

Abstract

Traditionally, wastewater treatment in urban areas has been carried out through a centralised system with collection of sewage from a large area, treatment to an adequate standard and then disposal of the treated effluent. However, there are situations, such as small rural townships, unsewered peri-urban areas and remote tourist areas (RTA), where centralised wastewater treatment is not available. In such situations, implementation of decentralised or onsite wastewater treatment technologies is of utmost importance to prevent groundwater or surface water contamination with untreated wastewater, and ultimately to protect environmental and public health.

Selection of appropriate decentralised wastewater treatment and recycling technologies is a complicated process due to the large amount of factors, specific to each wastewater situation, which must be considered. There are over 160 commercially available technologies. This increases the complexity of choosing one that is appropriate for a particular wastewater situation. Furthermore, the decision making process is often carried out by individuals with limited experience and familiarity to different technologies; therefore there is a need for an expert system (a decision support tool) to simplify the technology selection process.

RTA exhibit an exclusive range of factors that must be taken into account when implementing wastewater treatment. These factors range from energy availability, land availability, nutrient management for protection of the environment, as well as, ecotourism principles that need to be incorporated into technology selection.

Through this research project the DeWaTARS:RTA EDST (Decentralised Wastewater Treatment and Recycling System for Remote Tourist Areas Electronic Decision Support Tool) was developed to allow for appropriate decentralised wastewater technology selection for RTA, with a primary focus on nutrient management and energy availability. The tool operates as a binary algorithm, asking the user a series of questions (requiring a 'yes' or 'no' answer) related to their specific

wastewater situation. These questions allow the consideration of factors related to wastewater treatment and recycling in RTA in a systematic manner. The algorithm has been electronically adapted into an automated form in Microsoft Excel to allow uncomplicated application by the user.

The DeWaTARS:RTA EDST was tested on selected decision makers and was found to be able to ensure appropriate wastewater treatment and recycling technology is chosen for remote tourist areas.