



## Exercise IOWave23 – Report Task Team

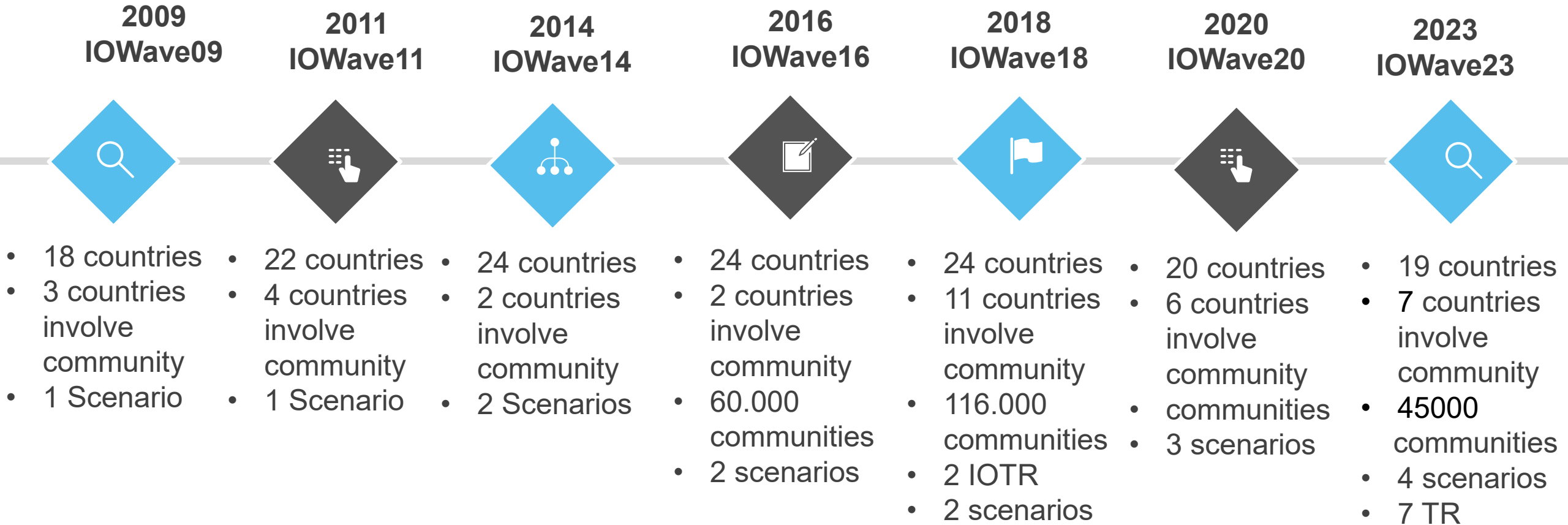
**Ms. Weniza - BMKG**  
*Chair - [weniza@bmkg.go.id](mailto:weniza@bmkg.go.id)*

**Dr. Ajay Kumar, INCOIS, India**  
*Vice Chair - [ajay@incois.gov.in](mailto:ajay@incois.gov.in)*

*Acknowledgements:*

*Rick Bailey and Nora Gale (Secretariat of ICG/IOTWMS UNESCO-IOC)*

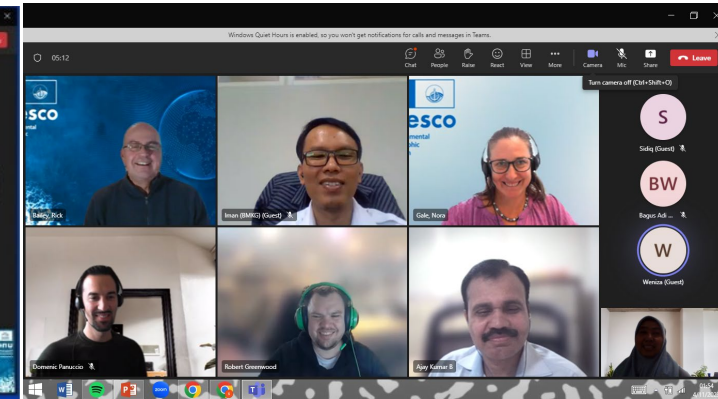
# Milestone of IOWave



# IOWave23 Task Team



- **Ms. Weniza**, BMKG, Indonesia – Chair
- **Dr. Ajay Kumar**, INCOIS, India – Vice Chair
- **Ms. Kate Parkey**, Australia – Member
- **Mr. Domenic Panuccio**, Australia – Member
- **Mr. Khalid Al-Wahaibi**, Oman
- **Mr. Ameer Hyder**, Pakistan - Member
- **Mr. Tariq Ibrahim**, Pakistan - Member
- **Dr. Ali Khoshkholgh**, Iran - Member
- **Mr. Sidiq Hargo**, Indonesia - Member
- **Ms. Gloria Simangunsong**, Indonesia – Member
- **Mr. Bagus Adi Wibowo**, Indonesia – Member
- **Mr. Ardito**, IOTIC - Member



- **TT Meeting** – 4 April, 15 June 2023
- **Meeting with TSP**– 12, 18, 25 April, 30 June 2023

# Term of Reference (ToR)

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Under the direction of Working Group 3 “Tsunami Ready Implementation”:

- Plan and coordinate the next IOWave Exercise (IOWave23), taking on-board suggestions from **the post-IOWave20 lessons learnt workshop including an increased focus on LDMO down to community level and implementation of IOTR.**
- Prepare the Exercise Manual in accordance with the Guideline on "How to Plan, Conduct and Evaluate Tsunami Exercises" (IOC Manuals and Guides No. 58) **at least 6 months in advance of the exercise.**
- Prepare **the Exercise Report for ICG/IOTWMS-XIV.**

The Task Team will report to Working Group 3 and work in collaboration with Working Group 1, Working Group 2 and IOTIC and be composed of members nominated by member states and representative from TSPs, with a chairperson and vice-chairperson.

# Purpose

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- To evaluate and improve **the effectiveness of the IOTWMS**, through its operational TSPs, NTWCs, NDMOs and LDMOs, in responding to a potentially destructive tsunami.
- To test their **operational lines of communications**, to **review their tsunami warning and emergency response SOPs**, and to **promote emergency and community preparedness**.

# Objectives are to validate:

1. **Procedures in place to ensure tsunami warnings get to all in the community, including those with disabilities, all genders, elderly, and youth.**
2. Level of community **awareness, preparedness, and response.**
3. SOPs within countries for **generating and disseminating tsunami warnings** to their relevant emergency response agencies, other authorities, media, and the public.
4. SOPs within countries for **the issuing of public safety messages, ordering evacuations and where possible issuing all-clear messages.**
5. **Dissemination by TSPs of Tsunami Bulletin Notification Messages to NTWCs** via Tsunami Warning Focal Points (TWFPs) of Indian Ocean countries and the reception by NTWCs of the TSP messages.
6. **Access by NTWCs to the tsunami bulletins and other products on the TSP websites**, and the use of that information to produce national warnings.
7. **Reporting by NTWCs to the TSPs of their National Tsunami Warning Status.**
8. **Receipt and understanding by NTWCs of new TSP service for tsunamis generated by non-seismic and complex sources.**

# Exercise Involvement

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The following organisations were involved in the Exercise:

- Tsunami Service Providers (TSPs)
- National Tsunami Warning Centres (NTWCs)
- National Disaster Management Organisations (NDMOs)
- Local Disaster Management Organisations (LDMOs)
- Media Organisations
- Local Communities

# Participation Level

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- Member States are invited **to participate in at least one scenario** or all **scenarios** (if country fall under threat);
- Member States are encouraged **to conduct community evacuations**;
- All Member States, particularly those piloting the Programme, are encouraged **to use the UNESCO-IOC Tsunami Ready guidelines and indicators to guide their community preparation for IOWave23 exercise.**

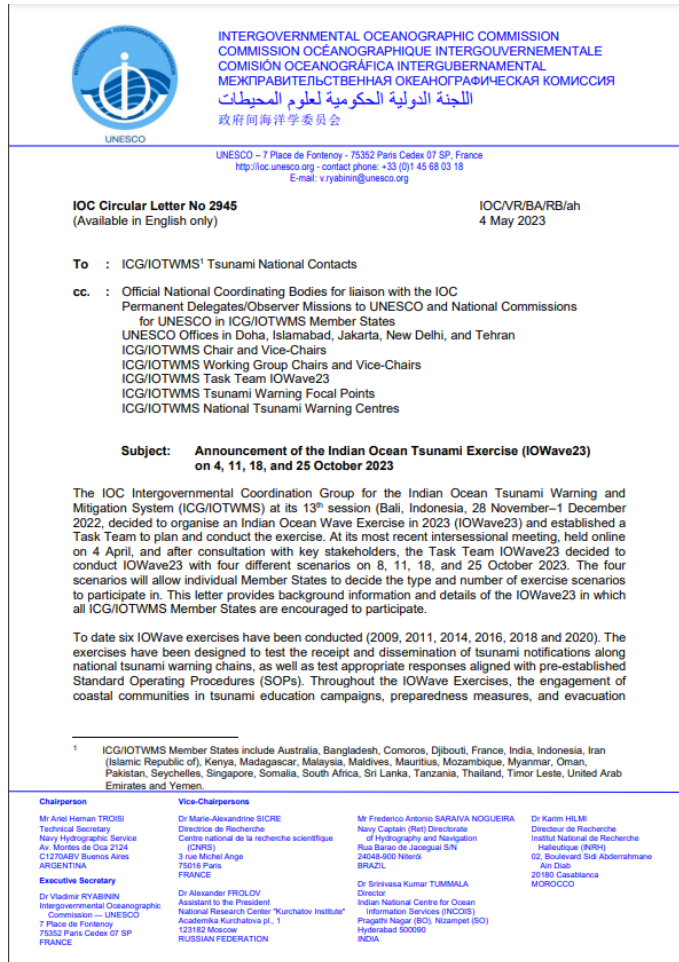


# IOWave23 Check List & Timelines



• <a href="#">1. Announcement by IOC Circular Letter 2945</a>	May 2023
• Set up IOWave23 Exercise National Coordination Committee involving NTWC, LDMOs, NDMOs, and all other important stakeholders including private industry participants.	May 2023
• Decide on level of participation and identify communities for evacuation (where applicable).	May 2023
• Assign agency roles including exercise controller, key participants, and observers.	May 2023
• <a href="#">2. Nominate a National Contact for IOWave23.</a>	May 2023
• <a href="#">3. Issue of IOWave23 Exercise Manual by the Secretariat.</a>	May 2023
• Secure funding and support for community activities.	Ongoing
• Develop a National IOWave23 Exercise Manual to plan/guide activities, including those at community level.	May 2023
• Address indicators of UNESCO-IOC Tsunami Ready Recognition Programme or similar national initiative (where appropriate).	Ongoing
• Share IOWave23 Exercise in-country participation plans with the ICG/IOTWMS Secretariat.	June 2023
• <a href="#">4. UNESCO-IOC Standard Operating Procedure (SOP) Training Workshops (regionally online and nationally face-to-face).</a>	July - August 2023
• Organise and hold pre-exercise national workshop(s) and meeting(s) with key stakeholders including media.	August – September 2023
• Ensure Standard Operating Procedures are in place and up to date.	August – September 2023
• Prepare a media press release.	One week before the Exercise
• <a href="#">5. Participate in IOWave23 Exercise.</a>	4 / 11 / 18 / 25 Oct. 2023
• Hold post-exercise hot and cold debriefs.	After the Exercise
• Complete the IOWave23 online post-exercise evaluation.	November 2023
• Revise and improve SOPs in accordance with lessons learnt during the Exercise.	After the Exercise
• <a href="#">6. IOC-UNESCO Post-IOWave23 Exercise Lessons Learnt Workshop (online).</a>	December 2023

# 1/2. IOC Circular Letter 2945: Announcement of the Indian Ocean Tsunami Exercise (IOWave23) on 4, 11, 18, and 25 October 2023



The Circular Letter announcing Exercise IOWave23 was issued on 4 May 2023.

It requested all Tsunami National Contacts to nominate one **National Contact to IOWave23** to oversee completion of **post-exercise evaluation**.

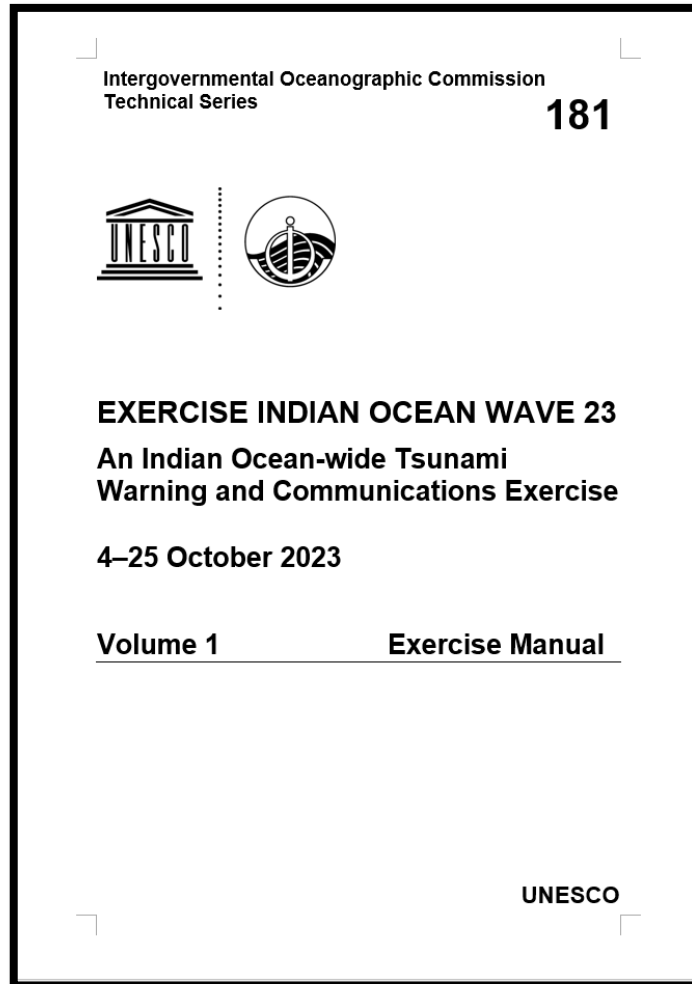
## Nominations received from:

Australia, Bangladesh, France, India, Indonesia, Iran, Kenya, Madagascar, Malaysia, Malaysia, Maldives, Mauritius, Mozambique, Myanmar, Oman, Pakistan, Seychelles, Singapore, South Africa, Sri Lanka, Tanzania, Timor-Leste, and United Arab Emirates **(23 Countries)**

## Nominations not received from:

Comoros and Yemen (2 Countries).

# 3. Manual & Supplements



- The IOWave23 **Exercise manual** was completed in July and the **Supplements (4)** were completed in August 2023.
- The **manual** provides an overview *Purpose, Objectives, Scope, Exercise Success Criteria, Types of Exercise, Scenarios, Dates, Checklist of Activities for Member States, Exercise Evaluation, Exercise Observers*
- The **supplements** contain all TSP bulletins and products
- All information and documents was **be made available on the exercise website:**

<https://oceanexpert.org/event/3916>

## 4. Pre-IOWave23 Briefs for Member States

Exercise IOWave23 briefs were provided to all Member States as part of the Standard Operating Procedure workshops in July and August 2023 -- Training Workshop on Standard Operating Procedures for National Tsunami Warning Centres and Disaster Management Organisations (online),

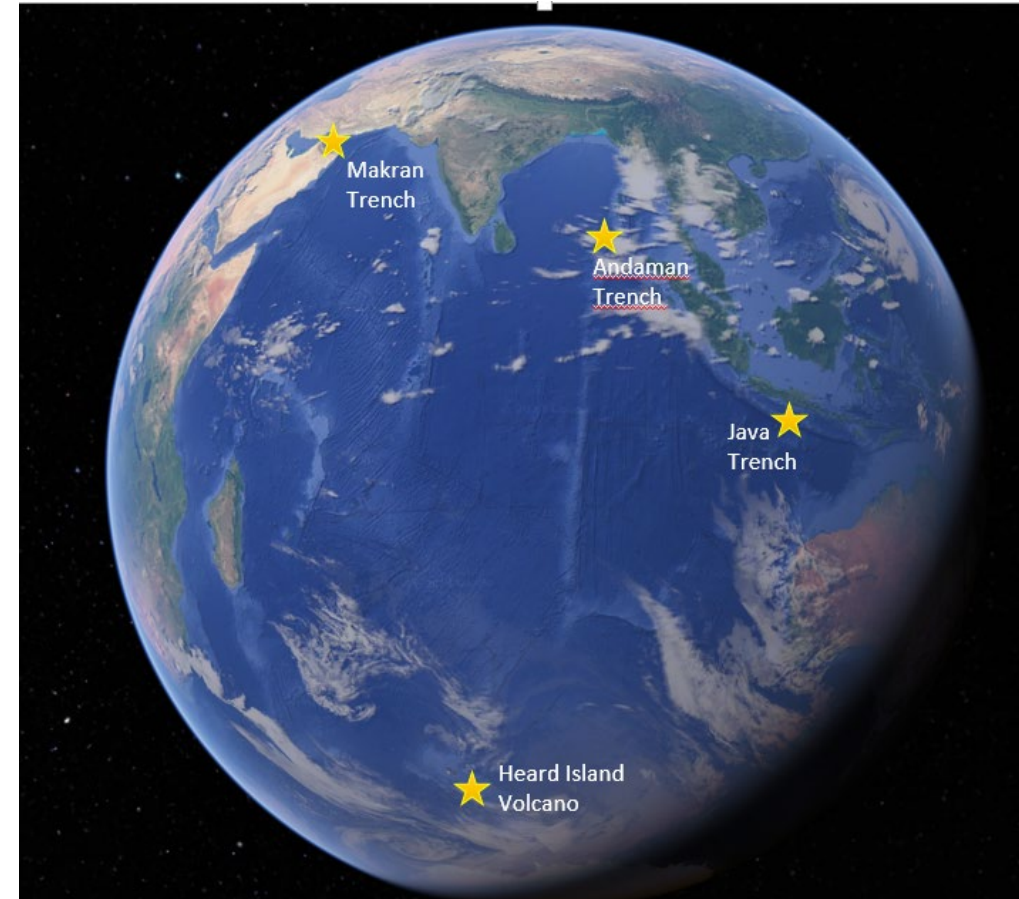


The workshops included information on:

- Exercise IOWave23 and scenarios
- New TSP Products for tsunamis generated by tsunami and complex sources
- Accessing products on TSP websites
- Participation of DMOs and communities in Exercise IOWave23
- How to plan, conduct and evaluate exercises

# Summary of Achievement : Exercise IOWave23

- Exercise IOWave23 was successfully conducted on 4, 11, 18, and 25 October 2023.
- The 3 IOTWMS Tsunami Service Providers of Australia, India, and Indonesia issued tsunami bulletins **in real-time**.
- Exercise Indian Ocean Wave 2020 contained **four earthquake scenarios with all scenarios run in real-time** (Andaman Trench, Makran Trench, Heard Island and Java).
- At least **7 active Indian Ocean Member States** involve **Communities**. At least 9 countries have procedures in place to ensure tsunami warnings including **those with disabilities, all genders, elderly, and youth**.
- **19 IOTWMS Member States** completed the online survey: Australia, Bangladesh, France (Indian Ocean Territories), India, Indonesia, Iran, Madagascar, Maldives, Mauritius, Myanmar, Oman, Pakistan, Seychelles, Singapore, South Africa, Sri Lanka, Tanzania, Thailand, and United Arab Emirates – (Kenya, Malaysia, Mozambique, Timor Leste)



# IOWave23 Scenario

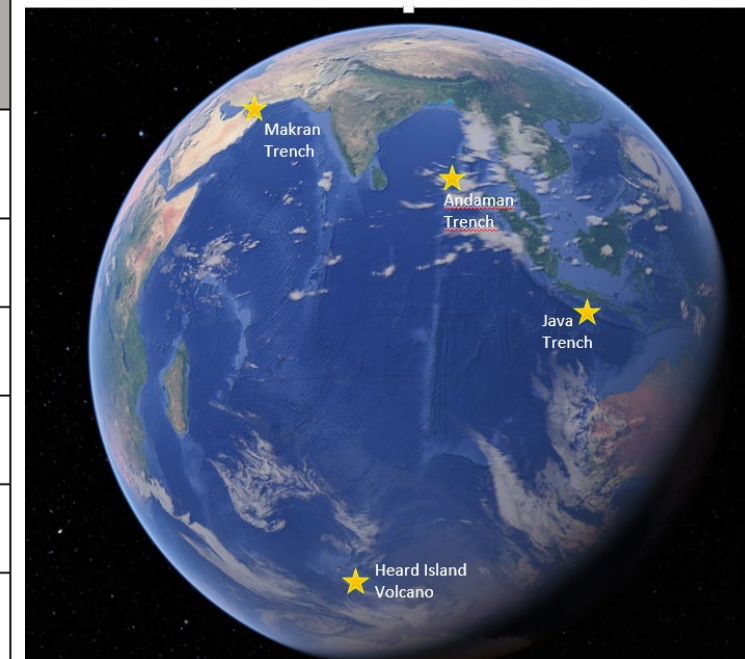
Scenario	1. Andaman Trench	2. Makran Trench	3. Heard Island Volcano	4. Java Trench
Date	4 October 2023 (Wednesday)	11 October 2023 (Wednesday)	18 October 2023 (Wednesday)	25 October 2023 (Wednesday)
Time	04:00 UTC	06:00 UTC	06:00 UTC	02:00 UTC
Magnitude	~M9	~M9	n/a	~M9
Depth	10 km	10 km	n/a	10 km
Latitude	7.20N	24.80N	53.10S	10.40S
Longitude	92.90E	58.20E	73.52E	112.80E
Location	Off west coast of Nicobar Islands, India	North-West Indian Ocean	Kerguelen Islands Region, Southern Ocean	South of Java, Indonesia

25 countries  
under threat

20 countries  
under threat

20 countries  
under threat

19 countries  
under threat



# Participation

*IOTWMS Member States participation in the scenarios included:*

## 1. Andaman Trench Scenario

Bangladesh, India, Madagascar, Myanmar, Seychelles, Singapore, Sri Lanka, Thailand (8 Member States)

## 2. Makran Trench Scenario

India, Iran, Oman, Pakistan, United Arab Emirates (5 Member States)

## 3. Heard Island Scenario

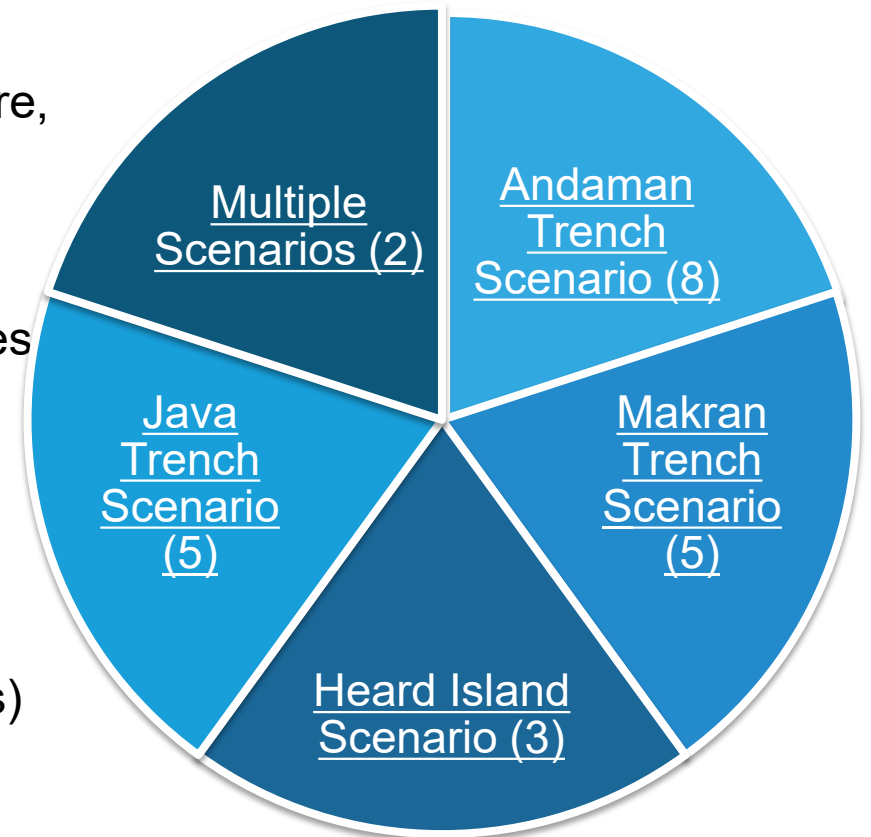
Australia, South Africa, Tanzania (3 Member States)

## 4. Java Trench Scenario

Australia, France, Indonesia, Maldives, Mauritius (5 Member States)

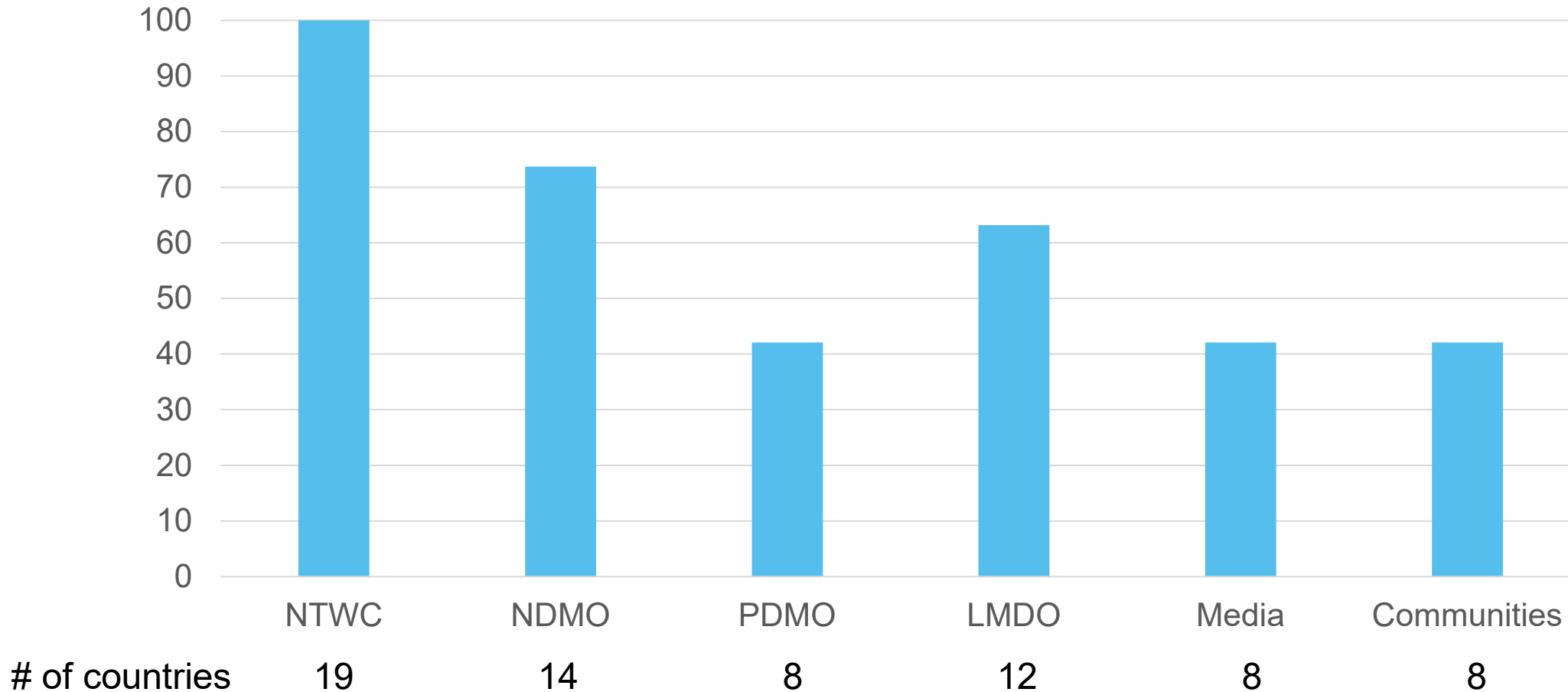
## 5. Multiple Scenarios

Australia, India (2 Member States)



# Stakeholder Involvement

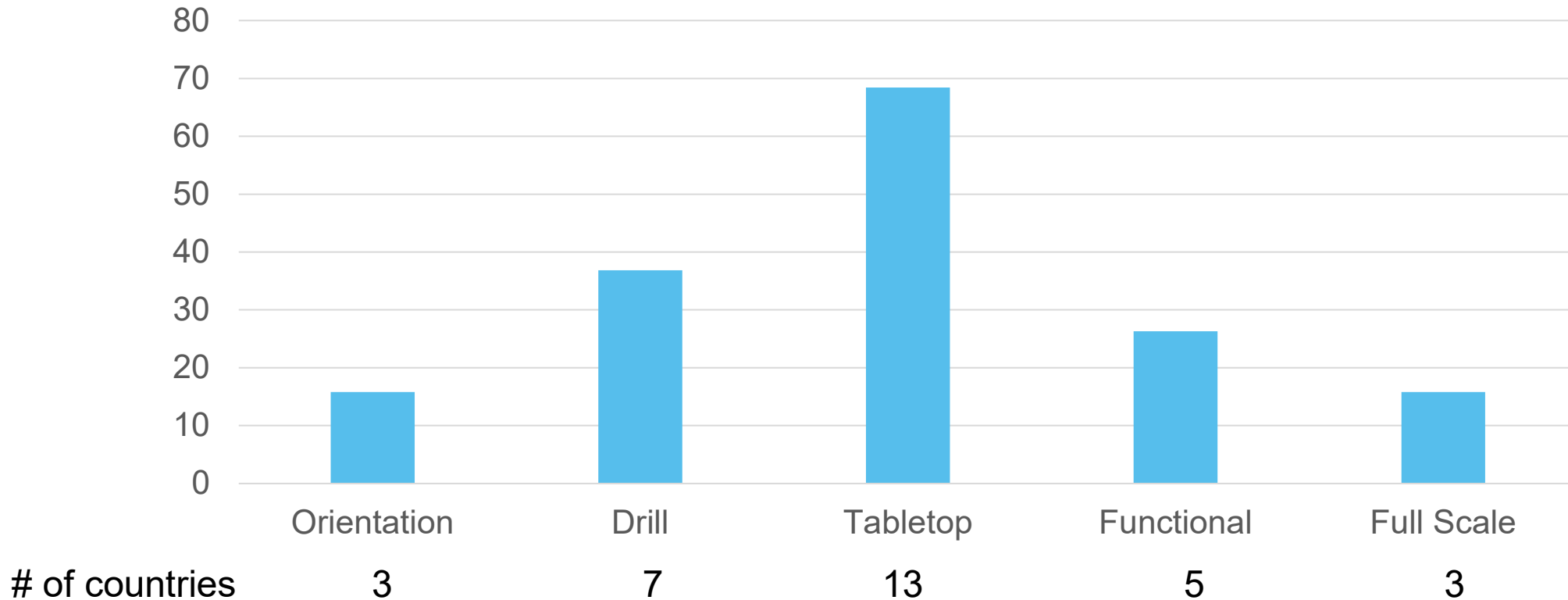
% Countries involving different Stakeholders





# Types of Exercises Conducted

% of Countries participating in each Exercise Type



# Receipt of TSP notification messages

TSP Notification Messages		Received in Time	Received Late	Not Received	Total MS Reporting
TSP-Australia	GTS	94%	0%	6%	16
	Fax	21%	21%	57%	14
	Email	88%	6%	6%	16
	SMS	53%	0%	47%	15
TSP-India	GTS	86%	7%	7%	14
	Fax	58%	0%	42%	12
	Email	93%	0%	7%	14
	SMS	54%	0%	46%	13
TSP-Indonesia	GTS	93%	0%	7%	14
	Fax	31%	15%	54%	13
	Email	86%	7%	7%	14
	SMS	42%	17%	42%	12

*Member State contact details for receipt of TSP notification messages should be verified (Secretariat).*

GTS and Email showed high rates of receipt while fax while SMS showed low rates of receipt across all Tsunami Service Providers.

These results are consistent with the June 2023 communications test.



# Inclusive Tsunami Warning & Mitigation

## *“Early Warnings for All”*

- **At least nine (9) IOTWMS Member States** have **procedures in place to ensure tsunami warnings** get to all in the community including those with disabilities, all genders, elderly, and youth.
- **Of the eight (8) countries** that held **pre-exercise awareness activities**, 75% (6) reported that the activities catered for people with disabilities, all genders, elderly, and youth.
- **Of the nine (9) countries with evacuation maps**, 78% (7) reported the maps account for evacuation of disabled persons, all genders, elderly, and youth.



# Evacuations

At least seven (7) IOTWMS Member States held community evacuations including **India, Indonesia, Iran, Maldives, Mauritius, Sri Lanka, and the United Arab Emirates**

1. **India:** Over **40,000** people from around **42 coastal villages**, including community members, school students, and the elderly, were evacuated to shelters/safe places during the Andaman trench scenario.
2. **Indonesia:** **11 coastal provinces** participated in the Java trench scenario with the evacuation of over **1,650** community members.
3. **Iran:** About **500** people in **Chabahar and Jask** undertook community evacuations during the Makran trench scenario.



## Evacuations cont.

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- 4. Maldives:** In **Baa Kendhoo** evacuations of community members including vulnerable groups took place during the Java scenario.
- 5. Mauritius:** Evacuations were carried out at **Quatres Soeur and Riviere Des Galets** where about **100** people including adults, children, elderly, and disabled people moved to higher ground. In Rodrigues, about 200 people were evacuated from Gravier, St Francois, and Pointes Coton.
- 6. Sri Lanka:** Nearly **2,000** people participated in community and school evacuations. The communities of **Pudawaikkadu Village, Maruthankudah Village, and Sagarapura Village** (Trincomalee District) included persons with disabilities, pregnant and lactating mothers, elderly, and children in the drill.
- 7. United Arab Emirates:** An evacuation exercise was held in **Al Righailat area in the Emirate of Fujairah**. In total, approximately **500** people participated including residents, visitors, local authorities, and non-governmental organisations. Participation included all community categories: men, women, children, elders, youth, and people with disabilities.

# Community Evaluation of Tsunami Ready Indicators

At least **seven (7) IOTWMS Member States** used Exercise IOWave23 as an opportunity to evaluate the UNESCO-IOC Tsunami Ready indicators in communities.

1. **India: 32 communities in Odisha**
2. **Indonesia: 7 communities: 1) Serangan Bali, 2) Cikakak Jawa Barat, 3) Pangarangan Banten, 4) Glagah Yogyakarta, 5) Kemadang Yogyakarta, 6) Sidaurip Jawa Tengah, 7) Tambakrejo Jawa Timur**
3. **Iran: Jask**
4. **Maldives: B. Kendhoo**
5. **Sri Lanka: 1) Senthoor Grama Niladari and 2) Jayanara Grama Niladari**
6. **Thailand: 1) Banaownang Tambon Aow Nang Meung District, Krabi Province and 2) Bannamkem, Tambon Bangnuang, Takua Pa District, Phang Nga Province**
7. **United Arab Emirates: Al Righailiat**



# Media Engagement



## INCOIS to lead tsunami mock exercise tomorrow

**IOWave23 to finetune tsunami preparedness**

CITY BUREAU  
Hyderabad

Hyderabad-based Indian National Centre for Ocean Information Services (INCOIS), along with several other countries in the Indian Ocean, is all set to take part in a tsunami mock exercise titled 'IOWave23' on October 4.

As part of the mock exercise, the tsunami early warning system of INCOIS will issue test tsunami bulletins through various modes of communication channels to all its stakeholders at national and regional

**“These exercises will help us fix any gaps in warning chains and be fully prepared for future events”**

DR T SRINIVASA KUMAR,  
Director, INCOIS

In India, the IOWave23 mock exercise is being coordinated by INCOIS in association with the National Disaster Management Authority (NDMA). All the disaster management organisations (DMOs) of coastal States/Union Territories, Navy, Coast Guard, and National Disaster Response Force (NDRF), personnel from critical installations such as nuclear power plants, port and harbours will participate in the exercise. “These exercises will

uate response capabilities in each State and improve co-ordination throughout the region.

## NEWS FROM OUR MEMBER STATES



## INCOIS TO SIMULATE EARTHQUAKES ON EITHER COAST TO TEST TSUNAMI PREPAREDNESS



**Tsunami Safety Evacuation Rehearsal**

**National Tsunami Disaster Evacuation Rehearsal will be held on 04<sup>th</sup> of October 2023.**

**9.30 to 11.30 AM**

**in Trincomalee, Galle and Matara districts.**

**Call-117**

Disaster Management Centre in an Emergency

Sponsored by: Ministry of Defence, Disaster Management Centre, World Vision, UNICEF, UN Women, UN Women Trust Fund, UN Women Emergency Fund, UN Women Rapid Response Fund, UN Women Resilient Communities Fund, UN Women Women's Empowerment Fund, UN Women Gender Equality Fund, UN Women Gender Equality Fund, UN Women Gender Equality Fund.

NDMA Maldives @NDMAmv · 22h

As part of our preparations for the #IOWave23 Tsunami Drill, we conducted a vital session yesterday, imparting knowledge to students, parents, and teachers in B. Kendhoo. Safety is at the forefront of our mission.



USAID Maldives

**الفرق بين أمواج تسونامي وأمواج البحر الشائعة**

**أمواج تسونامي**

**سبب الحدوث:** الهزات القوية البركانية، وبعض الحالات الجوية المفجعة

**سرعة الموجة:** العميقة (900-700) كيلو/ساعة، بالقرب من الشاطئ (30-90) كيلو/ساعة

**مدة الموجة:** (5 دقائق - ساعات)

**موقع الطاقة:** بين سطح وقاع المحيط

**أمواج البحر الشائعة**

**سبب الحدوث:** هبوب الرياح على سطح المحيط

**سرعة الموجة:** (8-100) كيلو/ساعة

**مدة الموجة:** (5-20) ثانية

**موقع الطاقة:** على سطح المحيط

9 أكتوبر 2023

**RAYMOND NYAMWIHULA**

**JENISTA MHAGAMA**

**UTAYARI WA NCHI KUKABILIANA NA ATHARI ZA EL-NINO**

**NEWS NAULI - JELA MIKA THELATHINI KWA KUKUTWA NA H**

# Webinar: Lessons Learnt during Exercise IOWave 2023

# Summary

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- ✓ New **non-seismic products by TSP-Australia very useful and encourage further development**, including MS tailoring of national SOPs to be able to utilize
- ✓ Multi scenario very useful to cover the entire MS in tsunami threat
- ✓ Good participation of Member States, with **many positive outcomes and identification of national issues** for urgent correction in case real event happens soon.
- ✓ Encouraging to see **community level engagement in 8 Member States**.
- ✓ Extensive **national stakeholder engagement, including with media**, helped with successful exercise outcomes and greater government and community awareness of the tsunami threat and what to do.
- ✓ Work to finalize a full and extensive exercise report will be undertaken by the Task Team on Exercise IOWave23. This report and further information on IOWave23 will be made available on the IOWave23 portal ([www.iowave.org](http://www.iowave.org))



# Recommendation



1. In terms of exercise planning → to conduct future biennial IOWave exercises at alternative times of the year to allow the full participation of Member States that are occupied **with other hazards during the September and October period** → **Multi hazard exercise** → **UN Ocean Decade White Paper Challenge 6**
2. Member States were encouraged to undertake national exercises and drills in the alternate years, so that exercises of some form are at least undertaken annually → **National exercise or Sub Regional Exercise**
3. In the next IOWave to address and engage **disabilities as one of the objective** – **WG 1**
4. IOWave Exercises should use **scenarios that are suitable for all Member States to participate, 3 scenario and 1 non seismic worked well for coverage** – **WG 2**
5. **The number of communities that involve in IOWave23 would be candidate for next TR** → Iran, Maldives, Sri Lanka, Thailand, United Arab Emirates – **WG 3**
6. **Countinue to maintain IOWave website (iowave.org) and social media -- IOTIC**

# Recommendation

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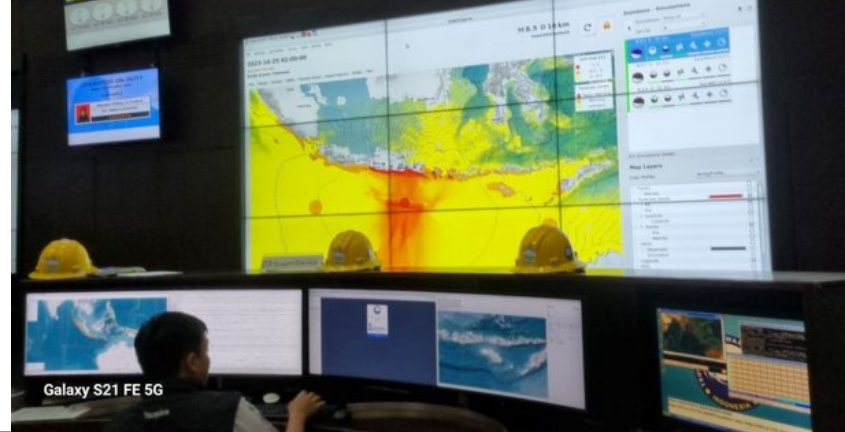
- Recommendations for the upstream components of the tsunami warning system, including the TSPs and NTWCs:
  1. Member States should **regularly review, update, and test contact information on national warning dissemination lists.**
  2. National Tsunami Warning Centers should **review and update Standard Operating Procedures (SOPs) based on lessons learnt during Exercise IOWave23.**
  3. All IOTWMS TSPs should **develop and implement products for tsunamis generated by non-seismic sources.**
  4. As well as the workshops **organized before the exercise to review and update the national tsunami warning chains and SOPs for each link in those chains for each Member States, further detailed training is required for NTWCs on TSP products, including how to deal with differences in predicted wave heights and how to best utilize the new non-seismic generated tsunami products.**

# Recommendation

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- Recommendations for the downstream tsunami warning system, including DMOs, communities, and media:
  1. Further **implementation of UNESCO-IOC Tsunami Ready Recognition Programme, or similar national initiatives**, supported by appropriate resources is urgently required to ensure communities receive warnings and know what to do to meet the goal of UN Ocean Decade Tsunami Programme of 100% at-risk communities prepared and resilient to tsunami threat by 2030, plus UN goal of "Early Warnings for All" by 2027.
  2. Community tsunami awareness and preparedness activities should be **regularly conducted and accommodate all in the community, including all genders, all ages, and those with disabilities**.
  3. Ensure communication between **stakeholders in the national tsunami warning chains is effective**.
  4. DMOs, communities, and media should review and update SOPs based on lessons learnt during Exercise IOWave23.




# THANK YOU



GLADI LAPANG ( DRILL ) & TABLE TOP EXERCISE / 771  
BENCANA TSUNAMI Kabupaten Bantul

**INDIAN OCEAN WAVE 23 (IOWave23)  
EXERCISE**

25 Oktober 2023




**RAYMOND NYAMWIHULA**      **JENISTA MHAGAMA**

**UTAYARI WA NCHI KUKABILIANA NA ATHARI ZA EL-NINO**

**NAULI — JELA MIKA THELATHINI KWA KUKUTWA NA H**

