

# ANALISIS EROSI DAN DEBIT SUNGAI DAS CISANGKUY MENGGUNAKAN SWAT DAN MODEL DINAMIS

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## ABSTRAK

Model *Soil and Water Assessment Tools* (SWAT) dapat mengidentifikasi, menilai dan mengevaluasi tingkat permasalahan biofisik suatu DAS salah satunya erosi dan debit namun belum banyak yang mengetahuinya. Penelitian ini bertujuan untuk: (1) mengetahui simulasi erosi dan debit pada SWAT, (2) mengetahui analisis erosi dan debit sungai menggunakan SWAT, (3) membuat model dinamis erosi dan debit sungai. Metode yang digunakan dalam penelitian ini yaitu metode deskriptif dengan analisis data menggunakan SWAT dan model dinamis. Analisis SWAT dilakukan dengan bantuan Sistem Informasi Geografi (SIG) melalui 4 proses yaitu deliniasi, pembentukan *Hydrological Response Units* (HRUs), pendefinisian stasiun hidroklimatologi, simulasi model. Fluktuasi debit yang terjadi cukup tinggi, yaitu 0,268 m<sup>3</sup>/s pada musim kemarau dan 35,35 m<sup>3</sup>/s serta rata-rata debit sebesar 14,38 m<sup>3</sup>/s. Erosi terbesar pada bulan Februari 2010 sebesar 313073.23 ton/bulan. Tingkat bahaya erosi menunjukkan kategori sangat ringan dan ringan terdapat pada wilayah hilir, sedangkan wilayah hulu dan tengah, umumnya berkategori sedang sampai sangat berat. Kalibrasi dan validasi menggunakan SWAT CUP didapat hasil R<sup>2</sup> sebesar 0.50 dan NS sebesar 0.36. Hasil simulasi model SWAT bisa dikategorikan memuaskan. Dari hasil model dinamis erosi dan debit didapatkan faktor aliran limpasan merupakan faktor yang berpengaruh pada prediksi erosi metode MUSLE, dan didapat uji validitas RMSPE = 10,8 % , AME = 0,13 % dan AVE = 0,65% dengan artian hasil model dapat diterima.

Kata Kunci : (DAS Cisangkuy, SWAT, erosi, debit)

# ANALYSIS OF EROSION AND RIVER DISCHARGE CISANGKUY WATERSHED USING SWAT AND DYNAMIC MODEL

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## ABSTRACT

SWAT (Soil and Water Assessment Tools) model can identify, assess and evaluate the level of biophysical problems of a watershed one of them erosion and discharge but not many people know. This study aims to: (1) to understand simulation of erosion and discharge on SWAT, (2) to understand the erosion and river discharge analysis using SWAT. The method used in this research is descriptive method with data analysis using SWAT and dynamic model. SWAT analysis is done with Geographic Information System (GIS) through 4 processes, that is delineation, Hydrological Response Unit (HRUs), defining hydroclimatology station, model simulation. The fluctuation of discharge is quite high, that is 0.268 m<sup>3</sup>/s in the dry season and 35.35 m<sup>3</sup>/s and the average discharge is 14.38 m<sup>3</sup>/s. The biggest erosion in February 2010 was 313073.23 ton/month. Erosion risk level shows very light and light category located in the downstream area, while the upstream and middle areas, generally categorized as moderate to very heavy. Calibration and validation using SWAT CUP resulted in R<sup>2</sup> is 0.50 and NS is 0.36. SWAT model simulation results can be categorized as satisfactory. From the results of the dynamic model of erosion and discharge, the runoff factor is a factor that influence the prediction of erosion of MUSLE method, and the validity of RMSPE = 10,8%, AME = 0,13% and AVE = 0,65% and it means that the model result can be accepted.

Keyword : (Cisangkuy Watershed, SWAT, erosion, discharge)