The Effect of Dam Removal upon Sediment Dynamics: Experiments of a Scale Model of Landao Creek Check Dam in Central Taiwan

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Compared with a lot of conceptions and models established for dam removals in the United States, there are only a few cases about dam removals in Taiwan. Streams in Taiwan are characterized by steep slopes (3 to 7 degree) and very high discharge during rainfall season. Frequent earthquakes generate loose sediment on hillslopes. Abundant sediment from hillslopes and river banks enter into channels during typhoon events, resulting in full of sediment upstream of check dams. It is considered removing check dams because of losing their function of storing sediment. An open-type check dam located in Landao Creek which is a tributary of Beigang River in Central Taiwan was chosen as the model of the dam removal experiments. We built a scale model (1:50) of the dam in the laboratory. Bed materials were composed of three different sizes of particles (0.8, 0.5 and 0.1cm) with different combinations. Different types of removals were applied to discover the dam removal effect on extent of upstream erosion, changes of channel slope and particle sizes downstream the dam under the conditions of different discharges. After removing a part of the dam, the upstream sediment coarsened while the downstream deposits were fine and moderate sediment. The extent of reservoir erosion was closed related to the height of removals.

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