Standard Operating Procedures for the

Tsunami Early Warning and Mitigation System in Sri Lanka

BACKGROUND: CASE OF SRI LANKA

Experience over recent years of the impacts of tsunamis has shown that inadequate preparation for, and response to, emergency situations have contributed to widespread damage and the avoidable loss of lives and livelihoods. The shortcomings in preparation have been due to a lack of warning through poor regional detection and communication systems, but also reflects inadequate awareness, planning and coordination.

A 2015 United Nations (UN) report estimates that each year, an additional 60,000 people and $4 billion (US$) in assets are exposed to the threat of tsunami hazard. As demonstrated by the human and economic losses from the 2004 Indian Ocean and 2011 Tōhoku disasters, and most recently in Palu, Indonesia, tsunamis inflict death and damage through violent, powerful flooding along the world's coastline. Sri Lanka suffered very high human and economic losses from the 2004 Indian Ocean tsunami. It also has a tsunami risk index of 8.9 (from 10), highest among several types of disasters.

An effective end-to-end tsunami warning system begins with the upstream rapid detection of a tsunami wave, including detection, verification, threat evaluation, and forecasting. It ends with a well-prepared community that is capable of responding appropriately to a warning, including delivery of public safety messages, risk assessment and management, initiating counter-measures, and standardised reactions.

An integrated Standard Operating Procedure (cross-agency SOP) within Sri Lanka for generating and disseminating tsunami warnings to their relevant emergency response agencies has been significantly updated and tested in a project led by the Global Disaster Resilience Centre at the University of Huddersfield, UK. The project is being undertaken in collaboration with Disaster Management Centre, Sri Lanka; Ministry of Disaster Management, Sri Lanka; Department of Meteorology, Sri Lanka, and Asian Disaster Preparedness Centre, with the support from Intergovernmental Oceanographic Commission of UNESCO IOTWMS. The revised SOP was tested in IOWave 2018 exercise, which was used to simulate Indian Ocean countries being put in a tsunami warning situation. Although improved, it revealed several significant challenges and shortcomings in the existing standard operating procedures and decision-making criteria in Sri Lanka. Recommendations included:

- Further development and validation of the SOPs for the issuing of public safety messages, ordering evacuations and issuing all-clear messages
- Testing of downstream SOPs, including those within key agencies
- Identifying staff training requirements to ensure that SOPs are understood and that they can be performed seamlessly and quickly during an event

PARTNERS

Ministry of Public Administration & Disaster Management, Sri Lanka

DMC SRI LANKA
Disaster Management Centre, Sri Lanka

In Collaboration with

University of HUDDERSFIELD
Global DIsaster Resilience Centre, University of Huddersfield, UK

UNESCO
United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

STANDARD OPERATING PROCEDURES

The foundation of effective, reliable warning systems is having the right Standard Operating Procedures (SOP). SOPs are a set of written instructions for routine/repetitive organisation activities and part of planning and emergency procedures. It consists of detailed work processes conducted/followed within an organisation and documents the way activities are performed for consistent conformance to system requirements and an organisation's mission.

All warning systems require SOPs, but for tsunami, rapid evaluation, warning and response is essential to save lives. In an end-to-end system, communication links between stakeholders must be robust or a warning chain will be broken. SOPs should be developed, practiced and modified as necessary – a "living document". SoP will also help understanding the division of roles and responsibilities in the warning chain:

- Upstream: Detection, verification, threat evaluation, tsunami forecast, warning dissemination
- Downstream: Delivery of public safety message, initiate national counter-measures, prepare and implement standardised reaction

Coordination is essential in making sure efficient and immediate actions to ensure public safety prior, during, and after the event. A range of stakeholders are involved in tsunami early warning, including scientific, technical and disaster management agencies responsible for receipt of warnings, evaluating threats and preparing warning information. These must be supported by other key stakeholders who will help to deliver warning information to communities at risk, and initiate counter measures. These might include: Local Authorities, Emergency Services, Government Agencies, NGOs, the Private Sector (health, tourism, transport, utilities, education, fisheries etc.), the Media and the Public. When developing SOPs, stakeholders need to consider:

- What information will be given by other agencies?
- When will information be given? Will it be public safety guidance, or instructions?
- Who will disseminate it?
- How / Where – transmit /communication method will it be found?
- Who will answer questions?

OBJECTIVES

This project seeks to strengthen tsunami warning and emergency responses by:

- Understanding the division of role and responsibility in warning chain between the appointed NTWC, NDMO/LDMO and the National Stakeholders
- Revisiting SoPs for Tsunami Early Warning and Mitigation System to ensure that the roles of all agencies are clearly defined and that there is better communication amongst stakeholders
- Promoting stronger coordination, cooperation and communication between NTWC and DMO (N/L) using the latest multi-mode communication
- Synergising the SOPs across agencies, especially among NDMO/LDMO (including Media) and NTWC
- Testing the SOPs through a table top exercise to ensure readiness and identify potential improvements
- Developing or revising flow charts, criteria tables, timelines, checklists, and pre-scripted templates that can be used to convey procedures that need to be followed quickly and correctly
- Identifying any gaps in the current SoPs
- Identifying areas of further work, including to address other hazards, such as flash flooding

PLANNED OUTPUTS

1. Updated SoPs
2. Briefing paper on improved decision-making criteria for tsunami evacuation.
3. Presentations at UNESCO on up to date Sri Lanka Standard Operating Procedures for Tsunami Early Warning and Mitigation System at the forthcoming Intersession Meeting of the IOC UNESCO IOTWMS, to be held in Jakarta, Indonesia in September 2019
4. International Conference on Tsunami Early Warning in association with IOC UNESCO
5. Scientific papers to disseminate the findings

IMPLEMENTING PARTNERS:

- ***Global Disaster Resilience Centre, University of Huddersfield, UK (Lead)***
- ***Ministry of Disaster Management and Disaster Management Centre, Sri Lanka***

ASSOCIATE PARTNERS:

- ***Intergovernmental Oceanographic Commission of UNESCO IOTWMS***

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