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Current Research Abstract

AN INTEGRATED APPROACH TO PREDICT OUTFLOW HYDROGRAPH DUE TO LANDSLIDE DAM FAILURE BY OVERTOPPING AND SLIDING

Formation and failure of landslide dam are one of the significant natural hazards in the mountainous area all over the world. In the event of catastrophic failure of landslide dam, we have to predict resulting outflow hydrograph. It will serve as an upstream boundary condition for subsequent flood routing to predict flood hazard in the downstream. Most of the existing models are applicable to overtopping failure of landslide dam. In this context, an attempt has been made to incorporate integration of three separate models: (i) model of seepage flow analysis, (ii) model of slope stability and (iii) model of dam surface erosion and flow to predict the outflow hydrograph resulted from failure of landslide dam by overtopping and sudden sliding. The main advantage of an integrated model is that it can detect failure mode due to either overtopping or sliding based on initial and boundary conditions. The proposed model is tested for three different experimental cases of landslide dam failure due to overtopping and sliding and reasonably reproduced the resulting hydrograph. The numerical simulation and experimental results of movement of moisture in the dam body, predicted critical slip surface and time to failure of the dam body are also in good agreement. The predicted hydrograph can be used for flood disaster mitigation in the downstream. The model can be further extended to three-dimensions for the better representation of failure process of landslide dam.

Key Words **:** *landslide dam, slope stability, seepage flow, overtopping flow, flood/debris flow hydrograph*