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A preliminary study on the effects of dredging on the environmental parameters and occurrence of crustacean and fish species in the Lunawa lagoon

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Lunawa lagoon, which is situated in the District of Colombo, has been highly degraded over the last two decades due to many anthropogenic activities. Lagoon restoration is being carried out through dredging and the removal of the sand bar at the sea outfall for the first time in Sri Lanka by the Coast Conservation Department. Thus, the evaluation of the success of such an effort is of utmost importance as the Coast Conservation Department is planning to use this methodology in their future restoration programmes. Main objective of this research was to study the effect of dredging on some environmental parameters and occurrence of phyto-plankton, zooplankton, crustacean and fish species in the Lunawa Lagoon.

Three sites comprising of, a site where dredging has completed (site 1), a site where dredging was ongoing (site 2) and a site where no dredging has been done (site 3) in Lunawa lagoon south were studied twice a month for a period of 6 months from June to December 2007 to collect data on some selected water quality parameters, phytoplankton and zooplankton. Site 1 was also sampled for fish and crustaceans where fish were taking place. The results obtained were statistically compared using MANOVA to determine the inter-site variation of lagoon waters.

There was significant inter-site variation ($p<0.05$) with respect to all observed environmental parameters except pH and temperature. Site 1 and 2, show marked increase in Salinity, Dissolved Oxygen (DO), Electrical Conductivity (EC) and a marked decrease in Orthophosphate, Nitrate, Sulphide and Biological Oxygen Demand (BOD_5). In contrast to these, Salinity, Dissolved Oxygen (DO) and Electrical Conductivity (EC) in site 3 remained in lower ranges than sites 1 and 2 while Orthophosphate, Nitrate, Sulphide and Biological Oxygen Demand (BOD_5) remained at higher ranges than sites1 and 2.

Shannon wiener diversity indices for phyto-planktons and zooplanktons in the 3 sites suggest that sites 1 and 2 are still moderately polluted and site 3 is heavily polluted. Number of fish and crustacean species which was 2 at the beginning of the study has increased to 11 at the end in site 1. These observations reveal the fact that dredging of Lunawa lagoon has positively affected on environmental parameters in lagoon and occurrence of crustacean and fish species and dredging also has contributed in reducing the pollution level of the lagoon.

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