



Short Communication

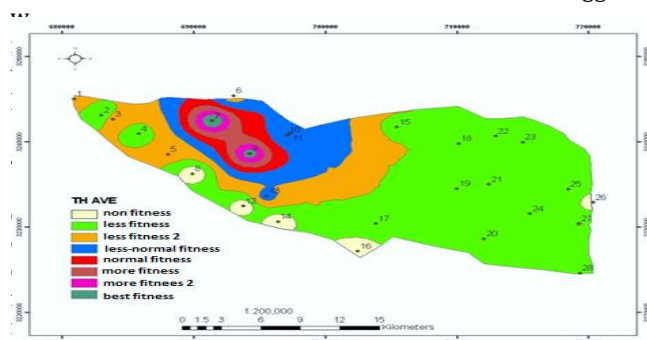
Recycling Summit 2019 - Experimental Data of Designing an Optimal System for Storage, Collection and Transfer of Household Waste in the GIS Environment, A Case Study of Tehran, IRAN

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Abstract:

This study was conducted to correctly manage the system of storage, collection and transfer of wastes in district 22, Tehran. After reviewing existing methods, an optimal system was designed in the GIS environment and appropriate solutions were suggested. Analytical Hierarchy Process (AHP) method was used. After extracting result criteria, these criteria were provided to 15 experts and managers by means of a Delphi questionnaire. Screening of the criteria was done using the criterion importance graph; a necessary condition to apply criteria and sub-criteria, is having at least half the numerical value of each vertical and horizontal vector. The results of the study showed that the most important criterion associated with the selection of waste transfer station is "distance from residential houses" with a final weight of 0.341. "Suitable traffic conditions" and "lack of noise pollution" are the next important criteria with weights of 0.259 and 0.118, respectively. Finally, "non-destruction of recreational facilities" was chosen as the least important (weight of 0.03). Transfer in this district is also 100% mechanized. At the district level, there are 10 garbage trucks, of which 7 collect during night and 3 during day. Given per capita of the district, it takes about 10 minutes to collect each ton of waste. In general, in order to investigate and plan specific methods in the study district, using Geographic Information System, the location of reservoirs in residential and commercial districts has been determined and suggested



cient of 0.75.

Determining an optimal waste storage system in district 22

For this purpose, the three following phases were done:

- 1) Extraction of the most important locating criteria for urban waste transfer stations;
- 2) Screening and selection of criteria by experts and specialists;
- 3) Weighting and prioritizing the criteria and sub-criteria.

Standard proposed criteria for each of the sub-criteria specified in the optimal mode with the least

Defined requirements were as follows:

- A. The quantity and quality of leachate must be within the standard range to prevent soil contamination;
- B. Unpleasant smell and air pollution from the transfer station must not move towards the residential districts;
- C. The transfer station must not be in the wind dominant direction in relation to residential regions;
- D. Distance of at least 1000 m from residential houses must be considered;
- E. Environmental noise must be less than 55 dB per day, so it does not cause noise pollution;
- F. The duration of transfer by trucks must not cause a disturbance in the traffic situation of the district;
- G. Station must have enough space for the possibility to be expanded in the future for the current use;
- H. Natural recreational sites of the district must not be affected by the location of the waste transfer station

Biography:

Professor Dr. Mohammad HadiDehghani (PhD) is a Full Professor at the Tehran University of Medical Sciences (TUMS), School of Public Health, Department of Environmental Health Engineering, Tehran, IRAN. His scientific research interests include the Environmental Science and Sustainable Development, Solid Waste and Disposal, Air Quality and Health, Water treatment, Drinking Water and Health, Air Pollution and Human Health, Environmental Toxicology and Human Risk Assessment. He is the author of various research studies published at national and international journals, conference proceedings and Head of several research project at the TUMS. He has authored 8 books and more than 150 full papers published in peer- reviewed journals. He is an editorial board member and reviewer in many internal and international journals and is member of several international science committees around the world. He has supervisor and advisor PhD and MSc theses at the TUMS.