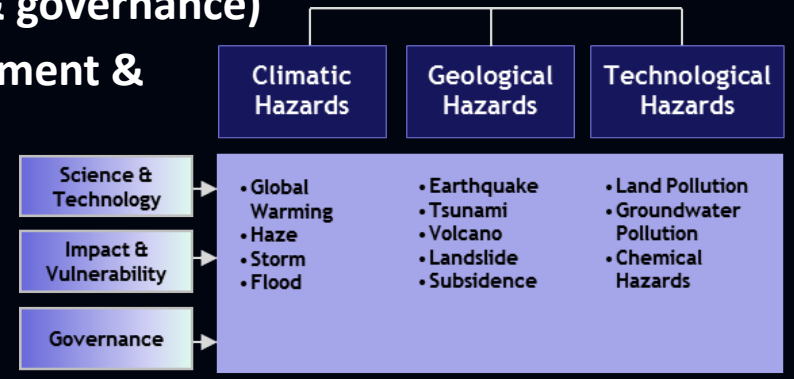
Southeast Asia
Disaster Prevention Research Initiative
(SEADPRI – UKM)

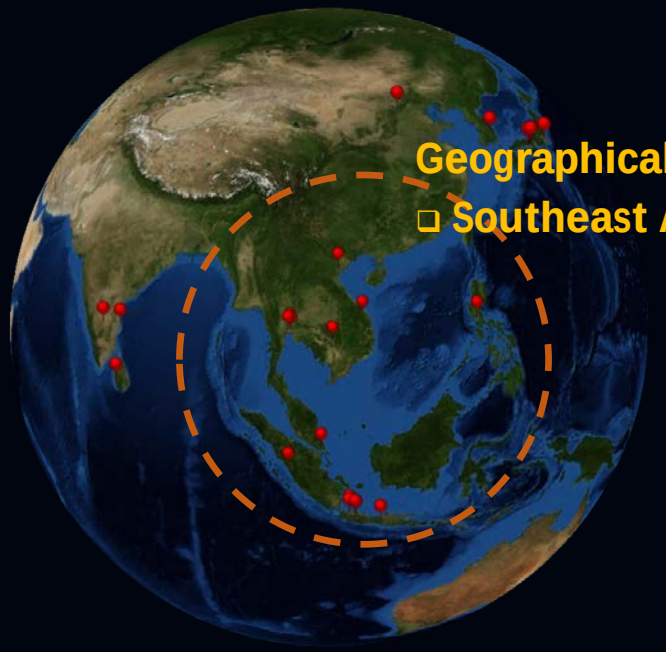
1. Core Academic Expertise (subject and geographical)

Holistic and integrated approach (science, technology, impact, vulnerability & governance)

Multidisciplinary research development & training to reduce risk of:

- ❑ Climatic Hazards
- ❑ Geological Hazards
- ❑ Technological Hazards





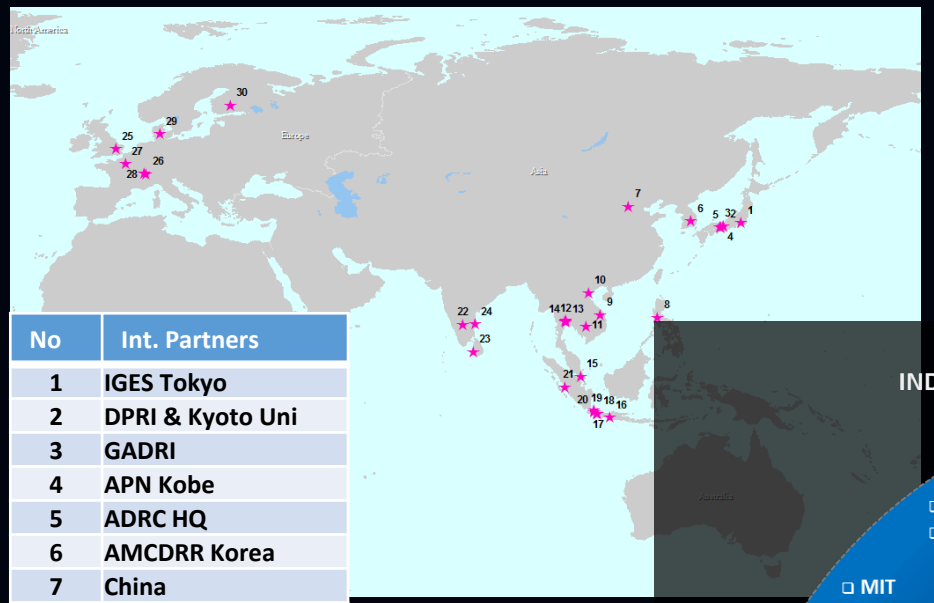
Past & Ongoing Projects:

- Enhancing **Local Level Climate Change Adaptation** in Southeast Asia -ASEAN-India Green Fund
- **ASEAN Pilot initiatives on Climate Extremes for Disaster Prevention**
- Indicators for **Climatic Hazards and National Security**
- Establish the Asian Network on **Climate Science and Technology** (ANCST) - Cambridge (CMEDT)
- Integrating **CCA, DRR and L+D** to Address Emerging Challenges Due to Slow Onset Processes -APN
- Strengthening Capacity for **Policy Research on Mainstreaming Adaptation** - APN
- **Adaptation Roadmap** for Malaysia -UNITEN/NRE
- Assessing Community **Risk Insurance** Initiatives and Identifying Enabling Policy and Institutional Factors for Maximizing Climate Change Adaptation and Disaster Risk Reduction Benefits of Risk Insurance - IGES
- Viral, Angry Birds: Fostering **Climate Resilience** through Entertaining Games -USAID
- **Disaster Resilient Cities:** Forecasting **Local Level Climate Extremes and Physical** Hazards for Kuala Lumpur - Newton Ungku-Omar Fund
- **Future Cities: Science to Action** for **Building Resilience** of Urban Communities to **Climate Induced Hazards** - Newton Ungku-Omar Fund
- Build capacity on integrating risks of **seismic-induced geohazards** into development planning & **tsunami** modelling - ITB
- **Policy and Planning Responses for Earthquake and Tsunami Hazards** in Malaysia - ASM
- Large-scale **Landslide & Debris Flow** in highland areas - MOSTI
- **Landslide** mechanisms and human-induced landslides - MOHE
- Estimation for **Flood Disaster** Damage and Losses in area of Kajang, Selangor Malaysia - Global Change System for Analysis, Research and Training (START)
- **Floods and Migration** in ASEAN
- **Community Based DRR**
- Investigation of Organic Quantum Cells Automata (QCA) Transduction for Multiple **Biohazards Detection** Based on Novel **DNA Biosensors**
- Developing a Rapid Dengue **Virus Biosensor** Early Warning System for Potential Mapping of High Risk Dengue Outbreak Zones in Malaysia -MOSTI
- Creating Silicon Nanostructure Platforms Integrated with **Nano-Biosensors for the Rapid Determination** of Biohazards to Ensure Food Safety - MOSTI
- A DNA Biosensor with Dry-Reagent for **Rapid Detection of Biohazards** Vibrio Cholera in **Flood Disaster Zones** - MOSTI
- Development of Solid-state **DNA Optosensor** for Visual Detection of Dengue Virus - UKM
- Transportation and Management of **Hazardous Chemicals**

seadpri
IRDR ICoE

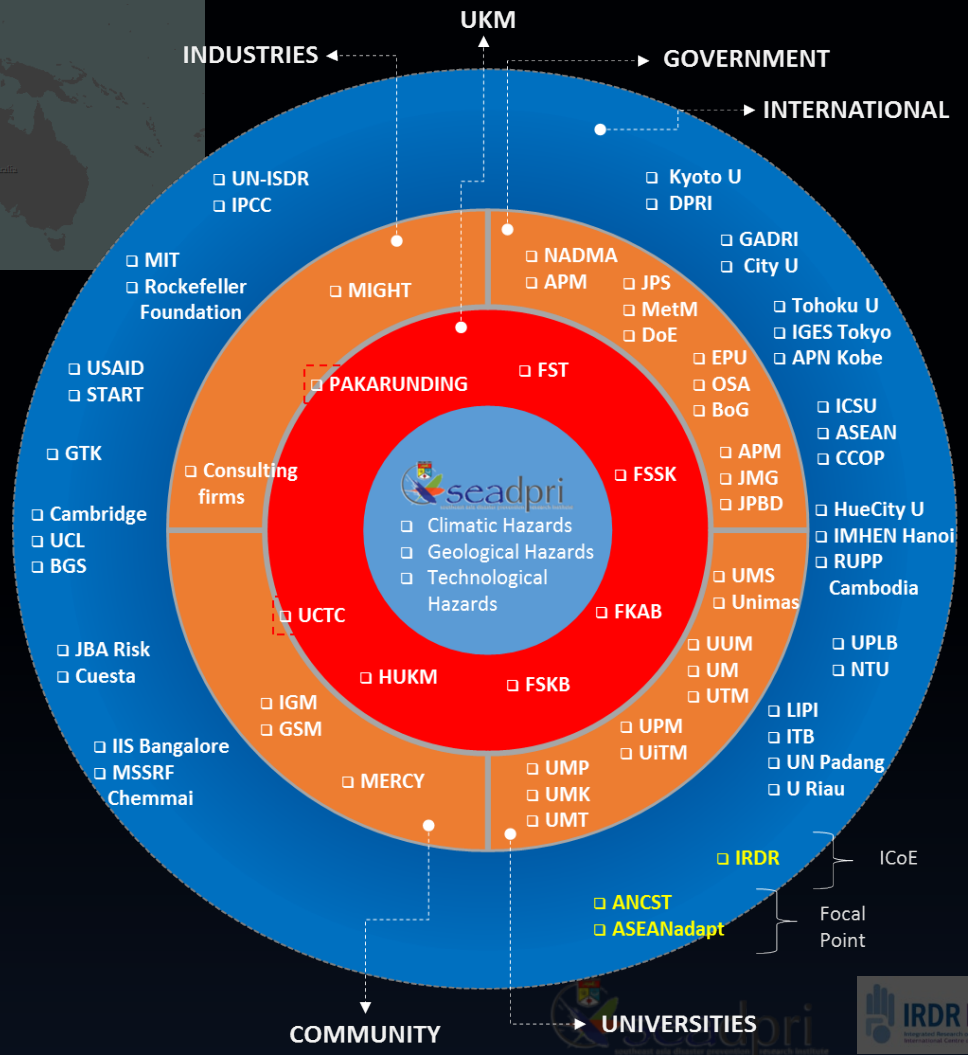
2. Training and Professional Partnerships

- **Education and Training**
  - Postgraduate Masters and Doctoral program (MA, MSc, PhD)
  - Professional/ Specialised Training
- **Workshop and Courses**
- **Applied Research**
  - Knowledge generation
  - Co-researcher
- **Policy Advisor to Government & Stakeholders**
- **Outreach and Networking**
- **Focal Points**
  - Technical support for National Disaster Management Agency - SFDRR indicators & monitoring
  - ANCST
  - ASEANadapt
  - Malaysia Window-to-Cambridge (MW2C@UKM)



No	Int. Partners
1	IGES Tokyo
2	DPRI & Kyoto Uni
3	GADRI
4	APN Kobe
5	ADRC HQ
6	AMCDRR Korea
7	China
8	UPLB Manila
9	HueCity Univ
10	IMHEN Hanoi
11	RUPP Cambodia
12	CCOP
13	APAN
14	UChi
15	NTU
16	Yogyakarta
17	ITB
18	LIPI
19	ASEAN
20	IPB Bogor
21	Padang
22	IIS Bangalore
23	ADRC Colombo
24	MSSRF Chennai
25	Cambridge, MIT
26	IPCC
27	ICSU
28	UNISDR
29	kfW Hamberg
30	GTK Finland

MALAYSIA:
NADMA, JMG, JPBD, MetMalaysia, APM, NRE, ASM, NAHRIM, MERCY Malaysiaetc.



3. Highlights of IRDR ICoE Branded Activity

SEADPRI-ICSU-ANCST Workshop on Natural Hazards and Risk in Asia Pacific

- 28 March 2017
- ICSU-ROAP Steering Group Committee on Natural Hazards and Disaster Risk (SGNHDR) Prof. James Terry, Prof. James Goff, Prof. Gensuo Jia, and Dr. Vena Pearl Bongolan shared their work on coastal Hazards, tsunami potential in the research on submarine landslides and palaeo-tsunami research in the region

ASEANAdapt

- Collaboration, knowledge sharing and communication between experts in ASEANmember countries via ASEANadapt. Enhanced Linkages and Outreach & Capacity Building and Stakeholder Consultation
- Country Scoping Studies - Key vulnerable ecosystems and regions in ten AMS: Adaptation needs and priorities | Potential impacts on resources and implications for regional security; Inputs from national and sub-national stakeholders; Good practices, CCA constraints and capacity building through local scenarios

3. Highlights of IRDR ICoE Branded Activity

CONSULTATION WORKSHOP NATIONAL PLAN ON SCIENCE, TECHNOLOGY AND INNOVATION FOR DRR

- Finance & Insurance for Disaster Risk Reduction
- STI for Earthquake Hazards
- STI for Landslide Hazards
- STI for Climate Extremes
- STI for Health and Other Emerging Hazards
- STI for Critical Infrastructure and Disaster Risk Reduction
- STI for Flood Hazards

- 24 Julai 2017
- Organised by National Disaster Management Agency Malaysia (NADMA), Office of the Science Advisor to Prime Minister, SEADPRI

3. Highlights of IRDR ICoE Branded Activity

1. **NATIONAL CONFERENCE ON SCIENCE, TECHNOLOGY & INNOVATION FOR DRR**
2. **DIALOGUE ON DRAFT NATIONAL PLAN ON SCIENCE, TECHNOLOGY AND INNOVATION FOR DRR**

- 5-6 Oktober 2017
- Organised by Academy of Sciences Malaysia, National Disaster Management Agency Malaysia (NADMA), Office of the Science Advisor to Prime Minister, SEADPRI

3. Highlights of IRDR ICoE Branded Activity

FELLOWSHIP FOR YOUNG SCIENTISTS

- Young scientists from Malaysia and Asia to participate in the MW2C@UKM. Training and networking away from their home institution to participate in training courses or summer school programmes to help them build their skills in the area of atmospheric sciences, climate change and climate extremes for disaster prevention

MALAYSIA WINDOW TO CAMBRIDGE AT UKM (MW2C@UKM): TRAINING WORKSHOP ON GEOHAZARDS AND DISASTER RISK REDUCTION: COMMUNICATING WITH STAKEHOLDERS

- 10 -12 October 2017

3. Highlights of IRDR ICoE Branded Activity

CCOP-SEADPRI-ANCST WORKSHOP ON DISASTERS AND HERITAGE AREAS

To highlight the inclusivity of heritage areas of national significance; disasters; and humans, where these geological and/or cultural heritage areas exhibit the relict, processes or vulnerability to geological or climatic disasters within the existing community.

- 15 October 2017
- Cebu, The Philippines

3. Highlights of IRDR ICoE Branded Activity

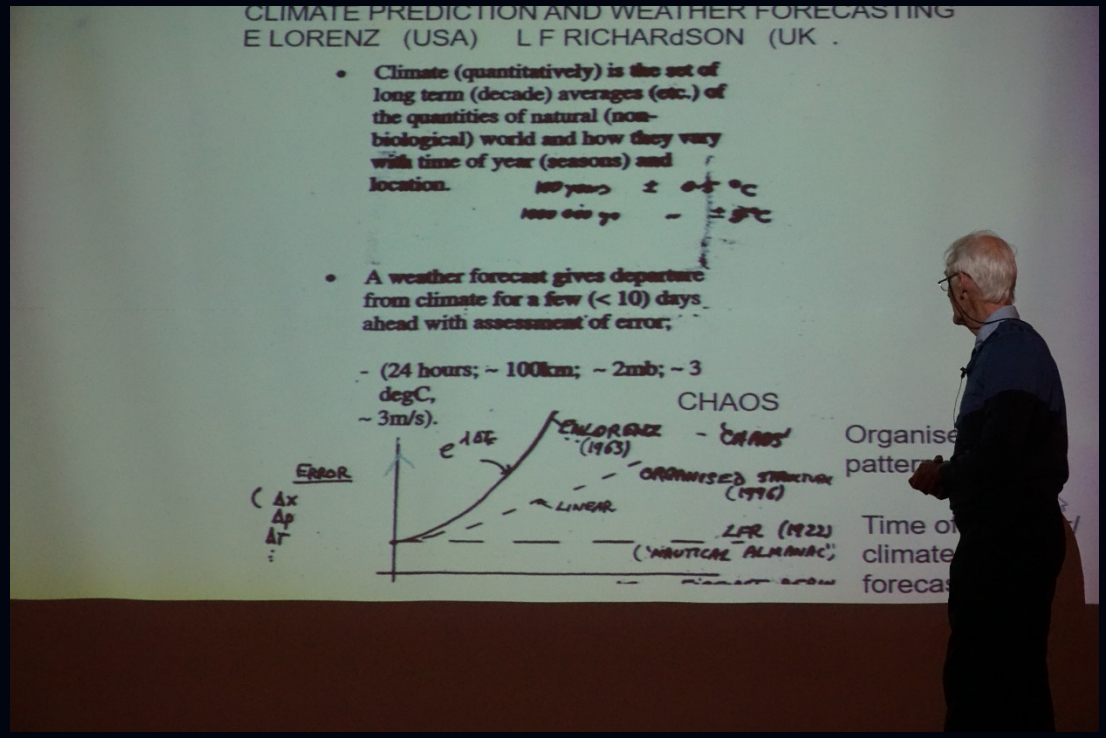
SEADPRI-UKM FORUM 2017 ON "FLOOD MODELLING FOR INSURERS: FROM DATA TO DECISIONS"

- 7 November 2017
- SEADPRI in collaboration with the Malaysian Association of Risk and Insurance Management (MARIM) Malaysia JBA Risk Management

3. Highlights of IRDR ICoE Branded Activity

FELLOWSHIP FOR YOUNG SCIENTISTS

- Young scientists from Malaysia and Asia to participate in the MW2C@UKM. Training and networking away from their home institution to participate in training courses or summer school programmes to help them build their skills in the area of atmospheric sciences, climate change and climate extremes for disaster prevention



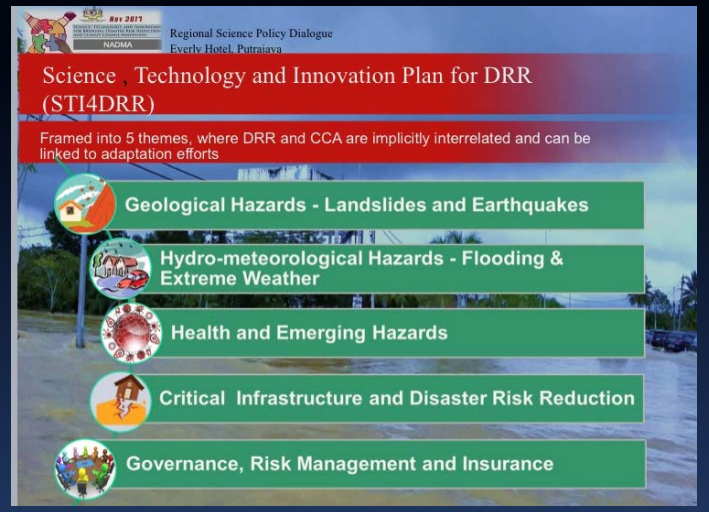
MALAYSIA WINDOW TO CAMBRIDGE AT UKM (MW2C@UKM): TRAINING WORKSHOP ON THE PREDICTABILITY OF EXTREME WEATHER EVENTS

- 14 -16 November 2017

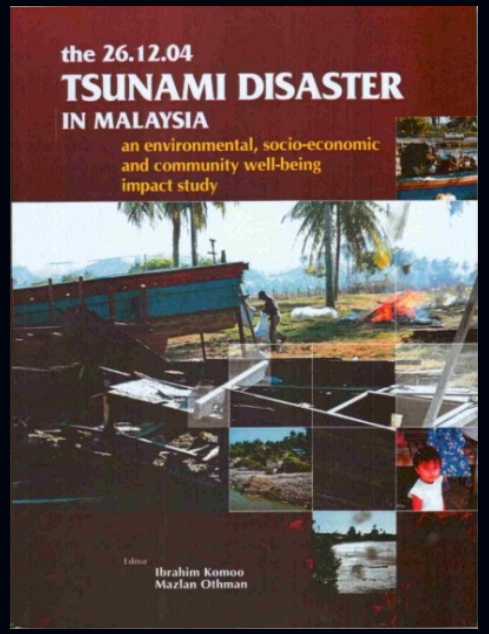
3. Highlights of IRDR ICoE Branded Activity

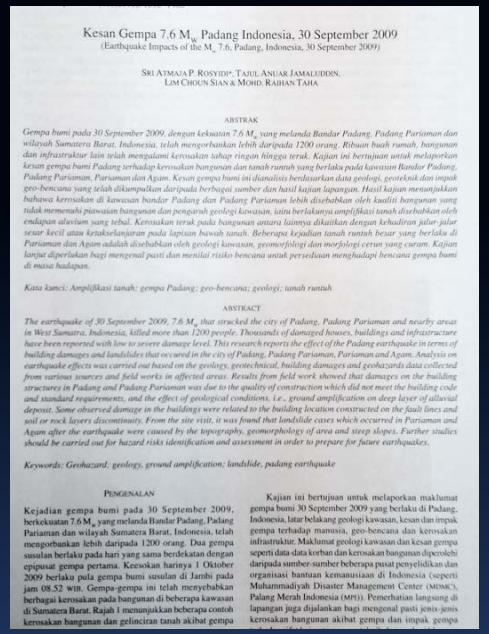
REGIONAL SCIENCE POLICY DIALOGUE ON SCIENCE, TECHNOLOGY AND INNOVATION FOR BRIDGING DISASTER RISK REDUCTION AND CLIMATE CHANGE ADAPTATION

- 16 Nov 2017
- Organised by Asian Network on Climate Science and Technology (ANCST), UNISDR Asia Science Technology Academia Advisory Group (ASTAAG), Asia-Pacific Network for Global Change Research (APN) and International Council for Science Regional Office for Asia and the Pacific (ICSU-ROAP) in conjunction with the National Disaster Management Agency (NADMA), Ministry of Natural Resources and Environment (NRE), Academy of Sciences Malaysia (ASM), Malaysia Meteorological Department (MMD) and SEADPRI, Omar Fund (NUOF) Project on Disaster Resilient Cities under the aegis of the Science to Action (S2A)



4. Collaboration among ICoEs





Kesan Gempa 7.6 M_w Padang Indonesia, 30 September 2009

(Earthquake Impacts of the M_w 7.6, Padang, Indonesia, 30 September 2009)

Sri Atmaja P. Rosyidi*, Taju, Anuar Jamaluddin,
Lim Choun Sian & Mohd. Raihan Taha

ABSTRAK

Gempa bumi pada 30 September 2009, dengan kekuatan 7.6 M_w yang melanda Bandar Padang, Padang Pariaman dan wilayah Sumatera Barat, Indonesia, telah mengorbankan lebih daripada 1200 orang. Ribuan buah rumah, bangunan dan infrastruktur lain telah mengalami kerosakan tahap ringan hingga teruk. Kajian ini bertujuan untuk melaporkan kesan gempa bumi Padang terhadap kerosakan bangunan dan tanah runtuh yang berlaku pada kawasan Bandar Padang, Padang Pariaman, Pariaman dan Agam. Kesan gempa bumi ini dianalisis berdasarkan data geologi, geoteknik dan impak geo-bencana yang telah dikumpulkan daripada berbagai sumber dan hasil kajian lapangan. Hasil kajian menunjukkan bahawa kerosakan di kawasan bandar Padang dan Padang Pariaman lebih disebabkan oleh kualiti bangunan yang tidak memenuhi piawaian bangunan dan pengaruh geologi kawasan, iaitu berlakunya amplifikasi tanah disebabkan oleh endapan aluvium yang tebal. Kerosakan teruk pada bangunan antara lainnya dikaitkan dengan kehadiran jalur-jalur sesar kecil atau ketakselanjaran pada lapisan bawah tanah. Beberapa kejadian tanah runtuh besar yang berlaku di Pariaman dan Agam adalah disebabkan oleh geologi kawasan, geomorfologi dan morfologi cerun yang curam. Kajian lanjut diperlukan bagi mengenal pasti dan menilai risiko bencana untuk persediaan menghadapi bencana gempa bumi di masa hadapan.

Kata kunci: Amplifikasi tanah; gempa Padang; geo-bencana; geologi; tanah runtuh

ABSTRACT

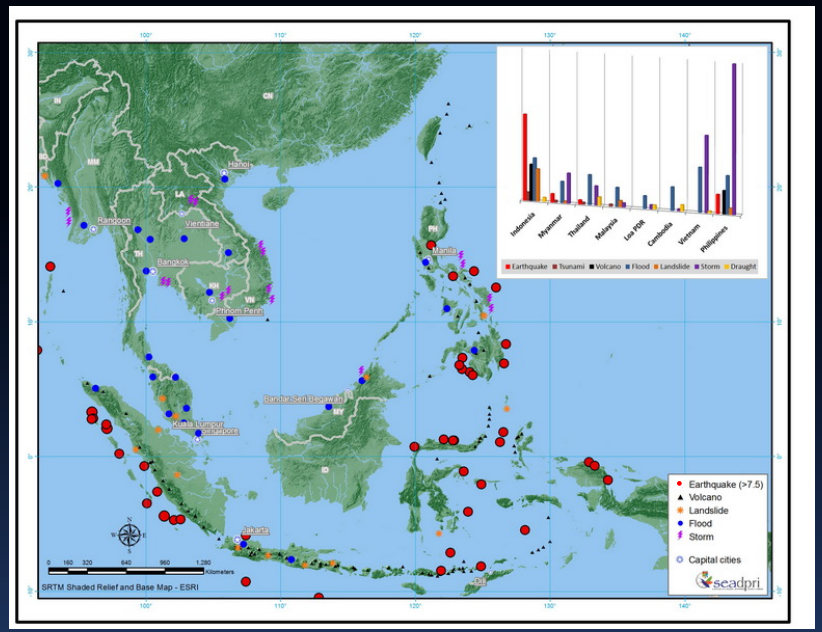
The earthquake of 30 September 2009, 7.6 M_w that struck the city of Padang, Padang Pariaman and nearby areas in West Sumatra, Indonesia, killed more than 1200 people. Thousands of damaged houses, buildings and infrastructure have been reported with low to severe damage level. This research reports the effect of the Padang earthquake in terms of building damages and landslides that occured in the city of Padang, Padang Pariaman, Pariaman and Agam. Analysis on earthquake effects was carried out based on the geology, geotechnical, building damages and geohazards data collected from various sources and field works in affected areas. Results from field work showed that damages on the building structures in Padang and Padang Pariaman was due to the quality of construction which did not meet the building code and standard requirements, and the effect of geological conditions, i.e., ground amplification on deep layer of alluvial deposit. Some observed damage in the buildings were related to the building location constructed on the fault lines and soil or rock layers discontinuity. From the site visit, it was found that landslide cases which occurred in Pariaman and Agam after the earthquake were caused by the topography, geomorphology of area and steep slopes. Further studies should be carried out for hazard risks identification and assessment in order to prepare for future earthquakes.

Keywords: Geohazard; geology; ground amplification; landslide, padang earthquake

PENGENALAN

Kejadian gempa bumi pada 30 September 2009, berkekuatan 7.6 M_w yang melanda Bandar Padang, Padang Pariaman dan wilayah Sumatera Barat, Indonesia, telah mengorbankan lebih daripada 1200 orang. Dua gempa susulan berlaku pada hari yang sama berdekatan dengan epipusat gempa pertama. Kerosakan harinya 1 Oktober 2009 berlaku pula gempa bumi susulan di Jambi pada jam 08.52 WIB. Gempa-gempa ini telah menyebabkan berbagai kerosakan pada bangunan di beberapa kawasan di Sumatera Barat. Rajah 1 menunjukkan beberapa contoh kerosakan bangunan dan gelinciran tanah akibat gempa

Kajian ini bertujuan untuk melaporkan maklumat gempa bumi 30 September 2009 yang berlaku di Padang, Indonesia, latar belakang geologi kawasan, kesan dan impak gempa terhadap manusia, geo-bencana dan kerosakan infrastruktur. Maklumat geologi kawasan dan kesan gempa seperti data-data korban dan kerosakan bangunan diperolehi daripada sumber-sumber beberapa pusat penyelidikan dan organisasi bantuan kemanusiaan di Indonesia (seperti Muhammadiyah Disaster Management Center (MDMC), Palang Merah Indonesia (MPI)). Pemerhatian langsung di lapangan juga dijalankan bagi mengenal pasti jenis-jenis kerosakan bangunan akibat gempa dan impak gempa



Thank You