

SPATIAL AND TEMPORAL VARIATION OF WATER QUALITY IN BORALESGAMUWA URBAN LAKE: A PRELIMINARY ASSESSMENT

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Urban lakes in Sri Lanka are different from other natural lakes as they are shallow, highly artificial, often hypertrophic and also vulnerable to pollution. Therefore protecting water quality of urban lakes is important to maintaining the health of natural ecosystem. Several studies have reported the declining of quality of urban lakes that has intensified due to rapid urbanization which occurred mainly during the past two decades. Hence the assessments of the quality of lake ecosystems are extremely important, not only to understand the present conditions and future trends but also to identify potential sources of pollution. This study presents the results of a preliminary assessment of water quality in the Boralessgamuwa urban lake of Sri Lanka. The lake is a shallow urban eutrophic lake located south of Colombo, with a size of 12 ha and a maximum depth of 2m. Surface water samples were collected at selected locations for four consecutive months (April to June in 2010) to analyze water quality parameters mainly pH, electrical conductivity (EC), turbidity, dissolved oxygen (DO), chemical oxygen demand (COD), biological oxygen demand (BOD), nitrates and total phosphates. Total and fecal coliforms were also counted in one sampling event. This study revealed a considerable spatial variation of water quality parameters within the lake. During the study period, pH varied from 6.0 to 7.5 (at 29 °C) while DO and BOD₅ values of the lake water varied from 1.5 to 8.2 (at 29 °C) mg/L and 1.0 to 12 mg/L, respectively. The variations of nitrate-N concentration in the lake was in the range of 0.07 to 7.25 mg/L and the phosphate content varied from 0.01 to 1.89 mg/L, indicating slight eutrophic condition. EC of lake water varied from 0.13 to 0.84 mS/cm and turbidity values varied from 9 to 389 NTU, while COD value varied from 4 to 84 mg/L. Total coliform count varied from 100 to >16000 and fecal coliform count varied from 0 to > 16000. Most of these values exceed the guideline values defined for inland surface waters in different categories by authorities. Comparison of results of this study with the results of previous studies indicated that the lake water is under highly vulnerable condition. This also indicated that the pollution occurs mainly due to anthropogenic activities such as industrial, disposal of solid wastes and also due to increased recreational activities. Results of this study prove that the implementation of suitable measures to restore the lake ecosystem is urgently needed and improvement of the quality of lake water resources should approach in much broader management perspectives.