

Geo-Hazards of Debris Flow at Southern Japan

(Analysis of a Case History)

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A case history of debris flow geo-hazard induced by sudden flash flood is described in this paper. Debris mudflow induced by flash flood just after the heavy rainfall had wiped out the entire village in southern Japan in the tragic midnight of 10th July 1997. Altogether 21 people were killed and a vast amount of property was damaged by this disaster. Detailed field investigation, in-situ survey, electrical prospecting, hydro-geological analyses were conducted to find out the main reason.

Topography of the hazard area is located on the southern side hill of the Mt. Yahazu, of which the elevation is 687.5m. Its fan shaped bottom spreads around the nearby river Harihara, that originates from the mountain and flows downstream towards the Ariake Sea. The rock types representing the area are mainly pyroxene andesite. The slopes composed of andesitic autobreccia with several slickensided slip discontinuities. Core samples from drill holes on either sides showed many cooling joints, but the state of weathering was not intense.

Fundamental cause behind this devastation was logically deduced to the hidden fault, which had been weakened by the confined ground water. Reduction of shear strength caused the slope instability and Debris flow combined with flash floods resulted the hydraulic jump that washed out the area. It was concluded that the sequential process of damming or formation of lake by partial failure at the fault, increased the back pressure and bursting of the dammed lake, induced the debris flow and total progressive slope failure of the region.