



Performances of two pilot decentralized wastewater treatment plants used to treat low-strength wastewater

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ABSTRACT

The performances of an anaerobic/aerobic baffled reactor (AABR) and a horizontal subsurface flow constructed wetlands (HFCW) have been investigated. In this study, both systems were operated in parallel using the same source of domestic low-strength wastewater (0.06–0.61 kg COD m³ d⁻¹). The inlet concentrations, expressed as chemical oxygen demand (COD), ranged from 105 to 381 mg COD L⁻¹. The outlet concentrations ranged from 12 to 147 mg COD L⁻¹ in the AABR and from 7 to 88 mg COD L⁻¹ in the HFCW. The AABR and HFCW achieved 78% ± 9% and 82% ± 9% COD average removal rates, respectively. To compare the results, a statistical test (significance level of 0.05) was used and showed no significant difference between the systems in terms of organic matter and total suspended solids (TSS) removal. In addition, this study addressed energy costs and treatment capacity per area for both wastewater treatment systems that were studied independently with capacities for 20 habitants, and showed lower energy consumptions per month when compared with a domestic electric shower generally used by a sample Brazilian family consisting of four members.

Keywords: Anaerobic baffled reactor; Aerobic chamber; Horizontal subsurface flow constructed wetlands; Sanitary wastewater; Energy cost

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