

A Model for Solid Transportation Problem with Three Hierarchical Objectives under Uncertain Environment

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Abstract : In this study, we have developed a mathematical programming model for a solid transportation problem with three objective functions arranged in hierarchical order. The mathematical programming models with more than one objective function to be solved in hierarchical order is termed as a multi-level programming model. Our study explores a Multi-Level Solid Transportation Problem with Uncertain Parameters (MLSTPWU). The proposed MLSTPWU model consists of three objective functions, viz. minimization of transportation cost, minimization of total transportation time, and minimization of deterioration during transportation. These three objective functions are supposed to be solved by decision-makers at three consecutive levels. Three constraint functions are added to the model, restricting the total availability, total demand, and capacity of modes of transportation. All the parameters involved in the model are assumed to be uncertain in nature. A solution method based on fuzzy logic is also discussed to obtain the compromise solution for the proposed model. Further, a simulated numerical example is discussed to establish the efficiency and applicability of the proposed model.

Keywords : solid transportation problem, multi-level programming, uncertain variable, uncertain environment

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