ABSTRACT

A multi-objective probabilistic linear programming problem has been considered when some or all of the parameters are random variables following known distributions with no fuzziness in the parameters. For the case when all the parameters of the problem are random variables, two distributions have been assumed namely, normal and exponential distributions. When only the right-hand-side parameters of a multi-objective probabilistic programming problem are random, four continuous distributions have been assumed, namely, uniform, exponential, gamma and log-normal. When the constraints of a multi-objective programming problem are jointly distributed so that the decision maker can assign a single probability level to the jointly distributed constraints and the right-hand-side parameters are normal random variables there the constraints are non-fuzzy has also been considered. The probabilistic models are converted to an equivalent deterministic model in each case and solved using fuzzy programming approach to obtain a compromise solution. Finally, a case study on an agricultural problem was done to study the arrival and withdrawal pattern of the wheat crop and based on certain assumptions, a multi-objective probabilistic linear programming model is constructed and solved using fuzzy programming technique. Throughout the thesis, the objective function coefficients and the coefficients in the constraints are assumed to be non-fuzzy.

Keywords : Chance constrained programming, two-stage programming, normal distribution, exponential distribution, log-normal distribution, gamma distribution, joint constraint, incomplete gamma function, fuzzy programming, membership functions.