

Application of a multi-criteria decision model to select of design choices for WWTPs

Cita:

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Abstract

Stricter regulations in the field of sanitation are driving new dimensions of analysis, in which socioeconomic criteria combined with associated environmental issues are in turn increasing the complexity of wastewater management. In this environment, the development of innovative wastewater treatment technologies provides decision-makers with many efficient alternatives to face these new challenges. This growing number of alternatives inevitably leads, however, to ever greater complexity in the design or upgrade of treatment facilities and demands the acquisition and integration of updated knowledge and well-coordinated expertise, encouraging a multi-disciplinary approach. In this paper, it was demonstrated that these requirements have been successfully met in a environmental decision support systems (EDSS). The EDSS was built according to a knowledge-based methodology, whose main objective is the identification and assessment of the most appropriate wastewater treatment technologies for the design of new facilities or the upgrading of obsolete plants. Because removal of nutrients is essential to this approach, this study explores the use of the EDSS to address the selection of biological treatment technologies for different scenarios characterized by wastewater composition (*C/N* ratio) and other relevant criteria such as environmental and economic factors, population size, discharge in sensitive areas, reuse, cost-benefit analysis, life-cycle analysis, and technical aspects (use of innovative technologies, space availability, reliability, and simplicity of operation).