

Water quality monitoring of Ma Oya, Sri Lanka for Water Safety Plan (WSP) implementation of the Galigamuwa urban water supply scheme

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Safety of water is vital for human consumption. Implementation of water quality monitoring programmes in a water safety plan is essential to understand the present status of the suitability of water for the intended purpose. The objectives of present study were to compare the significant differences of water quality parameters in two selected sites (intake; Helamada and reference; Polgahawela) and the comparison of those measured water quality parameters with Sri Lanka Water Quality standards (SLS: 614; 2013) to explore the suitability. Sampling was conducted from April, 2018 to March, 2019 covering 10 sampling occasions. Triplicate samples were composited and onsite and offsite physico-chemical parameters were measured. Samples were transported to the laboratory for offsite parameter analysis. In terms of water quality parameters in Ma Oya, values for colour (Hazen), turbidity, pH, Total Dissolved Solids (TDS), alkalinity (as CaCO₃), total hardness (as CaCO₃), nitrate (as NO₃⁻), total iron (as Fe), total coliform bacteria colonies and *Escherichia coli* bacteria colonies of the water ranged from 10-60 (Hazen), 2.29- 49.00 (NTU), 6.64-9.05 (at 27 °C), 36-96 mg/L, 36-96 mg/L, 36-96 mg/L, 1.76-5.72 mg/L, 0.12-1.21 mg/L, >100/100 mL and >100/100 mL respectively in both Helamada intake and Polgahawela reference sites. There was no significant difference between water quality parameters among the two sites ($p > 0.05$, 2 sample t-test, Minitab 17). Results revealed that, colour, turbidity, Fe content, total coliforms and *E. coli* colony count have exceeded with reference to SLS 614: 2013. Fecal contamination, higher turbidity and dissolving of Fe, soil and sediment washing with runoff may be the reasons for an exceeded coliform count, colour and Fe concentration respectively. In conclusion, proper planning and implementation of a WSF should be promoted to protect catchments from soil erosion, solid waste to avoid fecal contamination and sewage discharge in to the water source along with raising awareness of associated communities. Similarly, water treatment plants should be designed to address the Fe and fecal contamination issues.

Keywords: water quality, SL standards, water safety plan, fecal contamination

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