



Steering Group Meeting
Virtual, Thursday/14 July 2022

INDIAN OCEAN WAVE EXERCISE 20 (IOWave20)

-Report IOWave20 and Plan IOWave23-

Ms. Weniza
Chair IOWave20
weniza@bmqg.go.id

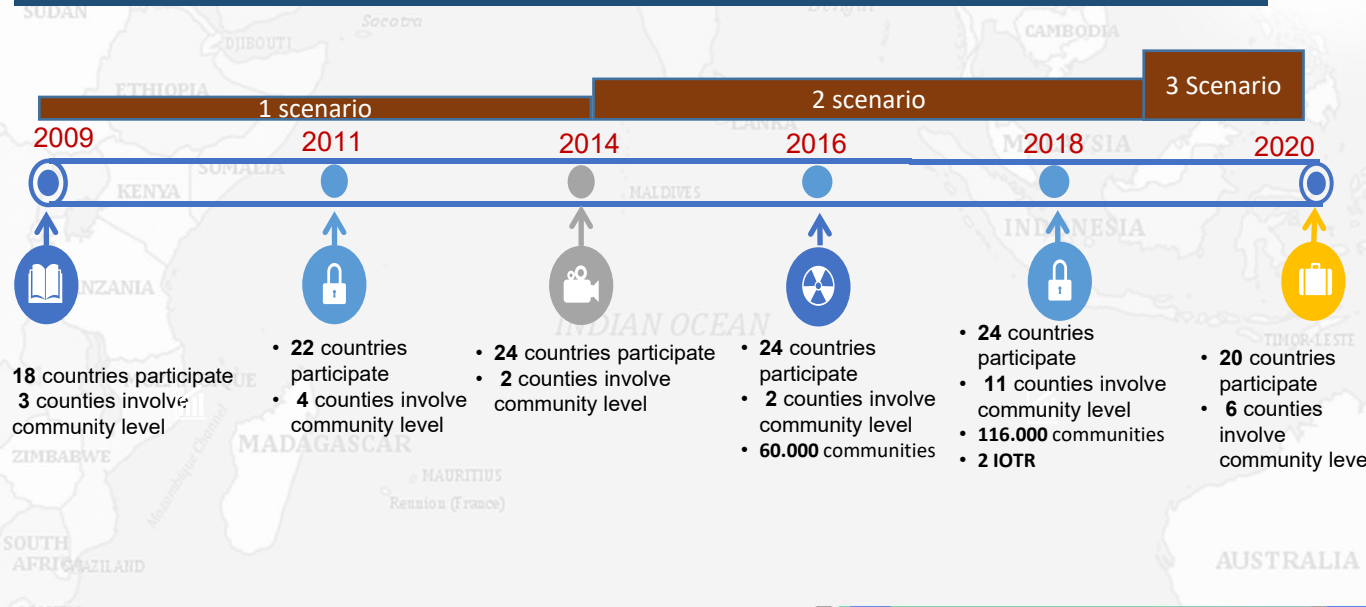
IOWave20 Task Team



- **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



Milestone of IOWave



Summary of Achievement of IOWave20



Intergovernmental Oceanographic Commission
Technical Series **153**



EXERCISE INDIAN OCEAN WAVE 20
An Indian Ocean-wide Tsunami Warning
and Communications Exercise
6–20 October 2020

Volume 2 **Exercise Report**

UNESCO

Evolution of Ocean Wide Exercises in the Indian Ocean

Nitu Guler, Arditio H Kodjar, Weniza, Ali Khoirikhloq, Ajay Kumar Bundeja, and Simon Allen POSTED ON JULY 6, 2021

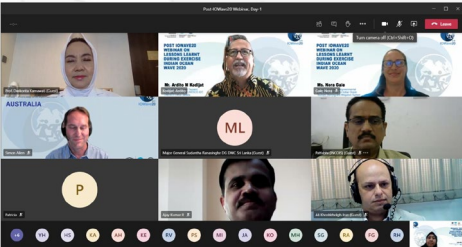


- In the Indian Ocean, Six IOWave Exercises have been conducted in 2009, 2011, 2014, 2016, 2018 and 2020.
- IOWave20 was held **during the Covid-19 pandemic**, which is affecting countries around the world and in the Indian Ocean region
- Exercise Indian Ocean Wave 2020 was held over two-weeks, **6-20 October 2020 --- 1 week intervals on 6, 13 and 20 October**
- Exercise Indian Ocean Wave 2020 contained **three earthquake scenarios with all scenarios run in real-time (Java Trench, Andaman Trench and Makran Trench)--- Each scenario was held in real time over a 1-hour duration.**
- IOC-UNESCO conducted **on online assessment** that was coordinated in country by the IOWave20 National Contacts.
- To date **20 Indian Ocean Member States** reported their participation in the IOWave20 evaluation survey.
- Reported in Ecomagazine UNECO-IOC website

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

AUSTRALIA

Summary of Challenge and Gaps



- **Technical guide/manual** for exercise in **pandemic situation** needs to be developed.
- **Evacuation Response** in pandemic situation needs to be **standardize and applicable for all countries**;
- Virtual exercise proved to be **effective in maintaining the goal of IOWave20 in term of fulfilling objective**, but decrease in term of number participants and technical difficulties.
- IOWave should be **integrated with the implementation of Tsunami Ready Program in local community**;
- 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)**

IOWave20 Recommendations



- IOWave Exercises should use scenarios that are suitable for all Member States to participate, 3 scenarios worked well for coverage.
- Holding the scenarios 1-week apart worked well.
- The Exercise should be conducted in September to 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].
- Coordinate with PTWS to ensure Exercises occur in opposite years [Australia, Indonesia, Timor Leste].
- International observers should be included in future exercises (such as IORA) [India] and virtual observations should be utilised more widely.
- Consider informing more national leaders of the Exercise in addition to the Tsunami National Contacts.
- Document the lessons learnt and changes triggered from the Exercise (i.e. establish a monitoring mechanism).
- Implementing Technical **guide/manual** for exercise in **pandemic situation**

IOWave20 Recommendations



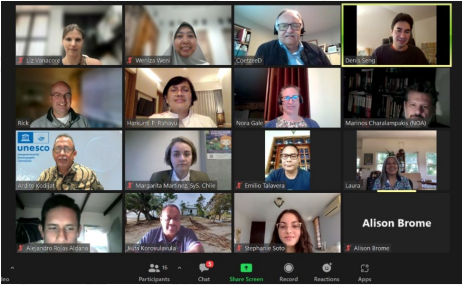
Downstream

- Member States should **update their SOPs for the pandemic situation** with support from WG1- IOTIC.
- Where possible, **communities should be encouraged to test/verify the UNESCO-IOC Tsunami Ready** Indicators during the Exercise.
- Encourage countries to conduct **regular exercises at least every year between IOWave**. They could align with communication tests.
- WG1-IOTIC should provide guidelines for **conducting virtual table-top exercises**.

Upstream

- Establish **a work mechanism between NTWCs and TSPs** to solve communication issues (i.e. non-receipt of messages).
- WG-2 to identify **reliable tide gauge stations with fast transmission rates**.
- Consider having the **TSPs send an SMS/email notification whenever there are tsunami product updates** (ex. Tide gauge observations).
- Conduct a **risk assessment of upstream tsunami warning including dissemination of tsunami warnings, reliable resources, etc.**

IOWave23 Plan

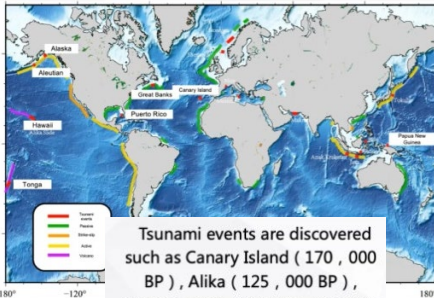


TTDMP Meeting, September 16, 2021

- 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)

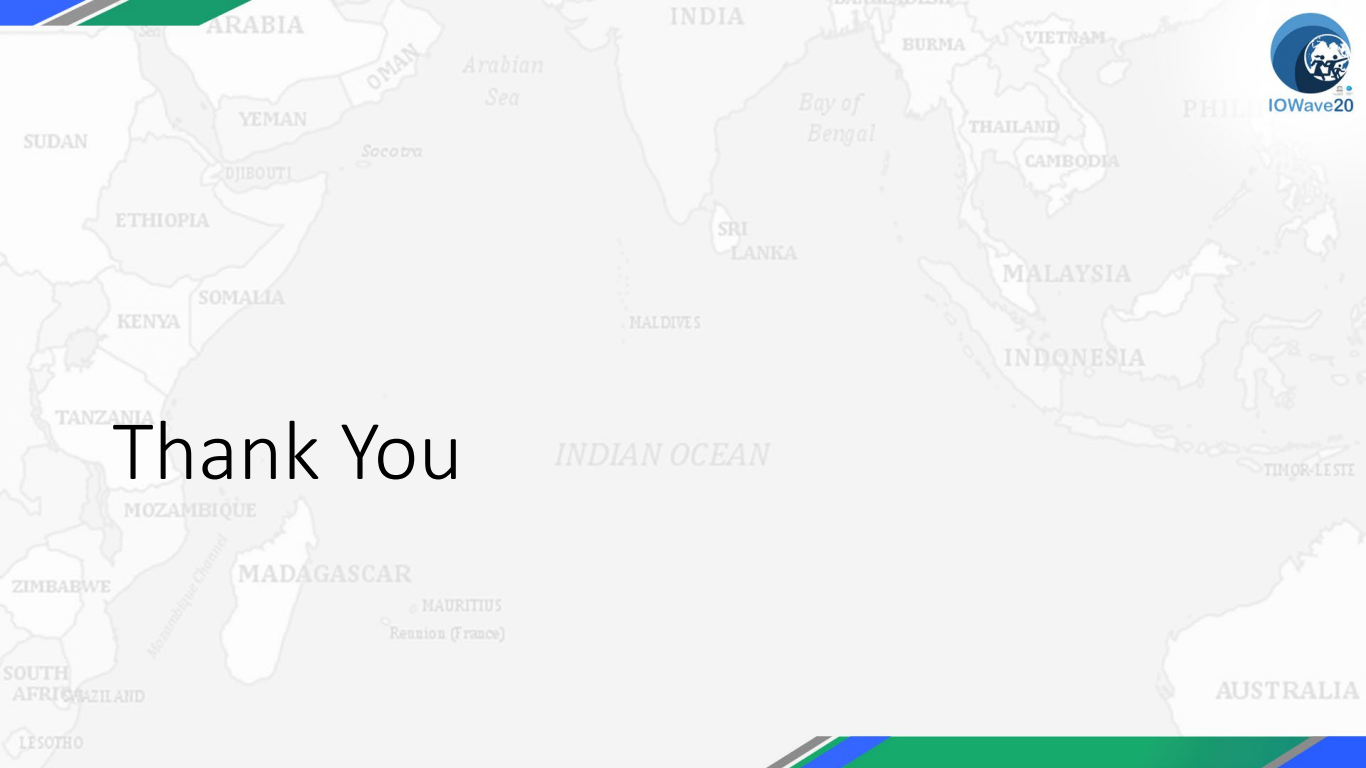
Critical Issue for Non-Tectonic Tsunami Exercise

The global distribution of submarine landslides, modified from (Tappin, 2021)



Tsunami events are discovered such as Canary Island (170 , 000 BP), Alika (125 , 000 BP), Storegga (8 , 150 BP), Messina (1908), Puerto (1918), Grand Banks (1929), Makran (1946), Aleutians-Unimak (1946), Alaska (1964), Nice (1979), Flores (1992), Papua New Guinea (1998), **Tohoku (2011) , Palu (2018) , Anak Krakatau (2018) , Tonga (2022)**

- Tsunami Non Tectonic caused by submarine volcanic eruption, landslide, submarine landslide, meteo-tsunami and atmospheric generated tsunami → Need to identify historical and the source with regionalization cluster.
- There is no instrumentation can detect trigger tsunami caused by non tectonic → tsunami warning rely on sea observation data
- Atmospheric generated tsunami – example of increase the speed of tsunami wave by the atmosphere example Tonga Tsunami → It is not part of nomenclature of tsunami source → Need to be added to Tsunami Glossary.
- Need collaboration among tsunami monitoring institutions.



Thank You