

Slope Collapse Mechanism Evaluated from Geology and Groundwater Level Monitoring for Atsumari-gawa Debris Flow Disaster in 2003

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The Atsumari River Mud flow triggered by heavy local down pour in July 20th of 2003 attacked the Atsumari village in the Minamata city in the Kumamoto Prefecture, and claimed 15 lives. This mud flow began from a large landslide at the mountain side slope of a 1.3km upstream far from the village along the Atsumari River. Debris flow of the landslide became a large mud flow flowing down and catching the sand and gravels of the river deposits, and reached the village.

The mountainside at the position of the landslide consists of an upper bed of andesite rock with very high permeability and a lower bed of tuff-breccia rock with low permeability and the boundary plane of the both has inclination down to the river side with a lower angle than the mountain slope.

It had already been reported that the landslide was caused by two factors: (1) a total of about 300 mm of the rainfall as a trigger and (2) the geological boundary as an unstable condition of the slope. But there is no discussion about the certain change of the groundwater level accompanied by the rainfall.

Based on long term monitoring data of the groundwater behavior at the slope after the landslide, this report estimates the groundwater behavior immediately before the collapse of the slope and describes the mechanism of the slope collapse concerning the unstable geological structure.

