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Disaster vulnerability revealed by the 2010 Mentawai tsunami earthquake in Indonesian society

Megumi Sugimoto^{1*}, M. H. Pradono², Atsushi Koresawa³, Kenji.Satake¹

¹ERI the University of Tokyo, ²BPPT Indonesia, ³Asian Disaster Reduction Center

A tsunami earthquake occurred off the Mentawai Islands, Indonesia on 25 October 2010, and its tsunami claimed around 445 lives and devastated western coastal villages. The proximity of epicenter to Pagai Islands made a fast arrival of tsunami at a rainy night. According to BMKG (Meteorological Climatological and Geophysical Agency in Indonesia), seismic wave magnitude was M7.2. However, the tsunami heights were 4 to 7m, larger than that expected from the magnitude.

As an emergency response to the disaster, a group of researchers from Japan and Indonesia carried out a collaborative survey in Pagai Islands. The objectives of the survey include to measure physical characteristics of the tsunami, to interview government and United Nations (UN) personnel for emergency relief situation, and to interview local refugees and residents for their reactions. We interviewed approximately 120 persons and distributed about 50 questionnaire sheets at 10 coastal villages. The questionnaire consists of 17 questions, including location, earthquake shaking, people's action before the tsunami, casualties, their opinions for many casualties and on a safer future against tsunami. Other important information not listed in the questionnaire was also obtained during the survey.

The interviews revealed that the first aid was late because of remote area, bad weather and high waves immediately after the disaster, limited transportations, and late recognition of the damage situation. For the first seven days, the main relief center was in Padang, west Sumatra, where the resources were gathered. Because South Pagai Island does not have harbor, space for plane/ helicopter landing, nor appropriate road system on land, transportation of relief was done by ships in high waves. After seven days, the government moved the center to Sikakap in South Pagai Island. The government added helicopter distribution to support sea transportation. Because the Merapi volcano erupted in east Java Island on 26 Oct 2010, emergency relief aid had to be divided to two locations in Indonesia. The cluster approach system for disaster, which has been initiated by UN, was not effective for the weather condition and remote area in Mentawai islands. Small NGOs could not charter ships and helicopters. Logistics had to depend on big organizations, especially Indonesian Red Cross, Indonesian army and UN. Many volunteers and some small NGOs stayed in Sikakap and returned without doing any activity.

The 2010 Mentawai tsunami earthquake revealed Indonesia's vulnerability for natural hazards. Countermeasures of tsunami were not enough. Tsunami early warning system has been developed by international society after the 2004 Indian Ocean tsunami. The official warning from BMKG reached the Mentawai regency office, but did not reach local communities due to lack of communication tools. Some residents saw running text of tsunami early warning on TV. However, the communities speak local dialect and some of them especially women cannot read characters. It was doubtful all of them could read the text of tsunami early warning. Education to mothers is necessary to protect their children against natural disaster.

The lesson from this survey is that the Indonesia and international societies have to prepare for complex disaster in different places, as well as disaster at remote areas. Therefore, a main relief center for emergency response need to be established close to disaster area as soon as possible. It is also time to change tsunami early warning system, correct education and emergency relief assistance to seamlessly reach vulnerable people.

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