

SISTEM MITIGASI BENCANA SEKUNDER GUNUNGAPI GAMALAMA DI SUNGAI TUBO (TUGURARA) KOTA TERNATE

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ABSTRACT

Gamalama Mountain with the height of 1,715 meters above sea level is located in the western Halmahera of Ternate Island which often erupts and causing the formation of volcanic material sediments and piroclastic from the previous eruptions deposited around the peak of the mountain. During the rainy season, those material sediments could bring secondary disaster in the form of debris flood and therefore six sabo constructions had been built to prevent sediment disaster created by debris flow. The most upstream constructions are check dam 1 and 2 that are supported by ground sill constructions. On the other hand, continuing traditional sand mining extraction by surrounding communities along Tubo River may cause environmental degradation and decreased function of the sabo constructions.

The research was carried out to study the sediment balance. Analysis of volume of the sediment inflow as sediment production (V_s) was approached with Takahashi and Mizuyama empirical formula meanwhile the sediment outflow (V_E) was approached with Zhimoda empirical formula. Analysis of sediment balance was accounted by volume of sediment inflow mixed with daily designed rainfall (R_{24}) for 25 years of return period.

The research showed that sabo system applied in Tubo River is inadequate to control debris flow since the inflow of sediment product is 42,267.03 m³ for daily designed rainfall (R_{24}) for 25 years of return period comparing to the total storage capacity of both check dam constructions is 15,308.15 m³. Performance level of Tubo River sediment control system was influenced by several factors such as management system of sediment balance and sand mining extraction. Sediment balance would be achieved if sediment management is controlled through sand mining inspections by practicing the enforcement of both constitution and the local regulation. Disaster mitigation efforts on debris flow was insufficient due to lack of periodical and continuous educational and training courses offered, and the absence of Local Action Plan on Disaster Risk Reduction as an essential reference in disaster mitigation.

Key words:

Mitigation, Sabo Dam, Mining, Sediment Balance.