Estimasi Umur Kelapa Sawit Berbasis Nilai Backscatter pada Citra Radar Sentinel-1 Menggunakan Pendekatan Machine Learningdi Perkebunan PT GBSM Seruyan Hilir KalimantanTengah = Age Estimation of Palm Oil Based on Backscatter Value on Image Radar Sentinel-1 Using Machine Learning Approach at PT. GBSM Seruyan Hilir Oil Palm Plantation, Central Kalimantan

Aulia Rahman, author

Abstrak

Aktivitas produksi dan ekspor komoditas kelapa sawit terus mengalami ekspansi dan peningkatan. Indonesia memiliki perkebunan kelapa sawit dengan luas mencapai 12.761.586 Hektar. menjadikan Indonesia sebagai salah satu penghasil CPO (Crude Palm Oil) terbesar di dunia. Keberhasilan produksi dari kelapa sawit tidak terlepas dari kegiatan perencanaan dan pengawasan sehingga diperlukan pemantauan secara cepat dan efektif. Penelitian ini dilakukan dengan tujuan untuk mengetahui karakteristik dan pola persebaran umur kelapa sawit berdasarkan nilai backscatter pada citra radar Sentinel-1. Data berupa citra radar Sentinel-1 digunakakan untuk dapat melakukan estimasi terhadap umur kelapa sawit berdasarkan nilai backscatter menggunakan pendekatan machine learning. Hasil pemodelan menunjukan bahwa tren nilai backscatter terhadap umur kelapa sawit memiliki karakter berbanding lurus dengan umur kelapa sawit. Estimasi umur kelapa sawit berdasarkan nilai backscatter pada Sentinel-1 GRD menghasilkan 3 kelas umur kelapa sawit dengan tingkat overall accuracy sebesar 93.3% pada anlisis yang dilakukan secara Single Time, sedangkan pada analisis time series diperoleh nilai overall accuracy sebesar 94.5% Hasil menunjukkan bahwa kelas umur dewasa memiliki nilai z score sebesar -4.190963 dengan pola persebaran clustered (mengelompok), kelas umur taruna dengan z score -8.388942 berpola clustered (mengelompok), dan kelas umur remaja dengan perolehan nilai z score 7.801667 dengan pola persebaran dispersed (seragam).
.....Production and export activities of palm oil commodities continue to expand and increase. Indonesia has oil palm plantations with an area of 12,761,586 hectares. making Indonesia one of the largest CPO (Crude Palm Oil) producers in the world. The success of production from oil palm cannot be separated from planning and monitoring activities so that it is necessary to monitor quickly and effectively. This research was conducted with the aim of knowing the characteristics and patterns of age distribution of oil palms based on the backscatter value on Sentinel-1 radar images. Data in the form of Sentinel-1 radar images are used to estimate the age of oil palms based on the backscatter value using a machine learning approach. The modeling results show that the trend of the backscatter value of the age of the oil palm has a character that is directly proportional to the age of the oil palm. Oil palm age estimation based on the backscatter value on Sentinel-1 GRD resulted in 3 oil palm age classes with an overall accuracy rate of 93.3% in the Single Time analysis, while the time series analysis obtained an overall accuracy value of 94.5%. adults have a z score of -4.190963 with a clustered distribution pattern, the cadet age class with a z score of -8.388942 with a clustered pattern, and the adolescent age class with a z score of 7.801667 with a dispersed distribution pattern.