

## Spatial modeling of site suitability assessment for apartments-based on the combined fuzzy MCDM approach

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**ABSTRACT:**

Due to development restrictions in different geographical aspects in the recent times, the city of Bandar Abbas in central Iran, is faced with acute shortage of suitable lands for the construction of apartments. Despite this shortage of land, the demand for housing continued to rise due to increasing urbanization and steep rise in the population of the city. One reason for this phenomenon is the availability of harbors, refineries and industrial zones around the city, which result in the migration of enormous populations into the city annually. On the other hand, there are a number of the old regions in the city, which suffer from low construction density and lack of development. As a consequence, the inhabitants of these regions move to the more developed regions of the city. As such, the development of a method for detecting sites, which are suitable for the construction of apartments, is indeed crucial. Specifically, this study aims to model the selection of suitable lands for constructing apartments in the Bandar Abbas city, which is one of the most popular cities for immigration in Iran. Another goal of the study is to determine the appropriate qualitative and quantitative criteria to evaluate alternative lands. Given the fact that the selection of suitable lands among a number of alternatives is the main problem associated with Multi Criteria Decision Making (MCDM), the fuzzy logic is utilized in the current study as the natural method for obtaining the ideal solution to the MCDM mode. Specifically, the hybrid MCDM method, together with the Fuzzy Analytical Hierarchy Process (Fuzzy AHP), were used to assign weights to the criteria and sub-criteria associated with land selection. Besides, the Fuzzy Technique for Order Preference by Similarity to Ideal Solution (Fuzzy TOPSIS) method was utilized to detect suitable alternatives based on the weights of criteria and sub-criteria. In the rest of the study sensitivity analysis results are presented.

**Keywords:**

Apartment, site selection, fuzzy AHP, fuzzy TOPSIS