

SYNOPSIS

Our investigations in the thesis entitled 'Some Constrained Stochastic Facility Location Problems' comprising of six chapters deal with the important practical problem of Operations Research of locating new facilities in a given environment optimally.

Chapter I deals with the relevant background of work done by various authors bringing out the motivation of the investigations undertaken in the thesis. The original work starts with Chapter II leading upto Chapter VI. All through our investigations we have taken the Euclidean norm as the distance between the facilities and also considered the location of each existing facility is a random variable with bivariate normal distribution. The objective function considered by us in the single facility location problems is the sum of weighted Euclidean distances representing interactions between the new facility and the existing facilities. Only direct interactions between the new facility and each existing facility are considered and indirect interaction between the new facility and the existing facilities via intermediate existing facilities are ignored. Similarly in the multifacility problems considered by us, the objective function is the sum of direct interactions between each new facility and the rest of the new facilities together with direct interactions with all

existing facilities. Again interactions via intermediate nodes are ignored. In the Appendix after Chapter I, we have discussed major conceptual aspects which have an overall bearing on our investigations carried out in the thesis. We have also established relevant mathematical results in this regard.

In Chapter II we have considered locating a single new facility within a given triangular area with respect to a number of existing facilities.

Chapter III deals with locating a single new facility within a given circular area with respect to a number of existing facilities.

In Chapter IV we have considered locating $n(>1)$ new facilities with respect to a number of existing facilities when there is an interaction between new and existing and between new and new facilities.

Chapters V and VI deal with locating $n(>1)$ new facilities within a given triangular area and circular area respectively with respect to a number of existing facilities.

In each chapter the mathematical formulation of the model and the relevant solution algorithm is presented. The solution procedure in each case has been illustrated with randomly generated numerical data. The iteration schemes involved have been convergent and turn out to be the values anticipated by theory. The numerical calculations have been conducted on EC 1030 using FORTRAN IV.