



“Gheorghe Asachi” Technical University of Iasi, Romania



ASSESSING THE SUSTAINABILITY OF CONSTRUCTION PROJECTS USING DEMPSTER-SHAFER (DS) THEORY OF EVIDENCE

Hamideh Asadi Aghbolaghi^{1*}, Faezeh Asadi Aghbolaghi²

¹*Department of Civil Engineering, Faculty of Engineering, Shahrekord University, Rahbar Boulevard, Shahrekord, Iran*

²*Department of System Management and Productivity, Faculty of Industrial and Systems Engineering,
Tarbiat Modares University, Tehran, Iran*

Abstract

The construction industry plays a vital role in providing the essential conditions for sustainability and development. Therefore, there is a need to examine construction activities from the perspective of sustainable development. Generally, construction activities, aimed at addressing the ever-increasing population growth and economic activities, have a significant impact on human life and various ecosystems. Assessing sustainability is inherently associated with uncertainty, which arises from a lack of knowledge and insufficient information. Dempster-Shafer (DS) theory of evidence provides an efficient tool for examining ambiguous and insufficient information. This method can be employed when uncertainty prevails in a subject and the lack of adequate information makes it challenging to determine the most favorable situation. The aim of this research is to investigate the stability of buildings to achieve sustainable development in the urban environment of Isfahan province. In this study, Dempster-Shafer theory of evidence was utilized to evaluate the sustainability performance of six construction projects within the "Commercial, Tourism, and Recreational Complex of Isfahan Province", based on economic, social, and environmental dimensions of sustainable development. Based on the results obtained, the theory of evidence is deemed a suitable method to assess the sustainability criteria for these six projects. The final outcome revealed that among the six investigated projects, the Negin Chahar Bagh project ranked first in terms of sustainable development dimensions.

Key words: construction projects, evaluation, Shafer dempster evidence theory, sustainability

Received: May, 2023; Revised final: November, 2023; Accepted: December, 2023; Published in final edited form: February, 2024

* Author to whom all correspondence should be addressed: e-mail: asadihamideh5@gmail.com