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Multi-objective Intuitionistic Fuzzy Linear Programming model for optimization of industrial closed-loop supply chain network

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ABSTRACT

The urge to remanufacture and address environmental concerns in various industrial processes has drawn the attention of academics as well as practitioners towards Closed-loop Supply Chain Networks (CLSC). Although ever-changing and complex external factors including social and economic ones, adversely impact the sustainable development of closed-loop supply chain networks. The basic aim of the research is to optimize the functioning of CLSC networks. For the above-said, two objective functions are made. The first objective is to minimize the cost of production and assembly expenses of the forward and reverse logistics. Secondly, an endeavour has been made to reduce the fixed costs associated with plants and retailers. For the sake of achieving two objective functions, two methods are employed: triangular fuzzy numbers and triangular intuitionistic fuzzy numbers. Among the two methods, triangular intuitionistic fuzzy numbers achieved the said objectives with greater optimization substantiated by statistics. This method can deal with uncertain external factors without undermining the optimization of the CLSC networks.

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