

Seismic reflection survey in the Kathmandu Valley, Nepal.

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On the April 25, 2015, earthquake of magnitude 7.8 Mw (USGS, 2015) struck in the 78 km north west of Kathmandu (Gorkha Earthquake) and major after shock of magnitude 7.3 Mw, with epicenter about 80 km north east of Kathmandu causes heavy damage in the Kathmandu Valley (KV). It was thought that the damage in the KV was particularly great, due to the underground structure of the KV.

We conducted gravity survey in the KV as part of the SATREPS projects in 2017. The shape of the gravity basement of the whole KV was estimated (Pradhan et al., 2018).

We conducted seismic reflection survey to clarify the detailed basement of the KV and the upper sedimentary structure in 2018. Survey lines were set up at Tribhuvan International Airport (TIA) where depth of gravity basement greatly changes and Nepal Agricultural Research Council (NARC) where deep gravity basement was estimated. Survey line length is about 4km (TIA) and 1km (NARC). Enviro Vibe (IVI, Inc.) was used as a seismic source.

The shape of the basement obtained by the seismic reflection survey and the shape of the gravity basement match well and the structure of the sedimentary layer in the basin was also revealed. These are the world's first results visually showing the underground structure in the KV and are expected to greatly contribute to future earthquake disaster prevention.

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