

# **KAJIAN PENGARUH EROSI LAHAN TERHADAP SEDIMENTASI DI WADUK BILI-BILI KABUPATEN GOWA PROVINSI SULAWESI SELATAN**

**Fadiyah**

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## **ABSTRACT**

Bili-Bili Reservoir is located in Gowa Regency, South Sulawesi Province. The reservoir has storage capacity of 375 million m<sup>3</sup>, inundation water surface area of 18.5 km<sup>2</sup>, and catchment area of 384 km<sup>2</sup>. It was constructed to have lifetime design for 50 years with sediment storage capacity of 29,000,000 m<sup>3</sup> and sedimentation rate of 580,000 m<sup>3</sup>/year. The result of the year 2004 echosounding shows sedimentation of 4,763,229.26 m<sup>3</sup> have occurred in Bili-bili Reservoir, while the year 2005 echosounding shows sedimentation of 22,686,654 m<sup>3</sup>. The main sources of reservoir sedimentation come from catchment area erosion and caldera collapse of Mount Bawakaraeng. An analysis is then needed to study the sources of sediment and their effect on Bili-Bili Reservoir sedimentation. This research is intended to analyze the effect of catchment area erosion on Bili-Bili Reservoir sedimentation and providing recommendation of countermeasure methods.

The analysis is conducted using land erosion prediction method of Universal Soil Loss Equation (USLE) and Modified USLE (MUSLE) based on the collected secondary data. Sediment yield entering reservoir is calculated using Sediment Delivery Ratio (SDR) method. Erosion countermeasures on the catchment area and construction of sediment control structures are needed in order to manage the sedimentation rate. Erosion control is carried out by improving land use management system. The improvement of land use is implemented by converting cultivated land into mixed cropping land.

The results show that land erosion of 1,609,216 m<sup>3</sup>/year or soil losses of 4.25 mm/year in average occur on the catchment area of Bili-Bili Reservoir. SDR calculation shows that 42.3 % of surface erosion on the reservoir catchment area has caused sedimentation in the reservoir. Sediment yield entering the reservoir provides a huge impact on reducing the reservoir operational lifetime design down to 29 years. The huge impact of sediment yield resulted from caldera collapse of Mount Bawakaraeng results in reduction of the reservoir operational lifetime less than it is designed. Revert to such condition, therefore collapse sediment countermeasure must be the first priority as well as land erosion countermeasure. Hopefully under proper land use management system the soil erosion will come to 970,969.16 m<sup>3</sup>/year which equivalent to 2.57 mm/year, and erosion rate is predicted turn down to 489,951 m<sup>3</sup>/year.

**Key words:** *USLE, MUSLE, SDR, control.*