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External and internal nutrient input and trophic alteration in Kandy Lake following the Cyanobacteria Bloom.

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Abstract

Since it collapsed by an outbreak of a cyanobacteria bloom (*Microcystis aeruginosa*) in May 1999 with the on set of South West monsoonal winds, there were considerable concern on peripheral waste water discharge and water quality of Kandy Lake, located in the heart of the hill capital adjoining to the most prestigious Buddhist temple. Implementation of a combination of top-down and bottom-up strategies was identified as the best approach for the restoration and rehabilitation of this important aesthetic water body. In order to regulate progressive of eutrophication, attempts are being made to reduce external and internal nutrient loading by diversion of effluent outfalls, dredging and de-silting, removal of anoxic water and tilapia population etc.,

A study was carried out at three sites in the open Lake for a period of two years form June 2003 to May 2005 to determine the trophic changes of lake water. This was followed by a separate study on seasonal and spatial patterns of external nutrient loading via twelve effluent outfalls from January 2004 to December 2005. Trophic status of the Lake exhibited eutrophic-hypereutrophic alteration with seasonal rainfall (TP = 75.8 ± 33.8 and Chl-a = 90.2 ± 35.6) and the correlation between Chl–a and bottom TP showed a significantly positive correlation ($r = 0.419$, $p < 0.05$). The effluent water was characterized by extreme concentrations of N-P compounds (NH_4^+–N = 353 ± 417, NO_2^-–N = 687 ± 778, NO_3^-–N = 2520 ± 3990, TP = 1153 ± 1100, and DP = 419 ± 724 μg L^{-1}) whereas Chl-a was negatively correlated external nutrient loading. Although partial dredging was completed, autochthonous nutrient mobilization is still more pronounce than external nutrient loading indicating another blooming episode in the future.

Key words: Lake Rehabilitation, Eutrophication, External and Internal Nutrient Loading

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