



The Roles of Satellite Data for Disaster Management in Indonesia



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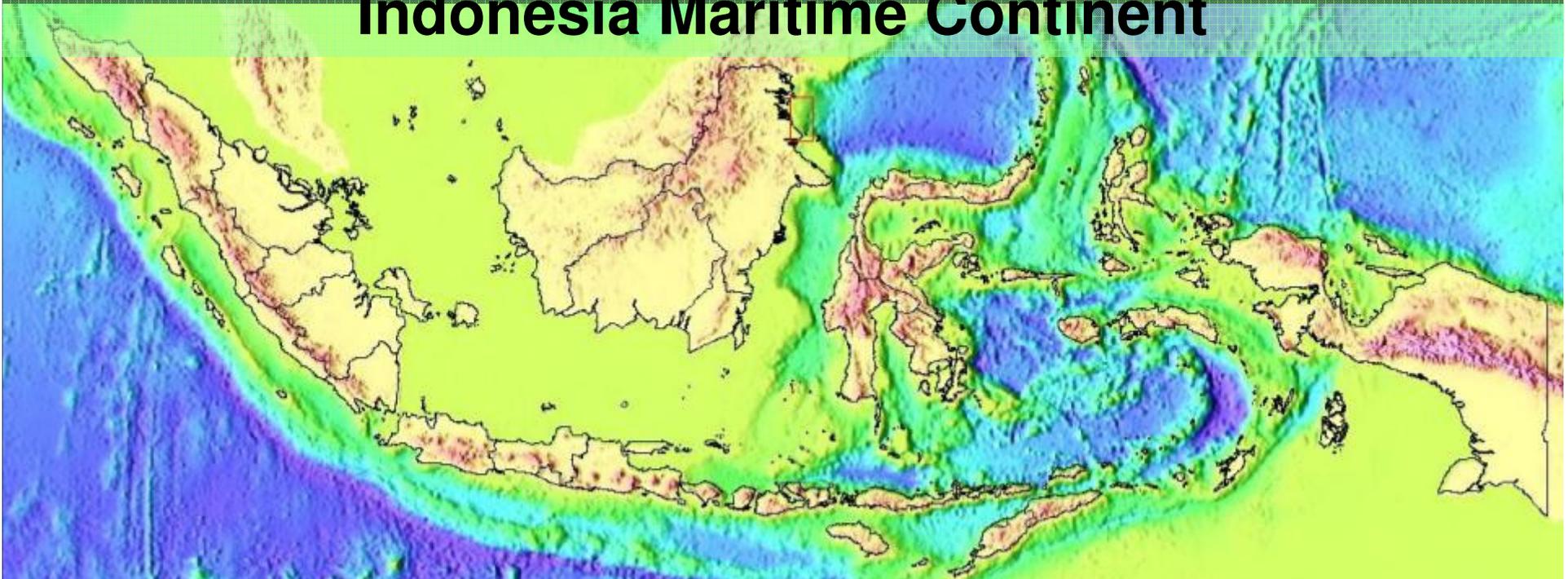
ICG -GNSS Seminar
Tokyo, September 5 2011

INDONESIA

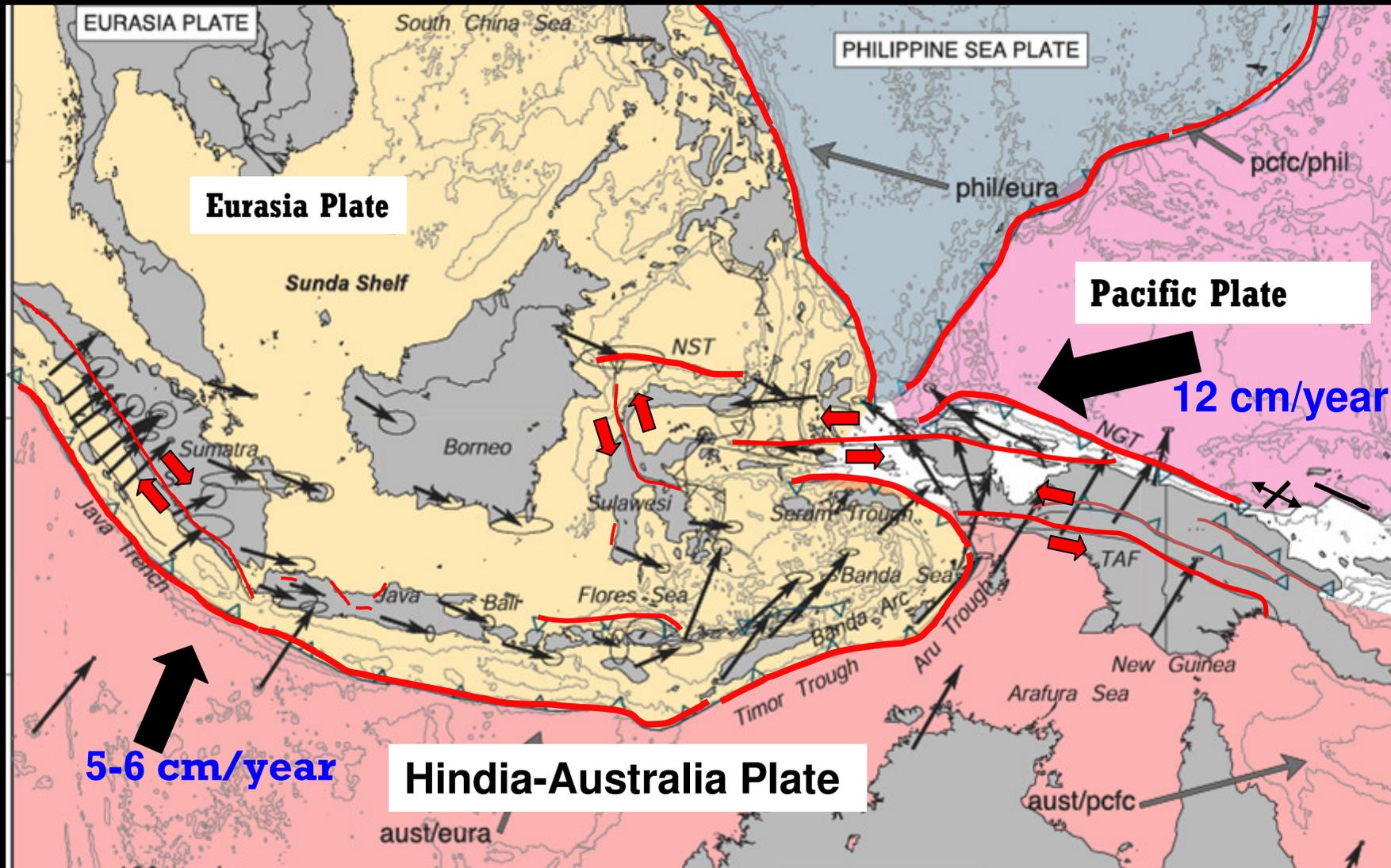


- 17,504 islands (1st in the world)
- 81,000 km long coastline (2nd in the world)
- Population 237 million people (4th in the world)
- Mega Biodiversity (10% plants, 12% of mammals, 16% of reptiles, 15% fish, 17% of bird in the world live in Indonesia) – 3rd in the world
- 13% or 129 active volcanoes in the world (1st in the world)

Indonesia Maritime Continent



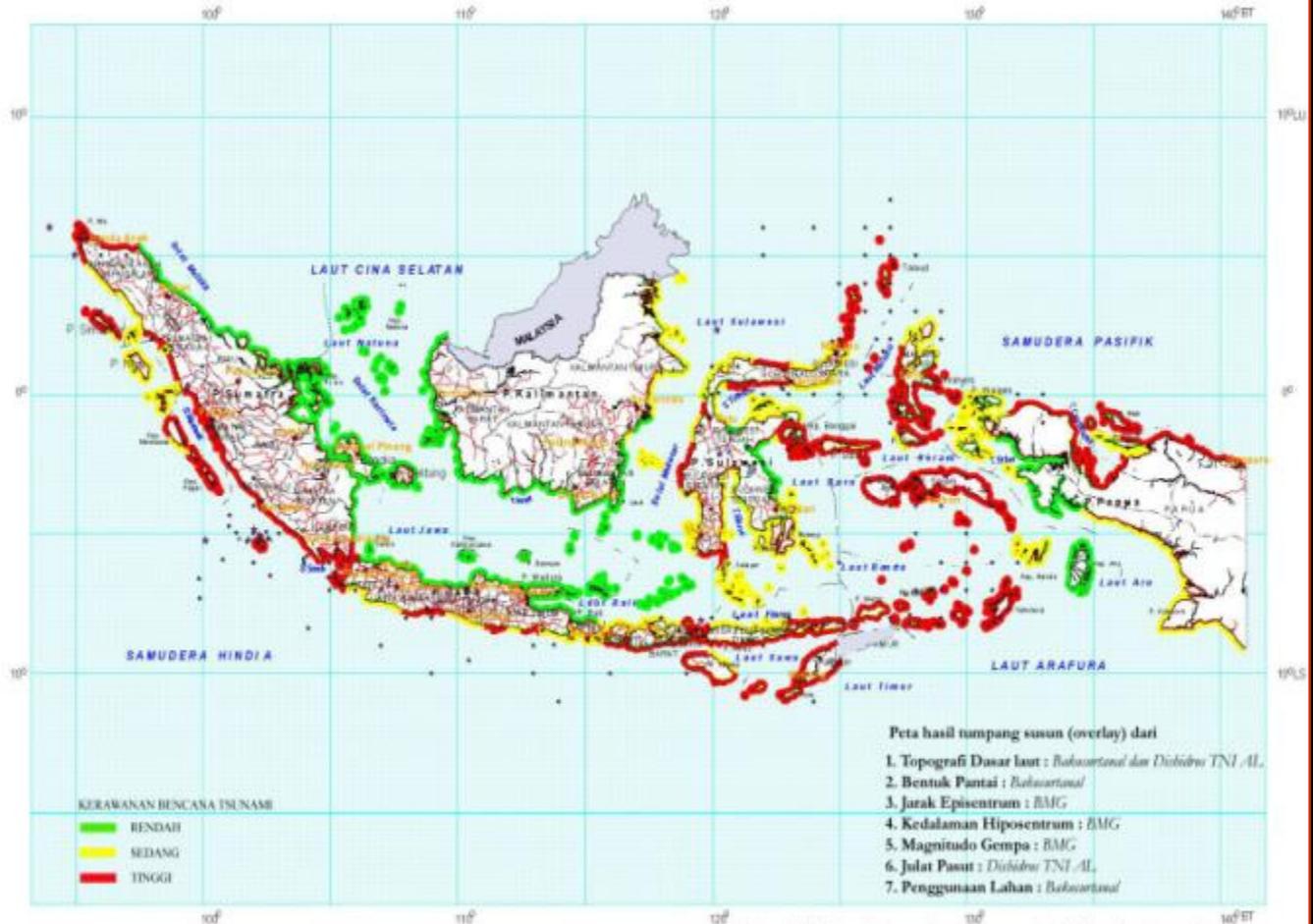
INDONESIA: DISASTER LABORATORY



Indonesia is located at 3 main tectonic plates which are active, they are Eurasia, Pacific and Hindia-Australia. The active tectonic process there are many earthquakes, tsunami, volcano eruption and others.

TSUNAMI HAZARD MAP

Total shoreline prone of tsunami is about 21.000 Km.



Badan Koordinasi Serevi dan Pemetaan Nasional (BAKOSURTANAL)

Kajian ini dilakukan melalui pengumpulan data dan peta wilayah darat sebagai informasi yang akurat, seperti Direktorat Geologi Tani Lingkungan, Korpriwil, BPS, BPS, BPS, BPS dan instansi terkait lainnya. Data dan peta tersebut digunakan sebagai bahan untuk pemetaan wilayah darat yang berisiko bencana dan secara spasial dengan menggunakan bantuan Sistem Informasi Geografis. Berdasarkan analisis kerawanan dan faktor-faktor lainnya, maka kerawanan, faktor-faktor penyebab bencana dan upaya mitigasi bencana dan dapat diuraikan. Selanjutnya dilakukan penggabungan data spasial berupa peta dan data statistik berupa data sosial kependudukan dan berbagai fasilitas yang diperlukan dalam penanggulangan bencana untuk membentuk sistem informasi penanggulangan bencana. Komponen-komponen pemetaan wilayah darat yang digunakan dalam penelitian ini adalah topografi dasar laut, bentuk pantai, jarak episentrum, kedalaman hiposentrum, magnitudo gempa, julat pasut dan penggunaan lahan.

Earthquakes



Aceh, 2004



Nias, 2005



Padang, 2009



Jogja, 2006



Mentawai, 2010

VOLCANOS



- 129 active Volcanos

Pacific Ring of Fire

Cause the geophysics disaster opportunity increased ”

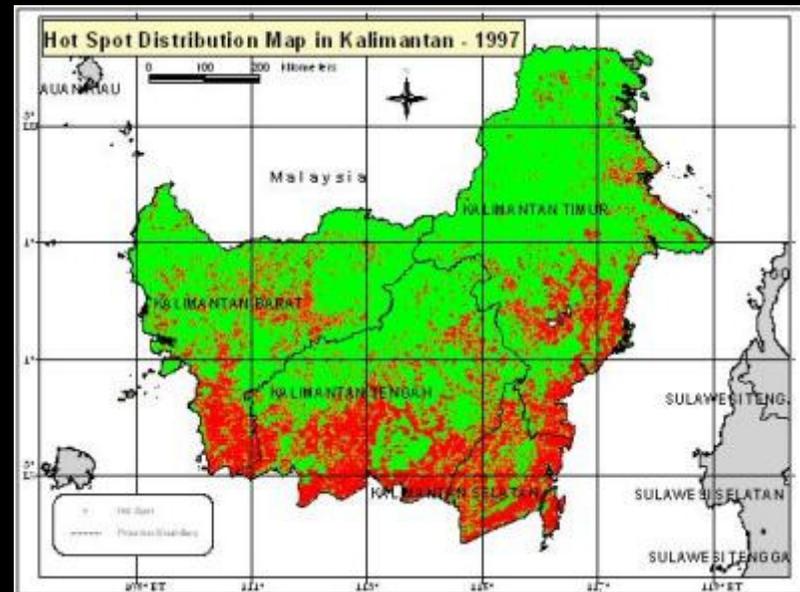
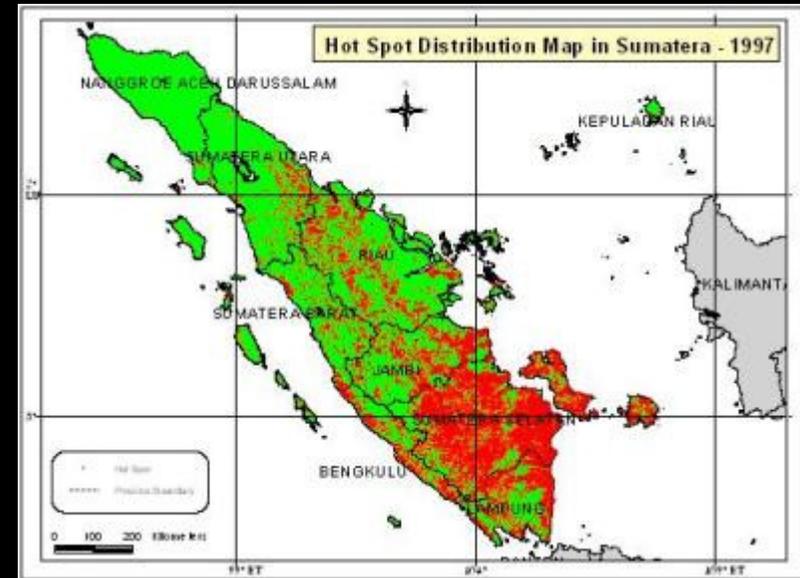
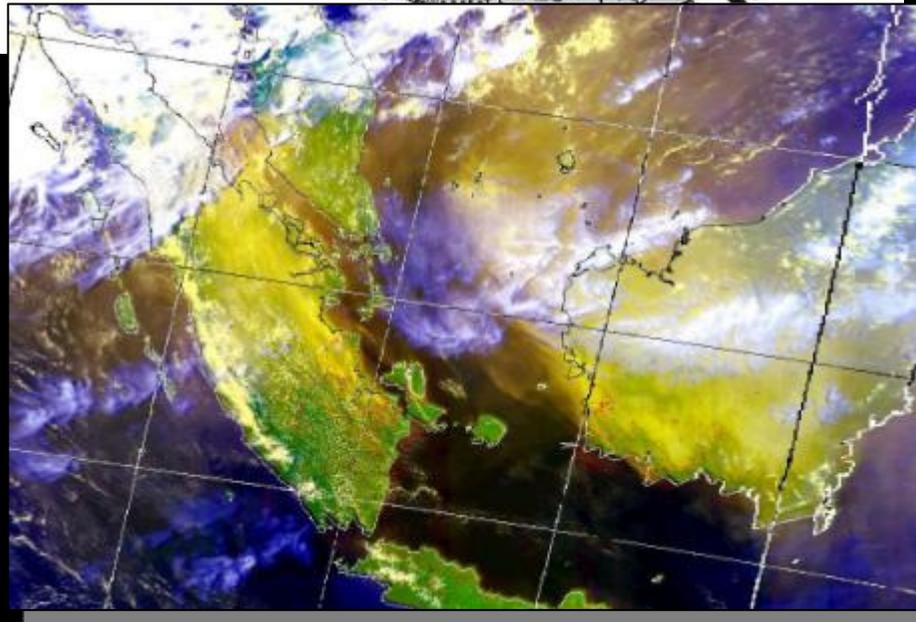
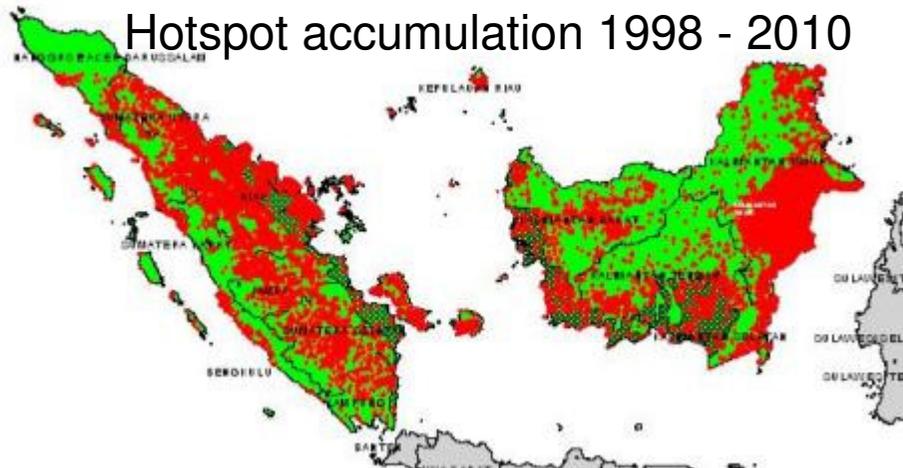


“ irony of nature,
we stand on the earth's rich
natural resources but also prone
to natural disasters, ”

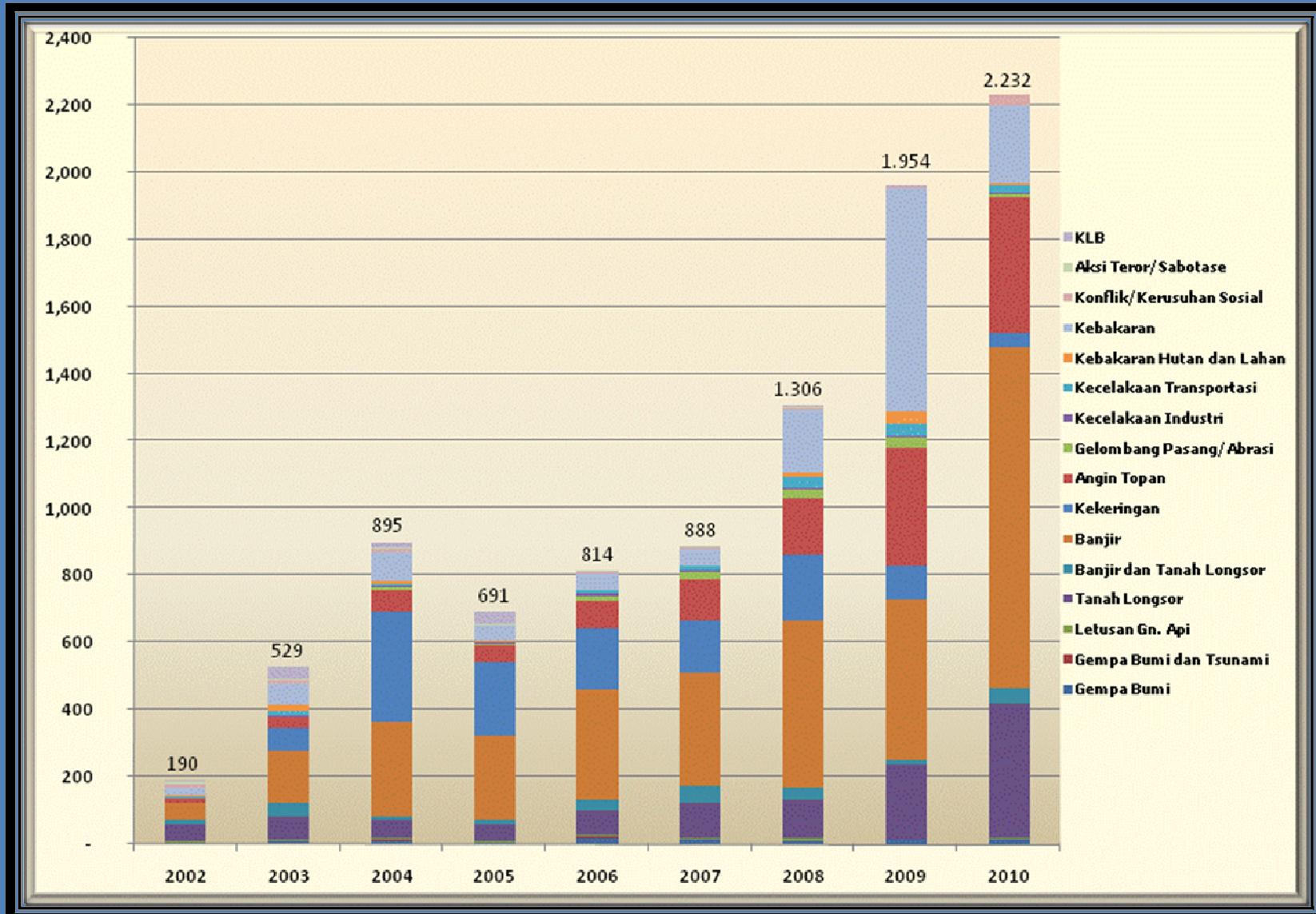


Indonesia's face of Land and Forest Fire

Hotspot accumulation 1998 - 2010



DISASTERS IN INDONESIA DURING 2002 - 2010



Nasional Agency for Disaster Management (BNPB)



- ✦ **BNPB** is the Indonesia National Agency for Disaster Management. It was established in 2008 to replace the National Disaster Management Coordinating Board that was established in 1979. BNPB is directly responsible to the President of Indonesia and the chairman is directly appointed by The President
- ✦ The Chairman BNPB is Mr. Dr. Syamsul Maarif





Law & Regulation of Disaster Management

1. GOVERNMENT LAW NO 24 / 2007

DISASTER MANAGEMENT

2. GOVERNMENT REGULATION NO 21 / 2008

DISASTER MANAGEMENT IMPLEMENTATION

3. GOVERNMENT REGULATION NO 22 / 2008

DISASTER RELIEF MANAGEMENT & FUNDING

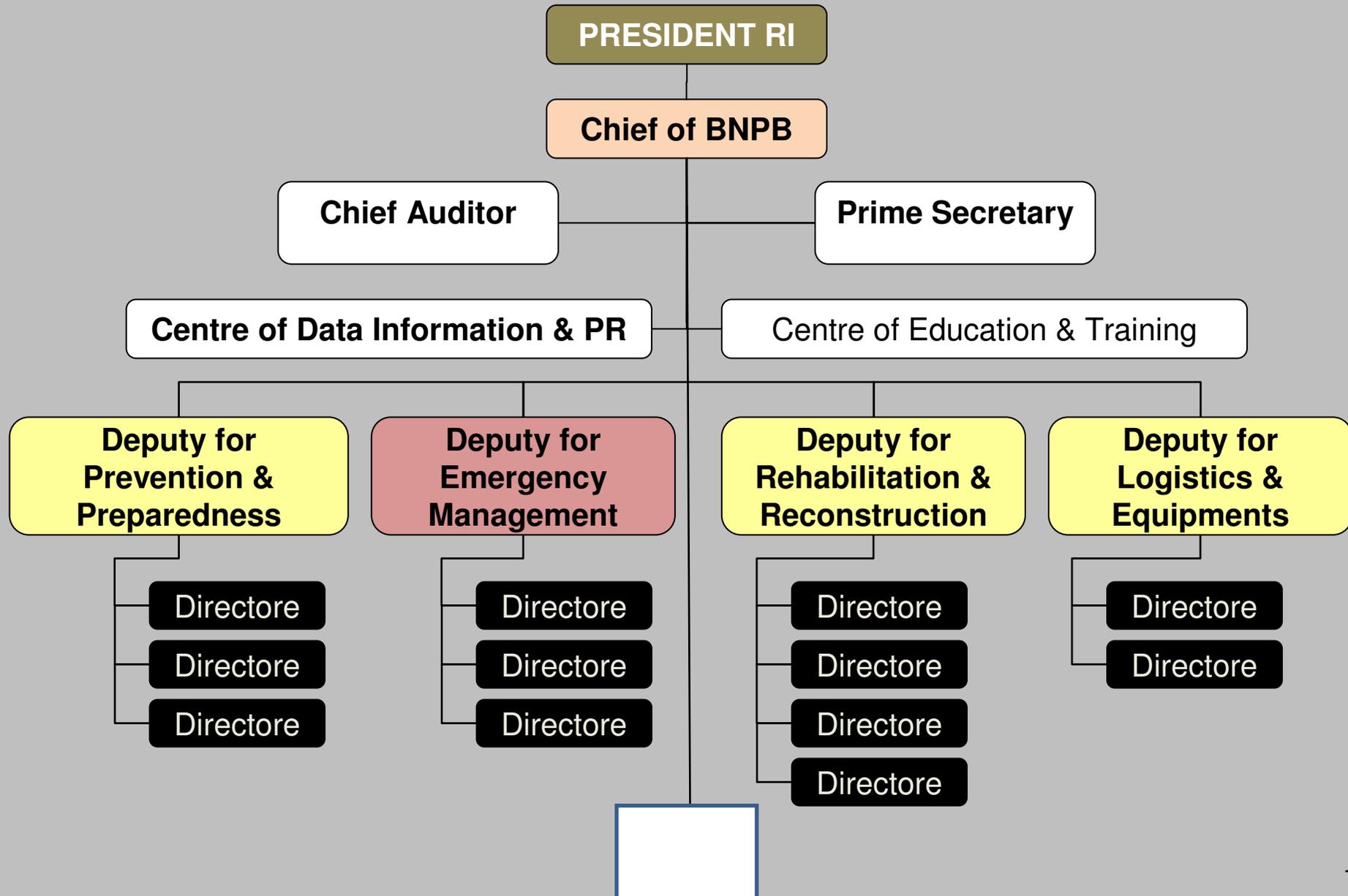
4. GOVERNMENT REGULATION NO 23 / 2008

***INTERNATIONAL & NGO ASSISTANTS
IN DISASTER MANAGEMENT***

5. PRESIDENTIAL DECREE NO 8 / 2008

NATIONAL DISASTER MANAGEMENT AGENCY

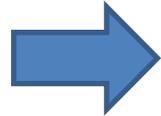
National Agency for Disaster Management (BNPB)



Policies

- Strengthen national capability in disaster management, especially in prevention, mitigation, and preparedness
- Manage and mobilize all potential resources (infrastructure and manpower) in disaster preparedness, response and recovery
- Empower local authorities in anticipating and responding to disasters in their regions
- Coordinate all stakeholders and activities in disaster management
- Incorporate Disaster Risk Reduction in the framework of National Development Plan

STRATEGY



- Disseminate DRR and strengthen capacity through Training and Education
- Develop Guidelines and SOP in responding to any type of disaster
- Develop a Disaster Management Information System (DMIS)
- Develop Hazard Mapping and Risk Mapping for Disaster prone areas
- Develop Disaster Management & Contingency Plan for National-Provincial-District levels
- Strengthen National/Provincial/District Emergency Operation Centers and Rapid Response Teams
- Strengthen local capacity in disaster recovery

HYOGO FRAMEWORK

- 1. Make Disaster Risk Reduction a Priority
- 2. Know the Risks and Take Action
- 3. Build Understanding and Awareness
- 4. Reduce Risk
- 5. Be Prepared and Ready to Act

Reduce Hazard
Reduce Vulnerability
Increase Capacity



Risk Reduction

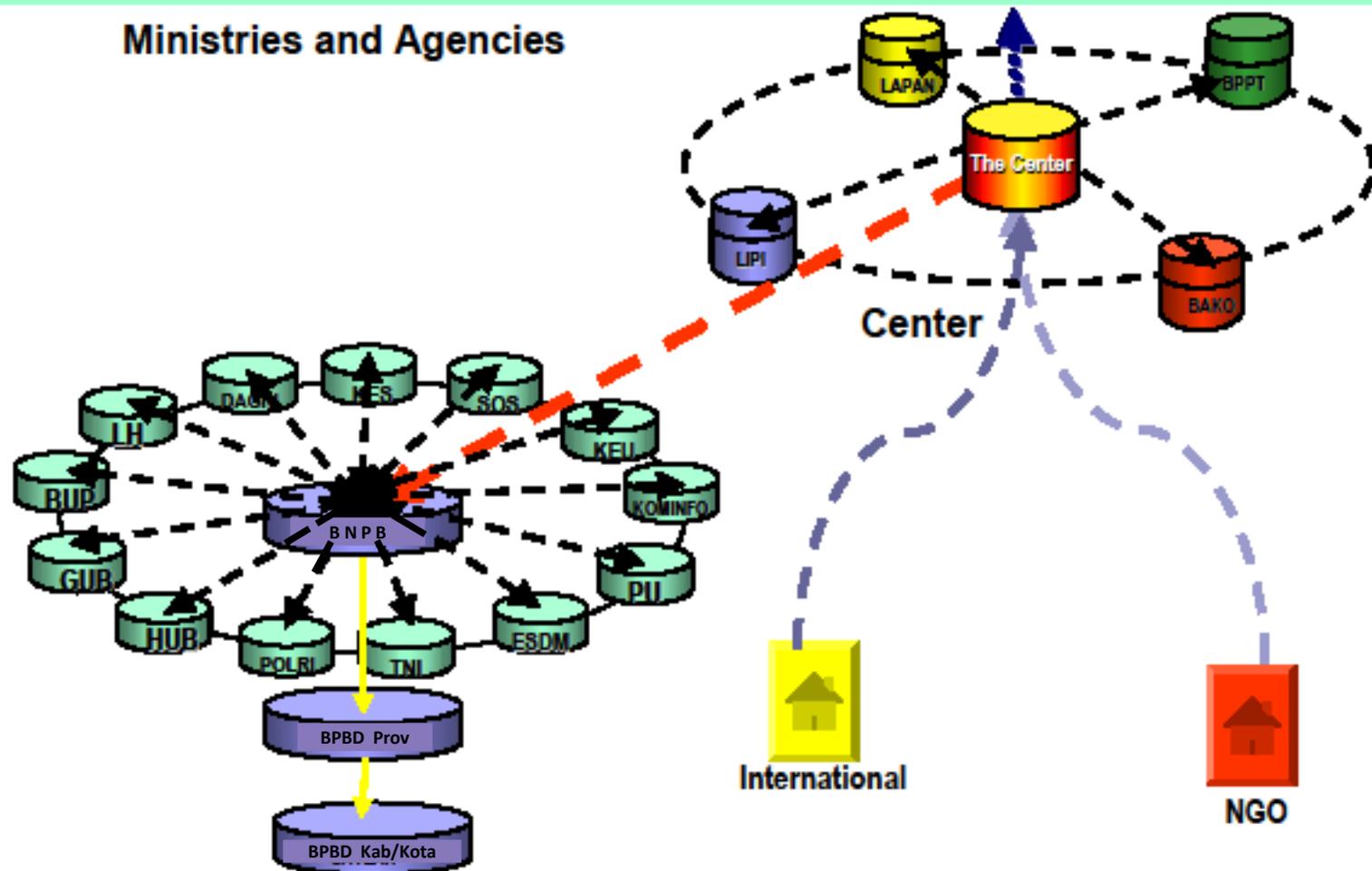
PROGRAM PRIORITIES

- ❑ Disaster Management Plan
 - Develop Disaster Preparedness Plan and Contingency Plan
- ❑ Public Awareness
 - Information, Education, Training and Drilling
- ❑ Risk Assessment
 - Hazard, Vulnerability, and Risk Mapping at local level
- ❑ Early Warning Systems
 - Monitoring, Analysis, Warning, and Dissemination
- ❑ Emergency Operation Center (EOC)
 - Establish EOC at National/Provincial/District Levels
- ❑ Joint- Assessment Guidelines in Emergency Response, in which results can be used by all responders

National Center Disaster Mitigation

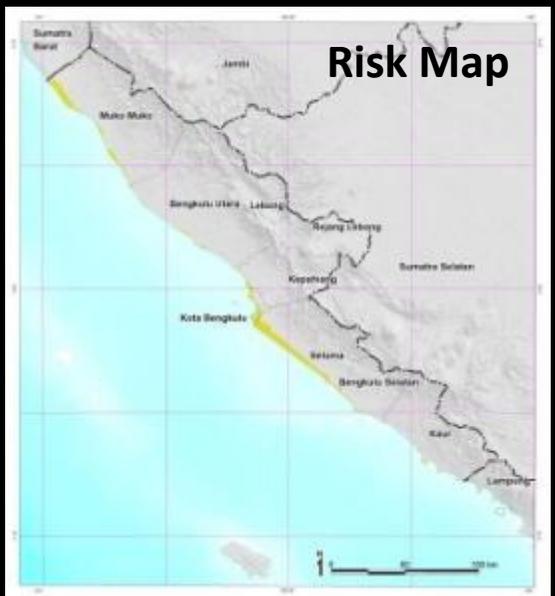


Ministries and Agencies



Risk Reduction Mapping

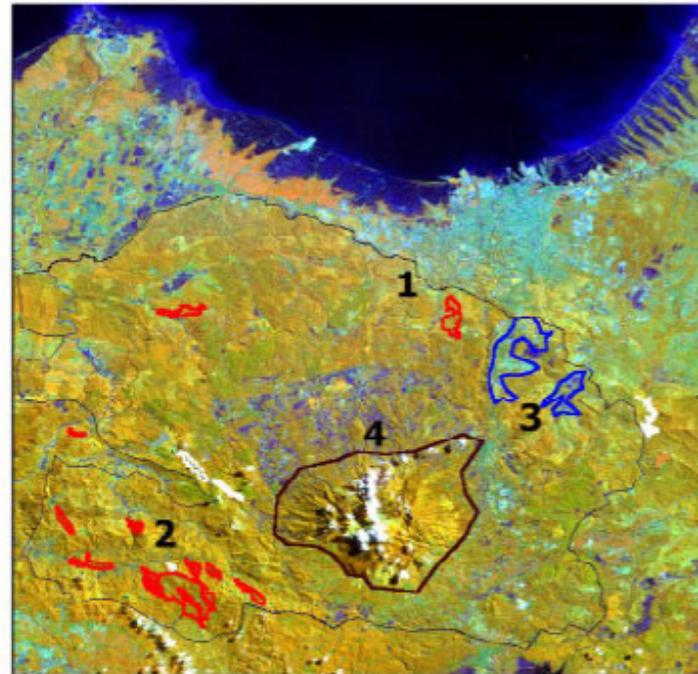
In 2011 Govt of
Indonesia should take
all efforts to complete
Disaster Risk Mapping
by 2015



Risk map

- Hazard
 - type of hazard
 - level of hazard
- Vulnerability
 - population density
- Risk
 - level of risk

Kelas gerakan tanah pada citra Landsat-TM daerah Semarang dan sekitarnya



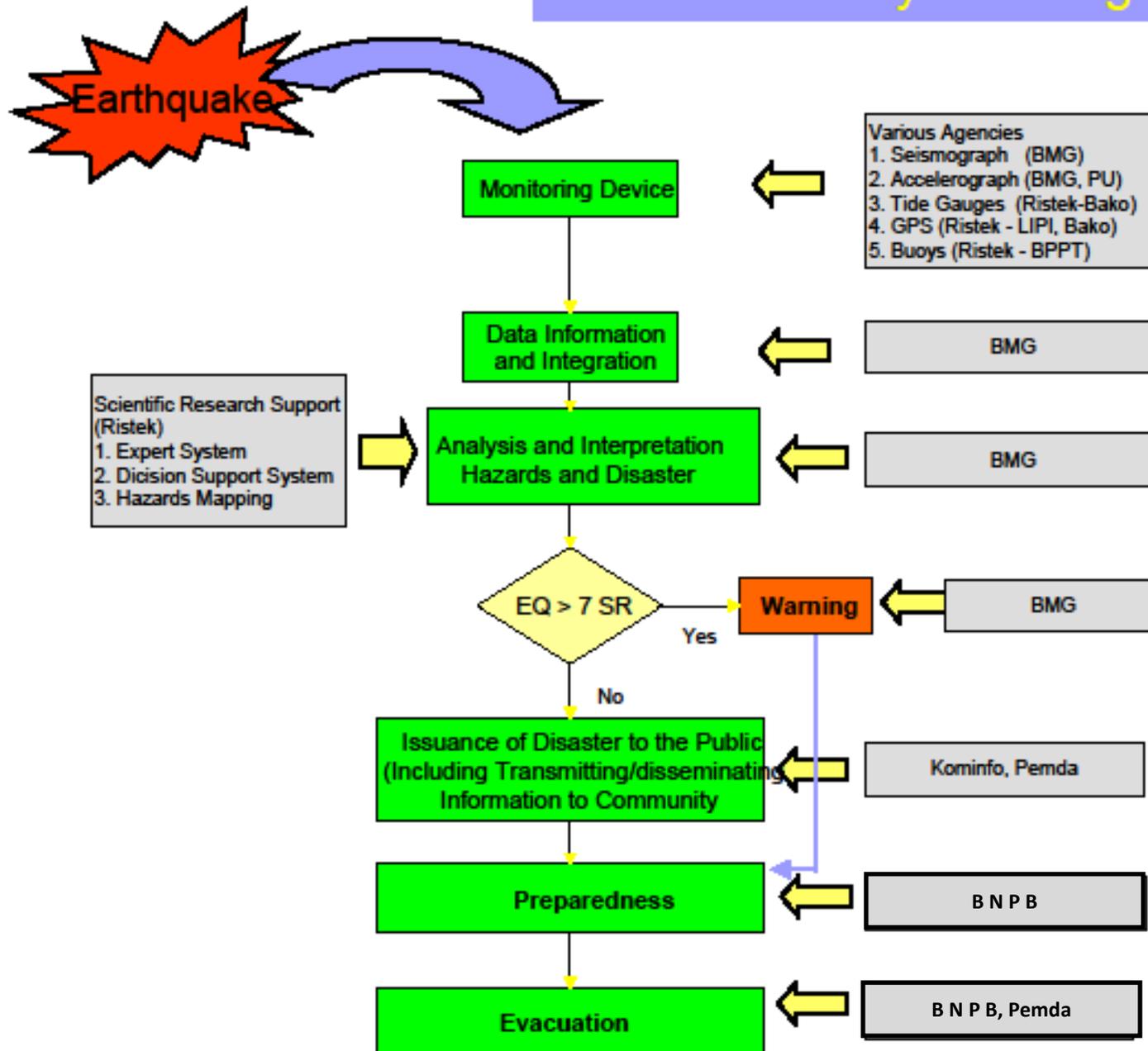
- 1 ~~~~~ skemp. block slide , rock slide. debris slide. rock slide. rock avalanche. debris avalanche di lereng G. Unggaran.
- 2 ~~~~~ Rock fall dan soil fall di beberapa tempat
- 3 ~~~~~ Earth flow, debris flow, dan mudflow (bentuk I nggar herupa aliran)
- 4 ~~~~~ Lahar (vulcanic debris fall atau vulcanic debris flow) di puncak G. Unggaran dan sekitarnya

Roles of Space Information

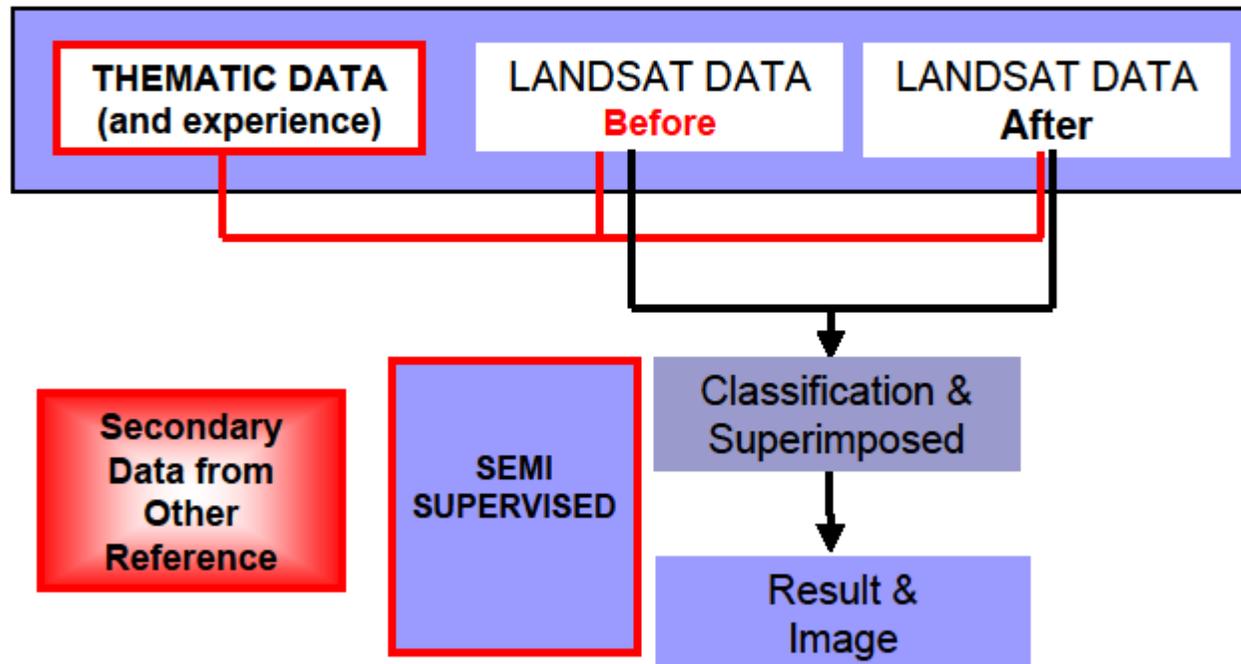


- **Satellite Data for Risk Assessment**
 - Hazard Mapping
 - Vulnerability and Risk Mapping
 - Satellite Data for Early Warning
 - Monitoring and Weather Prediction
 - Transmitting Data for Public Warning
 - Satellite Data for Damage Assessment
 - Satellite Data for Recovery

Tsunami Early Warning System



Rapid Damage Assessment from Satellite Imageries



Tsunami, December 26th, 2004

Ulee Lhuee Harbour, City of Banda Aceh



Before Tsunami



After Tsunami

CONCLUSIONS

- BNPB needs partnership with ICG in developing Disaster Management Information System that supported by Global Navigation Satellite System
- Disaster Management in Indonesia needs support from Space Technology particularly in analyzing Hazard , Vulnerability , Risk , Early Warning, Identify Damage Assesment and Recovery
- BNPB will organize and procure Spatial Data for the purpose of Disaster Management, so Providers are welcome to participate in developing Indonesia 's DRR Program until 2015 by using Satellite –Base Technology
- Indonesia is a very big Country, so that BNPB certainly needs Space Technology for Decision Making

THANK YOU
THANK YOU

