

ESTIMASI POTENSI EROSI TANAH DAN EVALUASI KORELASI DENGAN KARAKTERISTIK IRIGASI: STUDI KASUS KAWASAN DIENG

INTISARI

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Dieng merupakan salah satu kawasan pertanian hortikultura utama di Indonesia dengan komoditas unggulan berupa kentang. Namun, wilayah ini menghadapi tantangan erosi tanah akibat topografi yang curam, curah hujan yang tinggi, serta perubahan penggunaan lahan. Karakteristik sistem irigasi, seperti jenis, frekuensi, dan durasi, diduga turut berkontribusi terhadap laju erosi. Penelitian ini bertujuan untuk menemukan potensi hubungan antara karakteristik irigasi dan laju erosi di *catchment area* Desa Kepakisan, Dieng. Metode yang digunakan meliputi penentuan *catchment area*, pemilihan titik sampel tanah untuk analisis erodibilitas tanah, serta pengambilan data karakteristik irigasi melalui wawancara di titik-titik lahan tererosi. Prediksi potensi erosi dihitung secara spasial menggunakan metode *Universal Soil Loss Equation* (USLE), sedangkan potensi hubungan antara karakteristik irigasi dan erosi dikaji secara deskriptif dengan pendekatan *mixed method* tipe *convergent parallel design*. Penelitian ini menemukan bahwa potensi erosi di wilayah studi didominasi oleh kategori berat dan sangat berat, masing-masing seluas 151,34 ha (36,47%) dan 232,50 ha (56,02%), sementara kategori sedang hanya mencakup 31,18 ha (7,51%). Faktor utama yang memengaruhi erosi adalah kemiringan lereng dan curah hujan tinggi. Karakteristik irigasi di lahan tererosi didominasi oleh sistem *sprinkler* dengan durasi 2–24 jam per sesi dan frekuensi bervariasi, bergantung pada kelerengan, curah hujan, rotasi, dan jumlah *sprinkler*. Terdapat indikasi bahwa karakteristik teknis irigasi berpotensi memengaruhi erosi secara tidak langsung melalui kejenuhan tanah dan limpasan permukaan, namun hubungan ini belum dapat dibuktikan secara empiris dalam penelitian ini. Oleh karena itu, studi lanjutan dengan pendekatan eksperimental diperlukan untuk menguji pengaruh langsung variabel teknis irigasi terhadap laju erosi dan kualitas tanah.

Kata kunci: Erosi, Irigasi, USLE, *Catchment Area*, Dieng

ESTIMATION OF SOIL EROSION POTENTIAL AND EVALUATION OF ITS CORRELATION WITH IRRIGATION CHARACTERISTICS: A CASE DIENG REGION

ABSTRACT

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Dieng is one of the main horticultural agricultural regions in Indonesia, with potatoes as its leading commodity. However, this area faces significant soil erosion challenges due to steep topography, high rainfall, and land-use changes. Irrigation system characteristics, including type, frequency, and duration, are suspected to contribute to erosion rates. This study aimed to explore the potential relationship between irrigation characteristics and erosion rates in the catchment area of Kepakisan Village in Dieng. The methods used include determining the catchment area boundaries, selecting soil sampling points for soil erodibility analysis, and collecting irrigation characteristic data through interviews at erosion-affected sites. Soil erosion rates were spatially predicted using the Universal Soil Loss Equation (USLE), while the potential relationship between irrigation characteristics and erosion was analyzed descriptively using a convergent parallel mixed-methods design. This study proved that the study area is predominantly affected by severe and very severe erosion categories, covering 151.34 ha (36.47%) and 232.50 ha (56.02%) of the land area, respectively. The primary factors influencing erosion are slope steepness and high rainfall. The irrigated lands affected by erosion are predominantly managed using *sprinkler* systems, with irrigation durations ranging from 2 to 24 hours per session and frequencies varying according to slope, rainfall, rotation schedules, and the number of *sprinklers* available. Findings suggest a potential indirect relationship between irrigation characteristics and erosion through soil saturation and surface runoff. However, this relationship was not empirically confirmed in the present study. Therefore, further experimental research using controlled *sprinkler* irrigation plots is recommended to assess the direct effects of irrigation variables on soil erosion rates and soil quality.

Keywords: *Erosion, Irrigation, USLE, Catchment Area, Dieng*