

Comparative assessment of the treatment performance and water quality in Kahawatta and Godakawela drinking water processing plants

Rameshraj K.¹, Wijetunga S.¹, Gunaratne T.A.R.M.² and Wickramasinghe W.M.S.^{1*}

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

²*National water supply and drainage board, Muwagama, Ratnapura, Sri Lanka*

Water treatment produces water that is fit for domestic use reliably and consistently from a raw water source, at a cost that is reasonable to the consumers. The main objective of this study was to compare the treatment efficiencies and water quality of Kahawatta and Godakawela drinking water treatment plants (WTP). These two plants were specifically selected due to the request from National water supply and drainage board as they had received complaints from consumers. Water samples were collected twice a month for a period of four months, at four different treatment stages (at raw water, after sedimentation, after filtration and at storage) in the two treatment plants. Three replicates of each sample were tested for pH, EC, temperature, color, turbidity, dissolved oxygen (DO), total iron, sulphate, residual chlorine, chloride, total alkalinity, total hardness, magnesium, calcium, total dissolved solids (TDS), biological oxygen demand (BOD), total coliform, and *Escherichia coli*. The cost for chemicals was also determined. Results of all parameters except pH demonstrated that raw water used by Kahawatta plant was more polluted than that of Godakawela ($p < 0.05$). Overall removal efficiencies of turbidity, total hardness and total iron of Kahawatta plant was 94.41% ,16.47%, 63.67% and that of Godakawela plant was 89.38% , 21.63% and 72.86%, respectively. The microbial removal efficiency of both plants was 100% at the end of the purification. The chemical costs per production of 1 m³ of water were almost similar in both plants (Rs 0.9 per m³). All water quality parameters of final treated water in Kahawatta and Godakawela WTPs were within the permissible limit except residual chlorine which was slightly higher than the permissible limit of SLS.

Keywords: Treatment efficiency, water treatment plant, water quality

**Corresponding Author: srilani.wick@gmail.com*