



Numerical simulation of scouring-deposition variations caused by rainfall-induced landslides in the upstream of Zengwun River, Taiwan

Ming-Hsi Lee (1), Yi-Wen Liao (2), and Kuang-Jung Tsai (3)

(1) Department of Soil and Water Conservation, National Pingtung University of Science and Technology, Pingtung, Taiwan (mhlee@mail.npust.edu.tw), (2) Department of Soil and Water Conservation, National Pingtung University of Science and Technology, Pingtung, Taiwan (s0988615@gmail.com), (3) Department of Land Management and Development, Chang Jung Christian University, Tainan, Taiwan (kjtsai@mail.cjcu.edu.tw)

In recent years, the increasing sediment disasters of severe rainfall-induced landslides on human lives and lifeline facilities worldwide have advanced the necessity to find out both economically acceptable and useful techniques to predict the occurrence and destructive power of the disasters. In August 2009, Typhoon Morakot brought a large amount of rainfall with both high intensity and long duration to a vast area of Taiwan. Unfortunately, this resulted in a catastrophic landslide in watershed of Zengwun-River reservoir, southern Taiwan. Meanwhile, large amounts of landslides were formed in the upstream of Zengwun River. The major scope of this study is to apply numerical model to simulate the scouring-deposition variations caused by rainfall-induced landslides that occurred in the upstream of Zengwun River during Typhoon Morakot. This study proposed the relation diagrams of the intermediate diameter (d_{50}), recurrence interval (T) and scouring-deposition depth (D), and applied the diagrams to understand the impacts of the scouring-deposition variations on the structures for water and soil conservation and their measurements. Based on the simulation of scouring-deposition variation at the Da-Bu dam and Da-Bang dam, this study also discussed the scouring-deposition variations of different sections under different scenarios (including flow rate, intermediate diameters and structures). In summary, the result suggested that the diagrams of the intermediate diameter, recurrence interval and scouring-deposition depth could be used as the reference for designing the check dams, ground sills and lateral constructions.