UNESCAP funded project:
Strengthening Tsunami Warning in the North-West Indian Ocean Through Regional Cooperation

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Progress Report April 2023

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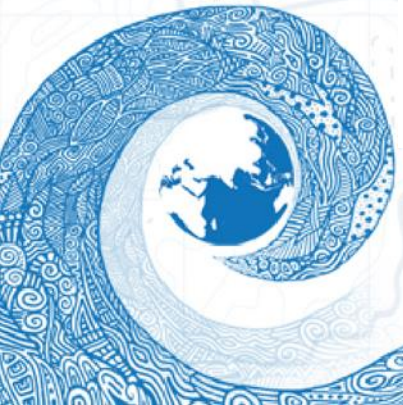
Phase 1 UNESCAP TTF-29 Project

Project Funder: UNESCAP Tsunami Trust Fund
Participating Member States: India, Iran, Pakistan, *Oman & UAE as self-funded*
Target Groups: NTWCs, national DMOs, Media, Communities, Response Agencies
Project Duration: 24 Months - completed

Outcomes:

1. **Better understanding of the risk knowledge based on scientific research**
2. **Improvement of warning services at NTWC level and the organization of the national warning chains to assure timely warnings and rapid response with due emphasis on self-protection for near source events.**



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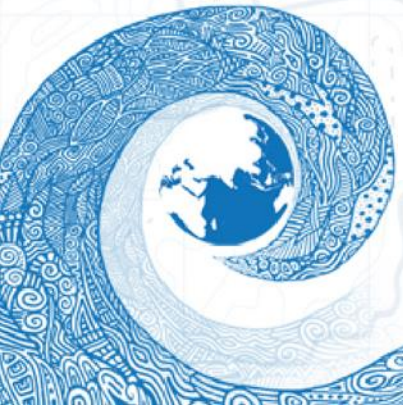
Phases 2a and 2b UNESCAP TTF-31 Project

Project Funder: UNESCAP Tsunami Trust Fund
Participating Member States: India, Iran, Pakistan, *Oman & UAE as self-funded*
Target Groups: NTWCs, national and local DMOs, Broadcast Media, Response Agencies
Project Duration: 12 Months: December 2021 – December 2022

Outcomes:

1. **Finalisation of Phase-1 activities in tsunami risk knowledge and strengthening of national tsunami warning chains.**

2. **Gap analysis and development of guidance on tsunami inundation mapping and evacuation planning in the NWIO region.**



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Phases 2a and 2b and 2c

Participating Member States: **India, Iran, Pakistan** (+Oman and UAE self-funded)
Target Groups: National Tsunami Warning Centres (NTWCs), national and local Disaster Management Organisations (DMOs), Response Agencies, Broadcast Media, and local Communities
Project Duration: 12 Months

Outcomes:

3 **Finalisation of some Phase-1 remaining activities in tsunami risk knowledge and strengthening of national tsunami warning chains (Phase 2a)**

4 **Gap analysis and development of guidance on tsunami inundation mapping and evacuation planning in the NWIO region (Phase 2b)**

5 **Inundation and evacuation mapping capacity development in the NWIO region (Phase 2c)**

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Programmatic Approach:

- Better understand tsunami risk
- Build national tsunami warning chains
- Assess and develop inundation and evacuation mapping capability
- Train in inundation and evacuation mapping
- Prepare at-risk communities to be Tsunami Ready

Phase 1 completed

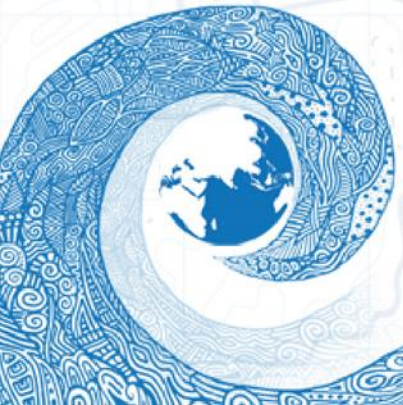
Phase 2a

Phase 2b

Finish 21/12/22

Phase 2c (proposed)

Phase 3 (proposed)



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TTF-29 and TTF-31 supported by consultancies

Key Tasks

- *Coordination in–country*
- *Help with development of training & briefing materials*
- *Identification of best practices in inundation & evacuation mapping*
- *Workshop & meeting preparation*
- *Reporting outcomes*

TTF-31 Consultants

- *Indian National Center for Ocean Information Services (INCOIS)*
- *Dr. Mehdi Masoodi (Iran)*
- *Ms. Ghazala Naeem (Pakistan)*
- *Mr. Harald Spahn (International)*
- *Dr. Jorn Lauterjung (International)*

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TTF-29 and TTF-31 consultative approaches

National consultation

- *Tsunami National Contacts (TNCs) established by IOC-UNESCO for all Member States of the Intergovernmental Coordination Group for Indian Ocean Tsunami Warning & Mitigation System (ICG/IOTWMS)*

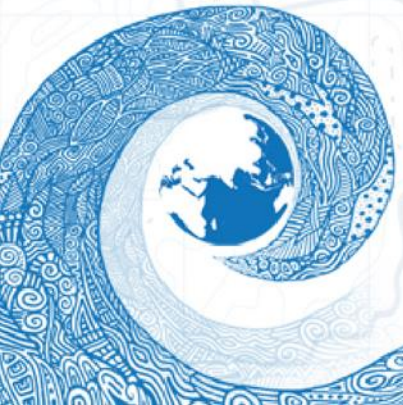
Regional consultation

- *ICG/IOTWMS*
- *Subregional Working Group for the North-West Indian Ocean*
- *Task Team on Scientific Tsunami Hazard Assessment of the Makran Subduction Zone*
- *Task Team on Tsunami Preparedness for a Near-Field Tsunami Hazard*

TTF-31 Calendar of Events 2022

Activity	Modality	Date
Develop ToRs and establish consultancies	Hybrid	Apr - May
PTHA simulations	Online	Apr - Sept
Hire consultants and develop training materials	Hybrid	May - Jul
Regional Tsunami Evacuation Planning Workshop	Online	24 Aug
Regional WG Inundation Modelling Meeting	Online	7 Sept
National Tsunami Evacuation Planning WG meetings	National	12 Sept – 17 Oct
SOP NTWC/DMO/Broadcast Media Workshop	Hybrid, national	31 Oct – 3 Nov
Makran Source Zone Science Strengthening Tsunami Warning & Preparedness	Hybrid	14 - 16 Nov

PHASE 2a: Finalisation of Phase-1 remaining activities in tsunami risk knowledge and strengthening of national tsunami warning chains



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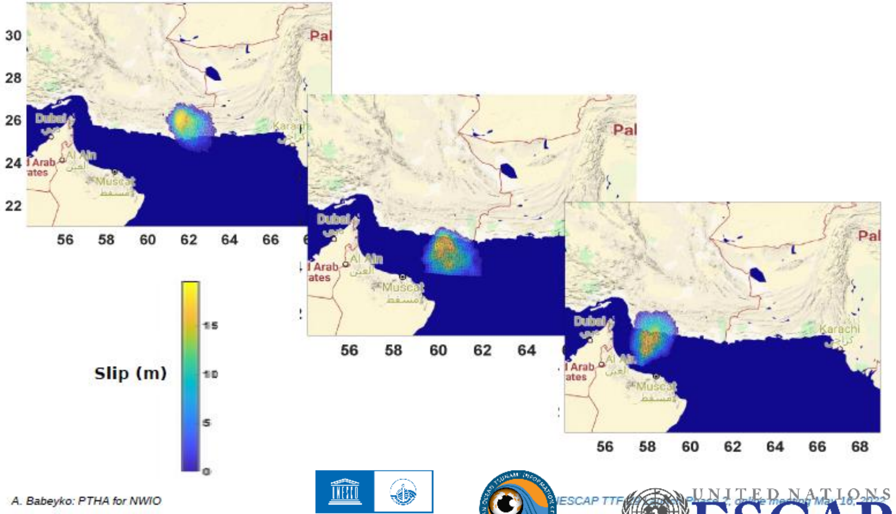
Output 3.1 Exchange of latest scientific results and studies from regional/international studies on the tsunami hazard in the MSZ

Progress:

- Arabian Sea **tsunami hazard simulations** completed (GFZ/INGV))
- Red Sea and Persian Gulf tsunami hazard simulations completed (INCOIS/India)

Probabilistic Tsunami Hazard Assessment (PTHA)

Makran subduction M8.5
slip distribution examples



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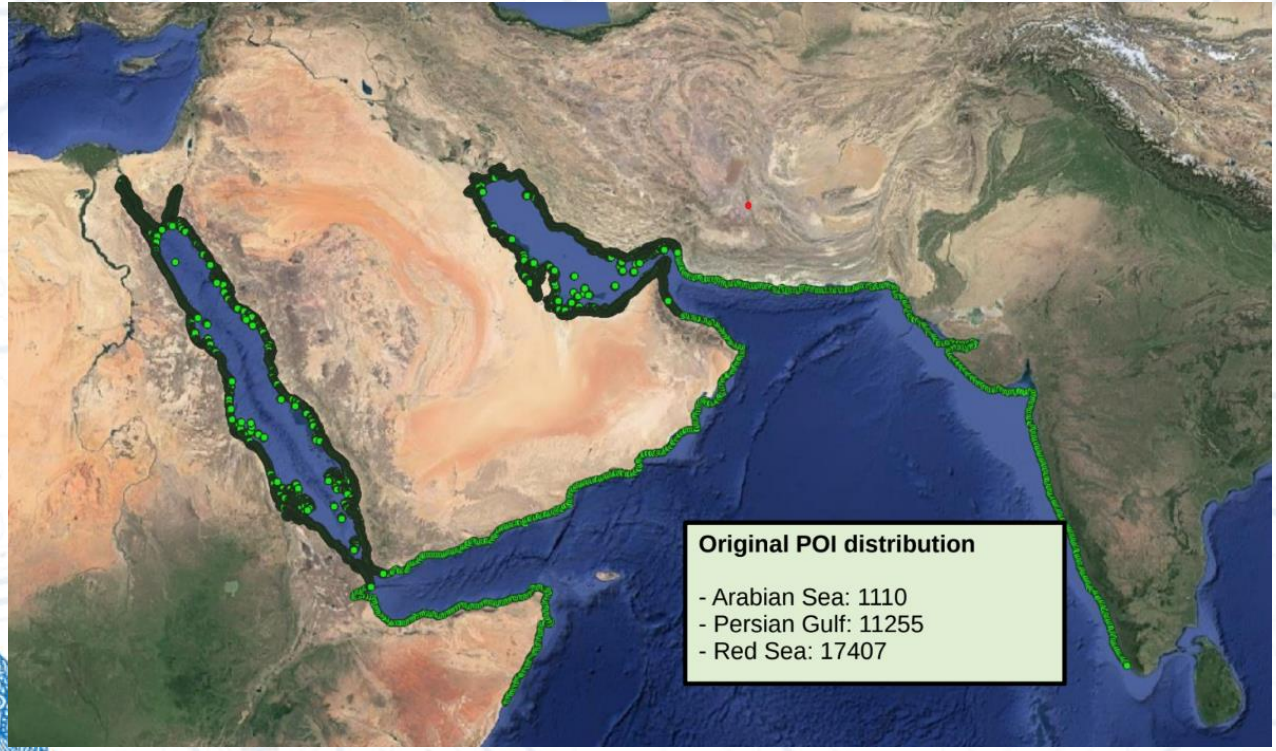

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Maximum modeled wave heights (deterministic)

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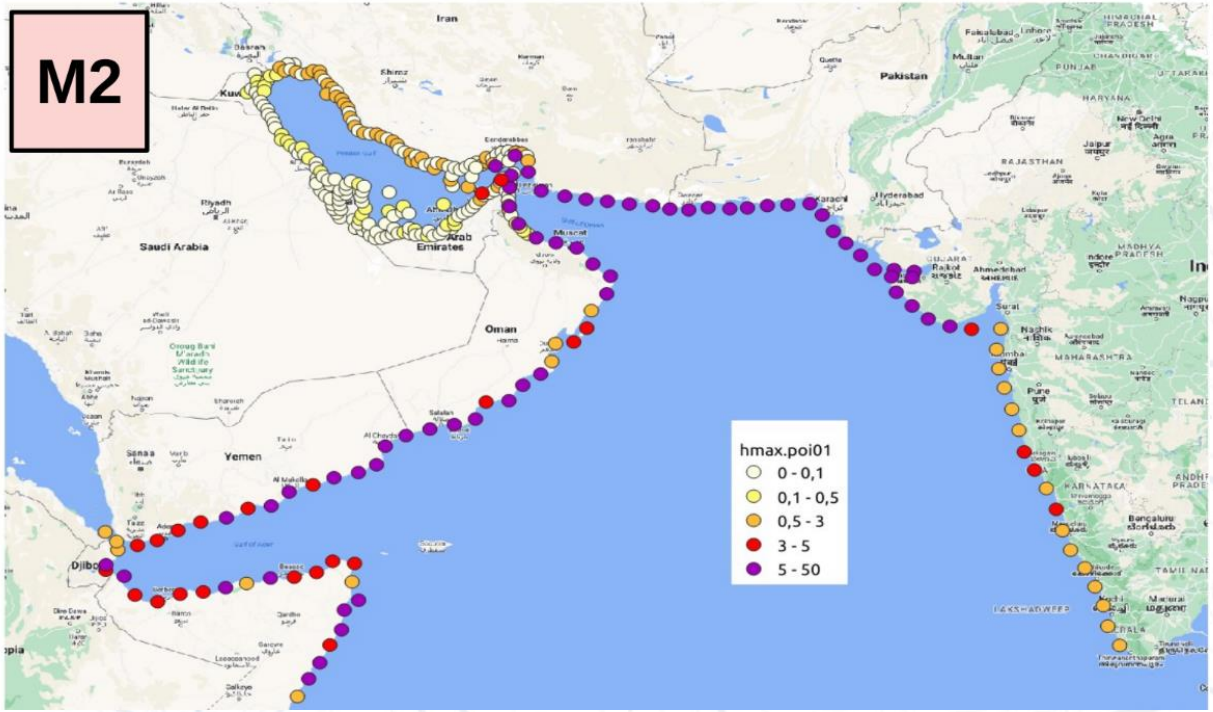
Maximum modeled wave heights (deterministic)



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Project Impacts

With the help of experts outside the region, Makran countries are taking ownership of producing a unified **Probabilistic Tsunami Hazard Assessment (PTHA)** for their region.

Enhanced regional scientific understanding of the Makran Subduction Zone and its potential tsunami hazard is improving through expert discussion and sharing of recent science among North-West Indian Ocean countries.

Through international collaboration, **scientists in Makran countries are enhancing their expertise in seismology, modelling and tsunami hazard assessment** and building networks with like-minded researchers.

By highlighting the tsunami hazard to Makran countries, the regional **PTHA will help influence disaster mitigation initiatives** such as community education, land use planning, and tsunami emergency response plans and procedures.

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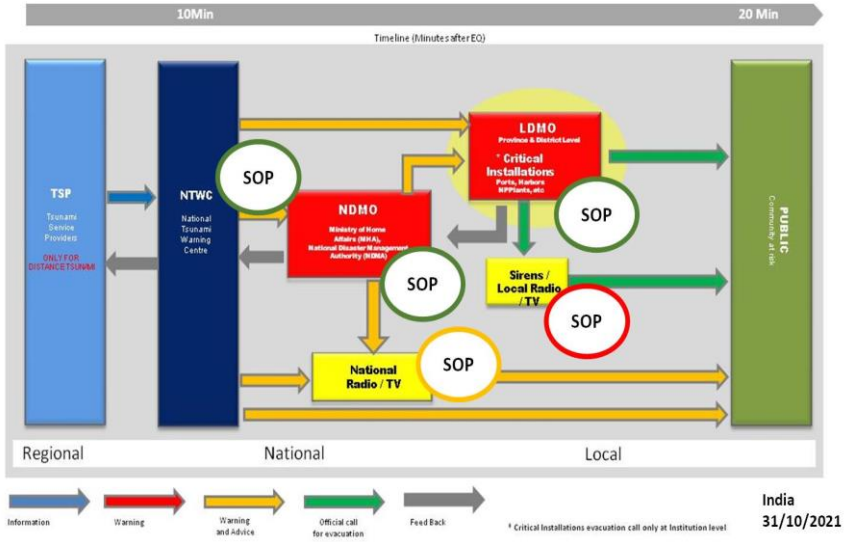
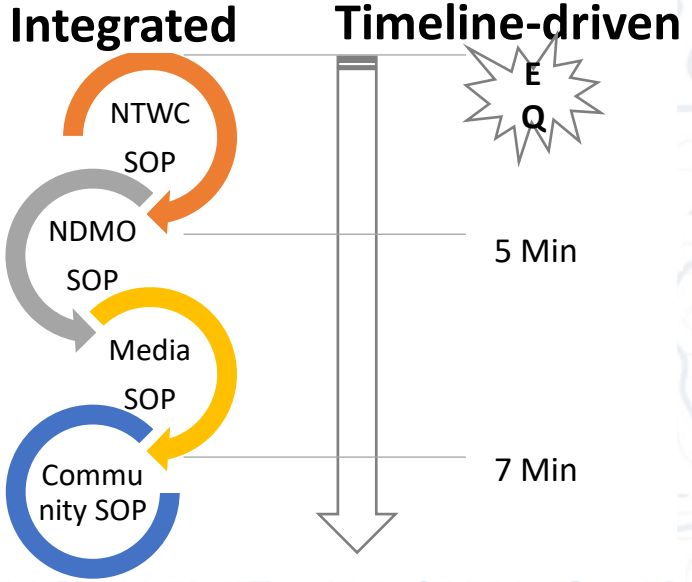
Output 3.2: Regional NTWC-DMO (N/L) and Media workshop to share experiences and provide mechanism to involve media in tsunami warning dissemination and outline requirements for related SOP development





Final SOP NTWC/DMO/Broadcast Media Training Hybrid Workshop
31 October – 3 November 2022

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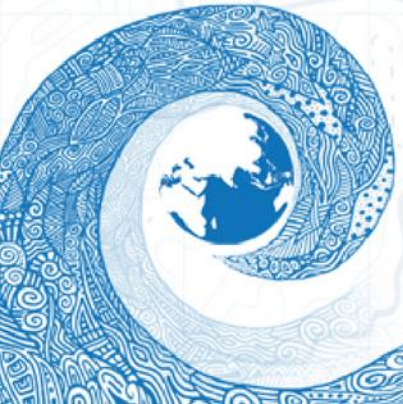
Project Impacts

- Much improved national tsunami warning chains to help get warnings to all at-risk communities
- Revised SOPs for NTWCs and DMOs along the national warning chains
- Policies and SOPs for Public Media for warning dissemination
- SOPs tested and exercised



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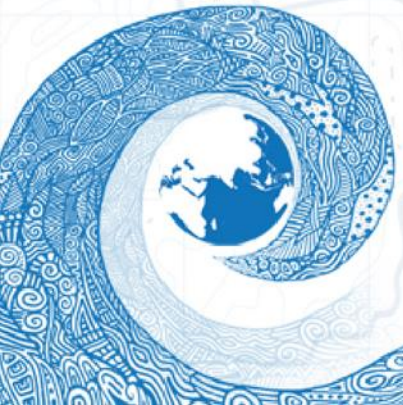
Phase 2b: Gap analysis and development of guidance on tsunami inundation mapping and evacuation planning in the NWIO region



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Output 4.1 Regional working group meetings on tsunami modelling and inundation mapping with the aim to undertake a gap analysis and develop specifications for a unified approach for tsunami modelling in the region, including the provision of inputs from international expertise

Progress:

- Regional Working Group formed and met online
- Cooperation and exchange of knowledge on tsunami modelling and inundation mapping
- Gap analysis of tsunami inundation capabilities in the region almost complete

Key Players

- National Tsunami Warning Centres, Regional Researchers/Academics, and International Experts
- Consultant undertaking a NWIO Region Inundation Modelling Gap Analysis

1. **PTHA modelling incorporation in unified approach and method for tsunami modelling and inundation mapping for the NWIO region discussed at science exchange meeting 14 - 16 Nov 2022, Abu Dhabi, United Arab Emirates.**
2. **Unified approach and method for tsunami modelling and inundation mapping for NWIO region presented at Indian Ocean Tsunami Ready Workshop, 22-26 Nov 2022, Bali, Indonesia.**

Output 4.2 Information package on existing approaches, standards, methodologies, and best practices for tsunami evacuation planning, as well as tailored recommendations for the NWIO countries including concrete steps for the development of context-specific policies, standards, and approaches

Progress:

- National Working Groups formed and met
- Questionnaire of national capabilities
- Gap analysis of evacuation mapping capabilities in the region

Key Players

- Disaster Management Organisations (local/provincial DMOs, national DMOs)
- Community Leaders and other local-level stakeholders
- International consultant supported by national consultants to assist with compilation of National Tsunami Evacuation Mapping Gap Analysis

Information package (including some translations) on existing approaches, standards, methodologies, and best practices for tsunami evacuation planning for the NWIO region presented at Indian Ocean Tsunami Ready Workshop, 22-26 Nov 2022, Bali, Indonesia.

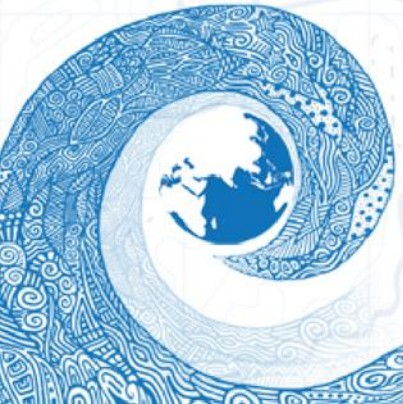
Project Impacts

A better understanding of the capabilities in each Member States to guide where capacity building is required for inundation and evacuation mapping

Helping build and develop networks and relationships between stakeholders involved in helping prepare at-risk communities against the tsunami hazard

Specifications for a unified approach for tsunami modelling and inundation mapping for the NWIO region

Help develop national policies, standards and approaches for evacuation planning in the participating countries



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Summary

- Significant progress has been made in assisting NWIO countries have the tools and capabilities to:
  i. Better understand the tsunami hazard in the region to be able to enhance awareness
  ii. Implement national tsunami warning chains to reach everybody
  iii. Determine capacities to prepare communities against the tsunami threat
- While Phase 1 focused on authorities at national level, phases 2a and 2b also focused on authorities at provincial/local level, including support for translators
- Supporting NWIO region stakeholders participate in broader Indian Ocean capacity development activities to maximise exposure and benefit