



Investigation of a Marsh Land as a Water Quality Improvement Habitat

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Abstract

Currently there is no proper regulation implemented for industrial waste water treatment in Sri Lanka. Many industries dispose their waste water into the natural water resources. There is recent information that the wetlands can contribute to the improvement of the quality of the waste water. Therefore this study was conducted to evaluate the wetlands' capacity to mitigate the water pollution.

Horakandawela marsh land situated in Gonawela, Kelaniya was selected as the study site. The information from the traditional sources reveals that the area was covered with very fertile paddy cultivation 25 years ago. Unfortunately, due to the recent industrialization oily effluent water is lodged in Horakanda canal that provided water to the surrounding paddy fields and abandoned fields have now become a natural marsh land.

Physical and chemical parameters such as temperature, turbidity, conductivity, hardness, pH, alkalinity (buffering capacity), dissolved oxygen (DO), chemical oxygen demand (COD), biological oxygen demand (BOD), total solids (TS), total dissolved solids (TDS), oil and grease, phosphate (PO_4^{3-}), metals and nitrogen (NO_3^- and NO_2^-) content were used to assess the quality of water sampled from different sites of the marsh land. Twelve sites were selected for sampling of water and each site was sampled eight times from June 2009 to March 2010. Therefore a total of 96 samples were obtained and each was analyzed for 15 parameters. Results obtained for each parameter was then graphically compared between the sites where the polluted water enters into the wetland and within its course through the wetlands ecosystem.

The results obtained at polluted water entering site, indicated high density of organic effluent in waste water than the inorganic pollutants. Results compared between sites indicated the parameters such as temperature, pH, conductivity, turbidity, total solids, total dissolved solids, alkalinity, BOD, oil and grease content lowered as the water flows through the marsh land. This is clear evidence that the water quality improves within its way through the marsh, although the quality improvement fluctuates between sites. In addition to the chemical metabolism, the biological factors such as submerge vegetation of plants and the microbial population also collectively contribute to reduce the organic pollutants. Therefore this fluctuation could probably be due to the biological variations of the different sampling sites. The essence of wetland conservation for the prevalence and the wellbeing of the life on earth can be re assured with the results of this study.