
Selecting the best logistics service providers by evaluating the sustainability performance using AHP and linear programming problem

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Abstract: Many manufacturers and retailers often outsource their logistics functions to logistics service providers (LSPs) to focus more on their core business process. Due to the competitiveness and the popularity of the sustainability concept, those organisations evaluate their prospective LSPs not only based on economic aspects but also social and environmental aspects. This paper proposes a framework that can be used by organisations when evaluating and selecting LSPs based on their sustainability performance. A composite sustainability performance index (CSPI) is constructed, incorporating multiple dimensions and indicators related to economic, social, and environmental aspects, which are widely used to measure sustainability performance. A linear programming (LP) model is then proposed, which allows the organisations to decide the desired number of LSPs after considering all requirements and limitations. The proposed framework is flexible as it depends on the sustainability requirements of the organisation when selecting LSPs.

Keywords: analytic hierarchy process; composite sustainability performance index; CSPI; linear programming problem; LPP; logistics service provider; LSP; sustainability.

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