



Sustainable Triple Level Supply Chain considering Consumption Cycle: Case for Book Stores



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Increase in environmental and social concerns associated with economic issues and confined production resources in supply chains made researchers to concentrate on design and development of sustainable supply chain. Consumption cycle is significant for coordinating supply chain elements in order to provide more benefit. In this paper, a strategic approach is proposed to investigate a three-level sustainable supply chain including supplier, customer and recovery center for a book store system. In this case, books as a commodity are sold to customers, and after a consumption cycle, are returned to the recovery center to be replenished for the next customers. Customers receive periodic discount as an incentive to return their used books to the recovery center and read more books. The process helps the culture of reading books and at the same time provides profit for supplier and cost reduction for customers. The sustainable effects are considered in environmental and long term cultural dimensions.

Economic-environmental objective function aims at minimizing the operational costs, decreasing cutting trees to produce paper for books, and increasing the book reading culture for a society.

The expected results of this research are: decreasing operational costs, increasing book reading culture, reducing cutting trees and environmental damages

In this paper, in order to improve the return rate of used products, we have proposed a product recovery framework by employing buy-back offer. The proposed recovery framework is integrated into an optimization model of CLSC to determine the optimal buy-back price that needs to be offered to the consumers on returning back the used products. The developed model also determines optimal indices of sustainability dimensions, optimal remanufacturing and recycling quantity of used products and components

A multi-objective decision model is developed based on the interaction among supply chain levels and sustainability dimensions.

