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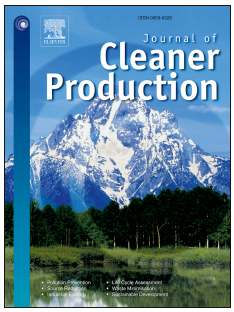

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City sustainability evaluation using MCDM with objective weights of interdependent criteria

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Abstract

City sustainability evaluation can be formulated as a multi-criteria decision making (MCDM) problem where the interactions and weights of interdependent criteria cannot be subjectively and reliably obtained. This paper develops an objective weighting approach to determining the weights of interdependent criteria in the context of MCDM. Equipped with a novel optimization model, this approach can objectively obtain the interaction coefficients and weights of the criteria on a multi-level hierarchy. An empirical study on the sustainability performance evaluation of 13 cities in China is conducted to illustrate how the approach works. The result shows that the approach can reflect the performance divergence of the cities on each criterion and ensure that the evaluation result is not affected by the inconsistency of subjective judgments. This approach is indeed a new contribution to the methodological development of MCDM research and to the practical application of city sustainability evaluation.

Keywords: Multicriteria decision making; City sustainability; Objective weights; Interdependent criteria

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