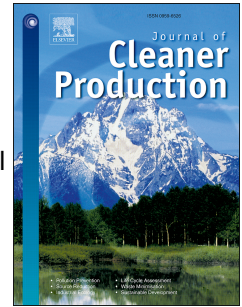


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Identifying eco-innovation in industrial symbiosis under linguistic preferences: a novel hierarchical approach

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Abstract

This study contributes to the integration of a set of measures and a hybrid method for eco-innovation in industrial symbiosis. Firms achieve competitive advantages in business management through eco-innovation, and industrial symbiosis makes a major contribution to achieving win-win status in supply-chain networks. However, although many attributes have been addressed in previous studies, the role of eco-innovation remains unclear in the extended industrial symbiosis literature. This study attempts to identify the key eco-innovation attributes for enhancing industrial symbiosis performance. These attributes can serve as a reference for firms involved in promoting operational activities. This study collected information from the textile industry in Vietnam. Next, the fuzzy Delphi method was employed to filter the attributes with higher weights, factor analysis was used to compose the hierarchical structure, fuzzy importance-performance analysis was applied to identify the key attributes, and a supermatrix was converged into attribute weight ranking. The fuzzy Delphi method resulted in a set of criteria, the factor analysis resulted in four aspects (environmental sustainability, collaboration, regulation and perception, and waste-management synergies), and 18 attributes remained in the hierarchical structure. The results of the importance-performance analysis and the converged supermatrix weight ranking in the hierarchical structure are presented. The results show that the regulation and perception aspect and the waste-management synergies aspect have the highest weights. Moreover, firms should implement action plans that include stakeholder and community involvement, customer perceptions, shared waste transport, and joint external-agent waste management.

Keywords: industrial symbiosis; eco-innovation; fuzzy Delphi method; importance-performance analysis; converged supermatrix; hierarchical structure.

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