Initiation conditions of debris flows in Ohsawa landslide, Mt. Fuji

*Fumitoshi Imaizumi[1], Kazuki Yamamoto[1], Atsushi Ikeda[4], Okihiro Ohsaka[1], Hiroyuki Sugimoto[2], Satoru Suzuki[2], Shinichi Sato[2], Yoshiaki Kashiwabara[3], Naoki Nishimura[3]

1. Faculty of Agriculture, Shizuoka University, 2. Fuji Sabo Office, Ministry of Land, Infrastructure and Transport, 3. Asia Air Survey Co., Ltd., 4. Faculty of Life and Environmental Sciences, Tsukuba University

Initiation condition of the debris flow is generally explained only using rainfall threshold. However, the rainfall threshold possibly changes in cold seasons because of decreasing in the infiltration rate by freezing of the ground water. Snow cover and volume of unstable sediment in the debris flow torrent are also potential factor affecting the rainfall threshold. We have studied initiation condition of debris flow in Ohsawa landslide, Mt. Fuji, where the ground freezes for a long period due to high elevation. Snow cover period was estimated by the degree-day method. Progress of the freezing and melting of the groundwater toward deeper part of the ground was estimated using freezing degree days and degree days, respectively. In addition, effect of the freezing, snow cover, and volume of storage was studied by analyzing the rainfall and debris flow records over fifty years. Rainfall intensity and total rainfall needed for occurrence of debris flows in freezing periods is lower than that in the non-freezing periods. Rainfall threshold in the non-freezing periods with small volume of storage is lower than that in the non-freezing periods with large volume of storage. Influence of snow cover on the occurrence of debris flow and slash avalanche was not clear.

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