The Expectation from Malaysian on JASTIP Disaster Prevention International Cooperation Research

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Kyoto University and School of Civil Engineering, USM

Professor Takara

Professor Fujii

Professor Kiyono

Professor Katsumi

Professor Gotoh

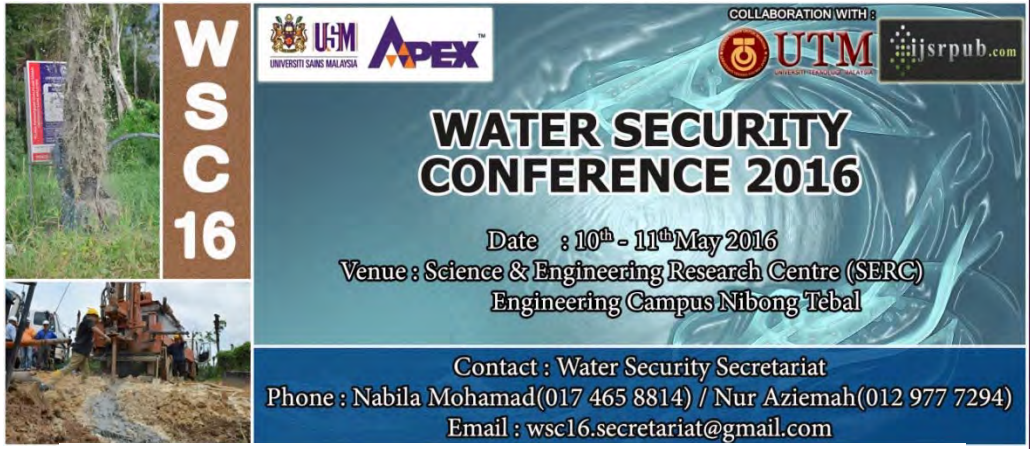
Professor Kenji Aoki

Prof Takara and Prof Gotoh are School of Civil Engineering Program (B.Eng Civil Engineering) Advisory Panels on 2001-03 and 2006-07 respectively

Bench Marking on our CE program in Kyoto University (2010)

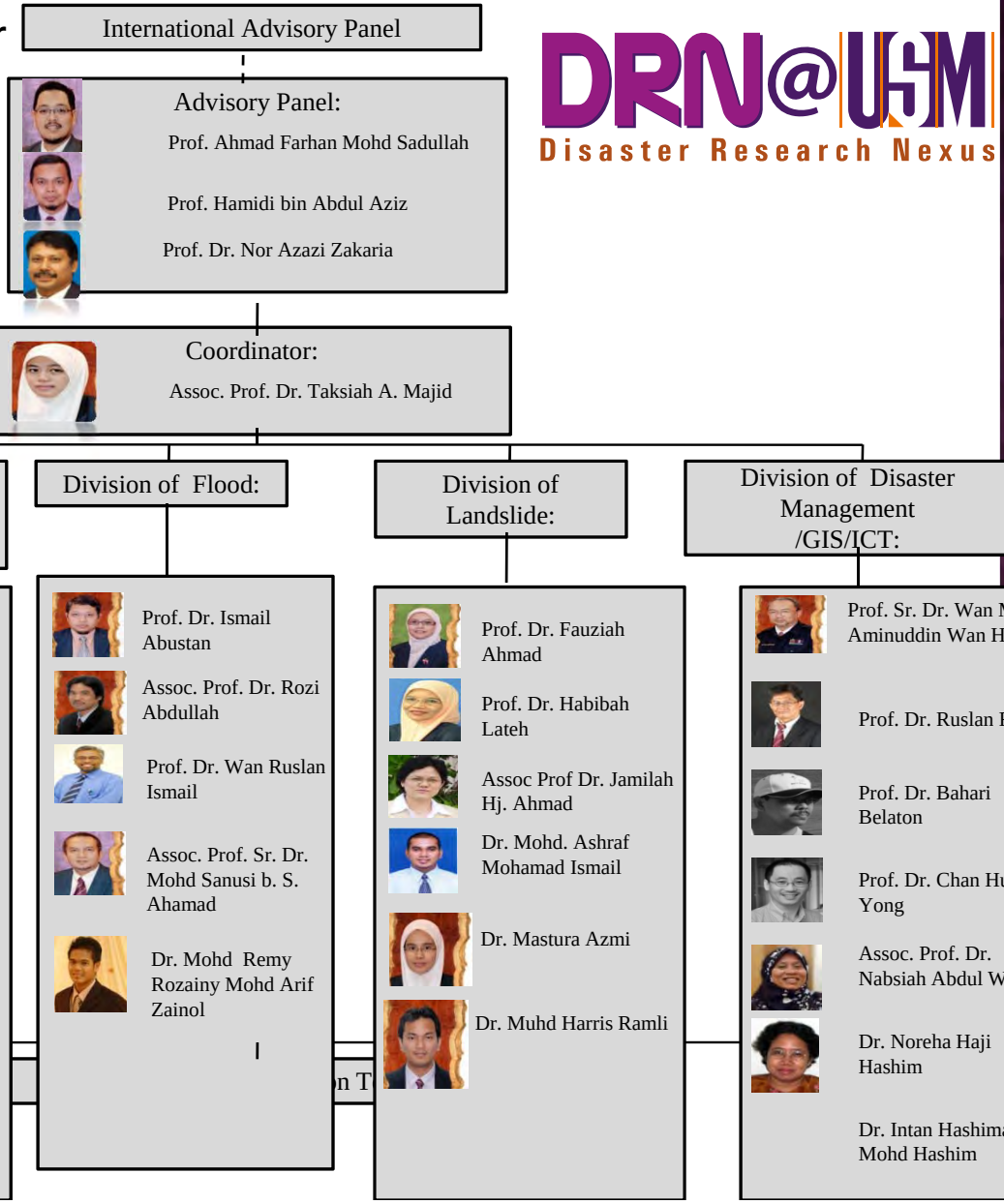
DRN@USM

Disaster Research Nexus



- 26 researchers - available expertise at USM, covering various expertise in disaster research and management.
- DRN has identified 5 main projects, i.e. Earthquake & tsunami, flood, landslide, windstorm and disaster management

DRN@USM
Disaster Research Nexus



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APEX
WATER SECURITY
Professor Ir. Dr. Mohd Nordin Adlan (Newcastle)
Project Leader
Professor Dr. Ismail Abustan (UNSW)
Urban Flooding
Professor Ir. Dr. Md Azlin Md Said (Wales)
Remote Sensing, GIS & Subsurface exploration
Professor Dr. Hamidi Abdul Aziz (Strathclyde, UK)
Water Treatment
Professor Dr. Mohd Zulkifly Abdullah (Strathclyde, UK)
Physical & Numerical Study
Water Security Cluster
Assoc. Prof. Dr. Rozi Abdullah (Newcastle)
Dr. Remy Rozainy Mohd Arif Zainol (Kyoto)
Dr. Fatehah Mohd Omar (Geneva)
Dr. Nuridah Sabtu (Sheffield)
Professor Dr. Mohd Nawawi Mohd Nordin (Birmingham)
Assoc. Prof. Dr. Kamar Shah Ariffin (Leeds)
Assoc. Prof. Dr. Mohd Suffian Yusoff (USM)
Dr. Puganeswary a/p Palaniandy (USM)
Dr. Mohamad Fared Murshed (UNSW)
Dr. Nurul Hana Mokhtar Kamal (Imperial)
Dr. Fatehah Mohd Omar (Geneva)
Dr. Hasnul Azan Tajarudin (Swansea)
Professor Dr. Ismail Abustan (UNSW)
Dr. Remy Rozainy Mohd Arif Zainol (Kyoto)
Dr. Mohamad Fared Murshed (UNSW)
Dr. Nuridah Sabtu (Sheffield)

Malaysia is a fortunate country

Less major disasters:

No Major Earthquake (.5.5)

No Volcano

No Typhoon (except Greg)

Federation of Malaysia
Persekutuan Malaysia

Flag

Coat of Arms

Motto: *"Bersekutu Bertambah Mutu"*
"Unity Is Greatness"[1]

Area	
• Total	329,847 km² (67th) 127,355 sq mi
• Water (%)	0.3
Population	
• 2015 estimate	30,818,000[11] (43nd)
• 2010 census	28,334,135[12]
• Density	92/km² (116th) 237/sq mi
GDP (PPP)	2015 estimate
• Total	$800.169 billion[13] (28th)
• Per capita	$25,833[13] (42nd)

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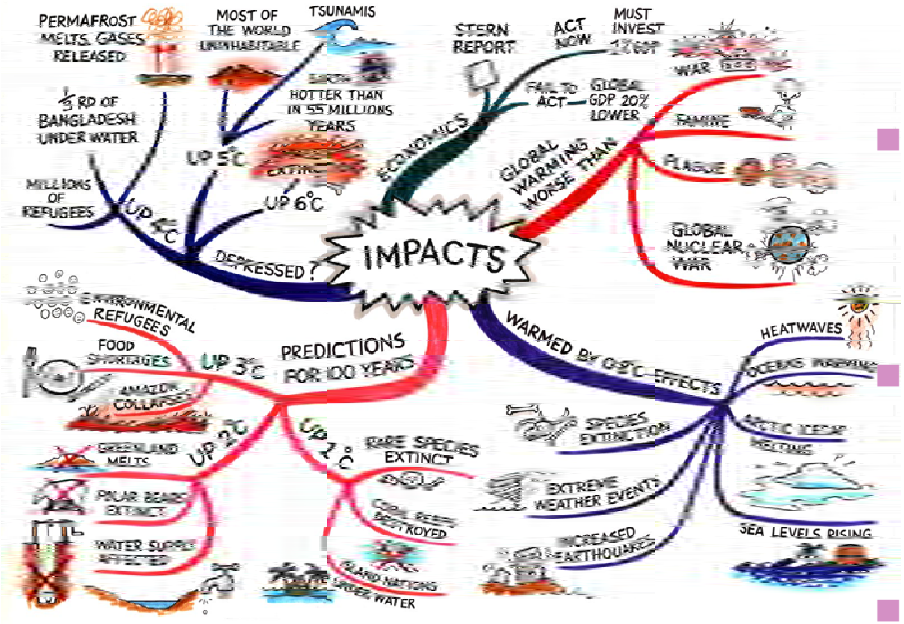
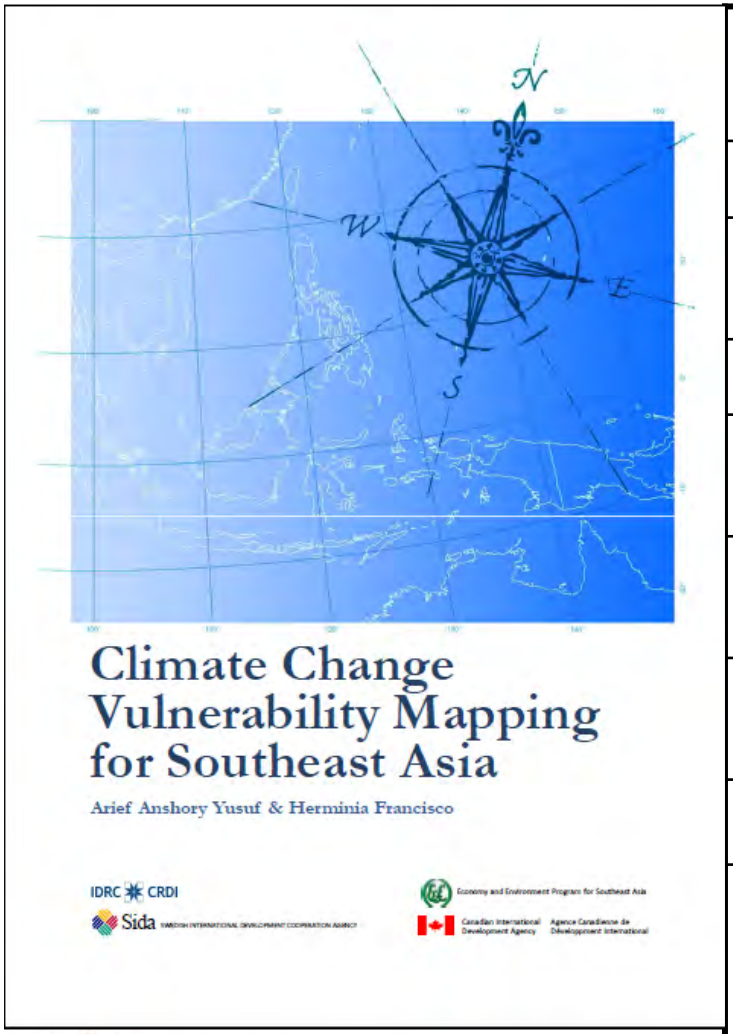
FUTURE CHANGES



www.unisdr.org

- Rainfall
  - Increased water availability in moist tropics and high latitudes
  - Decreased water availability and drought in mid-latitudes and semi-arid low latitudes
- Temperature
  - Global temperatures are likely to increase by 1.1 to 6.4°C from 1990 to 2100 (best estimates 1.8 to 5.4)
- Sea level rise
  - Sea levels are likely to rise in the range of 22-34 cm between 1990 and the 2080s
- Extreme events
  - Likely that future tropical cyclones, typhoons, and hurricanes will become more intense, with larger peak wind speeds and more heavy precipitation

ASEAN CLIMATE HAZARD HOTSPOTS AND DOMINANT HAZARDS



Climate hazard hotspots	Dominant hazards
Northwestern Vietnam	Droughts
Eastern coastal areas of Vietnam	Cyclones, droughts
Mekong region of Vietnam	Sea level rise
Bangkok and its surrounding area	Sea level rise, floods
Southern regions of Thailand	Droughts, floods
Philippines	Cyclones, landslides, floods, droughts
Malaysia	Floods, droughts
Western and eastern area of Java Island, Indonesia	Droughts, floods, landslides, sea level rise

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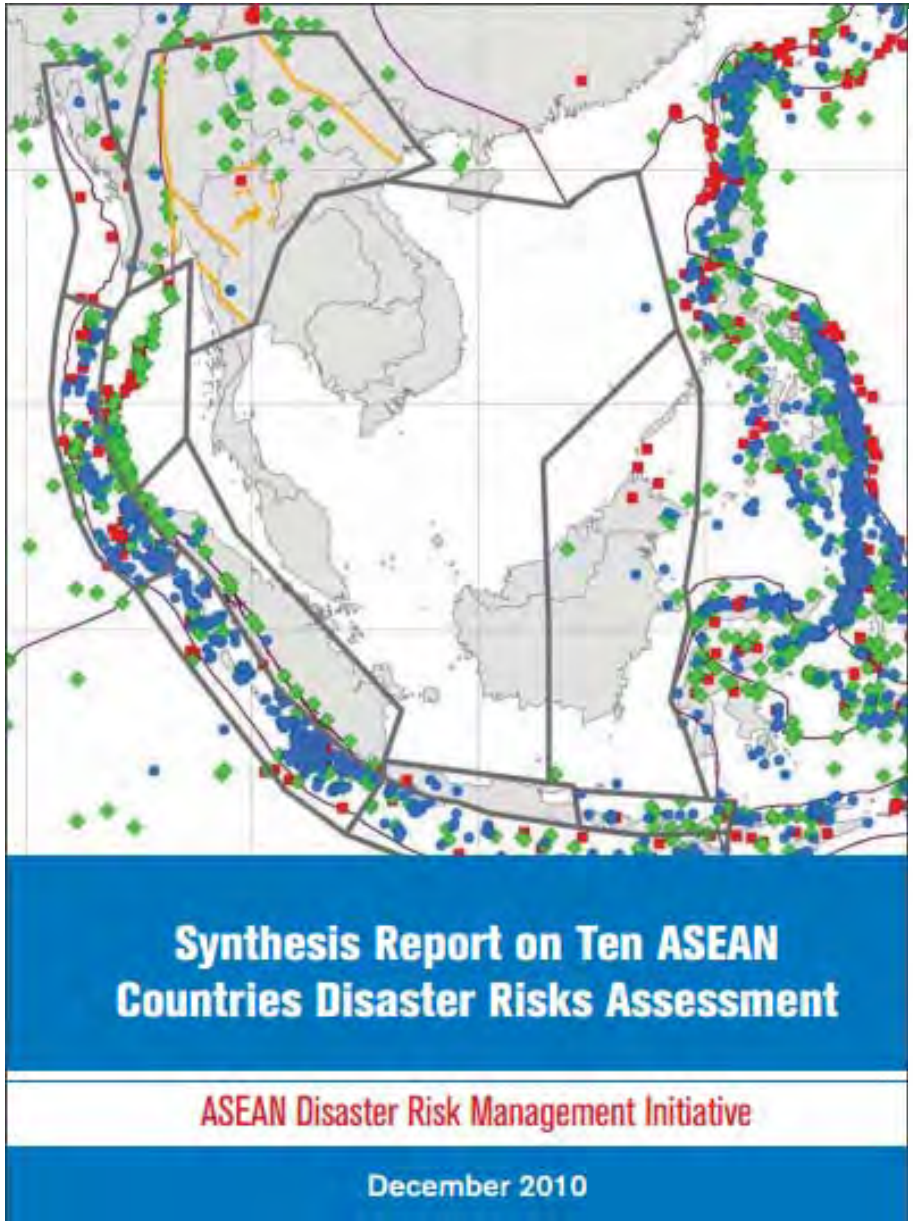


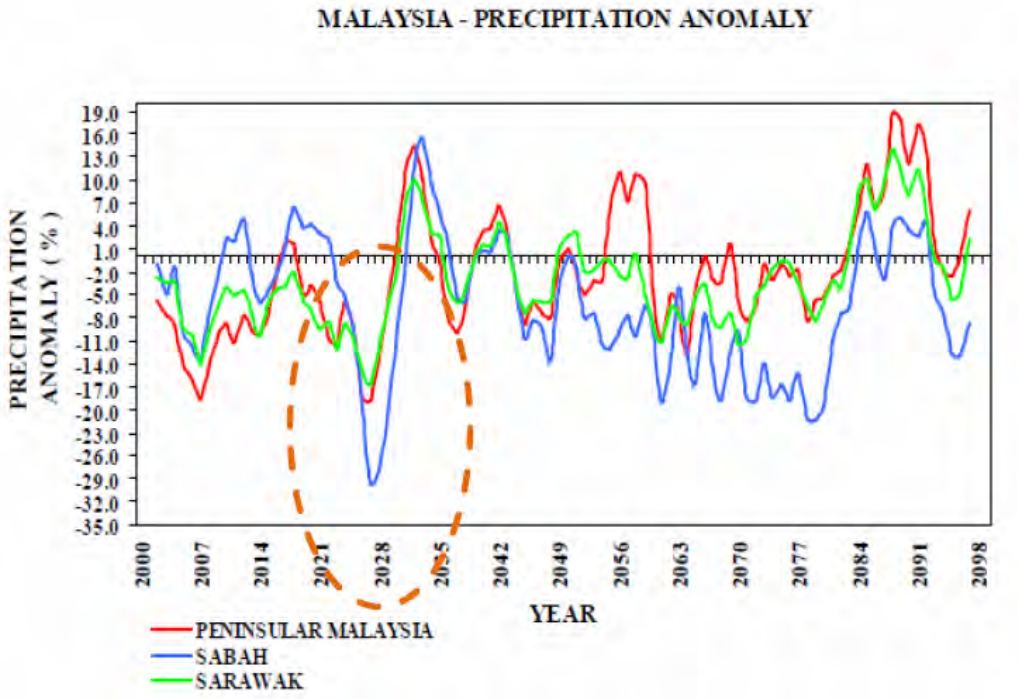
The quantitative risk assessment performed in this study confirms the following risk patterns for the ASEAN countries:

- Cambodia: floods represent the dominant risk followed by droughts
- Indonesia: forest (wild) fires, earthquakes and tsunamis, and floods represent the dominant risks followed by volcanoes, droughts, and landslides
- Lao PDR: cyclonic storms, and floods are the dominant risks followed by droughts
- Malaysia: floods are the dominant risks followed by forest fires, tsunamis, and cy clonic storms
- Myanmar: cyclonic storms are the dominant risk followed by tsunamis, floods and forest-fires
- Philippines: typhoons (cyclonic storms) are the dominant risk followed by floods, earth-quakes; volcanoes, droughts, and landslides
- Thailand: floods are the dominant risk fol-lowed by tsunamis, cyclonic storms, and droughts
- Vietnam: cyclonic storms, and floods are the dominant risk followed by droughts, and landslides
- Brunei and Singapore: no disaster data is available

MALAYSIAN SCENARIO

Setting the Scene – Future Rainfall

- More extreme weather conditions in the future (2025-2050) may be expected since higher maximum and lower minimum rainfall are observed.
- Increase in maximum monthly rainfall of up to 51% over Pahang, Kelantan and Terengganu.
- Decrease in minimum monthly rainfall from 32% to 61% for all over Peninsular Malaysia.



IMPACTS OF CLIMATE CHANGE ON DESIGN RAINSTORM

MOHD ZAKI M.AMIN
National Hydraulic Research Institute of Malaysia
Ministry of Natural Resources & Environment

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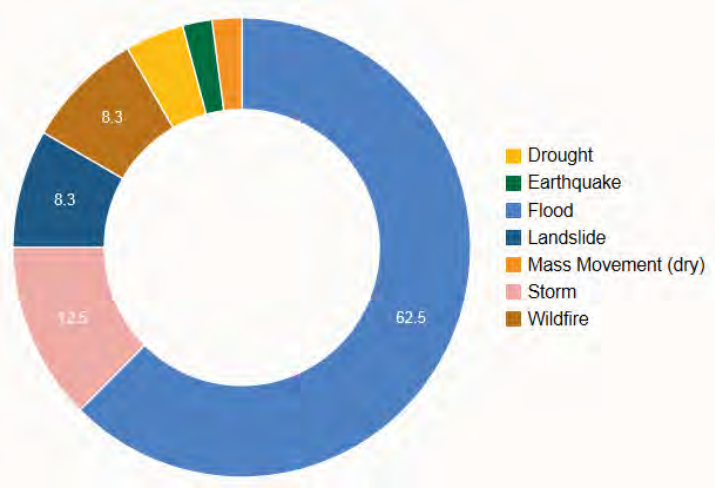
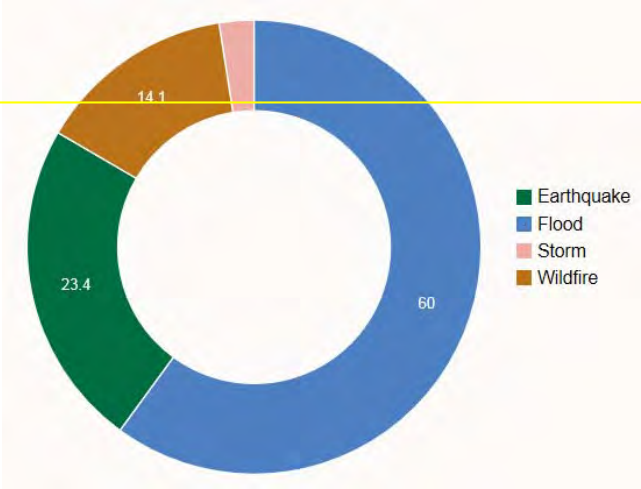
Floods in Malaysia:

Regular natural disasters happen nearly every year not only during the monsoon season



Frequency of internationally reported disasters 1990 – 2014 (PreventionWeb)

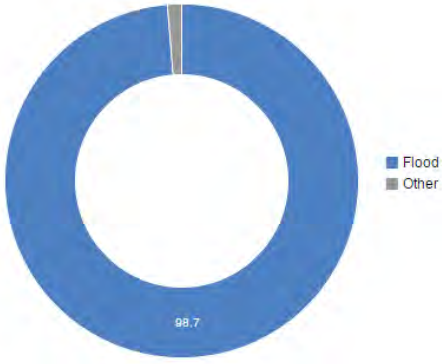


Economic issues of internationally reported disasters 1990 – 2014 (PreventionWeb)

Average Annual Loss (AAL) by hazard

Hazard	Absolute [Million US$]	Capital stock [%]	GFCF [%]	Social exp [%]	Total Reserves [%]	Gross Savings [%]
Earthquake	10.49	0.001	0.012	0.038	0.008	0.011
Storm Surge	0.52	0.000	0.001	0.002	0.000	0.001
Tsunami	5.52	0.000	0.007	0.020	0.004	0.006
Flood	1,271.09	0.109	1.511	4.555	0.953	1.312
Multi-Hazard	1,287.62	0.110	1.531	4.614	0.965	1.329

Hazard contribution to AAL



MALAYSIAN EXPECTATIONS

- Based on evaluation of Fundamental Research Grant Scheme (FRGS), Trans-disciplinary Research Grant Scheme (TRGS) and Prototype Grant Research Grant (PRGS) on Flood Disaster
- 1500 Applications from more than 25 Malaysian Higher Institutions
- More than 200 proposals had been accepted and the total cost of RM20,000,000.00 (USD6.5 mil)
- Technical, Medical and Social Scientists
- In view of Pre-During-Post flood disasters
  - Governance & Capacity Building (GCB)
  - Socio Economic (SE)
  - Environmental & Physical Impact (EPI) & Early Warning System (MEWS)
  - Governance & Capacity Building (GCB)
  - Health & Clinical Science (HCS) & Innovation & Technology (I&T)
  - Modelling & Early Warning System (MEWS)
  - Innovation & Technology (I&T)

MALAYSIAN EXPECTATIONS

- Advanced International Joint Research
  - Hydro-meteorological Forecasting/Nowcasting/Disaster
  - Multi-Geohazards Disaster Risks
  - Geo-enviromental Disaster
  - Disaster Governance (pre-during-post disaster)
  - Tsunami and Earthquake

  (not limited to these only)

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MALAYSIAN EXPECTATIONS

- Promotion of Societal Implementation
  - Social Vulnerability
  - Preparedness and Mitigation (Social response)
  - Involvement of Social Scientists and NGO
  - Public-private joint research

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MALAYSIAN EXPECTATIONS

- Fostering Human Resources
  - Retooling and training researchers/academics
  - Postgraduate Internship/Attachment
  - Dispatch Professors
  - Involvement of Junior Researchers in Collaboration research
  - Capacity buildings

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Flood and Flood Disaster :
Flood Hazard Map Utilizing Public Domain Inundation Hydrological (RRI) and Hydraulic (HEC-RAS) Models

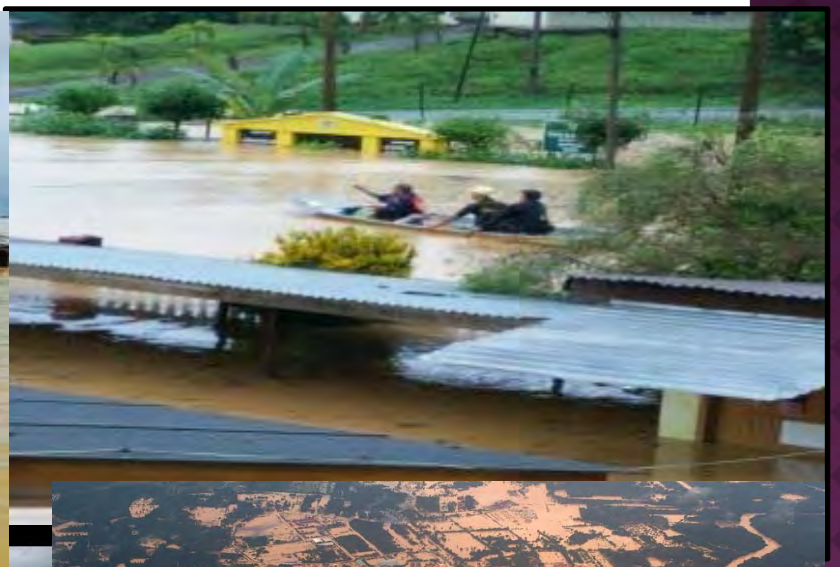
Members	**Institutions**
Ismail Abustan, Mohd Remy Rozainy Mohd Arif Zainol, Noorhazlinda Abd Rahman, Nabsiah Abdul Wahid,	USM
Choong Wee Kang,	Uni. of Nottingham Malaysia
Muhammad Salleh Abustan	UTHM
Sina Alaghmand	Monash Uni.
Kaoru Takara Choong Khai Lin Kan Setsu	Kyoto University

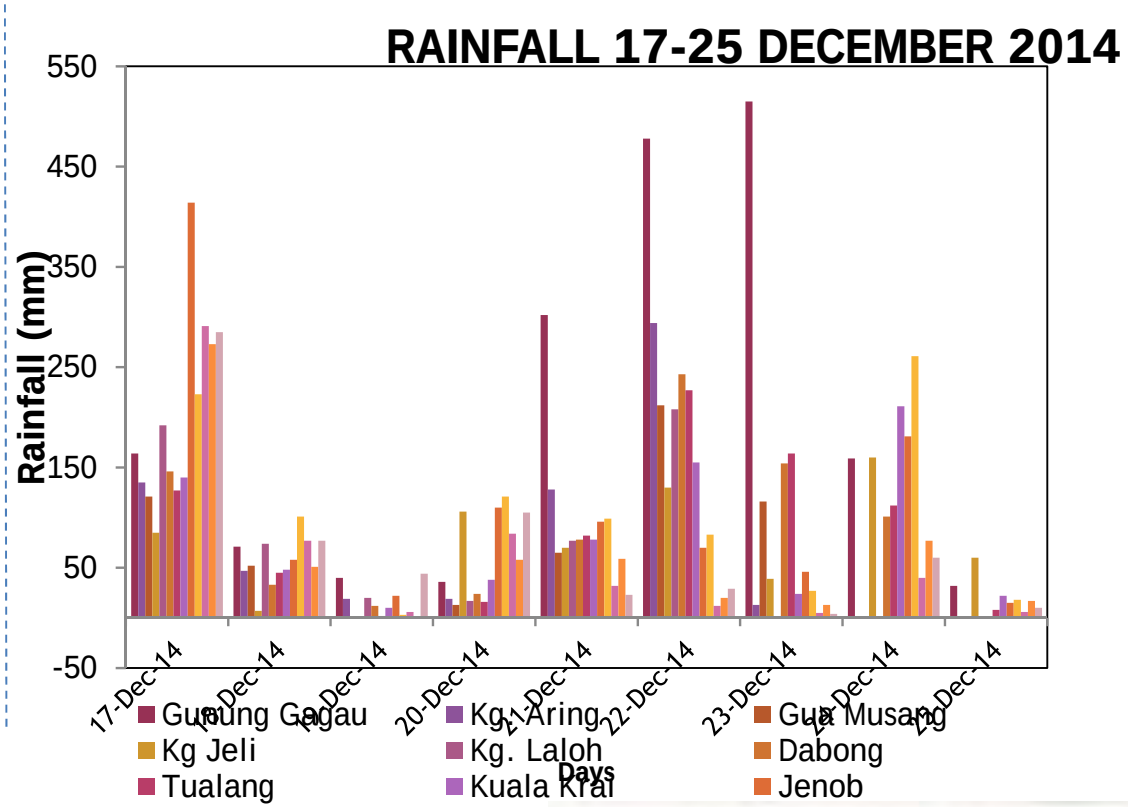
Kelantan Extreme Flood 2014 'Yellow Flood

- Flooding Twice in 2 weeks :

  15 December 2014 - 19 December 2014

  22 December 2014 - 29 December 2014





- Max Rainfall
- Gunung Gagau 1765 mm (17 to 24 Dec)
- Jenob 997 mm,
- Kusial 918 mm,
- Kuala Kerai 704 mm,
- Dabong, 791 mm,
- Tualang 783 mm,
- Kg Aring 655 mm
- Water level peak at Kuala Krai on 25 Dec

Annual Rainfall 2300mm

NUMBER OF FLOOD EVACUEES AS AT 9 PM, DEC 26

STATES	DEC 25	DEC 26 (5 PM)	DEC 26 (9 PM)
KELANTAN	34,955	45,467	45,467
TERENGGANU	29,082	34,884	34,109
PAHANG	28,578	32,380	33,324
PERAK	5,512	6,119	6,335
JOHOR	-	537	896
KEDAH	76	28	28
PERLIS	263	209	209
TOTAL	98,466	119,624	120,368

Source: Bernama


ALIEF MAJU

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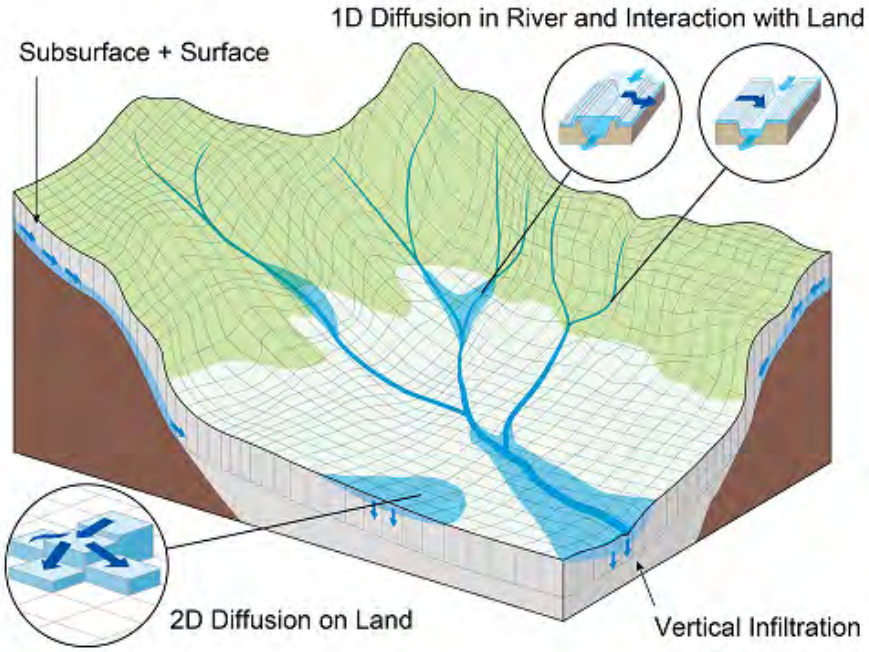
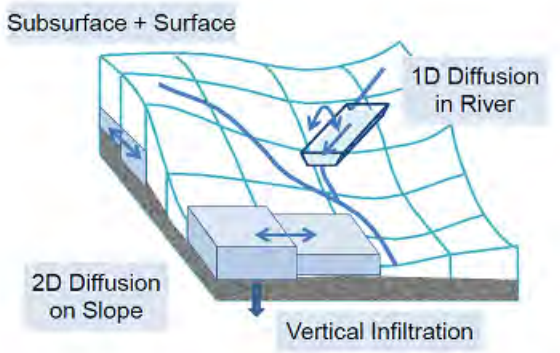
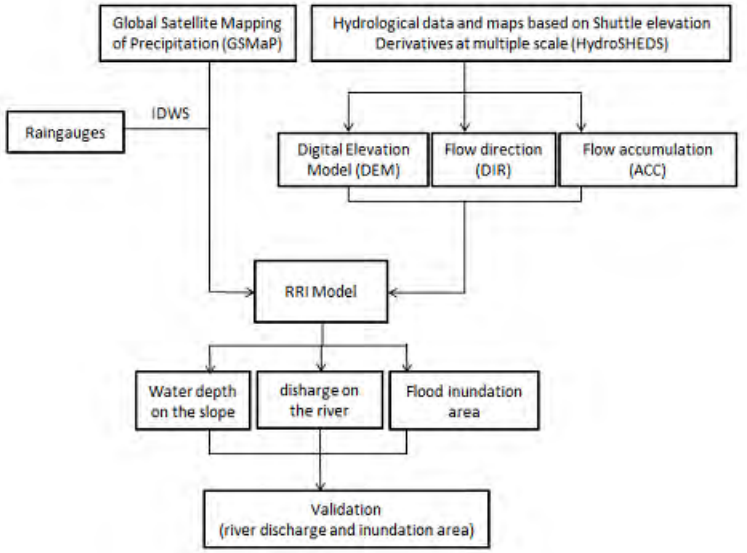
Activities

- Modelling of Rainfall-Runoff-Inundation (RRI)
- The simulation of RRI had been conducted with the collaboration of Kyoto University.



Schematic diagram of the rainfall–runoff–inundation





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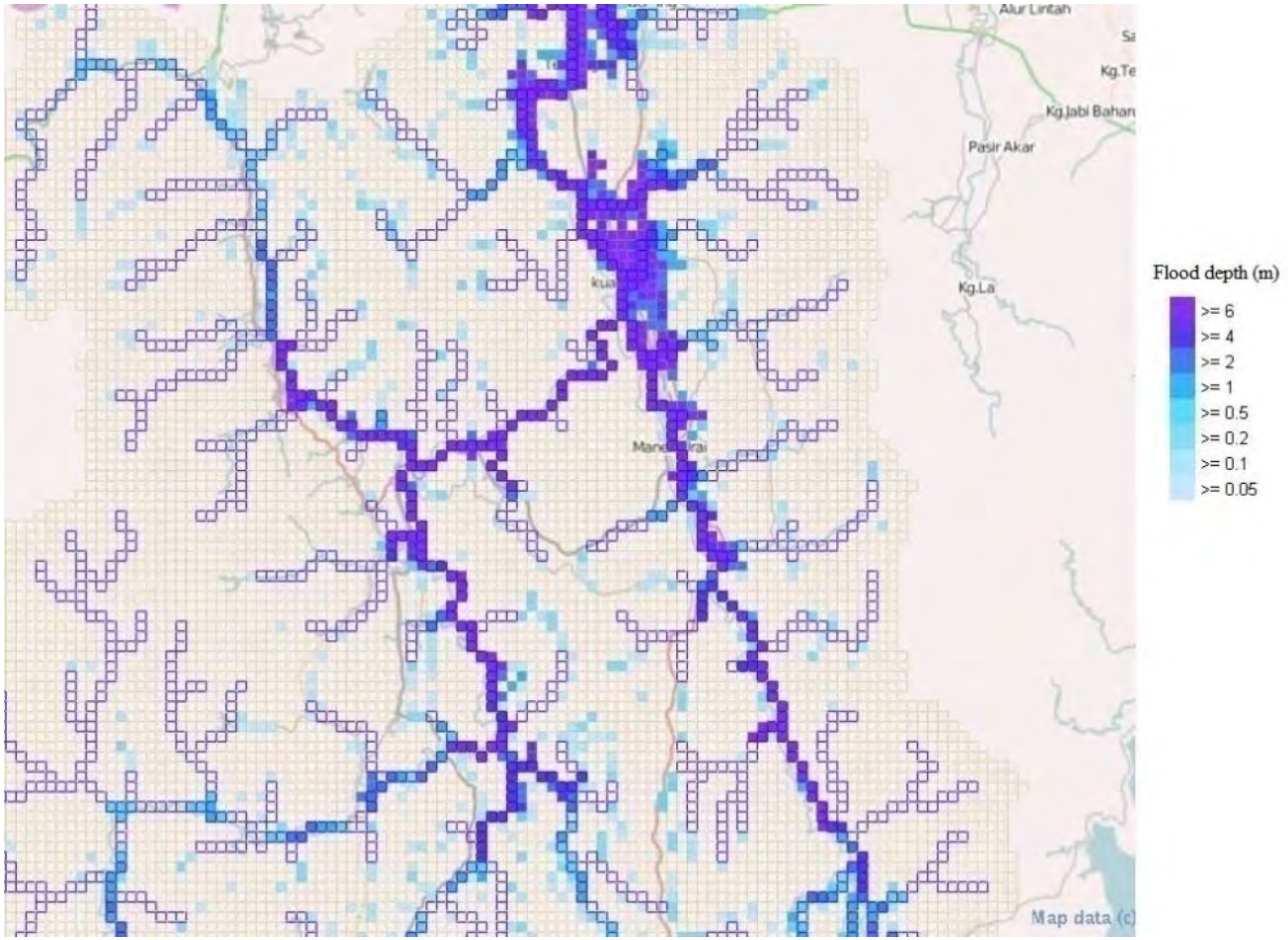

Figure 8: RRI simulation for maximum flood inundation for Kuala Kerai area.

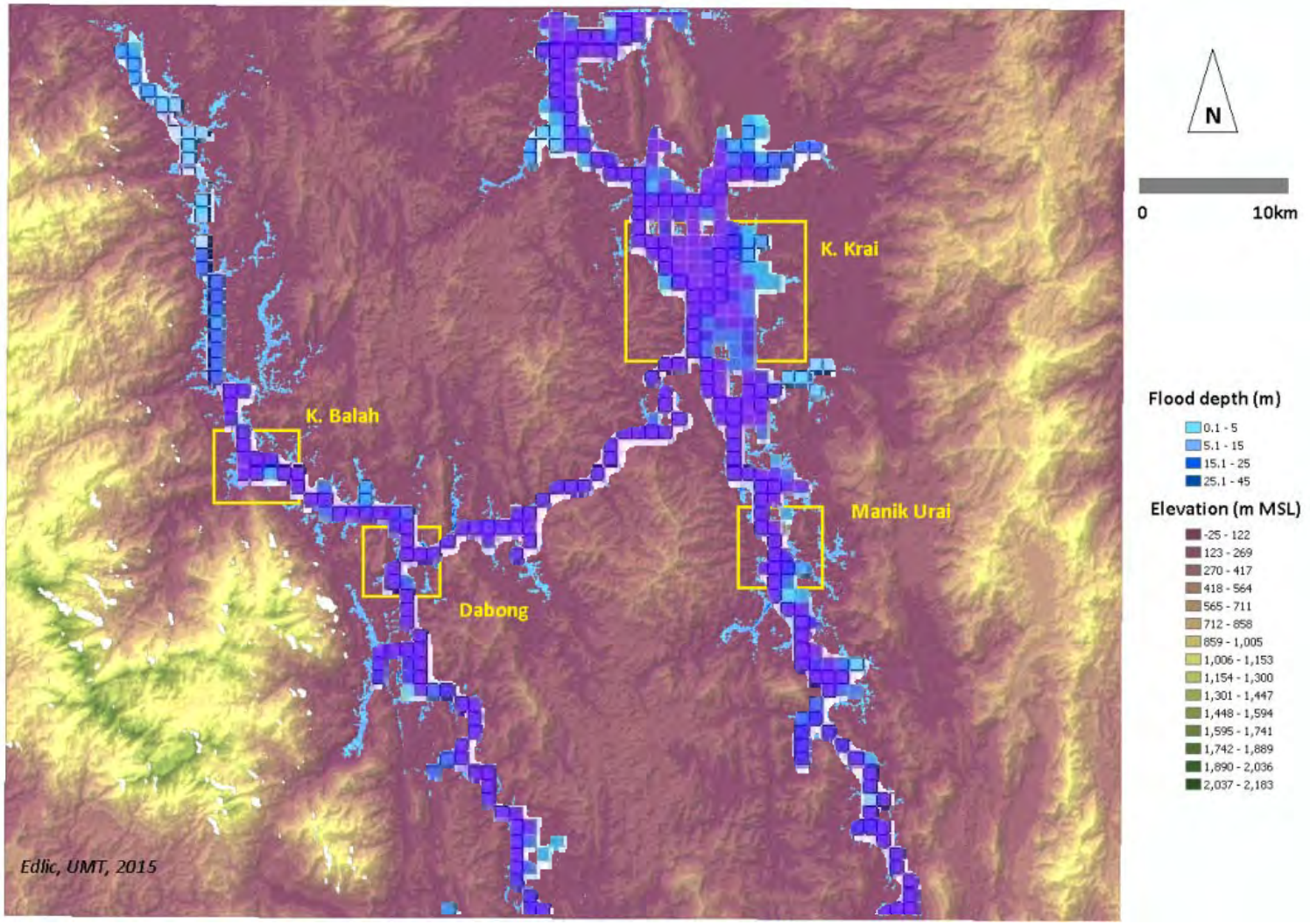

Figure: Comparison of inundation areas by superimposed observed (remote sensing) and RRI simulated flood inundation event in Kuala Kerai areas.

THANK YOU ...

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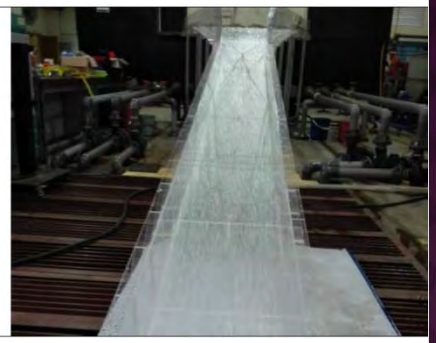
Expansion of Mengkuang Dam Pulau Pinang Malaysia



Model Study for Mengkuang Dam Spillway

KEMENTERIAN TENAGA, TEKNOLOGI HIJAU DAN AIR (KETTHA)
BLOK E4/5, KOMPLEKS KERAJAAN PARCEL E,
PUSAT PENTADBIRAN KERAJAAN PERSEKUTUAN
62668 PUTRAJAYA, MALAYSIA

Draft Final Report:

Hydraulics Model Study for

Spillway of Mengkuang Dam

Pulau Pinang

Angkasa Consulting Services Sdn. Bhd.
No. 49, Jalan USJ 10/1A, UEP Subang Jaya,
47620 Subang Jaya,
Selangor, Malaysia

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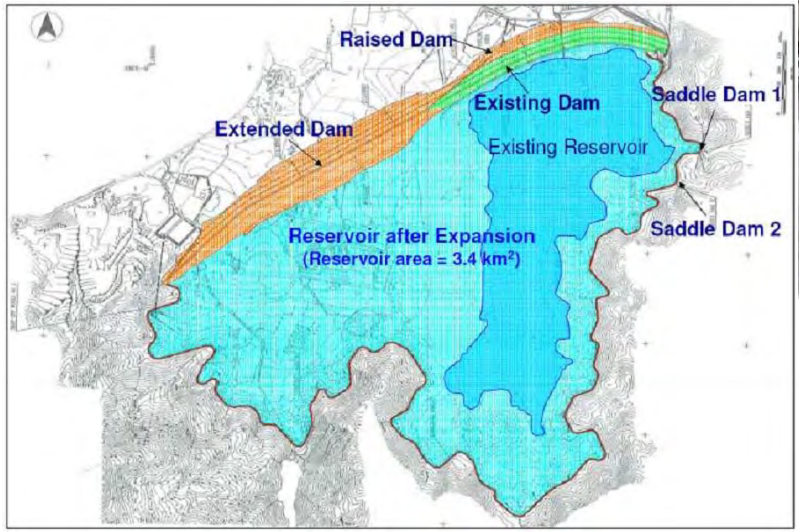

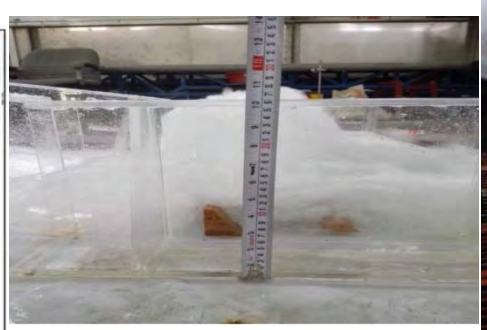

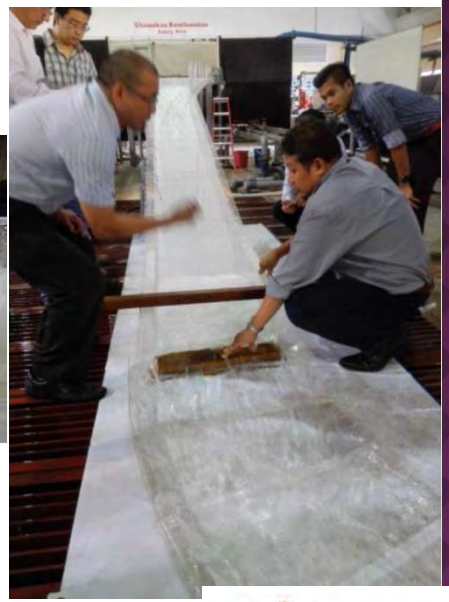

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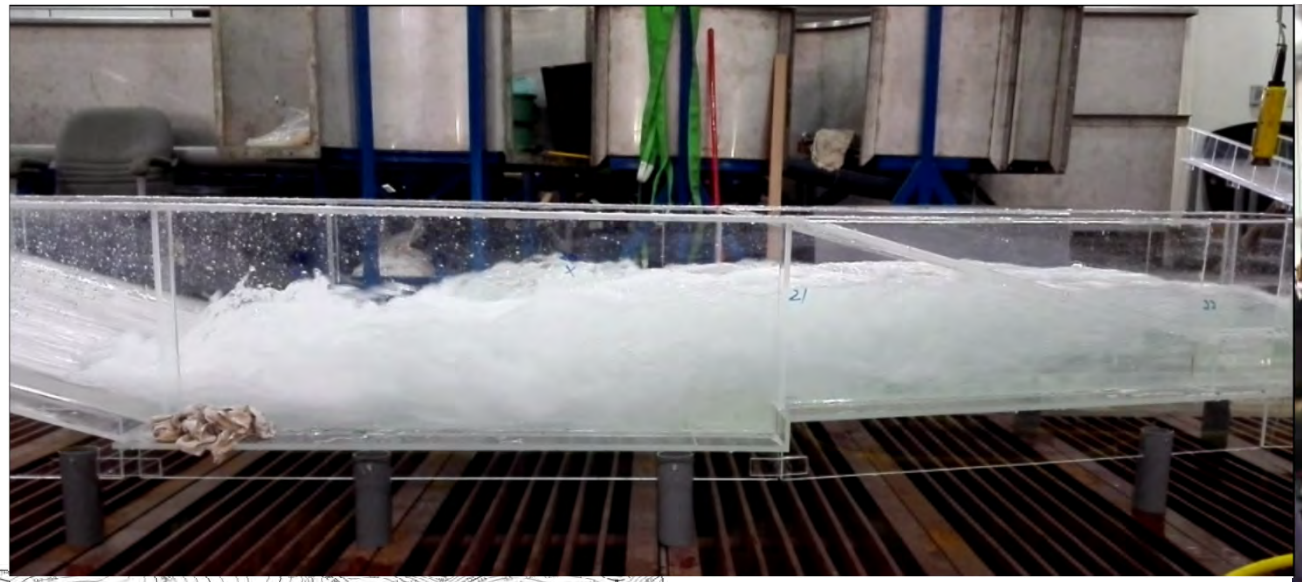
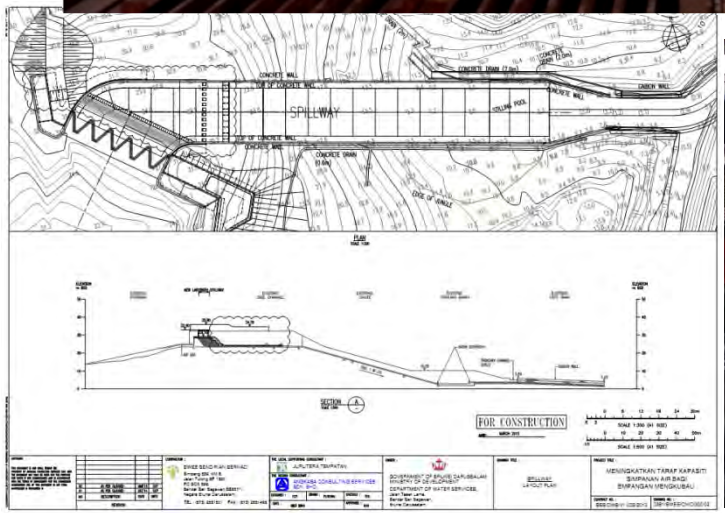
Expansion of Mengkubau Dam, Brunei, Darul Salam





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