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A Study on Domestic Wastewater Treatment by Pilot-Scale Constructed Wetlands

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Abstract : Explosion in population has resulted in enormous generation of wastewater, warranting an economically feasible and efficient method for its treatment. To offset the cost associated with conventional treatment method and to bring about a degree of treatment, fit for agricultural applications, the present study of wastewater treatment with constructed wetlands was carried out. The performance of pilot scale constructed wetlands in treating a pretreated domestic wastewater was done, with select plant species such as *TyphaLatifolia*, and *Croton Plants*. Various kinds of constructed wetlands such as horizontal flow types, vertical flow type and hybrid type were tested. The characteristics such as Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Solids (TS), Total Suspended Solids (TSS) and Total Dissolved Solids (TDS) of effluents, treated with these pilot scale constructed wetlands wereanalyzed at different Hydraulic Retention Times (HRT). On observation it was found that hybrid type constructed wetland exhibited the best removal efficiency in terms of all the characteristics of wastewater tested. At optimum HRT, brought down the BOD value from 370mg/L to 59.2mg/L, COD value from 480 to 103mg/L,TSvalue from 3200mg/L to 1820mg/L, TSS value from 500mg/L to 10mg/L and TDS value from 2700mg/L to 1810mg/L. which is within the permissible limit for irrigation standards (BOD is 100mg/L, TSS is 200mg/L, TDS is 2100mg/L and TS is 2300mg/L).The results indicate that bio-degrading micro-organisms could have played an active role in BOD reduction and the root zone could have acted as a filter media. This constructed wetlands can be used as an economic alternative for treating domestic wastewater.

Key words: Constructed Wetlands, Hydraulic Retention Time, Domestic Wastewater, Croton plants, TyphaLatifolia.

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