

Two-Stage Stochastic Optimization Model for Post Disaster Waste Management with Mixed Strategy for separation

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Abstract. Post-disaster waste management is one of the most essential activities in the recovery stage of the disaster cycle. Post-disaster waste management has been developed to help affected areas recover conditions back to a stable situation after a disaster. To develop an effective post-disaster waste management strategy, this research aims to propose the two-stage stochastic optimization model for waste management after the disaster. The proposed mathematical model was developed based on the mixed strategy between on-site separation and off-site separation for post-disaster waste in the supply chain. The proposed mathematical model aims to minimize the total cost in the post-disaster waste supply chain to provide waste flow decisions and select collection and separation sites, recycling sites, landfill sites, and incineration sites throughout the supply chain under the uncertain situation. The mathematical model is formulated as a two-stage stochastic mixed integer linear programming model for the consideration of the uncertain situation of disaster. To validate and verify the proposed mathematical model, the numerical case based on the realistic data is presented. Based on the numerical example, the results showed that the implementation of the mixed strategy for waste separation with the consideration of uncertain situations can reduce the total cost and determine the uncertain situation in the post-disaster waste supply chain efficiently.

Keywords: Post-disaster waste management, Mixed strategy for separation, Stochastic programming model