PREFACE

Conjunctive use is the development and management of multiple water resources in a co-ordinated manner such that yield of the system over a period exceeds the sum yield of individual components of the system resulting from an uncoordinated operation.

In my post graduation dissertation I have tried to find out the optimal net benefits for all the minors of Waghodia branch canal of Deo Irrigation Project. This initial work done by me, has boosted and motivated me to still continue some research in this subject. But, in the above said area, there was no problem of water logging and salinity. The problem of water logging and salinity in command area of Kakrapar weir is severe and there is an urgent need of implementing conjunctive use. Therefore I decided to develop linear programming models for conjunctive use in areas of water logging and salinity.

This made me think again to work on the entire main canal rather than working only on one branch canal. If the entire main canal is taken then only one can get the idea of the different problems in that area. For example if only one branch canal is taken then the problems pertaining to that branch canal can only be studied. Whereas in this present study of K.L.B.M.C. of Kakrapar weir there are eight branch canals, each branch canal has its own different problems which are different from other branch canals, for example, Umbhel minor and Dumas distributary of Surat branch canal have maximum irrigation intensity more than 330% and Onjal, Dandi and Borsi minors of Navsari and Amalsad branch canals respectively have the least irrigation intensity around 20%. Similarly Chaltan branch canal have increasing problem of water logging and at the same time Umbhart branch canal have the problem of the salinity in majority of minors.

Thus there are different cases to be studied in different branch canals. The study as a whole gives fair idea for the entire command area of K.L.B.M.C.

At the time of registration I was well versed with optimization technique of linear programming. During the coarse work of my research work I learnt fuzzy linear programming. Therefore, the present study is carried out using both linear programming and fuzzy linear programming.

I wish that the present study will help both, the N.W.R.W.S&.K. Department, Government of Gujarat and the farmers to adopt consumptive use to improve the net benefits, accrued to the farmers, to reduce water logging and seepage and to transfer the surplus water to the water scared areas.