Searching for carbon neutrality for charcoal and pole production in Matang Mangrove Forest Reserve, Malaysia

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Mangroves are the most carbon-rich forests in the world and have a high economic potential yet facing increasing anthropogenic threats. Matang Mangrove Forest Reserve is located on the northwest coast of Peninsular Malaysia. A large part of this forest is covered by *Rhizophora apiculata*, of 15, 20 and 30 years old, which follows a silvicultural plan for pole and charcoal production. Their contribution to carbon sequestration 113.19 tC.ha-1, 115.63 tC.ha-1 and 197.85 tC.ha-1 (= tonnes of carbon per hectare), respectively is perceived as a mean of conservation and a way to mitigate greenhouses emissions. Even so, the emissions released by every activity involved with production is of immediate concern. This exploratory study estimated a total average of 336.17 tC (over 2.2 ha) released during charcoal production while a less amount released during pole production, 11.82 tC (over 22.3 ha). We considered each activity and total workers assigned to 1 contractor. Our results show C emission values below the C sequestered by the allocated area under production. This indicates that the current silvicultural plan could be considered carbon neutral. Therefore, our exploratory study could be considered as a pilot project for future analyses on production emissions, however, more complex studies are needed to fill the gaps found during our research.

Keywords: mangrove forest; Malaysia; carbon emission; carbon qequestration; charcoal and pole production