Intersessional Meeting
Virtual, Wednesday/05 April 2023

Indian Ocean Wave Exercise 20 (IOWave20)

Ms. Weniza, BMKG, Indonesia, Chair IOWave20
Dr. Ali Khoshkholgh, INIOAS,Iran, Vice Chair

Acknowledge : Secretariat ICG/IOTWMS – Mr. Rick Bailey, Ms. Nora Gale –

History of Indian Ocean Exercise

IOWave20

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1 scenario | 2 scenario | 3 Scenario

2009
- **18** countries participate
- **3** counties involve community level

2011
- **22** countries participate
- **4** counties involve community level

2014
- **24** countries participate
- **2** counties involve community level

2016
- **24** countries participate
- **2** counties involve community level
- **60.000** communities

2018
- **24** countries participate
- **11** counties involve community level
- **116.000** communities
- **2 IOTR**

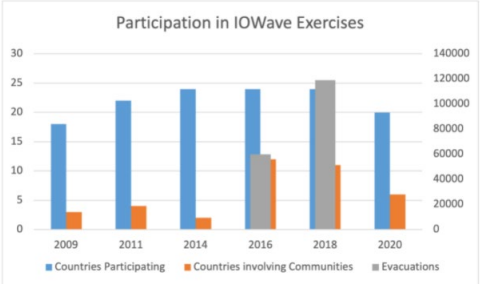
2020
- **20** countries participate
- **6** counties involve community level

Evolution of Ocean Wide Exercises in the Indian Ocean

Nora Gale, Ardito M Kodijat, Weniza, Ali Khoshkholgh, Ajay Kumar Bandela, and Simon Allen

POSTED ON JULY 6, 2021

https://www.ecomagazine.com/in-depth/featured-stories/evolution-of-ocean-wide-exercises-in-the-indian-ocean



IOWave20 Task Team

- **Ms. Weniza**, BMKG, Indonesia – Chair
- **Dr. Ali Khoshkholgh**, INIOAS,Iran – Vice Chair
- **Dr. Simon Allen**, BoM, Australia - Member
- **Mr. Ajay Kumar**, INCOIS, India - Member
- **Badar Al-Rumhi**, Oman – Member
- **Khalid Al-Wahaibi**, Oman – Member
- **Alyaqdhan Al-Siyabi**, Oman – Member
- **Ameer Hyder**, Pakistan - Member
- **Tariq Ibrahim** , Pakistan - Member

Term of Reference (ToR) on IOWave20

- Plan and coordinate the next IOWave Exercise (IOWave20), taking on-board suggestions from **the post-IOWave18 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-XIII.**

The Task Team will report to **the Steering Group and be composed of members nominated by Member States and representatives from TSPs, with a chairperson and vice-chairperson to be elected.**

Objective and Exercise Success Criteria

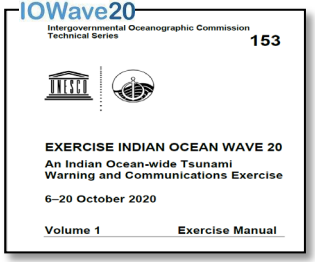
Scale:

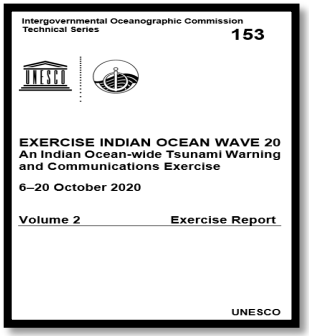
- Due to the ongoing Covid-19 pandemic, the scale of IOWave20 was **reduced in comparison with previous exercises**.
- Member States were encouraged to **test communication protocols and conduct a "virtual" table-top exercise (as a minimum)**
- Emphasis was placed on **updating organizational Standard Operating Procedures, plans and policies for tsunami warning and emergency response during a pandemic.**

Objective:

1. Validate **the 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.
2. Validate **the access by NTWCs to the tsunami bulletins and other products on the TSP websites**, and the use of that information for the production of national warnings.
3. Validate **the reporting by NTWCs to the TSPs of their National Tsunami Warning Status.**

Summary of Achievement





- IOWave20 was held **during the Covid-19 pandemic**, which is affecting countries around the world and in the Indian Ocean region
- Exercise Indian Ocean Wave 2020 was held over two-weeks, **6-20 October 2020 --- 1 week intervals on 6, 13 and 20 October**
- To date **20 Indian Ocean Member States** reported their participation in the IOWave20 evaluation survey.
- At least **6 active Indian Ocean Member States** involve **Communities** with health Covid-19 protocol.
- Exercise Indian Ocean Wave 2020 contained **three earthquake scenarios with all scenarios run in real-time (Java Trench, Andaman Trench and Makran Trench)**
- **For Each scenario, the TSPs issued four tsunami bulletins in real time over a 1-hour period.**
- IOC-UNESCO conducted **on online assessment** that was coordinated in country by the IOWave20 National Contacts.

Scenarios

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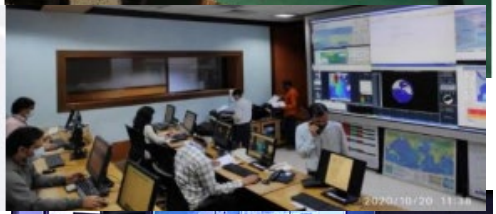
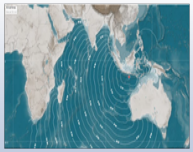


1. Java Trench

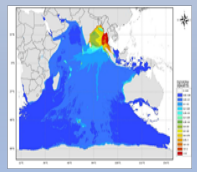
6 October 2020; 03:00 UTC; M9.1; 10 Km; 10.40 S, 112.80 E, South of Java, Indonesia



20 countries under threat

2. Andaman Trench

13 October 2020; 04:00 UTC, M9.2, 10 Km, 12.65 N, 93.50 E, Off West Coast of Andaman Islands, India



18 countries under threat

3. Makran Trench

20 October 2020; 06:00 UTC, M9.0, 10 Km, 24.8 N, 62.2 E, Off Coast of Pakistan

21 countries under threat

Participation (1)

20 IOTWMS active Member States participated

✓12 Member States participated in one scenario

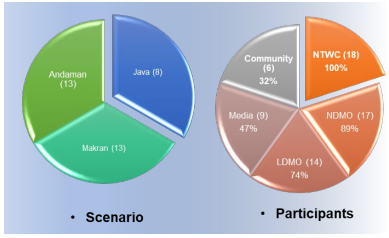
Australia, Comoros, Madagascar, Malaysia, Mauritius, Mozambique, Myanmar, Oman, Singapore, South Africa, Sri Lanka and United Arab Emeriates

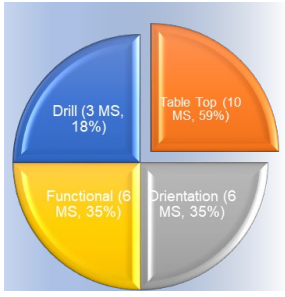
✓4 Member States participated in two scenario

Bangladesh, India, Seychelles and Yemen

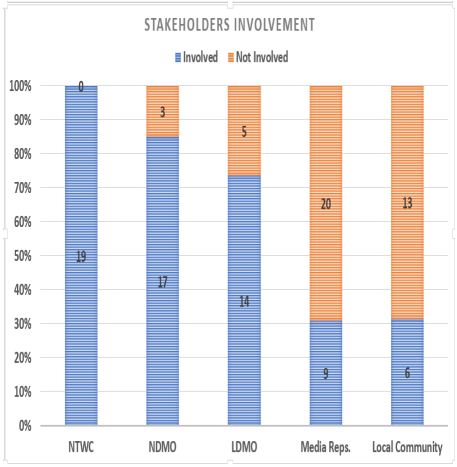
✓4 Member States participated in three scenario

Indonesia, Kenya, Pakistan and Thailand





Participation (2)

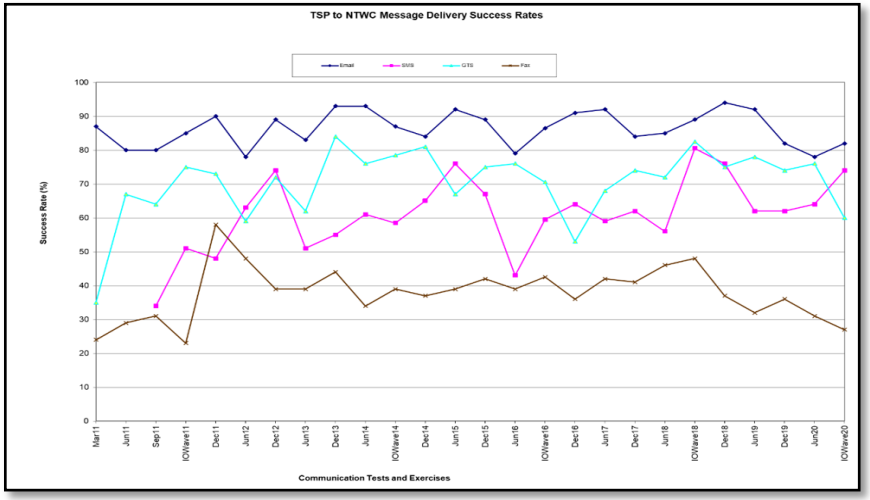


- ✓19 countries (100%) included the National Tsunami Warning Center in the execise,
- ✓17 countries (89%) included national disaster management organizations;
- ✓14 countries (74%) included local disaster management organizations;
- ✓ 9 countries (47%) involved the media,
- ✓ 6 countries (32%) involved the community but not necessarily in evacuations.

TSP to NTWC Message Delivery, Web Access and Status Reporting

Comparison with Previous Exercise and Tests

Message Delivery

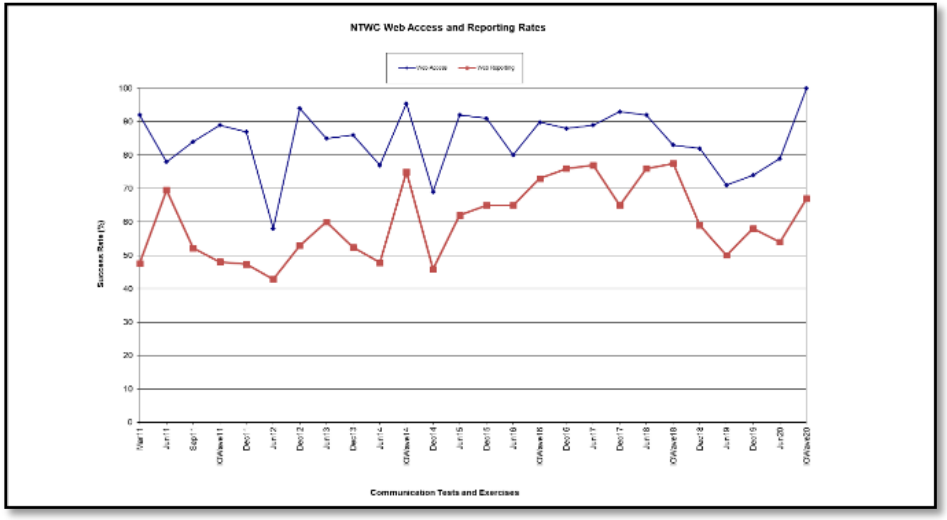


The above findings of the relative strength of each delivery method → **averaging improvement trend across the past exercises and communication tests**, particularly with regard to the SMS delivery method

TSP to NTWC Message Delivery, Web Access and Status Reporting

Comparison with Previous Exercise and Tests

Web access and Status Reporting



All of the reporting Member States (100%) accessed at least one TSP website → **highest access rate achieved to date when examining previous exercises and IOTWMS communication tests**

Timeliness of Message Dissemination – TSP Threat Information used in National Warnings

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Timeliness of Message Dissemination

IOTWS-TSP	Java Scenario (out of total 8 responses)			
	Email	GTS	SMS	Fax
Australia	75%	86%	63%	25%
India	75%	100%	75%	38%
Indonesia	75%	86%	88%	25%
Average	**75%**	**90%**	**75%**	**29%**
IOTWS-TSP	**Andaman Scenario (out of total 12 responses)**			
	Email	**GTS**	**SMS**	**Fax**
Australia	83%	92%	67%	33%
India	75%	92%	58%	33%
Indonesia	75%	83%	75%	25%
Average	**78%**	**89%**	**67%**	**31%**
IOTWS-TSP	**Makran Scenario (out of total 12 responses)**			
	Email	**GTS**	**SMS**	**Fax**
Australia	67%	82%	75%	27%
India	83%	82%	58%	36%
Indonesia	92%	91%	45%	18%
Average	**81%**	**85%**	**60%**	**27%**

TSP Threat Information used in National Warnings

TSP	TSP Tsunami Threat Information	All Scenarios (15 NTWCs reporting)
TSP-Australia	Tsunami Wave Observations	53%
	T1 Predicted Wave Arrival Time	53%
	T2 Predicted Wave Arrival Time	53%
	T3 Predicted Wave Arrival Time	40%
	T4 Predicted Wave Arrival Time	40%
	Predicted Maximum Wave Amplitudes	73%
	Coastal Forecast Zone Threat Levels	33%
	Other	20%
TSP-India	Tsunami Wave Observations	73%
	T1 Predicted Wave Arrival Time	60%
	T2 Predicted Wave Arrival Time	73%
	T3 Predicted Wave Arrival Time	53%
	T4 Predicted Wave Arrival Time	33%
	Predicted Maximum Wave Amplitudes	67%
	Coastal Forecast Zone Threat Levels	53%
	Other	13%
TSP-Indonesia	Tsunami Wave Observations	53%
	T1 Predicted Wave Arrival Time	60%
	T2 Predicted Wave Arrival Time	47%
	T3 Predicted Wave Arrival Time	47%
	T4 Predicted Wave Arrival Time	40%
	Predicted Maximum Wave Amplitudes	80%
	Coastal Forecast Zone Threat Levels	53%
	Other	20%

Community Involvement

- ✓ **Indonesia** → evacuation drill at the New Yogyakarta International Airport involving 120 people → to practice evacuation in a tsunami emergency situation, to test the new dissemination mode WRS New Generation, and to evaluation the airport infrastructure preparedness in case of a tsunami emergency.
- ✓ **Kenya** → involved 3 coastal communities (Kwale, Mombasa, Kilifi). Communities were involved in tsunami→ awareness activities and interviews with key community stakeholders on their tsunami response
- ✓ **Mauritius** → limited simulation exercise at the level of the National Disaster Risk Reduction and Management Centre for a small coastal locality
- ✓ **Seychelles** → community stakeholders Indian Ocean Tuna (staff residence), Eden Island (tourism, marina, commercial), Seychelles Maritime Academy and Seychelles Petroleum Company in a full scale exercise.
- ✓ **Mozambique** and **Thailand** responded to the survey that communities were involved, but did provide details.

Social Media Engagement

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Since 1920s the Oldest Daily...

Daily Telegr

...the Largest Circulating Da

Indian Ocean tsunami mock communication exercise -IOWave-20 successfully conducted by A&N Administration

Test conducted to check disaster management organization's preparedness for tsunami warning and response

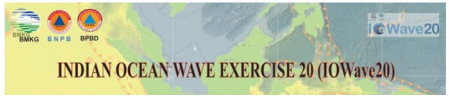
INCOIS participates in mock Tsuna drill

BADAN METEOROLOGI, KLIMATOLOGI, DAN GEOFISIKA

PROFIL CUACA IKLIM KUALITAS UDARA

Tingkatkan Kesiapan Hadapi Tsunami di Masa Pandemi, BMKG Gelar IOWave20

Ibrahim / 07 Okt 2020



Seychelles NATION

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DOMESTIC

DRDM conducts tsunami exercise | 14 October 2020

Bureau of Meteorology
6 October ·

In a year full of virtual events (thanks Covid), Australia has just survived a virtual tsunami

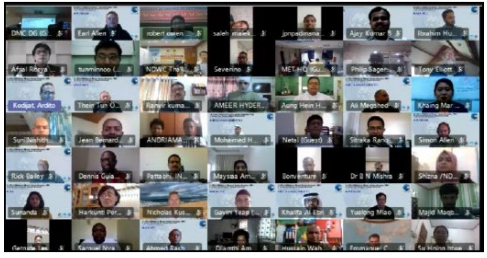
The Joint Australian Tsunami Warning Centre (JATWC) spent yesterday simulating a full-scale tsunami in the Indian Ocean as part of UNESCO's international Indian Ocean tsunami warning exercise involving 23 countries, to test the tsunami warning and response chain.

If a real tsunami ever threatens our shores, you'll find warnings and advice at http://ow.ly/c49350BKvxm... See more

Malagasy Youth for Sustainable Development (MY SD)

7,7 rb suka • 8,3 rb pengikut

Summary of Challenge and Gaps



Member States expressed the difficulty of holding the exercise during the pandemic

- Technical **guide/manual** for exercise in **pandemic situation**
- Virtual exercise proved to be **effective in maintaining the goal of IOWave20 in term of fulfilling objective** but there is no guidance on virtual table top exercise → decrease in term of number participants and technical difficulties
- Pre and post IOWave evaluation which consist of **capacity examination of each countries → to design the future IOWave (may refer to 12 indicators tsunami ready)**

Benefits and Enhancement for Future Exercise

- ✓ Improved preparedness for real earthquakes and tsunami events;
- ✓ Refined and tested standard operating procedures of for the pandemic situation;
- ✓ Validated the NTWC timeline standard operating procedures, tested communication channels and protocols;
- ✓ Exercised tsunami response plans, capacity building of key stakeholders (including first responders);
- ✓ Increased communication and collaboration between related organisations (NTWC-DMO);
- ✓ Event information exchange with neighbouring countries;
- ✓ Evaluation of Tsunami Ready indicators in pilot villages (Odisha State, India).

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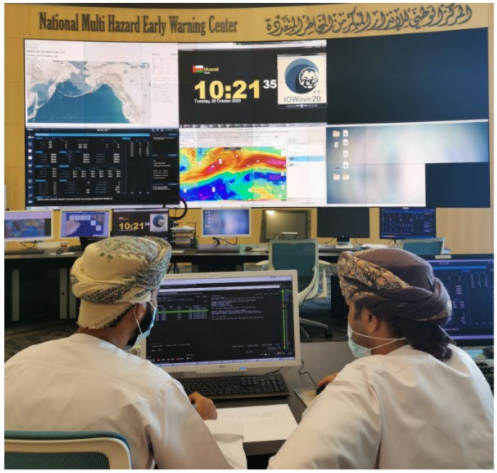
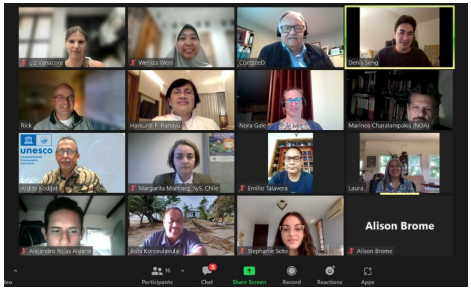
Thank you!
Terimakasih!

Upstream Response



Scientists at the Oman National Multi Hazard Warning Center participate in Exercise IOWave20 (October 2020).

Benefits and Enhancement for Future Exercise



TTDMP Meeting, September 16, 2021

- After coordinating with Pacific (through TTDMP Meeting) next IOWave will be conducted in 2023.
- IOWave Exercises will use 3 scenarios which cover all Indian Ocean Member State and holding the scenarios 1-week a part and conduct in September.
- IOWave will integrate with the implementation of Tsunami Ready Program in local community;
- IOWave technical guide/manual will provide scenario for non tectonic event (related with exercise mechanism etc)

Recommendations for Consideration

- **To consider to use scenarios that are suitable for all Member States** to participate → 3 scenarios worked well – choose one with major impact
- **To consider the period time of exercise** → 1 week apart rather than on consecutive days and **conducted in September/October** → avoid the cyclone season [Australia; India] However, after IOWave18 it was noted that September is inconvenient for some countries due to Monsoon and Floods [Pakistan, India, Sri Lanka] and hot weather [Oman].
- **To Coordinate with PTWS** → to ensure Exercises occur in opposite years [Australia, Indonesia, Timor Leste] PTWS 2022, IOTWS 2023
- **To include International observers** → should be included in future exercises (such as IORA) and virtual observations should be utilized more widely.

Recommendations for Consideration

- To consider informing more to **national leaders of the Exercise in addition to the Tsunami National Contacts.**
- To consider to **implement technical guide/manual** for exercise in pandemic situation.
- To consider guidelines for **conducting virtual table-top exercises.**
- To **encourage to test/verify the UNESCO-IOC Tsunami Ready** Indicators during the Exercise.
- To encourage countries to conduct **regular exercises at least every year between IOWave** → They could align with communication tests.