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Impacts of Selective Tree Harvesting on a Mono-specific *Ceriops tagal* Forest, Rekawa, Sri Lanka

Buddhika H.B.P.H.*, Kumara M.P.

Faculty of Fisheries and Ocean Sciences, Ocean University of Sri Lanka, Sri Lanka
**pramohb1234@gmail.com*

Abstract

As mangrove forest include large mono-specific areas, specific information on impacts of selective tree harvesting intensities (STHI) in such mono-specific mangroves are essential for their management and conservation. The current study focused studying changes in above ground dry biomass (AGDB) of trees, aboveground tree carbon and population changes in relation to three STHI (Low-disturbed: STHI<25%; Medium-disturbed: STHI=25% to 50%; High-disturbed: STHI>50%) in a mono-specific *Ceriops tagal* forest, Rekawa, Southern Sri Lanka. Three 20×20 m plots each representing one of the three STHI were selected from the forest and measurements were obtained in June 2018. Calculation of AGDB of each mangrove tree was done using a well-accepted common allometric equation that required diameter at breast height (DBH) and wood density. As trees were cut below the DBH, a regression equation was developed to infer the DBH of the cut trees in order to determine the AGDB of cut trees. The AGDB (kg per 400 m^2) of living trees were 1,759.1, 2,692.1 and 733.4 in the medium, low and high disturbed sites that had 332, 403 and 239 number of live trees respectively. The lost AGDB (kg per 400 m^2) due to tree cutting were 356.1 (82 trees), 94.1 (163 trees) and 766.1 (479 trees) for the medium, low and high disturbed sites removing 19.8, 28.8 and 66.7 percent of their initial trees that resulted net loss of 17.62, 15.01 and 55.34 percent basal area from each site. Compared to low-disturbed site, the medium-disturbed site had low basal area which had been resulted by harvesting large number of smaller trees. Thus, the low, medium and high cutting intensities had removed 20.2, 3.4 and 51.0 percent of initial AGDB. Based upon literature, at least 45% of mangrove dry weight represents carbon and accordingly, the lost carbon amounts (kg per 400 m^2) under the low, medium and high sites were 160, 42 and 344 respectively. Thus, even low cutting intensities can cause higher biomass or carbon removal if large trees are chosen to cut. The histograms of living tree heights showed extreme positive skewness for all the three STHI indicating predominant shorter trees as a negative impact of harvesting.

Keywords: Mangroves, Harvesting, Carbon, Biomass