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***SUBREGIONAL WORKING
GROUP
FOR THE NORTH WEST
INDIAN OCEAN (NWIO)
Progress Report***

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Subregional Working Group For The North West Indian Ocean (NWIO)



Terms-of-Reference

1. To **evaluate capabilities and ascertain requirements of countries** in the northwest Indian Ocean region for providing end-to-end tsunami warning and mitigation services within a multi-hazard framework and within the framework of the ICG/IOTWMS.
2. **To promote and facilitate tsunami hazard and risk studies and research in the region.**
3. To facilitate **cooperation** in the establishment and upgrading of **seismic, sea level, and GNSS stations and networks** and communication systems in the region.
4. To facilitate improvement of the **education programs** on tsunami mitigation in the region.
5. To facilitate capacity building and the **sharing of tsunami-related data and information** in the region.

1. Progress on Activities

UNESCAP Project

Strengthening Tsunami Warning in the North West Indian Ocean through Regional Cooperation

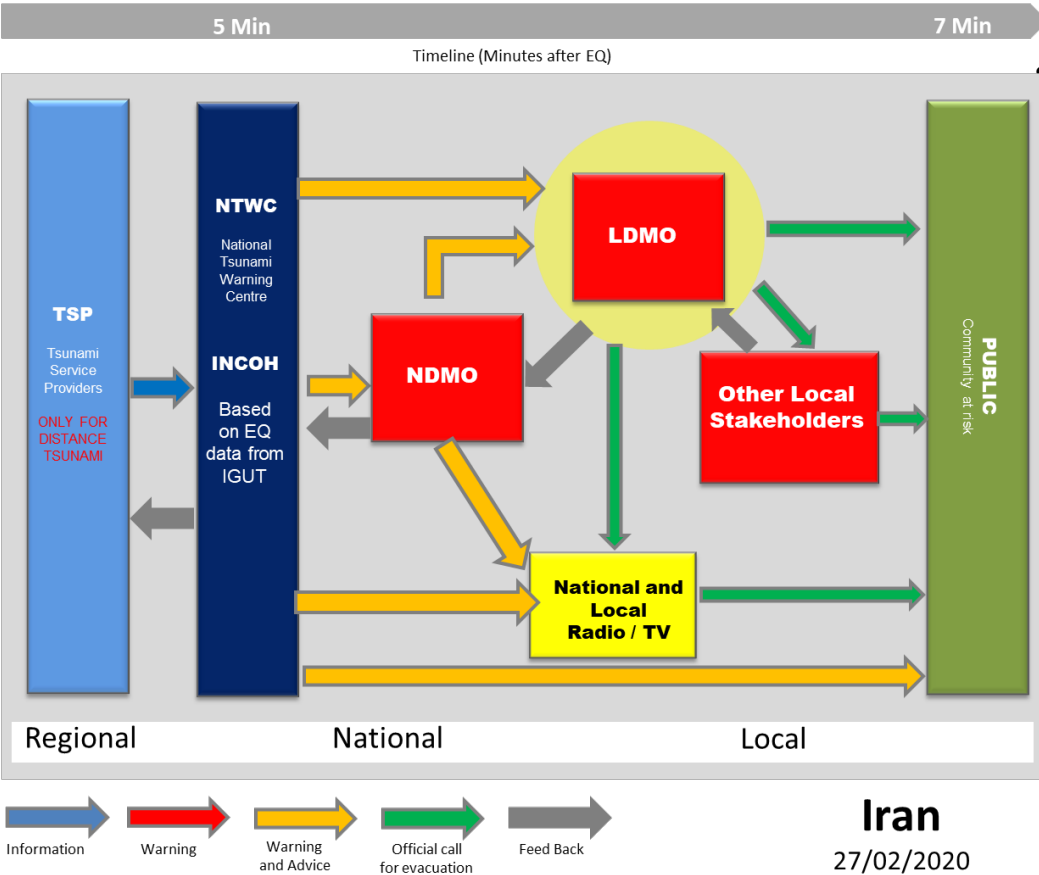
Timely delivery of national tsunami warnings to at-risk coastal communities who are prepared to respond effectively (*Tsunami Ready*)

- Phase 1: Hazard & risk assessment and National tsunami warning chain development (India, Iran, Pakistan + Oman and UAE self-funded)
- Phase 2: Inundation and evacuation mapping capacity development
- Phase 3: At-risk coastal community preparedness

1. Progress on Activities

UNESCAP Project

2. Improvement of warning services at NTWC level and the organization of the national warning chains to assure timely warnings.



- Key stakeholders involved in the national tsunami warning chains brought together to enhance ownership, communication, and coordination across national and local levels
- Series of virtual National Consultative Meetings with India, Iran, Oman, and Pakistan
- National tsunami warning chains developed, tested, and refined for each country
- Evolution of national tsunami warning chains at different stages between the countries
- Standard Operating Procedures (SOPs) completed or in development for NTWCs, DMOs, and Broadcast Media
- Pilot communities identified and Local Disaster Management Organizations and other stakeholders engaged
- Several Workshops and Webinars: February 2020, November 2020, June 2021, September 2021, twice in October 2021, the 2022 few meetings and workshops**
- COVID-19 guidelines provided to all IOTWMS Member States in 2020

1. Progress on Activities

IGCP Project

West Makran Paleo-tsunami Investigation

Objectives and plan

- Investigate the relationship between great earthquakes and associated tsunamis in Makran Subduction Zone, duration of the tsunami recurrence, probability of it happening in populated places, identification of the most affected places, the extent of the potential damage, the time needed for tsunami hazard alert, probability of major earthquakes occurrence, leading to the reduction of humanitarian and property damage.
- Develop a building stone for further analysis to support the identification of the most probable tsunami occurrence from a geological point of view, including identification of the major locations that have been affected by past (paleo) tsunami
- **The new 4 years approval of the project with funding has been confirmed and so far we have had three courses and plan to get in 2-3 weeks' time FIRST ONLINE FIELD WORK ON PALEOTSUNAMI TRENCHING.**
- **In this study there is a plan to study mud-volcanos in the region as a source of high-risk areas for future build environments and their relation to faulting.**

1. Progress on Activities

Meteo-tsunami

Persian Gulf Meteo-Tsunamimi Investigation

Objectives and plan

- Develop a building stone for further analysis to support the identification of the most probable tsunami occurrence from a meteorological point of view, including identification of the major locations that have been affected by past (paleo) meteo-tsunami
- A presentation of a paper on Challenges, historical and recent, Meteotsunamis in the Persian Gulf and their economic impact on MENORA international conference in Spain

1. Progress on Activities

Status of Action Items from Intersessional Steering Group December 2020

SI No.	Actions & Recommendations	Status
1	Requests the ICG/IOTWMS to encourage all Member States to work on their tsunami warning chain with a view to minimize the number of steps (between the NTWC and Public) in the warning chain, and with clear authorization of responsibilities amongst the NTWCs, NDMOs, LDMOs and Public.	As part of UNESCAP Project Warning Chains of all MSZ member states were refined and SOPs are being prepared
2	NWIO-WG member states are urged to exchange real-time data with the TSPs. It is also strongly suggested to go toward the multi-lateral.	Currently bi-lateral agreements between member states is in progress
3	The reaction to atypical tsunami events needs to be incorporated into tsunami early warning systems including community evacuation and emergency plans.	'Atypical' events needs to be further studied to incorporate them in TEWS
4	On-job training also needs to be initiated among NWIO member countries, may be when international travel is safe we can start with one by one member state.	Member states to consider after COVID-19 situation comes under control
5	Initiate building knowledge-based database of risk assessment (approaches adopted for hazard, vulnerability and risk assessment) that is accessible to all Member States (possibly IOTIC site or other portal).	Yet to initiate. NWIO will coordinate with IOTIC, A working plan to be initiated
6	Paleotsunami study has been initiated in Iran by the University of Hormozgan, to be extended in the region, this can help us to know more historical seismicity and also achieve the required Mmax for hazard studies.	Frist workshop conducted in October. To be extended to other member states in future
7	Encourage the participation <u>and experts of North</u> West Indian Ocean representatives in webinars and workshops with a focus on the Makran region.	On going
8	Chairs of WG1, WG2, WG-NWIO, and Task Teams to prepare a proposal for UN Ocean Decade with support from IOTIC and the Secretariat for enhancement by the Steering Group. Consider focusing on 1) Near-field tsunami warning and mitigation including: transforming tsunami warning services through new technology (GNSS, smart cables) through to community preparedness and infrastructure; and/or 2) Tsunami monitoring gaps in NWIO. In-particular enhancing the observing networks, PTHA development, and data sharing. These activities could be expanded to the entire Indian Ocean basin	Ongoing ?? Need to be completed or Removed
9	Working Groups to review the recommendations of the Capacity Assessment of Tsunami Preparedness: Status report 2018.	To review? To be checked
10	WG-2 and WG-NWIO to provide advice to Makran project team on harmonisation issues of NTWC products and warnings in the NWIO	Completed

2. Challenges

- Identifying all potential sources of the tsunami in the Makran Subduction **Zone including non-seismic**
- Assess and mitigate local tsunami threats, **Near Field**
- Maintaining effective national tsunami/**local** warning chains for rare events such as tsunami
- Integrating national tsunami warning chains with other multi-hazard frameworks
- Timeliness of tsunami warnings for near-field tsunami events, **SOP at its final stage in many countries in the region.**
- Need to further research the seismicity of the region and how to include features such as splay faulting, and non-seismic sources in the PTHA, that is including atypical tsunamis in the PTHA **(The result to be reported and knowledge transfer to the region, this is a big challenge).**
- **Optimal network design for Data Sharing**
- Strengthening of observation network with advanced technologies (GNSS/SMART Cables/OBS etc.)
- **Local language barrier needs some action**

3. Way Forward & New Opportunities

- Phase 2 UNESCAP Project funded and to start early 22
- **Paleo-tsunami project is now being funded by IGCP and online trenching will start soon....**
- Utilize National Tsunami Working Groups established by UNESCAP Project to further coordinate, maintain, and develop national tsunami warning chains
- Utilize national and next IOWAVE exercises to test and enhance national tsunami warning chains
- **Engage local communities in pilot areas identified by UNESCAP Project**
- **Tsunami Ready implementation**
- Ocean Decade – Tsunami Programme



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