



# The Indonesian Earthquake And Tsunami Activities And The Challenging On Developing The Effective Of The Indonesia Tsunami Early Warning System (InaTEWS)

## Member State Report for *Country INDONESIA*

Dr. Muhamad Sadly  
Tsunami National Contact, Indonesia  
Deputy Head For Geophysics BMKG

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## ESTABLISHMENT OF INATEWS INDONESIA TSUNAMI EARLY WARNING SYSTEM

Inaugurated on November 11, 2008



- The main product of InaTEWS is **Earthquake Info and Tsunami Warning**
- Disseminate Earthquake Information and Tsunami Warning within **5 minutes** after the earthquake occurred



Indonesia Tsunami Early Warning System Goal's:

Timely detection of earthquake event and provide tsunami warning to the responsible-institutions and people.



Proper response of communities to reduce and minimize the impacts of disaster.

# NATIONAL AND INTERNATIONAL SUPPORT (2008)



MENTERI KOORDINATOR BIDANG KESEJAHTERAAN RAKYAT  
REPUBLIK INDONESIA

KEPUTUSAN  
MENTERI KOORDINATOR BIDANG KESEJAHTERAAN RAKYAT REPUBLIK INDONESIA  
SELAKU  
KETUA HARIAN BAKORNAS PB  
Nomor : 21 /KEP/MENTKO/KESRA/IX/2006

TENTANG

PENUNJUKAN LEMBAGA PEMERINTAH SEBAGAI FOCAL POINT DAN PEMBENTUKAN  
TIM PENGEMBANGAN SISTEM PERINGATAN DENI TSUNAMI DI INDONESIA

MENTERI KOORDINATOR BIDANG KESEJAHTERAAN RAKYAT  
SELAKU KETUA HARIAN BAKORNAS PB

Meningkat :

1. bahwa sebagian besar wilayah Indonesia rawan akan terjadinya bencana gempa bumi dan tsunami;
2. bahwa bencana gempa bumi dan tsunami yang terjadi di Natagere Arah Darusalam dan Sumatera Utara serta Jawa Barat telah menyebabkan tingkat pentingnya dikembangkan Sistem Peringatan Dini Tsunami di Indonesia;
3. bahwa untuk mengembangkan sistem tersebut, Menteri Negara Riset dan Teknologi telah mengkoordinasikan berbagai lembaga dalam menyusun skema besar Sistem Peringatan Dini Tsunami;
4. bahwa untuk melaksanakan program tersebut, perlu dibentuk lembaga pemerintah yang menjadi Focal Point Komposisi Sistem Peringatan Dini Tsunami dan dibentuk Tim Pengembangan Sistem Peringatan Dini Tsunami di Indonesia dengan Keputusan Menteri Koordinator Bidang Kesejahteraan Rakyat.

Meringkat :

1. Undang-undang Nomor 18 Tahun 2002 Tentang Sistem Nasional Penelitian, Pengembangan, dan Penerapan Ilmu Pengetahuan dan Teknologi;
2. Undang-undang Nomor 32 tahun 2004 tentang Pemerintahan Daerah sebagaimana telah diubah dengan Undang-Undang Nomor 8 tahun 2005;
3. Peraturan Presiden Nomor 9 Tahun 2005 Tentang Kerdusukan, Tugan, Fungs, Soman Organisasi dan Tata Kerja Menteri Negara, sebagaimana telah diubah terakhir dengan Peraturan Presiden Nomor 62 Tahun 2005;
4. Keputusan Presiden RI Nomor 20/P tahun 2005;
5. Inisiatif Presiden Nomor 4 Tahun 2005 tentang Pengkoordinasian Penemuan dan Pelaksanaan Kebijakan Strategis Pembangunan Nasional Ilmu Pengetahuan dan Teknologi.



# “STRENGTHENING AND DEVELOPMENT OF EARTHQUAKE INFORMATION SYSTEMS AND TSUNAMI EARLY WARNING” in Indonesia

## STRUCTURE

(4 K/L)



### Roles:

- ✓ Construction and operation of equipment for earthquake and/or tsunami observation; and
- ✓ provision and dissemination of information on tectonic earthquakes and tsunami early warnings; Integrated with the tsunami early warning system organized by BMKG

**BMKG acts as Coordinator/Focal Point in Structural Components** reporting the implementation of strengthening and development of the Earthquake and Tsunami Early Warning Information System to the President at any time if necessary (Article 10)

## CULTURE

(18 K/L)

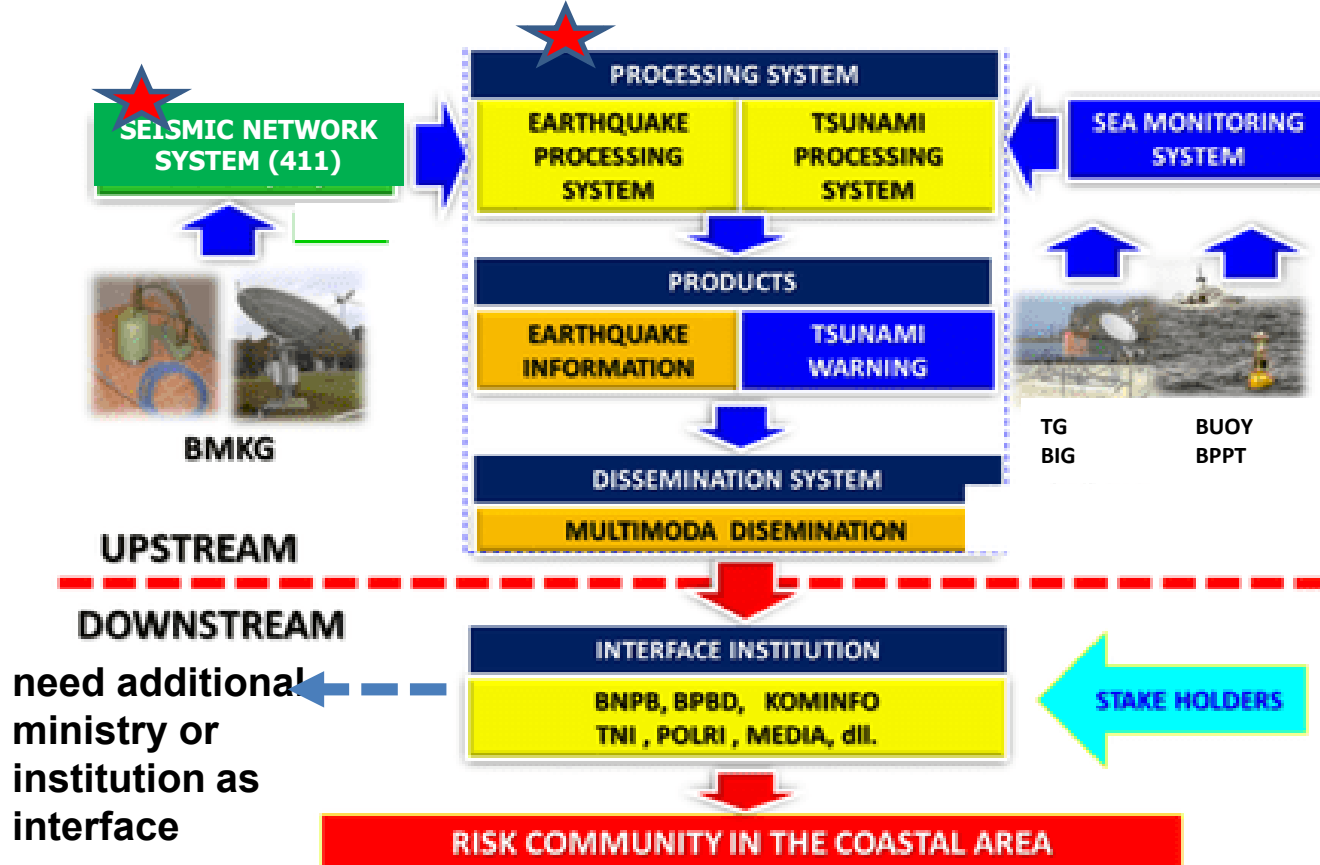


### Roles:

- ✓ risk understanding which consists of: risk assessment, capacity building, and research and development; and
- ✓ evacuation plan

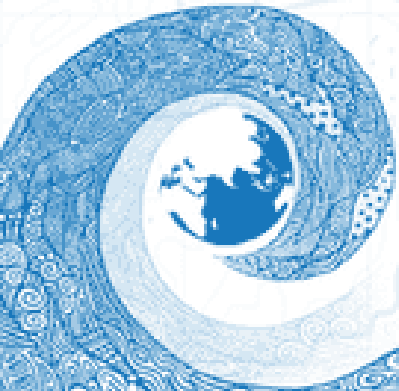
**BNPB acts as a coordinator or focal point in the Culture Component** and reports the implementation from time to time if necessary to the President. (Article 20 paragraph (5))

# THE END TO END CONCEPT OF IOT BASED-INATEWS



# Activities

- Monitoring System
- Processing System
- Dissemination System
- Capacity Buildings
- Mitigation Activities

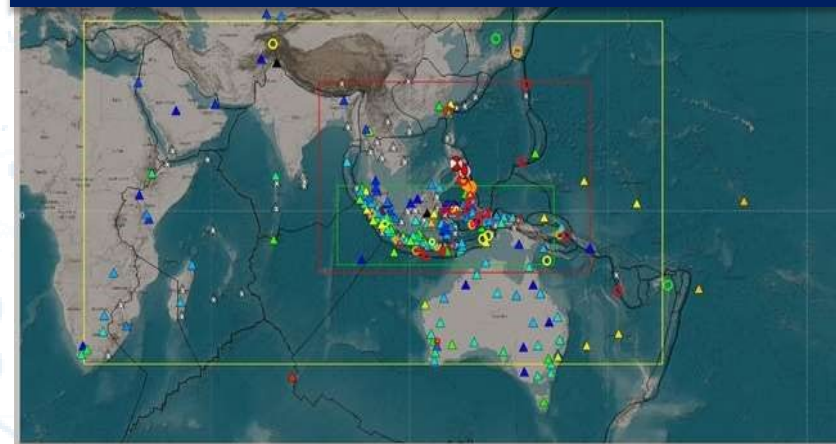




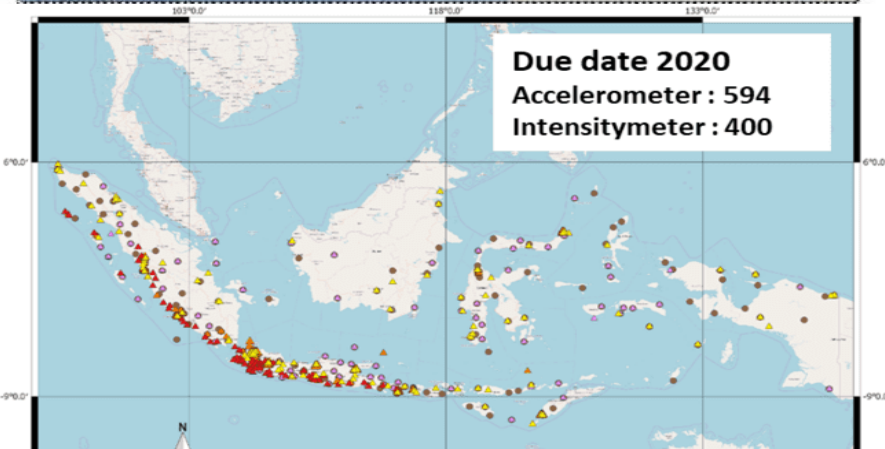
InaTEWS seismic monitoring network (code IA)  
411 seismic stations until Nov 2021



INDONESIAN : 411 STATIONS  
SITES FROM OTHER COUNTRIES : 200 STATIONS



Due date 2020  
Accelerometer : 594  
Intensitymeter : 400



INDONESIA ACCELEROMETER NETWORK



SEA LEVEL MONITORING NETWORK USED BY INATEWS

## InaTEWS Main system - Jakarta



## INATEWS BACKUP SYSTEM – BALI

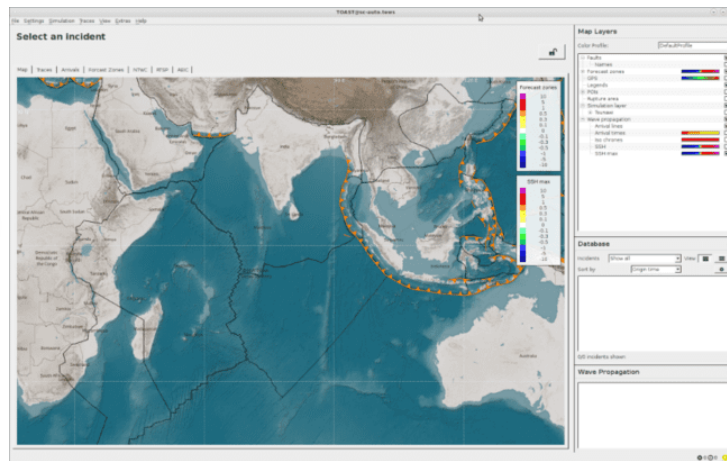




# PROCESSING SYSTEM

**TOAST (Tsunami Observation And Simulation Terminal )**  
Using real time simulation and pre-calculated tsunami DTB

Seiscomp – Eq Analysis



- Origin Time
- Magnitude
- Depth
- Location



# MULTI MODE DISSEMINATION



SMS



Fax



Email



WEB



Warning Receiver System



Warning Receiver System New Generation




**MEDIA SOSIAL**




InfoBMKG


## APLIKASI SMARTPHONE




Info BMKG




WRS - BMKG



WRS - BMKG



WRS - AEIC



WRS - TSP INDONESIA



BMKG

# CAPACITY BUILDING

- Formal degree and training for Staff
- Outreach Activities (INDONESIAN TSUNAMI READY)
- Participation on the exercise/com test of IOTWMS/PTWS/SCS
- Bmkg-jica: Capacity Development On Operation Of Earthquake And Tsunami Analysis And Warning Dissemination
- Other International cooperation



TRAINING FOR NTCW OPERATORS



EARTQUAKE FIELD SCHOOL (BMKG goes to School) IN BULUKUMBA

# Future Plans

- **Monitoring System :**

- ✓ Deploy additional 17 seismic stations until the end of 2021
- ✓ Deploy additional 92 seismic stations for 2022
- ✓ Deploy additional one hundred seismic stations until next 3 years
- ✓ Deploy additional sea level observations

- **Processing System :**

- ✓ Establish National Consortium to support development of InaTEWS
- ✓ Improve existing Seismic Processing with new additional necessary package/module by Indonesian
- ✓ New Tsunami Processing by Indonesian
- ✓ New emerging technology of processing

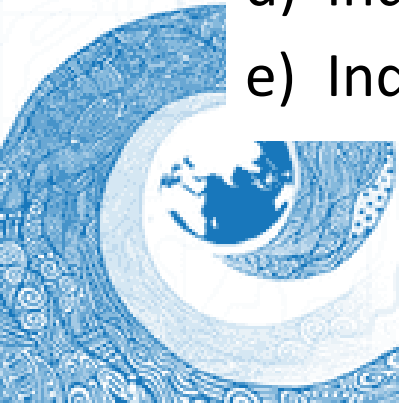
- **Dissemination System:**

- ✓ National standard of WRS
- ✓ WRS for ASEAN Countries
- ✓ WRS for Indian Ocean Countries
- ✓ New emerging technology of dissemination



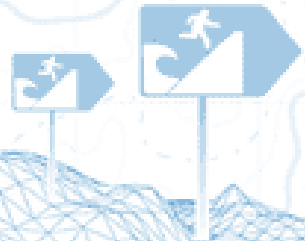
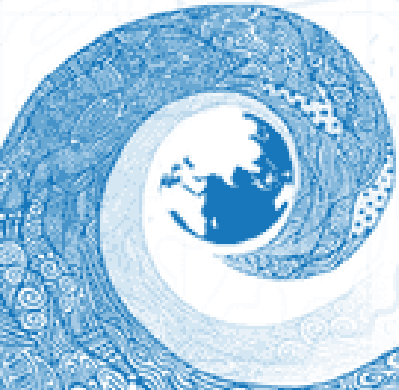
# Indonesia Responsibility in Global area

- a) Indonesia as Tsunami Service Provider (Indian Ocean)
- b) Indonesia as ASEAN Earthquake Information Center
- c) Indonesia as NTWC of IO area
- d) Indonesia as NTWC of Pacific area
- e) Indonesia as NTWC of SCS area



# Issues

- **Reliable Dissemination**
- **Earthquake Engineering Mitigation**
- **Social Innovation Program For Earthquake And Tsunami Preparedness**
- **Readiness culture campaign**





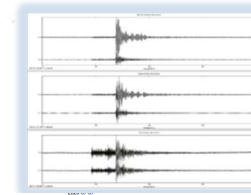
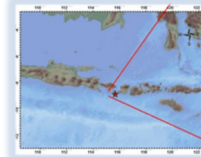


Site Specific Response Analysis,  
 Seismic Desain, Local Site Effect Vs30,  
 Fdom,SPAC,Mikrozonation, Seismic  
 Vulnerability Index, Ground shear

Structure Health Monitoring



Strain



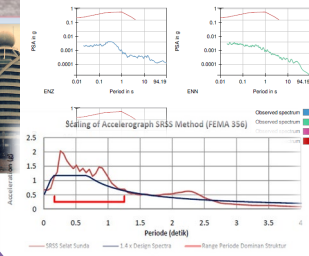
# ENGINEERING SEISMOLOGY DIVISION OF BMKG

Engineering Seismology

Soil Dynamic

Shakemap

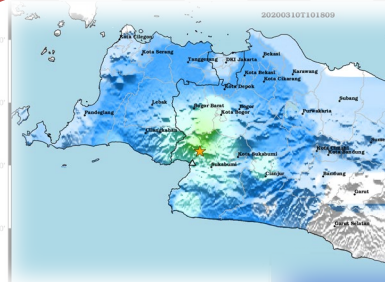
Earthquake Engineering



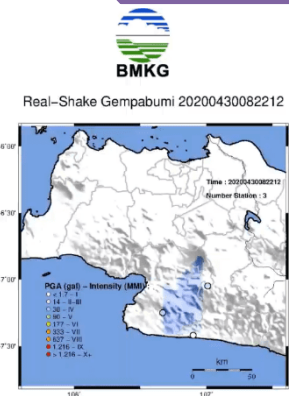
Engineering Seismology Information Services



Accelerometer, Intensitymeter, Strongmotion Motion,GMPE, DSHA,PSHA,



Shakemap



Analysis of engineering Seismology

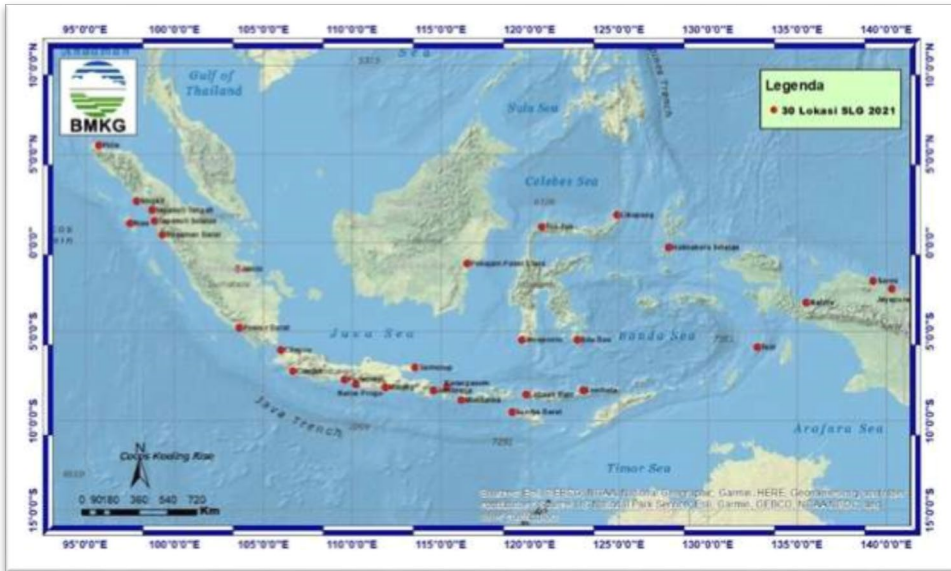






BMKG

# UNESCO-IOC TSUNAMI READY COMMUNITY PROGRAM



30 locations to be developed as tsunami ready community

## The Tsunami Ready Indicators

1. Have designated and mapped tsunami hazard zones.
2. To develop an initial estimate of the number of people that live in the tsunami hazard zone.
3. Have a public display of tsunami information.
4. Develop an inventory of available economic, infrastructural, political and social resources to reduce tsunami risk at the community level.
5. Produce easily understood tsunami evacuation maps as determined to be appropriate by local authorities in collaboration with communities.
6. Development and distribution of outreach and public education materials.
7. Hold at least three outreach or education activities annually
8. Conduct a biennial tsunami community exercise.
9. Have a tsunami emergency operations plan (EOP) for the community.
10. Have the capacity to manage emergency response operations during a tsunami.
11. Have redundant and reliable means to receive 24-hour official tsunami alerts
12. Have redundant and reliable means to disseminate 24-hour official tsunami alerts to the public.







# READINESS CULTURE CAMPAIGN

## Gerakan Budaya Siaga Bencana



**KOTAK P3K**  
Berisi Obat-Obatan



**MASKER, Hand Sanitizer,**  
Sarung Tangan



**MAKANAN dan MINUMAN**  
untuk asupan paska bencana  
minimal 3 hari



**HANDPHONE & CHARGER**  
untuk memberi informasi  
dan mencari bantuan



**DOKUMEN PRIBADI,**  
**UANG CASH** bekal  
untuk 3 Hari



**PAKAIAN LENGKAP**  
minimal untuk 3 Hari



**SENER dan**  
baterai tambahan



**PELUIT** untuk meminta  
pertolongan saat darurat



**RADIO PORTABEL**  
sebagai sumber informasi  
setelah bencana