

SOLID WASTE LANDFILL SITE SELECTION USING R S AND GIS: A CASE STUDY IN SOUTH SINAI GOVERNORATE, EGYPT

Mohamed Nagib Hegazy, Ossman Abdel Kader and Hala Effat

Abstract:

Site selection is an important and necessary issue for waste management in fast-growing regions like South Sinai Governorate. Because of the complexity of waste management systems, the selection of the appropriate solid waste landfill site requires consideration of multiple alternative solutions and evaluation criteria. Different Remotely sensed data have been used to present conditions of the land use of the study area. All factors affecting the site environment were considered, that include physical environment, man made network facilities and economic factors. Calculated criteria weights were applied using the Multi-criteria evaluation (MCE). All these procedures have lead to build a hierarchy model for solving the solid waste landfill site-selection problem in the area. A geographic information system (GIS) was used to manipulate and present spatial data. Suitability index maps were graded from 0 (lowest suitability) to 1 (highest suitability) using spatial information technologies. The candidate sites were determined by aggregation based on the criteria weights. The candidate sites were divided by 'best', 'good' and 'unsuitable' landfill areas. Best landfill areas represent optimal sites; good landfill areas can be used as back-up candidate sites. Our work can offer a sitting methodology and provides essential support for decision-makers in the assessment of waste management problems in the area and other rapidly developing cities in the Egyptian territory. We made a primary assessment for sites proposed by the Egyptian Environmental Affairs Agency EEAA along the Mediterranean Sea coast in South Sinai Governorate. The results should provide useful guidelines and recommendations to Decision makers for managing such problematic environmental issue.

Keywords: Geographic information system; Multi-criteria evaluation (MCE); Landfill sitting; Suitability index; North Sinai; Egypt.

Assoc. Prof. Dr. Mohamed Nagib Hegazy, Assoc. Prof. Dr.Ossman Abdel Kader, Dr.Hala Effat.
National Authority for Remote Sensing and Space Sciences, 23 Joseph Tito st. El Nozha El Gededa
P.O.Box 1564 Alf Maskan.

Tel: +2 02-26251209 Fax: +2 02-26225800 e-mail: mnhegazy@narss.sci.eg