

**Abstract No: MO-19**

**Assessment of treated wastewater reuse potential at a common wastewater treatment plant: A case study for a major export processing zone in Sri Lanka**

Dissanayake D. M. S. N.<sup>1</sup>, Mathota Arachchige Y. L. N.<sup>2\*</sup> and Welagedara A.<sup>1</sup>

<sup>1</sup>Department of Environment Management, Board of Investment, Sri Lanka.

<sup>2</sup>Department of Chemistry, Faculty of Science, University of Kelaniya, Sri Lanka.  
nadeesha@kln.ac.lk\*

The increasing global population and rapid industrialization have caused an increasing demand for clean water supply worldwide. As a solution, significant interest has been created in the reuse of treated wastewater. Therefore, the present study was carried out to evaluate the reuse potential of treated wastewater from a Common Wastewater Treatment Plant (CWWTP) in a major Export Processing Zone in Sri Lanka for agricultural purposes. The inlet and outlet wastewater quality of CWWTP was assessed using Biological Oxygen Demand, Chemical Oxygen Demand, pH, Oil and Grease content, Electrical Conductivity, Total Dissolved Solids and Chlorides. The parameters were compared with stipulated standards by the Board of Investment of Sri Lanka (BOI) and Government of Sri Lanka (GOSL). Phytotoxicity assessment of treated wastewater in different dilutions was carried out using *Vigna radiata* L. ANOVA followed by Tukey's pairwise comparison tests were performed to analyze the results. The inlet wastewater quality complied with the BOI's standard except for the BOD values. The daily mean BOD<sub>5</sub> values range from  $224 \pm 4.04$  mg/L to  $343 \pm 7.00$  mg/L. Mixing of the sewage water with pretreated industrial wastewater in the inlet has caused the observed high BOD<sub>5</sub> values. The treated wastewater quality of CWWTP outlet also complies with stipulated standards of GOSL and confirms the suitability for reuse in agricultural purposes. The daily mean pH values range from  $7.39 \pm 0.005$  to  $8.12 \pm 0.03$ . The highest recorded EC value was  $1306 \pm 2.56$   $\mu$ S/cm. The TDS values range from  $973 \pm 11.55$  mg/L to  $1214 \pm 11.55$  mg/L. The COD values range from  $35 \pm 8.89$  mg/L to  $90 \pm 9.24$  mg/L and the BOD<sub>5</sub> values range from  $13 \text{ mg/L} \pm 0.40$  to  $25 \pm 0.35$  mg/L. Treated wastewater having a concentration of 80% v/v showed significant toxic effects on the growth of *V. radiata*. The highest seedling growth was observed at 40% v/v dilution. Therefore, according to the phytotoxicity assessment, it is recommended that the 40% v/v dilution of treated wastewater can be used for irrigation.

**Keywords:** Agricultural purposes, Reuse, Standards, Toxic effects, Treated wastewater