

Species Diversity and Soil Carbon Sequestration Potential of Mangrove Species at *Katunggan It Ibajay (KII) Eco-Park*

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Abstract

The Katunggan It Ibajay (KII) Eco-Park (44.22 hectares) in Bugtongbato, Ibajay, Aklan (11.8047°N, 122.2094°E) in the Philippines was selected to determine the species diversity and quantify the soil carbon sequestration potential of mangrove species. Five (5) plots measuring 20m×20m were laid-out using quadrat sampling technique to identify and record the trees. Diversity Index and carbon density equations were utilized to determine species diversity and carbon stocks in the soil. The diversity index ($H' = 1.760$) was very low having a total of thirteen species belonging to four (4) families namely Avicenniaceae, Acanthaceae, Rhizophoraceae, and Sonneratiaceae were recorded; wherein soil pH ranged from acidic to slightly acidic. Despite its lean diversity, this mangrove forest dominated largely by species belonged to family Rhizophoraceae was still regarded for its great potential to sequester and store substantial amount of carbon in the aboveground layer of the soil. Average stored Carbon in the soil was 82.12 tons C ha⁻¹ equivalent to 3,631.35 tons CO₂e ha⁻¹. Hence, sustainable management strategies and collective efforts should be made to protect and preserve this pristine ecosystem.

Keywords: Carbon Stock; Carbon dioxide equivalent; Diversity Index; Katunggan It Ibajay; Mangroves; Species diversity 2

Introduction

Climate change is one of the primary concerns of humanity today and it has been concluded that a strong evidence that human activities have affected the world's climate attributed to the emission of greenhouse gasses, notably CO₂. Forests can be standing stores to sequester atmospheric carbon and as a valuable carbon pool, they draw significant attention as the global community becomes progressively more concerned about climate change. Of these ecosystems, the roles of mangrove forests to sequester substantial amounts of atmospheric carbon dioxide (CO₂) and store carbon in their biomass and sediments have been recently underscored (IPCC, 2001; Murdiyarso *et al.*, 2009; Chen *et al.*, 2012; Kauffman & Donato, 2012).

Mangroves cover only around 0.7% (approximately 140,000 km²) of global tropical forests but they can store up to 20 billion tons of carbon from the atmosphere and oceans which is a little more than twice the