

Decision Support System for Proper Selection of Wastewater Treatment Plants Using Analytic Hierarchy Process (AHP))

Ibrahim Mahmoud Mahdi Mostafa

Abstract

The wastewater treatment services are crucial, especially their economic impact in developing countries. This study's objective is to develop an approach for selecting the most appropriate wastewater treatment plant for different population level. Different stages are required in wastewater treatment. This study focused on the secondary treatment stage which is crucial for the selection of treatment plant. Seven plant alternatives are included in the study. A survey was conducted to identify factors influencing the selection process depending Delphi method. Structured interviews with engineers had experiences more than 15 years in wastewater treatment were conducted to identify the optimum alternative for population of different income levels (low, average and high income). The results of survey and interviews were analyzed using SPSS© and EXEL© programs to identify the relative importance of selection criteria. The alternatives were evaluated using analytical hierarchy process (AHP). The implementation of evaluation system developed in this research revealed that the optimum alternative in case of low income is Up Flow Anaerobic Sludge Blanket Reactor (USBR). In addition, the optimum alternative in case of the average income also (USBR) and the optimum alternative for high income is compact unit Moving Bed Biofilm Reactor (MBBR)

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