LATEST ADVANCEMENTS IN THE USE OF SDI FOR DISASTER MANAGEMENT:
THE EXPERIENCE CASE FROM INDONESIA GEOSPATIAL DATA INFRASTRUCTURE (INA-SDI)

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GEOSPATIAL INFORMATION AGENCY (Badan Informasi GeoSpasial: BIG)
WHO WE ARE

GEOSPATIAL INFORMATION AGENCY
Brief Introduction

2012 UR Forum Mapping Global Risk
BAKOSURTANAL

- THE NATIONAL POLICY REVIEWERS IN THE FIELD OF SURVEYS AND MAPPING
- NATIONAL BODY OF TRUSTEE IN THE FIELD OF SURVEYS AND MAPPING AND SDI

BADAN INFORMASI GEOGRAFIS

- THE NATIONAL ORGANIZER FOR TOPOGRAPHIC SURVEY AND BASE MAPPING
- NATIONAL BODY OF TRUSTEE IN DEVELOPMENT OF THEMATIC MAPS
- THE NATIONAL ORGANIZER FOR SPATIAL DATA INFRASTRUCTURE
1. TO ENDORSE SINGLE REFERENCE FOR INTEGRATY OF GEOSPATIAL INFORMATION IN INDONESIA;
2. TO ENSURE THE AVAILABILITY AND ACCESS OF GEOSPATIAL INFORMATION WITH ACCOUNTABILITY;
3. TO ACHIEVE USEFULNESS OF GEOSPATIAL INFORMATION THROUGH COOPERATION, COORDINATION, INTEGRATION AND SYNCHRONIZATION; AND
4. TO ENCOURAGE THE USE OF GEOSPATIAL INFORMATION IN GOVERNMENT ACTIVITY AND PEOPLE’S DAILY LIFE

LAW 4/2011, DICTUM 22

GEOSPATIAL INFORMATION AGENCY
BADAN INFORMASI GEOSPASIAL (BIG)
DISASTER MANAGEMENT IN INDONESIA
Brief Introduction
INDONESIAN HOSTS MOST OF HAZARDS

- Papua Earthquake
- Krakatoa Eruption
- Jakarta Flood
- Aceh Tsunami
- Kalimantan Forest Fire
Asia-Pacific Disaster Report 2010 stated people in the Asia Pacific is 4 times more susceptible than the impact of natural disasters in Africa, and 25 times more vulnerable than in North America and Europe. [1]

From 6 types of natural disasters, United Nations International Strategy for Disaster Reduction (UNISDR) rank Indonesia first in the two natural disasters (tsunami and landslide), third in the earthquake, and sixth in the flood.

4408 natural disasters occurred over the past 5 years (2004-2009) in Indonesia: 71 earthquakes; 2 Tsunami; 24 Volcanic eruption; 469 landslide events; 1916 floods; 158 Flooding with landslides; 1083 Drought 580 Hurricanes; and 105 Tides.

The UN report estimates: more than 18 million peoples affected by natural disasters in Indonesia from 1980 to 2009.

• **BNPB** is the **Indonesian National Board for Disaster Management** (Indonesian: *Badan Nasional Penanggulangan Bencana*), by law has the task to assist the President of the Republic of Indonesia: planning and coordinating the implementation of disaster management and emergency response activities in an integrated manner; and implement disaster management and emergency response from before, during, and after including disaster prevention, preparedness, emergency response, and recovery.

• **BIG** is the **Geospatial Information Agency** (Indonesian: *Badan Informasi Geospasial*), by law has the task to assist the President of the Republic of Indonesia: planning, organizing and coordinating the development of geospatial information for disaster management activities.
INDONESIA HOSTS MOST OF HAZARDS

- EXTRA-TERRESTRIAL: 
  - ASTEROID IMPACT
- INTERNAL GEO-DYNAMIC PROCESSES: 
  - EARTHQUAKE, TSUNAMI, VOLCANIC ERUPTION
- EXTERNAL GEO-DYNAMIC PROCESSES: 
  - LANDSLIDE, SOIL EROSION, LAND DEGRADATION
- HYDRO-Meteorological: 
  - FLOODS, TROPICAL STORMS, DROUGHT
- ECOLOGICAL / ENVIRONMENTAL: 
  - POLLUTION, CROP DISEASE,
- EPIDEMICS: 
  - SARS, HIV / AIDS, AVIAN FLU
- TECHNOLOGICAL: 
  - INDUSTRIAL ACCIDENTS
- CONFLICTS: 
  - PUBLIC DISORDERS, TERRORISM

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INDONESIA PREPARE MAPS FOR MOST OF HAZARDS

LOCAL RESPONDER
- PARTICIPATIVE MAPPING
- EARLY WARNING

MAYOR/CITY EXECUTIVE
- EMERGENCY PLANNING
- MITIGATION
- TAX POLICY

GOVERNOR/PROVINCE EXECUTIVE
- eMONITORING
- COORDINATION
- MITIGATION
- DECISION MAKING
- RELIEF
- REHABILITATION

BOARD FOR DISASTER MANAGEMENT
- eMONITORING
- COORDINATION
- MITIGATION
- DECISION MAKING
- RELIEF
- REHABILITATION
- RECONSTRUCTION

THE PRESIDENT
- DECISION MAKING

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INDONESIA PREPARE MAPS FOR MOST OF HAZARDS

dgeoSpatial Data Sharing
Indonesia- geoSpatial Data Infrastructure (Ina-SDI)

FUNDAMENTAL DATA

LAW / REGULATION

INSTITUTIONAL PARTICIPATION

HUMAN RESOURCES

TECHNOLOGY

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INA-SDI: TECHNICAL FOUNDATION

ISO

TC 211 ↔ TC 204

JTC-1

OpenGIS Consortium (OGC)

ISO: Ref Model, Terminology, Conformance testing, Profiles, Spatial Schema, Temporal Schema, Feature Cataloguing Methodology, Spatial Ref by Coords and Ids, Quality, Metadata, WMS, GML, LBS, Registration of Geo-information Items

adopters/Implementer Community

Adopter/Implementer Community

ISO Protocol (XMLP), XML Signature, I18N

World Wide Web Consortium (W3C)

W3C: HTTP, PNG, RDF, SOAP/XMLP (Web Services Activity), XML, Xlink, Xpath, Xpointer, XSL/XSLT, XML Schema

Internet Engineering Task Force (IETF)

OpenGIS Consortium (OGC)

OGC: Web Map Server, Web Feature Server, GML, Web Coverage Server, Style Layer Descriptor, Catalog Service

Facilitation Bodies

• GSDI
• ANZLIC
• PCGIAP
• FGDC
• PC-IDEA
• INSPIRE
• GeoConnections
• CODI/UNECA
• AGI
• INA-SDI

Provide expertise & Candidate stds.

Review & approve stds.
INA-SDI: Architecture Design

**Participating Institute Production User**

**Production Units**

- Participating Institutes Distributed Network Node

**BAKOSURTANAL Distributed Network Node**

- Data and File Server
- Application server
- Web server
- Geo-spatial Database server
- Map Server
- Catalog and Metadata servers

**BAKOSURTANAL Centralized Network Node**

- Cartographic Rendering Server
- Identification and Authentication server
- Map Server
- Data access services

**Participating Institute Mission User**

**Disaster Recovery Center (Backup Center)**

**Public User**

**Local Contributor**

**Internet**

**Public User**

**Local Contributor**
DISTRIBUTED NETWORK NODE:
TYPICAL TOPOLOGY IN 57 MINISTRIES, 33 PROVINCES AND 500 REGENCIES
INA-SDI APPS: INA-GEOPORTAL
One Map, One Solution, for the Nations ....!

MAIN FUNCTION:
- Search & Discover
- Integrate
- Analyse (GIS Desktop Tools)
- Share (data and application)
- Produce the Maps
- Publish the Geospatial Information
- Access via Mobile Device

Now ..., you can create and publish maps in an integrated manner in a common georeference → One Map Policy, One Solution, for the Nations ....!
INA-GEOPORTAL: http://maps.ina-sdi.or.id
One Map, One Solution, for the Nations....!
INA-GEOPORTAL: Toward Collaborative Mapping
GPS Tracking and Geop-Location on One Map
INA-SDI GEOPORTAL: INA-GEOPORTAL
Integrating Geospatial Information for Decision Making....!

http://geoservices.ina-sdi.or.id:
Power Plant 10,000MW Phase I (ESDM); Fishpond (KKP); Poverty Line (BPS)

http://geoservice.bakosurtanal.go.id:
State Border; Provincial Border; Land Cover

http://gis.dephub.go.id:
Connectivity of Economic Corridors

http://sigi.pu.go.id:
Spatial Plannings

http://sumsel.geoappliance.com:
Spatial Plannings
INA-SDI GEOPORTAL: INA-GEOPORTAL
Facilitating Citizens Utilizing Official Geospatial Data....!

http://geoservices.ina-sdi.or.id:
Power Plant 10,000MW Phase I (ESDM);
Fishpond (KKP); Poverty Line (BPS)

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State Border; Provincial Border; Land Cover

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Poverty Line (BPS)

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Spatial Plannings
INA-SDI GEOPORTAL: INA-GEOPORTAL
Connecting Various GeoApplications ....!

Web 2.0
Web Client

Services Oriented Architecture (SOA)
Desktop Client
Web Client
Mobile Client

• Interconnected
• Interoperable
• Integrative
• Dynamic

Highest Point Service

Point-to-Point Services

Flexible & Integrated Services

Highest Point Service
Terrain Service

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INA-SDI GEOPORTAL: ON GOING PROJECT
Serving Nation’s GeoApplications with cloud computing technology....!

GEOSPATIAL CLOUD COMPUTING FACILITIES

- Powerful Computer Server & Workstation
- Unlimited Bandwidth
- High Capacity and Low Cost Storage Media
- Mobile GIS
- Cloud

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- **Spatial Data Infrastructure** plays important roles in supporting decision makings *fastly*, effectively in government business.

- **Geospatial Data and Information** that accurate and up-to-date able to represent current situation of certain location and to determine level of quality of decision in all levels of governance.

- **Strong Political Will** from Custodians to implement ‘data sharing’ is key success in development of Ina-SDI.