

ABSTRACT

Fauzan Naufal. 24020119140117. **Estimation of Above-Ground Carbon Stock (AGB) in Mangrove Stands in Bedono Village, Sayung District, Demak Regency.** Laboratory of Plant Structure and Function Biology, Department of Biology, Faculty of Science and Mathematics, Diponegoro University, Semarang, supervised by Endah Dwi Hastuti and Erma Prihastanti.

Industrial development in Demak Regency has the potential to increase carbon dioxide (CO_2) emissions into the atmosphere. Mangrove stands can mitigate carbon dioxide emissions through photosynthesis and biomass accumulation. Carbon stocks stored within biomass can be used to estimate CO_2 equivalent sequestration. This study aimed to identify mangrove species composition, analyze community structure, and estimate biomass, carbon stocks, and CO_2 equivalent sequestration in the mangrove stands of Bedono Village, Sayung District, Demak Regency. The study was conducted at three observation stations, each consisting of three plots. Plots measuring $10 \text{ m} \times 10 \text{ m}$ were used for the analysis of mangrove community structure. Biomass, carbon stock, and CO_2 sequestration were estimated using allometric equations. The results revealed the presence of two mangrove species, namely *Avicennia marina* and *Rhizophora mucronata*. *Avicennia marina* exhibited a species density of $2,500 \text{ ind ha}^{-1}$, a species dominance of $26.65 \text{ m}^2 \text{ ha}^{-1}$, and an Important Value Index (IVI) of 242.33%. *Rhizophora mucronata* exhibited a species density of 100 ind ha^{-1} , a species dominance of $1.16 \text{ m}^2 \text{ ha}^{-1}$, and an Important Value Index (IVI) of 57.77%. The estimated aboveground biomass was $187.22 \text{ Mg ha}^{-1}$, with a carbon stock of $87.99 \text{ Mg C ha}^{-1}$ and a CO_2 equivalent of $322.91 \text{ Mg CO}_2 \text{ ha}^{-1}$.

Keywords: community structure, *Avicennia marina*, *Rhizophora mucronata*, carbon stock, biomass, mangroves.