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GREY WATER TREATMENT USING CONSTRUCTED WETLAND IN GHANA

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Abstract

The residential activities on the Kwame Nkrumah University of Science and Technology (KNUST) campus in Kumasi, Ghana, is a major source of pollutant to the main drainage Wiwi stream because the university lacks grey water treatment facilities. In order to assess the potential of constructed wetland in the treatment of grey water at KNUST; a Horizontal Sub-surface Flow pilot-scale constructed wetland was designed, constructed and operated on the KNUST campus. The grey water flow rate of 0.48 m³/day was passed through a sedimentation tank of dimensions 3.65 x 0.65 x 0.4 m deep and a subsequently into a Horizontal Sub-surface constructed wetland of 3.5m x 0.8m x 0.8m deep. The filter media was made up of 0.6 to 2 mm of coarse sand and had a hydraulic conductivity of 368.78 cm³/day. Cattails (*Typha latifolia sp*) were used as plants for the wetlands. The effluent flow rate of the plant was 327cm³/ day and the retention time was 15hours. The removal efficiency of BOD, COD, SS, Grease, and Faecal Coliform etc ranged between 72-79% while the nutrients removal was in the range of 34% to 53%. The effluent characteristics did not meet the EPA (Ghana) guidelines primarily because the organic load of the waste water discharged into the wetland was much more than anticipated due to inflow of wastewater from kitchens. The quality of the greywater was greatly improved and further research needs to be carried on improving on increasing the size of the wetland based on wastewater characteristics.