عنوان مقاله:

Reducing Environmental Pollutions in Closed-loop Supply Chain Optimization through Fuzzy Complex Integer Programming

محل انتشار:

مجله بین المللی مهندسی صنایع و تحقیقات عملیاتی, دوره 6, شماره 2 (سال: 1403)

تعداد صفحات اصل مقاله: 17

نویسندگان:

Homa Kalani - Department of Industrial Engineering, Dehaghan Branch, Islamic Azad University, Dehaghan, Iran

Sayyed Mohammad Reza Davoodi - Department of Industrial Engineering, Dehaghan Branch, Islamic Azad University, Dehaghan, Iran

خلاصه مقاله:

Increasing both the greenhouse gas and pollutant' volumes and the serious concern on environmental issues, have forced organizations and management academics to design networks with a specific focus in all sectors to optimizing environmental factors and reducing pollutants in their economic sense. Supply chain management is one of the major issues of businesses that affect all the organizational activities to better production, improve quality, reduce costs and provide good customer service. This study aims to increase the supply chain's total profit and reduce environmental pollution. The method applied here is descriptive-analytic. A dual-objective mathematical model is proposed here for the closed-loop supply chain design. This model is defined based on the criteria like product count, recycled product count, and item's count. A solution mode is proposed based on dual objective fuzzy programming. Next, by applying available data, the model is tested through GAMS optimization S/W. The increase in the first objective function volume has a linear relation with the increase in variation coefficient, while, demand change has a nonlinear relation with the second objective function, that is, an increase in demand leads to a drastic increase in environmental pollution. It can be deduced that either an increase or a decrease in demand can have a completely vivid effect on the total costs of the chain. Applying this developed model can both reduce the destructive effects on the environment and provide for a green image of the supply chain by reducing costs and assessing a profit increase.Increasing both the greenhouse gas and pollutant' volumes and the serious concern on environmental issues, have forced organizations and management academics to design networks with a specific focus in all sectors to optimizing environmental factors and reducing pollutants in their economic sense. Supply chain management is one of the major issues of businesses that affect all the organizational activities to better production, improve quality, reduce costs and provide good customer service. This study aims to increase the supply chain's total profit and reduce environmental pollution. The method applied here is descriptive-analytic. A dual-objective mathematical model is proposed here for the closed-loop supply chain design. This model is defined based on the criteria like product count, recycled product count, and item's count. A ... solution mode is proposed based on dual objective fuzzy programming. Next, by applying available data, the model is tested through GAMS optimization

کلمات کلیدی:

Supply chain, Closed-loop Supply chain, Environmental Pollutetion, Fuzzy Numbers