

**PENDUGAAN PRODUKTIVITAS PADI BERDASARKAN  
INDEKS KERAPATAN VEGETASI DARI  
CITRA SATELIT SENTINEL-2A DI KABUPATEN SLEMAN,  
D.I. YOGYAKARTA**

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**ABSTRAK**

Hasil komoditas tanaman pangan seperti beras terdapat permintaan sangat tinggi dan terus meningkat setiap tahunnya. Pendugaan mengenai produktivitas padi sangat diperlukan guna mengoptimalkan perencanaan penanaman yang tepat dan produksi padi yang maksimal. Penelitian ini bertujuan untuk mengidentifikasi indeks kerapatan vegetasi tanaman padi di Kabupaten Sleman yang akan menjadi dasar pendugaan produktivitas padi wilayah tersebut. Metode yang digunakan untuk menentukan nilai indeks kerapatan vegetasi adalah *Normalized Difference Vegetation Index* (NDVI) dari citra Sentinel-2A. Model prediksi produktivitas padi ditetapkan dari hasil analisis regresi linier dengan input data dari NDVI dan produktivitas padi di 17 Kapanewon. Hasil penelitian menunjukkan terdapat empat kelas kerapatan vegetasi di Kabupaten Sleman yaitu kelas non-vegetasi, vegetasi jarang, vegetasi sedang, dan vegetasi rapat. Persamaan pendugaan produktivitas padi adalah  $Y = 12,211 + 60,219 (X)$ , dengan koefisien determinasi sebesar 0,885. Variabel Y adalah produktivitas padi dan X adalah nilai indeks kerapatan vegetasi. Berdasarkan model regresi tersebut terdapat kelas interval pendugaan produktivitas padi di Kabupaten Sleman tahun 2021 yaitu kelas 0-3,33 ton/ha, kelas 3,33-4,53 ton/ha, kelas 4,53-5,55 ton/ha, dan kelas 5,55-6,67 ton/ha dengan rata-rata selisih 1,07 ton/ha dibandingkan dengan data Dinas Pertanian, Pangan, dan Perikanan Kabupaten Sleman serta rata-rata selisih 0,3 ton/ha dengan data pengamatan lapangan.

**Kata Kunci:** Citra Sentinel-2A, kerapatan vegetasi, NDVI, produktivitas padi, regresi linier

**ESTIMATION OF RICE PRODUCTIVITY BASED ON VEGETATION  
DENSITY INDEX FROM SENTINEL-2A SATELLITE IMAGERY OF  
SLEMAN DISTRICT, D.I. YOGYAKARTA**

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**ABSTRACT**

*The demand for food crop commodities such as rice has been very high and continues to increase every year. Estimation of rice productivity is needed to optimize proper planting planning and maximize rice production. The purpose of the study was to identify the index of vegetation density of rice plants in Sleman Regency which will be the basis for estimating the rice productivity of the region. In this study, Normalized Difference Vegetation Index (NDVI) from Sentinel-2A imagery was the method used to determine the value of the vegetation density index. The prediction model for rice productivity was determined from the results of linear regression analysis with input data from NDVI and rice productivity in 17 districts. The results showed that there were four classes of vegetation density in Sleman Regency, namely non-vegetation class, sparse vegetation, medium vegetation, and dense vegetation. The equation for estimating rice productivity was  $Y = 12.211 + 60.219 (X)$ , with a coefficient of determination ( $R^2$ ) 0.885. The variable Y was rice productivity and X was the value of the vegetation density index. Based on the regression model, there were interval classes for estimating rice productivity in Sleman Regency in 2021, namely class 0-3.33 tons/ha, class 3.33-4.53 tons/ha, class 4.53-5.55 tons/ha, and class 5.55-6.67 tons/ha with an average difference of 1.07 tons/ha compared to data from the Department of Agriculture, Food and Fisheries of Sleman Regency and an average difference of 0.3 tons/ha with field observation data.*

**Keywords:** *Sentinel-2A imagery, NDVI, vegetation density, rice productivity, linear regression*