Performance evaluation of a single household anaerobic packaged system for onsite domestic wastewater treatment

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ABSTRACT

The present study evaluated the performance of a uniquely configured compact anaerobic packaged system as an alternative to the conventional septic tank for a single household. The system consisted of two bioreactors, a septic tank followed by an upflow anaerobic filter. Both reactors were accommodated within a single compact unit. The treatment efficiency of the system was identified on the basis of its pollutant removal efficiency and desludging interval over a period of 12 months. The system was fed with actual onsite wastewater with large fluctuations in the flow throughout a day. The average removal efficiency for COD, BOD, TOC, TSS and faecal coliform was observed as 70.9, 68.7, 62.1, 78.1 and 86.5% (1.1 log), respectively. A hydrodynamic study revealed a low dead volume (19.8%) with plug flow regime within the system. Based on a significantly better performance than the septic tank, the present system has a good potential for application in the unsewered rural and peri-urban areas of the developing countries like India.

Keywords: Flow characterization; Hydrodynamic characteristics; Onsite system; Packaged system; Septic tank; Single household

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