

ABSTRAK

PENDUGAAN STOK KARBON ATAS PERMUKAAN TANAH MENGUNAKAN PENGINDERAAN JAUH PADA LANSKAP REPONG DAMAR DI KABUPATEN PESISIR BARAT

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Repong damar merupakan sistem agroforestri tradisional yang berpotensi besar dalam menyimpan karbon dan mendukung mitigasi perubahan iklim. Penelitian ini bertujuan untuk menduga stok karbon pada tiga jenis tutupan lahan, yaitu repong damar, hutan alam, dan kebun campuran di Kabupaten Pesisir Barat, serta menganalisis hubungan antara data lapangan dan indeks vegetasi berbasis penginderaan jauh. Data dikumpulkan melalui pengukuran vegetasi di 42 plot menggunakan parameter diameter, tinggi pohon, dan kerapatan kayu, yang kemudian dihitung biomassa dengan pendekatan persamaan alometrik. Biomassa lapangan dikonversi menjadi stok karbon dengan faktor konversi 0,47 sesuai pedoman IPCC dan SNI 7724:2011. Citra satelit Landsat 9 digunakan untuk menghitung indeks vegetasi (NDVI, GNDVI, NDMI, ARVI, SAVI), yang kemudian dianalisis korelasinya dengan data stok karbon menggunakan analisis regresi. Hasil penelitian menunjukkan bahwa repong damar memiliki rata-rata stok karbon tertinggi yakni sebesar 269,74 tC/ha, diikuti hutan alam sebesar 167,01 tC/ha, dan kebun campuran sebesar 96,61 tC/ha. Indeks vegetasi memiliki hubungan yang signifikan terhadap stok karbon dimana NDMI menunjukkan korelasi terkuat. Penelitian ini membuktikan bahwa teknologi penginderaan jauh dapat digunakan secara efektif untuk menduga dan memetakan stok karbon di berbagai jenis tutupan lahan, serta mendukung pemantauan mitigasi perubahan iklim skala bentang lahan.

Kata kunci : stok karbon, penginderaan jauh, indeks vegetasi, repong damar

ABSTRACT

ESTIMATION OF ABOVE GROUND CARBON STOCKS USING REMOTE SENSING ON REPONG DAMAR LANDSCAPE IN PESISIR BARAT REGENCY

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Repong damar is a traditional agroforestry system that has great potential in storing carbon and supporting climate change mitigation. This study aims to estimate carbon stocks in three types of land cover, namely repong damar, natural forest, and mixed gardens in Pesisir Barat Regency, and to analyze the relationship between field data and remote sensing-based vegetation indices. Data were collected through vegetation measurements in 42 plots using diameter, tree height, and wood density parameters, which were then calculated for biomass using an allometric equation approach. Field biomass was converted to carbon stock with a conversion factor of 0.47 according to IPCC guidelines and SNI 7724:2011. Landsat 9 satellite imagery was used to calculate vegetation indices (NDVI, GNDVI, NDMI, ARVI, SAVI), which were then analyzed for correlation with carbon stock data using regression analysis. The results showed that repong damar had the highest average carbon stock of 269,74 tC/ha, followed by natural forest of 167,01 tC/ha, and mixed garden of 96,61 tC/ha. Vegetation index had a significant relationship to carbon stock where NDMI showed the strongest correlation. This study proves that remote sensing technology can be used effectively to estimate and map carbon stocks in various types of land cover, as well as support monitoring of climate change mitigation at the landscape scale.

Keywords : carbon stock, remote sensing, vegetation index, repong damar