



**INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION  
(of UNESCO)**

**Ninth Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami  
Warning and Mitigation System  
(ICG/IOTWS-IX)  
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Agenda Item 4.1

**REPORT OF INTERSESSIONAL ACTIVITIES OF ICG/IOTWS WORKING GROUP 1  
ON:  
“TSUNAMI RISK ASSESSMENT AND REDUCTION”**

This document contains the report of the intersessional activities of the ICG/IOTWS Working Group 1 on Tsunami Risk Assessment and Reduction. The ICG is requested to consider, comment on and endorse the Working Group's action plan for the next intersessional period.



## **Report of Working Group 1 on Tsunami Risk Assessment and Reduction**

*Submitted by Dr. Sam Hettiarachchi, Chairman Working Group*

### **Introduction**

The importance of Risk Assessment and Management was identified at the first meeting of the Indian Ocean Tsunami Warning System (IOTWS) held in Paris in March 2005. The Working Group on Risk Assessment was established at the 1st ICG/IOTWS in August 2005. Following a needs assessment survey of the membership, the Terms of Reference of the Working Group was developed at the 2<sup>nd</sup> ICG/IOTWS which also gave birth to two other Working Groups on Modelling and Awareness/Response with overlapping areas of interest. It was decided to develop an activity profile which would permit healthy interaction with the newly established working groups.

Given the background of the work implemented, the mission of Working Group on Risk Assessment is 'Strengthening the Indian Ocean Tsunami Warning System (IOTWS) by moving ahead with new initiatives on Tsunami Risk Assessment and Management while recognising the footprints of progress since its inception'. It is the vision of the Working Group to bring together all stakeholders in tsunami prone ocean basins, including members of civil society, to make disaster risk reduction everyone's business.

This report comprises Activities, System Status, Gaps and Deficiencies and Action Plan of the Working Group on Risk Assessment.

### **Activities**

The needs assessment identified a number of important areas and priority was given to the following thrust areas.

1. Initiate investigative studies on tsunami hazard sources and data collection
2. Prepare an Integrated Regional Tsunami Hazard Map /Risk Model to enhance the understanding of tsunami hazards
3. Develop uniform guidelines for Tsunami Risk Assessment based on the wide experience available among the member countries
4. Provide guidance on tsunami hazard mitigation
5. Strengthen the capabilities of Indian Ocean states in the field of Tsunami Risk Assessment and Mitigation

The activity profile has been modified at regular intervals arising from Inter-sessional Meetings of the Working Group and the Annual Meetings of ICG/IOTWS. The most recent meeting being the two day Inter-sessional Meeting held in Jakarta in November 2011. Working Group continued to work on the above thrust areas and also to seek funding for new activities.

The Working Group prepared a detailed proposal to the UNESCAP Tsunami Trust Fund seeking funds to continue important activities on Tsunami Risk Assessment and Management. This collaborative initiative with Working Group on Awareness and Response was successful and reference is made to its implementation under the Action Plan.

It is recognized that in addition to the Focal Points of IOTWS there are several agencies, national and regional, who are engaged in Risk Assessment and Management relating to coastal hazards and every attempt has been made to establish working relationships with such organizations. With the assistance of the UNDP, Asia Pacific Regional Centre, Bangkok, a four day Workshop was held in Sri Lanka in March 2012, on 'Disaster Risk Assessment and Management within a Multiple-Hazard Coastal Risk Assessment Framework'. The workshop, comprising lectures, exercises and field visits was attended by delegates from Timor, Cambodia and Sri Lanka. Teaching materials developed by the Working Group were used for this event. The workshop was very successful and obtained high ratings from the participants. This type of initiative displays the commitment to contribute to continued professional development in disaster risk reduction.

The Working Group contributed to several publications by UNESCO and other international organizations on the subject of Tsunami and Coastal Hazards, Vulnerability, Risk Assessment and Management. These links will be made available to the member states once the publications are finalized.

Through its activity profile, the Working Group has strengthened the IOTWS and in this process has also established sustainable links with several agencies associated with Coastal Hazards and Disaster Risk Reduction leading to productive partnerships of mutual benefit. These include, UNISDR, UNDP, UN-SPIDER, UNEP, UNU-Bonn, GRF-Davos and Swiss RE.

## **System Status**

The Working Group adopted a three pronged approach to contribute positively to the IOTWS by the time the system becomes fully operational. The areas focused were,

1. The availability of an Indian Ocean Tsunami Hazard Map,
2. The development of the Tsunami Risk Assessment Guideline and
3. Strengthening the capabilities of Indian Ocean States in Training in Tsunami Risk Assessment and Management

The Indian Ocean Tsunami Hazard Map was prepared by Geo Science Australia as an activity of the Working Group. This was based on probabilistic tsunami hazard modeling, with funding from Aus-AID, and in full consultation with the regional and external experts. Geo Science Australia provided leadership for this activity.

Tsunami Risk Assessment Guideline was prepared and published as a UNESCO Manual and Guideline No.52. This Guideline was prepared over a two year period having convened several workshops in order to consult the regional and external experts. UNDP, Bangkok, WAPMERR, Dubai and IOTWS provided funding for these activities. Priority was given to the understanding

of the existing risk assessment framework in Indian Ocean Countries and to ensure that the guideline captured the existing knowledge base of the member states.

Strengthening the capabilities of member states in training in Tsunami Risk Assessment and Management was given high priority. Several seminars and workshops were held during the preparation of the Tsunami Hazard Map and the Risk Assessment Guideline. After the successful preparation of these two documents a Training Programme comprising a Seminar and Training Workshop was conducted over 9 days in Bangkok in November 2009 to provide training to member states on the use of the Tsunami Hazard Map and the Risk Assessment Guideline. Following this event country programmes were held in Sri Lanka and Indonesia in 2010. The Working Group has encouraged the adoption of the guideline or the development of country specific guidelines based on the said guideline.

### **Gaps and Deficiencies**

During discussions at Inter-sessional Meetings and at the annual meetings of ICG/IOTWS the following issues were identified,

1. Revision of the Tsunami Risk Assessment Guideline to incorporate issues which were not covered in detail and to include recent developments and demands arising from recent tsunami events.
2. Availability of a collection of Case Studies on Tsunami Risk Assessment and Management, capturing the diverse aspects of the process.
2. Development of a capability that serves real time operational needs, hazard/risk assessment needs and research through the use of a standard tsunami forecast system thereby optimizing the use of information available with the Regional Tsunami Service Providers (RTSP) for risk assessment. It is expected that this type of initiative will enhance the knowledge base of those engaged in risk assessment on the services made available by RSTPs.
3. Enhance the capability in conducting Tsunami Risk Assessment and Management via training and the development of a sustainable mechanism as part of continued professional development.

### **Action Plan**

(1) A joint proposal by the Working Group on Risk Assessment and the Working Group on Awareness and Response submitted to the UNESCAP Tsunami Trust Fund was successful and funds have been made available over a period of two years to achieve specific objectives identified by the two working groups. The title of the project is, 'Enhancing Tsunami Risk Assessment and Management, Strengthening Policy Support and Developing Guidelines for Tsunami Exercises in Indian Ocean Countries'. The working groups will work in close collaboration to achieve the said objectives for which a series of activities have been identified.

The Overall Objectives and the Expected Outcomes of the component of the project relating to the Working Group on Risk Assessment are,

#### Overall Objectives

1. Revision and Expansion of the Guideline on Tsunami Risk Assessment at regional level including sufficient guidance to implement activities at national level
2. To enhance the capability in conducting Tsunami Risk Assessment within a tsunami forecasting and early warning framework
3. Establishment of a sustainable mechanism for training in Coastal Hazards and Tsunami Risk Assessment and Management

#### Expected outcomes

1. Development of an upgraded and revised guideline on Tsunami Risk Assessment and Management
2. Development of a capability that serves real time operational needs, hazard/risk assessment needs and research/developments opportunities through the use of a standard tsunami forecast system
3. Enhanced capacity in training in Coastal Hazards and Tsunami Risk Assessment and Management through the development of training modules and teaching materials
4. Policy document on sustainable training and continued professional development in tsunami and coastal hazard mitigation

The Chair has been engaged in preliminary work relating to the project, focusing in particular in obtaining contributions from a wide range of experts to the proposed revision of the Tsunami Risk Assessment Guideline.

(2) The Chair of the Working Group on Risk Assessment has extended his support to the Working Group on Awareness and Response for their publication on 'Tsunami Early Warning and Community Preparedness-Insights and Compilation of Good Practices'. The Chair will contribute and coordinate with the editors the section dedicated to Risk Assessment. The Chair wishes to express his sincere thanks to Irina Rafliana, Chair of the Working Group on Awareness and Response for this important initiative.

(3) The Chair of the Working Group assisted UNESCO/IOC and the Government of Oman to prepare Terms of Reference for Tsunami Risk Assessment studies for the Oman coastline. The Project will cover, Hazard Source Identification and Assessment, Scenario Modelling, Vulnerability and Risk Assessment and Management within a multiple hazard framework. The project has an important component on training to which the Chair will contribute. It is expected that this project will strengthen risk assessment and management in regions which may be impacted by the Makran source.

(4) The Working Group is promoting Tsunami Risk Assessment Studies in the Indian Ocean region.

Thrust areas under this topic are

1. Initiating the implementation and compilation of Case Studies on Tsunami Risk Assessment in Indian Ocean States
2. To collaborate with member states from other Tsunami Warning Systems on Case Studies

The overall goal is to implement at least five Case Studies on Risk Assessment, spread across the Indian Ocean, using the RA Guidelines or respective national guidelines.

Two Case Studies are already available.

1. Tsunami Risk Assessment in Indonesia (Natural Hazards and Earth System Sciences)
2. Risk Assessment and Management for Tsunami Hazard-Case Study of the Port City of Galle, Sri Lanka (UNDP-APRC)

The intention is also to work in collaboration with other warning systems to record at least one Case Study on Risk Assessment from the other ocean basins prone to tsunami hazards.

The Chair is also contributing to the revision of the manual on Integrated Coastal Area Management undertaken by UNESCO/IOC Paris. This document will be used for training in risk assessment and management.

(5) The Working Group is collaborating with IOTWS Secretariat in planning, organising and conducting a workshop on “Assessment of coastal sea level-related hazards in the Western Indian Ocean and in the Eastern and Northern Indian Ocean”

IOC has been allocated funds under UNESCO’s Emergency Funding programme to support “Assessment of coastal sea level-related hazards in the Western Indian Ocean and in the Eastern and Northern Indian Ocean”. It is expected to utilize funding from this programme and the workshop is planned to be held in Sri Lanka in early 2013.