

THE EFFICIENCY OF WATER HYACINTH (EICHORNIA CRASSIPES) IN THE TREATMENT OF DOMESTIC SEWAGE IN AN AFRICAN UNIVERSITY

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ABSTRACT: Constructed Wetland (CW) is evolving as alternative to conventional sewage treatment in many parts of the world. However there is limited information from the developing countries on the use and performance of CW for the treatment of domestic and industrial sewage. Scanty research works involving the use of water hyacinth in the treatment of municipal sewage have been carried out in developing countries for possible re-use of the effluent water for other purposes. **Also**, in developing countries, especially in Africa, conventional sewage treatment plants have been found to fail because they are expensive to construct, operate and maintain. Many of these treatment facilities, where available, have broken down and the aquatic lives and the flora and fauna of most streams, canals and river courses are destroyed through the discharge of untreated wastewaters from both domestic and industrial sources rendering them useless for agricultural, recreational and other water uses. The paper reports the outcome of the research carried out on domestic sewage at the campus of University of Lagos, Nigeria to examine the effect of the use of water hyacinth as wetland plant on selected sewage quality parameters. Weekly observations of the influent and effluent parameters were carried out for a period of 24 weeks. The water hyacinth plant covered the entire pond area of 370m² in 11 weeks. The observed parameters were progressively reduced to acceptable levels over the observation period. The water hyacinth based CW system was able to reduced Colour from an average of 209 pcu to 0 pcu (100%), Turbidity from 95 HTU to 6.7 HTU (92.95%), BOD₅ (20°C) from 513 mg/l to 83 mg/l (83.84%), Total Dissolved Solids (TDS) from 616 mg/l to 74 mg/l (88%), Nitrate from 10.91 mg/l to 2.33 mg/l (76%), Phosphate from 21.75 mg/l to 2.60 mg/l 88.05% and e-coli from 2077.2 cfu/100ml to 7.0 cfu/100ml (99.65%) respectively. It was observed that the Water Hyacinth based CW required only 13% of the energy requirement of a Conventional Sewage Treatment plant for the same quantity of sewage inflow. It is concluded that the use of CW with water hyacinth as the wetland plant is a viable and cheaper option for the treatment of domestic sewage in a developing economy.

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