Comparison on the failure process and mechanism between a debris flow and a landslide dam

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Besides the numerous artificial dams, there are some other kind of dams distribute such as the glacier dams, moraine dams, landslide dams, and the debris flow dams in China. Especially, the landslide dams and debris flow ones widely distribute in southwest of China after the M8.0 Wenchuan earthquake. Much attention has been paid to the formation, stability, breach process, and the peak discharge prediction of a landslide dam. However few achievements are obtained on the debris flow dams even if the failure of a debris flow dam has posed great threat to the property and life of residents downstream. In this paper, based on the main difference between a landslide and debris flow dam, experiments were conducted by considering different clay content, the initial water content, and incoming water flow. It indicated that the failure duration of a debris flow dam was about 1.60 times as long as that than that of a landslide dam. The peak discharge at the debris flow dam breach was 5.38 L/s. However, the peak discharge at the landslide dam was 7.50 L/s, which was 1.39 times as big as that of a debris flow dam. Finally, by modifying the existing critical initialization condition for the landslide dams, the critical initialization condition for a debris flow dam was proposed.