Ruangwit Wanitphongphan 2008: Simulation of Downstream Flooding Due to Breaching of Maekuang Dam, Chiang Mai Province. Master of Engineering (Water Resources Engineering), Major Field: Water Resources Engineering, Department of Water Resources Engineering. Thesis Advisor: Associate Professor Suwattana Chittaladakorn, Ph.D. 198 pages.

Experiment concerns about a simulation of downstream flooding due to breaching of Maekuang dam, Chiang Mai. The simulation uses the applicability of mathematical model, MIKE 11, developed by Danish Hydraulic Institute (DHI), available for unsteady flow in one dimension. The study is assumed that Maekuang dam which is earth dam with crest +390.00 m and maximum volume 295 mcm, is collapsed. Subsequently, various forms of demolitions are considered and downstream water movement is also studied by applying probable maximum flood (PMF).

The collapse of dam model in the case of gradual destruction was studied by parameter effect analysis. That means monitoring destruction of dam as changing parameters; Side Slope (SS), Side Erosion Index (x), and also Initial Breach Width (B). In the case of overtopping, the final breach's shape could be classified to three as follows: trapezoid, rectangle, and triangle. The final breach's shape will be trapezoid in the case of piping.

From the study, in case of gradual destruction of dam, we found that most serious damage is occurred in the case of overtopping and rectangular shape. The serious case happens when parameters, x = 1.0 and B = 10, are applied to the model causing a maximum flow rate 5,045.1 cm^3/sec at 1 hr 50 m after cracking. Regarding effect of dam's demolition, water level will extremely increase at Muang Lamphun, km 53+000, and +296.06 m above MSL. The water level above river bank is equal to 6.05 m at 22 hr 16 m after demolition. The results from the study could be utilized as tool for defining the flooding area and preparing an inundation map at downstream area. The map will be available as instructions for land use, flood warning and evacuation to reduce loss.

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