emergency exits.

Familiarize yourself with your place of work and residence

Strap heavy furniture to walls

Store breakable items, harmful chemicals and flammable materials in lower most shelves

Turn off gas tanks when not in use.

Keep heavy materials in lower shelves.

Check stability of hanging objects.

Maintain an earthquake survival kit.

Familiarize yourself with your place of work and residence

DURING

Protect your body from falling debris

If inside a structurally sound building, stay there!

+ **Get away from power lines, posts, walls and other structures**

+ **Stay away from buildings with glass panes.**

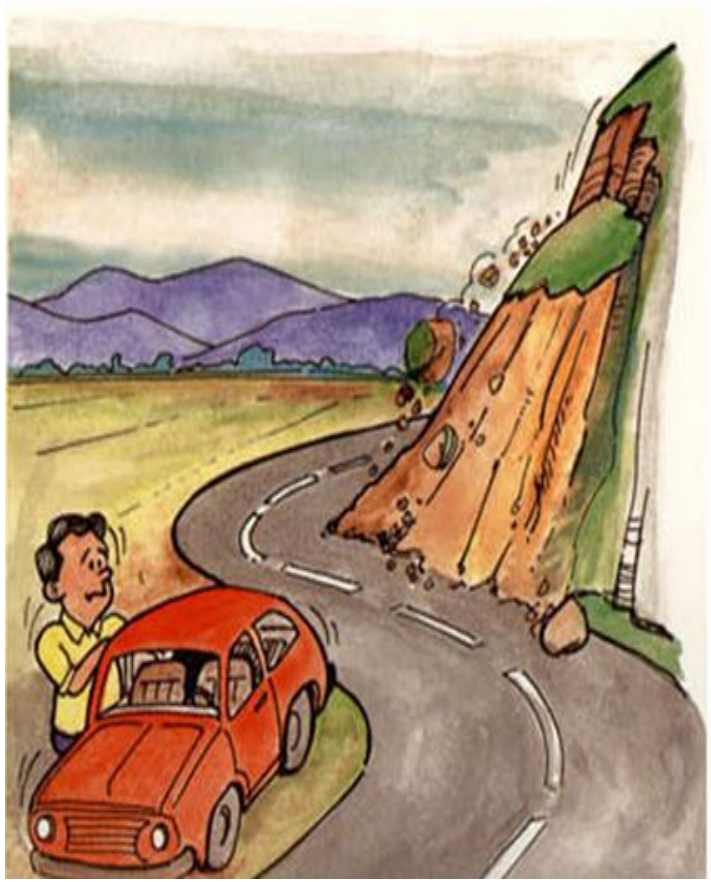
If outside, move to an open area.

Do not attempt to cross bridges or overpasses which may have been damaged.

When driving a vehicle, pull to the side of the road and stop.

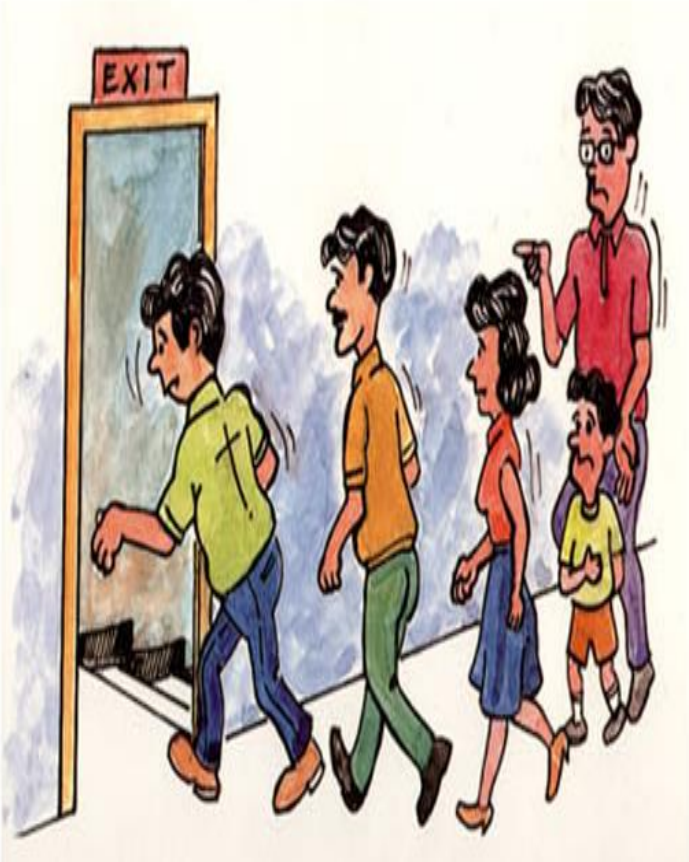
Run away from the shore toward higher ground

If along the shore and you feel an earthquake, strong enough to make standing difficult.



If on an open mountain, or near a steep hill slope, move away from steep escarpments which may be affected by landslides.

AFTER



Get out calmly in an orderly manner,

Use the stairs, do not use elevators.

Check yourself and others for injuries

If inside an old, weak structure, take the fastest and safest way out!

Clean up chemical spills, toxic flammable materials

Check for fire and if any, have it controlled.

Check water and electrical lines for defects.

***Check surroundings*.**

Do not enter partially damaged building, strong aftershocks may cause these to collapse.

Gather information and disaster prevention instruction from battery-operated radios.

Obey public safety precautions.

Help reduce the number of casualties from the earthquake:

Do not use your telephone to call relatives and friends.

Do not use your car and drive around areas of damage.

Unless you need emergency help!

Take with you your earthquake survival kit, which should contain all necessary items for your protection and comfort.

If you must evacuate your residence, leave a message stating where you are going.

PHASES OF AN EQ DRILL

1. Sounding the alarm
2. Response "Duck, Cover & Hold"
3. Evacuation
4. Assembly at the designated evacuation area
5. Head count
6. Evaluation

Summary

- The Philippine archipelago lies in the Pacific Typhoon Belt and Pacific Ring of Fire. This geographic location makes the country highly exposed to both hydro-meteorological and geological hazards. The country has one of the longest coastline which is twice that of the US. With 20 Typhoon and 300 volcanos,
- Our exposure to natural hazards makes the Philippines vulnerable to natural-caused disasters,
- Building Emergency Evacuation Plan (BEEP) on EQ Scenario,
- Incident Command System (ICS) Structure and Emergency Management Team (ERT) Organization.

We can't prevent Natural Hazards, It's God's way of reminding us.....

But, we can prevent their effects from becoming a Disaster...

PREPAREDNESS IS A MUST!!!

ACT NOW!!!

1. Prepare for the survival of yourself.
2. Prepare for the survival of your employees.
3. Prepare for the survival of your tenants.
4. Prepare for the survival of your patients.
5. Prepare for the survival of your students.
6. Prepare for the survival of your company or establishment.

" Hazards when not prepared for result to Disasters … and Disasters bring about evil effects "

“We are living with Risks; Lack of Prevention is the debt of development; and DISASTERS are the unpaid bills”

THANK YOU!