Abstract

The utilization of FTW has emerged as a prominent ecological solution, as evidenced by its increasing popularity to treat wastewater (WW). The aim of this study is to assess the effectiveness of a Floating Treatment Wetland (FTW) for the treatment of municipal WW by using *Phragmites australis* and *Canna indica*. Prior to the installation of the FTW, initial testing was conducted to identify the specific pollutant of interest. Following the results, the following parameters were selected for further monitoring: Biochemical oxygen demand (BOD), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Total Ammonia Nitrogen (TAN), Nitrate, Phosphate, Total Coliform (TC), and Fecal Coliform (FC). The performance of this system was monitored by analyzing the parameters mentioned above during the months of April and August. Throughout each phase, the system demonstrates high removal efficiency for the majority of parameters. Two way ANOVA was performed for multiple comparison between different phases and locations. The mature phase had the maximum removal efficiency, with BOD 91%, COD 91% TSS 88%, TDS 48%, Total ammonia 75% nitrate 68%, phosphate 70%. The addition of a settling tank in the treatment process has proven to enhance efficiency, as it demonstrates effective removal of TSS, turbidity, and COD. This indicates that the implementation of primary treatment contributes to the overall efficiency of the FTW. The cost analysis showed that this system can treat 1m^3 of WW with only 150 PKR which shows that this is cost effective technology. Therefore, the findings indicated that FTW has promise as a field-scale WW treatment method, offering a cost-effective technological solution. Moreover, it was recommended to investigate the long term potential of FTW on field scale.