Carbon Stock Assessment of Kertih Mangrove Forest, East Coast of Peninsular Malaysia

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Mangroves have gained global attention for their important role in climate change mitigation through carbon storage. However, information on mangrove carbon stock in Malaysia, particularly along the East Coast of Peninsular Malaysia, remains limited, particularly for riverine mangroves. Therefore, this study assessed the carbon stocks within the riverine mangroves, focussing on replanted forests, natural forests, and bare land areas. Aboveground carbon stock was estimated using a non-destructive allometric approach, while belowground carbon stock was estimated using ingrowth core methods. A total of 10 mangrove species from six families were identified, comprising nine exclusive mangrove species and one non-exclusive species during this study. Only two species were recorded in the replanted forest i.e., *Rhizophora apiculata* and *Rhizophora mucronata*, whereas nine species were found in the natural forest with *Bruguiera cylindrical* as the most abundant species. Natural forests stored approximately 3 three times higher aboveground carbon stock with 127.84±20.61 t C ha^{-1} than replanted forests 45.41±7.63 t C ha^{-1}. Similarly, belowground carbon stock was also recorded higher in natural forests with average of 30.17±3.45 t C ha^{-1}. Dead roots and fallen litter contributed more carbon storage than live fine and coarse roots in both forest types. This study demonstrates that natural mangrove forests along Kertih River store substantially higher carbon stocks than replanted forests due to their greater species diversity and structural complexity. The findings highlight the importance of conserving natural mangroves and improving restoration efforts to enhance long-term carbon sequestration and ecosystem resilience.

Keywords: *Riverine mangroves, Natural forest, Replanted forest, Carbon stock, Tropical mangroves, Climate mitigation*