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DEVELOPMENT OF A GIS BASED MULTICRITERIA DECISION SUPPORT SYSTEM FOR ORGANIC WASTE MANAGEMENT: IZMIR CASE STUDY

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The purpose of this research is to develop a geographic information system (GIS) based multicriteria decision support system that can take into account environmental and economic factors for modeling and comparison of incineration, anaerobic digestion and composting technologies in organic waste management system (organic municipal solid waste and livestock manure); and to implement the system by performing a case study for the City of Izmir. An integrated approach of fuzzy logic and analytical hierarchy process MCDM methods and GIS is used to model incineration, anaerobic digestion and composting technologies for organic waste management. The methodology includes; development of a proper geospatial database for organic waste, analysis of spatial distribution and energy potentials of organic waste, pre-screening process for suitable plant sites, determination of potential plant sites by multicriteria decision analysis, determination of locations and capacities by p-median solution approach, number and capacity of the system in relation to economic sustainability and cost-benefit analysis. This methodology is implemented for the first time to determine the optimal number, capacity and plant sites for various organic waste management technologies through integration of environmental and economic factors. This research represents a big step in establishment of local decision support system on organic waste management.

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