

Optimized siting municipal solid waste landfill for Kermanshah city using experimental method and based on the regional geomorphologic characteristics

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1- Introduction

Kermanshah city, with a population of about 766700 persons in 1385, produces 500 to 600 tons of waste per day. These rubbishes are accumulated on North Slope of Sefidkuh at a distance of about 10 kilometers from south of the city. Environmental pollution, water pollution in Qanbar spring and costly process of garbage transportation on the account of remote distance to northern part of city are some of the main reasons of inappropriate locating. Such problems cause hygienic solid waste landfill to be paid attention to by municipal managers. Choosing a suitable place is one of the most important matters for this purpose. The present research seeks to locate a better place for hygienic waste landfill in Kermanshah using GIS and considering the regional geomorphologic features.

2- Theoretical Bases

Hygienic solid waste landfill is defined as a method in which garbage are well dispersed along the land as layers and are then compact. The depth of compact layers should not exceed that of 2.5 meters. Compact layers are daily covered with covering materials (often soil) with thickness of 15 cm. Daily covering averts dispersion of materials, reproduction of insects and blazing. After the completion of layers, landfill cells are cramped with soil at thickness of between 60 to 90cm and eventually final coverage is formed.

3- Methodology

This research has been done in two library and fieldwork methods and three stages. In so doing, first the geomorphologic map of the Kermanshah city has been prepared alongside identifying 8 areas including alluvial plain, even erosional plain, uneven erosional plain, flood plain, alluvial fan, even slope, uneven slope and slide slope. Regarding the map and sifting 4 criteria in this locating such as slope, soil, lithology and underground water, the

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uneven erosional plain has been identified as an appropriate location. Afterward, using 11 variables including slope direction, geology, distance from road, distance from river, land use, rain distribution, distance from residential areas, wind direction, distance from wells and geomorphologic units and overlaying methods in GIS three locations in the uneven erosional plain of southeastern part of Kermanshah with a distance of four kilometers from city center are chosen to inter solid waste of the region aligned with the standard parameters. Eventually, features of these three places are diagnosed through fieldwork research while concerning six criteria incorporating landscape, ecology, land ownership, land value, distance from tourism centers and availability of required soil for garbage interment. Taking the above mentioned criteria for locating into consideration, and then the sites are given their final score and are introduced accordingly to be used as places for waste interment.

4- Conclusion

Results of overlaying of 11 variables indicate that the uneven erosional plain of southeastern part of Kermanshah has been identified as an appropriate location for municipal solid waste landfill for this city. In fact because this plain has been formed from radiolarit slope, not only contains no underground water, but also is not suitable for agricultural purposes. Also gentle slope and excess thickness of the overburden are two good characteristics of this unit for this purpose. Results of geomorphologic study also confirm this matter. Therefore, findings indicate that geomorphologic researches can play a paramount role in locating municipal solid waste landfill.

5- Suggestions

Since it is feasible that these dirty waters emanated from garbage penetrate into the land layers and afterward inundate to Qareso River, thus, it is recommended that after digging hole its bottom be covered with a plastic layer.

So as not to impinge onto areas of other cities, it is proposed that a holistic plan be codified so that municipal landfill be implemented regionally.

Key words: siting, hygienic waste landfill, municipal solid waste, Kermanshah city, geomorphology