

Tsunami Simulation Exercises

Types, Scales and Recommendation for Future Exercises

INTRODUCTION

Tsunami simulation exercises are important means to test the elements of end-to-end Tsunami Early Warning Systems (TEWS): risk knowledge, warning service, technical dissemination of warnings and guidance, and response capability of institutions and the public, to examine and improve the system's effectiveness. The Indonesian State Ministry of Research and Technology (RISTEK), with the Indonesian Institute of Sciences (LIPI) and other national and local institutions, has organized annual 'end-to-end tsunami drills' in tsunami-prone regions of Indonesia since 2005. GTZ IS-GITEWS supported its partners in the district of Bantul (Yogyakarta, Java) in conducting a tsunami drill at the end of 2008.



Bali Drill 2006



Operations Manual for TEW in local PUSDALOPS

SCALES AND TYPES OF TSUNAMI SIMULATION EXERCISES

Tsunami simulation exercises imitate a real tsunami event, which is defined by a pre-determined scenario. Depending on its scale and type, the exercises may focus on a single element or on various elements of the system. The following types and scales of exercises can be distinguished:

Tabletop exercise. Focusing on inter-institutional communication and coordination, particularly in the areas of warnings reception, decision-making and dissemination, tabletop exercises do not directly involve the public or utilize equipment. They can be conducted as stand-alone exercises or as part of the preparation of a larger end-to-end tsunami simulation exercise. Their goal is to improve institutional arrangements, roles and responsibilities, Standard Operating Procedures (SOPs), the content of warning and guidance messages, and the means of technical dissemination.

Evacuation exercise. This type of exercise tests the capability of the public to respond to an earthquake and to evacuate tsunami risk areas. The test can be done without the dissemination of an official test alert by national or local institutions. However, it is recommended to involve local institutions in the preparation, implementation and evaluation of the exercise. Conducted in selected neighbourhoods, schools and other public areas, evacuation exercises raise people's awareness, need only a small budget and can be done regularly once or twice a year.

Full-scale or field tsunami drill. As the largest of all tsunami simulation exercises, it tests and aims to improve the end-to-end warning system: warning services and the capability of institutions and the public to respond. It is conducted in 'real time', employs real equipment, and tests all functions, including emergency response. It involves the National Tsunami Warning Centre, national and local level authorities and institutions, and the communities. Preparation for this activity may take up to 12 months.



Evacuation Exercise in School



Tabletop Exercise in Bantul

RECOMMENDATIONS FOR FUTURE TSUNAMI SIMULATION EXERCISES

Objectives and resources determine scale. An end-to-end tsunami drill allows testing of all parts of the system and creates a momentum to raise public awareness of the importance of preparedness. However, it is costly and requires long-term preparation. A tabletop simulation is sufficient to examine institutional procedures. Small exercises that strengthen public response capability and involve single neighbourhoods or schools are less costly and can be conducted on a regular basis.

Test existing conditions and conduct authentic simulations. Tsunami simulation exercises test and evaluate procedures and communication technology that are already in place and the actual capability of institutions and the people to respond. Developing procedures, setting up communication equipment, and assigning responsibilities only for a simulation without ensuring its sustainability mean nothing for preparedness and could give rise to false expectations by the public in the case of an emergency.

Do not expect perfect results and evaluate thoroughly. A tsunami simulation exercise is a test to see what works and what does not. An exercise is considered successful if it shows aspects in the TEWS that need improvement. Involving all stakeholders and external observers in the evaluation is the key to getting clear recommendations. The evaluation must employ a clear and adequate methodology at the institutional and community levels to assess the effectiveness of the system. Proper documentation and follow-up on recommendations is vital.

Provide clear information to the public and all stakeholders before and after large-scale exercises. The role of the media in disseminating information to the public before an exercise is important to avoid public misperceptions and to support public education. Results of an exercise should also be shared with the public.

Conduct tsunami simulation exercises regularly. Exercises provide an opportunity to train institutions and the public for an emergency. Trainings must be frequent. Depending on the available resources, end-to-end tsunami drills can be conducted annually. Smaller institutional or evacuation exercises can be conducted more often and in alternating locations (e.g., different schools, neighbourhoods) to increase coverage.

Incentives. There is debate about whether communities (and institutions) involved in a simulation exercise should be provided with special incentives for their participation, since there is a common perception that simulation exercises are government events. For instance, day labourers, participating in an exercise might mean a considerable loss of income. Much work needs to be done to raise people's awareness of the benefits of participating in an exercise as a contribution to a well-prepared and safer community. This will reduce the costs of full-scale exercises considerably.



Warning Dissemination during Bantul Exercise



Evaluation of Bantul Drill



Media Exercise during IOWave09 Tabletop

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