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DEVELOPING AN OPTIMAL MODEL FOR LOCATING SANITARY LANDFILLS BY ANP METHOD. CASE STUDY: ILAM CITY

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Abstract

Locating sanitary landfills is one of the most significant environmental issues in the residential area. The aim of this study is to find the optimal location for the landfill in Ilam city in Iran. The current landfill is located near the river that supply water to the Ilam Dam. Inadequate landfill causes contamination of groundwater resources. Based on the field survey using GIS software and experts opinion, 4 regions were proposed for the landfill. Criteria as environment, hydrology, access roads and population centers were taken into consideration. Sub-criteria such as groundwater depth, the distance from springs, wells, and aqueducts, vegetation cover, surface water resources, animal species habitats, distance from protected areas, prevailing wind direction and distance from main roads were considered. The criteria were weighted by a questionnaire among experts. Ranking of the criteria, the coefficient of each criterion and pair-wise comparison matrix tables were determined with acceptable consistency by Analysis Network Process (ANP) method using Super Decision version 2.8. Results showed that region 1 with a weight of 0.419 and inconsistency rate of 0.05, according to the studied criteria and subcriteria was the most suitable option. The weighting order was obtained for the options 1,2,3,4 in order: 0.419, 0.274, 0.160 and 0.147. Therefore, in terms of the importance and appropriateness of the landfilling location options, they can be ranked as: 1>option 2> option 3> option 4. The results of this study concluded that environmental criteria for landfill location is essential. Landfills can generate harmful effects on their surroundings and influence the quality of public health.

Key words: environmental criterion, Ilam, inconsistency, landfill, optimal location

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