



Research on the affects to the sediment transportation equilibrium in channel after a large sabo dam broke

Cheng-Lun Shieh¹, Wen-Hsiao Tseng², Sin-Ping Lee², Wen-Chi Lai³

Disaster Prevention Research Center, NCKU ¹Department of Hydraulic and Ocean Engineering, NCKU PHD Student²

Department of Resources Engineering, NCKU PHD Student³

Abstract

To retard the sediment transport and affects the reservoir, large sabo dams are built in the main channel of the reservoir watershed in Taiwan. Therefore, these large sabo dams affect upper, down stream and the reservoir significantly if the dam breaks. There was about 450 mm of rain fell in the reservoir watershed during typhoon Wipha struck Taiwan in 17-19, September, 2007. This heavy rainfall caused Baling-sabo-dam broke about 60 m at the upper Dahan River in Shimen Reservoir watershed. The dam was built in 1977, is 38 m in height, 80 m in width, and was designed to reserve sediment material about 10 million m³. The upper river bed was diminished 20 m maximum in a month; the deposited and affected areas are unable to estimate. The long-term river bed elevation variation and the influence to the reservoir are still required to be observed.

This paper investigates the large-dam-break event in Baling in Shimen Reservoir watershed. According to the topographic data before the dam was built and after the dam broke, the approximate transport sediment volume is estimated. The rainfall and discharge data are analyzed, the dam-break event is tested and verified by sediment transportation models and the affected area is simulated.

Keywords: dam break, sabo dam, sediment transportation