

FENOMENA GERUSAN LOKAL DAN DEGRADASI DASAR SUNGAI DI HILIR SUB DAM PADA SABO DAM TIPE TERBUKA DAN TERTUTUP (UJI MODEL FISIK)

Makwan

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ABSTRACT

A huge sediment flow can result in disaster for human life. Sediment disaster is controlled by Sabo Dam. Sabo Dam is constructed in the base of the river which is built by sediment flow so that it has unstable characteristics. Several Sabo constructions are found in damaged condition after flood, and are assumed triggered by local scouring phenomenon and river base degradation. Physical model test research is conducted to understand local scouring phenomenon and river base degradation in down part of sub dam.

Physical model test research has done by modifying physical model at 1:25 scale from Boyong river and BOD-5 prototype which is already exist in laboratory by adding 10.6 m its length in down part of sub dam. Open type Sabo Dam is modified for close type. Model test has done toward open and close types of Sabo Dam. Peak discharge is resulted from $Q_{50} = 187.74 \text{ m}^3/\text{sec}$ discharge design. Discharge and time flow at 1:25 scale model, is based on AWLR flood hydrograph at Pulowatu station when it was flooding on December 14th 1994, $q_1 = 11.2 \text{ liter}/\text{sec}$, 10 m inutes; $Q_2 = 59.84 \text{ liter}/\text{sec}$, 14 m inutes (as peak discharge); $q_3 = 36 \text{ liter}/\text{sec}$, 20 m inute and $Q_4 = 16 \text{ liter}/\text{sec}$ during 16 m inutes.

Research result shows that local scouring phenomenon and river base degradation in down part of sub dam is influenced by flow discharge and type of Sabo Dam. The increasing discharge flow resulted on huge local scouring and degradation effect. Close type Sabo Dam which upstream structure has not been filled by sediment, result in greatest effect toward local scouring phenomenon and river base degradation compare to other type at peak flow (Q_2) condition. Maximum local scouring of 0.236 m and total river base sediment transport of 2.29 m^3 , result on 0.128 m river base degradation. It is followed by decrease of river base gradient from 6 % down to 2.6 %. Sub Dam is safe toward degradation. However, it is unsafe from local scouring. Local scouring and river base degradation at down part of sub dam are filled with sediment transport by Q_3 and Q_4 flows.

Keywords : *physical model test, local scouring, degradation*