



TSUNAMI EARLY WARNING SERVICE GUIDEBOOK FOR INATEWS



**Tsunami Early Warning Service Guidebook for InaTEWS - Summary Version
June 2013**

This Summary Version has been adapted from the “Tsunami Early Warning Service Guidebook for InaTEWS” published by BMKG in August 2012.

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Preface

This brochure is a summary of “The InaTEWS Tsunami Early Warning Service Guidebook” published in 2012 by the National Agency for Meteorology, Climatology, and Geophysics (BMKG), as the tsunami warning provider for the Indonesian Tsunami Early Warning System (InaTEWS).

The guideline consists of 12 principles that clarify the roles and responsibilities of institutions and key actors of InaTEWS in receiving, understanding, and responding to tsunami warnings from BMKG. It targets local government institutions at all levels, especially those in charge of disaster risk management, preparedness and emergency response in the regions, amongst others the *Badan Penanggulangan Bencana Daerah* (BPBD, Local Disaster Management Agency), and especially those officers with the authority to make decisions in emergency situations.

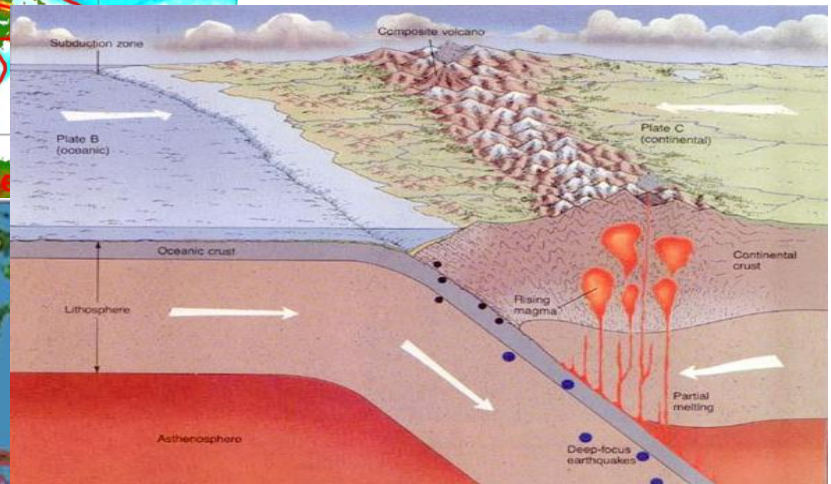
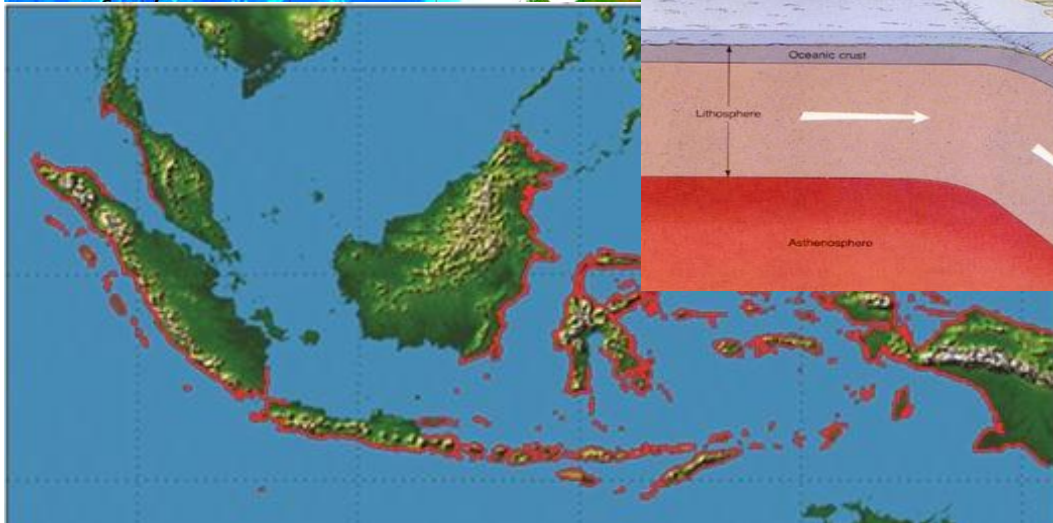
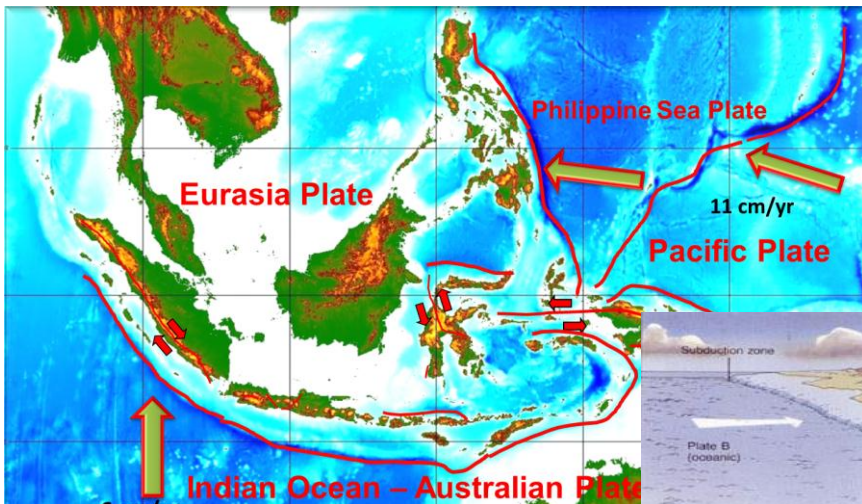
The guideline also provides recommendations on how to improve local earthquake and tsunami awareness and preparedness, and is considered a vital tool for building a common understanding of the tsunami risk, InaTEWS, and tsunami preparedness—a prerequisite for synergy amongst all stakeholders and for building an effective tsunami early warning system.

BMKG Jakarta, June 2013

- Principle 1: Indonesia is prone to local tsunamis**
- Principle 2: InaTEWS – Indonesia Tsunami Early Warning System and Community Empowerment**
- Principle 3: Roles and Responsibilities of Institutions and Communities in the Tsunami Early Warning Communication Chain**
- Principle 4: Instruments for Earthquake and Tsunami Observation**
- Principle 5: Sequence and Content of Tsunami Warnings**
- Principle 6: Dissemination of Earthquake Information Tsunami Early Warning by the BMKG**
- Principle 7: Local Government – the Key Actor in the Provision of Tsunami Early Warning Services to the People at Risk**
- Principle 8: Reception of Tsunami Warnings by Local Governments**
- Principle 9: Decision Making by Local Governments**
- Principle 10: Dissemination of Tsunami Warnings and Guidance by Local Governments**
- Principle 11: Standard Strategy for Community Reaction to Natural Tsunami Warning Signs, Earthquake Information, Tsunami Warnings from the BMKG and Guidance from Local Governments**
- Principle 12: Recommendations for Local Tsunami Preparedness**

Principle 1: Indonesia is Prone to Local Tsunamis

Indonesia is prone to local tsunamis due to the fact that its coastline is generally very close to tsunami sources. Local tsunamis can reach the shore in less than 30 minutes after an earthquake occurs.



Principle 2: InaTEWS — Indonesia Tsunami Early Warning System and Community Empowerment

Early warning is a combination of technology and community capacity that responds to information provided by the technology. As a component of disaster risk reduction, early warning is not only about the production of timely, technically accurate warnings but also an understanding of risk, a reliable link between providers and users of warnings and the capacity, on the part of communities and authorities, to respond appropriately to warnings. A failure in any one of these elements can mean failure of the whole warning system.

The Four Elements of People-centered Early Warning

and the related principles described in the InaTEWS Tsunami Early Warning Service Guideline

Conduct risk assessment and collect data systematically

Principle 1 & 12 describe the risks faced by Indonesia and the importance of risk assessments and provide information how to do it and whom to involve

Provide information, warnings and guidance

Principle 3 describes roles & responsibilities of the actors involved in the warning chain. **Principles 7-9** explain the roles and responsibilities of local governments to provide warnings and guidance. **Principle 10** describes how local governments can disseminate warnings and guidance.

Risk Knowledge

Are the hazards and the vulnerabilities well known?

What are the patterns and trends in these factors?

Are maps and data widely available?

Dissemination and Communication

Do the warnings reach those at risk?

Do people understand the warnings?

Do they contain relevant and useful information?

Monitoring and Warning Service

Are the right parameters being monitored?

Is there a sound scientific basis for making forecasts?

Can accurate and timely warnings be generated?

Response Capability

Do communities understand their risk?

Are response plans developed, practiced and up to date?

Do the people & institutions know how to react to natural and official warnings?

Develop observation technology and warning service

Principle 2 & 4 describe the InaTEWS concept, the earthquake and tsunami as well as the simulation system used by BMKG to generate earthquake information and tsunami early warnings.

Principle 5 & 6 explain the sequence and contents of tsunami early warnings as well as the communication channels for dissemination to local governments and media.

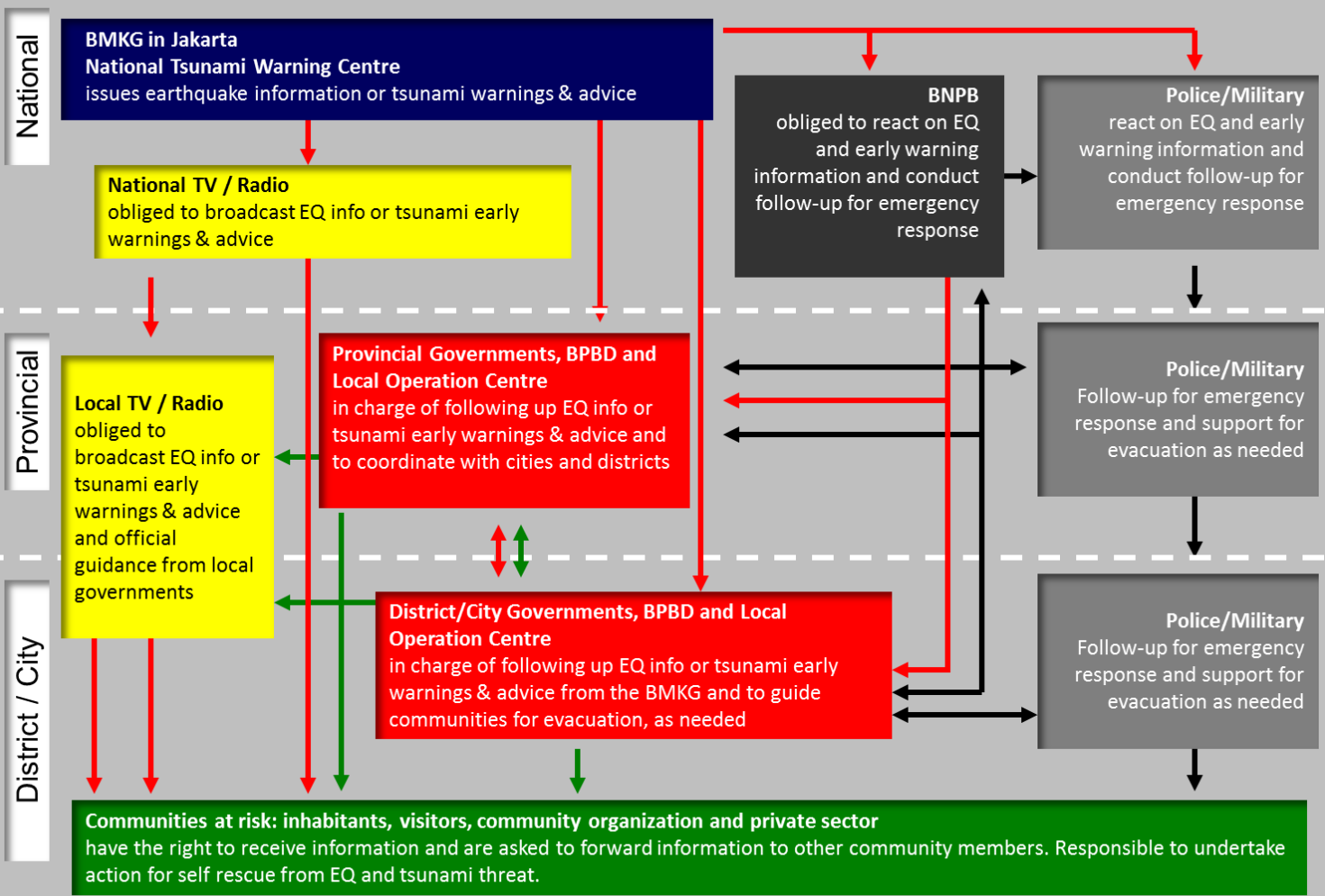
Build people's and institutional preparedness

Principles 11 – 12 illustrate the importance of preparedness at community level for the effectiveness of InaTEWS.

Principle 3: Roles and Responsibilities of Institutions and Communities in the Tsunami Early Warning Communication Chain

The BMKG provides earthquake information and tsunami warnings to BNPB, local governments and the media. Local governments are responsible for guiding their community's reaction to this information and for deciding whether or not to call for evacuation.

Roles and responsibilities of institutions and communities in the tsunami early warning communication chain of InaTEWS



Principle 4: Instruments for Earthquake and Tsunami Observation

There are three kinds of observation instruments, seismographs for earthquake observation, GPS for earth plate deformation observation, and the tide gauges, buoy, CCTV and tsunami radar for tsunami observation. Through communication networks, data from these instruments are sent to BMKG, to be processed and used as the basis for developing tsunami threat scenarios.



Seismograph



Buoy



Tide gauge



Satellite receiver
at BMKG



GPS station

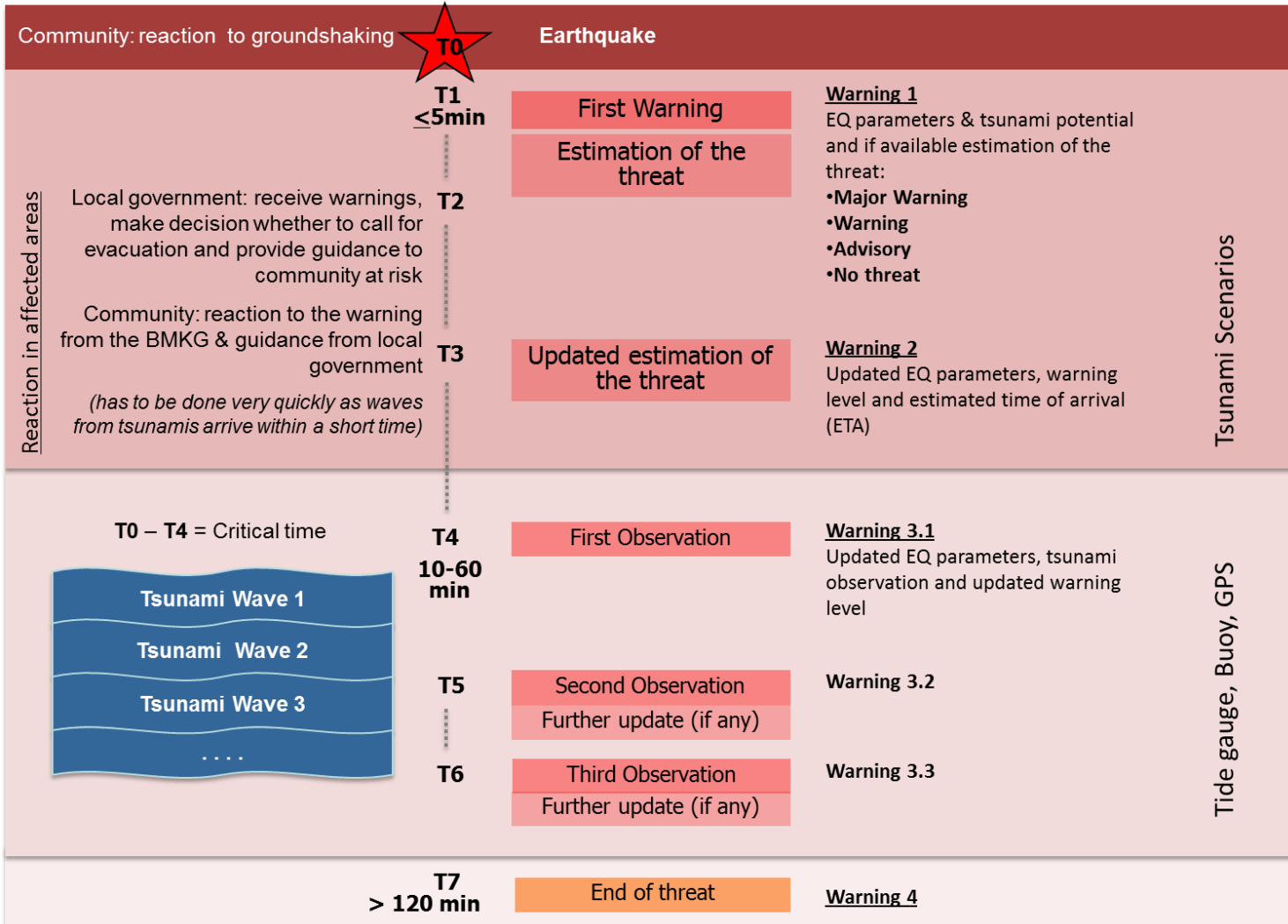


Data processing
at BMKG

Principle 5: Sequence and Content of Tsunami Warnings

The BMKG publishes earthquake information or tsunami warnings five minutes after an earthquake, which are followed by several updates and/or an all-clear message. The warning messages contain the tsunami threat level by district: “*Major Warning*” (Awas), “*Warning*” (Siaga) and “*Advisory*” (Waspada).

Tsunami early warning timeline for near-field tsunamis

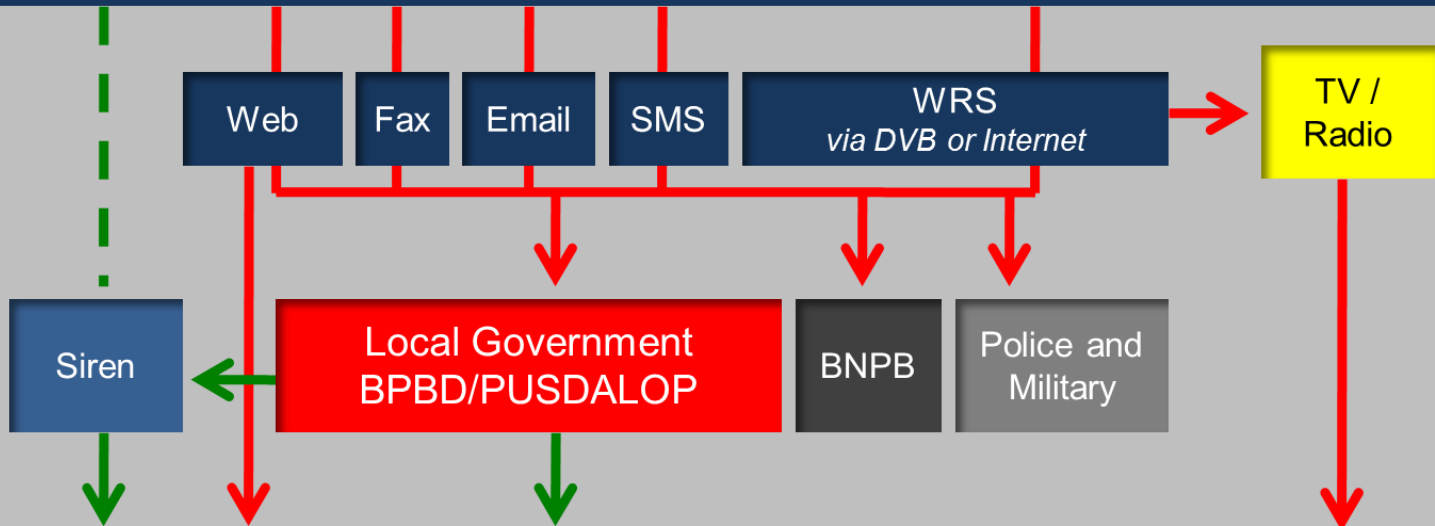


Principle 6: Dissemination of Earthquake Information and Tsunami Early Warnings by BMKG

The BMKG sends earthquake information and tsunami warnings to the public via local governments, interface institutions, and the media, using various communication channels.

National Tsunami Warning Centre (NTWC) at BMKG in Jakarta

Modes of Warning and Information Dissemination



Legend: → Warning from BMKG → Guidance from Local Government - - Temporary link until handed over to Local Government

Principle 7: Local Government – the Key Actor in the Provision of Tsunami Early Warning Services to People at Risk

Local governments are obliged to guide people's reaction to groundshaking from a nearby earthquake based on the information received from BMKG.

BMKG in Jakarta – National Tsunami Warning Centre

Operating
24/7

Earthquake information or tsunami warnings and advice for reaction in the regions
– *without instruction to the public*

Government at provincial / district and city level (BPBD and Operation Centre)

- **Receive** earthquake information or tsunami warnings and advice from the BMKG
- **Make a decision** about the required reaction based on the advice from the BMKG and the local SOPs (need to call for evacuation or not)
- **Disseminate** guidance to the public and related (non-)government institutions

Operating
24/7

TV / radio
Stations

Earthquake information or tsunami
warnings
– *and clear instructions to the public*

Government and non-
government institutions

Community at risk

National

Provincial / District / City

Community

Principle 8: Reception of Tsunami Warnings by Local Governments

Local governments have to ensure that they are able to receive earthquake information or tsunami warnings and advice from BMKG accurately and at all times (24/7) through various communication devices.

BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.bmg.go.id/depan.bmkg

prnyataan presiden sby tadi mala... KOMPAS.com

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BADAN METEOROLOGI KLIMAT... x

Prakiraan Musim
Mempred
Dinamika Atmosfer
Siklon
Rata-rata klimatof
Ketinggian Stasiun
Potensi Banjir
Air Basi Sdm

REALITAS UDARA

- Informasi S02
- Informasi NCC
- Informasi SP4
- Informasi Kima Air Hujan
- Informasi Ozon(O3)
- Informasi Gas Rumah Kaca
- Berita
- Data Base

GEOFISIKA

- Gempa Bumi
- Gempa Drasakan
- Tsunami
- Gbra Berat
- Tanda Waktu
- Magnet Bumi
- Sisuan Gempa Bumi
- Petr
- Seismologi Tokik

PUSLITBANG

- Berita

BMKG Website

INFO BHKG

Prakiraan cuaca kota propinsi Indonesia

Hedan	Samarinda	Hakasar	Jayapura	Denpasar	Jakarta
Hujan Ringan	Hujan Ringan	Berawan	Berawan	Berawan	Hujan Ringan
24 - 32 °C	24 - 33 °C	23 - 33 °C	24 - 33 °C	23 - 33 °C	24 - 33 °C

Selengkapnya...

Gempa tercatat (> 5.0 SR)

5.4
Skala Richter

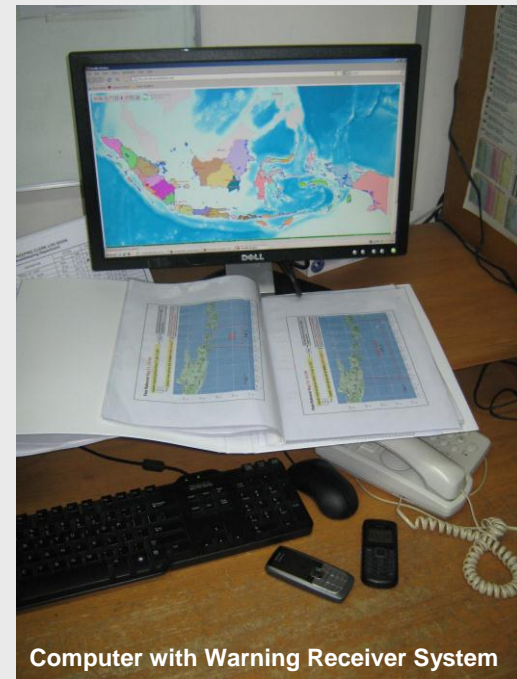
Terjadi pada	Lokasi	Magnitudo	Kedalaman	Potensi Tsunami
24-Hvy-09 11:00-31 WIB	11.2515 - 119.11 BT	5.4	100 km	tidak berpotensi TSUNAMI

Pusat gempa berada pada:
218 km BaratDaya WADGAPU-NTT, 311 km Tenggara KABA-NTB, 318 km BaratDaya LABUHANBAJO-NTT, 330 km BaratDaya RUTENG-NTT, 358 km Tenggara SUMBAWAESAR-NTB

Tanggal 22/11/2009-17:59:42.0 WIB
Kedalaman 4.3 SR
Kedalaman 10 Km
Lokasi 1.761S 116.11BT
Keterangan:
Pusat gempa berada di darat, 198 km Barat Daya Balikpapan
Dirasakan (shaki):
III Kecamatan Longkilo,

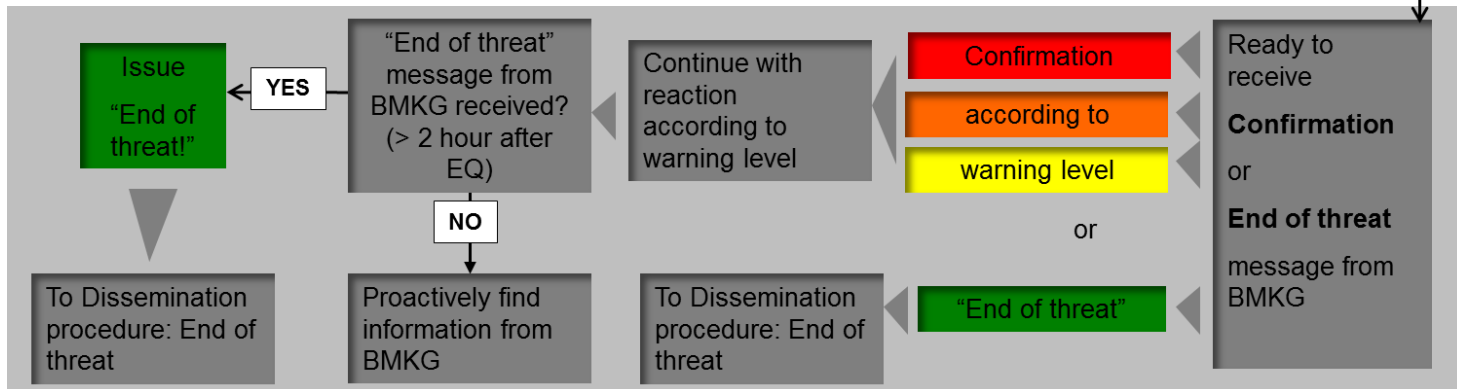
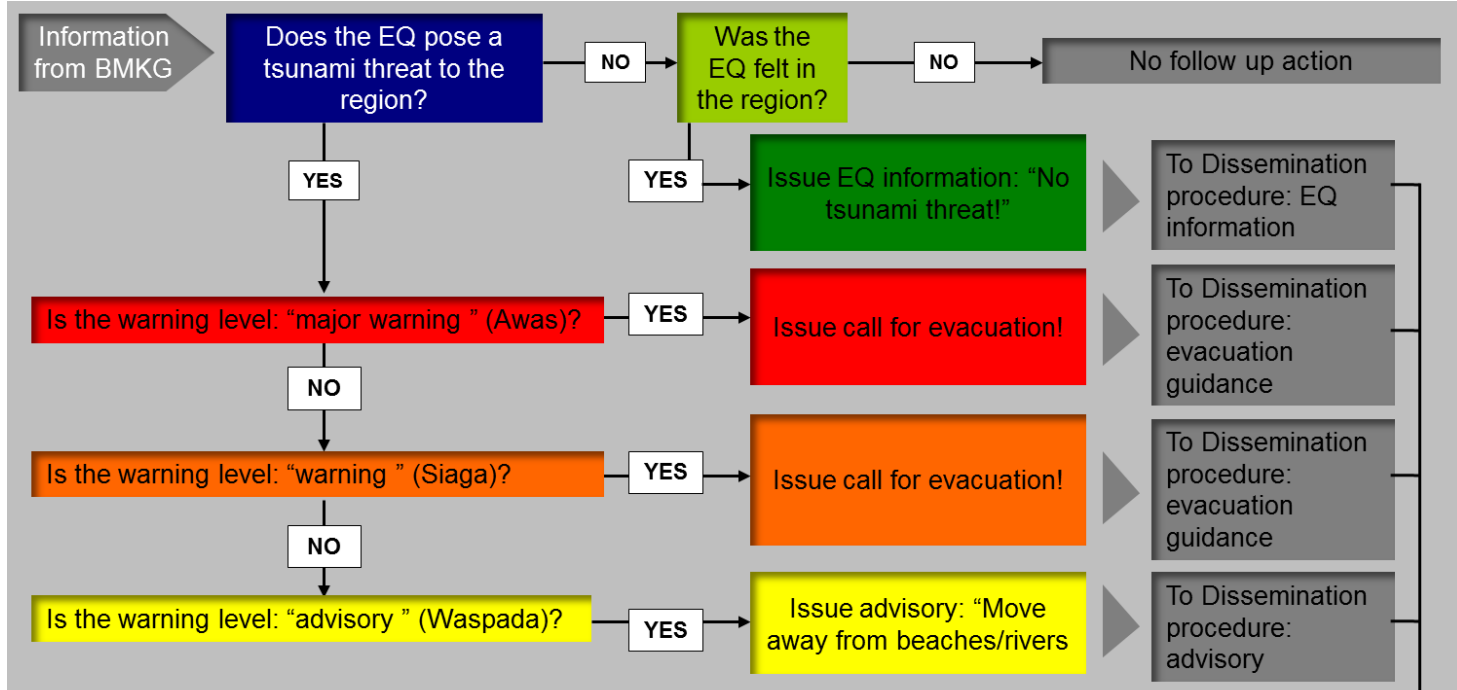
Read www.bmkg.go.id

2009 send2009 in Person... Yahoo! Messenger sj anfin (anfin_sj) -1... BADAN METEOR... Microsoft Excel 17:05



Principle 9: Decision Making by Local Governments

Local governments are expected to have the capacity to make a decision about the actions to be taken in their region (i.e., whether or not to call for evacuation) in a timely manner, based on earthquake information, tsunami warnings and advice from BMKG as well as local standard operating procedures (SOPs).



Principle 10: Dissemination of Tsunami Warnings and Guidance by Local Governments

Local governments are required to make use of various communication devices that enable them to widely disseminate earthquake information or warnings and guidance for evacuation, to the public. Sirens are one of several effective tools to call for evacuation. A steady three-minute sound from a tsunami siren means immediate evacuation.



Tsunami siren



Mosque
loudspeaker



Kul-kul (Bali)



VHF communication



Local radio station



Search and Rescue

Principle 11: Standard Strategy for Community Reaction to Natural Tsunami Warning Signs, Earthquake Information, Tsunami Warnings from the BMKG and Guidance from Local Governments

If people feel a strong earthquake, they should immediately evacuate to a safe location while seeking guidance from the local government. Earthquake information and tsunami warnings from BMKG that contain the estimated threat level and advice for response are the basis for official guidance to the public that either reinforces the need for evacuation or cancels an evacuation if there is no tsunami threat.

Standard reaction strategy for community reaction to ground shaking and first official warning

Natural warning and official warning or information based on information from the NTWC

Expected Community Reaction

Ground Shaking (not too strong but long shakes)

Ground Shaking (Strong and long shakes)

People move away from the beaches and river banks and to designated safe locations

EQ

5-10 minutes after the earthquake

Warning and guidance from local authorities

and

Warning and advice broadcast by TV and radio stations

Major Warning

Evacuate immediately!

Warning

Advisory

Stay away from beaches and river banks!

EQ Info

No tsunami threat!

People evacuate hazardous areas and move to designated safe locations

People stay away from the

People resume normal activities (depending on EQ damage)

Principle 12: Recommendations for Local Tsunami Preparedness

Tsunami preparedness depends on the preparedness both of local institutions and communities at risk. Local governments, together with other stakeholders, are obliged to analyse the tsunami risk, prepare tsunami contingency and evacuation plans, develop institutional capacity and infrastructure for early warning, issue local regulations for disaster management and raise people's awareness of the tsunami risk and appropriate ways to respond to it.

Risk assessment (tsunami hazard and community vulnerability)

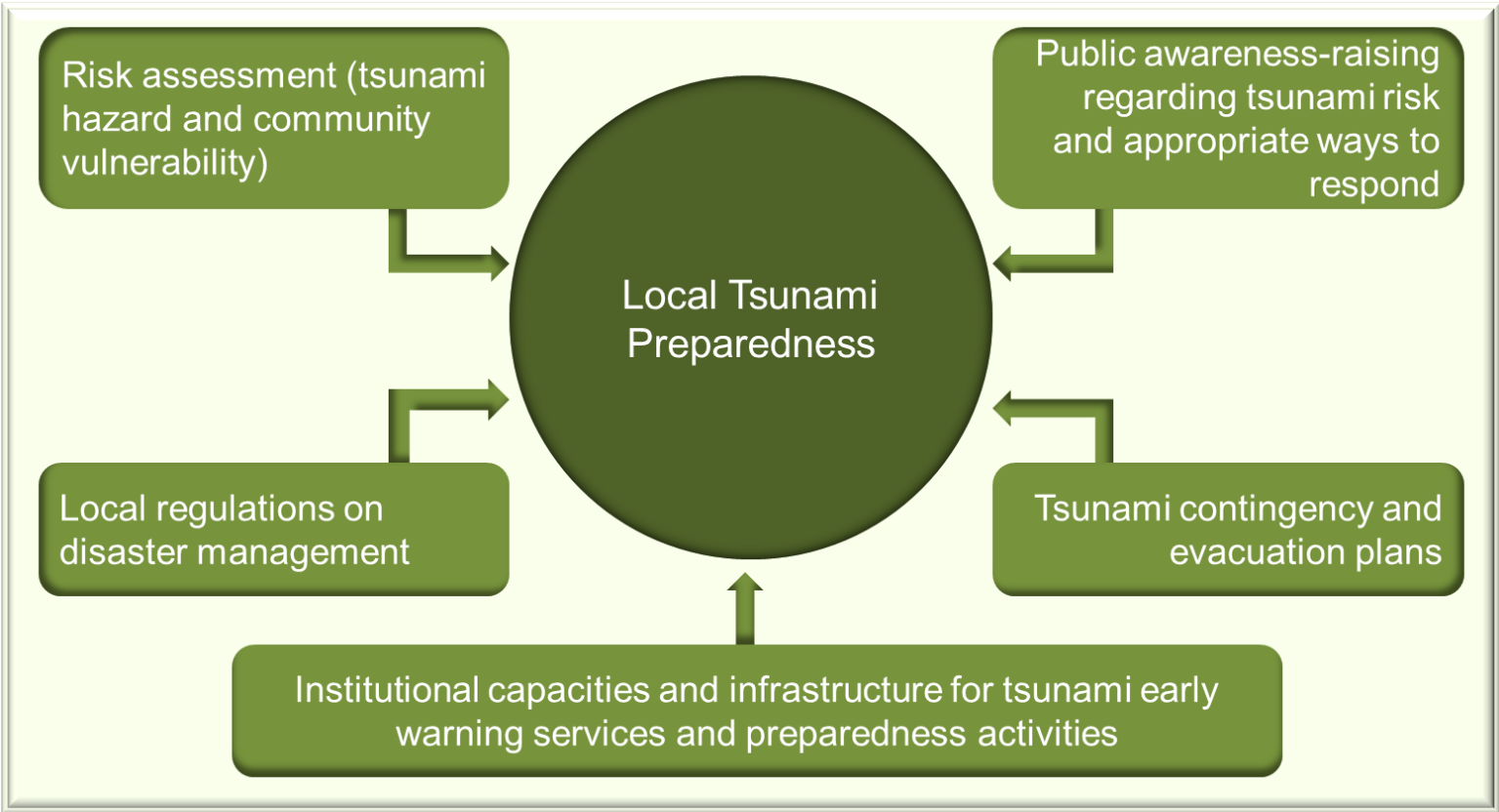
Public awareness-raising regarding tsunami risk and appropriate ways to respond

Local Tsunami Preparedness

Local regulations on disaster management

Tsunami contingency and evacuation plans

Institutional capacities and infrastructure for tsunami early warning services and preparedness activities





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