RELATIONSHIP BETWEEN MANGROVE STAND PRODUCTIVITY AND BIODIVERSITY: A CASE STUDY OF CHILAW LAGOON

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Mangroves are specialized coastal ecosystems which are very productive due to their particular adaptations to salty and wet settings. Chilaw lagoon, located in Sri Lanka's North-Western Province, Puttalam district, is known for its substantial mangrove forest. This study was carried out in the fringing area of Chilaw lagoon mangrove forest with the objectives of accounting the stand productivity with identifying the present species diversity and finding relationship between mangrove stand productivity and biodiversity. Here, the systematic random sampling method was used to take the measurements and observations. Near the shoreline (<50 m) and in each sampling plot, true mangrove species were identified and counted. Make use of measured Diameter at Breast Height (DBH) and height of the trees, computed the stand productivity of those mangrove species. Analysis of mangrove stand productivity was done by calculating the total volume of standing stock. The circumference at breast height of mangrove trees to calculate DBH were measured by using a diameter tape. Total tree heights were estimated using a Clinometer. Species diversity was calculated based on the forest inventory data. The Species Diversity index was determined using the Shannon–Wiener's Index. The mangrove stands in the research region comprised sixteen true mangrove species namely: *Rhizophora apiculata* Bl., *Rhizophora mucronata* Poir., *Bruguiera gymnorhiza* (L.) Lamk., *Bruguiera cylindrica* (L.) Blume, *Bruguiera sexangula* (Lour.) Poir., *Ceriops tagal* (Perr.) C.B. Rob., *Sonneratia caseolaris* (L.) Engler, *Acanthus ilicifolius* L., *Avicennia marina* (Forsk.) Vierh., *Avicennia officinalis* L., *Nypa fruticans* Wurmb., *Lumnitzera racemose* Willd., *Xylocarpus granatum* Koenig, *Aegiceras corniculatum* (L.) Blanco, *Heritiera littoralis* Dryand., *Excoecaria agallocha* L. Among them, *Bruguiera sexangular* showed the maximum average potential stand productivity (133.57±63.66 m^3 ha^{-1}). Secondly, 51.20±10.43 m^3 ha^{-1} was found to be *Rhizophora apiculata*. Here, *Nypa fruticans* and *Acanthus ilicifolius* were not considered in stand productivity calculations. From all sampling plots, two sampling plots were more abundant with *Bruguiera sexangular* and *Rhizophora apiculata* species and showed the maximum total average potential stand productivities (88.92±26.41 m^3 ha^{-1} and 42.71±18.51 m^3 ha^{-1}). Those two sampling plots were found to be with medium level of species diversities among all plots (1.19 and 1.17). So, through this research, could be concluded as, stand productivity is not dependent only with high species diversity but with the abundance with diverse high productivity trees. Anyway, as productivity increases, it can create a more favourable environment for other species, promoting further biodiversity. In turn, this enhanced biodiversity can support higher productivity, establishing a positive feedback loop that strengthens ecosystem health.

Keywords:, *Biodiversity, Chilaw lagoon, Fringing area, Mangrove stand productivity, True mangroves.*