

## RINGKASAN

RONI SAPIRA. Estimasi Stok Karbon Mangrove di Pantai Air Lingkung, Desa Terayak, Kecamatan Subi, Kabupaten Natuna. Dibimbing oleh FEBRIANTI LESTARI dan ANDI ZULFIKAR.

Ekosistem mangrove berperan penting dalam menyerap dan menyimpan karbon sehingga berkontribusi terhadap mitigasi perubahan iklim. Pantai Air Lingkung, Desa Terayak, Kecamatan Subi, Kabupaten Natuna memiliki kawasan mangrove yang masih relatif baik, namun belum tersedia data mengenai biomassa dan stok karbonnya. Ketersediaan informasi tersebut penting sebagai dasar dalam pengelolaan dan pelestarian ekosistem mangrove secara berkelanjutan. Penelitian ini bertujuan untuk mengetahui potensi biomassa vegetasi mangrove serta mengestimasi stok karbon dan penyerapan CO<sub>2</sub> berdasarkan pendekatan *Above Ground Biomass* (AGB). Penelitian dilaksanakan pada Agustus–September 2025 di Pantai Air Lingkung. Penentuan stasiun menggunakan metode *purposive sampling* pada tiga stasiun pengamatan. Data dikumpulkan menggunakan metode *non-destructive sampling* berdasarkan SNI 7724:2019 melalui pengukuran diameter batang, tinggi pohon, identifikasi jenis mangrove, kerapatan vegetasi, serta kayu mati. Biomassa dihitung menggunakan persamaan allometrik, kemudian dikonversi menjadi stok karbon dan penyerapan CO<sub>2</sub>. Analisis dilakukan untuk menggambarkan potensi biomassa, stok karbon, dan penyerapan CO<sub>2</sub> pada setiap stasiun pengamatan berdasarkan karakteristik vegetasi mangrove yang ditemukan. Hasil penelitian menunjukkan bahwa ditemukan empat jenis mangrove, yaitu *Rhizophora apiculata*, *Rhizophora mucronata*, *Bruguiera gymnorhiza*, dan *Xylocarpus granatum*. Kerapatan vegetasi pada seluruh stasiun tergolong sangat padat, yaitu 2.533 pohon/ha pada Stasiun 1, 1.533 pohon/ha pada Stasiun 2, dan 2.100 pohon/ha pada Stasiun 3. Jenis *Rhizophora* memiliki biomassa tertinggi sehingga memberikan kontribusi terbesar terhadap stok karbon dan penyerapan CO<sub>2</sub>. Kondisi tersebut menunjukkan bahwa kawasan mangrove Pantai Air Lingkung memiliki potensi yang baik sebagai penyerap dan penyimpan karbon serta memiliki peranan penting dalam menjaga fungsi ekologis ekosistem pesisir. Berdasarkan hasil penelitian dapat disimpulkan bahwa ekosistem mangrove di Pantai Air Lingkung memiliki biomassa, stok karbon, dan potensi penyerapan CO<sub>2</sub> yang tinggi sehingga berpotensi mendukung upaya konservasi mangrove dan mitigasi perubahan iklim. Hasil penelitian ini diharapkan dapat menjadi informasi ilmiah dan data pendukung bagi pengelolaan ekosistem mangrove serta penelitian selanjutnya di wilayah pesisir Kabupaten Natuna.

Kata kunci: Allometrik, Biomassa, Mangrove, Pantai Air Lingkung, Stok Karbon

## SUMMARY

RONI SAPIRA. Estimation of Mangrove Carbon Stock at Air Lingkung Beach, Terayak Village, Subi District, Natuna Regency. Supervised by FEBRIANTI LESTARI and ANDI ZULFIKAR.

Mangrove ecosystems play an important role in absorbing and storing carbon, thereby contributing to climate change mitigation. Air Lingkung Beach, Terayak Village, Subi District, Natuna Regency, has a relatively well-preserved mangrove ecosystem; however, data on its biomass and carbon stock are not yet available. The availability of such information is essential as a basis for sustainable mangrove ecosystem management and conservation. Therefore, this study aimed to determine the biomass potential of mangrove vegetation and estimate carbon stock and CO<sub>2</sub> sequestration using the Above Ground Biomass (AGB) approach. This research was conducted from August to September 2025 at Air Lingkung Beach. Sampling stations were determined using a purposive sampling method with three observation stations. Data were collected using a non-destructive sampling method based on the Indonesian National Standard (SNI) 7724:2019 through measurements of stem diameter, tree height, mangrove species identification, vegetation density, and deadwood. Biomass was estimated using allometric equations and then converted into carbon stock and CO<sub>2</sub> sequestration values. The analysis was carried out to describe the potential biomass, carbon stock, and CO<sub>2</sub> sequestration at each observation station based on the characteristics of the mangrove vegetation. The results showed that four mangrove species were identified, namely *Rhizophora apiculata*, *Rhizophora mucronata*, *Bruguiera gymnorhiza*, and *Xylocarpus granatum*. Vegetation density at all stations was classified as very dense, with 2,533 trees/ha at Station 1, 1,533 trees/ha at Station 2, and 2,100 trees/ha at Station 3. The *Rhizophora* genus had the highest biomass, contributing the largest proportion of carbon stock and CO<sub>2</sub> sequestration. These findings indicate that the mangrove ecosystem at Air Lingkung Beach has considerable potential for carbon absorption and storage while also playing an important role in maintaining the ecological functions of coastal ecosystems. Based on the findings, it can be concluded that the mangrove ecosystem at Air Lingkung Beach has high biomass, carbon stock, and CO<sub>2</sub> sequestration potential, making it valuable for supporting mangrove conservation and climate change mitigation efforts. The results of this study are expected to provide scientific information and supporting data for mangrove ecosystem management as well as future research in the coastal areas of Natuna Regency.

Keywords: Air Lingkung Beach, *Allometric*, Biomass, Carbon Stock, Mangrove.