ESTIMATION OF SURFACE CARBON STOCK USING RGBVI (Red Green Blue Vegetation Index) ANALYSIS IN BAROS MANGROVE FOREST AREA, BANTUL, YOGYAKARTA

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ABSTRACT

Global warming is caused by the increase of carbon dioxide (CO_2) level, and mangrove forests play a crucial role in absorbing CO_2. Indonesia, with the largest mangrove forest area in the world, plays a significant role in climate change mitigation through mangrove forests, such as in the Baros Mangrove Forest Conservation Area, Bantul, Yogyakarta. This study aims to estimate the surface carbon stock of the Baros mangrove forest using RGBVI (Red Green Blue Vegetation Index) analysis and to map its distribution. This research used allometric equations, vegetation index transformation, and drone utilization for data collection. Research parameters included tree species, diameter at breast height, density, and RGBVI values. The sample determination in this study was done by purposive sampling based on the mangrove species, using the random point toolbox in QGIS, followed by field adjustments. The sample points is 30, with 22 points used to build two estimation models and 8 points for validation. The results showed a positive relationship between RGBVI and carbon stock with a Pearson correlation coefficient (r) of 0.438, indicating a moderate correlation. The total surface carbon stock estimated for all mangrove types was 81.40 ton, and 105.92 ton for dominant species over an area of 2.45 hectares. The accuracy of the carbon stock estimation model was tested using RMSE and RPD with an accuracy value of 14.21 grams and 1.32 for all species and 12.75 grams and 1.47 for dominant species. The model for dominant species can be used for surface carbon stock estimation, facilitating continous monitoring and supporting conservation efforts of mangrove ecosystems in climate change mitigation.

Keywords: *Mangrove forest, carbon stock, RGBVI, drone, allometric equations*