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

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Abstract

The wastewater treatment services are crucial, especially their economic impact in developing
countries. This studyôs 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 SPSSÉ and
EXELÉ 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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