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Intergovernmental
Oceanographic
Commission

***SUBREGIONAL WORKING
GROUP
FOR THE NORTH WEST
INDIAN OCEAN (NWIO)
Review Plans and Issues***

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Chair

25 November 2021

Progress on Activities

1. 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*)

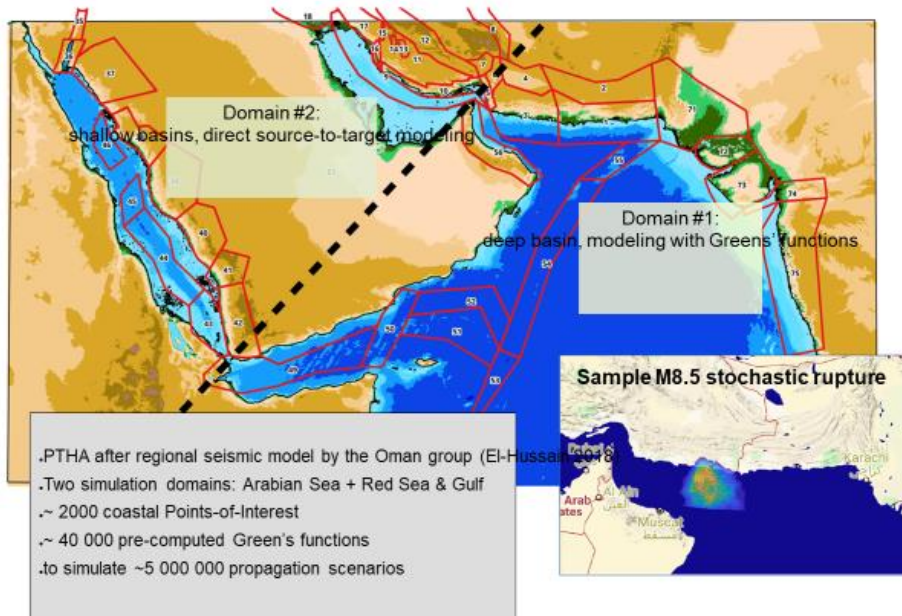
- Phase 1: Hazard & risk assessment and National tsunami warning chain development (India, Iran, Pakistan + Oman and UAE self-funded)
 - Better understanding of the risk knowledge (PTHA)
 - Improvement of warning services at NTWC level (SOPs)
- Phase 2: Inundation and evacuation mapping capacity development
- Phase 3: At-risk coastal community preparedness

Progress on Activities

1. UNESCAP Project

1. Better understanding of the risk knowledge to inform and underpin warning and mitigation systems in the NWIO to enable appropriate and effective community responses to the tsunami threat.

Probabilistic Tsunami Hazard Assessment
extended over the whole region and all earthquake sources

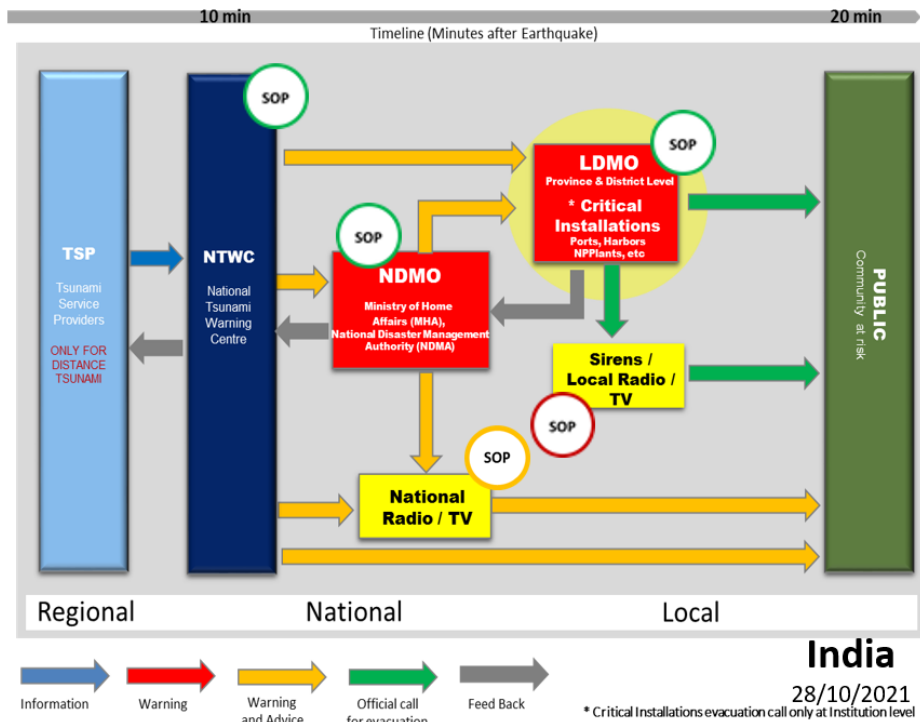


- Meetings of the Makran Probabilistic Tsunami Hazard Assessment (PTHA) in (1) December 2019, (2) May, 2020 (3) June 2020 & (4) August 2020
- Virtual meetings after COVID-19 impact. No break in progress, but slowed down.
- Initial benchmark PTHA model **simulations run at INCOIS [India]** with **guidance from GFZ [Germany], INGV and University of Malaga** .
- Examining the possibility of the tsunami threat in the neighbouring Persian Gulf and Red Sea.
- Working **towards data exchange** through MOUs
- To consider **hazard from atypical tsunamis** from non-seismic sources (eg submarine landslides)

Progress on Activities

1. 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,
- **COVID-19 guidelines provided** to all IOTWMS Member States in 2020

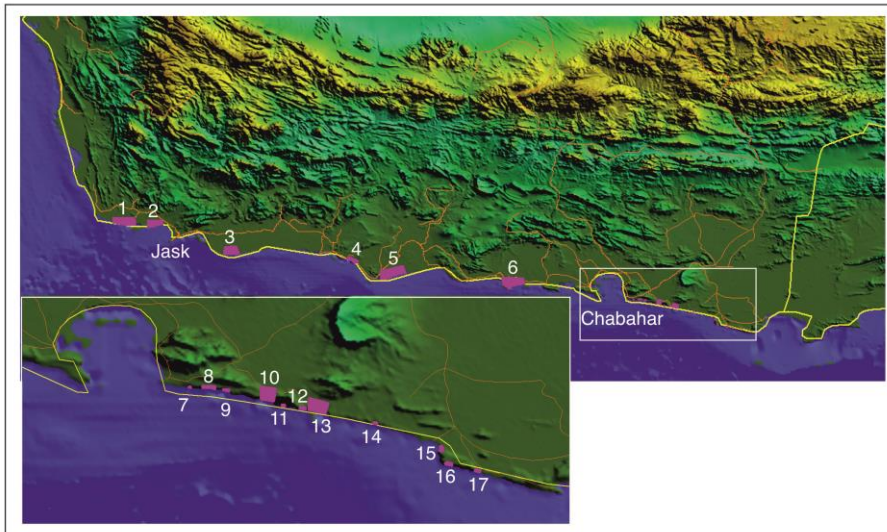
Progress on Activities

2. IGCP Project

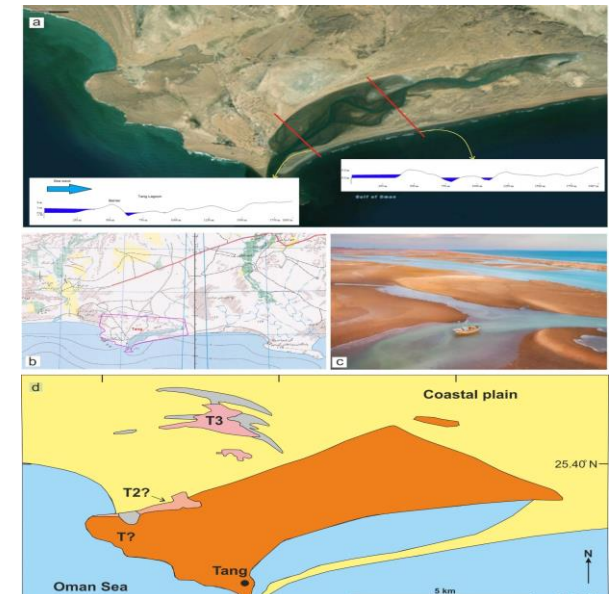
West Makran Paleo-tsunami Investigation

Objectives

- 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, extent of the potential damage, 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 geological point of view, including identification of the major locations that have been affected by past (paleo) tsunami



The first workshop was held virtually on October 29, 2021



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

Progress on Activities

Status of Action Items from Intersessional Steering Group December 2020



SI No.	Actions & Recommendations	Status
6	<p>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.</p>	<p>Frist workshop conducted in October. To be extended to other member states in future</p>
7	<p>Encourage the participation of North West Indian Ocean representatives in webinars and workshops with a focus on the Makran region.</p>	<p>On going</p>
8	<p>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</p> <ol style="list-style-type: none"> 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 	<p>On going</p>
9	<p>Working Groups to review the recommendations of the Capacity Assessment of Tsunami Preparedness: Status report 2018.</p>	<p>To review</p>
10	<p>WG-2 and WG-NWIO to provide advice to Makran project team on harmonisation issues of NTWC products and warnings in the NWIO</p>	<p>Completed</p>

Progress on Activities

Status of Action Items Intersessional Steering Group



SI No.	Actions	Status
1	Tsunamogenic sources and the related parameters.	On going
2	Assess and mitigate local tsunami threat	On going
3	Maintaining effective national tsunami warning chains.	On going
4	Integrating national tsunami warning chains with other multi-hazard frameworks	To review
5	Need to further research the seismicity (DATA SHARING) of the region.	On going
6	Include atypical tsunamis such as splay faulting in the PTHA	Waiting
7	Optimal network design for Data Sharing seismic, GPS and tidal Gauge,.....	Waiting
8	Strengthening tsunami awareness and preparedness especially for near-field threat.	On going
9	Incorporate the local languages as an important aspect in awareness and preparedness.	On going

Way Forward & New Opportunities

SI No.	Actions & Recommendations	Status
1	Phase 2 UNESCAP Project funded and to start late 21/early 22	Waiting
2	Paleo-tsunami project the phase one "site selection" the report being submitted to IGCP, it is 5 years project which is a regional project (India, Pakistan, Oman and Iran) as the nature of budget is only educational we would require some input from I would like to add some funding for the data analysis and field work already gain some support, but we would need some additional to full fil our commitment.	On going
3	Utilize National Tsunami Working Groups established by UNESCAP Project to further coordinate, maintain and develop national tsunami warning chains . A new chapter has been established In Iran to strengthen the local level SOP, this should be furthered.	On going
4	Utilize national and next IOWAVE exercises to test and enhance national/local tsunami warning chains.	On going/waiting
5	Engage local communities in pilot areas identified by UNESCAP Project.	Initiated
6	Tsunami Ready implementation	Waiting
7	Ocean Decade – Tsunami Program	On going

Way Forward & New Opportunities

SI No.	Actions & Recommendations	Status
8	Request a link for warning from TSP to LDMO as well as DMO to speed up the process of warning distribution. (short time).	On going/waiting
9	Establishment a system for better warning and awareness distribution of information in local languages.	On going/initiated
10	Atypical tsunami source investigations (Splay faults, Submarine land slides, onshore Earthquakes, Part as PhD thesis has already being initiated, few good publication (Canada and France as well as Iran and Pakistan).	On going/waiting
11	Strengthening the observation network with advanced technologies (GNSS/SMART Cables/OBS etc.).	Waiting
12	Source parameters some further work/some international funding as now the national funding become more difficult to obtain.	Ongoing/waiting
13	Other geophysical methods, such as Gravity, Magnetic and geoelectrical for structural identification beside the wide angle seismic reflection and refraction data.	Ongoing / waiting
14	Integration of all these data to boots the accuracy of the seismo-tectonic model of Makran subduction zone in NWIO.	Waiting



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