

ABSTRAK

PERBANDINGAN METODE *MAXIMUM LIKELIHOOD CLASSIFICATION* (MLC) DAN *OBJECT ORIENTED CLASSIFICATION* (OOC) UNTUK PEMETAAN TUTUPAN LAHAN DI KECAMATAN AMBARAWA DAN KECAMATAN PRINGSEWU

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Pemetaan tutupan lahan merupakan aspek krusial dalam pengelolaan sumber daya alam dan perencanaan wilayah yang kini didukung oleh teknologi penginderaan jauh menggunakan Citra Sentinel 2A. Tugas Akhir ini difokuskan di Kecamatan Ambarawa dan Kecamatan Pringsewu, Kabupaten Pringsewu, yang memiliki karakteristik penggunaan lahan beragam seperti permukiman, pertanian, dan vegetasi. Tujuan utama dari Tugas Akhir ini adalah melakukan pembuatan peta tutupan lahan serta membandingkan tingkat akurasi antara metode klasifikasi berbasis piksel dan berbasis objek.

Metode yang digunakan dalam Tugas Akhir ini adalah *Maximum Likelihood Classification* (MLC) dan *Object Oriented Classification* (OOC). Tahapan Tugas Akhir meliputi persiapan, pengolahan data citra Sentinel 2A tahun 2024, klasifikasi tutupan lahan ke dalam lima kelas (lahan pertanian, permukiman, vegetasi, badan air, dan jalan), serta uji akurasi. Uji akurasi dilakukan menggunakan *confusion matrix* dengan memvalidasi 54 titik sampel perkelas terhadap citra *Google Earth* untuk menghasilkan nilai *Overall Accuracy* dan *Kappa Coefficient*.

Hasil Tugas Akhir menunjukkan bahwa metode *Object Oriented Classification* (OOC) memiliki tingkat akurasi yang lebih tinggi dibandingkan *Maximum Likelihood Classification* (MLC) di kedua lokasi. Di Kecamatan Ambarawa, metode OOC menghasilkan *Overall Accuracy* sebesar 92% dan *Kappa Coefficient* 90%, sementara metode MLC menghasilkan 89% dan 87%. Di Kecamatan Pringsewu, metode OOC memperoleh *Overall Accuracy* 90% dan *Kappa Coefficient* 88%, sedangkan metode MLC memperoleh 88% dan 86%. Setelah mendapatkan hasil uji akurasi metode OOC lebih akurat dan konsisten dalam memetakan tutupan lahan karena mampu mengintegrasikan informasi spektral, bentuk, tekstur, dan konteks spasial objek.

Kata Kunci : Citra Sentinel 2A, Tutupan Lahan, *Maximum Likelihood Classification* (MLC), *Object Oriented Classification* (OOC), Uji Akurasi.

ABSTRACT

Comparison of Maximum Likelihood Classification (MLC) and Object-Oriented Classification (OOC) Methods for Land Cover Mapping in Ambarawa and Pringsewu Sub-Districts

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Land cover mapping is a crucial aspect in natural resource management and regional planning, which is currently supported by rapidly advancing remote sensing technology using Sentinel-2A imagery. This study focuses on Ambarawa District and Pringsewu District, Pringsewu Regency, which have diverse land use characteristics such as settlements, agriculture, and vegetation. The main objective of this research is to produce a land cover map and to compare the accuracy levels between pixel-based and object-based classification methods. The methods used in this study are Maximum Likelihood Classification (MLC) and Object-Oriented Classification (OOC). The research stages include data preparation, processing of Sentinel-2A imagery from 2024, classification of land cover into five classes (agricultural land, settlements, vegetation, water bodies, and roads), and accuracy assessment. The accuracy assessment was conducted using a confusion matrix by validating 54 sample points per class against Google Earth imagery to obtain Overall Accuracy and Kappa Coefficient values. The results show that the Object-Oriented Classification (OOC) method has a higher accuracy level compared to the Maximum Likelihood Classification (MLC) method in both study areas. In Ambarawa District, the OOC method achieved an Overall Accuracy of 92% and a Kappa Coefficient of 90%, while the MLC method obtained 89% and 87%, respectively. In Pringsewu District, the OOC method achieved an Overall Accuracy of 90% and a Kappa Coefficient of 88%, whereas the MLC method obtained 88% and 86%. Based on the accuracy assessment results, the OOC method is more accurate and consistent in mapping land cover, as it is able to integrate spectral information, shape, texture, and spatial context of objects.

Keywords: Sentinel 2A Imagery, Land Cover, Maximum Likelihood Classification (MLC), Object Oriented Classification (OOC), Accuracy Test.