(ID 009)

Optimizing Wastewater Treatment: Harnessing Non-Potable Treated Wastewater Reuse to Foster Sustainable Development Goals

Samaraweera, S.A.P.T.[1]*, Najim, M.M.M.[1,2]

[1]*Department of Zoology and Environmental Management, University of Kelaniya, Kelaniya, Sri Lanka*
[2]*Faculty of Agriculture, Sultan Sharif Ali Islamic University (UNISSA), Brunei Darussalam*
*pamudisamaraweera@gmail.com

Abstract

Kurunegala is an urban city located in the intermediate zone, facing the challenge of eutrophication, lousy odour, and blackish-coloured water in the city's stormwater drains despite the presence of a sewage treatment plant (STP). Wastewater collected from the city is effectively treated to acceptable quality complying with discharge standards and released back to the same inland water drains. This study investigated the recontamination of treated water in urban drains and explores the potential of utilizing treated water for direct non-potable uses (NPU) to achieve multiple Sustainable Development Goals (SDGs) for community benefits. Through a comprehensive assessment, it was observed that the water quality issues in urban drains are a result of excessive nutrients in the water, likely caused by recontamination of the treated wastewater by external sources. Water samples from five sampling sites downstream to the STP were taken and temporal and spatial variations of physicochemical parameters and *E. coli* were assessed. Based on the findings, after the establishment of the STP, current water quality in the canals depicted only marginal improvement ($p<0.05$, ANOVA) except for TDS, pH, conductivity, and *E. coli*. To address this issue, the best solution that can be employed is to direct treated wastewater for NPUs such as agricultural irrigation, industrial processes, and urban landscaping, by which the potential for recontamination of the treated wastewater in the canals could be minimized. The study demonstrates that redirecting treated water for NPU aligns with multiple SDGs and benefits the community in various ways. By reducing freshwater demand for non-drinking purposes, it contributes to SDG 6. Implementing water reuse practices promotes sustainable water management and conservation (SDG 6) while mitigating the impact of climate change on water resources (SDG 13). SDG 11 is positively impacted by enhancing the urban environment by promoting water reuse for sustainable land use. Moreover, utilizing the sludge to generate biogas supports SDG 7. Reutilizing the treated water of Kurunegala STP instead of returning it to polluted canals maximizes the value of wastewater treatment efforts, contributing to SDGs for sustainable development. To align with SDGs and safeguard existing freshwater sources, urgent action is recommended to reevaluate the discharge strategy for treated wastewater, seeking alternative means that would enhance its value and contribute to the broader goals of environmental sustainability effectively addressing water contamination concerns and conserving vital resources of Kurunegala City.

Keywords: Reuse, Sustainable development, Treatment plant, Wastewater, Water quality