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Greywater Treatment: Evaluation of a Residential Treatment System

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Abstract: *In areas with inadequate water supplies, the recovery and reuse of limited resources are crucial for sustainable water management. Greywater, generated from household activities, presents an exciting opportunity for resource conservation. This study aimed to design and analyse a pilot-scale greywater treatment system for in-house generated greywater, enabling its reuse. Greywater samples from various sources in an Indian middle-class single household were characterized over a six-month period. A filtration system with different filter layers was developed to treat the greywater. The system exhibited high removal efficiencies, with 85.98% for chemical oxygen demand, 86.28% for biochemical oxygen demand, and 94.44% for total suspended solids. The results demonstrate the potential for reusing in-house treated greywater for toilet flushing, gardening, car washing, and firefighting, thereby reducing freshwater consumption. Proper management of liquid waste is crucial, as improper methods such as incineration contribute to greenhouse gas emissions, exacerbating global warming and causing adverse environmental impacts.*

Keywords: Greywater, water reuse, resource recovery, filtration system, sustainability, wastewater treatment

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