

Surface water quality of Bisodola water source in Ratnapura, Sri Lanka

Dasanayake R.P.K.¹, Dharmadasa W.K.², Perera M.D.N.D.¹, Jayasinghe G.Y.^{1*}

¹*Department of Agricultural Engineering, Faculty of Agriculture, University of Ruhuna, Sri Lanka*

²*National Water Supply and Drainage Board, Regional Support Center, Sabaragamuwa, Sri Lanka*

This study was conducted to explore the surface water quality and water pollution status in ‘Bisodola’ water source. Water quality analysis in five sampling locations (L₁, L₂, L₃, L₄ and L₅) was done biweekly from August to November 2016, in order to identify the water contamination sources in the catchment. Water quality parameters monitored in this study were pH, electrical conductivity (EC), total alkalinity, total dissolved solids (TDS), turbidity, color, total hardness, chloride, sulphate, phosphate, biochemical oxygen demand (BOD), chemical oxygen demand (COD), total coliform and *Escherichia coli*. In addition, a questionnaire survey was also conducted to evaluate anthropogenic activities on the Bisodola catchment. Most of the parameters such as color, pH, EC, TDS, turbidity, chloride, alkalinity and total hardness were within the permissible limits, when compared to SLS standard levels. But, BOD, COD, nitrate, nitrite and phosphate levels were exceeded standard permissive levels. High levels of coliform and *E. coli* were observed in every location sampled in the study. Improper constructions of pit latrines by villagers may cause for excessive runoff in rainy seasons and it may be the reason for high *E.coli* and coliform content in the Bisodola stream. Total hardness, EC, TDS, color, BOD and COD of water were significantly differed in the location five (L₅) compared to other locations (L₁, L₂, L₃ and L₄). The questionnaire survey revealed that, anthropogenic activities such as agricultural practices, wastewater discharges, and poor sanitary facilities were the reasons for the surface water quality variations in the catchment. Improper fertilizer application for plantations in the catchment appeared to be a reason for elevated levels of nitrate, nitrite, and phosphate in the surface water in the Bisodola catchment. The water quality index for the Bisodola stream was 79 according to Canadian Council Ministry of Environment (CCME) and it has been ranked as a fair water quality. However, the water quality of Bisodola stream is not consistent and fluctuate time to time posing a threat on the health of consumers.

Keywords: Anthropogenic activities, Bisodola catchment, CCME water quality index, water quality

*Corresponding Author: jayasinghe@ageng.ruh.ac.lk