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Assessment of Biodiversity and Blue Carbon in Mangroves, Sea grasses, Salt Marshes and Algae in Mannar, Northern Sri Lanka**Senarathne S.¹, Ranasinghe D.M.S.H.K.^{1*}, Wahala W.M.P.S.B.²**¹*Department of Forestry and Environmental Science, University of Sri Jayewardenepura, Nugegoda, Sri Lanka*²*Department of Tourism Management, Sabaragamuwa University, Belihuloya, Sri Lanka*
hemanthi.ranasinghe@gmail.com*Abstract**

Blue carbon is the carbon stored in coastal and marine ecosystems. Coastal ecosystems such as mangroves, tidal marshes, seagrass meadows and algae sequester and store more carbon per unit area than terrestrial forests and are now being recognised for their role in mitigating climate change. The objective of this study was to assess the biodiversity and carbon storage capacities in these ecosystems. The study was conducted in Vidathalathivu in Mannar, Kiranchi in Kilinochchi and Pooneryn. In mangroves, belt transects were taken from the shore towards the land. Nested circular plots having 7 m radius were established, large trees were sampled for diameter. Small trees (<3 cm dbh) were sampled in 2 m radius. Litter, pneumatophores and seedlings were sampled in plots of 30×30 cm area. Soil samples were taken at depths; 0-30 cm, 30-60 cm, 60-100 cm for the measurement of bulk density and carbon content. The biomass of the mangrove plants was measured using species specific allometric equations. In the salt marshes, 1×1 m plots were sampled. In the seagrass beds and algae, several 30×30 cm grids were sampled. In each plot, the species composition and the number of plants in each species were assessed. Samples of seagrasses and salt marsh vegetation were uprooted and taken to the laboratory for oven dry analysis. Three soil cores were taken using the soil auger which was inserted to a depth of 1 m in each ecosystem. The soil samples were taken from the core to represent the following depths; 0-30 and 30-60, 60-90. The data was analysed using MINITAB statistical software. The results showed natural mangroves in the study sites comprised of *Avicennia marina*, *Ceriops tagal*, *Excoecaria agallocha*, *Lumnitzera racemosa*, *Rhizophora murconata* and *Pemphis acidula*. In sea grasses, *Thalassima hemprichii*, *Cymodocea serrulate*, *Ruppia maritima* and *Syringodium isoifolium* were observed. *Kappaphycus alvarezii* and *Eucheuma spinosum* were the cultivated algae and *Padina antillarum*, *Caulerpa racemosa*, *Ulva lactuca*, *Sargassum illifolium* and *Gelidium* sp. were natural ones observed. *Suaeda* sp. and *Salicornia* sp. were the salt marsh species observed. The carbon content of these ecosystems were assessed.

Keywords: Blue carbon, Mangroves, Seagrasses, Salt marshes, Algae, Carbon sequestration