Environmental Engineering and Management Journal

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu

"Gheorghe Asachi" Technical University of Iasi, Romania

SITE SELECTION FOR POST-EARTHQUAKE SETTLEMENTS: A CASE STUDY OF HATAY, TÜRKİYE

Deniz Arca[1]*, Umut Erdem[2], Kazimierz Becek[3]

[1]*Department of Architecture and Urban Planning, Izmir Vocational School, Dokuz Eylul University, Izmir, Türkiye*
[2]*Department of City and Regional Planning, Faculty of Architecture, İzmir Democracy University, Izmir, Türkiye*
[3]*Wroclaw University of Science and Technology, Faculty of Geoengineering, Mining, and Geology, Wroclaw, Poland*

Abstract

Though it is located in one of the world's most seismically active regions. Türkiye's spatial planning efforts often fall short when it comes to addressing earthquake risks. This study aimed to identify suitable locations for post-earthquake settlements in Türkiye's Hatay province, Türkiye, a region severely affected by the February 2023 earthquake. To this end, spatial multicriteria decision-making methods—the analytical hierarchy process (AHP) and fuzzy AHP (FAHP) — were employed within a geographic information systems (GIS) framework. Our analysis was based on 14 spatial criteria, including geological, topographic, hydrological, and infrastructural factors. We found only 7.58% (AHP) and 8.95% (FAHP) of the study area are to be suitable for new settlements. Our findings emphasise the need to integrate spatial data analysis into urban planning to enhance resilience to natural hazards, including earthquakes. The unsuitable areas must be strictly avoided, and the less suitable areas must be used under controlled development strategies.

Key words: analytical hierarchy process (AHP), earthquake, fuzzy analytical hierarchy process (FAHP), geographic information systems (GIS), Hatay

Received: July, 2024; Revised final: July, 2025; Accepted: August, 2025

* Author to whom all correspondence should be addressed: e-mail: deniz.arca@deu.edu.tr; Phone: +90 2323012571; Fax: +90 2324205181