

四川大地震により発生した大規模地すべりに関する調査結果（速報）

Preliminary investigation on some catastrophic landslides triggered by 2008 Sichuan earthquake

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On May 12, 2008, a 7.9 M_w earthquake struck Sichuan province of China, causing a huge number of death and injuries, and also triggering numerous landslides. We performed reconnaissance field trips on the landslides, and have investigated some of the catastrophic ones in details. This report introduce some preliminary results that we had obtained.

1. Xiejiadian landslide

Xiejiadian landslide (Fig. 1a) is located in Pengzhou City, which occurred on a valley during the earthquake with very high mobility and killed about 100 people. The displaced materials included rounded granite blocks, sandstone, shale, and black mudstone. The landslide (1.7 km long, 300m wide and 40m deep) was initiated along the valley. Liquefaction of the groundwater-rich colluvial deposits on the valley might have triggered and played the key role on the high mobility.

2. Xiaojiqiao landslide

Xiaojiqiao landslide (Fig. 1b) originated on a slope of weathered dolomite with the sliding surface being along the stratification plane. The landslide mass blocked the river on the toe part of the slope, forming a dam of 80 m high. The results of S-wave profile survey by means of a multichannel surface wave technique indicated that the deposited landslide mass was of heterogeneity.

3. Donghekou landslide

Donghekou landslide (Fig. 1c) is located in Qingchuan County. The settings of this landslide are mainly composed of dolomite and sandy slate with grey-black Siliceous slate and phyllite. The displaced mass ($1 \times 10^7 \text{ m}^3$) developed into a flowslide and deposited on the rice paddy after passing through the residential areas with a travel distance of about 2 km, killing about 780 people and damming two rivers. Field investigation showed that during the earthquake fluidized failure was triggered at first on the lower part of the slope where ground water was rich, thereafter the upper part of the slope suffered retrogressive failure. The heterogeneity of the deposited mass was made clear by the S-wave profile survey. The seismic response of the slope had also been monitored by installing earthquake recorders on the toe and source areas of the landslide, respectively. Three aftershocks in Qingchuan County had been successfully recorded and the data showed that the amplification of the seismic wave due to the landscape might be differing for different kind of waves.

4. Summary

(1)The strong seismic excitation and precipitous mountains as well as the fragmented rocks enabled the occurrence of vast of landslides. (2) The rich ground water in some gentle slopes might have favored the triggering of liquefaction failure and then resulted in rapid landsliding. (3) Many landslide dams had been formed. Due to the different geological background and movement of each landslide, the debris forming the dam is heterogeneity. (4) Amplification of seismic waves depended on both the location and the seismic features of

the earthquake.

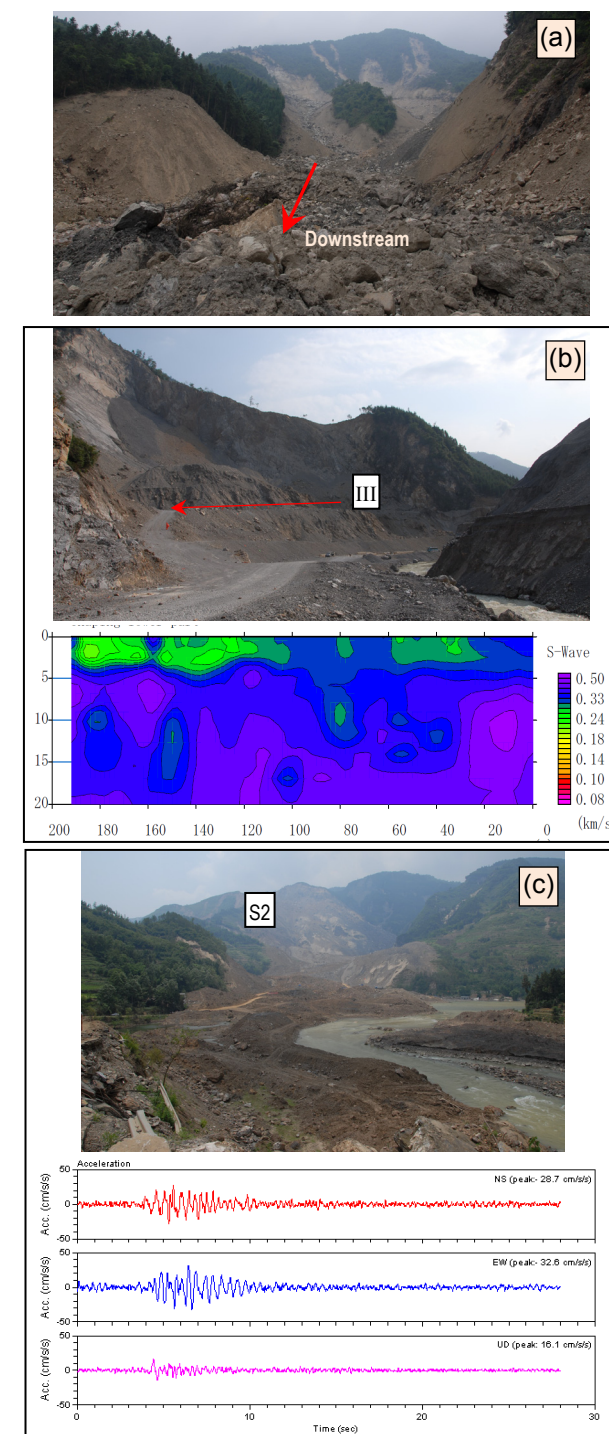


Fig. 1 (a) Xiejiadian landslide; (b) Xiaojiqiao landslide and S-wave profile; (c) Donghekou landslide and seismic recordings on point S2.