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UASB TECHNOLOGY AND CONSTRUCTED WETLAND ALTERNATIVE TO SEWAGE TREATMENT OF SMALL COMMUNITIES

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Abstract

In Brazil, there is a deficit of access in relation to sewage services for a large part of the population, and this fact is the one responsible for the contamination of watercourses. This is because to the lack of investment in infrastructure in the country, since sewage treatment plants require high costs and high area demand for deployment, besides the installation of the collection system, which directs the wastewater to treatment. This paper describes the behavior of wetlands as a post-treatment unit for anaerobically treated sewage for the removal of organic matter, suspended solids, nutrients (nitrogen and phosphorus) and faecal coliforms. Raw sewage was treated in a Upflow Anaerobic Sludge Blanket (UASB) reactor with a retention time of 8 h and the effluent was used in two units of constructed wetlands (CWs), vertical flow and horizontal flow, operated in series, with crushed stone of different diameters and continuous flow. The UASB reactor with post-treatment with CWs has achieved high overall removal efficiencies for chemical oxygen demand (COD), total suspended solids (TSS) and Faecal coliforms: 96.5%, 98.4% and 98.2%, respectively. In relation to total kjeldahl nitrogen (TKN), ammonia and phosphorus the results were similar to those described in the literature, with mean values of 67.1%, 63.4% and 63.5, respectively. The anaerobic pretreatment reduced the area of the CW by about 60%, and appeared to be helpful to prevent CW clogging and odor problems.

Key words: constructed wetlands hybrid, organic matter removal, nitrogen removal, phosphorus removal, rural areas

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