ESTIMATING THE INFLUENCE OF DIFFERENT COMMERCIAL CROPS ON RURAL WASTEWATER TREATMENT IN HORIZONTAL SSF CONSTRUCTED WETLAND

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Abstract - HSSF-CW planted with different vegetation is considered to be a suitable solution for rural domestic wastewater treatment. CW does not only provide a clean environment, but also biodiversity andappropriate soil sanitation. In addition, it can be utilized for production of biomass which could be processed to food, fodder, fuel, medicines, etc. In this study, four plant species were selected according to their specific economic value. Those areIpomea aquatic (vegetable), Oryza Sativa (field crop), Iris Pseudocorus (herb) and Canna indica (versatile crop). In order to compare the effects of selected species, they were cultivated in five HSSF-CWs. In four HSSF-CWs species were cultivated separately while in fifth one they were mixed. The experiment results indicated: (i) mixed vegetation was highly efficient in the removal of all pollutants; (ii) IpomoeaAquatica showed good performance in removal of TN, TP, NH4-N, and NO3-N with removal rate of 76.9%, 94.8%, 90.5% and 75.7%, respectively; (iii) Iris and Canna had significantly better results in FC and TSS reduction with removal rate of 76% and 67%, respectively; (iv) Oryza sativa had average removal rate for all parameters. During the experiment every plant has achieved its maximum yield rate what resulted in large biomass production. This study has confirmed that HSSF-CW coupled with the selected plants possess strong ability to treat wastewater, and has significant economic benefits through biomass production.

Index terms - HSSF-CW; wastewater; TP; TN; NH4-N, NO3-N, TSS; FC; biomass