عنوان مقاله:

Fuzzy bi-level linear programming problem using TOPSIS approach

نویسندگان:

Shyamali Ghosh - *Dept. of Applied Mathematics with Ocenology and Computer Programming,Vidyasaghar University, India*

Sankar Kumar Roy - *Department of Applied Mathematics with Oceanology and Computer Programming*

خلاصه مقاله:

This paper deals with a class of bi-level linear programming problem (BLPP) with fuzzy data. Fuzzy data are mainly considered to design the real-life BLPP. So we assume that the coefficients and the variables of BLPP are trapezoidal fuzzy numbers and the corresponding BLPP is treated as fuzzy BLPP (FBLPP). Traditional approaches such as vertex enumeration algorithm, Kth-best algorithm, Krush-Kuhn-Tucker (KKT) condition and Penalty function approach for solving BLPP are not only technically inefficient but also lead to a contradiction when the follower's decision power dominates to the leader's decision power. Also these methods are needed to solve only crisp BLPP. To overcome the difficulty, we extend Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) in fuzzy environment with the help of ranking function. Fuzzy TOPSIS provides the most appropriate alternative solution based on fuzzy positive ideal solution (FPIS) and fuzzy negative ideal solution (FNIS). An example is included how to apply the discussed concepts of the paper for solving the FBLPP.

کلمات کلیدی:

Bi-level linear programming, Fuzzy programming, TOPSIS, Compromise solution

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