Assessment of water eutrophication in selected locations of the Diyawanna Oya using chemical assessment methods

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Eutrophication is one of the most widespread environmental problems of inland water bodies of Sri Lanka. It has lot of negative impacts on the aquatic ecosystems including increased biomass, growth of harmful algal species, decrease in water transparency, changes in the biodiversity and effects on the aquatic food web. In addition, eutrophication can cause serious health effects in humans and domestic animals. Diyawanna oya is one of the major water body situated in Kotte area that is currently showing signs of eutrophication and many problems associated with it. The objectives of the case study were to compare BOD levels, COD levels, Chlorophyll a, and NO_3^- and PO_4^{3-} levels in selected three sites of Diyawanna Oya with Sri Lankan water standards and to compare physical parameters such as Temperature, pH and Visibility in three selected sites over wet, dry and intermediate seasons. Three sites were selected for the study and, sites 1 and 2 were rehabilitated sites while site 3 was a non-rehabilitated site. BOD_5 of the study sites ranged from 5.5-8.0 *mg/L* which is higher than the permissible threshold limit (*>5 mg/L)*.The COD value of tree study sites during the period of case study was between 15.501- 41.670 *mg/L*, The nitrate concentrations of the three study sites varied between 1.3 – 2.5 *mg/L* during the period of study while the phosphate concentration varied between the values of 8.8 – 50 *mg/L*. Higher BOD values and Chlorophyll a were observed in sites 2 and 3 and higher values for COD and nitrate concentrations were observed in sites 1 and 2 meanwhile higher level of phosphate concentrations were observed in all three sites. Many of the readings obtained exceeded the highest permissible threshold limits that should be present in inland water bodies of Sri Lanka. Chlorophyll a level in the selected three study sites were in the range of 3.11 – 29.82 *mg/L*. The water temperature of the three study sites were between 31^0C – 34^0C and the pH ranged from 7.64 – 8.57 showing a slight alkaline conditions in the water of the study sites. Visibility was relatively low in all three selected study sites during the study period. According to the results it was noted that Eutrophication in Diyawanna oya cannot be monitored using only chemical assessment. Regular visual assessments accompanied with routinely chemical analysis of water quality can help in maintaining and keeping eutrophication of Diyawanna oya at controlled condition. By taking proper regulatory, control methods Diyawanna oya and the ecosystem that is bound with it can be protected.

Keywords; Diyawanna Oya, eutrophication, water quality monitoring, chemical assessment