

**CONSTRUCTED WETLAND SYSTEM FOR TREATMENT OF
GREYWATER USING BULRUSH PLANTS**

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Constructed wetlands (CWs) are a reliable technology for the treatment of greywater especially in tropical countries. Wetland plants are capable of treating the wastewater by adsorbing and absorbing various pollutants through their roots. Therefore, this study aimed to evaluate the performance of greywater treatment by Free Water Surface flow constructed wetland located in Faculty of Agriculture, Rajarata University of Sri Lanka. The CW system was planted with bulrush (*Scirpus californicus*) which has been selected after a series of pilot studies. The greywater discharged from a student hostel complex was directed in to the wetland at the rate of $0.75\text{m}^3\text{h}^{-1}$. The hydraulic retention time was 45h. Water quality parameters of the influent and effluent were monitored for a period of two months by analyzing Biological Oxygen Demand (BOD), Total Dissolved Solid (TDS), Dissolved Oxygen (DO), pH, Electrical Conductivity (EC), NO_3^- -N, NH_4^+ -N, PO_4^{3-} -P and heavy metals. According to the results, the system reduced the concentration of contaminants with the increasing Removal Efficiencies (RE) throughout the monitoring period. The average RE of BOD_5 , NO_3^- -N, NH_4^+ -N, PO_4^{3-} -P were 68.8%, 28.6%, 2.3%, 69.0% respectively. The pH and the TDS level were also within the permissible level following the wastewater discharge standards given by Central Environmental Authority of Sri Lanka. Hence, it can be concluded that the bulrush plant is efficient in removing BOD_5 (RE 45%), PO_4^{3-} -P (RE 69%) from greywater. However, the selected plant poorly performed in removal of NO_3^- -N, NH_4^+ -N during the study period with lowest REs. This can be due to the perennial nature of the bulrush plant and further studies are recommended to enhance the efficiency of CW system.

Keywords: Phytoremediation, Pollutant removal efficiency, Wastewater treatment.