

Strong ground motion observation network in Himalaya, India

Kazuki Koketsu¹, Kiyoshi Takano¹, Takashi Furumura¹, Satoko Oki¹, Tetsu Masuda^{1*}, Takamori Ito², Rajender Kumar Chadha³, Davulurib Srinagesh³

¹Earthquake Research Institute, ²Keio University, ³National Geophysical Research Institute

It is pointed out that acquisition and analysis of data on the natural hazard and social conditions are fundamental to the disaster mitigation scheme, and that information about disaster impact is essential for the first aid and recovery planning. However, the technical issues and the environment for actual use are not yet established. It is a universal subject. 'Information Network for Natural Disaster Mitigation and Recovery' is a project of 'Science and Technology Research Partnership Sustainable Development (SATREPS) International Collaborative Research Program' supported by JST and JICA. The participants are Keio University, the University of Tokyo, Indian Institute of Technology Hyderabad, CSIR:National Geophysical Research Institute, Indian Institute of Technology Kanpur, Indian Institute of Technology Madras, International Institute of Information Technology Hyderabad, India Meteorological Department Hyderabad, and India Meteorological Department Pune.

In India, heavy rains and floods are causing thousands of casualties and building damages, for example 2001 Gujarat earthquake and 2005 Kashmir earthquake killed thousands of people. In Japan too, heavy rains and floods caused severe damages, and recent inland earthquakes and 2011 Tohoku earthquake caused tremendous damages.

From a view point of disaster mitigation, the infra-structure in India is still in infancy stage. and thus recovery will be hindered in case of such disasters. In Japan, information technology is recognized as useful in case of emergency and has been occasionally utilized. However, 1995 Kobe earthquake, 2004 Hukui and Niigata floods, and 2011 Tohoku earthquake revealed that a lot of issues remain unsolved in handling information.

The objectives of the project are to construct seismic and meteorological observation networks, data acquisition and analysis systems by means of global information network, to develop necessary technology to help effective performance of the first aid and recovery by means of preparing the information infra-structure in case of emergency, and to establish the basis for disaster mitigation and recovery by applying our experiences to Indian conditions.. The project contains studies on earthquake disaster mitigation, basis for meteorological observation, sustainable communication system, and platform of information in case of emergency and for disaster mitigation.

The study on earthquake disaster mitigation aims at observation networks for strong ground motion, crustal movement by GPS, and building performance to understand the seismic hazards and risks, and contribution to earthquake disaster mitigation from future earthquakes in Indo-Gangetic plain near the seismic active region. The present report introduces some achievements on the strong ground motion observation network. India has a warm and humid climate. The equipments are required to operate under such a circumstance. They are also required to be feasible for the infra-structure environment in India. Furthermore, it is desired that the sensor is able to record long period waves as well as short period motions. The velocity type strong motion seismometer was selected according to these conditions. The equipments were deployed at 26 sites in the seismic active region in Himalaya. Networking of the observation sites is on progress. The precise seismic activity, propagation characteristic of seismic waves, and effects of seismic waves to the buildings will be studied in the following years.

Keywords: strong ground motion, observation, network, Himalaya