

# *Sri Lanka*



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Intergovernmental  
Oceanographic  
Commission



Webinar:  
**Lessons Learnt during  
Exercise IOWave 2023**

**12 - 13 December 2023**

*Chathura Liyanarachchige*  
*Disaster Management Centre*  
**chathura@dmc.gov.lk**

# Scenarios Exercised



Andaman Trench (4 Oct)



Makran Trench (11 Oct)



Heard Island (18 Oct)



Java Trench (25 Oct)

## Scenario – Andaman Trench

**Date** Wednesday 04 October 2023

**Time** 0400 UTC

**Magnitude** M 9.0

**Depth** 10 km

**Latitude** 3.3 N

**Longitude** 96.0E

**Location** Andaman trench off the west coast of Nicobar Islands, India.

# Key Agencies



Disaster Management Centre  
(NDMO) Sri Lanka

Department of Meteorology  
(NTWC) Sri Lanka

# Partner Agencies



Child Fund Sri Lanka



World Vision, Sri Lanka



UNICEF



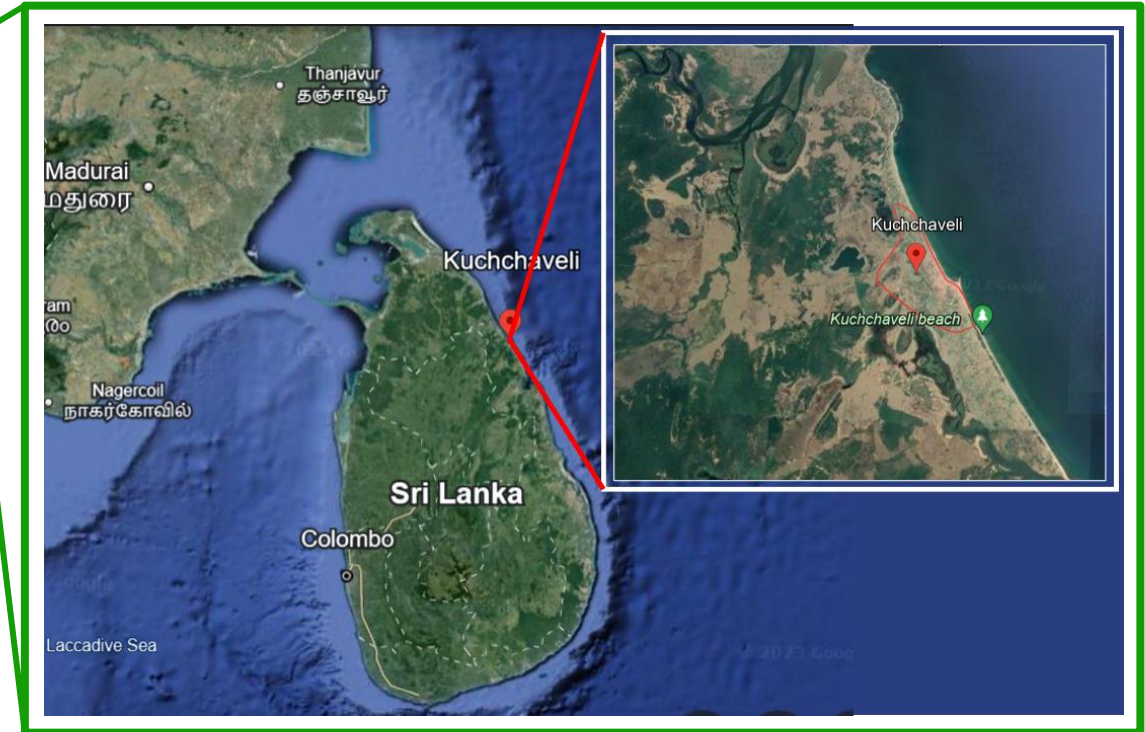
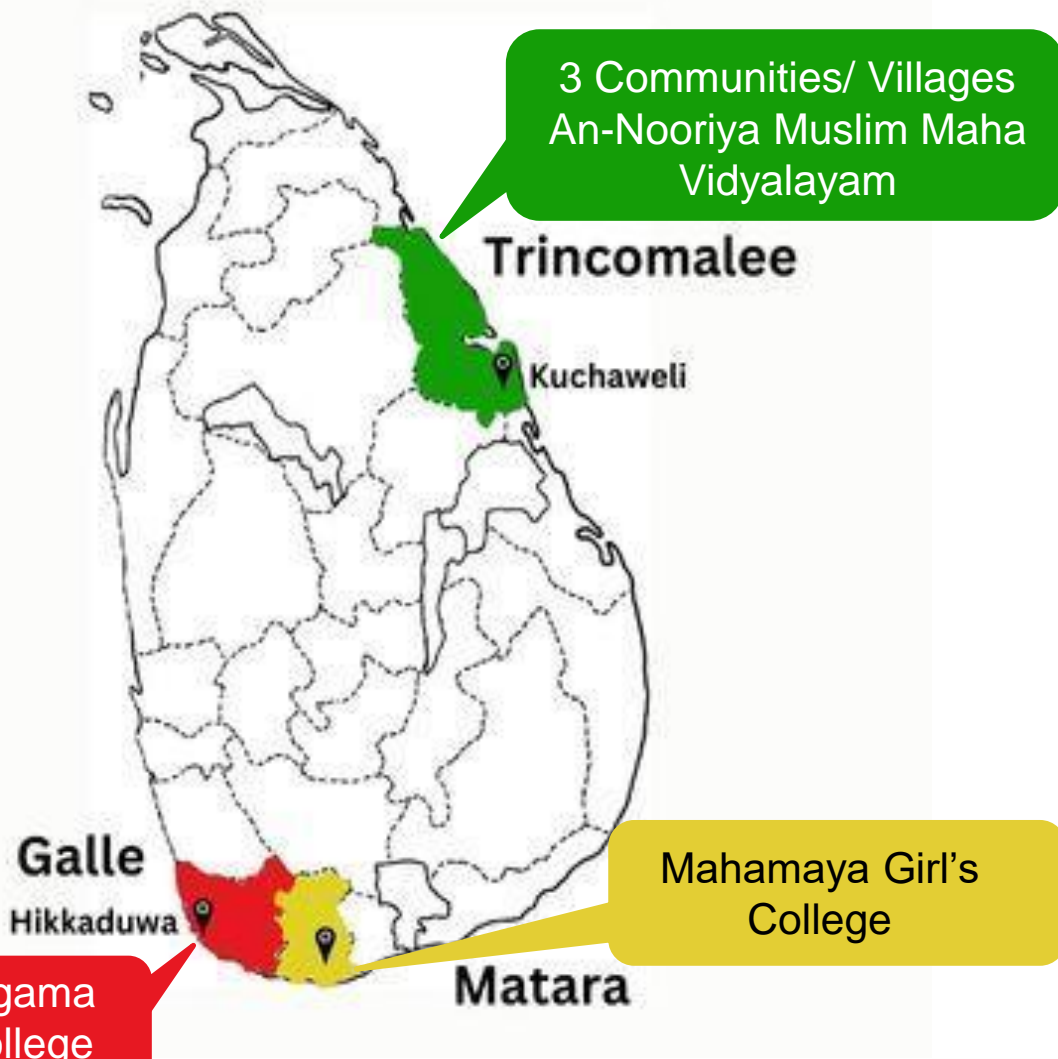
World Food Programme



University of Moratuwa

Research support:

# Exercise Participants



## Three villages were exercised:

- Pudawaikaddu Village
- Maruthankudah Village
- Sagarapura Village – A Fishing Community

# Exercise Participants (Evacuees)

## Situational Report from Trincomalee

No	Administrative Parview			Disaster	Date of Commenced	Affected		School evacuated			Deaths	Injured Persons	Missing Persons	House Damaged		Other Damages		Safety Centers			Remark		
	District	Division	GN Division			Families	Persons	Boys	Girls	Staffs				Fully	Partially	Small,Medium Enterprises Damages	Damages to critical infrastructure	No	Families	Persons			
1	Trincomalee	Kuchchaveli	Senthoor	Tsunami	04.10.2023	287	680											1	287	680	Padavaiakatu Muslim Maha Vidyalayam		
2			Jayanagar			24	49													1	24	49	Sekarapura Vihara
3			Cassim Nagar (T/An-Nooriya Muslim Maha Vidyalayam Students and Staffs)			-	373	155	198	20											1	-	373
<b>Total</b>						<b>311</b>	<b>1102</b>	<b>155</b>	<b>198</b>	<b>20</b>								<b>3</b>	<b>311</b>	<b>1102</b>			

# Exercise Participants

- Disaster Management Centre (NDMO)
- Department of Meteorology (NTWC)
- District Disaster Management Coordination Units (LDMOs)
- Police and Tri-forces
- Stakeholders from other agencies
- NGOs and CBOs
- Exercise evaluators
- Media
- All the coastal communities



National Stakeholder Meeting



National level meeting for developing the seal-off plan



Exercise day – Officers involvement from National level to the community level



# Exercise Participants (School Evacuations)



## An-Nooriya Muslim Maha Vidyalayam - Trincomalee

- 400 students
- Education from Grade 6 to Grade 13
- Located very close to the sea (200m)

## Madampagama Central College Galle

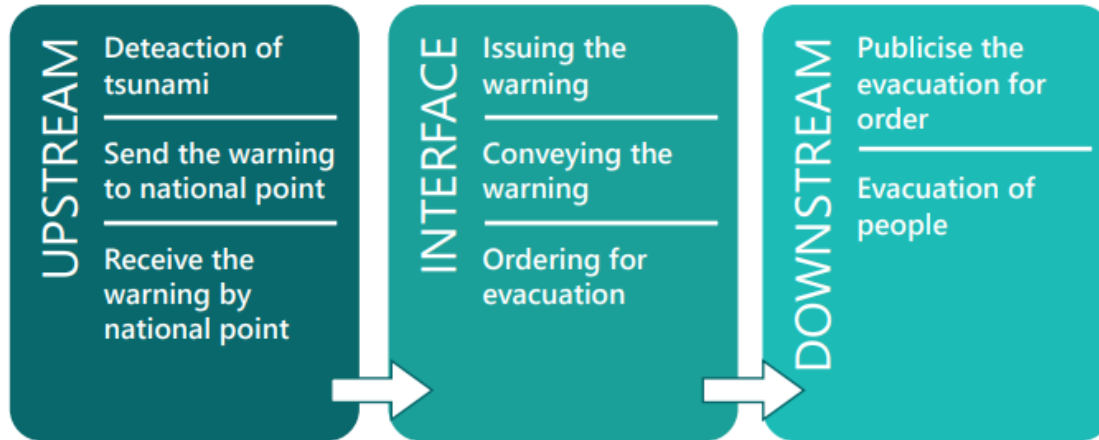
- 873 students (566 male, 307 female)
- Education from Grade 6 to Grade 13
- Located within 500 meters from the coastline

## Mahamaya Girl's College Matara

- 977 students, 57 teachers, and 19 non-academic staff
- Education from Grade 01 to Grade 13
- School's close proximity to the coast

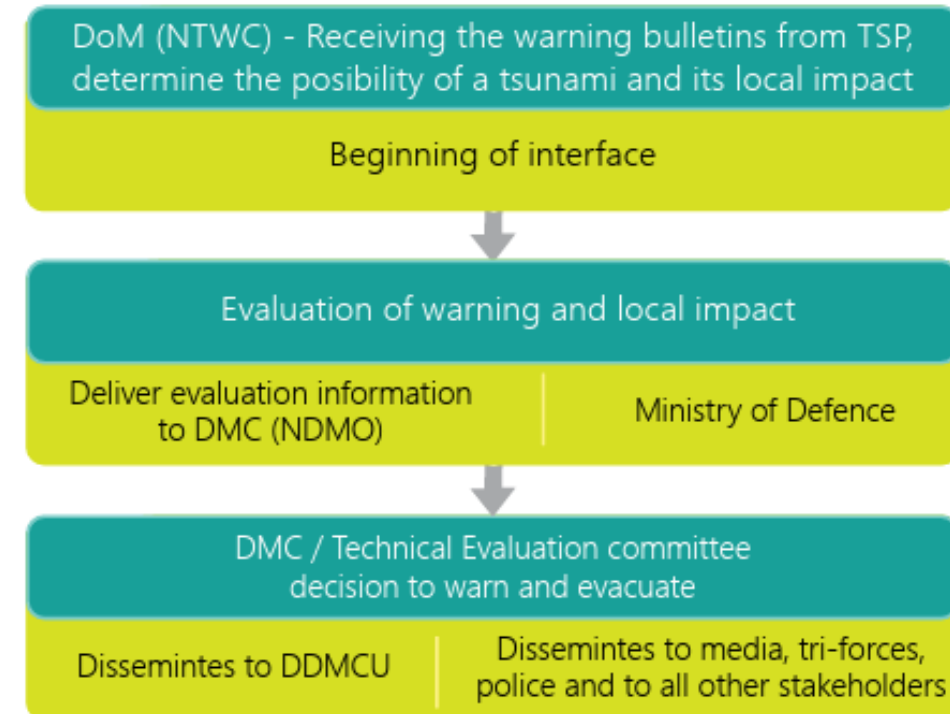
# National Tsunami Warning & Mitigation System

## Sri Lanka end-to-end TEWMS



### In Brief:

- The Department of Meteorology (NTWC) generates national tsunami bulletins
- Disaster Management Centre (NDMO) is mandated to issue evacuation order
- DDMCUs as LDMO
- Decision-making template proposed by DG-DMC is in practice

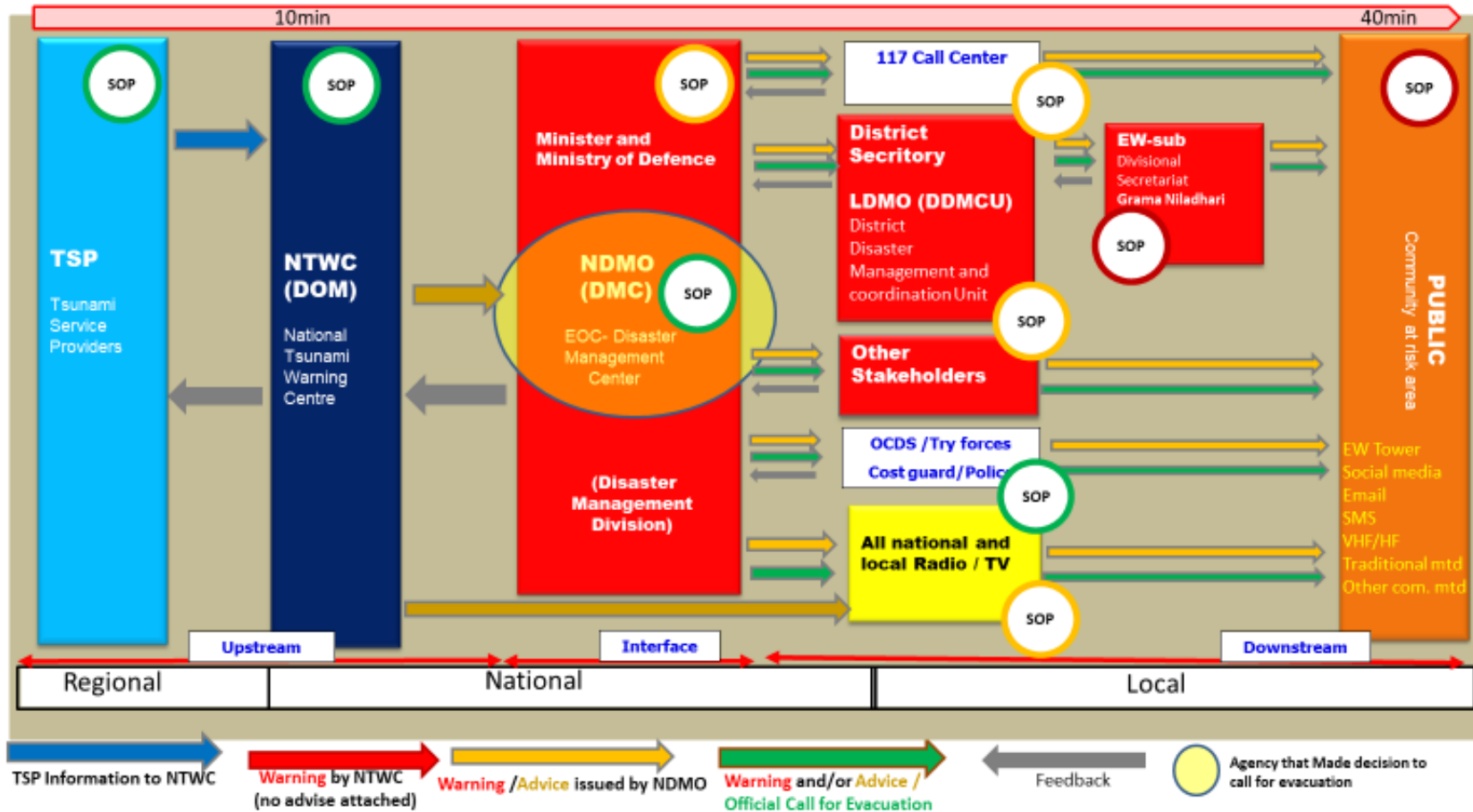




# National Tsunami Warning & Mitigation System

Sri Lanka


12.07.2023



## Standard Operating Procedures (SOPs) for:

- National Tsunami Warning Centre (NTWC)
- National Disaster Management Organisation (NDMO)
- Local Disaster Management Organisations (LDMOs)

# National Organisation of Exercise IOWave23



INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION  
COMMISSION Océanographique Intergouvernementale  
КОМИССИЯ Океанографическая Межправительственная  
اللجنة الدولية لعلم المحيطات  
政府間海洋学委員会

UNESCO - 7 Place de Fontenay - 75320 Paris Cedex 07 SP - France  
http://ioc.unesco.org - contact phone +33 (0)1 45 68 03 15  
E-mail: v-ryabin@unesco.org

**IOC Circular Letter No 2945**  
(Available in English only)

IOC/VR/BA/Bar/1ah  
4 May 2023

To : ICG/IOTWMS' Tsunami National Contacts

cc. : Official National Coordinating Bodies for liaison with the IOC  
Permanent Delegates/Observer Missions to UNESCO and National Commissions for UNESCO in ICG/IOTWMS Member States  
UNESCO Offices in Doha, Islamabad, Jakarta, New Delhi, and Tehran  
ICG/IOTWMS Chair and Vice-Chairs  
ICG/IOTWMS Working Group Chairs and Vice-Chairs  
ICG/IOTWMS Task Team IOWave23  
ICG/IOTWMS Tsunami Warning Focal Points  
ICG/IOTWMS National Tsunami Warning Centres

**Subject: Announcement of the Indian Ocean Tsunami Exercise (IOWave23) on 4, 11, 18, and 25 October 2023**

The IOC Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS) at its 13<sup>th</sup> session (Bali, Indonesia, 28 November–1 December 2022), decided to organise an Indian Ocean Wave Exercise in 2023 (IOWave23) and established a Task Team to plan and conduct the exercise. At its most recent inter-session meeting, held online on 4 April, and after consultation with key stakeholders, the Task Team IOWave23 decided to conduct IOWave23 with four different scenarios on 8, 11, 18, and 25 October 2023. The four scenarios will allow individual Member States to decide the type and number of exercise scenarios to participate in. This letter provides background information and details of the IOWave23 in which all ICG/IOTWMS Member States are encouraged to participate.

To date six IOWave exercises have been conducted (2009, 2011, 2014, 2016, 2018 and 2020). The exercises have been designed to test the receipt and dissemination of tsunami notifications along national tsunami warning chains, as well as test appropriate responses aligned with pre-established Standard Operating Procedures (SOPs). Throughout the IOWave Exercises, the engagement of coastal communities in tsunami education campaigns, preparedness measures, and evacuation

<sup>1</sup> ICG/IOTWMS Member States include Australia, Bangladesh, Comoros, Djibouti, France, India, Indonesia, Iran (Islamic Republic of), Kenya, Madagascar, Malaysia, Maldives, Mauritius, Mozambique, Myanmar, Oman, Pakistan, Seychelles, Singapore, Somalia, South Africa, Sri Lanka, Tanzania, Thailand, Timor-Leste, United Arab Emirates, and Yemen.

Chairperson	Vice-Chairpersons
Dr Anil Kumar TRIDIB Technical Secretary Navy Hydrographic Service Av. Steiner de Sola 2124 C/CIENAVY Buenos Aires ARGENTINA	Dr Marie-Alexandrine BÉRE Directrice de Recherche Centre national de la recherche scientifique (CNRS) 3 rue Michel Ange 75008 Paris FRANCE
Dr Yasuhiro IYANAGA Intergovernmental Oceanographic Commission - UNESCO 7 Place de Fontenay 75320 Paris Cedex 07 SP - FRANCE	Dr Anandita PRADYU Assistant to the President National Research Centre "Kurchatov Institute" Akademika Kurchatova pl. 1 125412 Moscow RUSSIAN FEDERATION
Dr Francisco Antonio SARRAÑA RODRÍGUEZ New Captain (R/C) Coordinator of Hydrography and Navigation Rue Sirens de Angkor 8/6 20002-900 Niterói BRASIL	Dr Karim HILMI Direktur de Riset Institut Nasional de Riset Indonesia (INRI) 02, Boulevard Sidi Aedammarine BRUNAI
Dr Simanase Kumar TUNAWALA Director Indian National Centre for Ocean Information Services (INCOIS) Pegangra Nagar (20), Warangal (20) Hyderabad-506006 INDIA	Dr Youssef EL-BAZ Director National Centre for Ocean Information Services (NCOIS) P.O. Box 1171 Alexandria EGYPT

## IOC Circular Letter No 2945

Member states are requested

Indian Ocean Tsunami Exercise

## CONCEPT NOTE



### INDIAN OCEAN TSUNAMI EXERCISE (IOWave23) An Indian Ocean-wide Tsunami Warning and Communications Exercise 4–25 October 2023



**Organized by**  
**Disaster Management Center (DMC), Ministry of Defence, Government of Sri Lanka**

#### 1. Background

The devastating impact of the 26 December 2004 Indonesia earthquake and Indian Ocean Tsunami tragically demonstrated what could happen without an effective tsunami warning system. Tsunamis may not occur often, but when they do, they can affect coasts, sometimes across an entire ocean.

Following the 2004 event, UNESCO's Intergovernmental Oceanographic Commission (IOC) was requested to establish an Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS) to promote the exchange of seismic and sea level data for rapid tsunami detection and analysis, to provide warnings for such events, and to coordinate mitigation efforts among its Member States. An efficient and effective end-to-end warning system was needed, ready to react 24 hours a day to any potential tsunami threat, alert those at-risk coastal communities, and motivate them to take immediate and appropriate steps to save their lives.

Under the guidance of the ICG/IOTWMS, Member States collaborated in the development of the Indian Ocean Tsunami Warning and Mitigation System (IOTWMS). The IOTWMS is a system of systems with each Department of Meteorology as National Tsunami Warning Centre (NTWC) and Disaster Management Centre (DMC) of the active Member States issuing tsunami warnings to their respective communities based on the tsunami threat information provided by three Tsunami Service Providers (TSPs) of Australia, India, and Indonesia.

The IOC Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS), at its 13<sup>th</sup> session, decided to organise an Indian Ocean Wave Exercise in 2023 (IOWave23) and established a Task Team to plan and conduct the exercise. The Task Team IOWave23 decided to conduct IOWave23 with four different scenarios on 4, 11, 18, and 25 October 2023.

To date, six IOWave exercises have been conducted (2009, 2011, 2014, 2016, 2018 and 2020). The exercises have been designed to test the receipt and dissemination of tsunami notifications along national tsunami warning chains, as well as test appropriate responses aligned with pre-established Standard Operating Procedures (SOPs). Throughout the IO Wave Exercises, the engagement of coastal communities in tsunami education campaigns, preparedness measures, and evacuation.

The end-to-end tsunami warning system of Sri Lanka was initially tested in the Indian Ocean-wide tsunami warning and response exercise during IOWave16 (September 2016) and IOWave18 (September 2018). Exercise IOWave18 improved upon the previous exercises with all 25 coastal districts participating, and a record 3457 people were evacuated in Selected GNs of four coastal districts. Further, IOWave 20 (November 20) was conducted with limited scope as a national tabletop exercise under the backdrop of the COVID-19 pandemic.

## Concept Note of Sri Lanka

### Action plan of National Tsunami Exercise IOWave 23

National Tsunami Contact : Major General Sudantha Ranasinghe (Retd)  
(Director General –DMC)  
Exercise Coordinator : Director Preparedness

Date	Action	Responsibility	Tentative Budget (LKR)	Remarks
19 <sup>th</sup> June	Initial Planning Meeting	DIR-Prep		EOC Div, Awareness div, Preparedness div, WFP, UNDP, APAD, world vision
30 <sup>th</sup> June	Developed the Concept Note	DIR-Prep		After agreed on the scenario with the scale of the proposed exercise
1 <sup>st</sup> week of July	Initial sensitization of the state minister & Secretary Defense	DG -DMC		Since, this is an international exercise which need to inform President Prime minister, all Ministers, and the member of parliament
23 <sup>rd</sup> of July	Sensitization and planning discussion with all 14 Coastal ADs	DIR-Prep, DD-Com		All 14 coastal district Ads (linked virtually)
23 <sup>rd</sup> of July	National Stakeholder meeting	DIR-Prep	WFP	MoD, DMD, DoM, Tri-forces, police, Humanitarian agencies, Stakeholders.
ongoing	Preparation of TTX guideline, PPT TTX scenario and injects	DIR EOC, DIR-Prep	-	Main scenario done by D-PP and TTX scenarios developed by the EOC
13 <sup>th</sup> September	District ADs meeting	DIR-Prep	-	Trinco, Galle and Matara district must plan for last mile dissemination and evacuation.
Ongoing	District Sensitization	14 Coastal Districts DDs/ADs	WFP	All 14 coastal districts
done	Time synchronized with IOTWMS, DOM & DDMCUs	DD-EW DMC	-	Trinco, Galle & Matara
done	Confirmation of Safety arrangements, Evacuation Centers	DIR EOC, Mil. Cord, Police &NDRSC	-	Safety of observers, officers, community members engaged. Camp Management, developing sit-raps, etc.
done	Exercise arrangement EOC, EOCs in DDMCUs	Director EOC, Mil. Cord, police	-	Exercise execution; assign duties, communication arrangements, operation room arrangements
ongoing	Security arrangements, with shield of plans and plan submission	Military coordinator	-	With three district Ads and military forces (shield off plan)
2 <sup>nd</sup> October	Tabletop exercise	DIR-Prep,	WFP	EOC/Trinco

## Action Plan of Sri Lanka

# National Organisation of Exercise IOWave23

## Exercise Planning & Execution:

### Awareness and Sensitization of Tsunami Operational Plans

- Efforts extended to all 14 coastal districts in Sri Lanka

### Development of Seal-Off Plan

- A plan to execute in case of a real incident - Authority granted to battalion heads for community evacuation and security

### Engagement with Non-Governmental Agencies

- Collaboration due to financial constraints

### Appointment of Independent Observers

- From the national to community level
- Evaluate exercise procedures, SOPs and communication channels

### Conduct the National Tabletop Exercise (TTE)

- Simulated situations for response formulation

### Press Release and Media Briefing

- Comprehensive release through major national media channels
- Media briefing to minimise confusion among coastal populations

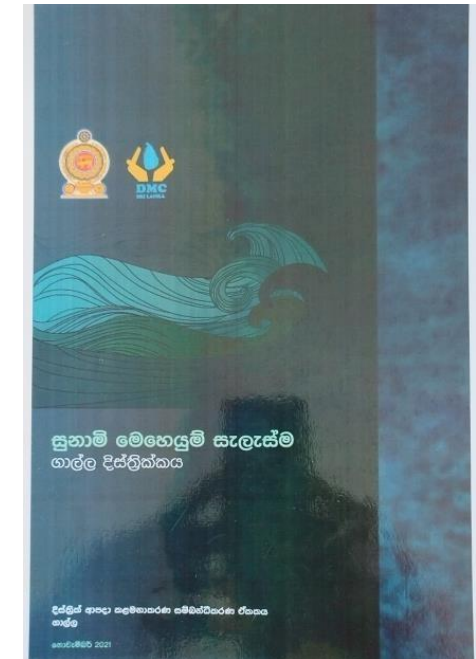
## Exercise Day – 4<sup>th</sup> October 2023 – Summary

- Tested communication from TSPs to NTWC, NTWC to NDMO, and NDMO to LDMO and other downstream entities and to the community level
- Conducted a functional Tsunami simulation, including people and resource movement, for a realistic on-ground response
- Practised evacuation in selected coastal communities in Trincomalee District and schools in Trincomalee, Galle, and Matara
- Tested the CTRIs of evacuated communities

# National Organisation of Exercise IOWave23

## Awareness and Sensitization of Tsunami Operational Plans

- All Other 14 districts
- ✓ District Stakeholder sensitization.
- ✓ Coastal DS divisional and GND awareness
- ✓ Updating TOPs



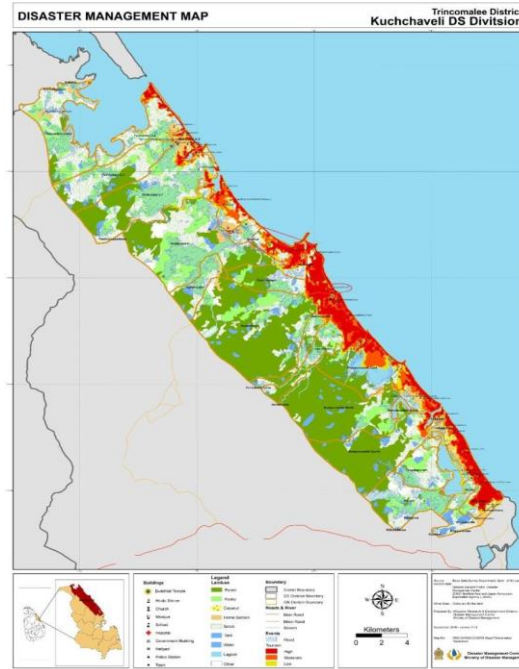
# National Organisation of Exercise IOWave23

- **Trinco;**

Eastern province, Trincomalee district, Kuchawelli DS division

- Pudawaikaddu Village
- Maruthankudah Village
- Sagarapura Village

School  
An-Nooriya mahavidyalaya



- ✓ District Stakeholder sensitization.
- ✓ Coastal DS divisional and GND awareness
- ✓ Selected school awareness and preparation of School Safety Plan
- ✓ Updating TOPs; Trinco
- ✓ District Local Media Awareness
- ✓ Community/School evacuation
- ✓ Practicing Military seal off plan
- ✓ Developing the Exercise video
- ✓ Submitting Final Excises report.

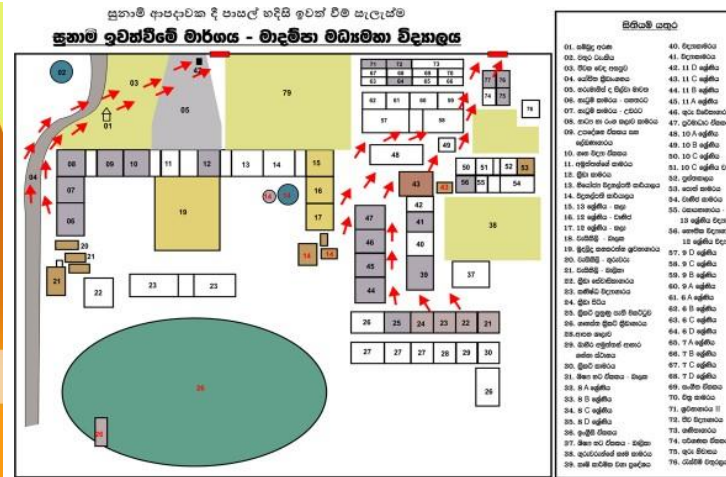
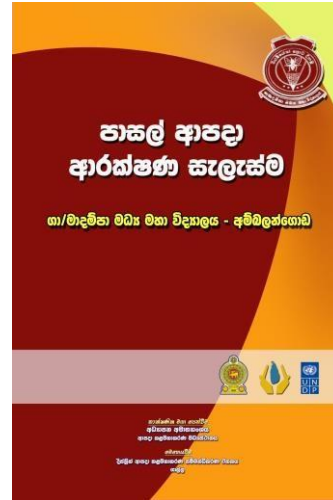


# National Organisation of Exercise IOWave23

- **Galle, Matara;**

Southern province, Galle and Matara districts

School  
Matara-Mahamaya Girls Collage  
Galle-Madampagama Collage

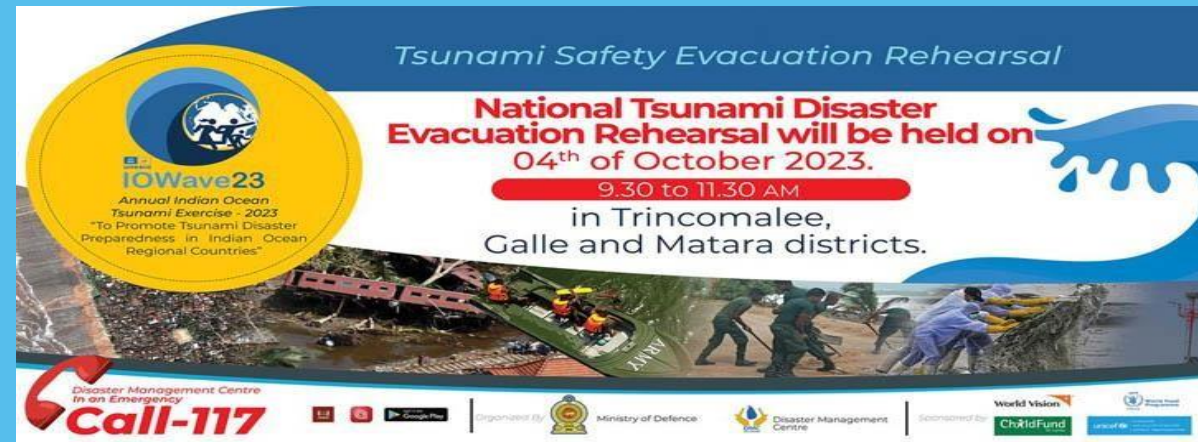


- ✓ District Stakeholder sensitization.
- ✓ Coastal DS divisional and GND awareness
- ✓ Selected school awareness and preparation of School Safety Plan
- ✓ Updating TOPs; Galle, Matara
- ✓ Submitting Final Excises report.

# National Organisation of Exercise IOWave23

## Press Release and Media Briefing

Media response & informing to all .  
National Media Briefing, Paper articles, Social media, web publications, etc.



IOWave 23 exercise banner displayed in trilingual

- ✓ H.E the president
- ✓ Hon. Prime Minister
- ✓ All the Ministers
- ✓ Members of the parliament
- ✓ Secretaries of the ministries
- ✓ District secretaries
- ✓ Chief of the defense staff
- ✓ Commanders of the tri forces
- ✓ Inspector general of the police
- ✓ Security forces head quatres



National Media Briefing

Letters were sent to all stakeholders



Paper advertisement published in trilingual 4th October

# National Organisation of Exercise IOWave23

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## Exercise Day – 4<sup>th</sup> October 2023 – Summary

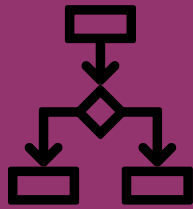
- NTWC (Department of Meteorology) generated the national tsunami warnings
- NDMO (Disaster Management Centre) disseminated the tsunami warnings and public safety messages to the downstream
- Tested communication from TSPs to NTWC, NTWC to NDMO, and NDMO to LDMO and other downstream entities and to the community level
- Conducted a functional Tsunami simulation, including people and resource movement, for a realistic on-ground response
- Practised evacuation in selected coastal communities in Trincomalee District and schools in Trincomalee, Galle, and Matara
- Tested the CTRLs of evacuated communities



# Lessons Learnt –What Worked Well?

Objective No	Exercise Objective	Observations
1	Validate procedures are in place to ensure tsunami warnings get to all in the community, including those with disabilities, all genders, elderly, and youth.	Validated
2	Validate the level of community awareness, preparedness, and response.	Validated
3	Validate the Standard Operating Procedures within countries for generating and disseminating tsunami warnings to their relevant emergency response agencies, other authorities, media, and the public.	Within the exercise scope in Sri Lanka, NTWC's and NDMO's SOPs were validated.
4	Validate the Standard Operating Procedures within countries for the issuing of public safety messages, ordering evacuations and where possible issuing all-clear messages.	Validated within a limited scope. Additionally, during the process, revisions to existing Standard Operating Procedures (SOPs) were identified. Furthermore, the DMC proposed a new decision-making template for issuing public safety messages.
5	Validate the dissemination by TSPs of Tsunami Bulletin Notification Messages to NTWC via Tsunami Warning Focal Points (TWFPs) of Indian Ocean Countries and the reception by NTWCs of the TSP messages. 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.	Except for the Indian TSP's bulletins, other information were received.
6	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. Validate the reporting by NTWCs to the TSPs of their National Tsunami Warning Status.	Validated.
7	Validate the reporting by NTWCs to the TSPs of their National Warning Status.	Validated.
8	Validate receipt and understanding by NTWCs of new TSP service for tsunamis generated by non-seismic and complex sources.	Validated.

# Lessons Learnt



SOPs

- **Revisions for existing SOPs:** Identified gaps in the existing SOPs such as need for decision-making templates for public safety messages
- **Who issues warnings to the general public:** Emphasized the importance of clarifying the entity responsible for issuing warnings and their legal authority concerning community warnings in media releases.



Warning  
Dissemination

- **EW Tower Maintenance:** Ensure all 77 Early Warning (EW) towers are operational and can be manually activated when needed
- Identified missing stakeholders: Ensure EOC has current and comprehensive key contacts
- **Communication Testing:** Thoroughly test major communication channels, including police communication
- **EW Mechanism:** Recognized the necessity for community-level enhancements, such as a 24/7 operational early warning mechanism and exploring cost-effective alternatives

# Lessons Learnt



## Exercise Planning

- **Incorporating more stakeholders into the exercise:** Missing stakeholders such as the health sector, fisheries and transport sector were identified
- **Full-scale exercise:** Need for a full-scale exercise in line with the 20<sup>th</sup> commemoration of the 2004 tsunami was identified.
- **Night-time exercise:** Need for conducting simulation exercises during nighttime was identified

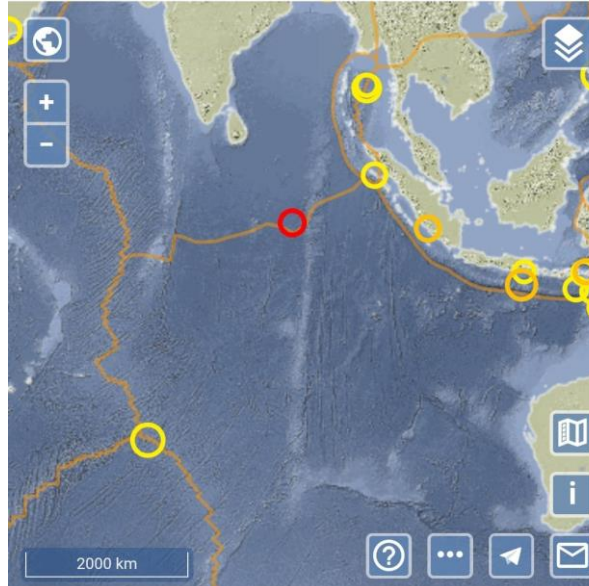


## Technical Support

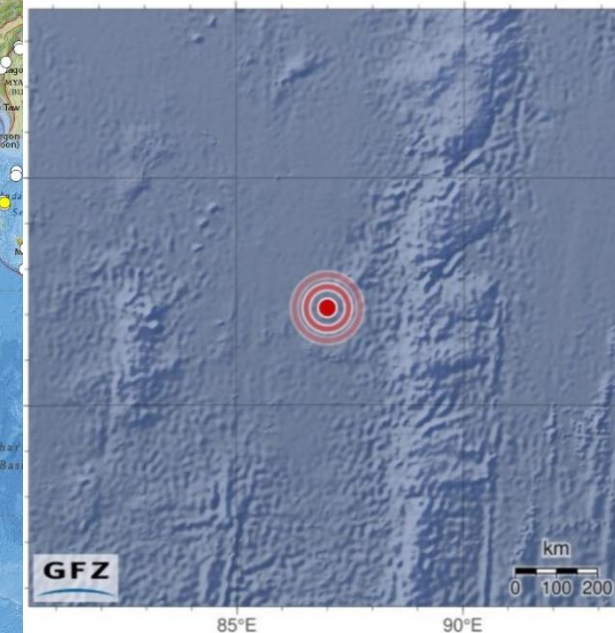
- **DART Buoys:** DART Buoy's functionality issues were identified while the need for installing more buoys was recognized
- **Hazard/ Risk maps:** Recognized the necessity for scenario-based tsunami hazard/risk maps, where technical assistance from IOTWMS would be incredibly helpful.
- **Collaborative research:** Need for collaborative research with local and international universities for impact-based warning dissemination strategies
- **Collaborative research:** Need to test the effectiveness of leveraging social media for effective communication

# Technical Support from IOTWMS

- **Enhance Support for Near Field Tsunami Preparedness:** Sri Lanka seeks IOTWMS assistance to fortify early warning systems and effectively manage potential near-field tsunami events in the wake of recent tremors on the southern coast of Sri Lanka.
- **Improve TSP Communication:** Address challenges in receiving critical bulletins from Tsunami Service Providers (TSPs), emphasize continuous communication testing, and devise contingency plans for accessing vital information during incidents where multiple TSPs may fail to provide updates, as observed during IOWave23 with Indian TSPs not being received via GTS.



**F-E Region** South Indian Ocean  
**Time** 2023-12-04 15:11:25.2 UTC  
**Magnitude** 4.8 (mb)  
**Epicenter** 87.00°E 2.87°S [↗](#)  
**Depth** 10 km (fixed) [?](#)  
**Status** A - automatic [?](#)



# Images



**Students from An-Nooriya Muslim Maha Vidyalayam participating in the exercise**



**Students from Matara Mahamaya Girl's College participating in the exercise & supported by Tri forces**



**Camp registration work at one of the evacuation centres**

**THANK YOU**