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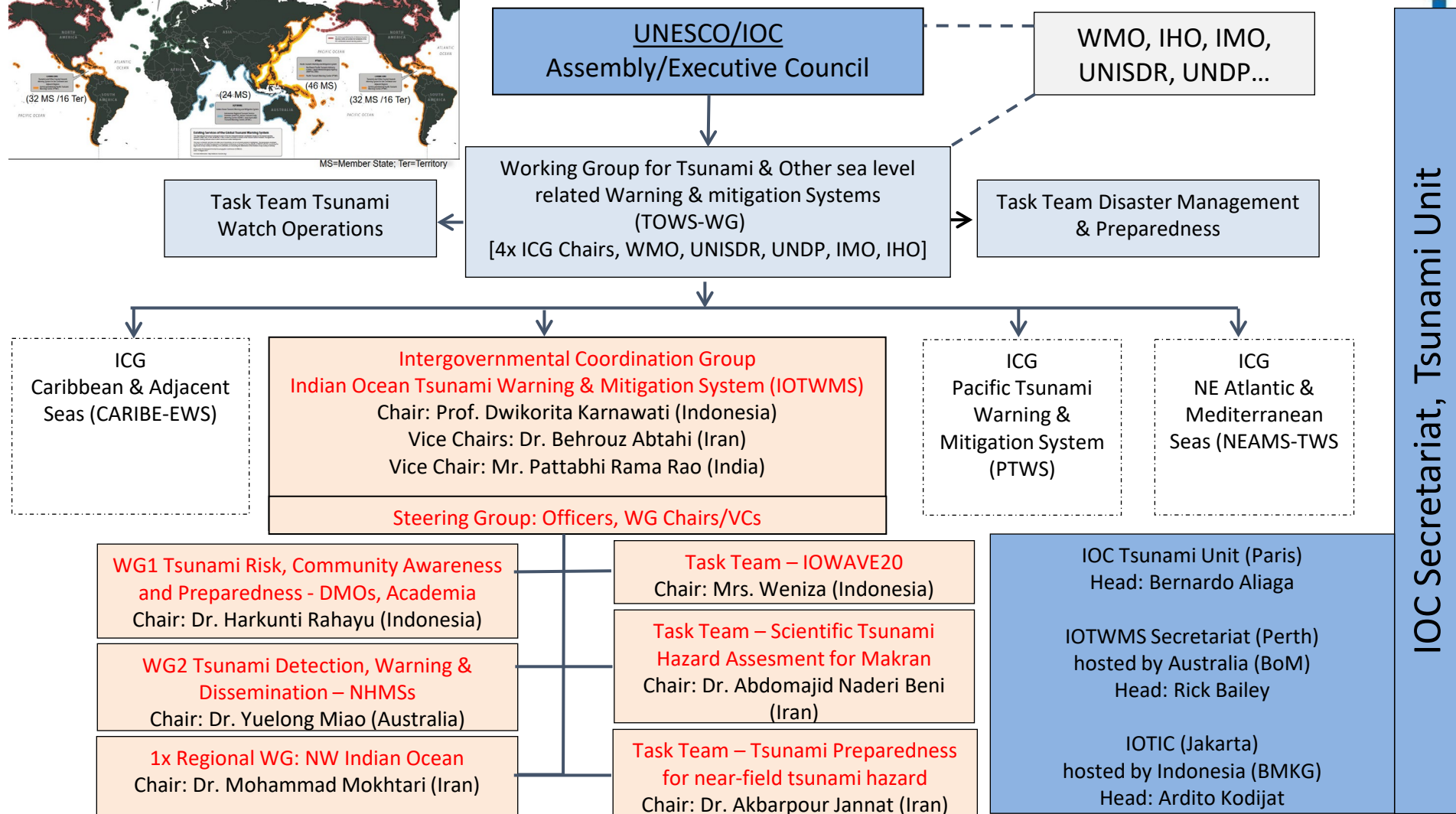
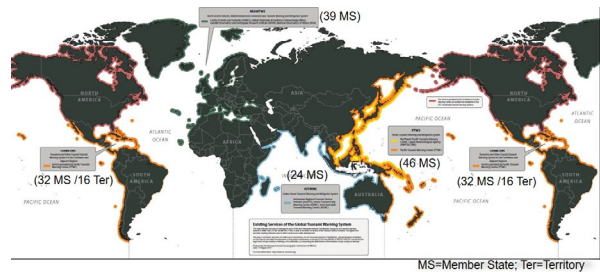
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***UN Ocean Decade Tsunami
Program:
Draft Science and
Implementation Plan***

**Scientific Committee
*Harkunti P. Rahayu***

13th ICG IOTWMS Meeting 28 November – 1 December 2022

Governance



IOC Secretariat, Tsunami Unit

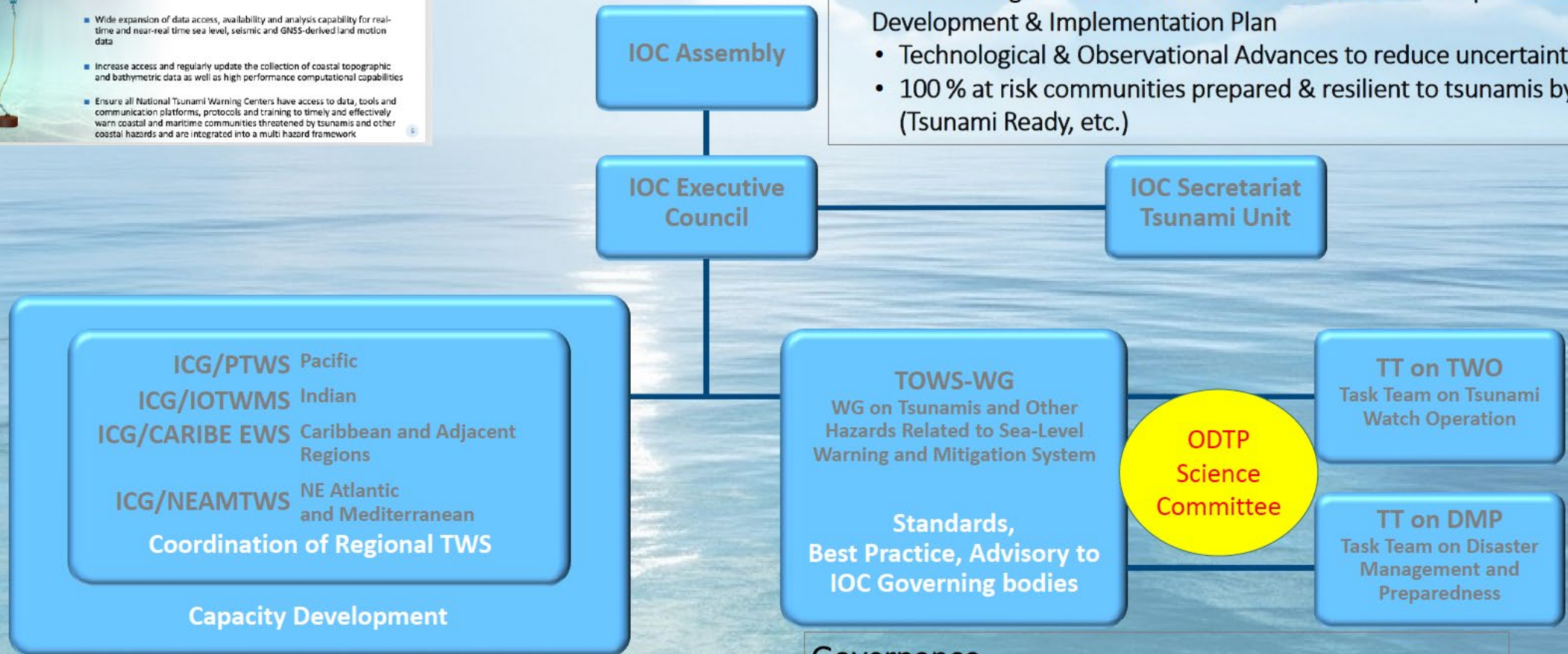
IOC Tsunami Program and UN Ocean Decade

OCEAN DECADE TSUNAMI PROGRAMME:
the Focus Areas Related to Tsunami Warning Capabilities

- Expansion of existing observational systems to fill identified gaps
- Deploy new technologies such as scientific instrumentation on deep-ocean telecommunications cables
- Wide expansion of data access, availability and analysis capability for real-time and near-real time sea level, seismic and GNSS-derived land motion data
- Increase access and regularly update the collection of coastal topographic and bathymetric data as well as high performance computational capabilities
- Ensure all National Tsunami Warning Centers have access to data, tools and communication platforms, protocols and training to timely and effectively warn coastal and maritime communities threatened by tsunamis and other coastal hazards and are integrated into a multi hazard framework

UN Ocean Decade (2021-30)

- Once-in-a-generation opportunity to address gaps in tsunami warning, enhance community preparedness and contribute to "A Safe Ocean"
- IOC Assembly 31 (Dec. A-31/3.4.1) established the Ocean Decade Tsunami Programme + Scientific Committee to Develop Research, Development & Implementation Plan
 - Technological & Observational Advances to reduce uncertainties
 - 100 % at risk communities prepared & resilient to tsunamis by 2030 (Tsunami Ready, etc.)



Governance

- TOWS-WG & ICGs: Global & Regional Steering Committee
- Scientific Committee: Advisory Role
- Special coalition for Tsunami Ready

UN Ocean Decade Tsunami Program Scientific Committee

Annex to Dec. A-31/3.4.1

Membership:

- Four (4) members nominated by the each of the TOWS-WG Task Teams;
- Three (3) members nominated by the TOWS-WG on the basis of their scientific expertise;

2022-2023

Annex to Dec. A-31/3.4.1 (cont.)

- All members will serve for a period of two years and would be eligible for renewal once.
- In selecting Expert Members, due consideration will be given to geographic, generational and gender balance.



**Srinivasa Kumar
Tummala**

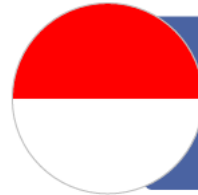
Chairperson



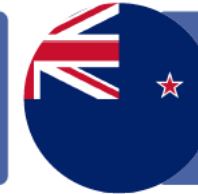
**Christa von
Hillebrandt**



Amir Yahav



**Harkunti Pertiwi
Rahayu**



David Coetsee



Silvia Chacon



**Srinivasa Kumar
Tummala**



François Schindele



Yutaka Hayashi



Michael Angove



Sergio Barrientos



Alexander Rabinovich

Call for Actions



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- Under the UN Decade of Ocean Science for Sustainable Development, a **framework** from which actions can be developed to address critical gaps in the tsunami warning and mitigation system as a whole.
- We envision realizing transformational gains related to **rapid tsunami detection, measurement and forecasting capability** and communities that are **Tsunami Ready** along with **dedicated capacity development efforts**, specifically targeted at **SIDS and LDCs**
- We seek to identify and advance specific actions that align with the components of UNDRR **People-Centered Early Warning Systems** including:
 - Risk Knowledge
 - Monitoring and Warning
 - Warning Dissemination and Communication
 - Response Capability
 - Capacity Development and attention to SIDS and LDCs

UN Ocean Decade Tsunami Programme Scientific Committee – ToR

1. Develop a Draft 10-Year Research, Development and Implementation Plan for the Ocean Decade Tsunami Programme based on the concept paper *“Protecting Communities from the World's Most Dangerous Waves: A Framework for Action under the UN Decade of Ocean Science for Sustainable Development”*;
2. Identify and address gaps in global tsunami hazard assessment as follows:
 - a. comprehensive assessment to include all potential tsunamis, anywhere in the world, regardless of their source,
 - b. strategies to validate historical tsunami sources, through the application of paleotsunami techniques and historical seismology
3. Identify gaps in tsunami detection, measurement, forecasting, with a special emphasis on tsunamis generated close to populated coastlines;
4. Propose to enhance sensing and analysis strategies to enable the rapid characterization of tsunami sources through the combined use of land-based seismic and geodetic sensors, GNSS terminals, coastal sea level gauges, deep-ocean tsunameters, SMART repeaters on deep-ocean fiber-optic cables and satellite-based observations;

UN Ocean Decade Tsunami Programme Scientific Committee – ToR

5. Propose a roadmap for collaboration with the ITU/WMO/IOC SMART Joint Task Force cable initiative to fully explore the feasibility of widespread deployment of scientific instrumentation on deep-ocean fiber-optic cables to improve capability to rapidly detect and characterize tsunami sources as well as propagating tsunami wave fields;
6. Consider and propose strategies, programmes and content to enhance societal resilience for tsunami and other ocean hazards;
 - a. build the framework needed to ensure the training and development of the next generation of technical-scientific expertise,
 - b. identify strategies that allow to characterize structural and social vulnerability in tsunami hazard zones
7. Overview the consolidation of inputs received to IOC [Circular Letter 2825](#) on Inventory of actions being considered under the United Nations Decade of Ocean Science for Sustainable Development (2021–2030) in the field of Tsunamis and Other Sea-Level Related Hazards warning and mitigation;
8. Submit a Draft 10-Year Research, Development and Implementation Plan for endorsement by the TOWS-WG at its 15th meeting.

Scientific Committee for the UN Ocean Decade Tsunami Programme (SC-ODTP)²¹

Goal=Draft a 10-Year Research, Development and Implementation Plan for the Ocean Decade Tsunami Programme

Proposed Timeline



Tsunami Decade Value Proposition

- Tsunamigenic processes are complex and difficult to accurately simulate in real-time. Reliance on seismic proxy
- In contrast the tsunami **wavefield** is detectable, measureable and propagates deterministically in open water.
- Opportunity: Focus effort on improving direct tsunami detection and measurement
 - *Science?*
 - *Observations?*
 - *Techniques?*
- **RESULT: EM Decisions informed by accuracy and precision, rather than broad uncertainties.**

ODTP Draft for Science and Implementation Plan



1. Introduction
2. Tsunami Risk Knowledge
3. Monitoring, detection, analysis and forecasting of tsunamis and possible consequences
4. Warning, dissemination and communication
5. Preparedness and Response Capabilities
6. Capacity Development and Attention to SIDS and LDCs
7. Governance: Cooperation, Participation: Inclusiveness, Legal, Institutional policy and regulatory frameworks
8. Monitoring / Reporting on the Global Sendai Target
9. Implementation Plan

1. Introduction

- Early Warning Systems include four pillars (WMO, 2018):
 - (i) Tsunami Disaster Risk Knowledge,
 - (ii) Detection, Monitoring, Analysis and Forecasting of the tsunami hazard and possible consequences
 - (iii) Warning Dissemination and Communication and
 - (iv) Preparedness and Response Capabilities.
- These four components are underpinned by Capacity Development and Governance.

2. Tsunami Risk Assessments

- Understanding the physical processes that govern the generation, propagation, and inundation of tsunamis as well as the assessment of the tsunami hazard and risk for specific locations are of crucial importance for an effective development of the various tsunami risk reduction actions at those locations.
- 2.1 Advance Risk Knowledge
 - Understanding and improving our knowledge of global tsunami hazard and risk, including non-seismic generated tsunami events, PTHAs, and use of paleotsunami studies
- 2.2 Tsunami Hazard
 - Seismic Tsunami:
 - Probabilistic THA (PTHA)
 - Methodologies to define tsunami parameters
 - Input needed for THA
 - *Non-seismic source:*
 - *Meteo Tsunami*
 - volcanic generated tsunamis
 - landslide generated tsunamis
- 2.3 Exposure and vulnerability
- 2.4 Cascading Risk

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**



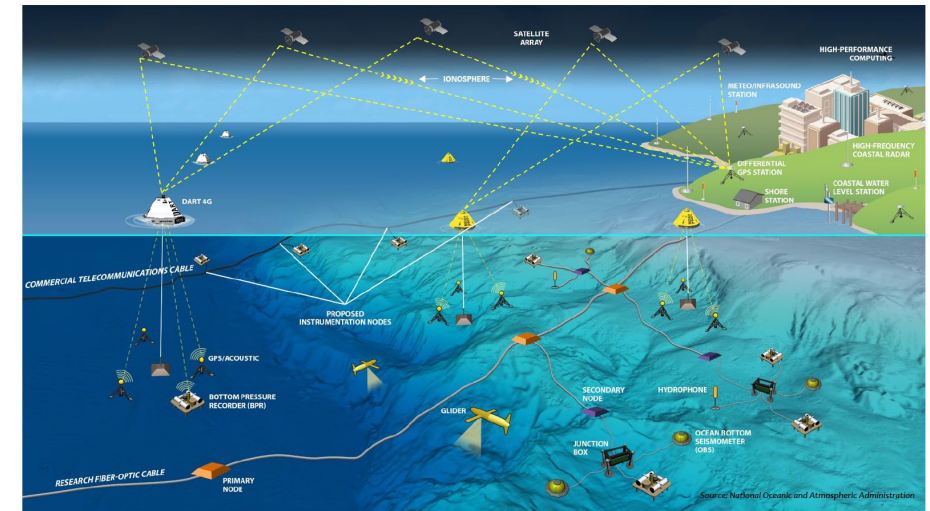
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3. Detection, analysis and forecasting of tsunamis and associated hazardous consequences

- Vision: Enhanced accuracy and timeliness of tsunami warnings
- Strategy: Achieve improvements in tsunami warning by focusing on direct tsunami wave measurements and detection and developing techniques to incorporate all available data.
- Implementation: Identify opportunities for Member States, the R&D community and the general scientific community to contribute to achieving the Decade vision. Advocate for establishment of pilot projects within ICGs

Rethinking Ocean Observations:
Reducing Uncertainty in Global Tsunami Forecasts





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4. Warning, dissemination and communication

- Challenge/Issue Potential Solution :
 1. National and local tsunami warning chains and SOPs
 2. Construction of the warning
 3. Warning Dissemination and Communication Options

- How will it be measured and Milestone from 2024 up to 2030:
 1. National and local tsunami warning chains and SOPs
 2. Construction of the warning
 3. Warning Dissemination and Communication Options



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5. Preparedness and Response Capabilities

With a view on people centred warning systems, the following key issues need to be addressed in the Ocean Decade Tsunami Programme (ODTP):

1. Effective decision making to warn
2. Effective construction of warnings
3. Effective dissemination and communication of warnings

6. Capacity Development and Attention to SIDS and LDCs

- 6.1 Dedicated capacity enhancement: coastal disaster risk management at SIDS (Small Island Development States) and LDCs (Least Developed Countries)
- 6.2 Capacity development for local communities and authorities (warning interpretation response and other issues)
- 6.3 Train the trainers
- 6.4 Tsunami education
- 6.5 SIDS and LDC full integration
- 6.6 Bridging science, policy and development through multidisciplinary approach

7. Governance: Cooperation, Participation: Inclusiveness, Legal, Institutional policy and regulatory frameworks



- Global DRR Related Frameworks:
 - Sendai Framework for DRR
 - The Paris Agreement
 - The Sustainable Development Goals (SDG)
- 7.1 Mainstreaming Tsunami DRR into Urban Planning
- 7.2 Cooperation (international, subregional, etc.): 3 pillars
 - *Hazard and Risk Assessments, Information and Communication*
 - *Monitoring and Tsunami Early Warning Services*
 - *Preparedness and Response Capacity*
 - **New Cooperation Opportunities**
- 7.3 Inclusiveness, gender diversity, youth involvement
- 7.4 Legal, national policy and regulatory aspects
- 7.5 Uncertainty, Limitations/ Accountability/managing expectations



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Thank you ...