

**The Second Expert Group Meeting
on the Great East Japan Earthquake
- Learning from the Mega-Tsunami Disaster -**

Thematic Session Report

Session : No.1
Session Title: Early warning System and Public Awareness and Education
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1) Outline

The objective is to review the tsunami warning system in different phases (monitoring, issuance of warning, dissemination, response, public awareness and education) to identify what worked well and what needs to be improved. Key question was why so many people died during the Great East Japan Earthquake by looking at the early warning system and evacuation behaviour of residents. The session identified areas for improvement (review of tsunami early warning system), people's assumptions about past experiences.

2) Key messages, outcomes, recommendations

- ✓ Early evacuation is key to safety

The surveys carried out on people's behaviours during the March 11 Tsunami identified 4 behaviour patterns: immediate evacuation, delayed evacuation, urgent evacuation (only when tsunami was in sight), and no evacuation. Safety check on members of family often hindered safe evacuation of residents. On the other hand, high awareness of tsunami risks resulted in early evacuation.

- ✓ People's wrong assumptions delayed evacuation. Education and awareness is as important as the technical aspects of early warning system and structural measures for mitigation of tsunamis

People's wrong assumptions were based on past experience of tsunami which did not come far to affect their houses or their own beliefs (did not think that tsunami would come so far) as well as believing that sea wall would protect them from tsunami. An effective way to tackle assumptions is through public awareness and education as has been seen in the good example of Kamaishi City where schoolchildren led evacuation of the community.

- ✓ Disaster risk reduction needs to consider vulnerable groups

More than 60% of the disaster victims were found to be over 60 years old. In Rikuzentakata of Iwate prefecture, elderly women were found to be particularly vulnerable. The increasing difficulty in mobility delayed evacuation and as a result many people became victims. Future disaster preparedness plans need to reflect the changing needs of a rapidly aging society not only in Japan but in many other Asia-Pacific countries.

- ✓ Tsunami warning delayed evacuation during the Great East Japan Earthquake

Under-forecasting of tsunami height by the Japan Meteorological Agency (JMA) 3 minutes after the earthquake is likely to have delayed evacuation, and subsequent revision of the tsunami scale was not received by local and municipal governments due to power cuts. Learning from this lesson, JMA is reviewing its tsunami warning operating procedure in order to improve the system.

3) Conclusions

It was agreed that public awareness and education activities need to complement the structural measures to further reduce tsunami risks in the future. Good practices such as the Kamaishi tsunami education example needs to be replicated in other parts across Japan and in Asian Pacific region, many of whom do not have the structural measures in place. Participation to evacuation drills was also an indicator for early evacuation, and making these effective (by considering tsunami risks, instead of only focusing on earthquake risks) will increase awareness about future tsunami risks.