

## ABSTRACT

A MLPP is very similar to the MODM problem since conflicting objective functions are present in both cases but in a MLPP the DMs are placed in hierarchical order and each DM control's a subset of the set of decision variables. Therefore, some of the MODM methods are applicable to solve the MLPPs. Practical instances of the MLPPs can be observed in government organizations, autonomous institutes, agriculture, military, maintenance set-up, managerial decision making, networks, schools, hospitals, banks etc. We have applied the KKT transformation method, FMP approach, GP approach and Weighting method to linear/nonlinear MLPPs. All relevant corresponding theoretical explanations and derivations have been provided. Mainly we are concerned with continuous decision variables but GP approach has been used to obtain integer values as well. From our study we observe that the KKT's transformation method to a linear BLPP or BLDPP or MLPP results in a highly nonlinear and nonconvex programming problem whereas by the FMP approach the resulting problem remains a LP problem. Therefore, FMP is a superior method compared to KKT transformation method. Any comparison between FMP and GP approaches is more difficult to make. The Weighting method gives a nondominated solution set.

**Key Words :** Bi-Level Decentralized Programming Problems, Bi-Level Programming Problems, Branch-and-Bound Method, Convexity, Cutting Plane Method, Decision Vector, Deviation Vector, Fuzzy Mathematical Programming, Generating Methods, Global Optimal Solution, Goal Programming, Hierarchical Systems, Implementable Solution, Integer Goal Programming, Karush-Kuhn-Tucker's Optimality Conditions, Local Optimal Solution, Membership Functions, Multi-Level Programming Problems, Multiphase Algorithm, Nondominated Solution, Nonlinear Functions, Satisfactory Solution, Sequential Linear Goal Programming.