

Pilot Scale Sub-Surface Constructed Wetland: Evaluation of Performance of Bed Vegetated with Water Hyacinth in the Treatment of Domestic Sewage

Authors : Abdul-Hakeem Olatunji Abiola, A. E. Adeniran, A. O. Ajimo, A. B. Lamilisa

Abstract : Introduction: Conventional wastewater treatment technology has been found to fail in developing countries because they are expensive to construct, operate and maintain. Constructed wetlands are nowadays considered as a low-cost alternative for effective wastewater treatment, especially where suitable land can be available. This study aims to evaluate the performance of the constructed wetland vegetated with water hyacinth (*Eichhornia crassipes*) plant for the treatment of wastewater. Methodology: The sub-surface flow wetland used for this study was an experimental scale constructed wetland consisting of four beds A, B, C, and D. Beds A, B, and D were vegetated while bed C which was used as a control was non-vegetated. This present study presents the results from bed B vegetated with water hyacinth (*Eichhornia crassipes*) and control bed C which was non-vegetated. The influent of the experimental scale wetland has been pre-treated with sedimentation, screening and anaerobic chamber before feeding into the experimental scale wetland. Results: pH and conductivity level were more reduced, colour of effluent was more improved, nitrate, iron, phosphate, and chromium were more removed, and dissolved oxygen was more improved in the water hyacinth bed than the control bed. While manganese, nickel, cyanuric acid, and copper were more removed from the control bed than the water hyacinth bed. Conclusion: The performance of the experimental scale constructed wetland bed planted with water hyacinth (*Eichhornia crassipes*) is better than that of the control bed. It is therefore recommended that plain bed without any plant should not be encouraged.

Keywords : constructed experimental scale wetland, domestic sewage, treatment, water hyacinth

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