

TEN YEARS SINCE 2004 SUMATERA EARTHQUAKE AND THREE YEARS SINCE 2011 TOHOKU EARTHQUAKE: EARLY-WARNING SYSTEMS ALONE CANNOT SAVE EVERYONE

KIMATA FUMIAKI

Tono Research Institute of Earthquake Science

Assoc. for the Development of Earthquake Prediction, Japan

Extended Abstract

Much Japanese watched the tsunami video attacking Banda Aceh on the 2004 Sumatra, and they have a lot of tsunami disaster memories, and early tsunami warning system. However, we lost about 20,000 people by the 2011 Tohoku earthquake tsunami. It makes clear that we never rescue the people from the tsunami only by an early warning system.

Never remained the ward of "Tsunami" in Banda Aceh in 2004

In February 2004, a research team of Nagoya University was coming to Banda Aceh to investigate the disaster on the 2004 Sumatra earthquake tsunami (I was a research member of Nagoya University at the 2004 Sumatra earthquake, and joined the research team since the first field survey in 2012). Not only the natural scientists but also the humanities' scientists, including Indonesians joined the research team, and field researches in Aceh have been continued every year until now. As results of the research, eight annual reports totaling 1,000 pages and four books, including writings in Indonesia are published. Through the first interviews in Banda Aceh, we understand that not so many people remained the tsunami coming after the earthquake felt, and when they watched the tsunami they never shouted "Tsunami!". They shouted out, "Sea is ascending". As results, there are many fatalities by the tsunami along the coastlines. They had no time to evacuate from the tsunami, because they started the evacuation after they watched the attacking tsunami. In one village, only the people going out the village to the down-town were saving their lives.

In spite of tsunami warning in three minutes after the earthquake

On March 11, 2011, a giant earthquake with 10 minute-strong shaking was occurred in Tohoku off. In three minutes of the earthquake, JMA issued the tsunami warning through the TV program. Additionally, following the warning of JMA, local broadcasting system told the people, "Big tsunami is coming". However, we lost 20,000 people, and we had an accident of the nuclear power plant in Fukushima by the tsunami. All people remained the tsunami attack by the long-strong shaking of the earthquake, and many people preparing their evacuation. Some people never evacuate from their homes, because my home is in highland or home has second floor.

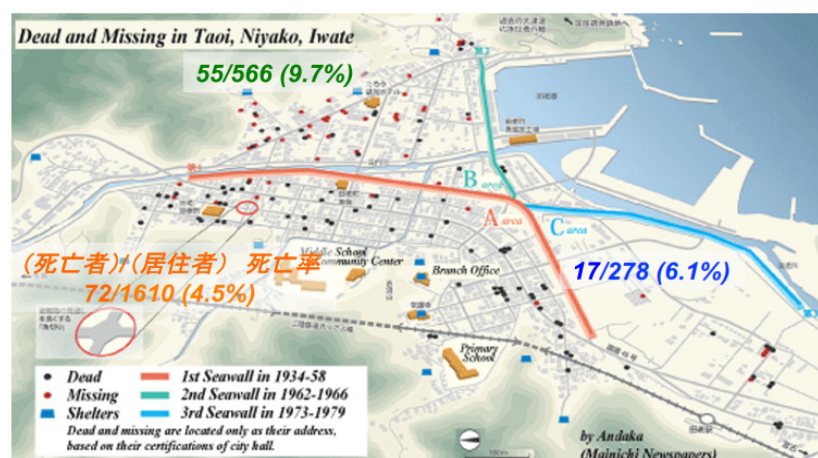


Figure 1: Distribution of the dead or were missing in Taro-cho, Iwate-ken by the 2011 Tohoku earthquake tsunami. by Andaka reporter of Mainich Newspaper

Development of on site warning system

In natural disaster such as earthquake, volcano eruption, heavy rain, land slide and flood, firstly natural hazards were reported in the field. In Japan, regional weather station is permitted to issue the warning of only meteorological hazards. As the results, in the field, there are seismometer stations, and there are no records of earthquakes in local weather stations. When they felt the earthquake, they are only waiting the warning issue of the central weather station. Japan Railways develop the "on site warning system", Urgent Earthquake Detection and Alarm System UrEDAS to stop the running Shinkansen for the saving the passenger instantly. It is the very simple basic conception. When seismometers detect shaking of the earthquake, the system processes the data and stops the running train in the region in few seconds just before the strong shaking.

The regional research center to achieve the disaster mitigation

We need regional warning systems more closely communicated to local citizens, which is a very important information for their evacuation from the disaster. I suggest establishing of the regional research center to achieve the disaster mitigation. Of course, the center is constructed by local governments, branches of earthquake and volcano agencies, and researchers of the university. For example, they detect some volcanic activities by monitoring. They issue the warning directly to the citizens around volcanoes. In my idea, it is not regional subjects, but it is a national subject of Indonesia.