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SYSTEM DESIGN OF RECYCLE MANAGEMENT USING AHP AND TOPSIS IN BUYUKCEKMECE MUNICIPALITY

Abstract:

Local governments are researching efficient and sustainable solutions to the problem of increasing amount of solid waste. Recycling is proposed as one of these solutions considering increasing environmental concerns. Recycling operation system starts with separating recyclable waste at household level. Though an efficient recycling system's success largely depends on the participation rate of inhabitants.

Büyükçekmece is a district and municipality in the suburbs of Istanbul, Turkey on the Sea of Marmara coast of the European side, western part of the city. It is largely an industrial area with a population of 380,000. Although Büyükçekmece is a non-large district of İstanbul in terms of the amount of population, the population is growing in the summer months.

Department of Environmental Protection and Control of Büyükçekmece Municipality conducts activities for air pollution measurement, noise control and environmental impact assessment. In addition to these activities, office engages in recycling activities of vegetable wastes, packaging wastes, batteries, electronic wastes, plastics, glass and paper. Recycling activities at the municipality are handled by a private companies. Currently these recycling activities and operations are carried out in an unsystematic way. This recycling activity is irregular though awareness level of the inhabitant is extremely low.

In this research, three alternative recycle collection methods are evaluated on three different locations. Alternatives are evaluated using AHP and TOPSIS methodologies. First important factors for a successful application of recycling were identified by AHP methodology. In AHP application, three main criteria are identified as economic factors, social factors and operational factors. There exists ten sub-criteria in the AHP tree. AHP surveys are filled out with project partner company managers, municipality engineers and administrators. After that TOPSIS methodology is used while comparing and ranking alternative recycle collection methods.

After selecting the application sites application started with handing out recycling flyers, brochures of information about the study. Next a survey is prepared in order to understand the inhabitants' perception of recycling and demographics. Application lasted for three weeks starting with collecting survey papers and distribution of recycling bags to the residents periodically. During that period observations are made by the regional partners such as trash collector, site administrators as well as project team.

Keywords:

recycle management, Büyükçekmece, AHP, TOPSIS, solid waste management

JEL Classification: Q53, C65, D70