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Supply Chain Network Design for Perishable Products in Developing Countries

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Abstract : Increasing environmental and social concerns are forcing companies to take a fresh view of the impact of supply chain operations on environment and society when designing a supply chain. A challenging task in today's food industry is the distribution of high-quality food items throughout the food supply chain. Improper storage and unwanted transportation are the major hurdles in food supply chain and can be tackled by making dynamic storage facility location decisions with the distribution network. Since food supply chain in India is one of the biggest supply chains in the world, the companies should also consider environmental impact caused by the supply chain. This project proposes a multi-objective optimization model by integrating sustainability in decision-making, on distribution in a food supply chain network (SCN). A Multi-Objective Mixed-Integer Linear Programming (MOMILP) model between overall cost and environmental impact caused by the SCN is formulated for the problem. The goal of MOMILP is to determine the pareto solutions for overall cost and environmental impact caused by the supply chain. This is solved by using GAMS with CPLEX as third party solver. The outcomes of the project are pareto solutions for overall cost and environmental impact, facilities to be operated and the amount to be transferred to each warehouse during the time horizon.

Keywords : multi-objective mixed linear programming, food supply chain network, GAMS, multi-product, multi-period, environment
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