

## **Estimating the total carbon stock in the mangrove forest of Kota Marudu, Sabah, Malaysia**

### **ABSTRACT**

Mangrove forests are capable of storing vast amounts of carbon and are recognised as one of the highest carbon densities in the world. This research examines the mangrove forest in Kota Marudu, Sabah, Malaysia, specifically its soil's physico-chemical properties and total carbon stock. Using two 100-metre-long transect lines with sevenmetre diameter circle subplots established at every 25 metres, a forest inventory and an allometric equation were used to determine the aboveground and belowground biomass. The carbon content was estimated to be 50% of biomass. Simultaneously, soil samples were collected at depths of 0-15 cm, 15-30 cm, 30-50 cm, and 50-100 cm for soil analysis and bulk density. A CHNS elemental analyser was used to determine the carbon content in the soil. The results showed that the Kota Marudu mangrove forest has a total carbon stock of 1,010.65 Mg C ha<sup>-1</sup>, where around 80% of it was contributed by the soil carbon pool at 876.16 Mg C ha<sup>-1</sup>. The results also revealed that the living tree and roots carbon pool were measured at 100.87 Mg C ha<sup>-1</sup> and 33.62 Mg C ha<sup>-1</sup>, respectively. These findings highlight the crucial role of mangrove forests in carbon sequestering and mitigating climate change.