

Trophic condition of Madu Ganga Estuary, a Ramsar wetland in Sri Lanka

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Abstract

Madu Ganga Estuary, which extends for 915 ha is a Ramsar wetland in the south-western coastal region of Sri Lanka. This slow flowing water body is rich in biodiversity with 248 vertebrate species which include 20 endemics and 303 plant species. About 10% of the 111 species of birds are winter migrants. Cinnamon and paddy cultivations form the dominant land use type in the surrounding area and at present, a nature based tourism industry is also developing rapidly at the estuary due to its ecological and aesthetic significance. In addition, resident traditional fishermen are involved in commercial fishing activities using traditional gear such as Kraals. The present study aimed to figure out the trophic condition of this important wetland. During the study period from March to November 2014, the mean values for physicochemical parameters were found to be as follows; Depth: 1.89 m; Secchi Depth (SD): 0.91 m; Temperature: 30.8 °C; Total Dissolved Solids (TDS): 8.8 g/L; Salinity: 8.29 g/L; pH: 7.2; Dissolved Oxygen (DO): 6.79 mg/L; Biological Oxygen Demand (BOD₅): 1.40 mg/L; Nitrate-N: 0.2 mg/L; Total dissolved phosphorous: 0.09 mg/L and Total Phosphorous (TP): 0.17 mg/L. The TP values suggest that the trophic condition of this highly ecologically and economically important wetland is eutrophic. Excess and indiscriminate use of fertilizer in the watershed area and soil erosion appear to be the major reasons for this condition, which may be controlled by educating farmers on repercussions of applying excess amounts of fertilizer and ensuring that only the recommended levels are applied. Remote Sensing methods can also be used in nearby agricultural fields to detect the areas where deficiency symptoms are present and fertilizer can be applied only to those regions. In addition, erosion control methods can also be applied to retain the fertilizer within the agricultural fields without being washed into the estuary with storm water.

Keywords: Biodiversity, Total phosphorus, Eutrophic condition, Excess fertilization