

Disaster Risk Reduction

LESSON LEARNED FROM MOUNT MERAPI: PLANNING TOWARDS DISASTER RESILIENCE

“ASIAN CONFERENCE ON DISASTER RISK REDUCTION 2016”

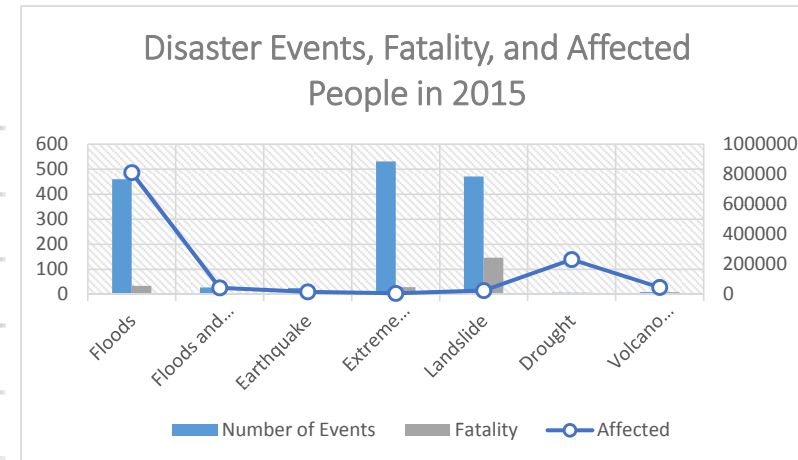
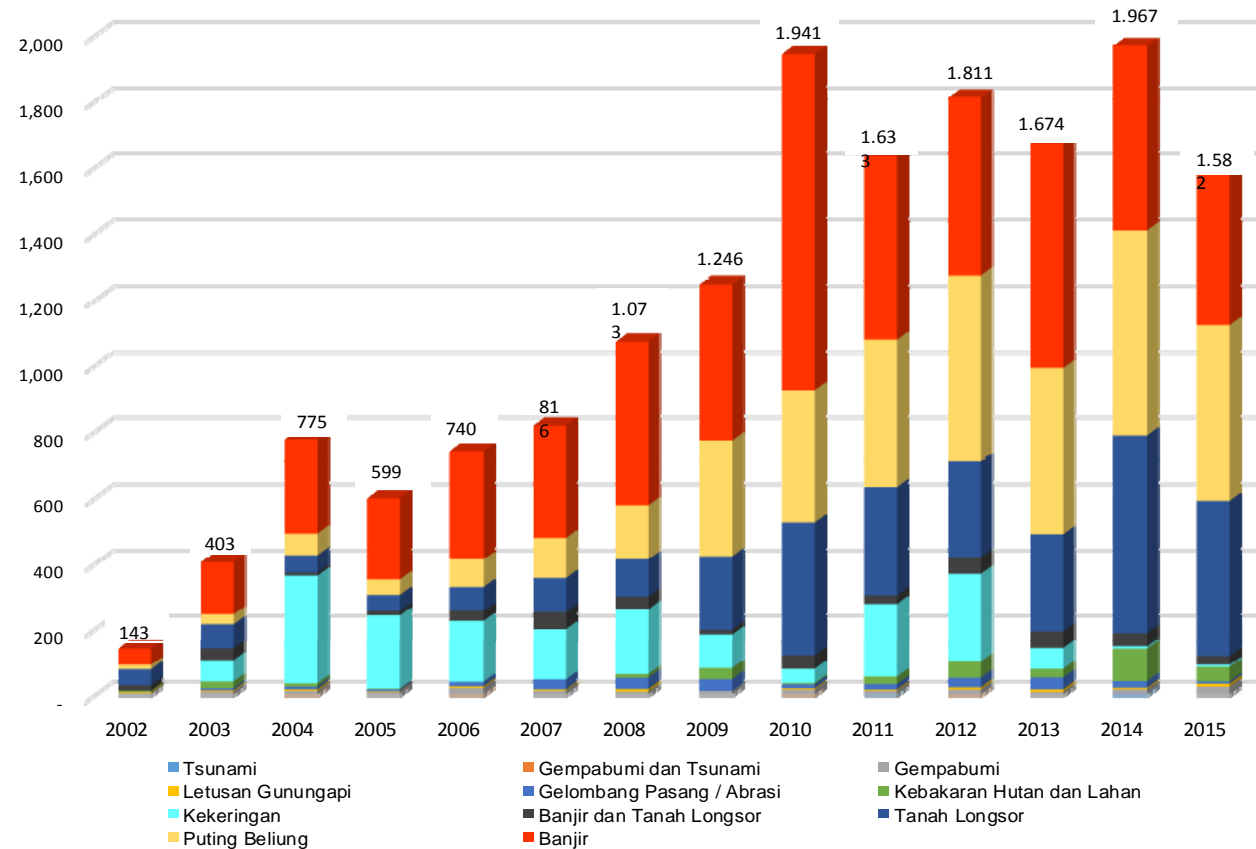
DR. Raditya Djati

Deputy Director for Prevention
Directorate for Disaster Risk Reduction
The National Authority for Disaster Management

Phuket 25-26th of February 2016

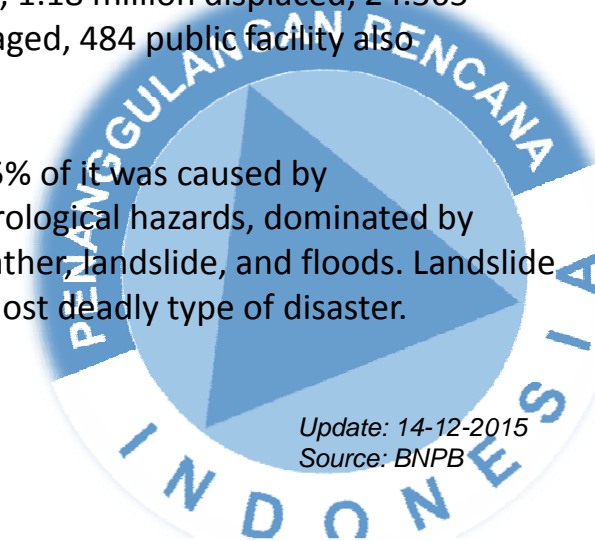


Disaster Trend in Indonesia 2002-2015



Of 1,582 disaster event in 2015, 240 people were loss their life; 1.18 million displaced, 24,365 houses damaged, 484 public facility also damaged.

Morethan 95% of it was caused by hydrometeorological hazards, dominated by extreme weather, landslide, and floods. Landslide still be the most deadly type of disaster.



Update: 14-12-2015
Source: BNPB

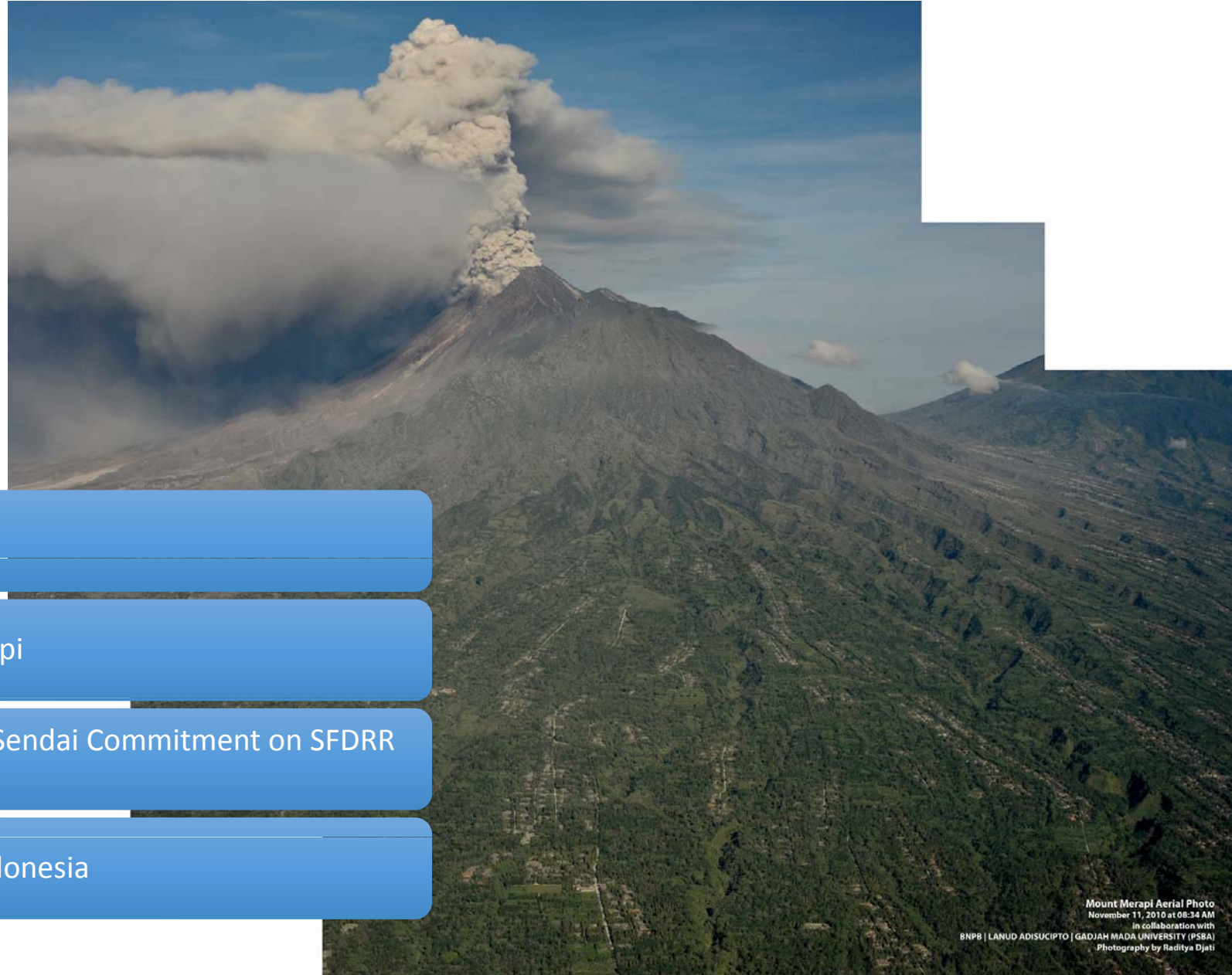
Agenda of Discussion for Today

Indonesian issues on Volcanoes

Lesson Learned from Mount Merapi

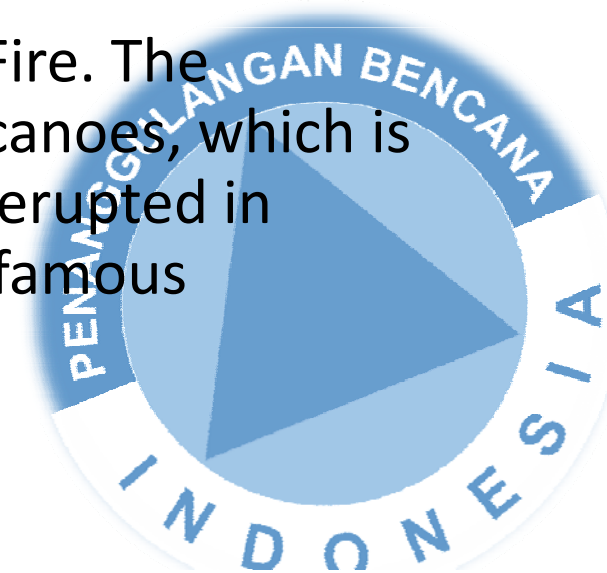
Implementation on HFA and Post Sendai Commitment on SFDRR 2015-2030

National Action Plan on DRR in Indonesia

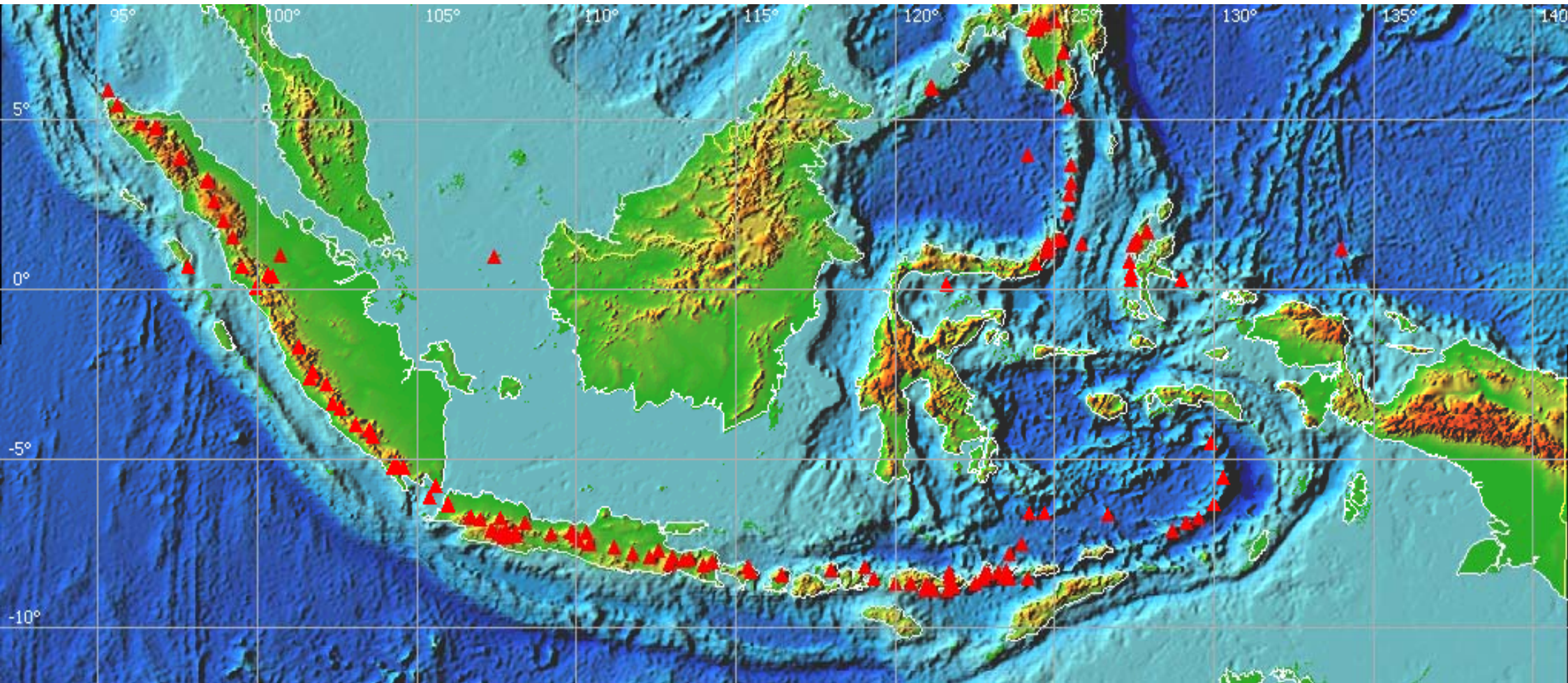


#1 INDONESIAN ISSUES ON VOLCANOES

- The Indonesian archipelago is the result of complex tectonic plate collision involving four different plates. Subduction of the continental Indo-Australian plate beneath the Eurasian plate formed the main Sunda-Banda volcanic arc stretching from Sumatra to the West, through Java, Bali, Nusa Tenggara Islands till Banda to the East.
- Volcanoes in Indonesia are part of the Pacific Ring of Fire. The Indonesian archipelago contains about 130 active volcanoes, which is more than any other country. About 76 of them have erupted in historical times. It contains some of the world's most famous volcanoes like Toba, Krakatau, Tambora, and Merapi.



Distribution of Volcanic Activity in Indonesia



INDONESIA


Historic Data on Great Volcanic Eruption Event

| Rank | Death Toll | Event | Location | Date |
|------|------------|---|--|----------------------|
| 1. | 92,000 | Mount Tambora (see also Year Without a Summer) | Indonesia | April 10, 1815 |
| 2. | 36,000 | Krakatoa | Indonesia | August 26–27, 1883 |
| 3. | 29,000 | Mount Pelée | Martinique | May 7 or May 8, 1902 |
| 4. | 25,000 | Mount Vesuvius | Pompeii and Herculaneum, Italy | August 24, 79 AD |
| 5. | 23,000 | Nevado del Ruiz | Colombia | November 13, 1985 |
| 6. | 15,000 | Mount Unzen | Japan | 1792 |
| 7. | 10,000 | Mount Kelut | Indonesia | 1586 |
| 8. | 9,350 | Laki . Killed about 25% of the population (33% were killed about 70 years before by smallpox) | Iceland | June 8, 1783 |
| 9. | 6,000 | Santa Maria | Guatemala | 1902 |
| 10. | 5,115 | Mount Kelut | Indonesia | May 19, 1919 |

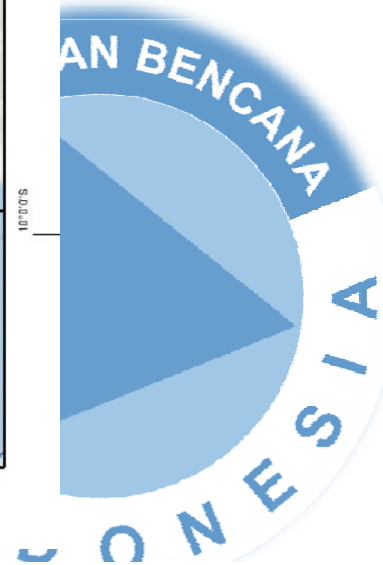
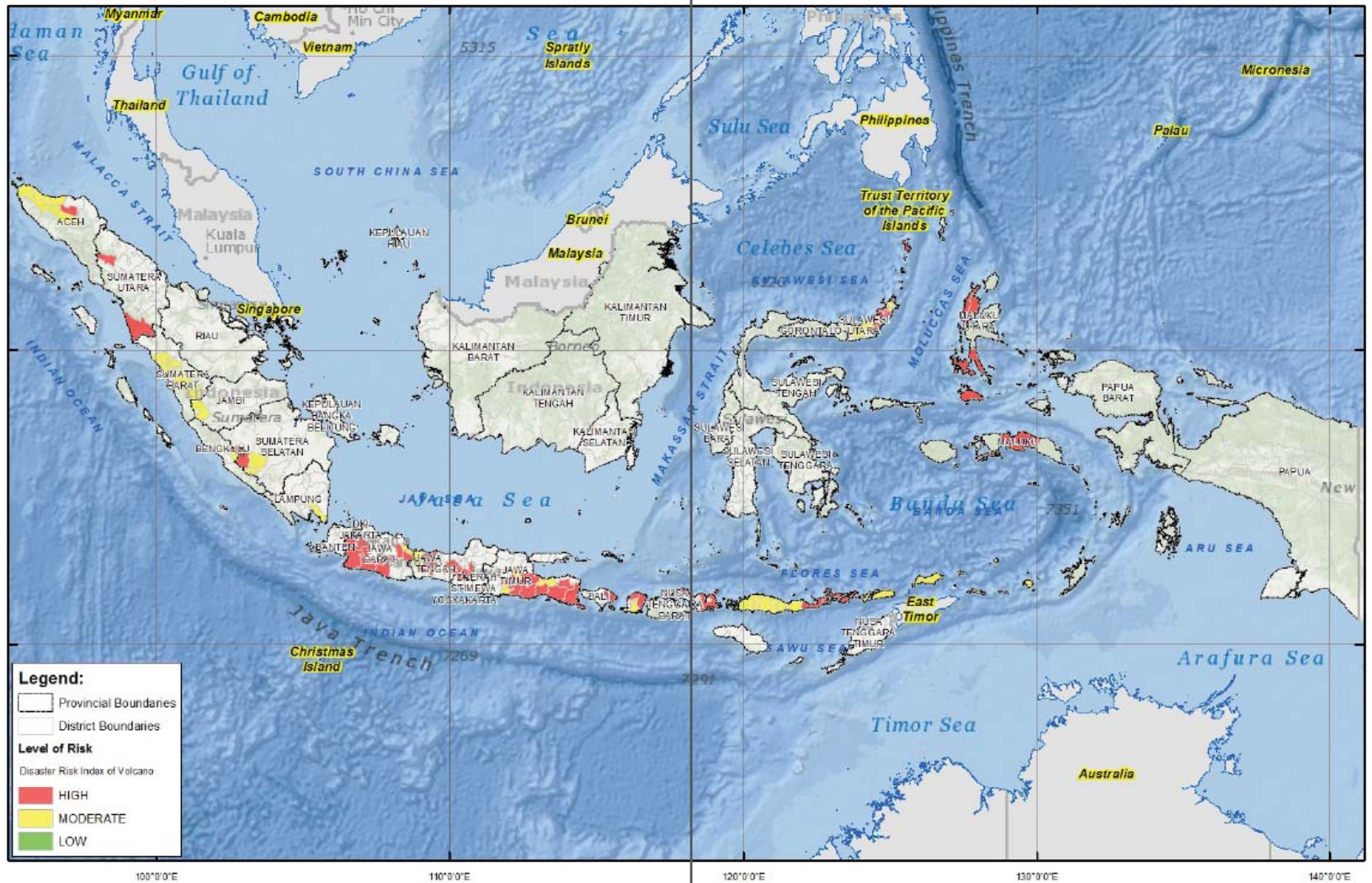


DISASTER RISK INDEX MAP OF VOLCANO

Update : Year 2013

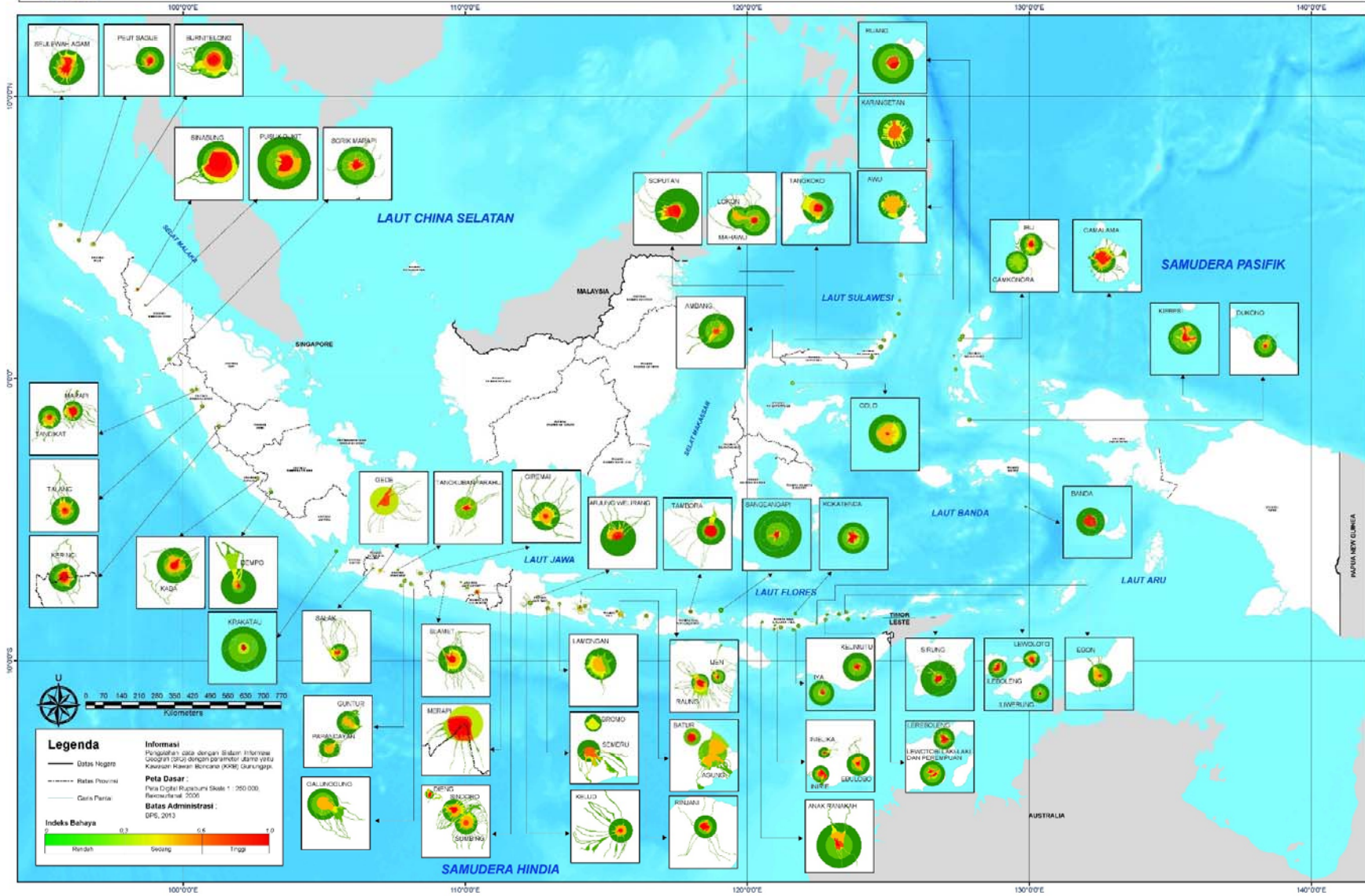


Badan Nasional Penanggulangan Bencana (BNPB)
 Jl. Ir. H. Juanda, No. 36 Jakarta 10120 Indonesia
 Telp. (021) 345 8400, Fax. (021) 345 8500



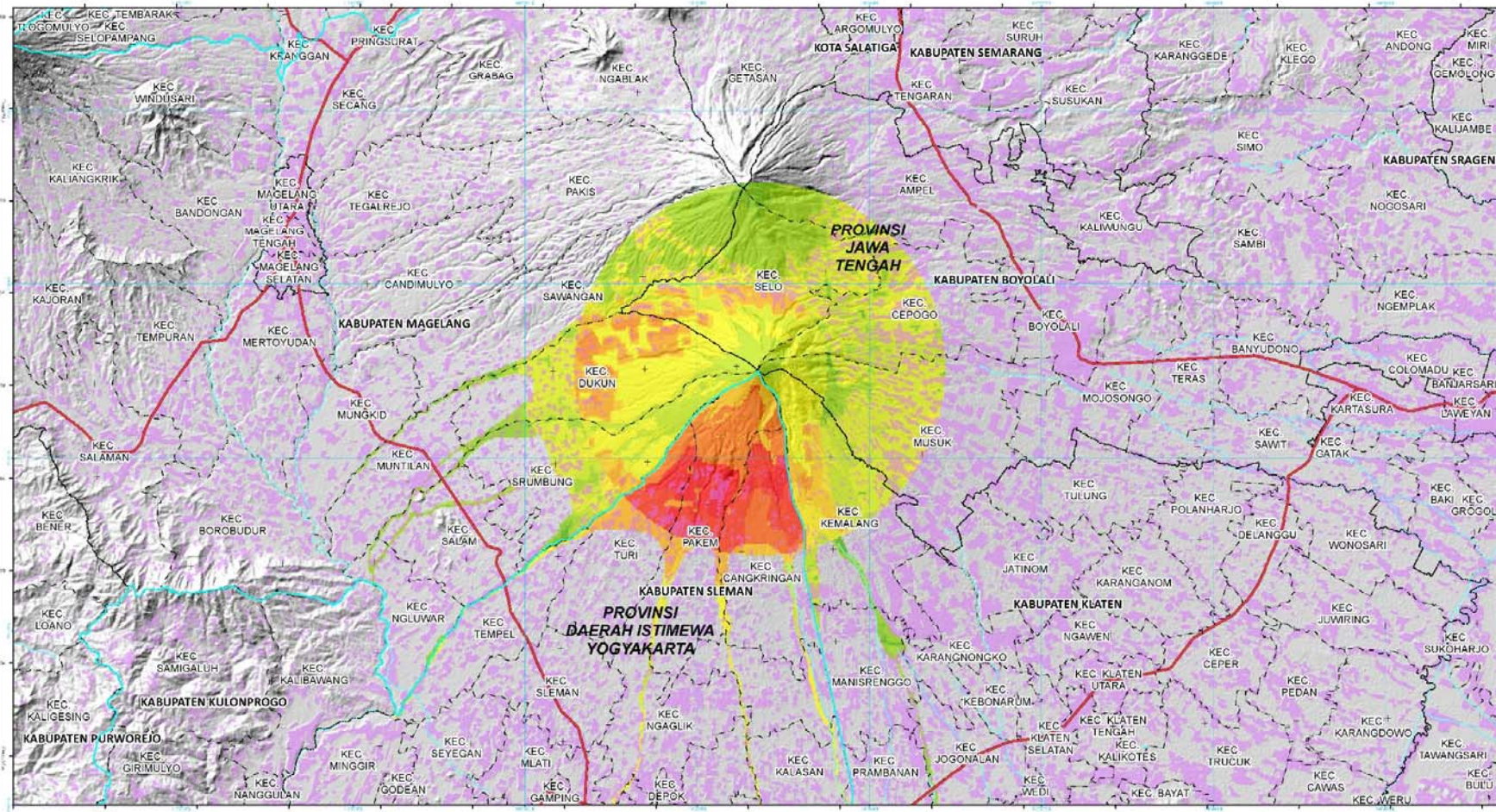


PETA BAHAYA LETUSAN GUNUNGAPI





PETA RISIKO LETUSAN GUNUNGAPI MERAPI
 PROVINSI JAWA TENGAH DAN DAERAH ISTIMEWA YOGYAKARTA



Legenda

Ibu Kota
 ● Ibu Kota Provinsi
 ○ Ibu Kota Kabupaten/Kota
 + Bandara
 ↓ Pelabuhan

Batas Administrasi
 --- Batas Provinsi
 --- Batas Kabupaten
 --- Batas Kecamatan

Jaringan Jalan
 --- Jalan Arteri
 --- Jalan Kolektor
 --- Gedung dan Bangunan
 --- Perumahan

Perairan
 --- Garis pantai
 --- Sungai
 --- Deras/Meleak

Skala 1:100.000 pada ukuran A1
 1 cm di peta sama dengan 1 km di lapangan
 ID Peta : Peta_Bahaya_Letusan_Gunungapi_Bromo
 Diklat Tanggal : 14 Desember 2015

Unit GDI:
 Geografis: Interval Antar Grid 5 Meter
 UTM: Zona 48 S Interval Antar Grid 5000 Meter

Unit Datum:
 WGS 84

Kota, Pelabuhan, dan Bandara:
 Kementerian Perhubungan

Peta Dasar:
 Peta Digital Rupa Bumi Skala 1:50.000, Bakosurtanal, 2008

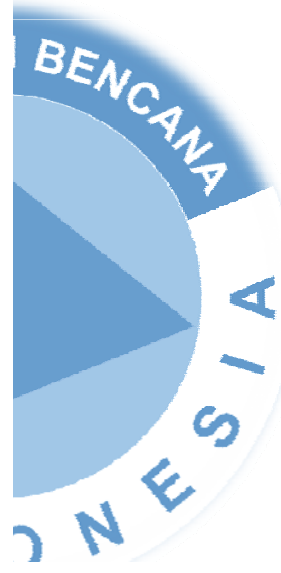
Batas Administrasi:
 BPS, 2013

Proyekti Lokal World Mapper



KETERANGAN DOKUMEN
 Pengambilan batas administrasi dan nama geografis, toponim umum, batas dan kesehatan, dan skala merupakan pengamatan resmi dari BNPB

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 Telp. 021-21281200, Fax. 021-21281200





**DEPUTI BIDANG PENGINDERAAN JAUH
LEMBAGA PENERBANGAN DAN ANTARIKSA NASIONAL**

DEPUTY FOR REMOTE SENSING AFFAIRS
INDONESIAN NATIONAL INSTITUTE OF AERONAUTICS AND SPACE
Jl. Kalibaru-LAPAN No.8, Pekayon, Pasar Rebo, Jakarta 13710, Indonesia
Telp.021-8710965, Faks. 021-8722733, E-mail: tirtanggabencana@lapan.go.id, Http://www.lapan.go.id



**PETA CITRA SATELIT
SPACEMAP**

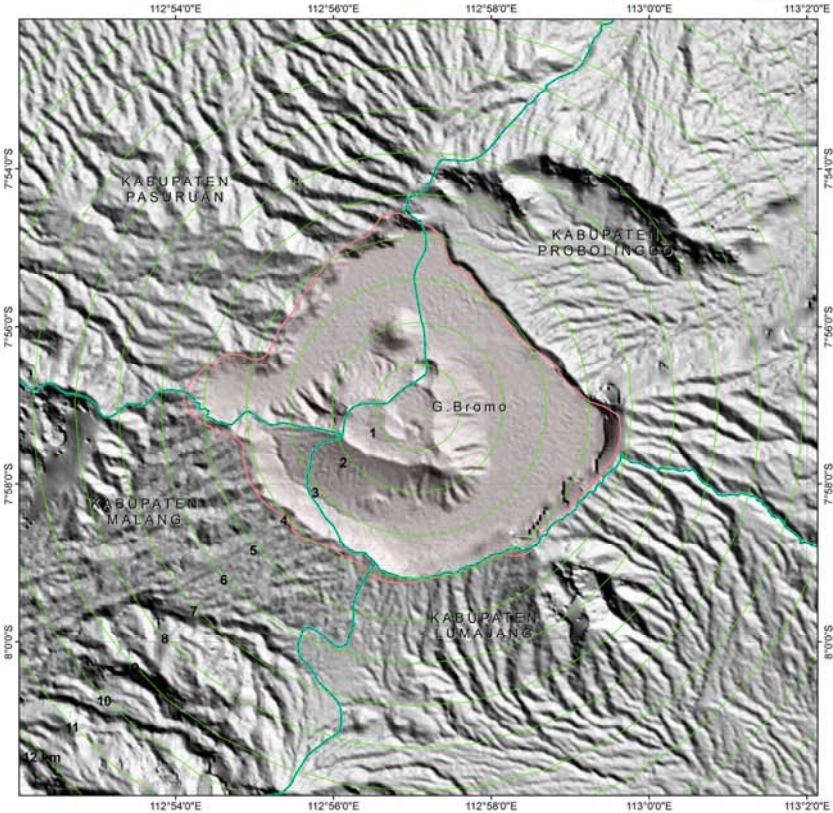
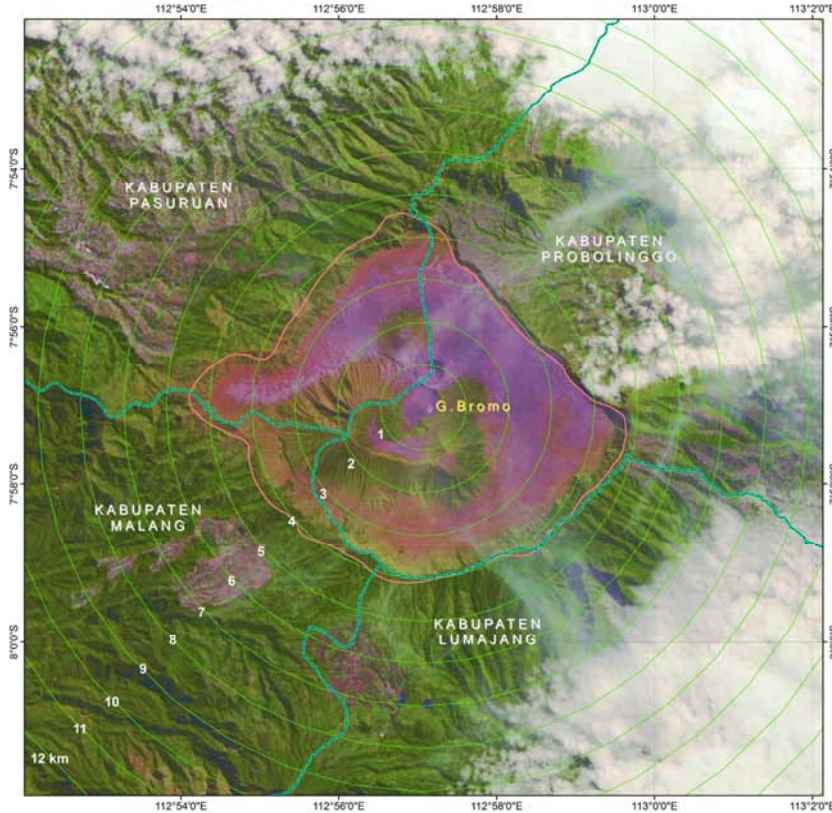
GUNUNGAPI BROMO

KABUPATEN MALANG, PASURUAN, PROBOLINGGO DAN LUMAJANG PROVINSI JAWA TIMUR
BROMO VOLCANO

MALANG, PASURUAN, PROBOLINGGO AND LUMAJANG REGENCY, EAST JAVA PROVINCE

Model Medan Digital SRTM
Digital Terrain Model - Shuttle Radar Topography Mission

Landsat-8 Komposit Warna RGBPan 6548 (Warna Asli), 15 Juli 2014
Landsat-8 Color Composite RGBPan 6548 (Natural Color), July 15, 2014



- Legenda :**
Legends :
- BATAS WILAYAH PROVINSI**
Administrative Boundaries of Province
 - BATAS WILAYAH KOTA/KABUPATEN**
Administrative Boundaries of City/Regency
 - GARIS PANTAI**
Coastline
 - PERMUKIMAN**
Settlements

- Kawasan Rawan Bencana (KRB) :**
Zoning of Volcano Disaster Prone Area :
- Kawasan III : Zone III** : Sering terlanda awan panas, aliran lava, lontaran atau guguran batu (pijar).
Frequently affected by pyroclastic flow, lava flow, ejected rock fragments (glowing).
 - Kawasan II : Zone II** : Berpotensi terlanda awan panas, aliran lava, guguran batu (pijar), dan aliran lahar.
Potentially affected by pyroclastic flow, lava flows, glowing rock fragments, and lahar.
 - Kawasan I : Zone I** : Berpotensi terlanda lahar/banjir dan kemungkinan dapat terkena perluasan awan panas dan aliran lava.
Potentially affected by lahar and the possibility of pyroclastic flows and lava flows and lava flows extertions.

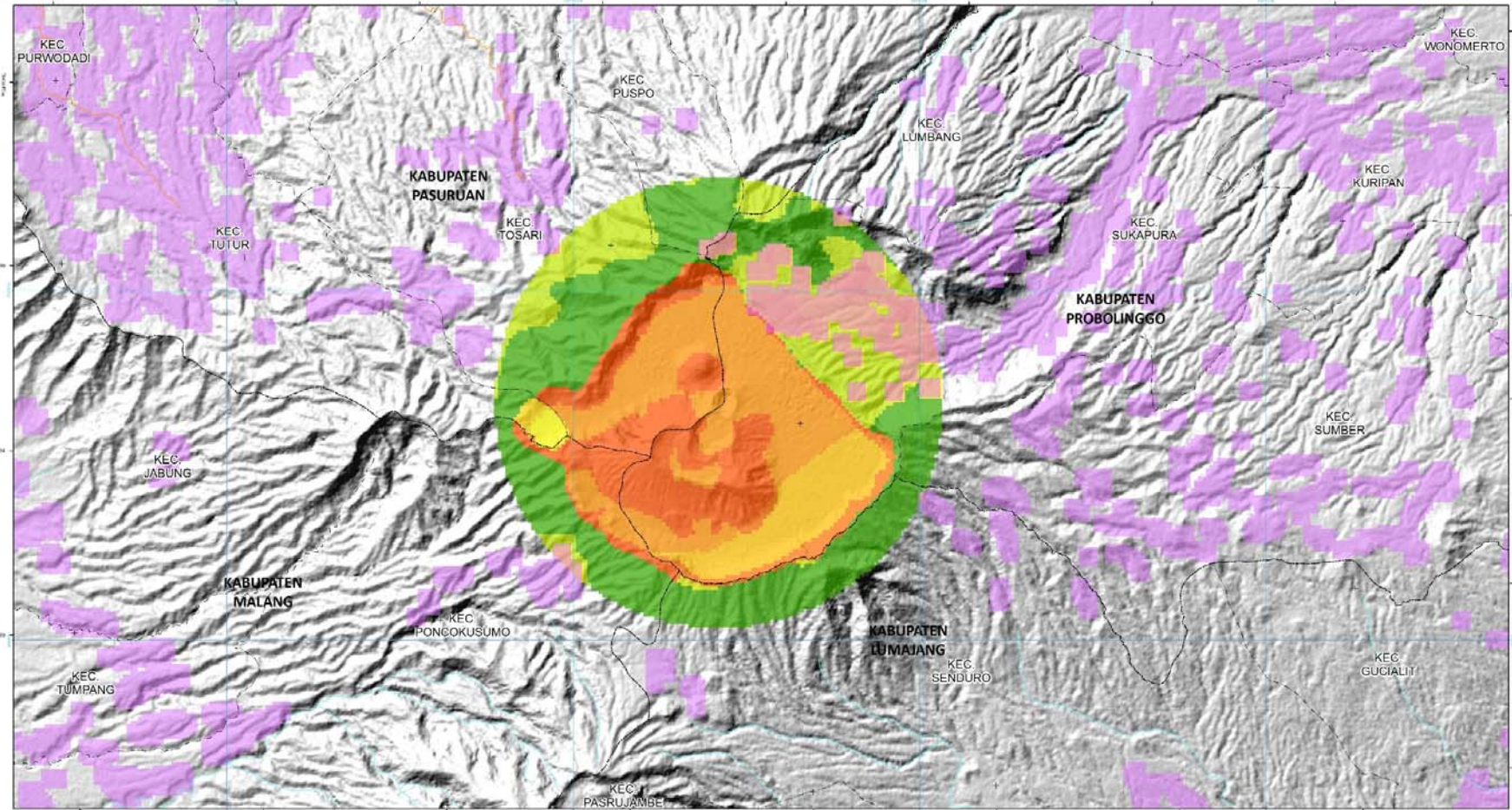
- Sumber Data :**
Data Sources :
- Citra Landsat-8 Tgl. 15 Juli 2014 (dari : LAPAN)
Landsat-8 July 15, 2014 (from: LAPAN)
 - DTM SRTM 30 meter (dari : USGS)
Digital Terrain Model 30 meter (from: USGS)
 - Peta Batas Administrasi (dari: BIG).
Administrative Boundaries (from: Indonesian Board for Geospatial Information).
 - Peta Kawasan Rawan Bencana Gunungapi (dari: PVMBG).
Map Zoning of Volcano Disaster Prone Area.
(from: Center for Volcanology and Geological Disaster Mitigation).





PETA RISIKO LETUSAN GUNUNGAPI BROMO

PROVINSI JAWA TIMUR



Legenda

- Ibu Kota
- Bukala Provinsi
- Bukala Kabupaten/Kota
- Bandera
- Pelabuhan
- Paraliran
- Garis pantai
- Sungai
- Dawa/Waduk
- Batas Administrasi
- Batas Provinsi
- Batas Kabupaten
- Batas Kecamatan
- Jaringan Jalan
- Jalan Arteri
- Jalan Kolektor
- Gedong dan Bangunan
- Pemukiman



Skala 1:50.000 pada ukuran A1
 1 cm di peta sama dengan 0,5 km di lapangan
 ID Peta : Peta_bahaya_letusan_Gunungapi_Bromo
 Dibuat Tanggal : 14 Desember 2015

Unit Grid
 Geografis : Interval Antar Grid 5 Menit
 UTM : Zona 49S Interval Antar Grid 5000 Meter
 Unit Datum
 WGS 84
 Kota, Pelabuhan, dan Bandara :
 Kementerian Perhubungan
 Peta Dasar
 Peta Digital Republik Skala 1 : 50.000, Bakosurtanal, 2006
 Basis Administrasi:
 BPS, 2013
 Proyeksi Lokal World Mercator

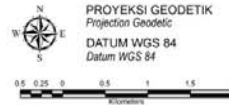


Sumber Peta
 Pengolahan data dengan Sistem Informasi Geografis (SIG) menggunakan parameter sistem proyeksi Zona Waktu Zone daunan (PVMU). Data ketinggian dan klasifikasi parameter dapat dilihat di buku pedoman kajian risiko bencana nasional, BNPB, 2012

KETERANGAN DOKUMEN
 Penggambaran batas administrasi dan nama geografis, nama umum, toponim, dan koordinat, dan tidak menyiratkan pengesahan resmi dari BNPB

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RESPON TANGGAP DARURAT BENCANA BERBASIS DATA SATELIT
SPACE-BASED DISASTER EMERGENCY RESPONSE

LETUSAN GUNUNGAPI SINABUNG
KABUPATEN KARO PROVINSI SUMATERA UTARA

SINABUNG VOLCANO
KARO REGENCY, NORTH SUMATERA PROVINCE

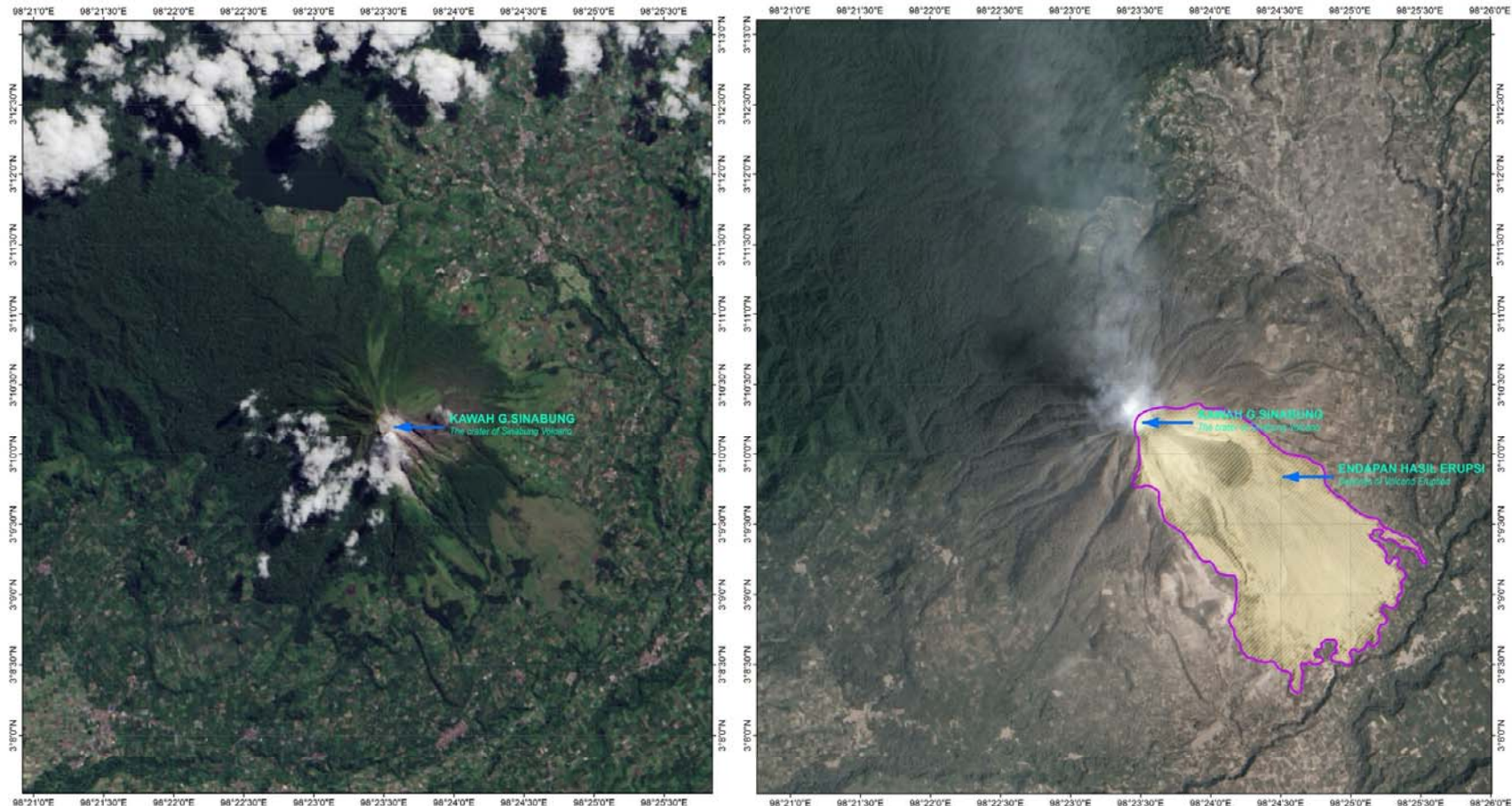
KONDISI SEBELUM DAN SETELAH ERUPSI, DIAMATI DARI CITRA SATELIT LANDSAT-OLI DAN ASTER-ALI
Condition of Before and After Eruption, Observed from LANDSAT-8 OLI and ASTER-ALI Images

SEBELUM ERUPSI
Before Eruption

LANDSAT-OLI, Tanggal 7 Juni 2013
Landsat-8 OLI Date June 7, 2013

SETELAH ERUPSI
After Eruption

Citra ASTER ALI Tanggal 6 Februari 2014
ASTER ALI Image Date February 6, 2014



Peta ini dihasilkan dari pengolahan citra Landsat-8 OLI (periode sebelum erupsi) dan citra ASTER-ALI (periode pada saat/setelah erupsi eksplosif). Peta ini memperlihatkan dengan sangat jelas arah dan sebaran material erupsi. Arah erupsi dominan ke Tenggara.

This map was produced from Landsat-8 image (period of before eruption) and ASTER-ALI image (period of during/after explosive eruption). It shows very obviously the devastated of lava dome on crater of the volcano. The dominant direction of eruption is South East.

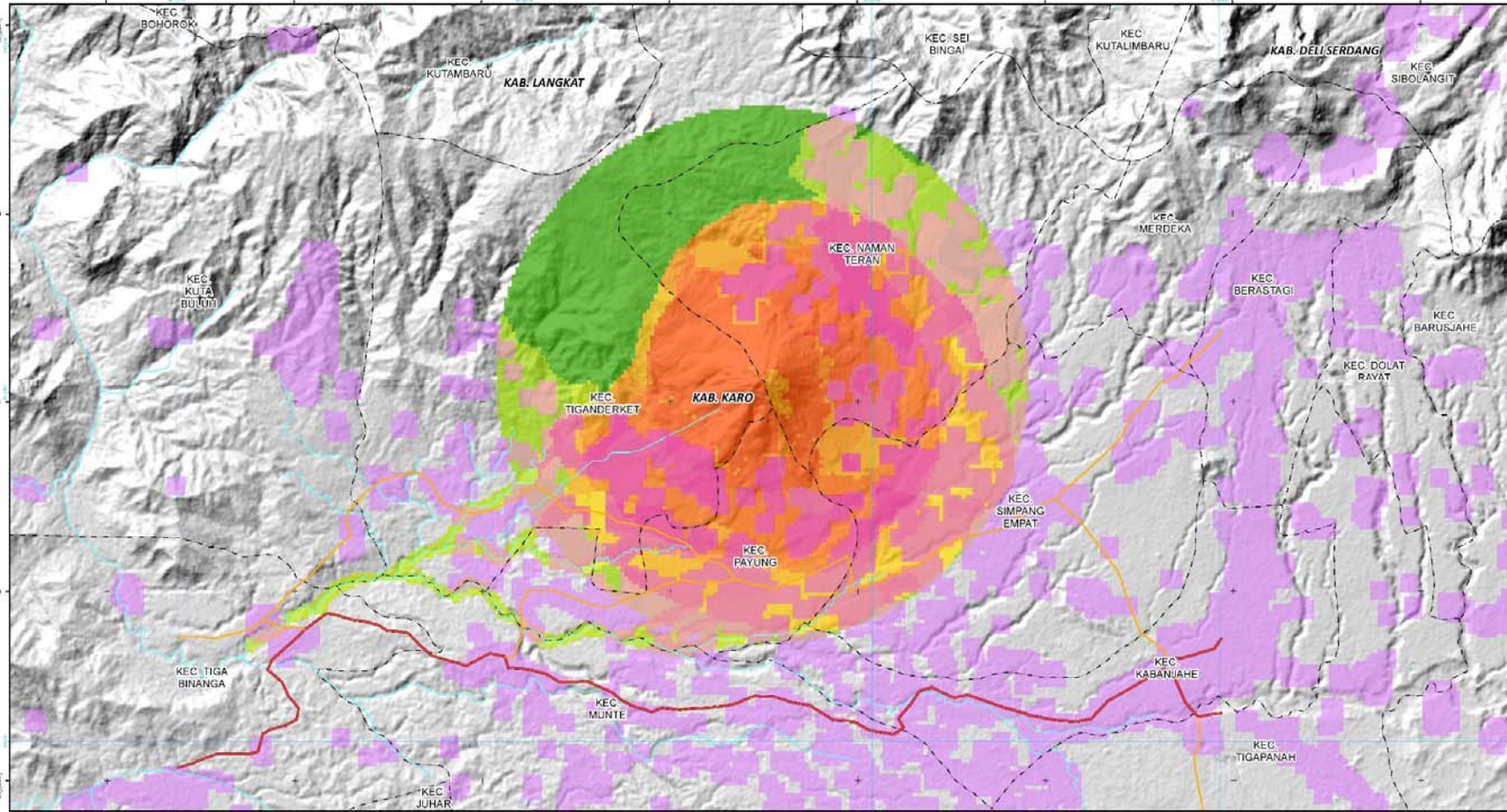
Citra ASTER-ALI dan LANDSAT-8 OLI disediakan oleh USGS. Kompilasi dan analisis data oleh Lembaga Penerbangan dan Antariksa Nasional (LAPAN).

ASTER-ALI and LANDSAT-8 OLI images provided by United States of Geological Survey. Data compilation and analyzes by Indonesian National Institute of Aeronautics and Space (LAPAN).



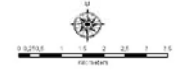


PETA RISIKO LETUSAN GUNUNGAPI SINABUNG
PROVINSI SUMATERA UTARA



- Legenda**
- Batas Kota**
 - Kota
 - Kota Kabupaten/Kota
 - Bandara
 - Pelabuhan
 - Perairan**
 - Daris pantai
 - Sungai
 - Danau/Waduk

- Batas Administrasi**
 - Batas Provinsi
 - Batas Kabupaten
 - Batas Kecamatan
- Jaringan Jalan**
 - Jalan Arteri
 - Jalan Kolektor
- Gedung dan Bangunan**
 - Pemukiman



ID Peta : Peta_Bahaya_Letusan_Gunungapi_Bromo
Obat Tanggal : 14 Desember 2015

Koordinat
Geografis: Interval Antar Grid 5 Merid
UTM: Zona 49 S Interval Antar Grid 5000 Meter
Muti: Datum: WGS 84

Kota, Pelabuhan, dan Bandara :
Kementerian Perhubungan

Peta Dasar:
Peta Digital Rupabumi Skala 1:50.000, Bakosurtanal, 2008

Batas Administrasi:
BPS, 2013

Proyekti Lokal (World Mapper)



KETERANGAN DOKUMEN
Penggunaan batas administrasi dan nama geografis, serta ukuran skala dan kesesuaian, dan tidak merupakan pengesahan resmi dari BNPB.

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#2 Lesson Learned from Mount Merapi



Photography by Raditya Jati, 2010

ACTIVE VOLCANOES AROUND MERAPI



Merapi stratovolcano (2965 m) is located in Java, Indonesia, 30 km north of the city of Yogyakarta.

F. Lavigne, J. Morin, Surono (eds.), The Atlas of Merapi volcano, First Edition, 2015

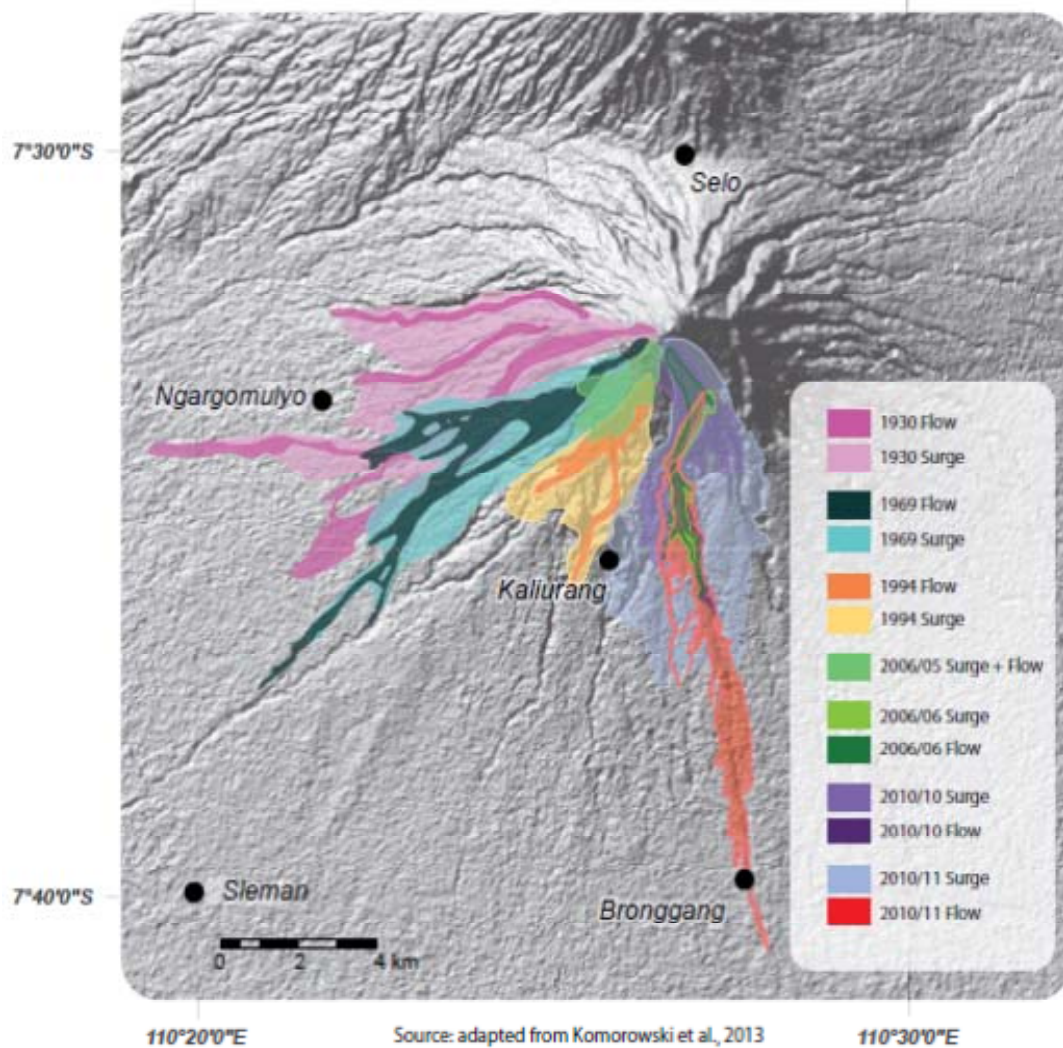


Disaster Occurred in Yogyakarta

- In 2006 an earthquake claimed more than 5000 victims, and damaged almost 380,000 units of private and public infrastructure.” After the earthquake, the Mount Merapi erupted and had the impact on the northern side of Yogyakarta City
- On 25th October 2010 Mount Merapi erupted, releasing larva and ashes for over a week, the volcano’s largest eruption since 1870.
- The death toll was 353, and more than 350,000 people were evacuated.



MAIN PYROCLASTIC DEPOSITS SINCE 1930

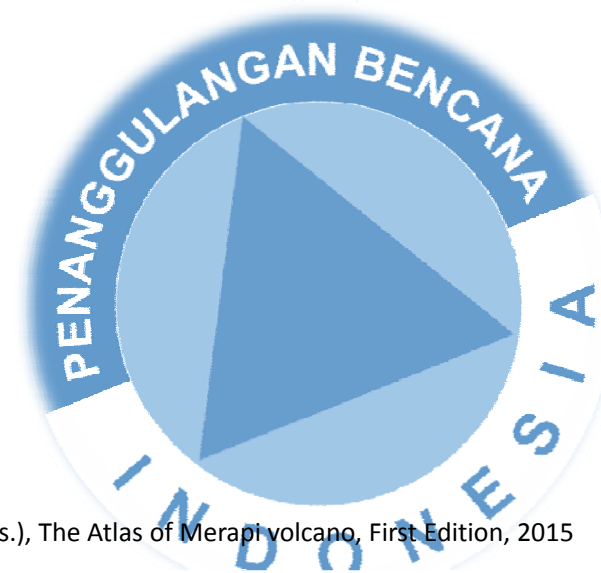


MAJOR MERAPI ERUPTIONS SINCE 1872

| Date of eruption | VEI | Volume ejected (million m ³) | Victims | Injured | Evacuated or made homeless |
|------------------|-----|--|---------|---------|----------------------------|
| 1872 | 4 | | 200 | | |
| 1904 | 2 | | 16 | 45 | 3 000 |
| 1920 | 2 | 5 | 35 | | 1 000 |
| 1930 | 3 | 26 | 1 369 | | 13,000 |
| 1954 | 2 | 20 | 64 | 57 | 3 000 |
| 1961 | 3 | 29.4 | 6 | 6 | 8 000 |
| 1994 | 2 | 3.5 | 64 | 500 | 6 026 |
| 1998 | 2 | | | 314 | 6 000 |
| 2006 | 1 | 13.3 | 2 | | 22,253 |
| 2010 | 4 | 150 | 341 | 368 | 1 300,000 |

VEI= Volcanic Explosivity Index

Sources: Thouret et al. 2010; Mei and Lavigne 2012



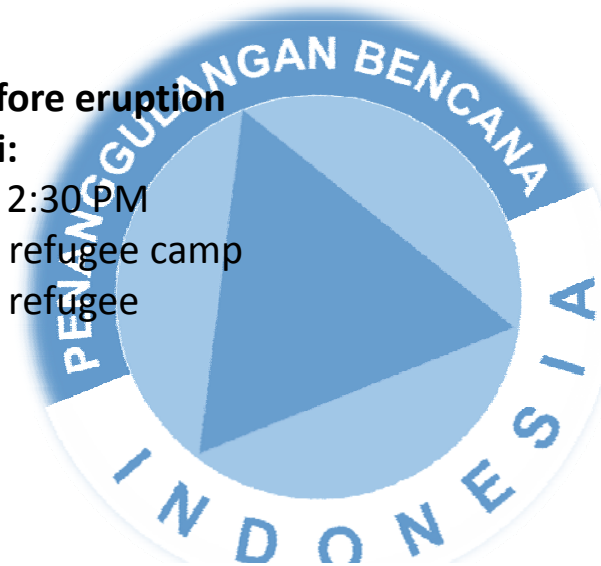
F. Lavigne, J. Morin, Surono (eds.), The Atlas of Merapi volcano, First Edition, 2015



Photography by Raditya Jati, 2010

**Several hours before eruption
of Mount Merapi:**

- Oct 26, 2010 at 2:30 PM
- Hargobinangun refugee camp
- more than 300 refugee

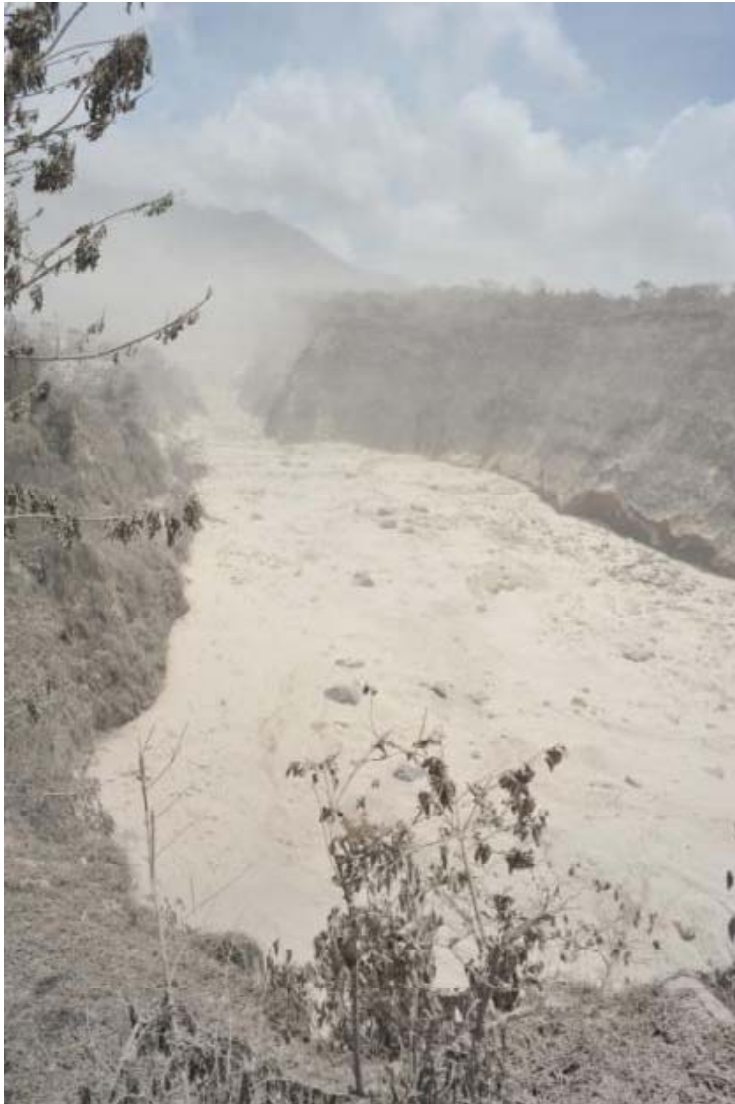




Photography by Raditya Jati, 2010

AFTER ERUPTION OF MOUNT MERAPI
October 27, 2010
9:00 PM





Photography by Raditya Jati, 2010



Turgo, Yogyakarta
1 Nopember 2010



Eruption had happened with around 4 KM of blast up to the sky. It can be seen from the city of Yogyakarta .

Ndeles, Klaten,
1 Nopember 2010



Yogyakarta, 4 Nopember 2010



People are still doing their daily activities near Mount Merapi



Some people still leave their cattles at the disaster zone and have to deliver the food to the disaster zone. Today, some had been evacuated (Nov, 8 2010)

Photography by Raditya Jati, 2010



After the hazard zone moved to the radius of 20 Km from Mount Merapi, many of the refugee camps are migrated to the save zone that are located and concentrated in the Sport Stadium of Maguwohardjo. More than 22 thousand refugees are concentrated in this place.

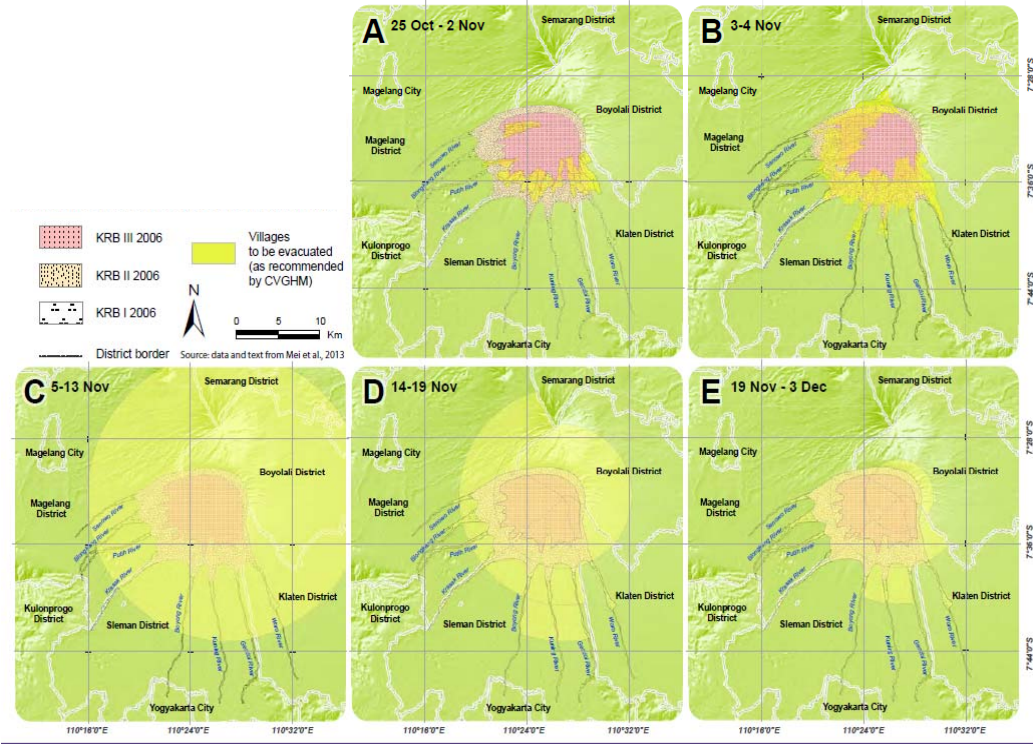


Photography by Raditya Jati, 2010

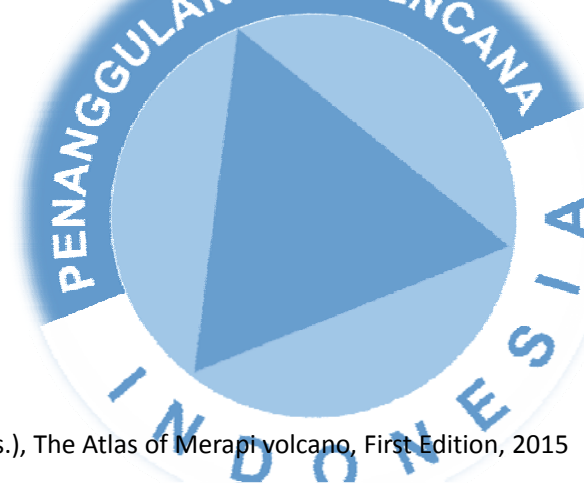
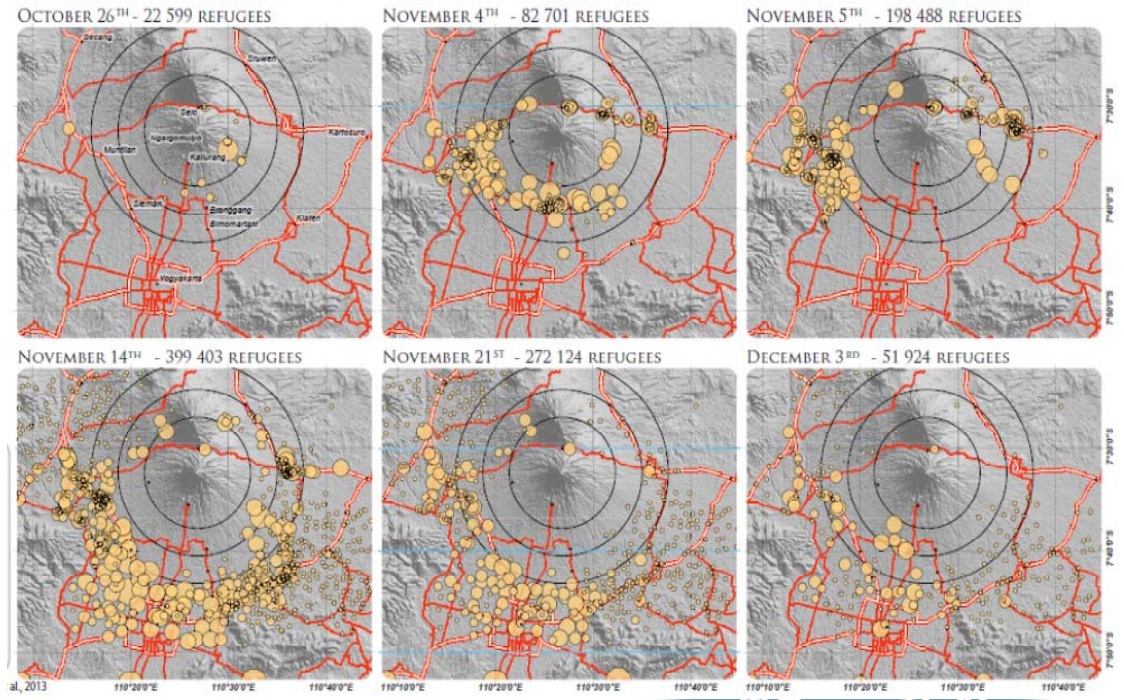
Maguwohardjo, 5 November 2010



CHANGES IN RESTRICTED ZONES DURING THE 2010 ERUPTION



LOCATION AND ATTENDANCE OF REFUGEE CAMPS DURING AND AFTER THE 2010 ERUPTION





Photography by Raditya Jati, 2010

Kepuharjo, after eruption
19 November 2010





Photography by Raditya Jati, 2010

Argomulyo, surrounding Kali Gendol after eruption
19 November 2010





Landscape view surrounding Kali Gendol, 19 November 2010



Photography by Raditya Jati, 2010



Photography by Raditya Jati, 2010



Candi Borobudur covered with volcanic ash of Mount Merapi
10 November 2010





Photography by Raditya Jati, 2010

Surrounding the Temple Park of Candi Borobudur
10 November 2010



Photography by Raditya Jati, 2010



Main entrance of Candi Borobudur
10 November 2010





**KEDEPUTIAN PENGINDERAAN JAUH
LEMBAGA PENERBANGAN DAN ANTARIKSA NASIONAL**

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Jl. Kalisari-LAPAN No.8, Pekayon, Pasar Rebo, Jakarta 13710, Indonesia
Telp.021-8710065, Faks. 021-8722733. E-mail: simba@lapan.go.id. Http://www.rs.lapan.go.id



PROYEKSI GEODETIK
Projection Geodesic
DATUM WGS 84
Datum WGS 84

RESPON TANGGAP DARURAT BENCANA BERBASIS DATA SATELIT

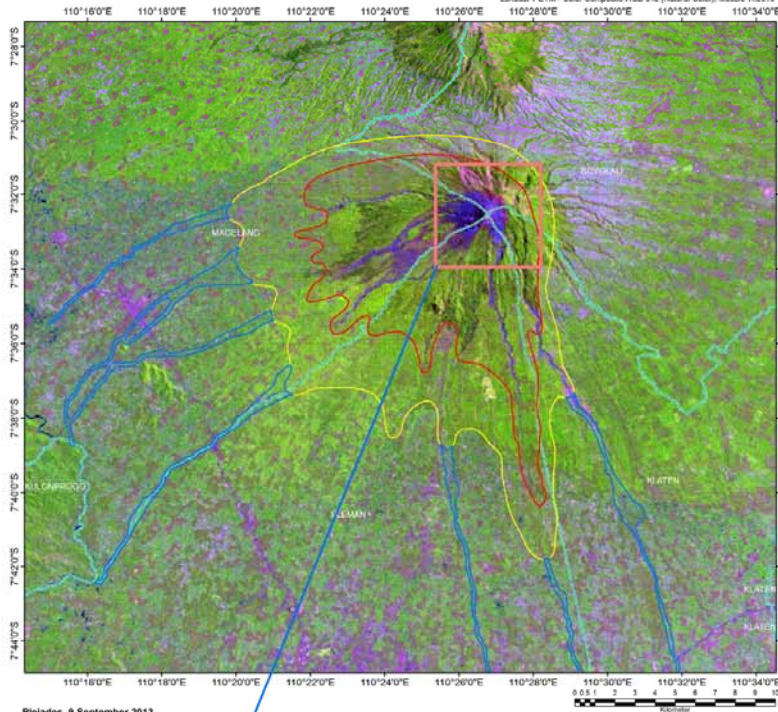
SPACE-BASED DISASTER EMERGENCY RESPONSE

ANTISIPASI LETUSAN GUNUNGAPI MERAPI
PROVINSI JAWA TENGAH dan DIY

MERAPI VOLCANO
CENTRAL JAVA and YOGYAKARTA PROVINCE

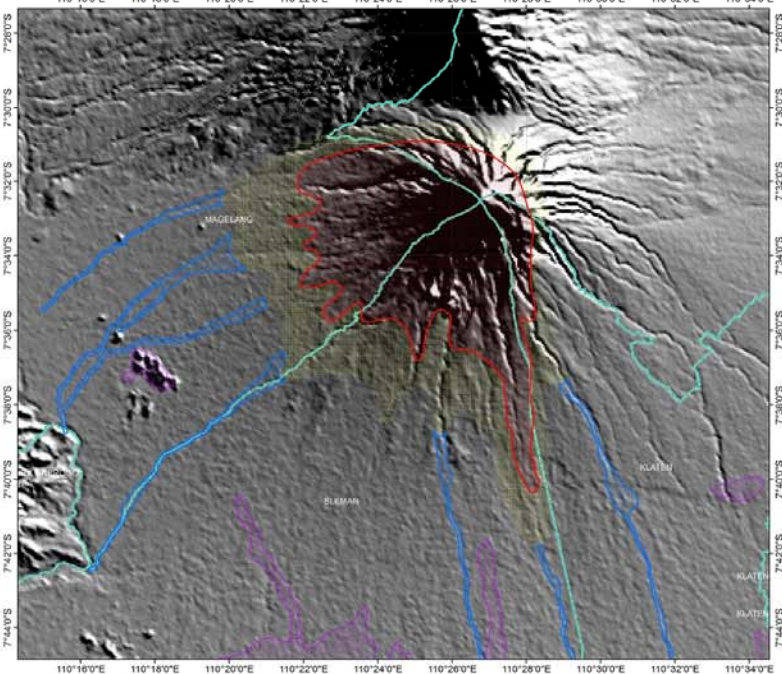
Landsat-7 ETM+ Komposit Warna RGB 542 (Warna Alami), Mosaik Th.2010

Landsat-7 ETM+ Color Composite RGB 542 (Natural Color), Mosaic Th.2010

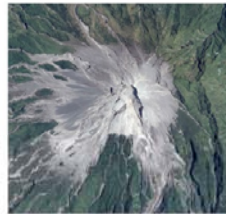


Sebaran Permukiman Terhadap Sumber Erupsi (Kawah) dan Kawasan Rawan Bencana Ditampilkan Pada Model Medan Digital

Spatial Distribution of Settlements to The Eruption Sources and... shown in the Digital Terrain Model



Pielades, 9 September 2013
Pielades, September 9, 2013



KAWAH G. MERAPI
CRATER OF MERAPI VOLCANO

Legenda :
Legends :

- BATAS WILAYAH KOTA/KABUPATEN
Administrative Boundaries of City/Regency
- LOKASI KAWAH G. MERAPI
Location of Crater of Merapi Volcano
- PERMUKIMAN
Settlements

KAWASAN RAWAN BENCANA (KRB) :

Zoning of Volcano Disaster Prone Area :

- Kawasan III :** Sering terlanda awan panas, aliran lava, lontaran atau guguran batu (pijar).
Frequently affected by pyroclastic flow, lava flow, ejected rock fragments (glowing).
- Kawasan II :** Berpotensi terlanda awan panas, aliran lava, guguran batu (pijar), dan aliran lahar.
Potentially affected by pyroclastic flow, lava flows, glowing rock fragments, and lahar.
- Kawasan I :** Berpotensi terlanda lahar/banjir dan kemungkinan dapat terkena perluasan awan panas dan aliran lava.
Potentially affected by lahar and the possibility of pyroclastic flows and lava flows and lava flows extensions.

Sumber Data :

Data Sources :

- Citra Landsat-8 OLI Tgl/26 Juni 2013.
Landsat-8 OLI, date June 26, 2013.
- DTM SRTM 90 meter.
Digital Terrain Model 90 meter.
- Peta Penutup Lahan, tahun 2002.
Landcover Map, 2002.
- Peta Batas Administrasi (dari: BIG).
Administrative Boundaries
(from: Indonesian Board for Geospatial Information).
- Peta Kawasan Rawan Bencana Gunungapi (dari: PVMBG).
Map Zoning of Volcano Disaster Prone Area.
(from: Center for Volcanology and Geological Disaster Mitigation).

Pemutakhiran, Kompilasi & Interpretasi Data : 20 April 2014.
Date updating, compilation and interpretation : April 20, 2014.

LPN_QR_GA_MERAPI_20140420_Release_1



Photography by Raditya Jati, 2010



Majalah Merapi Aerial Photo
November 11, 2010
di Galeri Satekto 1010
Jalan Laksur Adisucipto | GADJAH MADA UNIVERSITY / PSMA
Photograph by Raditya Jati





#3 Implementation on HFA and Post Sendai Commitment on SFDRR 2015-2030

- Indonesia is extremely disaster prone: between 1980-2009 Indonesia suffered 312 natural disasters, this ranking fourth highest in the Asian Pacific nations. Its death total, however, was the second highest at approximately 191,000 people, and the country suffered economic losses of some 22.5 billion US\$.”



Disaster Risk Governance has been developed

Policy and Regulation

- Law No. 24 year 2007
- Government Regulation No. 21, 22, and 23 year 2008.
- Regulations of the Chief of BNPB
- Local Regulation on Disaster Management at Provincial and District/City Level

Institutions

- BNPB established in 2008
- BPBD at Provincial and District Level

Planning

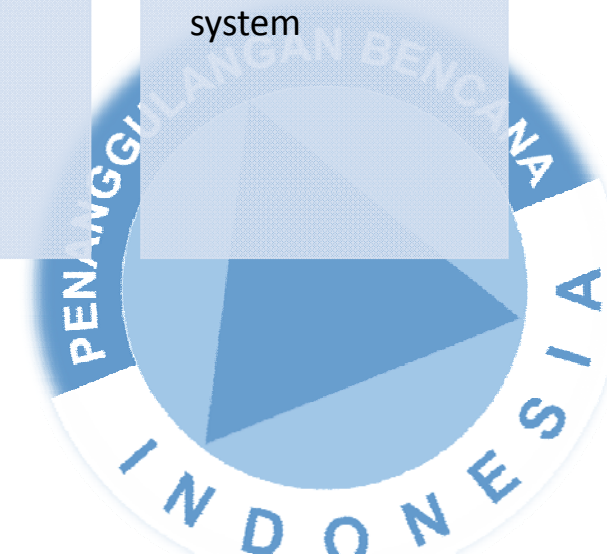
- National Disaster Management Plan
- DRR Action Plan
- Local DM Plan
- Master Plan of 12 hazards

Finance

- National Budget for DM has been increased.

Multistakeholder Collaboration

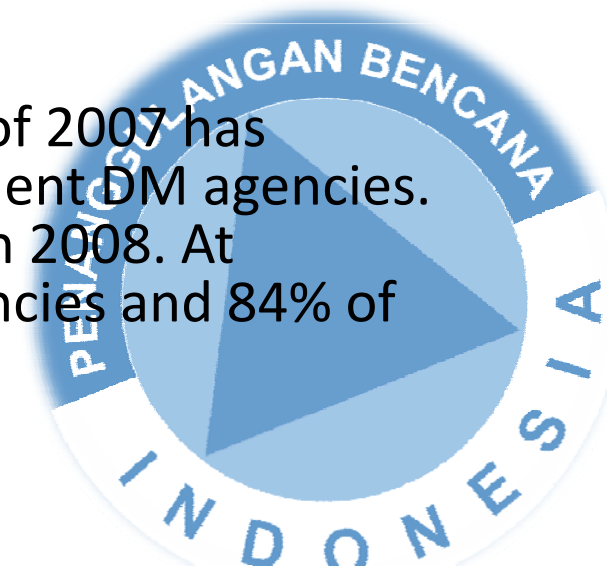
- National and Local Platform of DRR
- Active role of CSOs in DRR
- Establishment of cluster coordination system



- First of all the Hyogo Framework has encouraged Indonesia to shift its approach in disaster management from response-oriented to disaster risk reduction. Prior to the HFA, disaster in Indonesia was managed by a unit under the Vice President's Office, which dealt mostly with emergency response and post-disaster recovery. After HFA, Indonesia focuses more on efforts to reduce risks and build resilience to disaster.
- Secondly, the four priorities of the HFA have shaped Indonesian national disaster management system, with its focus on: (1) legislation, (2) planning, (3) institution, (4) budget, and (5) capacity development at all levels.
- With regards to legislation, in 2007 Indonesia enacted its first Disaster Management Law, Law No. 24 of 2007. It has been subsequently followed by a series of presidential and government decrees and other subsidiary legislations at all government levels down to the district/city level.



- In terms of planning, as the focus is more on DRR, Indonesia launched its first national DM Plan 2010-2014 in late 2009. It was subsequently followed by provincial and district/city governments that issued their Local DM Plans. Currently all provinces have their DM Plans and more than 80 districts and cities (out of a total of 506 districts and cities) have developed their DM Plans.
- Related to the institutional arrangement, the Law No. 24 of 2007 has mandated all levels of government to have their independent DM agencies. At the national level we have BNPB that was established in 2008. At present all provinces have already had their own DM Agencies and 84% of the districts and cities have established DM Agencies.

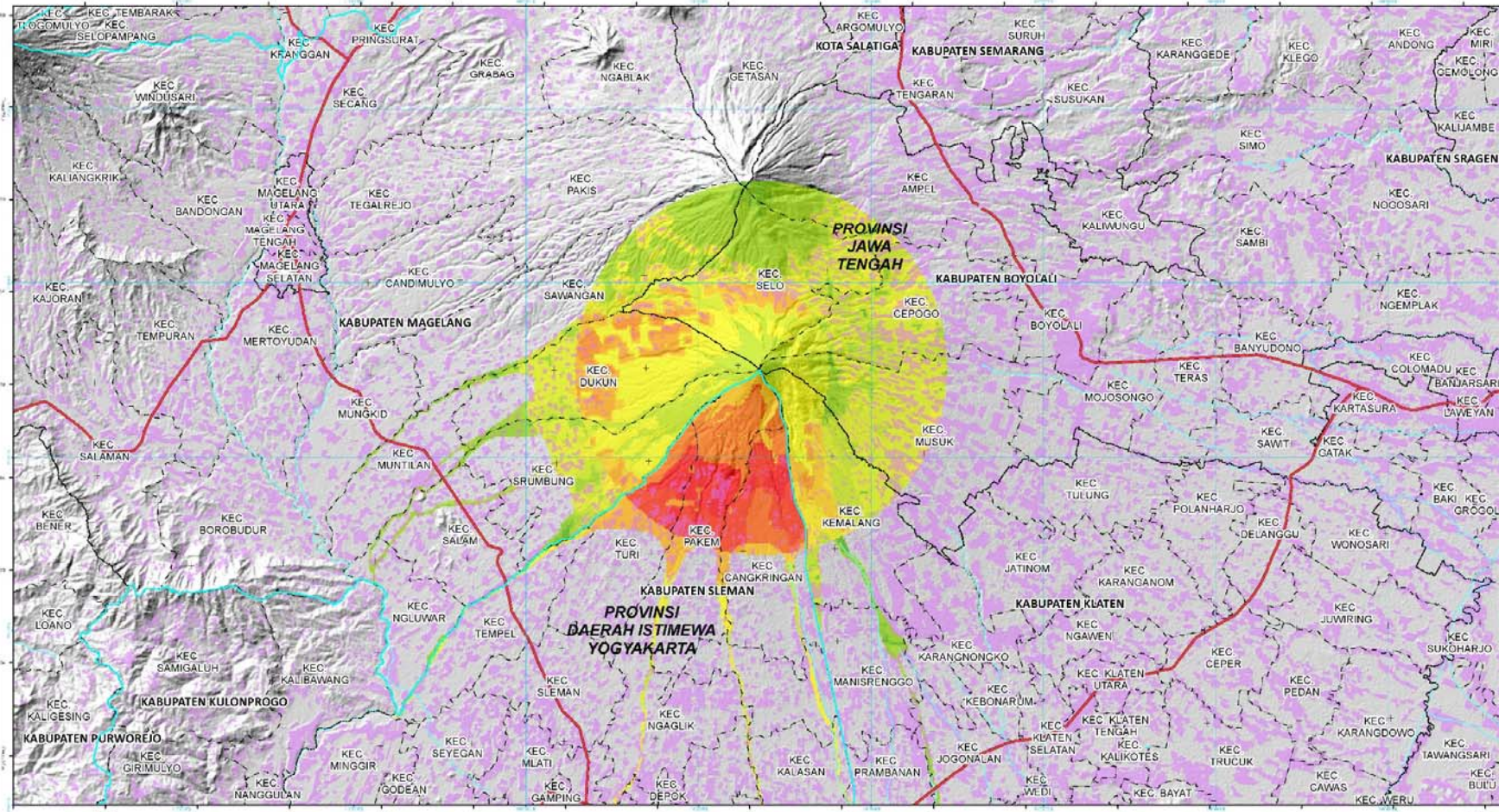


- In terms of budget, in the past 10 years budget for DRR has shown a significant increase. A recent study by the National Planning Board, Bappenas, currently the level of budget for DRR in sectoral line ministries has exceeded 1% of the total national budget.
- With regard to Priority 2, 3 and 5 of HFA, progress has been achieved in risk mapping, Early Warning System, disaster education, enhancement of science and technology for DRR and preparedness for response. Progress has mostly been achieved in and around bigger cities in the country's main islands, particularly those that have strong tertiary education institution and research centers.





PETA RISIKO LETUSAN GUNUNGAPI MERAPI
 PROVINSI JAWA TENGAH DAN DAERAH ISTIMEWA YOGYAKARTA



- Legenda**
- Ibu Kota
 - Batas Provinsi
 - Batas Kabupaten/Kota
 - Batas Kecamatan
 - Batas Desa/Kelurahan
 - Perairan
 - Garis pantai
 - Sungai
 - Danau/Waduk

- Batas Administrasi
- Batas Provinsi
- Batas Kabupaten
- Batas Kecamatan
- Jaringan Jalan
- Jalan Arteri
- Jalan Kolektor
- Gebang dan Bangunan
- Pemukiman

Skala 1:100.000 pada ukuran A1
 1 cm di peta sama dengan 1 km di lapangan
 ID Peta : Peta_Bahaya_Letusan_Gunungapi_Bromo
 Diklat Tanggal : 14 Desember 2015

Ukuri Garis:
 Geografis: Interval Antar Garis 5 Meter
 UTM: Zona 48 S Interval Antar Garis 5000 Meter
 UTM Datum: WGS 84
 Kota, Pelabuhan, dan Bandara : Kementerian Perhubungan
 Peta Dasar: Peta Digital Rupa Bumi Skala 1 : 50.000, Bakosurtanal, 2008
 Basis Administrasi: BPS, 2013
 Proyekti Lokal World Mercator



KETERANGAN DOKUMEN
 Pengambilan batas administrasi dan nama geografis, toponim umum berupa deskripsi, dan label merupakan pengambilan resmi dari BNPB

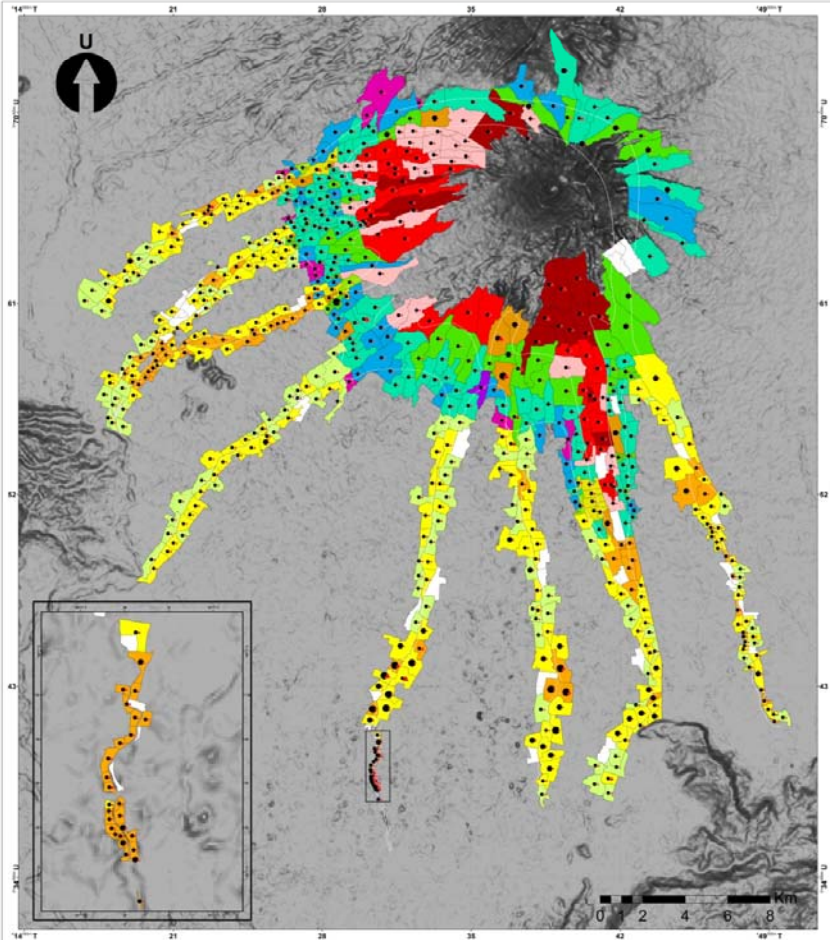
BADAN NASIONAL PENANGGULANGAN BENCANA (BNPB)
 Gedung GRAHA BNPB Jalan Pramuka Kav.38, Jakarta Timur.
 Telp. 021-21281200, Fax. 021-21281200





PETA RISIKO BAHAYA AWAN PANAS DAN LAHAR G. MERAPI

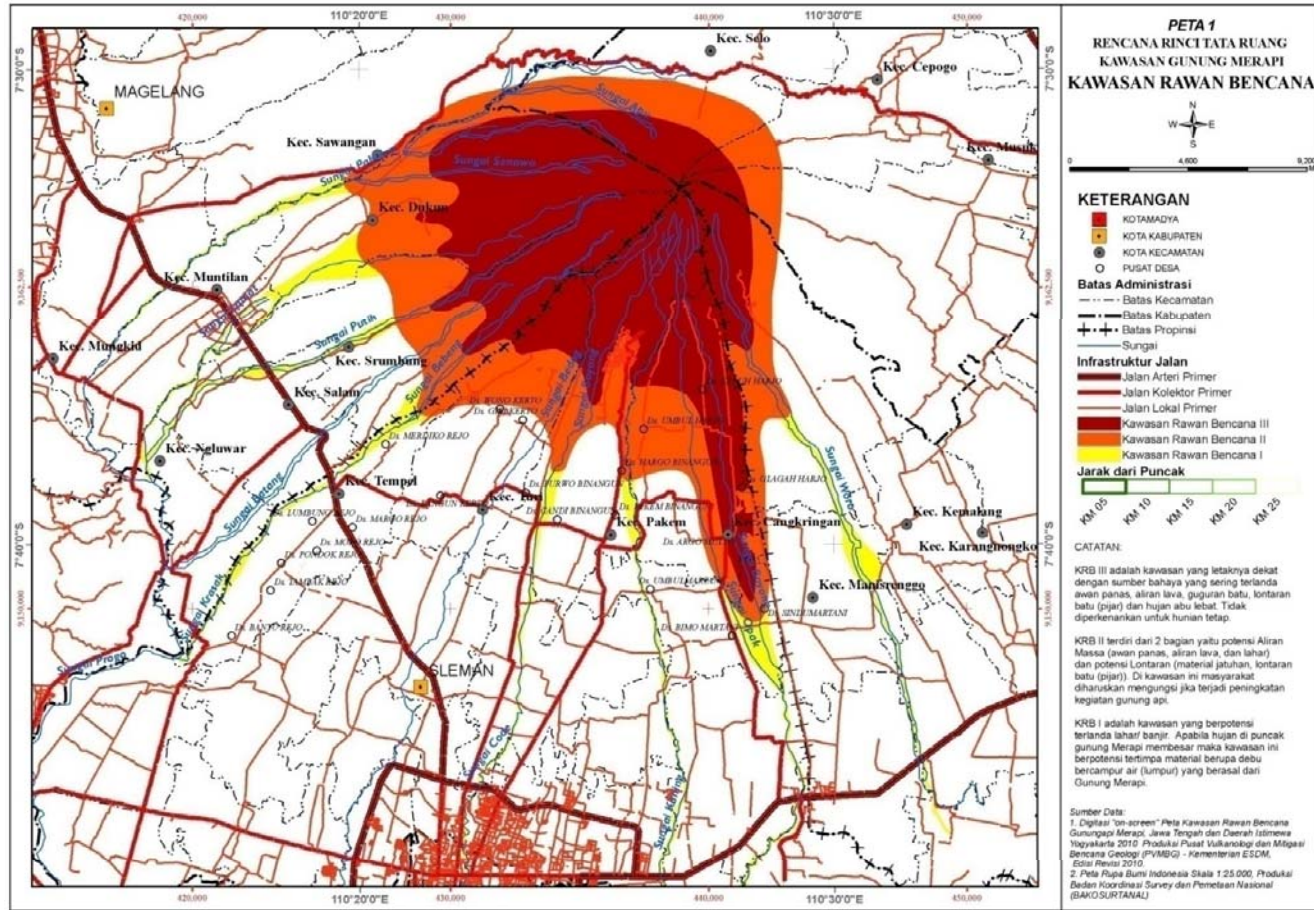
SKALA 1:50.000



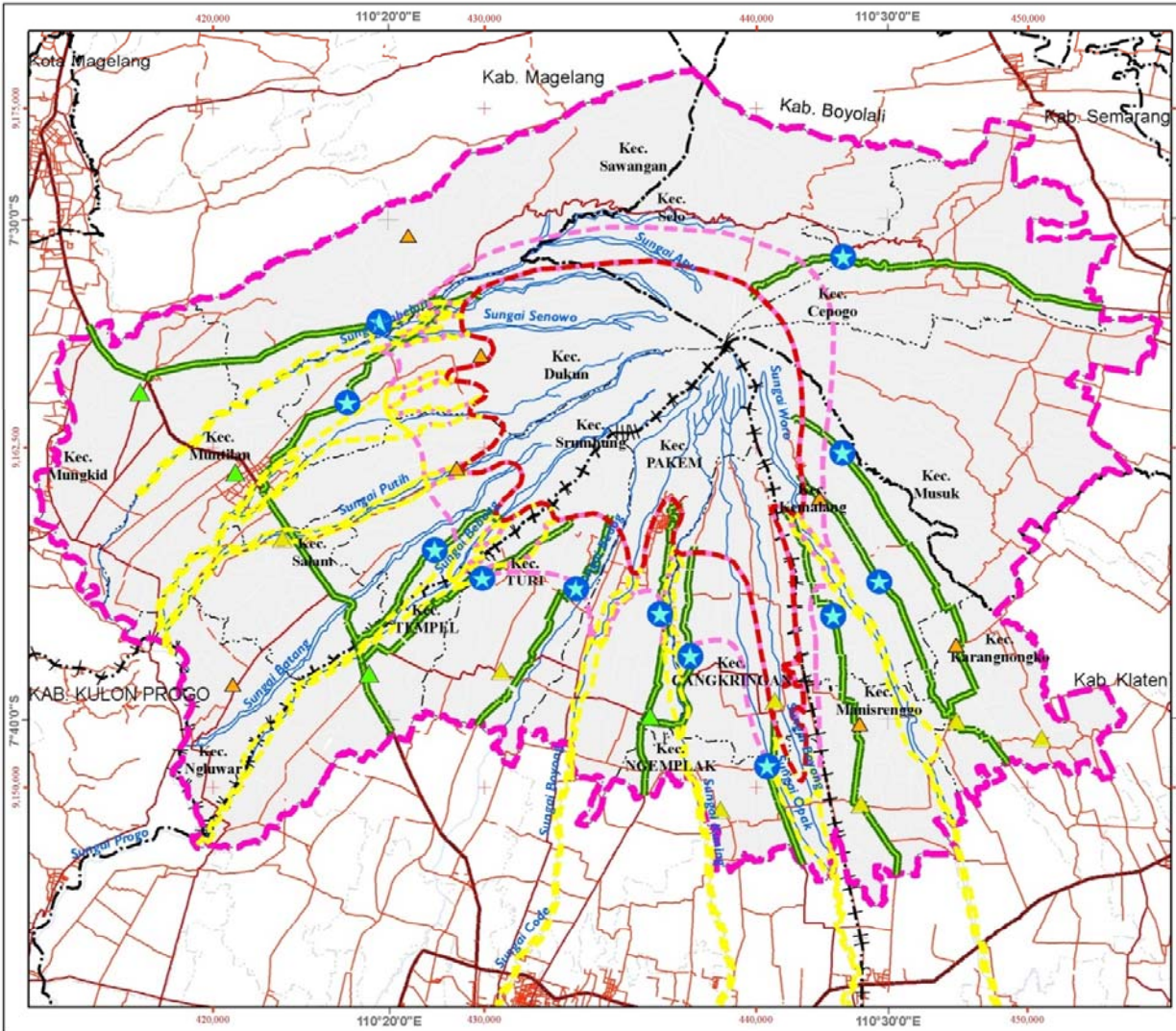
LEGENDA :

| TINGKAT RISIKO BAHAYA LAHAR | | TINGKAT RISIKO BAHAYA AWAN PANAS DAN LAHAR | | |
|-----------------------------|--------|--|--------------------------------|--------------------------------|
| RENDAH | SEDANG | AWAN PANAS TINGGI LAHAR TINGGI | AWAN PANAS SEDANG LAHAR TINGGI | AWAN PANAS RENDAH LAHAR TINGGI |
| RENDAH | SEDANG | AWAN PANAS TINGGI LAHAR SEDANG | AWAN PANAS SEDANG LAHAR SEDANG | AWAN PANAS RENDAH LAHAR SEDANG |
| RENDAH | SEDANG | AWAN PANAS TINGGI LAHAR RENDAH | AWAN PANAS SEDANG LAHAR RENDAH | AWAN PANAS RENDAH LAHAR RENDAH |
| RENDAH | SEDANG | < 22 milyar | 22 - 44 milyar | > 44 milyar |
| RENDAH | SEDANG | < 1600 jiwa | 1600 - 3200 jiwa | > 3200 jiwa |

Risk Map of the Pyroclastic flow and Hazard Zone after the impact



Source: BPBD DIY and BAPPEDA
Local Authority for Disaster Management and
Local Authority for Regional Planning



PETA 3.a
RENCANA RINCI TATA RUANG
KAWASAN GUNUNG MERAPI
RENCANA
STRUKTUR RUANG

0 4.975 9.950
 M

KETERANGAN

Batas Administrasi

- - - Batas Kecamatan
- - - Batas Kabupaten
- + + + Batas Propinsi
- Deliniasi Wilayah Perencanaan
- Sungai

Infrastruktur Jalan

- Jalan Arteri Primer
- Jalan Kolektor Primer
- Jalan Lokal Primer

Struktur Ruang

- ▲ PKL
- ▲ PPK
- ▲ PPL
- ★ Usulan Pusat Evakuasi

Kawasan Rawan Bencana

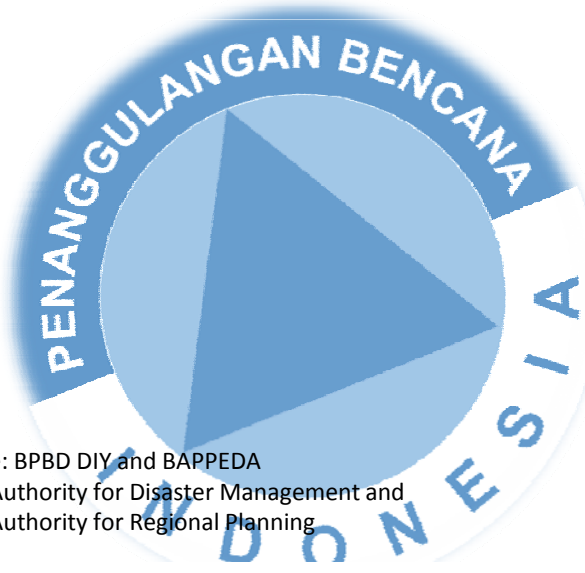
- Kawasan Rawan Bencana III
- Kawasan Rawan Bencana II
- Kawasan Rawan Bencana I
- Jalur Evakuasi

Sumber :

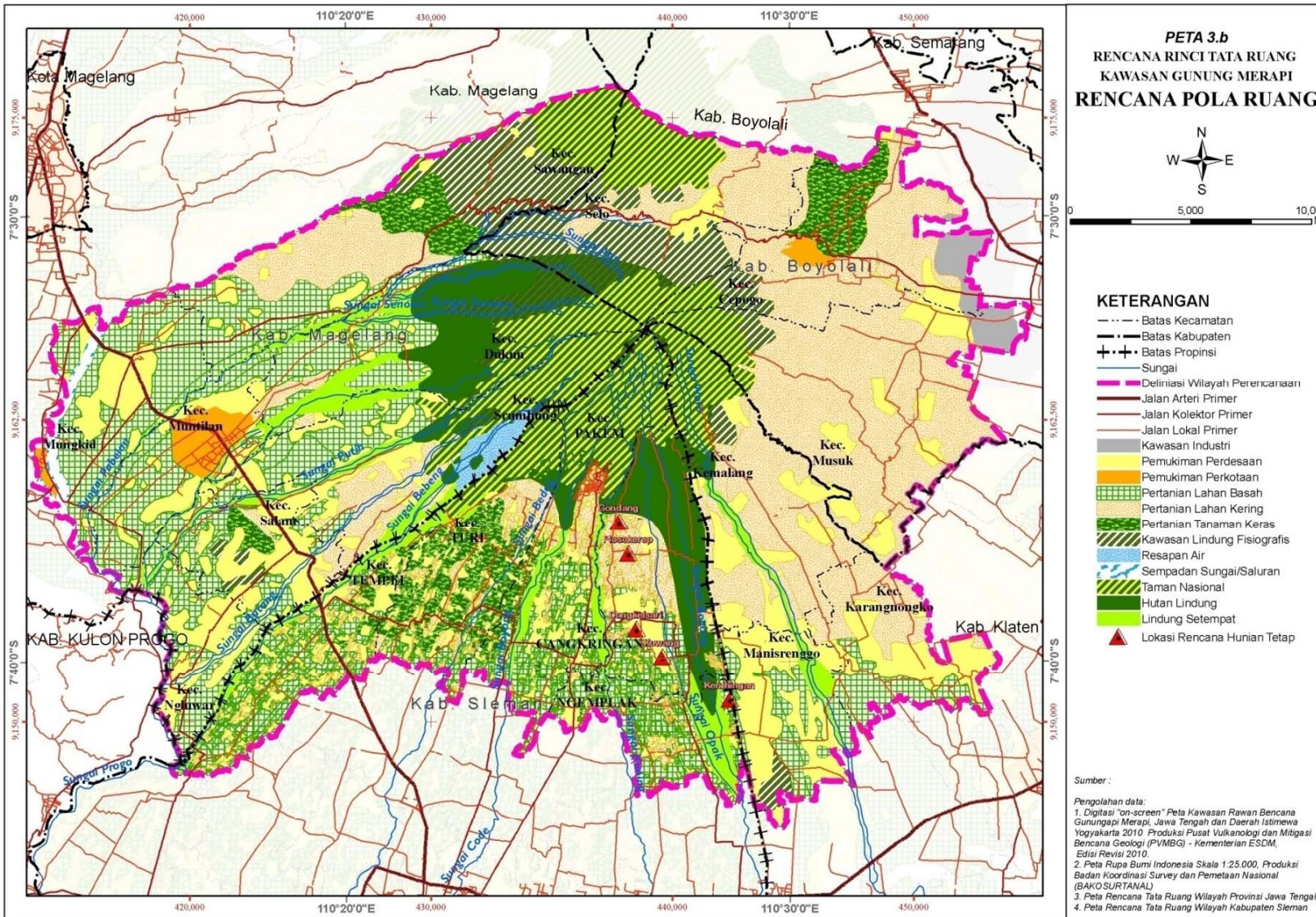
Pengolahan data:

1. Digitasi "on-screen" Peta Kawasan Rawan Bencana Gunungapi Merapi, Jawa Tengah dan Daerah Istimewa Yogyakarta 2010. Produk Pusat Vulkanologi dan Mitigasi Bencana Geologi (PVMBG) - Kementerian ESDM, Edisi Revisi 2010.
2. Peta Rupa Bumi Indonesia Skala 1:25.000, Produk Badan Koordinasi Survey dan Pemetaan Nasional (BAKOSURTANAL)
3. Peta Rencana Tata Ruang Wilayah Provinsi Jawa Tengah
4. Peta Rencana Tata Ruang Wilayah Provinsi DI Yogyakarta

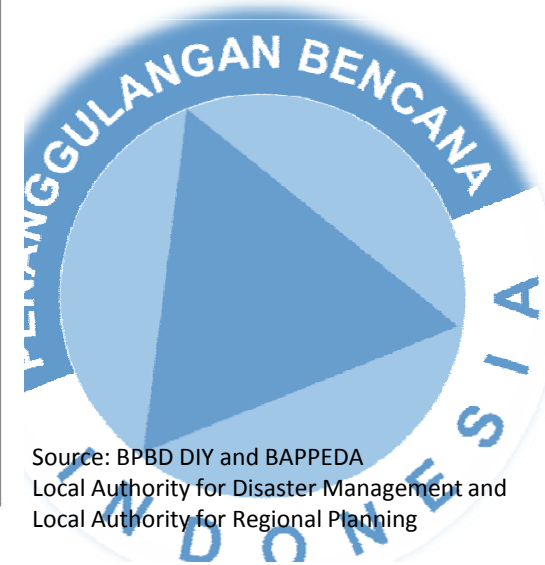
Spatial Structure Plan for Surrounding Mount Merapi



Source: BPBD DIY and BAPPEDA
 Local Authority for Disaster Management and
 Local Authority for Regional Planning



Spatial Structure Plan for Surrounding Mount Merapi



Source: BPBD DIY and BAPPEDA
 Local Authority for Disaster Management and
 Local Authority for Regional Planning

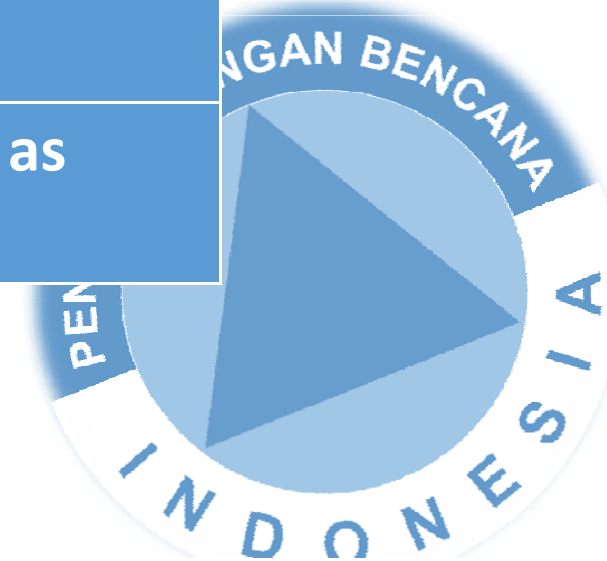
After Sendai for Priority #1 of SFDRR

The availability of detailed risk assessment for multi hazard in all area

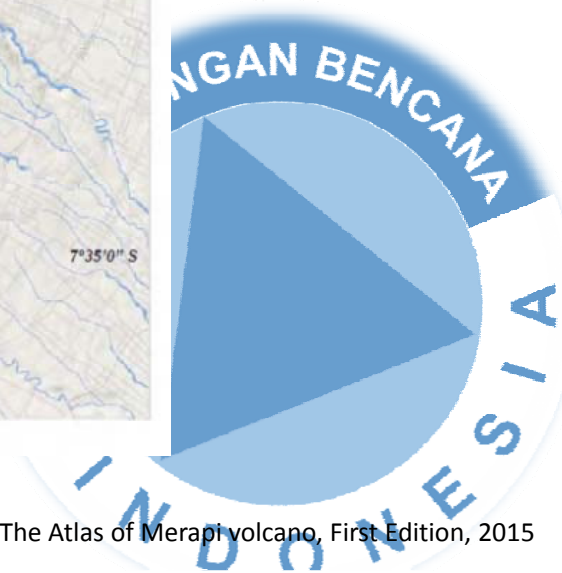
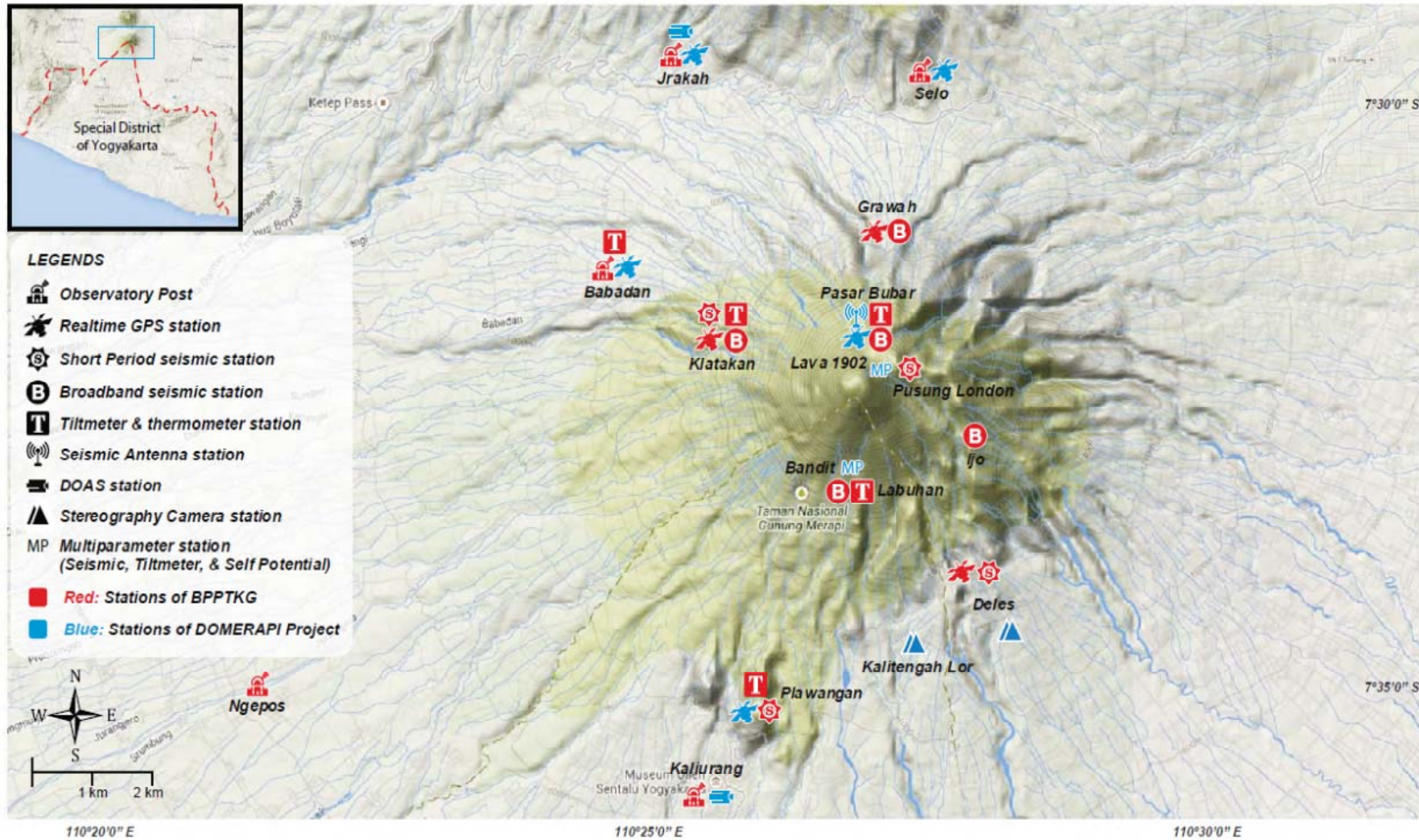
Risk assessment became the basis for development

The use of semi-detailed risk assessment as a policy consideration, DRR and investment

All spatial planning policies are using risk assessment as basis consideration



THE MAP OF MERAPI MONITORING NETWORK IN 2014



#4 National Action Plan on DRR in Indonesia

- Issues related to disaster risk reduction have been specifically referred to in the **new middle-term development plan**. In the part of RPJMN that elaborates the general direction of **development in 2015-2019**
- Disaster management and risk reduction are detailed more in priority number seven regarding effort to achieve economic independence. Under sub-agenda IV sustainable natural resources and environmental management, and disaster management, it is mentioned that the target of development in disaster management and disaster risk reduction is **reduction in Disaster Risk Index in growth centers** that are located in hazard-prone areas, through (1) **Mainstreaming of disaster risk reduction into sustainable development framework at the national and local levels**, (2) **Reducing vulnerability to disaster**, and (3) **Enhancement of the capacity of the national government, local governments and all communities in disaster management**.



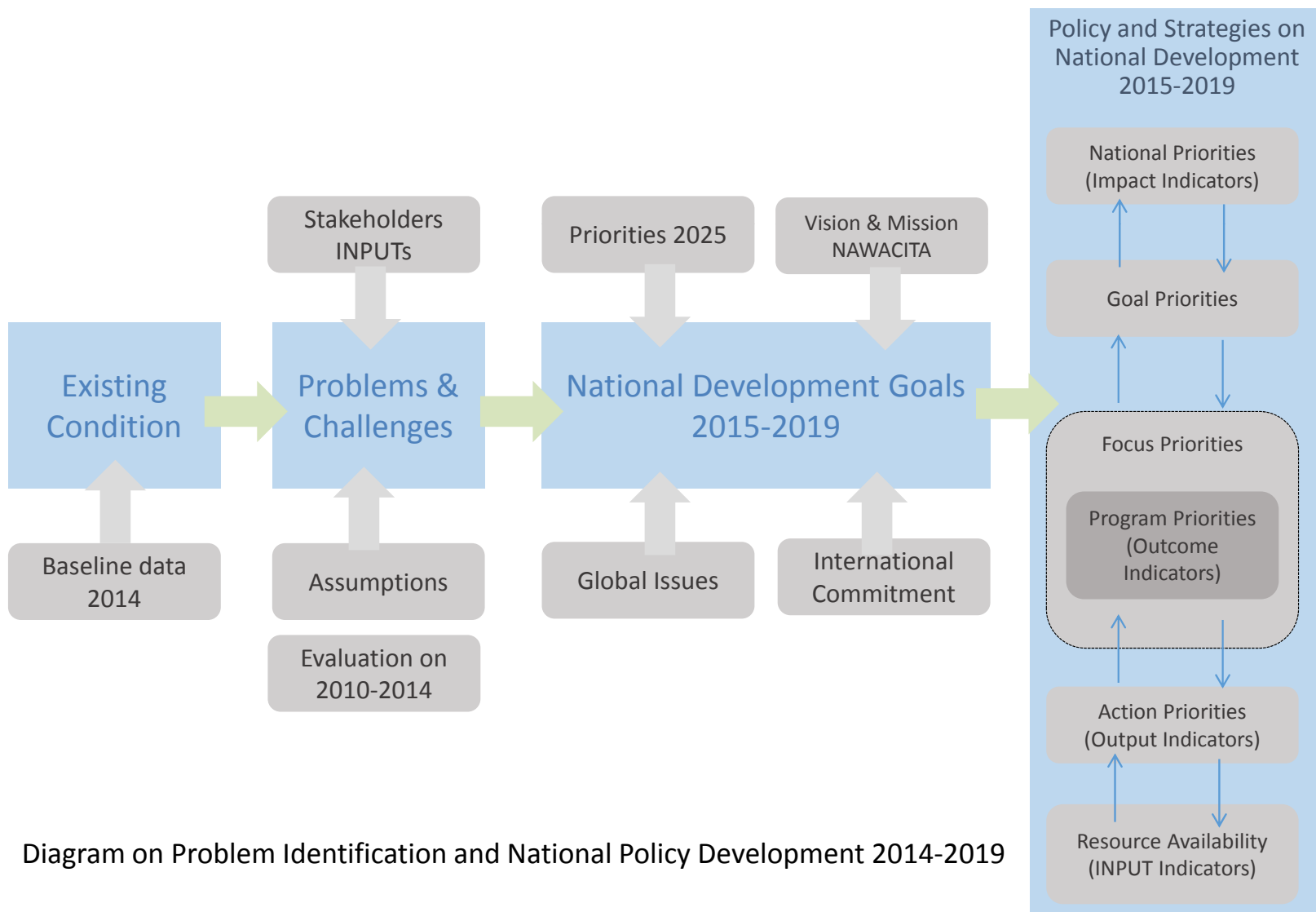
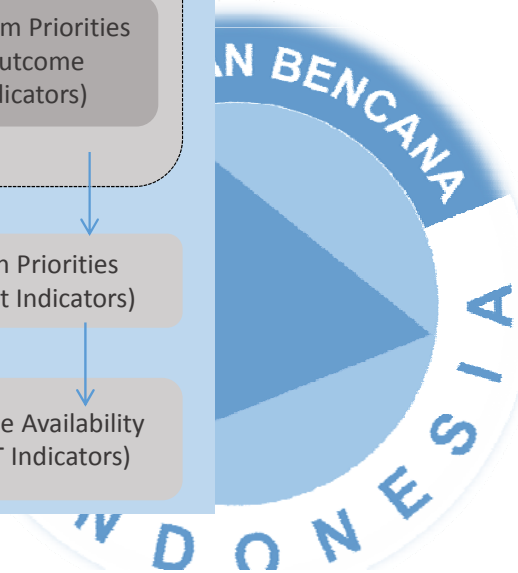


Diagram on Problem Identification and National Policy Development 2014-2019



National Action Plan on DM 2015-2019

7 Priorities and 36 Action Plan

1. Strengthening Regulation on DM

- Revised of the National Law No 24/2007 on Disaster Management
- Synergized the regulation framework of disaster management implementation
- Improvement of technical regulation on Disaster Management
- Enhancement of implementation framework regulation on disaster management

2. Mainstreaming Disaster Management on Development Planning

- Mainstreaming Disaster management and Climate change adaptation to national development
- Monitoring, evaluation, and review of National DM Plan related with other integrated sectors
- Improvement of Information system to National Action Plan implementation



National Action Plan on DM 2015-2019-cont.

3. Improvement of stakeholders partnership

- Improvement of community capacity and its implementation on disaster resilience focusing on local wisdom, climate change adaptation, gender, and vulnerable group
- Enhancing partnership for sustainability
- Strengthening National DRR Forum, local, and thematic as a sharing media for DM
- Strengthening and improvement of the education institution and expert association to educate and build culture of disaster awareness
- Improvement of volunteer's role on DM

4. Good governance on DM

- Fulfill the Standard of Minimum Services on DM
- Strengthening capacity of institution, human resources, and community
- Strengthening the capacity of infrastructure in DM
- Management and accountability support for technical implementation in DM



5. Effectively to improve prevention and mitigation

- To build national institution and community on prevention and mitigation
- Strengthening the implementation on research and technology
- Updating the disaster risk analysis with information system at national level
- Optimizing resources and spatial planning for land planning on prevention and mitigation
- Disaster mitigation management on CCA considering the vulnerable groups and local wisdom

6. Preparedness and emergency response improvement

- Integration DRR and Emergency Response
- EWS development on multirisk of disasters
- Spreading the information system networks
- National framework on emergency response development
- Development of preparedness capacity on national disaster
- Acceleration on infrastructure and logistic on emergency response



- Acceleration on determining situation state mechanism on emergency response
- SRC improvement on DM in Indonesia
- Improvement with international partnership on emergency response at national level
- Strengthening and partnership on emergency response at local level
- Capacity improvement on emergency response

7. Capacity improvement on disaster recovery phase

- Strengthening the mechanism and support of recovery phase from international, national, and local level
- Integration of DRR and disaster recovery phase
- Optimizing the rehabilitation and reconstruction on every sectors
- Character building and resilient community on disaster readiness



Thank You



Photography by Raditya Jati, 2010

**Badan Nasional Penanggulangan Bencana
Graha BNPB
Jl. Pramuka Kav. 38, Jakarta 10120**

**Deputy for Prevention and Preparedness
Ina-DRTG Building, PMPP/IPSC
Jl. Anyar, Desa Tangkil, Kec. Citereup, Sentul – Kab. Bogor**



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|----------|--|
| Telp. | : 021-3458400 – 021 29618877 |
| Fax. | : 021-3458500 – 021 29618876 |
| Email | : contact@bnpb.go.id |
| Website | : www.bnpb.go.id |
| Facebook | : www.facebook.com/bnpb.indonesia |
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