

Locating Temporary Settlement Sites Using Fuller's Fuzzy Triangle Process in a Geographic Information System (GIS) (Case Study: The City of Chabahar)

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Extended Abstract

1. Introduction

An earthquake is one of the most dangerous natural disasters of the present age, which has always shown its importance objectively, and based on its magnitude, it can create huge disasters spontaneously. Due to geographical circumstances, our country is constantly threatened. According to official statistics, in the past 25 years, %6 of the country's casualties have been caused by an earthquake, and an average of 6 earthquakes per year and a 10-year earthquake of 7 degrees occur in the country. 'Temporary settlement' is of paramount importance in earthquake crisis management as it may reduce casualties caused by earthquakes considerably. Although this type of settlement is the case during a certain period and it loses its main application over time, its location process is very important. The present research attempts to predict optimal temporary settlement sites for victims of a probable earthquake in the city of Chabahar. It also aims at helping earthquake crisis management through combining a proper and scientific plan and creating necessary facilities for identifying suitable locations for temporary settlement.

2. Theoretical Framework

The problem of positioning and allocating locations is not a recent issue, yet it still has numerous functions. From the early beginning of human creation, one of the most fundamental priorities of every man has been the issue of finding a good way to position and allocate different sites. Thus, in analyzing the location, valuation and formulation of such criteria is regarded as a crucial stage, and its recognition is of great importance.

3. Methodology

The research method of this study was descriptive- analytical, so in the process of gathering initial data, library surveys and field studies and observations along with interviews with the experts were used. Then, a questionnaire was distributed between the relevant elites. Meanwhile, enough accuracy was taken for choosing the criteria so that a comprehensive and systemic perspective was obtained on selecting the most desirable site. Moreover, Fuller's triangular module and their

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fuzzification in the geographic information system (GIS) environment were selected as the criterion value model. Next, the layers were overlapped through combining the above- mentioned criteria and fuzzification of the data using the ARC GIS analysis functions. The result extracted the final map which represented the suitable lands for the most optimal positioning of temporary accommodation sites.

4. Findings

In this research, based on the location criteria of urban green spaces and in accordance with the type of the applied model suitable for this type of research (Fuller) and the recognition of the geographical, socioeconomic and physical aspects of the study area, the factors affecting positioning temporary accommodation for gathering information layers and identifying the sites with the highest priority for locating temporary accommodation are identified.

The results indicate that the criteria such as population density, and open spaces (parks) have the maximum importance and the criteria such as soil slope and waterway have the minimum importance in a selection process of temporary settlement areas in the decision-making field from the perspective of planners.

5. Conclusion & Suggestions

The purpose of this article was to present and develop a scientific and precise framework for locating temporary sites. Hence, 11 indicators affecting the locating process of such accommodation centers were introduced and evaluated, and the relevant criteria were selected and weighted. The main objective of weighing is expressing the significance of each criterion in comparison with other criteria. In this study, weighing the criteria was conducted according to the mean of the experts' opinions. First, a questionnaire was distributed among several individuals who were specialized in the field of research. Next, necessary explanations were offered. Then, they were asked to prioritize the desired criteria in terms of their viewpoints, as previously described in detail. Finally, they allocated the required points based on comparing the criteria.

Finally, the Fuller triangular method was used to evaluate the criteria and obtain the final score points and values. These final scores were inserted in the Calculator Raster environment and the layer map effective in selecting the most optimal site for temporary accommodation was extracted. In addition, for the purpose of layer overlapping, the fuzzy model was used so that the best place to locate the city was introduced and the significance coefficients of each criterion were measured respectively using Fuzzy Fuller Hierarchical Triangle.

The results of the study indicated that in the process of selecting the temporary accommodation sites and in terms of the planners' opinions, criteria such as population density and open spaces (parks) had the highest levels of significance in decision making domain, while the least levels of significance were recorded in the criteria of land gradient and water canal.

Key Words: Temporary settlement, Fuller's Fuzzy Triangle Process, Geographic Information System (GIS), Chabahar.

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