

INVESTIGASI SIFAT FISIK TANAH DALAM ANALISIS ERODIBILITAS UNTUK EVALUASI LAJU EROSI TERHADAP KUALITAS AIR DAERAH ALIRAN SUNGAI JUWANA

INTISARI

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Daerah Aliran Sungai (DAS) Juwana merupakan wilayah yang meliputi 5 kabupaten dan memiliki beragam permasalahan lahan, salah satunya erosi tanah. Tingginya laju erosi di DAS Juwana dipicu oleh alih fungsi lahan akibat aktivitas pertambangan ilegal di Pegunungan Kendeng serta pembukaan lahan pertanian di Gunung Muria. Penelitian ini bertujuan mengkaji sifat fisik tanah, menentukan nilai erodibilitas tanah, memprediksi laju erosi tanah, menganalisis pengaruh laju erosi terhadap kualitas air, serta mengevaluasi kualitas air DAS Juwana terhadap baku mutu kelas II. Sampel air dan sampel tanah dikumpulkan, dilanjutkan dengan uji struktur tanah, tekstur tanah, dan permeabilitas tanah guna mendapatkan data erodibilitas tanah. Prediksi laju erosi menggunakan metode *Universal Soil Loss Equation* (USLE). Sedangkan parameter kualitas air yang diuji yaitu *Total Suspended Solid* (TSS), *Total Dissolved Solid* (TDS). Nilai laju erosi kemudian diuji korelasi dengan parameter kualitas air untuk mengetahui hubungan antara laju erosi tanah dan kualitas air Sungai Juwana. Berdasarkan hasil penelitian menunjukkan bahwa sifat fisik tanah dapat mempengaruhi erodibilitas tanah. Semakin tinggi kandungan pasir dan debu, maka nilai erodibilitas akan semakin besar. Semakin tinggi kandungan liat dan bahan organik, maka semakin kecil erodibilitas tanah. Besaran laju erosi tanah di DAS Juwana berkisar 1,494- 1611,59 ton/ha/tahun. Nilai laju erosi tanah terbesar berada di titik A5 dan terkecil ada di titik A3. Pada pengujian kualitas air di badan Sungai Juwana terdapat beberapa titik sampel yang melebihi batas baku mutu kualitas air kelas dua yaitu, A6 untuk parameter TDS sebesar 10818,6 mg/L dan parameter kekeruhan di titik A3 dan A4 dengan nilai 29,03; 38,316 NTU. Korelasi laju erosi tanah terhadap TSS berkorelasi negatif dengan nilai -0,261. Korelasi laju erosi tanah terhadap TDS berkorelasi kuat dengan nilai 0,657. Korelasi laju erosi tanah terhadap kekeruhan berkorelasi lemah dengan nilai 0,143. Besaran laju erosi tanah di setiap titik sampel memiliki peran penting untuk mempengaruhi kualitas air di Sungai Juwana.

Kata Kunci: erosi, USLE, DAS, TSS, TDS, kekeruhan

**INVESTIGATION OF SOIL PHYSICAL PROPERTIES IN ERODIBILITY
ANALYSIS FOR EVALUATION OF EROSION RATE ON WATER
QUALITY OF JUWANA RIVER BASIN**

ABSTRACT

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The Juwana Watershed is an area that covers 5 districts and has various land problems, one of which is soil erosion. The high erosion rate in Juwana watershed is triggered by land conversion due to illegal mining activities in Kendeng Mountains and agricultural land clearing in Mount Muria. This study aims to assess soil physical properties, determine soil erodibility values, predict soil erosion rates, analyse the effect of erosion rates on water quality, and evaluate the water quality of the Juwana watershed against class II quality standards. Water samples Soil samples were collected, followed by tests of soil structure, soil texture, and soil permeability to obtain soil erodibility data. Prediction of erosion rates using the Universal Soil Loss Equation (USLE) method. The water quality parameters tested were Total Suspended Solid (TSS), Total Dissolved Solid (TDS). The erosion rate value was then tested for correlation with water quality parameters to determine the relationship between soil erosion rate and water quality of Juwana River. Based on the results of the study, it shows that soil physical properties can affect soil erodibility. The higher the sand and dust content, the greater the erodibility value. The higher the clay and organic matter content, the smaller the soil erodibility. The amount of soil erosion rate in Juwana watershed ranges from 1,494 to 1611,59 tonnes/ha/year. The largest soil erosion rate value is at point A5 and the smallest is at point A3. In testing water quality in the Juwana River body, there are several sample points that exceed the second class water quality standards, namely, A6 for the TDS parameter of 10818.6 mg/L and turbidity parameters at points A3 and A4 with values of 29.03; 38.316 NTU. The correlation of soil erosion rate to TSS is negatively correlated with a value of -0.261. The correlation of soil erosion rate to TDS is strongly correlated with a value of 0.657. The correlation of soil erosion rate to turbidity is weakly correlated with a value of 0.143. The amount of soil erosion rate at each sample point has an important role in influencing water quality in the Juwana River.

Kata Kunci: erosion, USLE, TSS, TDS, turbidity