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How Warnings Reach People?

Dissemination Technology Development in the Pilot Area of Java

THE CHALLENGE

Assuring that people in tsunami prone areas receive official warning and guidance on time is a challenge for tsunami early warning systems. A warning dissemination system needs to be reliable to perform when electrical power is out, which usually happens after strong earthquakes. Various models of warning dissemination systems have been implemented in different communities. In some areas, sirens have been installed and are activated either by the local authority or by the National Tsunami Warning Centre (NTWC) at the Meteorology, Climatology and Geophysics Office (BMKG) in Jakarta.

To develop a durable warning dissemination system, however, we need to consider its suitability with local conditions and ensure long-term operability.

THE INITIATIVE

The community and the local government of Bantul District developed the "Bantul Integrated Siren System (BISS)", a dissemination technology to provide warning and guidance to people in tsunami risk areas. The system was designed in a way that operational reliability was assured, the costs of production and maintenance kept low and it could be managed with local resources and expertise.

The Bantul Integrated Siren System now links the local warning centre, PUSDALOPS, and the people in the risk areas. The system combines Ultra High Frequency (UHF) narrow band radio communication with outdoor loud speakers or sirens placed in the villages to disseminate warnings to the people. The sirens and loudspeakers can be activated remotely from the local PUSDALOPS, which is located in Bantul. The system can transmit siren sounds and/or verbal announcements, such as guidance for evacuation or the "All Clear" message. To allow a better reception for sirens in hilly areas, a repeater unit is installed in areas of higher elevation.

WHAT HAS BEEN ACHIEVED?

To date, there are 29 siren units installed in the villages and in the tourist areas along the coast of Bantul. All the siren units are connected to PUSDALOPS and placed in the centres of the coastal villages. Most of them are attached to the local mosques and several others to the coastal Search & Rescue (SAR) posts.

In December 2008, the system was tested for the first time in a tsunami drill. Later, several earthquakes that occurred in the southern part of Java also tested the system. During these events, the system proved to work as expected. However, some technical aspects of the siren units needed attention, for example, keeping the power-pack battery fully charged and the siren or loudspeaker volume high. For future improvements the technicians are considering linking the system to local FM radio stations.

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LESSONS LEARNT & POTENTIAL FOR REPLICATION

The system installed in Bantul is simple enough that local technicians are able to operate and maintain it. Also, most of the technical parts are locally available in Indonesia. Although the system was built with low costs, it is considered to be of good quality. The UHF offers a relatively good sound quality.

The Bantul type of siren units is appropriate to serve small communities, such as villages or hamlets along the south coast of Java. The sound of the sirens can reach about 300 metres throughout the surrounding areas. Ideally the people assigned to be responsible for the maintenance of the loudspeakers live nearby to the locations of the sirens.

In several villages in the districts of Kebumen and Cilacap, the same technology was implemented as a pilot activity. The siren units are attached to mosques, SAR posts, tourist information posts, and village offices. The benefit of attaching a siren unit to a mosque is that the technology is "tested" regularly, as the loudspeaker is used for daily announcements.

The system has also been adopted by the Padang Working Group and a modified version has been recently set up in the city of Padang.

ACKNOWLEDGEMENTS

The dissemination warning system in Bantul was a joint initiative of the Bantul district government and the provincial government of Yogyakarta, following the catastrophic Pangandaran tsunami in 2006.

Local technicians, Muhammad Ayyub of ORARI and Taufiq Faqih Oesman of SAR Linmas Bantul, developed the technology and its implementation.

The Bantul system was funded by local institutions and later extended to other areas with support from various organisations, including GTZ IS-GITEWS.

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Published by:

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

Photos:

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