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Study of relationship between earthquake-induced landslide displacement with groundwater condition based on landslide me

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As a triggering factor of landslides, strong earthquakes were known to induce large-scale landslides in mountainous region. Due to less measurement data that captured landslide movement at earthquake, the characteristics of landslide behavior are still not clearly understood. So far, there are few reports that collected and documented the displacement of landslide measurement at earthquakes. In this study, we collected literatures that include description about landslide measurement at earthquakes occurred from 1964 to 2007 in inland and offshore of Japanese islands.

We analyzed these data from literatures, revealed some characteristics of landslide sites, including landslide movement, groundwater level and pore water pressure change of at earthquake.

1)Landslides sites where no movement before earthquake, tends to result relatively large displacement, but rarely continues its movement during and after that earthquake.
2)Landslides that acting by rainfall before earthquake, show more displacement during earthquake than before earthquake; but after earthquake, it will become steady in some cases.
3)The depth of displacement of landslides is the depth of slip surface in most of the cases.
4)In most of the cases, the groundwater level or pore water pressure of landslide site increased at earthquake.
5) After earthquake, groundwater level and pore water pressure in landslide site recovered to the level before that earthquake, the period ranged 1 day to 3 months.

According to the above characteristics of landslide displacement at earthquakes, it is considered that the abrupt rise of groundwater level or pore water pressure is a possible factor that initiate landslide movement during earthquakes.

Keywords: Earthquake, Landslide, Landslide measurement, Landslide displacement, Groundwater level