

Management of desalinated seawater, wastewater and reclaimed water in insular and geographically isolated areas using optimisation techniques

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ABSTRACT

For the insular areas lacking substantial freshwater resources, the utilisation of alternative water sources, such as desalinated seawater and reclaimed water, is a crucial issue. The use of optimisation techniques can assist in making the right decisions, with respect to water resources management, as the increased complexity, due to various potential solutions, is impeding the derivation of the optimal solution. This work presents a mathematical programming approach to optimise water resources management for the island of Syros, Cyclades, Greece. Taking into account the population spread out on the island, and the subsequent localized needs for water use/quality and wastewater production, as well as geographical considerations, the model optimises the location of desalination plants and wastewater treatment and water reclamation plants, as well as the water conveyance infrastructure needed, in order to achieve water management at minimum cost.

Keywords: Water resources management; Desalination; Water reclamation; Optimisation; Mathematical programming

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