

**ESTIMASI LAJU EROSI MENGGUNAKAN MODEL USLE DAN RUSLE  
DI WILAYAH SUB DAERAH ALIRAN SUNGAI  
DAERAH ISTIMEWA YOGYAKARTA**

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**INTISARI**

Sub-DAS Petir merupakan wilayah daerah aliran sungai dengan beberapa permasalahan lahan, salah satunya erosi. Erosi di Sub-DAS Petir diperparah dengan adanya alih fungsi lahan terutama pada daerah perbukitan. Estimasi laju erosi di Sub-DAS Petir menggunakan model USLE (*Universal Soil Loss Equation*) dan Model RUSLE (*Revised Universal Soil Loss Equation*). Estimasi laju erosi pada kedua model tersebut dibandingkan secara spasial menggunakan metode indikator kehilangan tanah yaitu pengukuran pedestal dan erosi alur. Penelitian ini bertujuan untuk (1) Menganalisis laju erosi berdasarkan Model USLE di wilayah Sub-DAS Petir; (2) Menganalisis laju erosi berdasarkan Model RUSLE di wilayah Sub-DAS Petir; dan (3) Membandingkan hasil pemodelan USLE dan RUSLE dengan laju kehilangan tanah di lapangan.

Hasil estimasi pemodelan erosi menunjukkan model USLE cenderung lebih tinggi daripada model RUSLE. Rata-rata laju erosi model USLE sebesar 216,20 ton/ha/tahun, sedangkan rata-rata laju erosi model RUSLE sebesar 146,76 ton/ha/tahun. Hasil estimasi pemodelan erosi dibandingkan dengan pengukuran pedestal dan erosi alur. Pengukuran laju kehilangan tanah di lapangan menunjukkan variasi perbedaan yang tinggi akibat kompleksitas kondisi lahan. Pengukuran pedestal memiliki variasi sebesar 307,9-723,9 ton/ha/tahun, Pengukuran erosi alur memiliki variasi sebesar 6,93-389,52 ton/ha/tahun.

**Kata kunci:** Erosi, USLE, RUSLE, Indikator Kehilangan Tanah

## EROSION RATE ESTIMATION USING USLE AND RUSLE MODELS IN THE SUB-WATERSHED AREA YOGYAKARTA SPECIAL REGION

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### ABSTRACT

*The Petir Sub-watershed encompasses an area marked by various land-related challenges, with erosion emerging as a prominent issue. Erosion within the Petir Sub-watershed is further compounded by changes in land use, particularly pronounced in hilly terrain. The estimation of erosion rates within the Petir Sub-watershed employs both the USLE (Universal Soil Loss Equation) and RUSLE (Revised Universal Soil Loss Equation) models. The resulting erosion rate estimations from these models are spatially compared using indicators of soil loss, specifically through pedestal measurements and furrow erosion assessments. This research aims to achieve three primary objectives: (1) Analyze erosion rates based on the USLE Model within the Petir Sub-watershed area; (2) Analyze erosion rates based on the RUSLE Model within the Petir Sub-watershed area; and (3) Compare the outcomes of the USLE and RUSLE modeling with actual soil loss rates observed in the field.*

*The erosion estimation modeling outcomes reveal a tendency for the USLE model to yield higher rates compared to the RUSLE model. The average erosion rate projected by the USLE model is 216.20 tons/ha/year, whereas the average erosion rate estimated by the RUSLE model is 146.76 tons/ha/year. The results of the erosion modeling are then juxtaposed with measurements obtained through pedestal and furrow erosion assessments. Notably, field measurements of soil loss rates exhibit substantial variations due to the intricate nature of land conditions. Pedestal measurements display a range of variation from 307.9 to 723.9 tons/ha/year, while furrow erosion measurements encompass a range from 6.93 to 389.52 tons/ha/year.*

**Keywords:** *Erosion, USLE, RUSLE, Soil Loss Indicator*