

Above Ground Biomass Estimation of Oil Palm Tree using PALSAR.

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Abstract: Quantification of Above Ground Biomass (AGB) across oil palm plantation is essential for a wide range of modern day research and management demands. Information on the spatial distribution of oil palm plantation AGB is therefore important for the oil palm industry. In this study, the oil palm plantation in Perak, Malaysia was accessed to obtain the AGB information. The lack information of biomass due to the uncertainties and cost has limited its determination and changes over the years. Hence, this research studied the relation of AGB of oil palm plantation. In a tropical country like Malaysia, cloud cover is a hindrance to visible light sensing. Phased Array type L-band Synthetic Aperture Radar (PALSAR) sensor is an added advantage to overcome the cloud problem to analyze the biomass of the oil palm plantation. Ground data of oil palm biomass which covers age 6,8,10 and 12 years old are compared to the estimation of AGB by PALSAR for all the polarization. PALSAR images were applied various filters and compared among the four window sizes; 3x3, 5x5, 7x7, and 9x9. The filters used in this study are Gaussian low, Gaussian high, Laplacian and Median filter that was applied in the HH, HV, VH and VV polarized image. Speckle suppression index was applied to allow checking of filters' efficiency and thus selection of model building. A valid model was constructed to show the VV polarization degree of relationship between the field data results and filtered PALSAR data of biomass. The model developed had an R^2 value of 0.90, between the VV backscattering against the AGB values. This model was subsequently validated and found to have an accuracy of 85%.

Keywords: PALSAR, AGB, Oil Palm trees