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Tsunami Hazards: effectiveness of early warning in impact mitigation

M M P D Samarasekara^{1*} and A H R Ratnasooriya²

¹*Institute of Technology, University of Moratuwa, Moratuwa*

²*Department of Civil Engineering, University of Moratuwa, Moratuwa*

Most Sri Lankans were not aware of tsunamis prior to the Indian Ocean Tsunami (IOT) in 2004, which caused widespread destruction in coastal areas of the country. Although such hazards have not been frequent in Sri Lanka, the IOT and the alerts and warnings issued since then have clearly indicated the exposure of the country to tsunami hazards.

Undersea earthquakes are the most common cause of tsunamis, and, in view the location of Sri Lanka relative to such earthquake prone zones in the Indian Ocean, it can be considered that the country is potentially exposed to tsunamis generated along the Sunda Trench and the Makran Fault, located to the East and Northwest respectively. As none of these zones are located in coastal waters of Sri Lanka, the tsunamis to which the country is potentially exposed can be considered as far-filed tsunamis as opposed to near-filed tsunamis. The propagation times associated with these tsunamis, which are usually in excess of one hour before reaching the coastal waters of Sri Lanka, allow adequate time to issue alerts and early warnings for public evacuation and other precautionary measures to mitigate the adverse impacts.

The assessment of the public response to the tsunami alerts and early warnings issued plays an important role in the identification of the effectiveness of a tsunami early warning system. Such assessments have been carried out earlier and the preliminary findings have been presented. The results of a detailed analysis of such a study are presented here. The study has been carried out in 2011 in the form of a questionnaire survey conducted mainly in the coastal areas of the country.

The analysis indicated that although the majority, 76 %, of the population in coastal areas of the country was not aware of the causes of tsunamis prior to the IOT, a large majority, 77 %, is currently aware of undersea earthquakes as the most common cause of tsunamis. To a lesser extent the public is also aware of the other potential causes of tsunamis. A significant majority, 78 %, was aware of the difficulty in predicting potential tsunamis in the future. A majority, 63 %, identified early warnings as an effective mitigation measure. The results indicate that the warnings have been received by a majority of more than 70 % of the public. The clarity of the warning was also confirmed by a majority in the order of 80 % of the community. Early warnings have been conveyed by a variety of modes and the results indicated that the electronic media/communication (radio, television and telephone) as the predominant mode. The social interaction of the communities also played an important role with a significant level of the public receiving the warning from the neighbors. The public response to the tsunami warnings issued was assessed in terms of the % of the public evacuated, time taken for evacuation and the awareness on safe locations for evacuation. The results indicate that the majority of public, in excess of 60%, evacuated after receiving the warning and a majority, in excess of 65%, was also aware of places of evacuation. A favorable public response to the warnings issued and the effectiveness of the early warning system was thus revealed by the results.

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priyan0506@gmail.com

Tel: +94 773165188