

Management Options and Life Cycle Assessment of Municipal Solid Waste in Madinah, KSA

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Abstract : The population growth in the KSA beside the increase in the urbanization level and standard of living improvement have resulted in the rapid growth of the country's Municipal Solid Waste (MSW) generation. Municipalities are managing the MSW system in the KSA by collecting and getting rid of it by dumping it in nearest open landfill sites. Solid waste management is one of the main critical issues considered worldwide due to its significant impact on the environment and the public health. In this study, municipal solid waste (MSW) generation, composition and collection of Madinah city, as one of largest cities in KSA, were examined to provide an overview of current state of MSW management, an analysis of existing problem in MSW management, and recommendations for improving the waste treatment and management system in this area. These recommendations would be not specific to Madinah region, but also would be applied to other cities in KSA or any other regions with similar features. The trend of waste generation showed that current waste generation would be increased as much as two to three folds in 2030. Approximately 25% of total generated waste is disposed to a sanitary landfill, while 75% is sent to normal dumpsites. This study also investigated the environmental impacts of MSW through the Life Cycle Assessment (LCA) of waste generations and related processes. LCA results revealed that among the seven scenarios, recycling and composting are the best scenario for the solid waste management in Madinah and similar regions.

Keywords : municipal solid waste, waste recycling and land-filling, waste management, life cycle assessment

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