

USE OF IN-SERIES CONSTRUCTED WETLAND SYSTEM TO REMOVE ORGANIC MATTER AND NUTRIENTS FROM PIG FARM SEWAGE

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Abstract: In the last decades, most ecosystems around the planet are experiencing problems associated with water quality. Human activities may cause degradation in surface and ground water affecting its potential use for human and animal consumption, agriculture, recreation, industry and others. In Mexico the pollution release from pig farms has caused pollution problems in many surface water reservoirs. The increasing concern has driven the search of low cost wastewater treatment solutions. The objective of this research was to evaluate the potential of in-series constructed wetland to remove nutrients from sewage generated in a pig farm. The constructed wetland system consist in three cells; the first cell is a surface water wetland, followed by a sedimentation cell, and finally a sub-surface flow wetland. The vegetation used was *Thypha sp.* and *Scirpus sp.* For the vegetation support a mix of soil was used; tezontle (10-30 mm diameter) and sand (2-8 mm diameter). The experiments were carried out in triplicate, the water samples were collected every 5 days at the inlet and outlet of every cell. Two RTD (5 and 10 days) were evaluated and three TOC inflow (400, 800 and 1200 mg/L). Several data was collected in the field such as T°C, pH, DO, EC and TDS. The following parameters were analyzed in laboratory; COD, TKN, NH₃ and TP. Results demonstrated that the in-series constructed wetland is a feasible system for nutrient pollutant removals, the COD removal was about 75 and 80% mg/L, for 5 and 10 days of RTD respectively. The TKN, NH₃ and TP removal reached about 70% at 5 days of RTD, meanwhile 85% of removal was obtained by using 10 days of RTD. The wetland reached the maximum removal capacity at 10 days or RTD and 400 mg/L of organic matter at the inflow. In general, the organic matter and nutrient concentration of the effluent complied with the Mexican standards for irrigation purposes.

Key-words: Organic matter, nutrients removal, constructed wetlands.