

KAJIAN PENGENDALIAN SEDIMENTASI WADUK PANGLIMA BESAR SOEDIRMAN DENGAN TEKNOLOGI SABO

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ABSTRACT

Natural disaster due to sediment/debris flow often occurs in volcanic area or mountainous area. Sediment/debris flow has a big destruction so it is very dangerous to human lives and infrastructures along the river and its surroundings. One of the countermeasures against sediment/debris flow is by constructing checkdam/sediment control dam. In order to know the effectiveness of the dam to control sediment/debris flow, a physical model test at 1:25 scale was conducted.

Existing checkdam K Boyong No 5 (BOD5) is taken as a model with several modifications. Peak discharge was modified from $Q_2 = 188 \text{ m}^3/\text{sec}$ during 70 minutes to $Q_2 = 59.84 \text{ liter}/\text{sec}$ during 14 minutes and the width of slits from 3 m to 8.4 cm. Simulation of sediment or debris flow in the model applies a simplified flood hydrograph of 50 years return period at AWLR Pulowatu those are $Q_1 = 11.2 \text{ liter}/\text{sec}$ during 10 minutes, $Q_2 = 59.84 \text{ liter}/\text{sec}$ during 14 minutes, $Q_3 = 36 \text{ liter}/\text{sec}$ during 20 minutes, and $Q_4 = 16 \text{ liter}/\text{sec}$ during 16 minutes. Implementation of running test of the model uses both open and close type of checkdam.

Results of the experiment reveal that controlled sediment volume (V_c) for open type sediment control dam after flowing of discharge Q_1 is $0,137 \text{ m}^3$, Q_2 is $2,749 \text{ m}^3$, and after Q_3 and Q_4 are $1,748 \text{ m}^3$. The controlled sediment volume (V_c) for close type sediment control dam after flowing of discharge Q_1 is $0,081 \text{ m}^3$, Q_2 is $1,989 \text{ m}^3$, and after Q_3 and Q_4 are $1,761 \text{ m}^3$. Based on the controlled sediment volume, open type sediment control dam is more effective than close type sediment control dam.

Keywords:

sediment control dam, debris flow, effectiveness, physical model test