Building Disaster Knowledge Infrastructure in Indonesia

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Outline

• Introduction
• Disaster Information Systems in Indonesia
• BNPB ICT Master-Plan
• Discussions
- Number of islands 17,504 islands (1<sup>st</sup> in the world)
- 81,000 km long coastline (2<sup>nd</sup> in the world)
- Population 237 million people (4<sup>th</sup> in the world)
- Mega Biodiversity (10% plants, 12% of mammals, 16% of reptiles, 15% fish, 17% of birds in the world live in Indonesia) – 3<sup>rd</sup> in the world
- 13% or 127 active volcanoes in the world (1<sup>st</sup> in the world)

INDONESIA ...... dangerously beautiful and also danger to disasters

Number of population exposed to disaster in millions (BPS 2010):

1. Landslide: 229.6
2. Earthquake: 227.4
3. Drought: 225.6
4. Typhoon: 115.7
5. Flood: 60.9
6. Forest fire: 50
7. Tsunami: 5
8. Volcanic eruption: 3.8
Disasters in Indonesia (The Law 24/2007 regarding Disaster Management, Chapter I: General Requirements, section 1)

- **Natural Disasters**
  - (1) earthquake, (2) tsunami, (3) volcanic eruption, (4) flood, (5) drought, (6) typhoon, (7) landslide;

- **Un-Natural Disasters**
  - (8) technological failure, (9) land and forest fire, (10) epidemic, (11) disease;

- **Social Disasters**
  - (12) social conflict among groups or community (13) terrorism.
Disasters become a global problem

International

Hyogo Framework for Action 2005 – 2015, agreed by 168 country, as a DRR guide

Indonesia

Aceh Tsunami 2004 as 2\textsuperscript{nd} National Awakening $\rightarrow$ raise the importance of national disaster management $\rightarrow$ law no 24/1997 concerning disaster management
Disaster Information Systems in Indonesia

- InaTEWS: BMKG, BPPT, BIG, KKP
- Geospatial: BNPB, UNDP
- DIBI: BNPB, UNDP, UNFPA
- InaSAFE: BNPB, AIFDR, GFDRR
- InAWARE: BNPB, PDC
- EWS feature through Digital TV – KOMINFO
- EWS Portal – MIC Japan & KOMINFO, BMKG, BNPB
Indonesia has developed InaTEWS that can relay earthquake and tsunami information 5 minutes after the incident and disseminate to the public. InaTEWS was built based on seismograph network, tsunami buoys and tide stations that are spread throughout Indonesia
DATA AND INFORMATION FLOW of InaTEWS

UPSTREAM

BMKG
NC – SEISMIC
NC – ACCELEROMETER

BAKOSURTANAL/BIG
NC – Tide Gauges
NC – GPS

NC: National Centre

DSS

INSTITUTIONS INTERFACE:
- BNPB
- MINISTRY OF HOME AFFAIRS
- NATIONAL POLICE
- MILITARY
- MINISTRY OF COMMUNICATION AND INFORMATION TECHNOLOGY
- LOCAL GOVERNMENT
- REGENCY LOCAL GOVERNMENT

INSTITUTIONS INTERFACE:
- GSM PROVIDER
- INTERNET PROVIDER
- USER CELLPHONE
- SOCIAL COMMUNITY NETWORK
- LOCAL GOVERNMENT
- PROV. GOV
- DISTRICT GOV
- CITY GOV

DOWNSTREAM

RESIDENT / COASTAL COMMUNITIES

GSM PROVIDER
INTERNET PROVIDER
USER CELLPHONE
SOCIAL COMMUNITY NETWORK

ELECTRONIC MEDIA
TV, RADIO, MEDIA ON LINE

DISSEMINATION FACILITIES
Aceh Earthquake April 11th, 2011, 8.9 SR
Geospatial Data Sharing  http://geospasial.bnpb.go.id

Web-GIS Portal

Geospatial website:
web map services, map for download, etc.

Disaster monitoring watch
The Integration of Population Data into Indonesia Disaster Database System (DIBI)
http://dibi.bnpb.go.id

DIBI dashboard menu

Query function for Population Census 2010 and Village Potency 2011 data

Graphic and maps tools
InaSAFE http://inasafe.org
Indonesia Scenario Assessment For Emergencies

- Free and open source: based on Quantum GIS
- Used available geospatial data from line ministries data, OSM, etc.
- Simple and easy to used.
- Automatic real time earthquake impact map
Landslide and Flood Early Warning System

LEWS
Detect land movements and soil moisture

AWS & Main Siren
Send SMS notifications to BPBD (local authority)
To improve early warning and disaster management decision making outcomes:

- Enhance access to automated international, regional, and national hazard information,
- Improve information-sharing between agencies, and
- Provide for effective dissemination of alerts and warnings to at-risk communities
Streamlining All Platforms and Systems in National Roadmap

Long-term implementation in harmonizing all potential infrastructure, platforms, systems both technical and non-technical, business operations, from existing and future elements.
What is the first and most important thing for everyone in terms of disaster?

**INFORMATION**—allow everyone to be aware, so they may think then make calculated decision. Thus born, the first platform: *Dissemination*.

Where does BNPB stand among all elements?

Leading **COORDINATION** among all elements, so that resources are put to maximum effectiveness and efficiency to save lives. Thus born, the second platform: *Command and Control*.

How is BNPB able to perform coordinated operations throughout thousands of islands?

Utilizing its sub-national representatives, **BPBD**, and embedding coordination capacity in all its business layers. Thus born, the third platform: *Emergency Operations Center*.

Why does BNPB conduct extensive investment and intensive development every year?

Because nature is always evolving and humanity must adapt, so too, **KNOWLEDGE AND LEARNING**. Thus born, the fourth platform: *Business Operations*.

When a global disaster bigger than any we have faced before strikes, will we be ready?

We may never be perfectly prepared, but to always have *Actionable Response Plan* and continuous drills are the least. Thus, the fifth platform: *Migration and Contingency*.
Five Platforms of BNPB ICT Master-Plan

01. Dissemination
   - Integrated Communication
   - Multi-Disaster Warning Portal
   - Call Center
   - Public Support Tools

02. Command and Control
   - Real-Time Disaster Impact Monitoring
   - Fleet and Logistics Management
   - Inter-Agency Disaster Management
   - Computer-Aided Command and Control System

03. Emergency Operations Center
   - Integrated EOC CHQ Facility
   - EOC Backup and Contingency
   - Rapid Deploy, District, Provincial, and Regional EOC

04. Business Operations
   - Critical Support Operation Rooms
   - Integrated Safety and Security
   - Knowledge Management and E-Governance
   - Learning and Training Center

05. Migration and Contingency
   - Migration of Critical Facilities
   - Contingency Against Global Disasters
## Multi Disaster Warning Portal

( Output 2 of BNPB ICT Master-Plan )

<table>
<thead>
<tr>
<th>Tool</th>
<th>Description</th>
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<tbody>
<tr>
<td>InAWARE</td>
<td>Potential platform for common operational awareness, dissemination, coordination, and operations</td>
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<td>DIBI</td>
<td>Primary data source for InAWARE</td>
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<tr>
<td>Disaster Monitoring Tool</td>
<td>In process of merging with InAWARE</td>
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<td>(Geospasial BNPB)</td>
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<tr>
<td>InaSAFE</td>
<td>One of the modeling tool to support InAWARE</td>
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Thank You