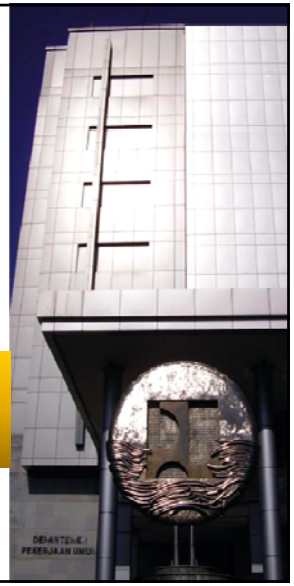
FLOOD RISK MANAGEMENT IN ASIA : INDONESIA EXPERIENCES



Ir. Hartanto, Dipl.HE
&
Sudarsono, ATP.CES.
Directorate of Operation and Maintenance

2012 JSCE Annual Meeting – Nagoya

DIRECTORATE GENERAL OF WATER RESOURCES
MINISTRY OF PUBLIC WORKS

OUTLINE

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1. INTRODUCTION

2

INTRODUCTION

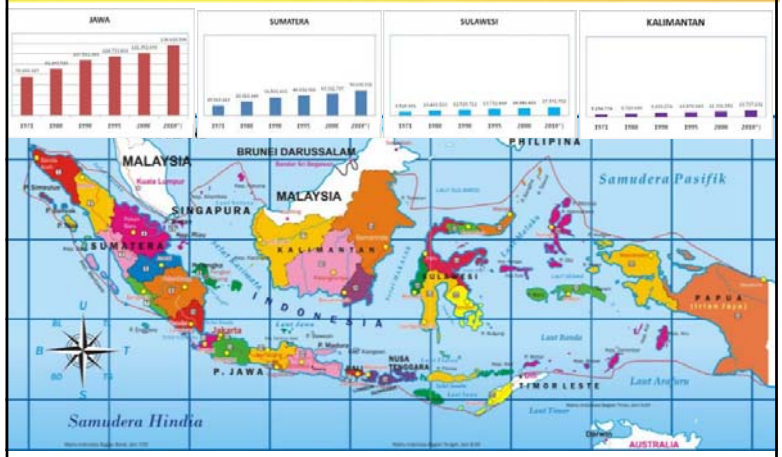
REPUBLIC OF INDONESIA

- covering land : 1.904.570 km².
- current population of 230 million peoples
- current growth rate of 1,2% annually.
- Comprises of 17.508 islands,
- 6,1 million Km² of its territory are covered by water.
- two distinct seasons; monsoon wet and dry

high rainfall during rainy season (2.000 – 3.000 mm a year) and very low rainfall during dry season.

3

POPULATION GROWTH IN INDONESIA



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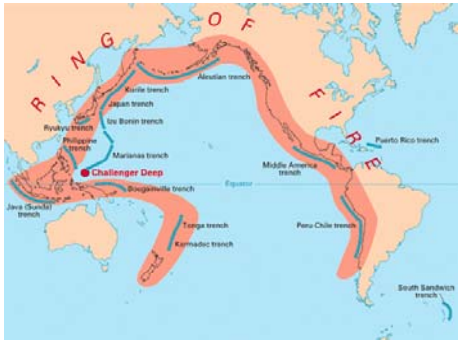
INTRODUCTION



- The archipelago is located on triple junction plate convergence (Indo-Australia, Eurasia and Pacific plates) that part of **the Pacific Ring of Fire**.

5

INTRODUCTION

- Accordingly, Indonesia experiences frequent earth-quakes incidents, which in some cases results in tsunami incidents.

  Devastating cases : Tsunami in Aceh (December 26, 2004)

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INTRODUCTION

- Abundant of water resources
- High annual rainfall intensity
- Climate become unpredictable these day

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2. NATURAL DISASTER

2. NATURAL DISASTER

- Indonesia frequently suffers from devastating natural disasters, such as:
  - Floods;
  - Sedimentation/mudflow;
  - Landslides;
  - Earthquakes;
  - Volcanic eruptions;
  - Tsunami;
  - Typhoon/whirlwinds;
  - Draught/water crises.

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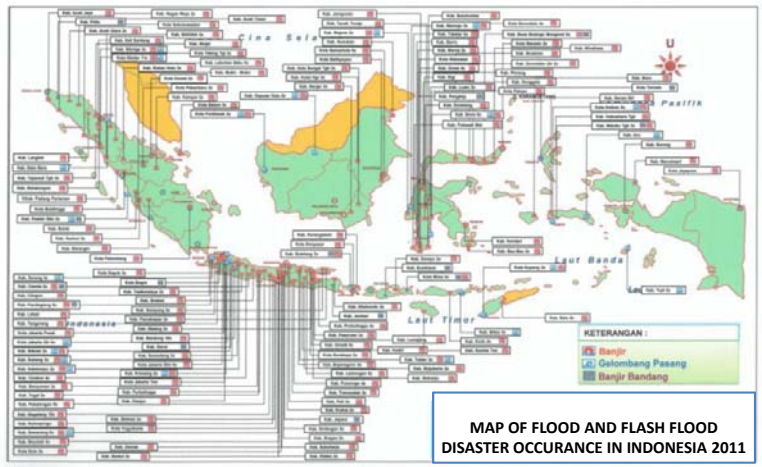
2. NATURAL DISASTER



MAP OF FLOOD AND FLASH FLOOD DISASTER OCCURANCE IN INDONESIA 2011

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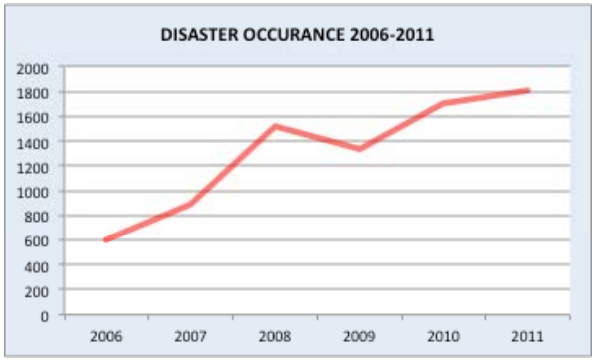
2. NATURAL DISASTER

NATURAL DISASTER EVENTS IN INDONESIA 2006-2011



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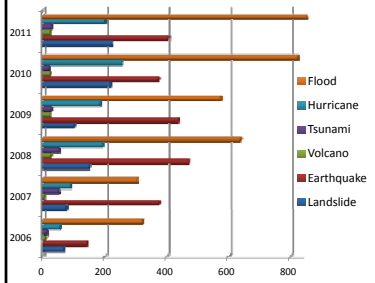
2. NATURAL DISASTER

NATURAL DISASTER EVENTS IN INDONESIA 2006-2011



Year / Disaster	2006	2007	2008	2009	2010	2011
Flood	319	304	637	571	821	943
Landslide	67	73	148	101	214	222
Earthquake	139	373	468	435	372	403
Volcano	7	3	24	21	19	22
Tsunami	13	49	50	25	18	25
Hurricane	52	88	191	184	253	198
Total	597	890	1518	1337	1697	1813

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2. NATURAL DISASTER

River Situation

There are about 5.590 and 600 of them potentially cause flooding.

Causes of flooding :

1. Increasing of changing land use
2. Natural events
3. Increasing of using river zone

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2. NATURAL DISASTER

Types of Floods in Indonesia

Riverine Floods

Flash Floods

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2. NATURAL DISASTER

Bengawan Solo River Basin

Ciliwung River Basin

Citarum River Basin

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3. NATURAL DISASTER REDUCTION AND RELIEF

- **Lesson Learnt:**

1). Disaster often occurs when we are not ready.

2). Local governments should prepare disaster countermeasures plan and allocate sufficient contingency budget.

3). Pre-disaster incident

4). During disaster incident

5). Post disaster incident

- **Related Laws and Regulations:**

1). Law (UU) No. 7/2004 concerning Water Resources (Chapter V, Art. 51-58);

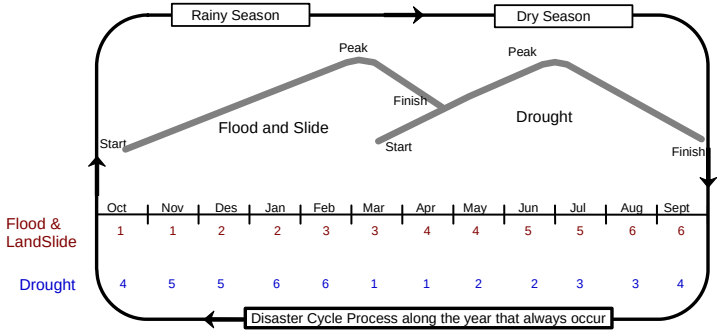
2). UU No. 24/2007 concerning Disaster Counter-measures;

3). Government Act (PP) No. 21/2008 concerning Disaster Countermeasures Management;

4). PP No. 22/2008 concerning Disaster Budget and Aid Management;

5). PP No. 23/2008 concerning Participation of Inter-national Organizations and NGOs

5). PP No. 38/2011 concerning River



1. Preparedness
2. Disaster moment/Response
3. Recovery
4. Research, Study and Development
5. Action Plan
6. Prevention dan Mitigation

Figure 1. Water–related disaster cycle diagram

3. NATURAL DISASTER REDUCTION AND RELIEF

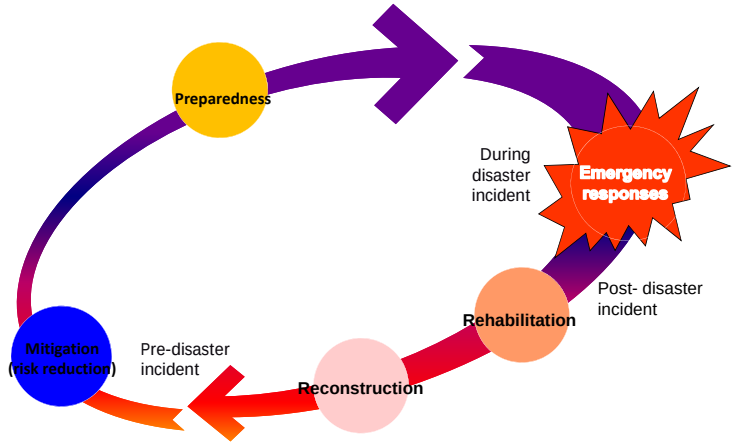


Figure 2. Water–related disaster management cycle

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3. NATURAL DISASTER REDUCTION AND RELIEF

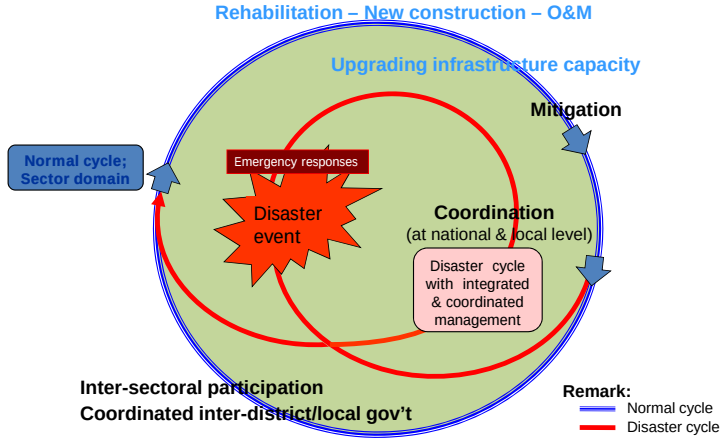

Figure 3. Emergency responses cycle

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4. DISASTER POLICY & MANAGEMENT

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4. DISATER POLICY AND MANAGEMENT

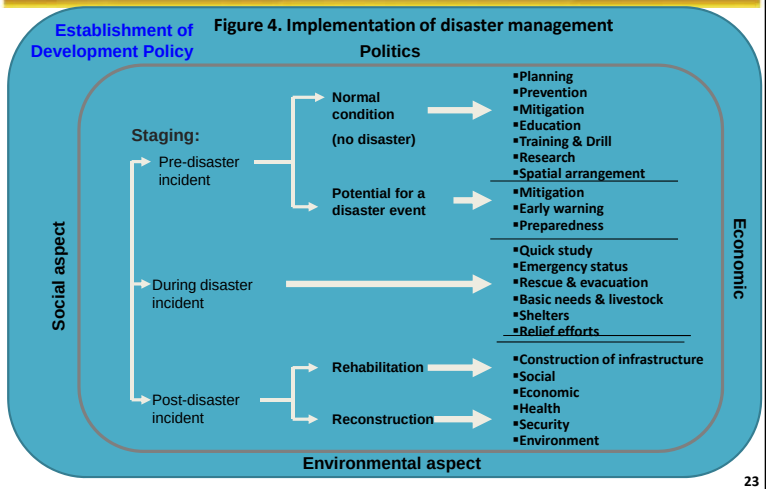

Figure 4. Implementation of disaster management

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4. DISASTER POLICY & MANAGEMENT

DISASTER POLICY MEASUREMENT:

- **Adaptation measures**
- **Mitigation measures**
- **Response**
- **Recovery**

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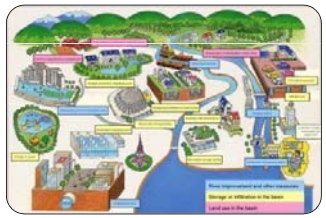
4. DISASTER POLICY & MANAGEMENT

Policies:

1. Modify human susceptibility
2. Modify the impact
3. Modify flooding
4. Preserve and restore the natural resources regulations
5. Non structural measures
6. Operation and Maintenance



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4. DISASTER POLICY & MANAGEMENT

TRENDS OF MITIGATION ACTIVITIES IN INDONESIA LAST 10 YEARS

PREVIOUS DECADE	LAST DECADE
Focus on disaster response	Focus on disaster risk reduction & mitigation
Reactive	Proactive
Single Institution	All parties participation
Focus on one field of expertise	Multidiscipline
Response Management	Risk Management
Planning for community	Planning together with community
Socialization to community	Communication with community

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5. INSTITUTIONAL & ORGANIZATION

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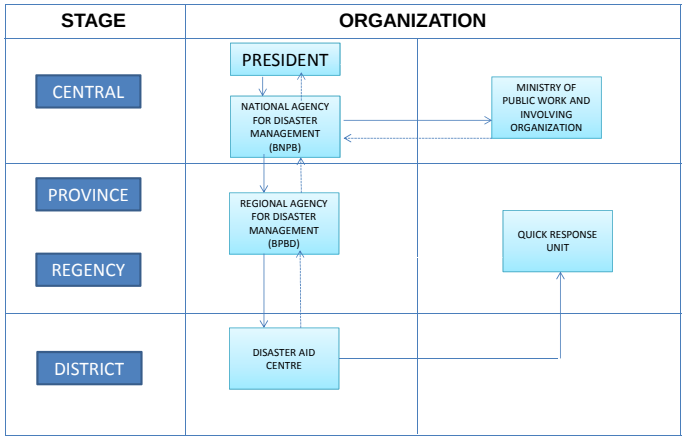
5. INSTITUTIONAL AND ORGANIZATION

INSTITUTIONAL EMPOWERMENT



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5. INSTITUTIONAL AND ORGANIZATION

Duties and Responsibilities related to Disaster Management

- National Agency for Disaster Management (BNPB)
- Regional Agency for Disaster Management (BPBD)
- Ministry of Public Works
- Private and International Organization
- Volunteers

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5. INSTITUTIONAL AND ORGANIZATION

Role of Civil Engineering :

•University (University of Gadjah Mada – Master of Disaster Management Program)

•Professional Organization (Hathi, KNI-BB, PII, etc)

•Private

•Etc

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5. INSTITUTIONAL AND ORGANIZATION

Future International Cooperation :

•AHA Centre – ASEAN

•Intra-Government Cooperation

•Inter-Organization Cooperation (JICA, KOICA, USAid,etc)

•Regional Cooperation

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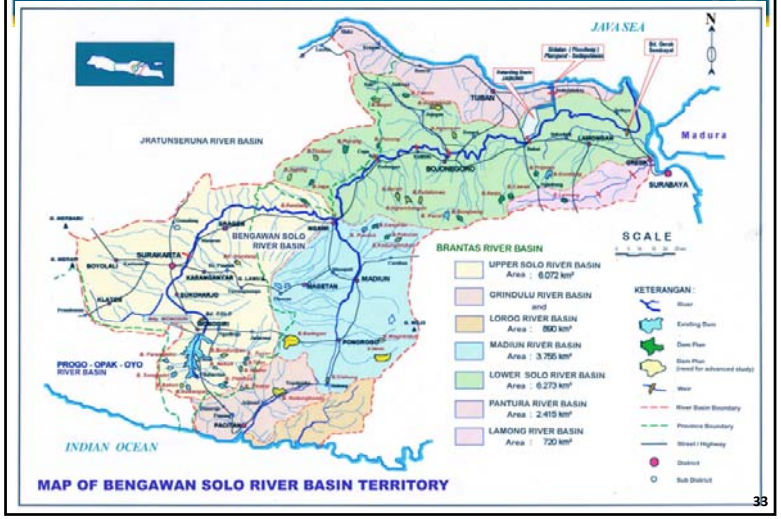
5. FLOOD DISASTER IN BENGAWAN SOLO RIVER BASIN

5. FLOOD DISASTER IN BENGAWAN SOLO RIVER BASIN



MAP OF BENGAWAN SOLO RIVER BASIN TERRITORY

5. FLOOD DISASTER IN BENGAWAN SOLO RIVER BASIN

MASTER PLAN (1974)
SOLO RIVER BASIN DEVELOPMENT

5. FLOOD DISASTER IN BENGAWAN SOLO RIVER BASIN

- Bengawan Solo River Basin Territory (Solo River Basin), which is located in 20 regencies and municipalities of Central Java Province and East Java Province, covering an area of 20,125 km². It consists of Bengawan Solo River, Grindulu and Lorog rivers, Pantura Gelangban rivers, as well as Lamong River basins.

5. FLOOD DISASTER IN BENGAWAN SOLO RIVER BASIN

Solo River, the longest river in Java Island (main river about 600 km length), is the most important water resources for people in the basin. It provides water for domestic, municipality, and industral uses, as well as for irrigation. The river, however, experiences heavy floods frequently causing extensive damages and casualties.

Year 2009

Average annual rainfall in Solo River Basin 2,100 mm, about 80% occurs in rainy season October-April. Due to global climate change, however, rainfall occurance becomes un-predictable, in many cases rainfall intensity become extremely high causing flash floods in tributaries of the basin.

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5. FLOOD DISASTER IN BENGAWAN SOLO RIVER BASIN

Post Office

Merdeka Hotel

Hardjodaksino Bus Terminal

Sunan Palace North Gate

FLOODS IN SOLO CITY (1966)

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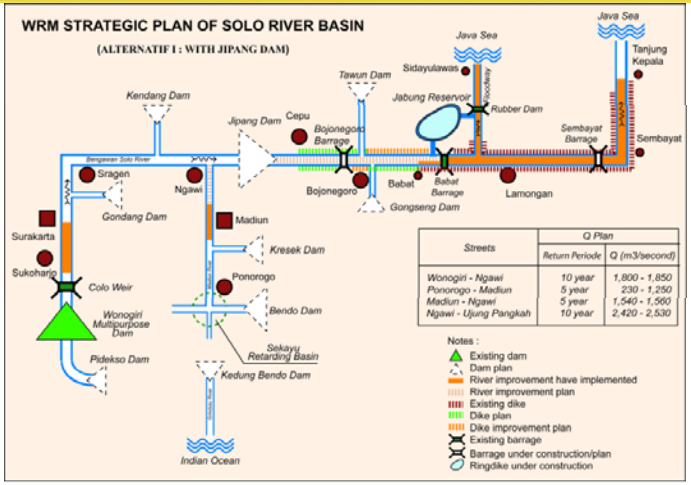
5. FLOOD DISASTER IN BENGAWAN SOLO RIVER BASIN



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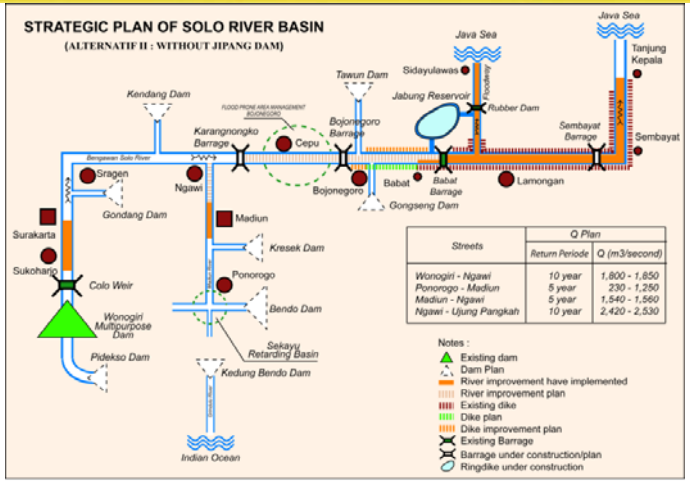
5. FLOOD DISASTER IN BENGAWAN SOLO RIVER BASIN



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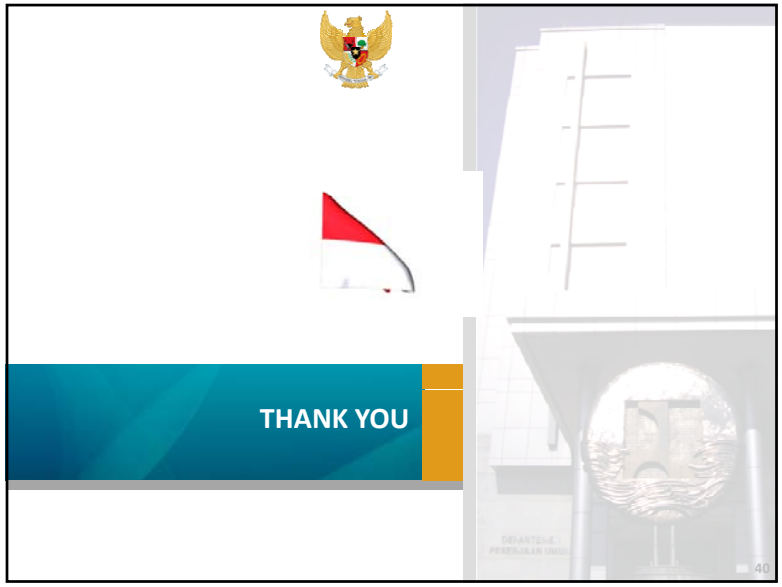
THANK YOU
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