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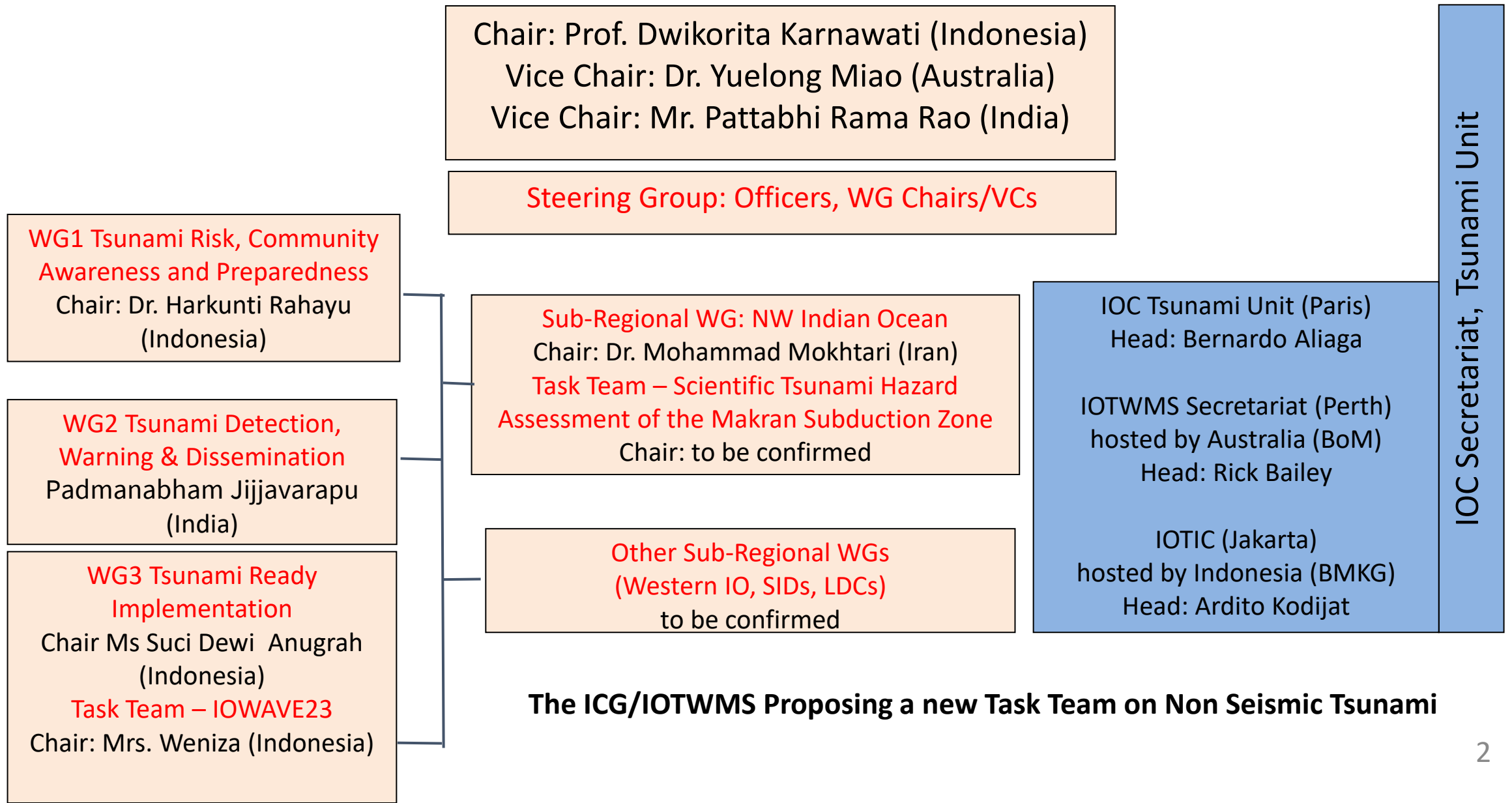
Intergovernmental
Oceanographic
Commission

Intergovernmental Coordination Group Indian Ocean Tsunami Warning & Mitigation System (IOTWMS)



Prof Dwikorita Karnawati
Chair, ICG/IOTWMS

GOVERNANCE OF INTERGOVERNMENTAL COORDINATION GROUP INDIAN OCEAN TSUNAMI WARNING & MITIGATION SYSTEM (ICG/IOTWMS)



ACTIVITIES IN 2023-2024: Intersessional Meeting: SG, WG, TT

Steering Group Meeting:

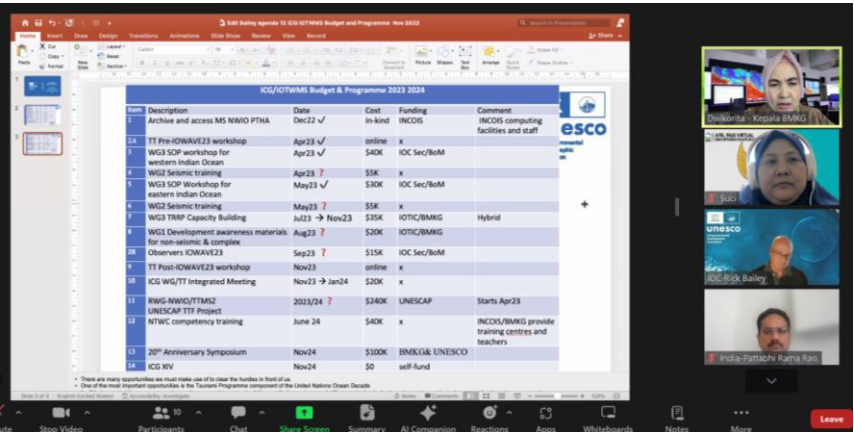
1. Steering Group Meeting, 16 February 2023, Online
2. Steering Group Meeting, 5-6 February 2024 in Hyderabad

Working Group and Task Team Meeting:

1. WG 1 Meeting, 23 March 2023
2. WG 2 Meeting, 5-6 April 2023
3. WG 3 Meeting, 23 August 2023
4. IOWave Task Team Meeting, 4 April & 15 June 2023

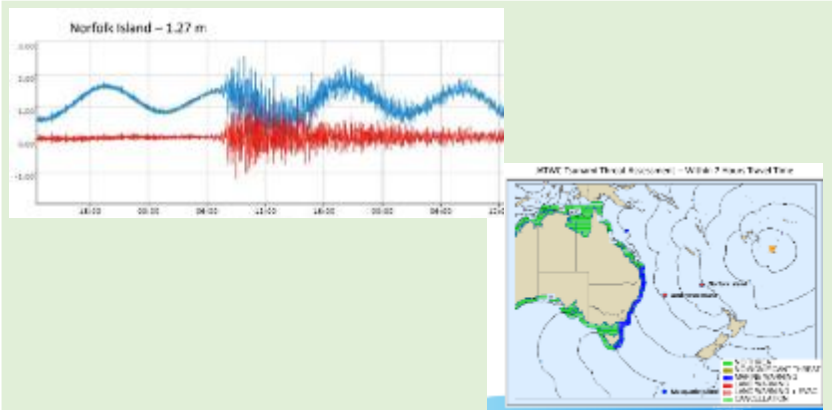
Outcomes of the Last Steering Group Meeting in Hyderabad:

1. To propose a new Task Team on non Seismic Tsunami
2. To continue Capacity Assessment of Tsunami Preparedness by involving the Tsunami Ready Implementation
3. Developing Non Seismic Tsunami SOP
4. Providing Product for Maritime Community through NAVAREA Coordinator
5. Establish a partnership with private sector to accelerate and strengthen the Tsunami Ready
6. Continue to provide advocacy for Tsunami Ready, prioritize for SID's and LDC's
7. Tsunami Ready for Critical Infrastructure
8. Multi Hazard Regional Exercise



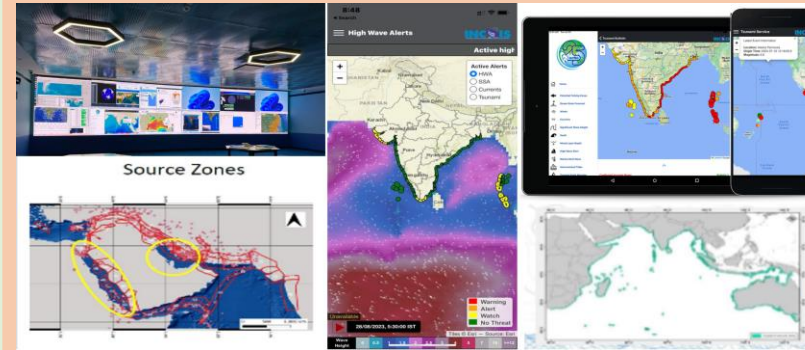
TSP PROGRESS REPORT

TSP Australia



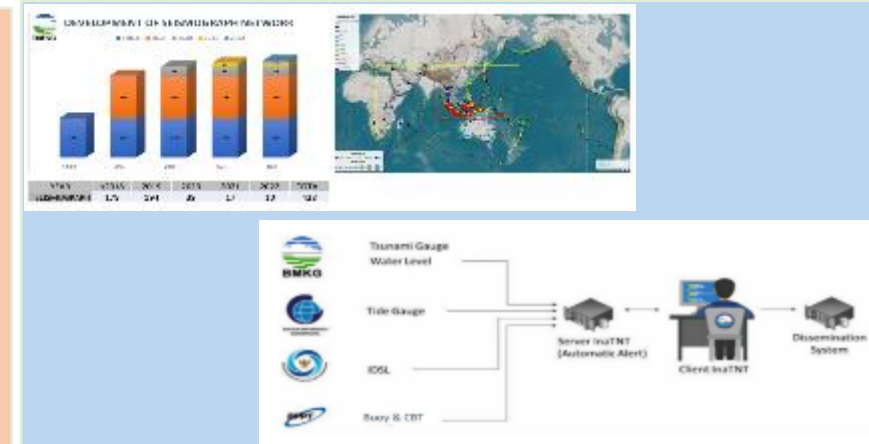
- Capability to produce Indian Ocean products for Non Seismic events
- Capability to deliver Navarea maritime product
- Bureau-Joint Australia Tsunami Warning Center's quality management system has been ISO recertification for another 3 years

TSP India



- Maintaining CFZs Layers for IOTWMS
- UNESCO PTHA Project for Makran Subduction Zone (Phase-2b completed simulations) and Initiated Phase-2c in Nov 2023.
- SAMUDRA Mobile App. It is a comprehensive multi-hazard early warning app to the coastal communities about oceanic threats.
- Inaugurated the state-of-the-art SynOPS lab, enhancing ocean monitoring and prediction capabilities.
- ISO 9001 recertification

TSP Indonesia



- Progressive deployment of the seismometers (535 in 2024)
- Developing Indonesia Tsunami Non-Tectonic monitoring system
- Multi-Hazard Platform (InfoBMKG mobile App)
- Establishment of the National Consortium of the EQ and Tsunami Experts
- Development new processing impact based real time system of InaTEWS supported by National Consortium

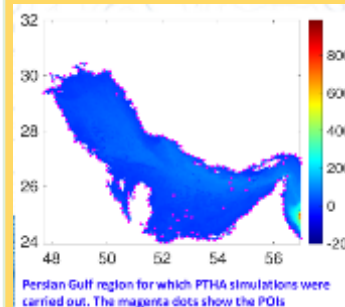
TSP FUTURE PLAN

TSP Australia



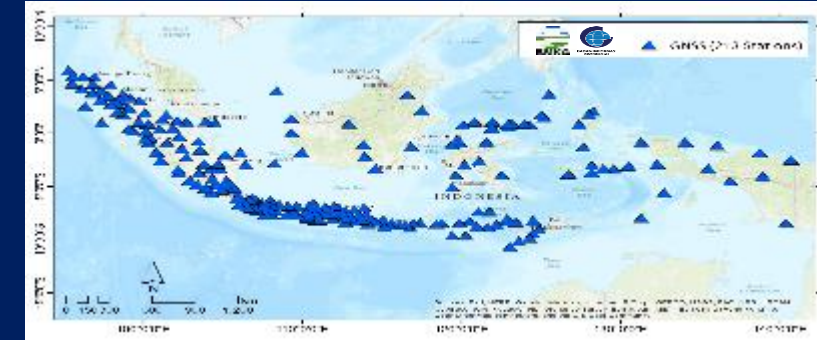
- GA-JATWC to integrate, test and operationalise seismic array processing as input to rapid earthquake detection and characterization.
- GA-JATWC to commence work towards ISO 9001 accreditation for GA-JATWC systems
- Bureau-JATWC to replace the current tsunami Decision Support Tool with TOAST

TSP India



- Developing SOPs and implementing products for non-seismic tsunamis
- Implementing NAVAREA products for upcoming trails.
- Utilizing GNSS & SMA for precise rupture characterization.
- Archiving Makran source PTHA for access to member states.
- Providing on-job trainings for IO member states.
- Advancing integrated inversions for tsunami source analysis.

TSP Indonesia

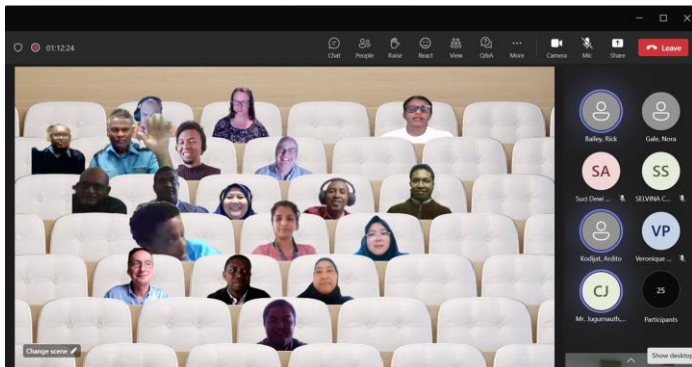


- Utilization of GNSS for earthquake parameter calculation
- Research on non seismic tsunami
- Provide sea level observation portal for the Indian Ocean area
- Support the On Job Training for the IO member states
- Development of processing system for Earthquake Early Warning

CAPACITY DEVELOPMENT ACTIVITIES IN 2023

No	Activities	Date
1	SOP Workshop for the West Indian Ocean	03-06 July
2	SOP Workshop for the Eastern Indian Ocean,	10-13 July 2023
3	SOP Workshop for the North West Indian Ocean,	7-8 August 2023
4	Tsunami Ready Training Timor Leste	31 July- 1 August 2023
5	Tsunami Ready Training Seychelles	31 July- 1 Agustus 2023
6	On job trainings for the Indian Ocean Member States (Oman and Timor Leste)	13-21 March 2023
7	TSP-India at INCOIS, has conducted a two weeks in-person on-job training course for Oman on “Tsunamis & Other Ocean Hazards”	11-22 December 2023

- The Training covering developing and implementing SOP, Warning Chain, and Tsunami Ready



SOP Training



Tsunami Ready Training in Seychelles



Tsunami Ready Training in Timor Leste



Oman, On Job Training

OTHER ACTIVITIES OF THE WORKING GROUPS

1

Tsunami Risk, Community Awareness Preparedness

- Review and update CATP tools
- Capacity Development Assessment under the UNESCAP Project
- Preparing the International Tsunami Symposium in Banda Aceh in cooperation with WG3

4

Strengthening tsunami early warning in the North-West Indian Ocean region through regional cooperation (India, Iran, Pakistan + Oman and UAE self-funded):

- **Phase 1** : Hazard & risk assessment and National tsunami warning chain development
- **Phase 2** : Inundation and evacuation mapping capacity development
- **Phase 3** to be proposed: Implement Tsunami Ready Recognition Programme (or similar national initiative)

2

Tsunami Detection, Warning and Dissemination

- Updated IOTWMS TSP Service Definition Document, including:
 - Requirement to produce a TSP product for NAVAREA Coordinators for issuing warnings to ships.
 - Expanded the TSP services to handle non-seismic and complex tsunami.



3

Tsunami Ready Implementation

- Expanding Tsunami Ready for the Critical Infrastructure
- Webinar to Commemorate the WTAD (Fighting Inequality for Resilience Future)
- Promoting Tsunami Ready IO Regional Decade Conference 2024, 1-3 February 2024, in Hyderabad



IOWAVE 2023 (4, 11, 18, and 25 October 2023)

IOTWMS Member States participation in the scenarios included:

- 5 scenarios including a non seismic tsunami scenario
- 19 countries participated
- More than 44.000 people conducted tsunami evacuation drill, including disabilities people
- The exercise also been participated by the critical infrastructure, and decision makers

Propose for the next Exercise:

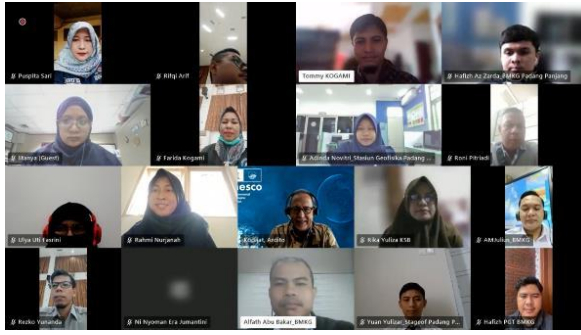
- to conduct sub regional exercise, based on the needs and potential tsunami hazards
- to carry out the Multi-Hazard exercise



IOTIC-BMKG Activities

The IOTIC-BMKG conducted several activities of Tsunami Ready Capacity Development including:

1. Tsunami Ready Training for Facilitators in Indonesia- February 2023 - Online
2. National Tsunami Ready Training in Timor-Leste – July 2023
3. Preserving Past Tsunami information for Future Preparedness of 1995 Tsunami Dili – July 2023
4. Field Verification of Tapakih Village for UNESCO-IOC Tsunami Ready Recognition – September 2023
5. National Tsunami Ready Training in Seychelles – November 2023
6. Preserving Past Tsunami information for Future Preparedness of 2004 Indian Ocean Tsunami affected Seychelles – November 2023



12 IOC-UNESCO Tsunami Ready Communities in the Indian Ocean



INDIA:

1. Venkatraipur (August, 7th 2020)
2. Noliasahi (August, 7th 2020)

INDONESIA:

1. Tanjung Bena Village (May, 28th 2022)
2. Glagah Village (December, 26th 2022)
3. Kemadang Village (November, 26th 2022)
4. Pangandaran Village (December, 26th 2022)
5. Panggarangan Village (November, 26th 2022)
6. Desa Tambakrejo (November, 26th 2022)
7. Kuta Mandalika Village (December, 26th 2022)
8. Purus Village (December, 26th 2022)
9. Lolong Belanti Village (December, 26th 2022)
10. Tapakih Village (December, 20th 2023)

INDONESIA Locations: Tapakis Village, Purus Village, Lolong Belanti Village, Kemadang Village, Tambakrejo Village, Panggarangan Village, Kuta Mandalika Village, Pangandaran Village, Glagah Village, Tanjung Bena Village.

Tsunami Ready

Plan for Tsunami Ready Communities in the Indian Ocean

- Expecting 24 communities from India and 12 from Indonesia will be recognized
- To prioritize on providing advocacy for SIDS and LDCs to implement Tsunami Ready

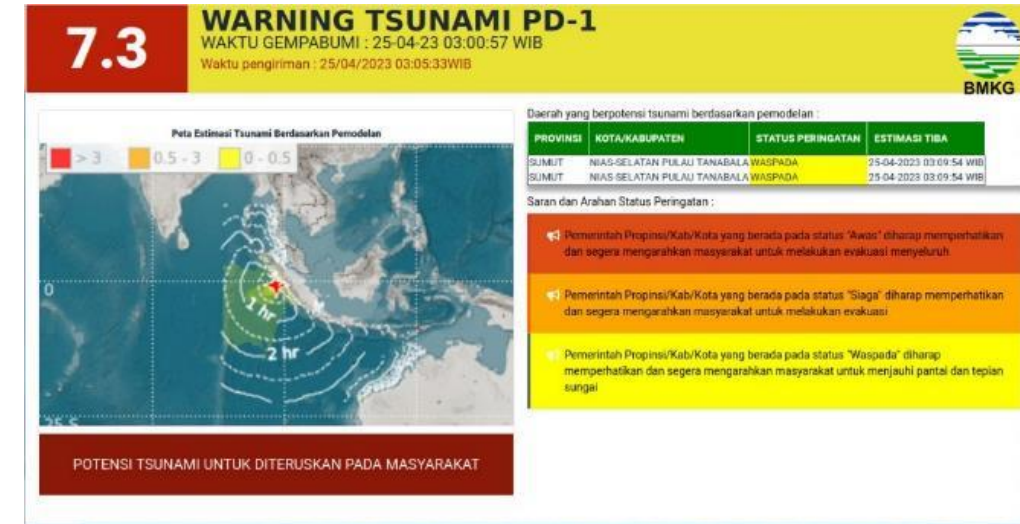
LESSON LEARNT FROM TSUNAMI READY COMMUNITIES DURING THE 25 APRIL EARTHQUAKE AND TSUNAMI WARNING IN PADANG

Earthquake and Tsunami Warning:

- On Tuesday 25 April 2023, 03:00:57 Western Indonesian Time, the M 7.3 earthquake occurred with a tsunami warning proposal.
- It struck West Sumatra and North Sumatra for more than one minute. BMKG disseminated the earthquake information using Warning Receiver System (WRS) on the short and long text format, which blast through multimode mobile phone, public display, social media, telegram, WhatsApp, and others.

Lesson Learnt from Purus and Lolong Belanti Tsunami Ready Communities:

- Responded well based on capacities built through 12 Tsunami Ready indicators
- Conducted self-evacuation protocols
- Well-aware of tsunami evacuation plans, routes, and evacuation sites
- Vulnerable people evacuated by their family and assisted by Local Disaster Ready Group
- Understanding about hazard in their area reduced panic.
- Although there was no significant tsunami (detected only 11 cm), community accepted action taken was necessary



MAINSTREAMING TSUNAMI READY FOR COASTAL RESILIENCE

- **Implementing Tsunami Ready to critical infrastructure:** The Yogyakarta International Airport (YIA) in South Java, Ngurah Rai, Minangkabau International Airport). The YIA facilitate a shelter evacuation for the Tsunami Ready Community of Glagah
- **Collaborative works with Private Sector** such as tourist management (Hotel): The community of Tanjung Benoa Village-Bali has a support from the hotel to utilize the hotel's roof top for evacuation place.
- **Implementing Tsunami Ready for the Industrial Estate:** develop the Standard Operating Procedures and other communication chain, Tsunami Hazard map, Simulation, Capacity Development activities. The Industrial Estate facilitated the Siren, Assembly Point, and Evacuation Sign for the fishing community
- **Optimizing the existing program of Coastal Community Preparedness to be focused on Tsunami Ready**



Evacuation shelter for tsunami in the YIA and Hotel that also used by the community surrounding as the evacuation place



PUSAT GEMPABUMI DAN TSUNAMI KEDEPUTIAN BIDANG GEOFISIKA
Jl. Angkasa 1 No. 2, Kemayoran, Jakarta 10770
Telp. (021) 424 6322 | Fax. (021) 424 6703

"SEKOLAH LAPANG GEMPABUMI"

METODE

1. Paparan tentang potensi gempa bumi dan tsunami serta kesiapsiagaan menghadapinya
2. Diskusi kelompok mengidentifikasi peran masing-masing kelompok
3. Table Top Exercise (TTX) Simulasi dengan skenario gempa bumi dan tsunami

TUJUAN & SASARAN

Tujuan: Meningkatkan peran BPBD dan pemangku kepentingan di daerah sebagai simpul komunikasi agar dapat memahami informasi gempa bumi dan peringatan dini tsunami dan BPBD

Sasaran: BPBD, Masyarakat, Sekolah, Aparat dan Media di wilayah rawan gempa bumi dan tsunami.

MANFAAT

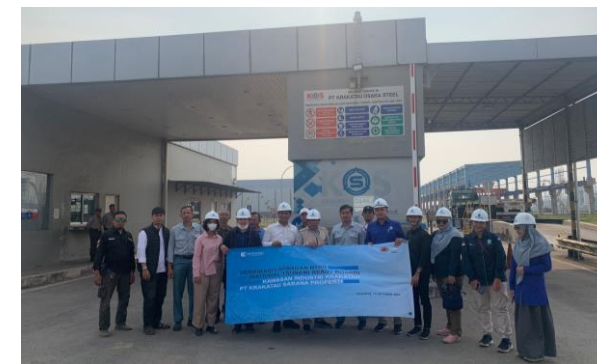
- BPBD dan pemangku kepentingan memahami informasi gempa bumi dan peringatan dini tsunami dan BPBD
- Masyarakat siaga dan tanggap terhadap ancaman gempa bumi dan tsunami di wilayahnya
- Media dapat berperan dalam serta peringatan dini tsunami

PELAKSANAAN SLG

2015	10 Kota / Kabupaten
2016	23 Kota / Kabupaten
2017	1 Kota
2018	2 Kota
2019	30 Kota / Kabupaten
2020	1 Kota / Kabupaten
2021	30 Kota / Kabupaten
2022	10 Kota / Kabupaten

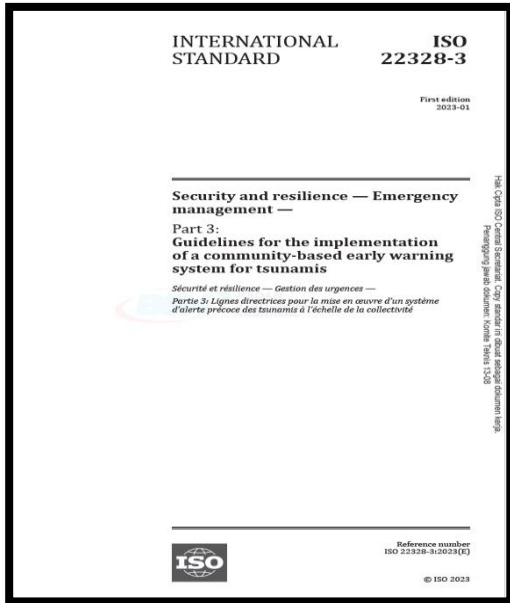
114 LOKASI

Sekolah Lapang Gempabumi dan Tsunami, Existing Community Preparedness program is now focusing on Tsunami Ready



Tsunami Ready in Krakatau and Cilacap Industrial Estate

ISO22328-3: ENFORCE THE IMPLEMENTATION COMMUNITY-BASED TSUNAMI EARLY WARNING SYSTEM



- The ISO of a Community-Based Tsunami Early Warning System, is a practical instrument **to be referred by Private Sector as well as Cities prone to tsunami** to develop the Tsunami Early Warning System as a part of Tsunami Ready Community program
- As recommendation of ISO Annual Meeting in Sydney that **ISO need to promote for reaching the wide implementation. The implementation of ISO would be monitored by ISO Secretariat.**
- On 26 November – 1 December 2023, **BMKG has already promoted ISO 22328-3:** Guideline for the Implementation of Community-Based early warning system for tsunami to Pacific Tsunami Early Warning System (PTWC) and International Tsunami Information Center (ITIC) in Hawaii.

FUTURE ACTIVITIES

- Development SOP for evacuation for Disability inclusive higher education for tsunami disaster risk reduction (Research grant from British Council)
- Special Issue Journal to response the Ocean Decade Challenges - will be launched call for paper in March 2024 and publish during UNESCO IOC Global Tsunami Symposium
- Initiating the trail run of TSP messages for the maritime community in co-ordination with Secretariat & NAVAREA operators
- Creating a Standard Operating Procedure (SOP) document for dealing with non-seismic sources of tsunamis, specifically focusing on Tsunami-Generating Volcanic Events (TGVVs)
- Monitoring and Evaluation Tsunami Ready Recognition Program Implementation
- Synergizing the local and national resilient program
- Continue to implement Tsunami Ready for the critical infrastructure
- Coordinate with the 5 Member States of NWIO to implement the Tsunami Ready
- Tsunami Ready Training for SID's and LDC's (Maldives and Srilanka)

2nd UNESCO IOC GLOBAL SYMPOSIUM Banda Aceh, 11-14 November 2024

- To commemorate the 20th years of the Indian Ocean Tsunami
- Open for public
- Activities:
 - Symposium and Poster Session
 - Exhibition and Ignite Stage
 - Video Competition
 - Tsunami Ready Inauguration including 4 communities from Aceh



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World Heritage
Organization

BMKG
Badan Meteorologi, Klimatologi,
dan Geofisika

IUGG
International Union of
Geodesy and Geophysics

2nd UNESCO IOC Global Tsunami Symposium

**Two Decades After 2004
INDIAN OCEAN TSUNAMI**

**Reflection and the
Way Forward**

Monday 11th - Thursday 14th November 2024
in BANDA ACEH, INDONESIA

AIMS AND SCOPE

Aims:

- ◆ To commemorate two decades after 2004 Indian Ocean Tsunami
- ◆ To reflect what has been achieved in two decades
- ◆ To identify gaps, challenges and priorities for tsunami early warning
- ◆ To identify synergy with global challenges and coherence with global commitments
- ◆ To gather global tsunami community

Scope:

- ◆ Session 1-6 (Day 1 and 2) are open to public.
- ◆ Day 3 : Field Trip to Tsunami Museum and Tsunami Ready Community Village to witness Tsunami Drill.
- ◆ Session 7-8 (Day 4) aims to formulate the way forward and identify actions.
- ◆ Invited speakers for the sessions will be nominated/selected from global and local prominent academia, engineers, practitioner, politician and public figures.
- ◆ Day 1 and 2 with anticipated 800 participants, who can express or give intervention during discussion.
- ◆ Day 4 is for the invitation only, anticipated 100 participants.
- ◆ Several side events:
 - Exhibitions, - Poster Sessions,
 - Ignites Stage, - Rumah Resilience,
 - Local elementary school drawing competition will be organized by IABI and USK.
 - Global Video Competition for youth (high school) will be organized by IOTIC-BMKG.
 - Open access edited book "Two Decades After 2004 Indian Ocean Tsunami: Reflection and the Way Forward", drawing upon inputs from each session - editor HPR, DA and RH.
 - Tsunami Ready Inauguration.

ISSUES AND CHALLENGES

- Developing SOP of the non seismic tsunami
- Providing information for maritime communities through the NAVAREA Coordinator
- Guidance in evacuation/receiving tsunami warning for implementation of Tsunami Early Warning For All including the vulnerable group, and Communities at remote area
- Mainstreaming the Tsunami Ready Implementation to get more collaboration (Critical Infrastructure, Industrial Zone, Private Sector, Tourism Management/hotel)
- Multi-Hazard Exercise to implement in the IOWave/PacWave
- Regional Exercise

THANK YOU