

Identifikasi Kawasan Rawan Erosi Tanah Menggunakan Metode Analytical Hierarchy Process (AHP) pada Daerah Aliran Sungai (DAS) Kalicilet, Kabupaten Indramayu, Majalengka, dan Sumedang, Provinsi Jawa Barat = Identification of Soil Erosion-Prone Areas Using the Analytical Hierarchy Process (AHP) Method in the Kalicilet Watershed, Indramayu, Majalengka, and Sumedang Regencies, West Java Province

Fathur Rozik, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=9999920574232&lokasi=lokal>

Abstrak

Erosi tanah merupakan salah satu bentuk degradasi lahan yang berdampak signifikan terhadap kestabilan lingkungan dan produktivitas lahan. Wilayah Daerah Aliran Sungai (DAS) Kalicilet, yang meliputi Kabupaten Indramayu, Majalengka, dan Sumedang, menjadi area yang rentan terhadap erosi akibat tekanan geomorfik dan antropogenik yang tinggi. Penelitian ini bertujuan untuk mengidentifikasi kawasan rawan erosi tanah dengan pendekatan sistem informasi geografis (SIG) dan metode Analytical Hierarchy Process (AHP). Sebanyak 11 parameter digunakan dalam analisis, yaitu elevasi, kemiringan lereng, bentuk lereng, Topographic Wetness Index (TWI), litologi, jarak ke sungai, curah hujan, NDVI, kerapatan kelurusan, tutupan lahan, dan jenis tanah.

Pembobotan parameter dilakukan melalui AHP berdasarkan hasil perhitungan konsistensi matriks, dengan nilai Consistency Ratio (CR) sebesar 0,09063 yang menunjukkan konsisten karena memiliki nilai $< 0,1$. Parameter kemiringan lereng (20,50%) dan elevasi (18,01%) menunjukkan kontribusi paling besar terhadap kerawanan erosi. Pemetaan akhir menghasilkan empat kelas kerawanan, dengan dominasi luasan kelas rendah sebesar 39,31% dan kelas tinggi sebesar 30,74%. Validasi model menggunakan Receiver Operating Characteristic (ROC) menghasilkan nilai Area Under Curve (AUC) sebesar 81,04%, yang mengindikasikan akurasi model sangat baik. Hasil penelitian ini diharapkan dapat menjadi dasar pengelolaan dan perencanaan konservasi lahan berkelanjutan di wilayah DAS Kalicilet.

.....Soil erosion is one of the forms of land degradation that significantly affects environmental stability and land productivity. The Kalicilet watershed area, which includes the regencies of Indramayu, Majalengka, and Sumedang, is highly vulnerable to erosion due to intense geomorphic and anthropogenic pressures. This study aims to identify areas susceptible to soil erosion using a Geographic Information System (GIS)-based approach combined with the Analytical Hierarchy Process (AHP) method. A total of 11 parameters were used in the analysis, including elevation, slope, slope shape, Topographic Wetness Index (TWI), lithology, distance to rivers, rainfall, NDVI, lineament density, land cover, and soil type.

Parameter weighting was conducted through AHP based on matrix consistency calculations, yielding a Consistency Ratio (CR) value of 0.09063, which indicates consistency because the value is $< 0,1$. The parameters of slope (20.50%) and elevation (18.01%) contributed the most to erosion susceptibility. The final mapping classified the area into four levels of susceptibility, with the low-susceptibility class dominating 39.31% of the area, followed by the high-susceptibility class at 30.74%. Model validation using the Receiver Operating Characteristic (ROC) method produced an Area Under Curve (AUC) value of

81.04%, indicating excellent model accuracy. The results of this study are expected to serve as a basis for sustainable land management and conservation planning in the Kalicilet watershed area