

Application of Geographic Information Systems (GIS) and Remote Sensing (RS) in solid waste management in Southern Africa: a review

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Abstract

Solid waste is a topical aspect globally owing to limited dumping sites due to its increase attributed to population increase, urbanisation, industrialisation, and diseases. In order to attain sustainable solid waste management, current technology including GIS and RS became relevant. GIS and RS present to be more germane in developed than developing countries. Consequently, this review focuses on application of GIS and RS in solid waste management in Southern Africa (SA). The paper covered published and grey literature related to SA, although literature from other regions was used for benchmarking and comparison purposes. Results illustrate that GIS and RS are utilised in solid waste management issues namely siting of disposal sites and monitoring, accurate solid waste data collection and indicating relationship of landfills with other environmental attributes. GIS and RS guide decision makers when planning solid waste collection routes, areas to place bins and assessing environmental health impacts. Application of GIS and RS in solid waste management in SA is still at an embryonic stage. This scenario is exacerbated by limited solid waste data and technical expertise and financial constraints. However, GIS and RS have potential to enhance solid waste management in SA. Successful utilisation of GIS and RS in solid waste management in SA requires development of a comprehensive GIS database and capacity building to equip responsible stakeholders with necessary skills. Moreover, SA countries are urged to develop policies which support utilisation and integration of technology namely GIS, RS, Global Positioning System and Sensors in solid waste management.

Keywords: Solid waste, Solid waste management, GIS, RS, Southern Africa