

Turkish-Japanese Joint Project on Earthquake Monitoring System for Real Time Source and Damage Estimation in Republic of Turkey

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Abstract

Turkish and Japanese Government have been decided to make a project in order to mitigate disaster loss in Turkey. Because of this purpose an agreement signed between Japan International Cooperation Agency (JICA) and General Directorate of Disaster Affairs in 1993. JICA has been supported the project titled as Earthquake Disaster Prevention Research Project. A research center has been established at Earthquake Research Department (ERD) in Ankara in 1997 to mitigate earthquake risk in Turkey. The aim of the center is to collect earthquake data and make rapid real-time loss estimation for cities located along middle part of the North Anatolian Fault Zone in case of an earthquake. The system that was installed at the Earthquake Data Collection and Vulnerability Evaluation Center receives seismic wave data automatically which are recorded by velocity type seismometers installed at 10 observing terminals. It then determines hypocenter of earthquake from P and S arrivals by simulating annealing algorithm and calculates moment magnitude (M_w) with the long period seismograms and sends this information via short message service (SMS) and e-mail to the researchers. It also produces Seismic Intensity Distribution and Peak Ground Acceleration maps. Consequently, it estimates casualties, damaged buildings and roads by considering seismic intensity, population and building stock database of the project area.

The system has been developed by the Follow-Up Project which has been supported by Japan International Cooperation Agency (JICA) in 2005 and 2006. In the scope of this project, all the system softwares have been moved from SUN to LINUX and the database from ORACLE

to MySQL. Besides, the system has become more user-friendly for the operator and able to estimate disaster loss not only project area but also whole Turkey.

In future, data of nationwide strong ground motion network which are operated by new governmental agency will be linked to the system in order to determine more reliable source location of the earthquakes.