

SEASONAL STUDY AND ITS IMPACT ON SEWAGE TREATMENT IN THE ANGULAR HORIZONTAL SUBSURFACE FLOW CONSTRUCTED WETLAND USING AQUATIC MACROPHYTES

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ABSTRACT

The increasing applications of constructed wetland for sewage treatment coupled with increasingly strict water quality standards is an ever growing incentive for the development of better process design tools. This paper states the pollution removal efficiency depend on the impact of seasons on the sewage treatment. In the present study used surface and subsurface flow types constructed wetlands using free floating and emergent types of macrophytes. Surface flow e.g. *E. crassipes* and subsurface flow e.g. *Typha latifolia*, *Colocasia esculenta*, *Cana indica*, *Panicum maximum*, *Pennisetum purpureum*, and Control. Seasons are rainy, winter and summer were selected for the investigations of the impact on sewage treatment. Test samples before and after treatment were analyzed through selective parameters like pH, EC, TSS, TDS, TS, COD, BOD₅, NO₃, PO₄ and SO₄ using standard methods. Aim is to evaluate sewage treatment effectiveness and seasonal performance of the system. Present study carried for one year and samples were collected and analyzed from 2011 to 2012. Results reveal that the *E. crassipes* shows maximum pollution reduction in the type of the surface flow CW. In *E. crassipes* the maximum pollution reduction found in the rainy season and less pollution reduction found in summer season. In the subsurface flow category *Pennisetum purpureum* plant shows maximum removal efficiency in the winter season less efficiency found in the summer seasons. In *Typha latifolia* shows maximum removal of pollutants in rainy and less reduction in summer, in the *Colocasia esculenta* shows maximum removal in rainy and less removal in summer, in *Cana indica* maximum removal in winter and less removal in summer, in *Panicum maximum* shows maximum removal and in control shows maximum removal in rainy and less in removal in summer season. In the overall study maximum pollutants removal found in the rainy and winter season and seems better for the plants growth.

KEYWORDS: Seasonal Performance, Sewage Treatment, Angular Horizontal Subsurface Flow, Constructed Wetland, Aquatic Macrophytes