EARTHQUAKE: POLICY AND RISK MANAGEMENT

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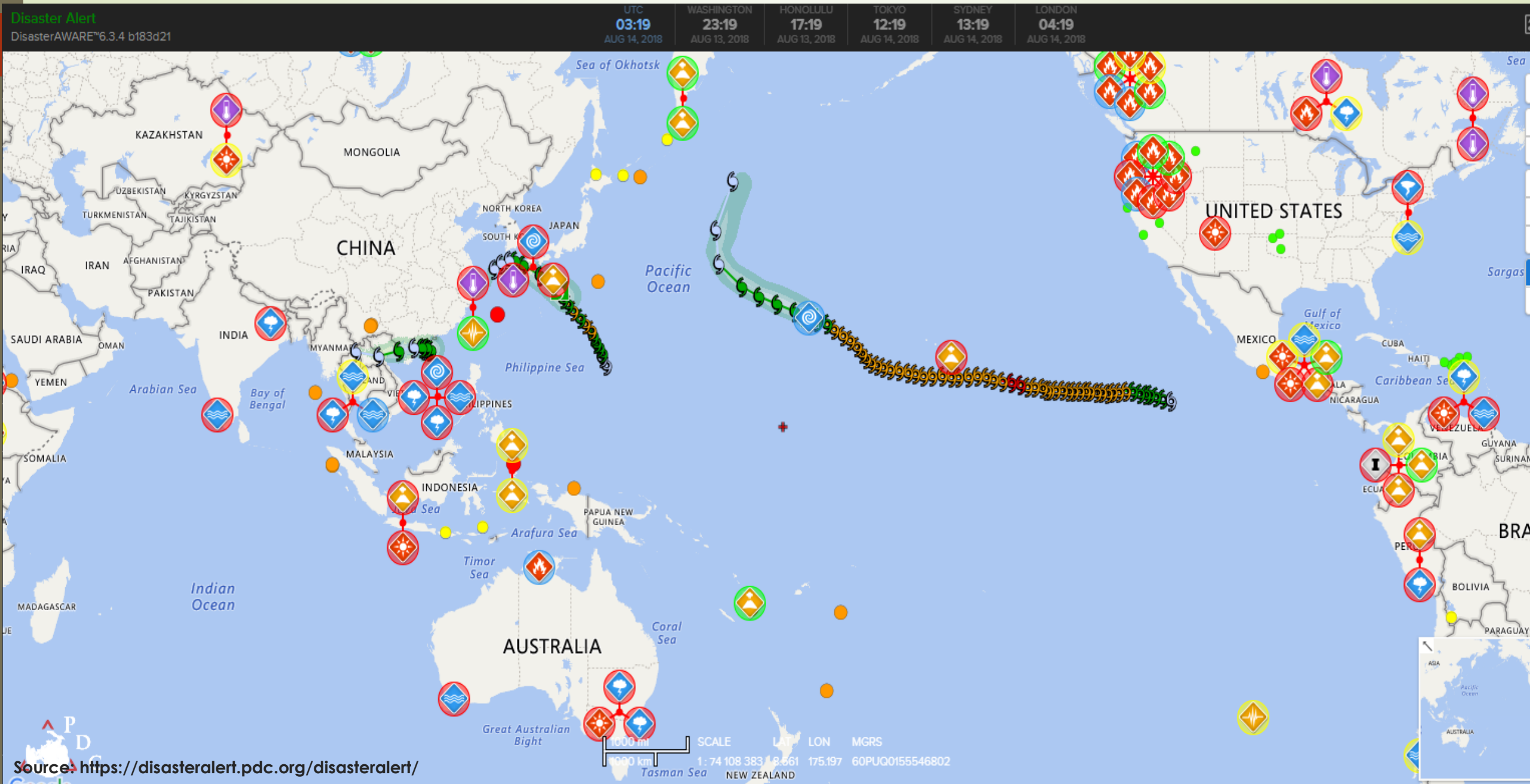
OUTLINE

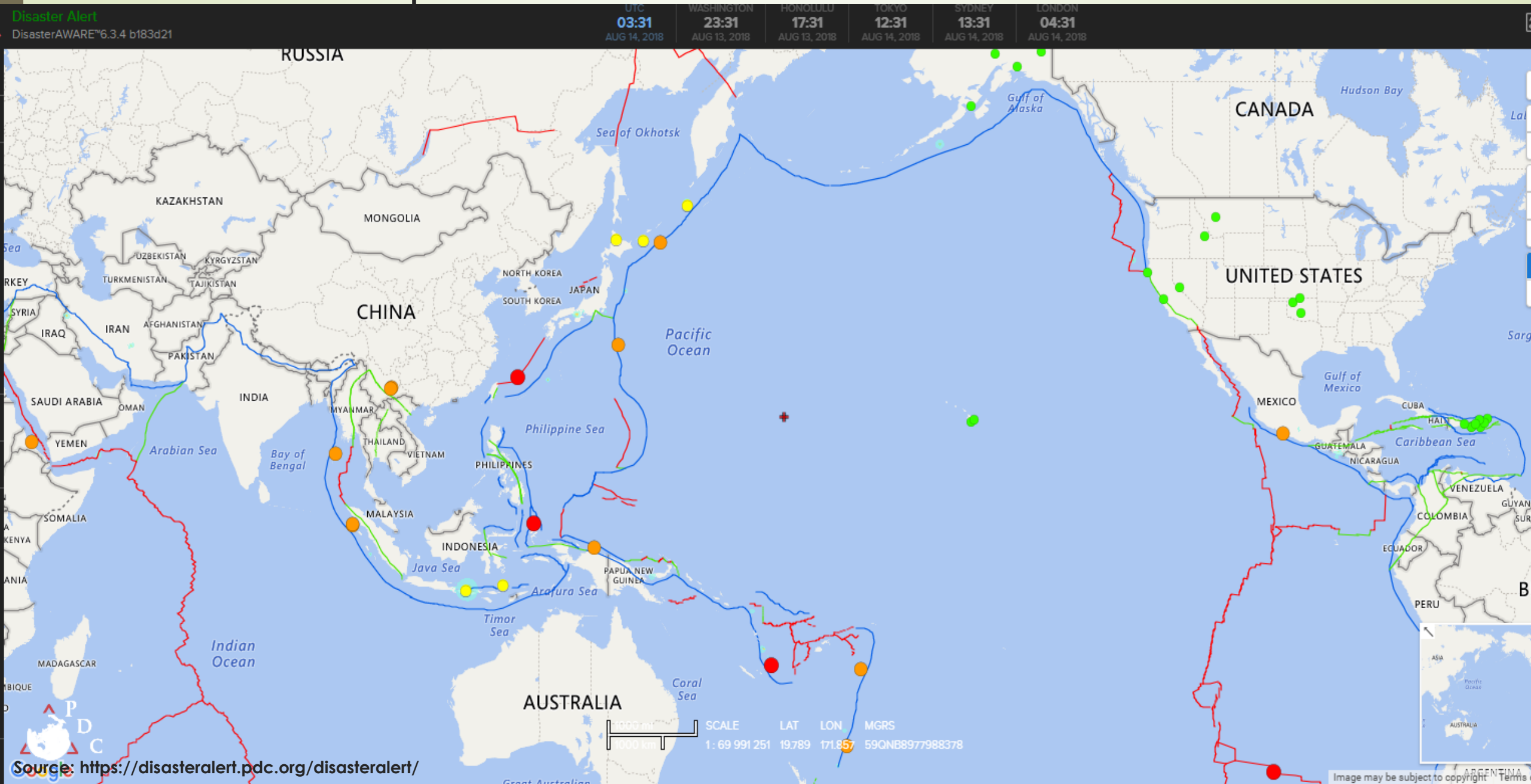
- **INTRODUCTION**
- **EARTHQUAKE 101**
- **DISASTER MANAGEMENT IN MALAYSIA**
- **NATIONAL POLICY ON DRR & WAY FORWARD**

Disasters around the world



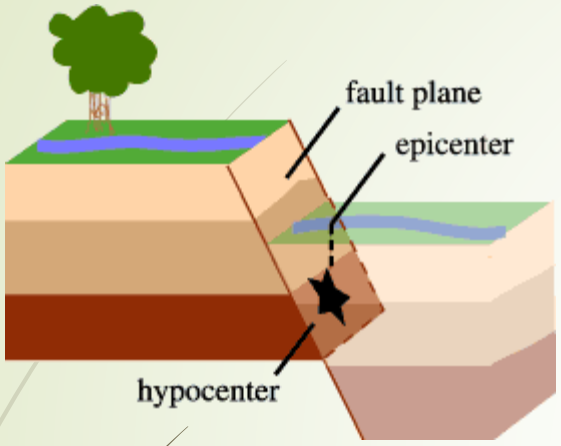
Source: https://disasteralert.pdc.org/disasteralert/

Earthquakes around the world



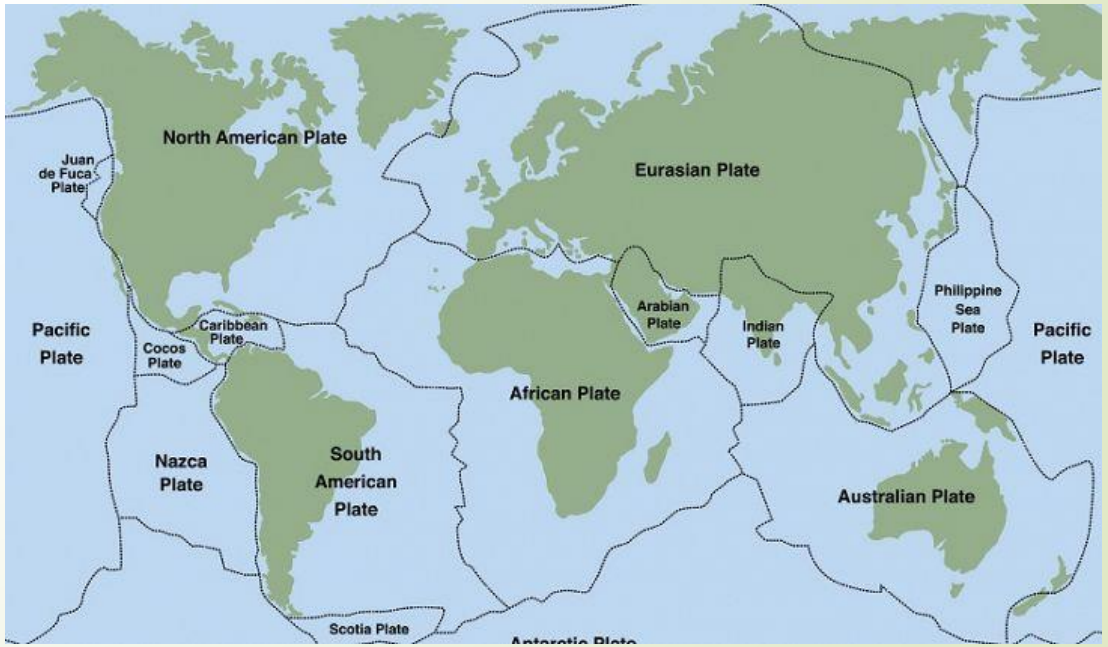
Source: https://disasteralert.pdc.org/disasteralert/

Earthquake 101



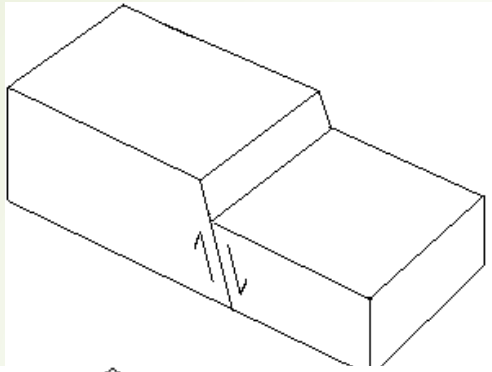
An *earthquake* is what happens when two blocks of the earth suddenly slip past one another. The surface where they slip is called the *fault* or *fault plane*. The location below the earth's surface where the earthquake starts is called the *hypocenter*, and the location directly above it on the surface of the earth is called the *epicenter*.

The plate boundaries are made up of many faults, and most of the earthquakes around the world occur on these faults. Since the edges of the plates are rough, they get stuck while the rest of the plate keeps moving.

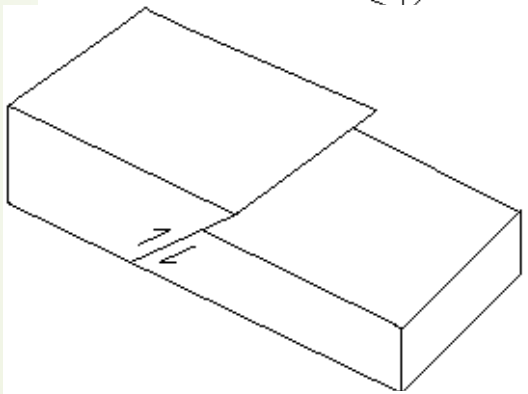


Types of faults

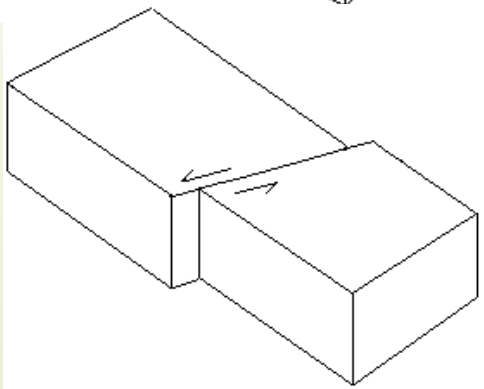
- 1. Normal faults

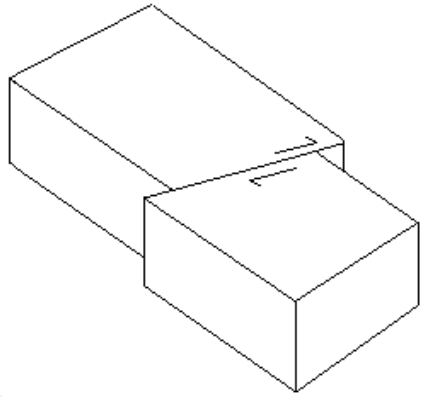


- 2. Reverse faults



- 3. Strike-slip faults





Degree of damage

Richter magnitude	Character
M = 1 to 3	Recorded on local seismographs, but generally not felt
M = 3 to 4	Often felt, no damage
M = 5	Felt widely, slight damage near epicenter
M = 6	Damage to poorly constructed buildings and other structures within tens of kilometers of the epicenter
M = 7	“Major” earthquake, causes serious damage up to ~ 100 km
M = 8	“Great” earthquake, great destruction, loss of life over several 100 km; Kepulauan Banyak/Nias, Sumatra, 28 March 2005
M = 9	Rare great earthquake, major damage over a large region over 1000 km; Aceh, Sumatra 26 December 2004

Degree of damage

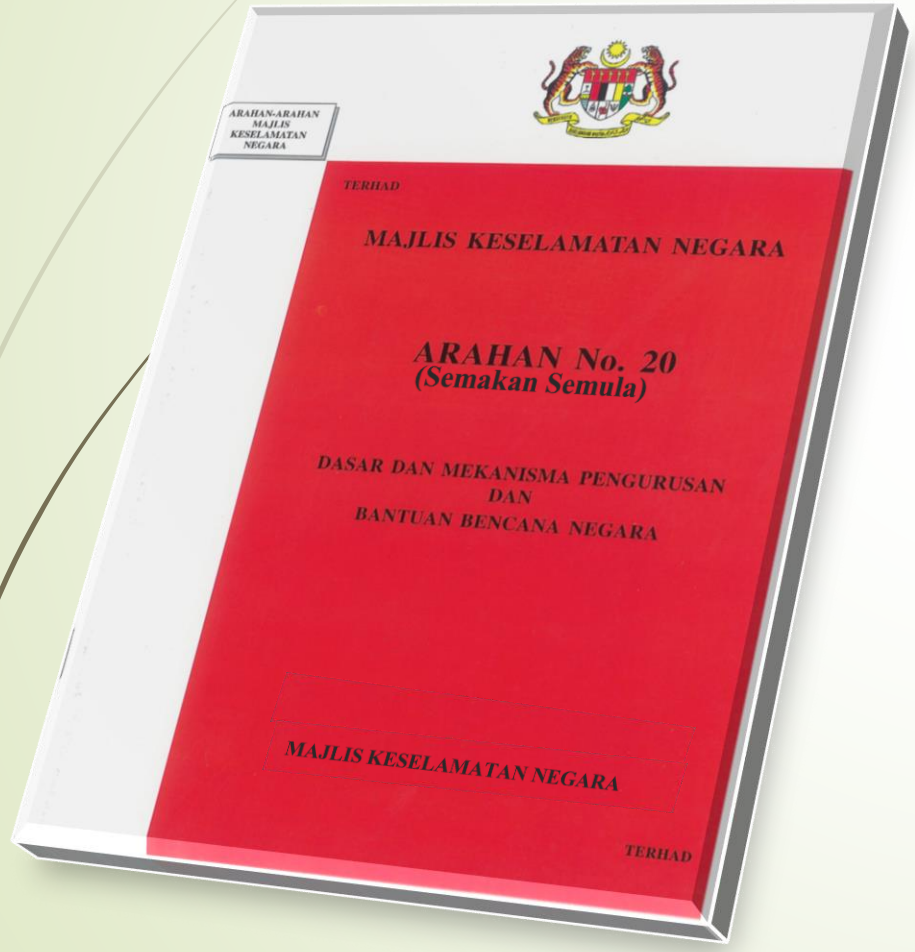
MMI value	Shaking severity	Damage description	Indication
I			Not felt. Marginal and long period effects of large earthquakes.
II			Felt by persons at rest, on upper floors, or favourably placed
III			Felt indoors. Hanging objects swing. Vibration similar to passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV			Hanging objects swing. Vibration similar to passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing cars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV, wooden walls and frames creak.
V	Light	Pictures move	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing. Close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.
VI	Moderate	Objects fall	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc. off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and masonry cracked. Small bells ring (church, school). Trees, bushes shaken (visibly, or heard to rustle).
VII	Strong	Nonstructural damage	Difficult to stand. Noticed by drivers of cars. Hanging objects quiver. Furniture broken. Damage to masonry, including cracks. Weak chimneys broken at the roof line. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments). Some cracks in concrete masonry. Waves on ponds, water turbid with mud. Small slides and caving in along sand and gravel banks. Large bells ring. Concrete irrigation ditches damaged.
VIII	Very strong	Moderate damage	Steering of cars affected. Damage to concrete masonry, partial collapse. Fall of some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperatures of springs and wells. Cracks in wet ground and on steep slopes.
IX	Violent	Heavy damage	General panic. Masonry destroyed, collapsed; general damage to foundations. Frame structures (not bolted) shifted off foundations. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground; sand and mud ejected from ground in alluvial areas (sand boils, fountains, craters).
X	Very violent	Extreme damage	Most masonry and frame structures destroyed with their foundations. Some well-built wood structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes and other water bodies. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI			Rails bent greatly. Underground pipelines completely out of service.
XII			Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.

Definition of disaster

"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 to cope using its own resources"

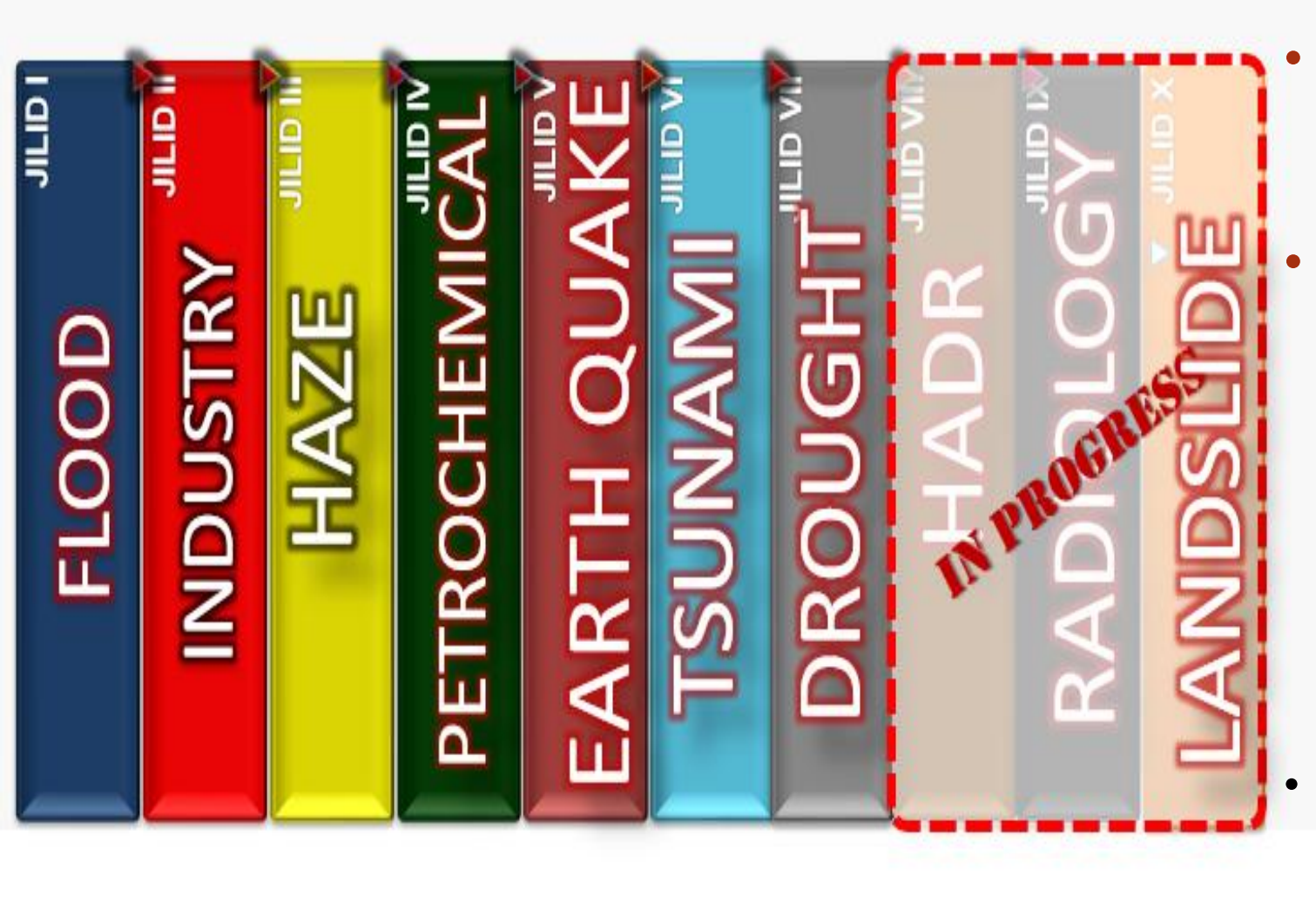
MKN Directive No.20, 2012

Policy & Directives



- **Originate from the *Highland Towers* tragedy on 11th Disember 1993;**
- **First Edition : 11th Mei 1997;**
- **Revised : 30th Mac 2012;**
- **Why need to be revised?**
  - **Comprehensive response;**
  - **More complex disasters; and**
  - **More agencies & NGO's involved.**
- **New directives will issued in accordance of the establishment of NADMA**

Standard Operating Procedure



- To **clarify and explain the roles & responsibilities** of each agencies.
- Objectif & Goals:
  - As a **guideline and reference**;
  - To **Improve** disaster management **coordination, integration and more effective**;
  - Avoid confusion and conflict;
  - Ensure the **welfare of the victims** more secure.
- Planning to have a multi-hazards SOP.

DISASTER MANAGEMENT MECHANISM

Central Disaster Management Committee

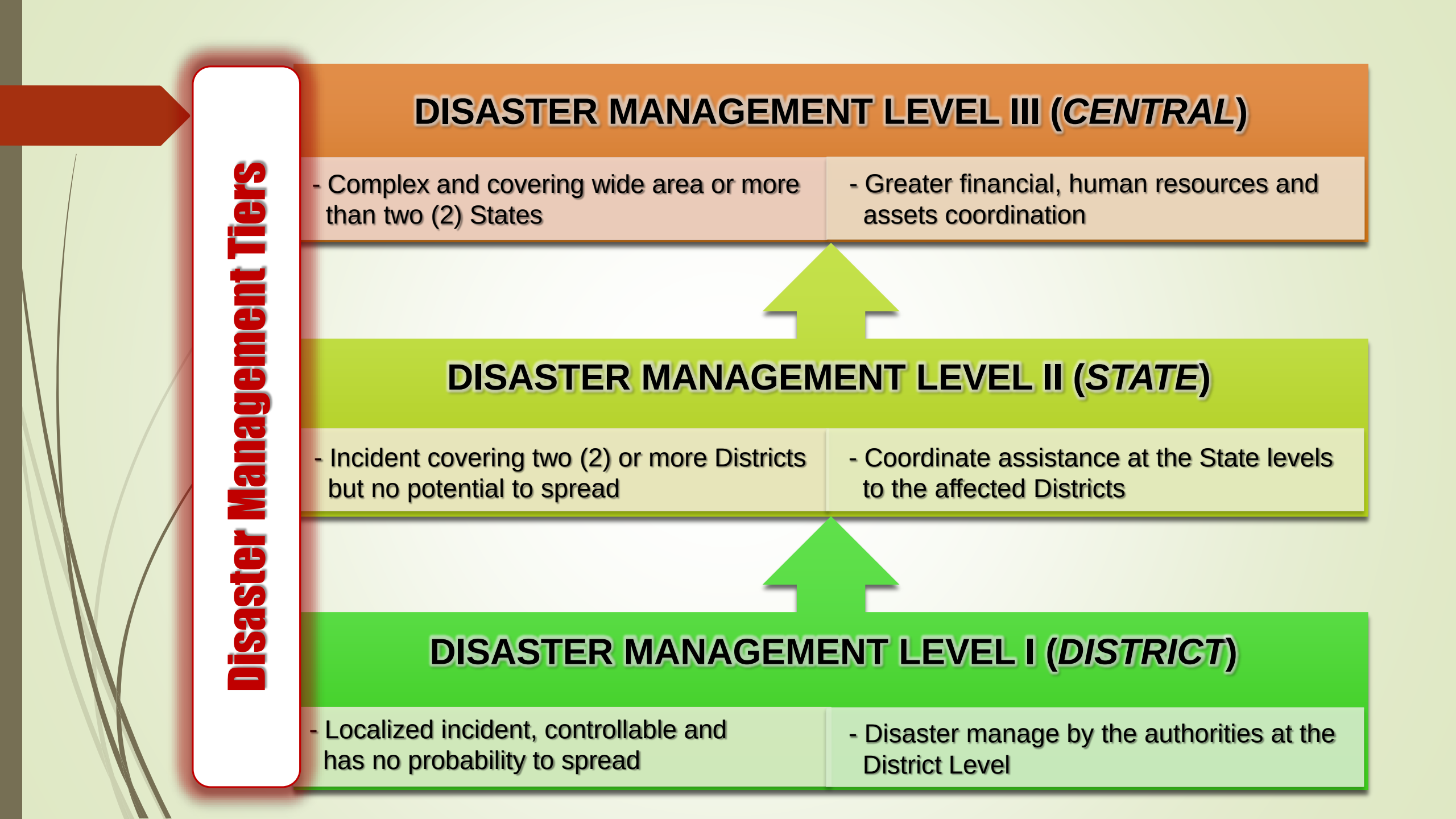
- Head by the Minister in The Prime Minister 's Department
- Determining the national disaster management policy, asset, financial and human resources

State Disaster Management Committee

- Head by the State Secretary
- Provide assistance to the affected area such as financial aid, assets & human resources

District Disaster Management Committee

- Head by the District Officer
- Ensure that coordinated action, sufficient assets and human resources, in relation to media


Disaster Management Tiers
DISASTER MANAGEMENT LEVEL III (CENTRAL)
- Complex and covering wide area or more than two (2) States
- Greater financial, human resources and assets coordination
DISASTER MANAGEMENT LEVEL II (STATE)
- Incident covering two (2) or more Districts but no potential to spread
- Coordinate assistance at the State levels to the affected Districts
DISASTER MANAGEMENT LEVEL I (DISTRICT)
- Localized incident, controllable and has no probability to spread
- Disaster manage by the authorities at the District Level

Command & Control Mechanism

On-Scene Command Post (OSCP)

- To be set up as soon as an incident is declared a disaster;
- The OCPD is responsible to set up the OSCP;
- Disaster Operations Commander:
  - Responsible to establish a communication and information network with the DOCC;
  - Coordinates Search and Rescue operations;
  - Can appoint a Forward Commander to lead the SAR operations;
- All Agencies involved are to report to the OSCP

Disaster Operations Control Centre (DOCC)

- To be set up by the Disaster Management Committee Secretariat;
- Shall convene regularly to monitor the progress of a disaster and decide on actions to tackle it;
- District DOCC shall report to the Stet and Central DOCC;
- Government Agencies involved are required to assign liaison officers at the DOCC to facilitate the smooth handling of disasters.

National Policy on DRR

1 OUTCOME

The substantial reduction of disaster risk and losses in lives, livelihood , health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities & countries

1 GOAL

Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social health, cultural, educational, environmental, technology, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience

4 PRIORITIES

Understanding disaster risk

Strengthening disaster risk governance to manage disaster risk

Investing in disaster risk reduction for resilience

Enhance disaster preparedness for effective response and to "build back better" in recovery, rehabilitation, and reconstruction

Sendai Framework for Disaster Risk Reduction

2015 - 2030

The Seven Global Targets

Understanding Disaster Risk

- Improving Disaster Risk Information
- Application of Science and Technology
- Translate information into action

Strengthening Disaster Risk Governance

- Enhance institutional framework
- Capacity building
- Communication

Investing in DRR

- Mitigation measures
- Risk transfer
- Shared responsibility

LAMPIRAN 5

KELENGKAPAN, PERKAKASAN DAN PERISIAN SERTA ANGGARAN KOS UNTUK CADANGAN PUSAT PEMANTAUAN GEMPA BUMI SABAH (PPGS) DI RANAU, SABAH

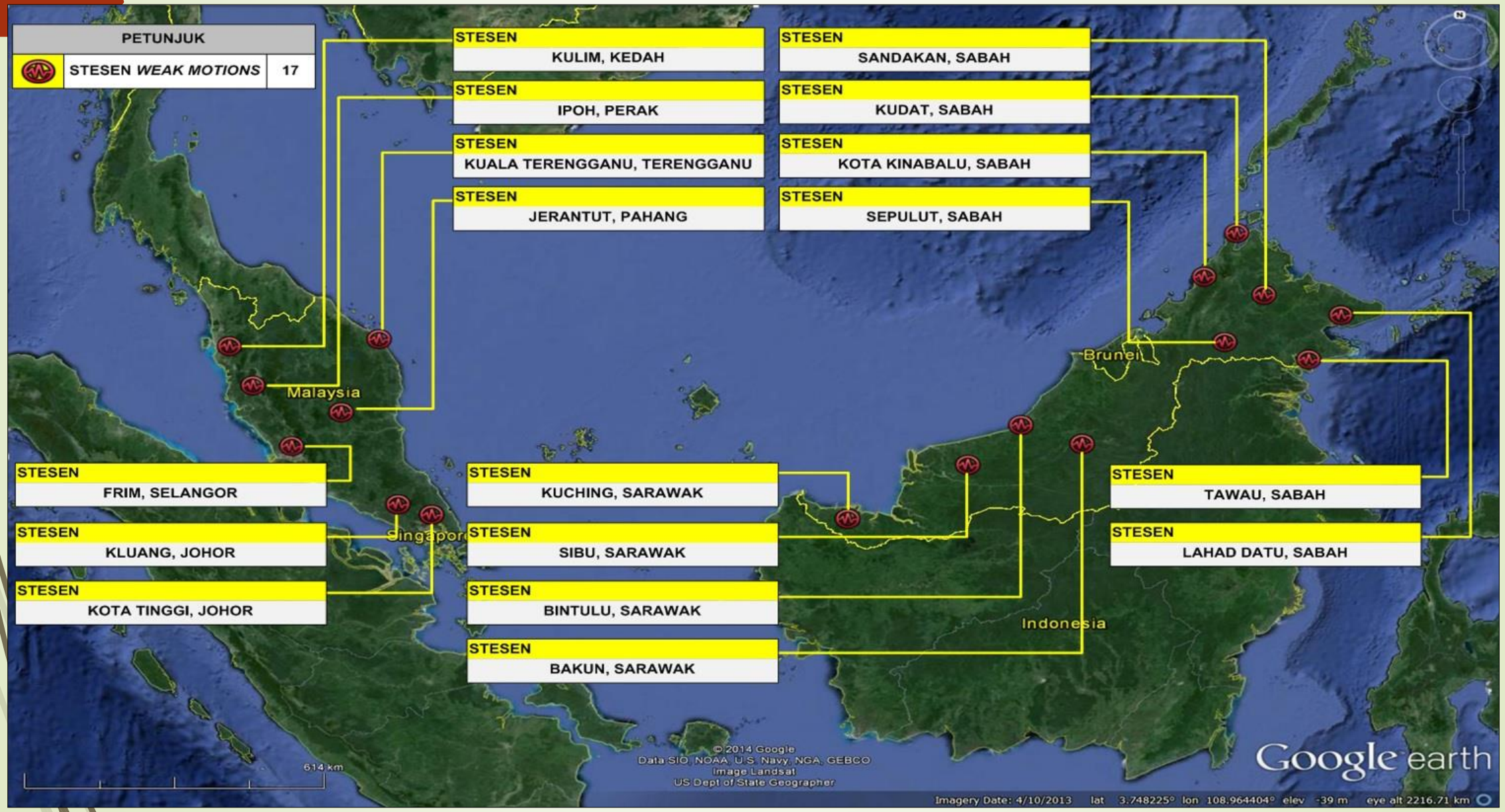
ITEM	PERKARA	ANGGARAN HARGA (RM)
A	NAIK TARAF RUANG OPERASI BAGI PEMBANGUNAN SEBUAH PUSAT PEMANTAUAN GEMPA BUMI DI PEJABAT METEOROLOGI RANAU, SABAH	200,000.00
B	15 BUAH STESEN SEISMIK BARU DI NEGERI SABAH	9,700,000.00
C	TALIAN KOMUNIKASI (VSAT, IPVPN DAN INTERNET BERKELAJUAN TINGGI)	3,000,000.00
D	PERKAKASAN DAN PERISIAN PENGKOMPUTERAN (SISTEM PEMPROSESAN DAN PAPARAN)	1,700,000.00
E	2 BUAH KENDERAAN PACUAN 4 RODA (PENYELENGGARAAN DAN OPERASI)	300,000.00
	JUMLAH BESAR	**14,900,000.00**

Preparedness and Build Back Better

- EWS
- Awareness
- Lesson learned

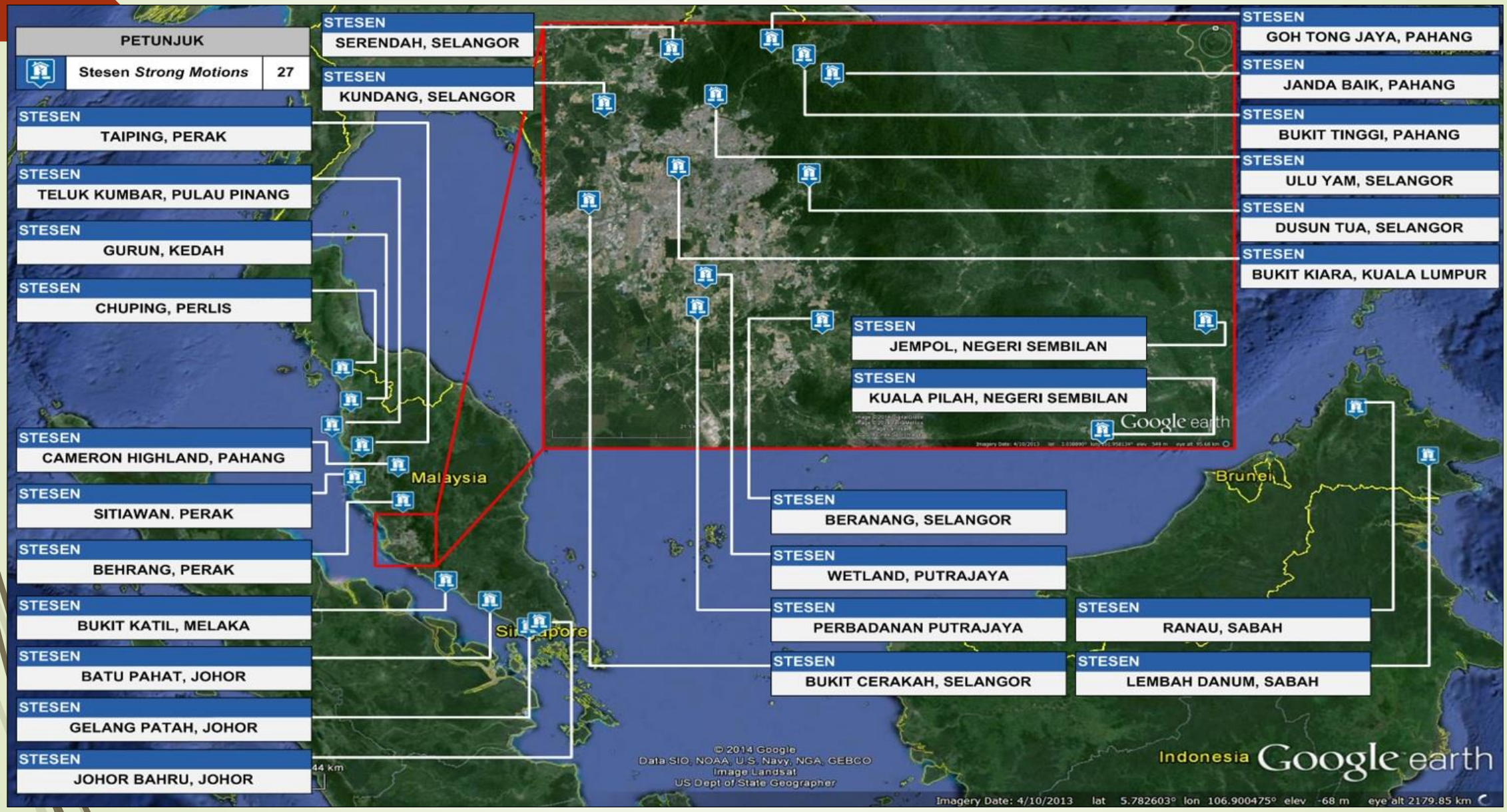
LAMPIRAN 2

RANGKAIAN STESEN-STESEN SEISMOLOGI JENIS WEAK MOTIONS SEDIA ADA



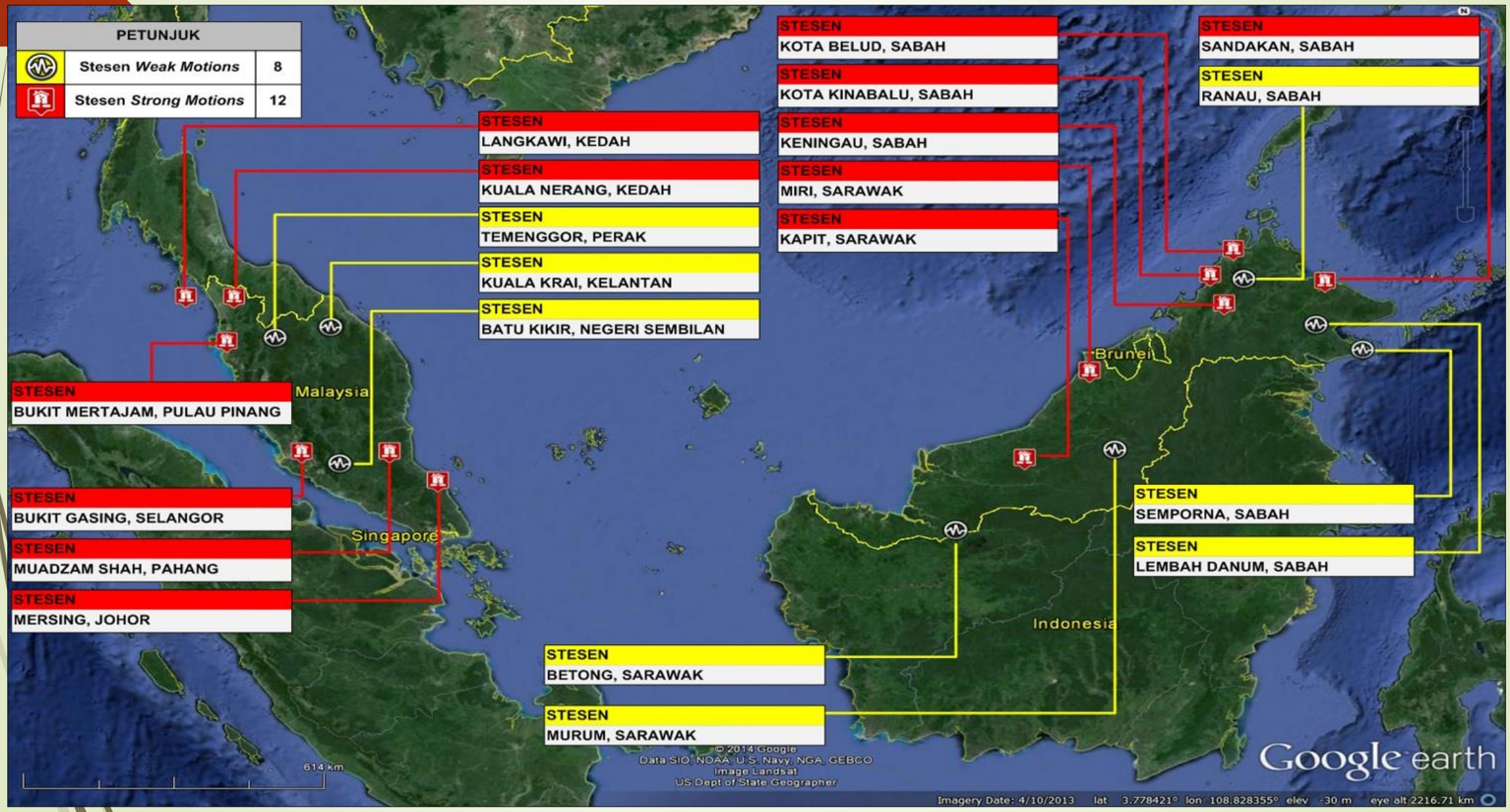
LAMPIRAN 3

RANGKAIAN STESEN-STESEN SEISMOLOGI STRONG MOTIONS SEDIA ADA



LAMPIRAN 4

RANGKAIAN STESEN-STESEN SEISMOLOGI BARU



Thank you