World Academy of Science, Engineering and Technology
International Journal of Industrial and Systems Engineering
Vol:11, No:10, 2017

Metrics and Methods for Improving Resilience in Agribusiness Supply Chains

Authors : Golnar Behzadi, Michael O'Sullivan, Tava Olsen, Abraham Zhang

Abstract : By definition, increasing supply chain resilience improves the supply chain's ability to return to normal, or to an even more desirable situation, quickly and efficiently after being hit by a disruption. This is especially critical in agribusiness supply chains where the products are perishable and have a short life-cycle. In this paper, we propose a resilience metric to capture and improve the recovery process in terms of both performance and time, of an agribusiness supply chain following either supply or demand-side disruption. We build a model that determines optimal supply chain recovery planning decisions and selects the best resilient strategies that minimize the loss of profit during the recovery time window. The model is formulated as a two-stage stochastic mixed-integer linear programming problem and solved with a branch-and-cut algorithm. The results show that the optimal recovery schedule is highly dependent on the duration of the time-window allowed for recovery. In addition, the profit loss during recovery is reduced by utilizing the proposed resilient actions.

Keywords : agribusiness supply chain, recovery, resilience metric, risk management
Conference Title : ICSCOR 2017 : International Conference on Supply Chain and Operations Resilience
Conference Location : Bangkok, Thailand
Conference Dates : October 26-27, 2017