INTERSESSIONAL MEETING OF WORKING GROUP 1 ON TSUNAMI RISK, COMMUNITY AWARENESS AND PREPAREDNESS

Online Meeting

3 December 2020

Members

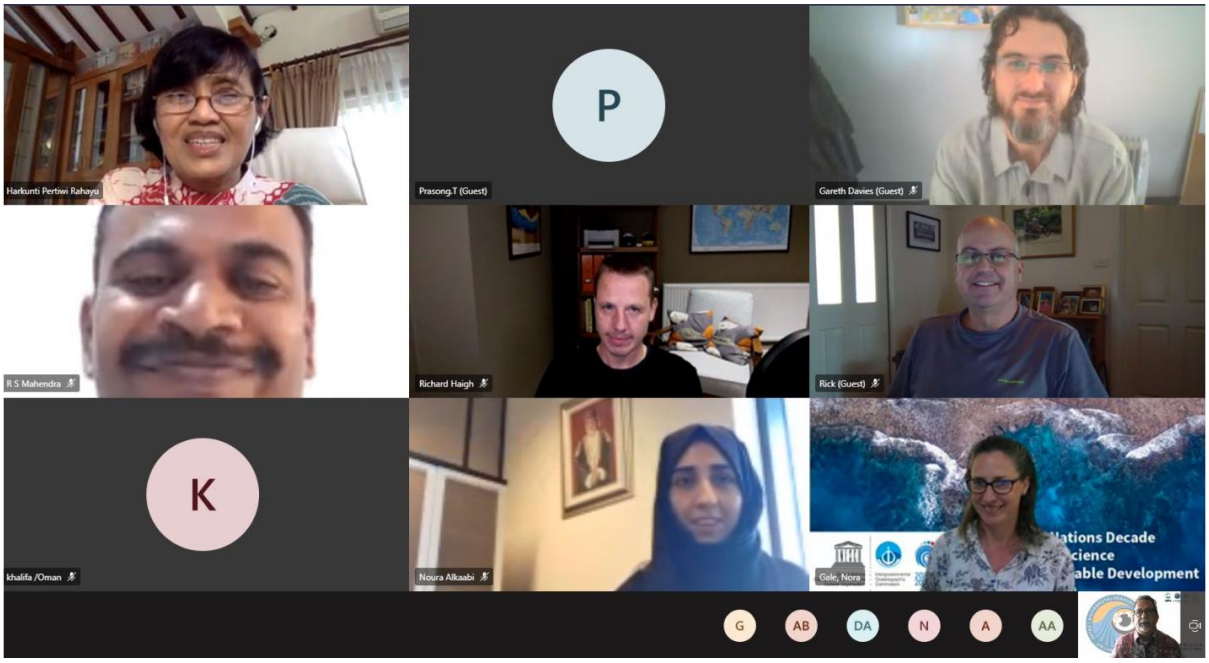
Dr. Harkunti Rahayu, Chair (Indonesia)
Mr. AlYaqdhan AlSiyabi, Vice-Chair (Oman)
Dr. Gareth Davies, Vice-Chair (Australia)
Mr. Ajay Kumar Bandela (India)
Mr. Mahendra Ranganahalli (India)
Mrs. Azahani Abd. Azaz (Malaysia)
Mr. Khalifa Al-Sudairi (Oman)
Ms. Noura Alkaabi (Oman)
Dr. Prasong Thammapala (Thailand)

Invited Experts

Mr. Rick Bailey (Australia)
Prof. Dilanthi Amaratunga (United Kingdom)
Prof. Richard Haigh (United Kingdom)

United Nations Representatives

Ms. Nora Gale (UNESCO-IOC)
Mr. Ardito M. Kodijat (UNESCO)



A selection of participants at the Intersessional Meeting of Working Group 1 on Tsunami Risk, Community Awareness and Preparedness, Online Meeting, 03 December 2020.

1.1 OPENING

1.1.1 Opening Remarks

Prof. Dwikorita Karnawati, Chair of ICG/IOTWMS, welcomed the distinguished delegates, Working Group members, invited experts, and UNESCO representatives to the Working Group 1 meeting on tsunami risk, community awareness and preparedness. She noted that the Working Group has adapted to the ongoing Covid-19 pandemic by holding online meetings.

Prof. Karnawati drew attention to two important documents. Firstly, the *Capacity Assessment of Tsunami Preparedness in the Indian Ocean: Status Report 2018*, was published this year as a follow-up to the capacity assessment conducted in 2005. This document provides a benchmark of the current status of the ICG/IOTWMS and contains important recommendations for the Working Group. Secondly, *Guidelines for Tsunami Warning Services, Evacuation and Sheltering during Covid-19* was published in response to the pandemic. The Makran Probabilistic Tsunami Hazard Assessment (PTHA) is being developed as part of the UNESCAP-funded project on *Strengthening tsunami early waning in the North West Indian Ocean region through regional coordination.* The UNESCO-IOC Tsunami Ready Programme is gaining momentum with the first Indian Ocean communities of Venkatraipur and Noliasahi in Odisha State, India being granted Tsunami Ready recognition. Furthermore, there is growing interest from Indian Ocean coastal communities to become Tsunami Ready.

Prof. Karnawati thanked Dr. Harkunti Rahayu, Mr. Alyaqdhan Al-Siyabi, Dr. Gareth Davies, and Working Group 1 members for their hard work. Ms. Nora Gale of the ICG/IOTWMS Secretariat and Mr. Ardito Kodijat of the Indian Ocean Tsunami Information Centre (IOTIC) were acknowledged for their ongoing support. In conclusion, Prof. Karnawati encouraged all participants to actively contribute and learn during the Working Group 1 meeting.

1.1.2 Review and Adoption of Agenda

Dr. Harkunti Rahayu, Chair of ICG/IOTWMS Working Group 1, reviewed the provisional agenda. A new item on implementation of capacity assessment tools was added and the modified agenda was adopted by the Working Group (refer to Annex 1).

1.1.3 WG-1 Terms of Reference and Membership

Dr. Rahayu reviewed the membership of Working Group 1 and invited the participants to introduce themselves. The list of participants is provided above at the start of Section 1 with more details provided in Annex 2.

Dr. Rahayu reviewed the terms of reference of Working Group 1. They are to liaise with other working groups and task teams within the ICG/IOTWMS and with working groups from the other ocean basins through the TOWS-WG to:

1. Assist, develop and strengthen the overall capacity and capability of Member States in tsunami risk assessment and mitigation, community awareness and preparedness.
2. Encourage Member States to mainstream tsunami Disaster Risk Reduction into sustainable development to help achieve resilient communities in the region.
3. Identify areas of priority for action following assessments, exercises and real tsunami events.
4. Provide advice on user requirements and utility of tsunami warning products and services.
5. Provide advice to the Indian Ocean Tsunami Information Centre (IOTIC) on educational, awareness and preparedness materials.
6. Promote collaboration among academia, research institutions and disaster management offices to encourage multidisciplinary and multi sectoral interaction in ensuring tsunami risk knowledge are streamlined to risk reduction strategies.

1.2 BRIEF REPORTS AND UPDATES ON ACTIVITES

1.2.1 Review of Recommendations and Actions

Ms. Nora Gale of the ICG/IOTWMS Secretariat reviewed the WG-1 actions and recommendations. Sixteen (16) items were closed during the WG1 meeting as noted in the table below.

#	Closed Action	Update from WG1 2020
WG1 2018.03R	Compile good practices on Tsunami Preparedness --> Evacuation Process	Closed.
WG1 2018.07R	Continue integrated capacity development initiatives (SOP and TEMPP), with special emphasis on engaging media in future SOP workshops and identifying new capacity development needs of Member States based on TT-CATP survey results.	Closed and completed.
WG1 2018.01	Prepare a briefing paper to share the findings and recommendations from the Tsunami Interface study conducted in Indonesia and Sri Lanka (Harkunti Rahayu, Dilanthi Amaratunga, Richard Haigh)	Closed and completed.
WG1 2018.02	Prepare a toolkit for the Tsunami Interface analytical framework that enables other Indian Ocean countries to adopt the framework and methods to engage all stakeholder agencies into the national end-to-end TEWS SOPs (Harkunti Rahayu, Dilanthi Amaratunga, Richard Haigh)	Closed and superseded by WG1 2019.11.
WG1 2018.03	Explore opportunities (e.g. CABARET; other research projects) to extend and test a revised multi-hazard interface analytical framework with a view to extending the scope to a multi-hazard environment, as per target (g) of SFDRR (Harkunti Rahayu, Dilanthi Amaratunga, Richard Haigh)	Closed and completed. Done in Myanmar and Maldives.
WG1 2018.04	Explore possibility of expanding the Tsunami	Closed and completed. Done in Myanmar and Maldives.

	Interface study to other Indian Ocean countries (Harkunti Rahayu, Dilanthi Amaratunga, Richard Haigh)	
WG1 2018.07	Explore opportunities (e.g. CABARET; other research projects) to develop online / blended learning curriculum to support (i) existing demand of TEMPP and SOP trainings and (ii) new capacity development needs of Member States as identified by the TT-CATP survey (Harkunti Rahayu, Dilanthi Amaratunga, Richard Haigh)	Closed and superseded by WG1 2019.11.
ICG 12.60	Requests Working Group 1 to create an infographic (1-2 pages) of the Executive Summary of the IOTWMS Status Report	Closed and completed.
ICG 12.56	Requests Working Group 1 to investigate tsunami hazard from the South Sunda mega thrust zone;	Closed and superseded by WG1 2019.04.
ICG 12.57	Requests Working Group 1 to review the PTWS KPI framework with reference to the TT-CATP survey and provide input to a consolidated report for TOWS-WG-XIII;	Closed and superseded by WG1 2019.01.
ICG 12.58	Requests Working Group 1 to investigate the use of socio-technical innovations such as crowd sourcing to assist real-time tsunami evacuation;	Closed and superseded by WG1 2019.06.
WG1 2019.04	Investigate a hazard assessment approach for the South Sunda mega thrust zone with national scientists taking the methodology of the Makran assessment into consideration.	Closed and superseded by ICG 12.55. This would be included in the IO PTHA. ITB, GA, ANU worked on this initiative. Scientific Reports article published.
WG1 2019.05	Create an infographic (1-2 pages) of the Executive Summary of the IOTWMS Status Report targeted at policy-makers	Closed and completed.

WG1 2019.06	Investigate the use of socio-technical innovations such as crowd sourcing to assist real-time tsunami evacuation	Closed and completed. Theme of 2nd special edition of International journal on building disaster resilience (IJBDR) to be published in quarter 1, 2021.
WG1 2019.09	Conduct an international conference on TEWS upstream-downstream interface (Collaboration of WG-1, ITB, Huddersfield University, CABARET, etc.)	Closed and completed. Online international symposium on multi-hazard early warning and disaster risk reduction to be held on 14-16 December 2020.
WG1 2019.10	Annual International Journal of Disaster Resilience in Building Resilience (IJDBRB) special edition dedicated for WG-1	Closed and completed. This will be an annual publication.

Twelve (12) actions remained open and will be the subject on ongoing work (refer to table below).

#	**Open Action**	**Update from WG1 2020**
ICG 12.55	Requests Working Group 1 to update the Probabilistic Tsunami Hazard Assessment (PTHA) for Indian Ocean based on recent work by Geoscience Australia in collaboration with relevant experts from the Member States;	Ongoing – Makran PTHA under development as part of UNESCAP project. A natural progression would be to undertake the IO PTHA following the completion of the Makran PTHA noting lessons learnt during the initiative. regarding Hazard Assessment for MSZ.
ICG 12.59	Requests Working Group 1 to prepare guidance to facilitate Member States to establish/update their national policies and plans to make tsunami preparedness mandatory for the coastal and marine private/business sector and infrastructure;	Ongoing – Guideline needs to be completed. IOTIC held a workshop on tsunami preparedness for critical infrastructure (Dec 2019).
WG1 2019.01	Review the PTWS KPI framework with reference to the TT-CATP survey and provide input to a consolidated report for TOWS-WG-XIII	Ongoing – Chairs of WG2 and WG2 (Harkunti Rahayu and Yuelong Miao) to contribute.

WG1 2019.02	Conduct regular performance status assessment using Survey Monkey, once in every two years (upcoming survey in October 2020)	Ongoing – To be discussed further at SG meeting.
WG1 2019.03	Continuous improvement on CATP questionnaires	Ongoing – WG-1 suggested to add section on pandemic. Harkunti, Nora, Richard and Dilanthi to discuss further.
WG1 2019.07	Develop an IOC Technical Series document on governance of the upstream-downstream interface in tsunami early warning including a national self-assessment tool	Ongoing.
WG1 2019.08	Develop a concept note on mainstreaming disaster risk reduction into urban planning and resilience	Ongoing – GDRC has secured funding to work with ITB on this initiative.
WG1 2019.11	Develop tools for upstream-downstream interface assessment	Ongoing – Funding has not been secured.
WG1 2019.12	Support IOTIC in implementation of UNESCO-IOC Tsunami Ready Program and recognition in the IOTWMS Member States	Ongoing.
WG1 2019.13	Support integrated capacity development training workshops (i.e. SOP, TEMPP, Media)	Ongoing – Held virtual pre-IOWave20 SOP workshop.
WG1 2019.14	Explore the possibility of utilising the online training platform being developed by the Global Disaster Resilience Center and other collaborative opportunities for meeting the capacity development needs of the IOTWMS Member States;	Ongoing.
WG1 2019.15	In conjunction with IOTIC, develop a brief note on communication plan including target audience, means to be shared at ICG-XIII	Ongoing.

1.2.2 TOWS-WG Task Team on Disaster Management and Preparedness Report, Feb 2020

Dr. Rahayu reported on the inter-ICG Task Team on Disaster Management and Preparedness held in Paris on 18-19 February 2020. Indian Ocean representatives to the task team include Mr. Ardito Kodijat of IOTIC and Dr. Rahayu. The terms of reference and membership of the Task Team on Disaster Management and Preparedness were presented. The meeting report was reviewed in detail including actions for follow-up.

1.2.3 IOTWMS Regional Guidelines for Tsunami Response during Covid-19

Mr. Rick Bailey reported on the ICG/IOTWMS regional guidelines for tsunami response during Covid-19. The guidelines have been coordinated across the four ICGs (i.e. Pacific, Caribbean, North East Atlantic and Mediterranean, and Indian Ocean). The document is aimed at national authorities. It recognizes that every country is different in terms of their pandemic status and response plans. Therefore, Member States should adapt the guidelines to their unique situations. It is important for communities to know what to do before a tsunami hits their shores. The suggested best practices are categorized as preparedness before an event, principles for tsunami warning and evacuation during an event, and recommended sheltering strategies. Notably, evacuation should take priority over stay-at-home orders.

1.2.4 Indonesia Guidelines for Tsunami Response during Covid-19

Mr. Ardito Kodijat briefed on the actives undertaken by IOTIC during 2020 coincident with the Covid-19 pandemic. Key activities include Tsunami Ready recognition in the first Indian Ocean communities of Venkatraipur and Noliasahi, Odisha State, India. Additionally, IOTIC has contributed to project managing the UNESCAP-funded project on *Strengthening tsunami warning in the North West Indian Ocean region through regional coordination*, as well as organising workshops, lecture series, and national consultation meetings. IOTIC is also preserving past tsunami information for future preparedness and developing documentation of tsunami survivors and eyewitnesses.

Mr. Kodijat provided a brief on the Indonesia Guidelines for Tsunami Response during Covid-19. The guidelines were developed with wide stakeholder engagement and published in May 2020 (both in English and Bahasa). The guidelines aim to avoid virus infection in shelters during tsunami evacuation and recommend re-assessment of Covid-19 designated hospitals, preparation of tsunami evacuation shelters, protocols for social workers, and evacuation plans and health protocols.

Prof. Dilanthi Amaratunga noted that current country disaster risk responses are very much focused on Covid-19. However, it is also important to ensure that other disasters are not forgotten and therefore tsunami awareness raising is important.

Mr. Bailey noted that the pandemic is a good example of a multi-hazard scenario and we should promote this approach.

Mr. Ajay Kumar Bandela noted that in India special guidelines have been developed for both national and local disaster management organisations for tsunami during the pandemic. These are based on the ICG/IOTWMS guidelines.

1.3 DISCUSSION

1.3.1 Capacity Assessment of Tsunami Preparedness Report

Ms. Nora Gale presented on the IOC technical series publication (IOC TS-143): *Capacity Assessment of Tsunami Preparedness in the Indian Ocean: Status Report, 2018*. This report provides a new baseline of the status of tsunami preparedness capacity in the region. Of relevance to Working Group 1 is section 3 on risk assessment and reduction and section 5 on public awareness, preparedness and response.

Key outcomes for the way forward were presented. Capacity building in tsunami hazard and risk assessment should continue to be a key activity of the Working Group. Inundation modelling has been identified as a priority to better inform evacuation planning and community responses. Probabilistic Tsunami Hazard Assessments are important for decision makers because they help provide estimates of uncertainties. The 2018 tsunamis in Palu and Sunda Strait demonstrated that tsunami hazard

assessments need to be conducted at the local level to facilitate detailed local planning. Working Group 1 with the support of ICG/IOTWMS Secretariat and IOTIC should continue to support downstream activities such as the UNESCO-IOC Tsunami Ready programme. It is important to conduct tsunami exercises and drills to test standard operating procedures and maintain public awareness. Working Group 1 should continue to support the interface between the upstream tsunami warning and downstream emergency management operations, especially standard operating procedure development. Workshops and training on tsunami awareness, education and preparedness should continue as an activity of Working Group 1 with the support of ICG/IOTWMS Secretariat and IOTIC.

> ***Recommendation 1***: Endorse the recommendations of the Capacity Assessment of Tsunami Preparedness [Status Report 2018] related to a) risk assessment and reduction and b) awareness, preparedness and response for consideration in the WG-1 work plan.

There was a discussion about the next Capacity Assessment of Tsunami Preparedness survey, which is intended to be shared with Member States for updates prior to the next ICG in replacement of the National Report. The timing and modality need to be decided on by the Steering Group. Ms. Gale suggested that the responses from the 2018 survey be shared with Member States for review and update. Mr Rick Bailey advised the meeting, as Chair of the ICG/IOTWMS at its 10th meeting in Muscat Oman he initially proposed the need to redo the extensive assessment undertaken in 2005. This subsequently led to the Capacity Assessment of Tsunami Preparedness being undertaken. He also advised he proposed that a separate, less detailed but nonetheless comprehensive Status Report be prepared before each ICG meeting for its consideration, based on a streamlined uniform National Report template.

Dr. Rahayu proposed to include a survey section on how tsunami warning and mitigation has been affected by the pandemic and actions taken towards modifying tsunami response procedures during a pandemic.

> ***Action 1***: Noting the kind offer of WG1 to assist with the upcoming Capacity Assessment of Tsunami Preparedness, a team consisting of Harkunti Rahayu, Dilanthi Amaratunga, Richard Haigh and Nora Gale to discuss the CAPT survey in more detail including incorporation of pandemic-related questions such as the extent to which tsunami preparedness measures have been adapted to Covid-19 conditions.

The group discussed the Survey Monkey platform. There was general agreement that it is familiar to Member State representatives and easy to use, and India and Oman conveyed their support.

The University of Huddersfield offered their assistance in setting up and analyzing the survey as they did for the 2018 Capacity Assessment of Tsunami Preparedness.

Mr. Alyaqdhan Al-Siyabi asked about the security of the data on Survey Monkey and if it will be utilized for academic research. Dr. Harkunti replied that the platform is secure.

Mr. RS Mahendra recommended conducting a multi-hazard assessment.

1.3.2 Status of Updating Probabilistic Tsunami Hazard Assessment

Dr. Gareth Davies briefed on the Probabilistic Tsunami Hazard Assessment (PTHA) for the Indian Ocean. He also provided an update on the PTHA for the Makran subduction zone, and a recent paper on hazard assessment for the South Sunda mega-thrust zone.

PTHA simulates hypothetical tsunami scenarios such that many possible scenarios can be explored and uncertainties can be quantified (e.g. there is a 50% chance that Mw>9 earthquakes are possible). The Indian Ocean PTHA was developed in 2009 and is still in use. There has been a lot of progress in PTHAs since that time, with learnings from the 2011 Tohoku earthquake and tsunami and a renewed interest to update the Indian Ocean PTHA (ICG-XII, Kish, 2019). The proposal was to draw on the freely available 2018 Australia PTHA with inputs from others around the Indian Ocean, noting that uncertainties in earthquake source-representation favor an approach that includes multiple regional experts, for example, the current project happening in the Makran region. During 2020, no progress has been made on a collaborative PTHA for the Indian Ocean. However, progress is being made towards a Makran PTHA. Dr. Davies suggested to undertake an Indian Ocean PTHA following the completion of

the Makran PTHA. In terms of South Sunda threat zone, there has been a recent publication in Scientific Reports with earthquake scenarios up to Mw 9.1.

Ms. Noura Alkaabi noted that in Oman there is a deterministic tsunami hazard assessment.

1.3.3 Disaster Risk Reduction into Spatial Planning

Dr. Rahayu reported that the self-assessment tool for governance of the upstream-downstream interface in tsunami early warning is under development.

Dr. Dilanthi Amaratunga of the Global Disaster Resilience Centre reported on urban planning and development designed to reduce tsunami risk. They have issued a flyer on integrating pandemic, tsunami and other multi-hazard preparedness into early warning and urban planning.

Mr. Al-Siyabi noted that natural warning signs should get more recognition by incorporation into the warning.

Dr. Harkunti reported on new initiatives that should be endorsed by Working Group 1 on integrating epidemic and pandemic preparedness into disaster risk reduction. There is also a second proposal under evaluation in Indonesia.

> ***Action 2***: Working Group 1 to support the developing and harmonizing local capacities for tsunami early warning project being undertaken with ITB and University of Huddersfield with a case study taken in Indonesia funding from 2020 Newton Prize Winner (Harkunti P. Rahayu and Richard Haigh).
>
> ***Action 3***: Working Group 1 to support the integration of pandemic, tsunami and other multi-hazard preparedness into Early Warning and Urban Planning project being undertaken in 2021-2021 by ITB and University of Huddersfield, with a major survey to be undertaken in the Indian Ocean and case studies to be undertaken in Indonesia and Sri Lanka.

1.3.4 Status of Annual Journal

Dr. Richard Haigh noted that the International Journal of Disaster Resilience in the Built Environment (volume 11, issue 2) was published in memory of Prof. Sam Hettiarachchi. The special issue on "end-to-end tsunami early warning systems" included nine papers. The upcoming issue will include the topic of technology enabled tsunami early warning: opportunities, gaps, barriers and challenges (for publication in July/August 2021). Furthermore, a topic and guest editor for the 2022 edition should be finalised in the coming months.

1.3.5 Any Other Business

Prof. Dilanthi Amaratunga noted the upcoming symposium on Multi-Hazard Early Warning and Disaster Risk Reduction will be held online during 14 to 16 December 2020. The symposium aims to promote the availability and application of research, science, and technology to support the implementation of Sendai Framework for Disaster Risk Reduction 2015-2030.

1.4 RECOMMENDATIONS AND ACTIONS

ICG/IOTWMS Working Group 1 Recommendations and Actions arising during the intersessional meeting are provided below.

Recommendation 1: ICG/IOTWMS endorse the recommendations of the Capacity Assessment of Tsunami Preparedness [Status Report 2018] related to a) risk assessment and reduction and b) awareness, preparedness and response for consideration in the WG-1 work plan.

Action 1: Noting the kind offer of WG1 to assist with the upcoming Capacity Assessment of Tsunami Preparedness, a team consisting of Harkunti Rahayu, Dilanthi Amaratunga, Richard Haigh and Nora Gale to discuss the CAPT survey in more detail including incorporation of pandemic-related questions such as the extent to which tsunami preparedness measures have been adapted to Covid-19 conditions.

Action 2: Working Group 1 to support the developing and harmonizing local capacities for tsunami early warning project being undertaken with ITB and University of Huddersfield with case study taken in Indonesia funding from 2020 Newton Prize Winner (Harkunti P. Rahayu and Richard Haigh).

Action 3: Working Group 1 to support the integration of pandemic, tsunami and other multi-hazard preparedness into Early Warning and Urban Planning project being undertaken in 2021-2021 by ITB and University of Huddersfield with a major survey to be undertaken in the Indian Ocean and case studies to be undertaken in Indonesia and Sri Lanka.

1.5 SUMMARY AND CLOSING

Dr. Rahayu noted that the meeting had been productive and thanked the attendees for their participation. She officially closed the meeting at 09:00 UTC.

Annex-1

Agenda ICG/IOTWMS Working Group 1
on Tsunami Risk, Community Awareness and Preparedness

Thursday, 3 December 2020

Chair: Dr. Harkunti Rahayu

***Time: 5:00 – 8:30 UTC**, 9:00 – 12:30 Muscat/Mauritius, 10:30 – 14:00 Hyderabad, 12:00 – 15:30 Bandung/Jakarta/Thailand, 13:00 – 16:30 Malaysia/Perth, 16:00 – 19:30 Canberra/Melbourne*

5:00 – 5:30 UTC	**1. Opening** • **Welcome Remarks** *Prof. Dwikorita Karnawati (Chair of ICG/IOTWMS)* • **Review and Adoption of Agenda** *Dr. Harkunti Rahayu (WG-1 Chair)* • **WG1 Terms of Reference and Membership** *Dr. Harkunti Rahayu (WG-1 Chair)*
5:30 – 6:30 UTC	**2. Brief Reports and Updates on Activities** • **Review of Recommendations and Actions** *(15 min)* *Ms. Nora Gale (ICG/IOTWMS Secretariat)* • **TOWS TTDMP Report - Feb 2020** *(15 min)* *Dr. Harkunti Rahayu (WG-1 Chair)* • **IOTWMS Regional Guidelines for Tsunami Response during Covid-19** *(15 min)* *Mr. Rick Bailey (Tsunami DRR Consultant)* • **Indonesia Guidelines for Tsunami Response during Covid-19** *(15 min)* *Mr. Ardito Kodijat (IOTIC)*
6:30 – 6:15 UTC	**Break** *(15 min)*
6:45 – 8:00 UTC	**3. Discussion** • **Capacity Assessment of Tsunami Preparedness Report** *(20 min)* *Ms. Nora Gale (ICG/IOTWMS Secretariat))* • **Status of updating of PTHA** *(15 min)* *Dr. Gareth Davies (WG-1 Vice-Chair)* • **DRR into spatial planning** *(15 min)* *Dr. Harkunti Rahayu (WG-1 Chair)* • **Status of Annual Journal** *(10 min)* *Dr. Harkunti Rahayu (WG-1 Chair)* • **Others** *(15 min)*
8:00-8:15 UTC	**4. Action Updates** *Dr. Harkunti Rahayu, Mr. AlYaqdhan Al-Siyabi, Dr. Gareth Davies*
8:15 – 8:30 UTC	**5. Summary and Closing** *Dr. Harkunti Rahayu (WG-1 Chair)*

Annex 2:
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