

Field Survey of earthquake and tsunami of Sumatra Mentawai Islands in 2010

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1. Introduction

On October 25, 2010, at 23:42 JST (21:42 on the same day in local time), an M7.7 earthquake occurred under the seabed, west of Sumatra Island in Indonesia. It caused a tsunami disaster centered on the Mentawai Islands (Fig. 1). From November 10 to 13, 2010, a joint survey team of NILIM and the Port and Airport Research Institute (PARI) conducted a field survey of the damage of the earthquake and tsunami in cooperation with the Ministry of Maritime Affairs and Fisheries (MMAF) of Indonesia.

2. Outline of the survey

Measurements of trace heights of the tsunami clarified the tsunami height on North Pagai and South Pagai Islands, which are part of Mentawai Islands. And interviews with residents clarified the state of inundation and the way the residents evacuated. The only way to reach Mentawai Island is a ferry service and it takes 10 hours under the normal conditions. The ferry service, however, was suspended because of the disaster. The team was able to access Pagai Islands with the help of MMAF. There were difficult conditions not only the ferry service but also the mobile phone service.

Tsunami with height of about 6m above sea level struck North Pagai and South Pagai Islands, and damaged buildings. Brick houses were completely destroyed. At several villages, the tsunami reached between 7 and 8m in height (Fig. 2).

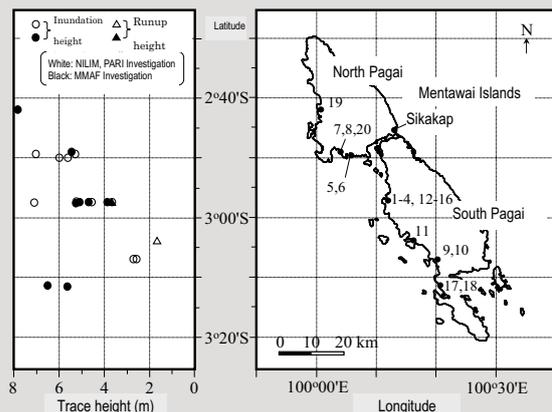
The human damage varied greatly between communities. For example, no human damage occurred at one village of the South Pagai, because one villager, who is the first witness of tsunami in the village, instructed the other residents to evacuate to the safe place by screaming in loud voice.



Figure 1. Location of the Mentawai Islands



Photo 1. Measuring trace height (white line shows trace height)



1-4, 12-16: Malakopa 5, 6: Muntebarubaru 7, 8, 20: Sabeungkung 9, 10: Saumang, 11: Bake, 17, 18: Bulasat, 19: Silabu

Figure 2. Distribution of Trace Height of Tsunami

3. Supplement

The region surveyed was a remote island, isolated from the country's major land areas. Performing the survey in circumstances in which the transportation and communication services were almost suspended, it was found to be difficult to supply materials and transmit information to restore disaster damage in the remote islands. Risks similar to the remote island disaster will be found in case an earthquake disaster strikes Japanese remote islands. We wish to thank everyone who helped us with this survey.

[Sources]

T. Tomita, T. Arikawa, K. Kumagai, D. Tatsumi, G. S. Yeom: Field survey of the 2010 Mentawai tsunami disaster, Technical Note of the Port and Airport Research Institute, 2011.