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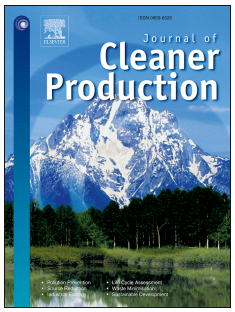

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Solid Waste Disposal Methodology Selection Using Multi-Criteria Decision Making Methods and an Application in Turkey

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ABSTRACT

Rapidly increasing population, rising living standards and developments in the fields of science and technology causes continuously increase in the quantity and variety of solid waste. This situation results a further contamination of natural resources. A variety of technologies for solid waste disposal have been developed to reduce the detrimental effects of solid waste to a minimum level. In literature, studies that are focused on solid waste disposal are generally considering thermal, biological, recovery methodologies or they are just devoted for solid waste technologies used in a determined country, city or region. Besides, in this study all alternatives that are currently used all around the world are investigated and suggestions are made based on the idea of possible implementations in Istanbul, Turkey. For that purpose, firstly overview definition and types of solid waste and general information about solid waste management was given. Afterwards, 10 disposal alternatives of solid waste were evaluated via 18 criteria's which are determined by Istanbul Environmental Management Industry and Trade Co., Ltd. experts to select best disposal technology. Three different multi-criteria decision making methods, Technique for Order Preference by Similarity to Ideal Solution-TOPSIS, Preference Ranking Organization Method for Enrichment Evaluations-PROMETHEE and Fuzzy TOPSIS were used for the selection. In this comparison current disposal methodologies are evaluated and tried to determine the most feasible one. According to final results, ordered storing and burning systems are selected as top two methodologies for Istanbul case.

Keywords: *Fuzzy, multi criteria decision making, PROMETHEE, solid waste disposal, TOPSIS*

1. INTRODUCTION

Solid wastes can be defined as all materials such as package, bottles, leftovers, newspapers, equipment, devices, batteries and dyes etc. which we produce as a result of our daily activities (Ekmekçioğlu et. al., 2010). These materials can cause serious damage on environment and population especially when they leave on any water supply, sewage system, collecting and storing area of garbage unless they are eliminated. For that reason, after collecting them in the proper technical and medical conditions, transporting and eliminating solid wastes is a must

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