

# **SYSTEM STUDIES FOR MICRO LEVEL IRRIGATION WATER MANAGEMENT**

**BY  
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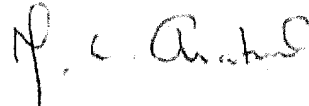
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CERTIFICATE

This is to certify that the thesis entitled, 'SYSTEM STUDIES FOR MICRO LEVEL IRRIGATION WATER MANAGEMENT' submitted by Mr. SHANKAR DASS KHEPAR to the Indian Institute of Technology, Delhi, for the award of degree of DOCTOR OF PHILOSOPHY is a bonafide piece of research work carried out by him under our guidance and supervision. The quality of his thesis fulfils all requirements of the regulations relating to the said degree.

The results contained in this thesis have not been submitted in part or full to any other University or Institution for the award of any Degree or Diploma.



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ABSTRACT

Irrigation water is one of the most vital inputs to agricultural production. The major bottleneck in achieving the food production targets is the scarcity of water. The shortage of irrigation water could be met either with the construction of new projects or by improving the terminal facilities. So far, main emphasis has been laid on the construction of new projects, specially the major and medium size river valley projects. Further development of such projects may be not only technically more difficult, but may also be economically unviable. Improvement of the terminal system by implementing appropriate land and water management programmes, therefore, holds out greater possibilities of meeting water shortage for agricultural production. The need for development of water management programmes at micro level has not been given due recognition so far. The overall improvement is the product of improvement of individual water management alternatives. The development of all components of water management require huge investment. Neither it is possible for developing country to make such investment nor it may be economical. Therefore, decision models need to be developed for maximising the returns with limited funds available. In addition to the optimum decisions for investment, management of water distribution, consistent with optimal cropping pattern will have to be developed.

Over recent years, several studies have been reported

(v)

in the literature which deals with the problem associated with decision making at micro level, yet these studies have been mainly piecemeal and of qualitative nature with limited application for decision making. Thus, in the present study an attempt has been made to develop decision models for optimum solutions for individual irrigation water management alternatives at micro level like lining of watercourses, conjunctive use of canal and poor quality ground water consistent with optimum cropping pattern and ground water development alternatives and precision land levelling etc. The decisions developed give an optimal solution for each alternative while dealing with them independently. The optimum decisions thus developed for each alternative have been integrated for investment policies for maximising the returns when all these alternatives are competing for implementation with limited funds. The facts for irrigation farming system including water management aspects, institutional infrastructures and interaction of the farmers with Government officials who are concerned with decision making are reported with a view to bring an overall improvement in the irrigation farming system. The summary of the research work carried out and suggestions for further scope of research work are also highlighted.

## TABLE OF CONTENTS

		Page
	CERTIFICATE	(i)
	ACKNOWLEDGEMENTS	(ii)
	ABSTRACT	(iv)
	TABLE OF CONTENTS	(vi)
	LIST OF FIGURES	(ix)
	LIST OF TABLES	(xi)
CHAPTER I	INTRODUCTION	1
1.1	Issues	1
1.2	Objectives, Scope and Approach	4
CHAPTER II	OPTIMUM DECISIONS FOR LINING CANAL WATER COURSES	12
2.1	Introduction	12
2.2	Model Formulation	16
2.2.1	Linear Programming Approach	16
2.2.2	Dynamic Programming Approach	18
2.3	Model Application	21
2.4	Results and Discussions	22
2.5	Conclusions	24
CHAPTER III	OPTIMUM DECISION FOR CROPPING PATTERN AND CONJUNCTIVE USE OF CANAL AND POOR QUALITY GROUND WATERS	26
3.1	Introduction	26
3.2	Formulation of Model	29
3.3	Model Application	32
3.3.1	Characteristics of the Area Selected for the Study	37
3.3.2	Data Requirements	37
3.4	Results and Discussions	43
3.5	Conclusions	49

CHAPTER IV	PRECISION LAND LEVELLING	51
4.1	Introduction	51
4.2	Methods and Materials	54
4.2.1	Field Experimental Set-Up	54
4.2.2	Experimental Procedure	56
4.2.3	Hydrological Properties of Soil	60
4.2.4	Farming System	61
4.3	Results and Discussions	61
4.3.1	Relationship Between Crop Yield and Topography Index	61
4.3.2	Relationship Between Topography Index and Annual Benefit as a Result of Precision Land Levelling	63
4.3.3	Relationship Between Annual Cost and Topography Index	65
4.3.4	Economic Decisions	67
4.3.5	Economic Inter-relationships	68
4.4	Conclusions	71
CHAPTER V	INTEGRATED IRRIGATION WATER MANAGEMENT INVESTMENT DECISIONS	73
5.1	Introduction	73
5.2	Approach to the Study	75
5.3	Model Formulation	76
5.3.1	Using Lagrangian Multiplier	77
5.3.2	Linear Programming Model	79
5.3.3	Dynamic Programming Model	80
5.4	Model Application	82
5.5	Results and Discussions	84
5.6	Conclusions	87
CHAPTER VI	IRRIGATION FARMING SYSTEM AND FARMERS INTERACTION WITH GOVERNMENT OFFICIALS - CASE STUDY	88
6.1	Introduction	88
6.2	Characteristics of the Area Selected for the Study	88
6.3	Methodology	89
6.4	Organisations	90
6.5	Results and Discussions	92
6.5.1	Irrigation Farming System	93
6.5.2	Interaction with Government Officials	109
6.4	Conclusions	114

		Page
CHAPTER VII	CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER WORK	115
7.1	Summary of Results	115
7.2	Achievements and Limitations	122
7.3	Recommendations for Further Work	124
REFERENCES		126
APPENDIX-A	OPTIMUM LENGTH TO BE LINED OF A SINGLE WATERCOURSE	130
APPENDIX-B	PRODUCTION FUNCTIONS OF DIFFERENT CROPS	146
APPENDIX-C	UNIT COST OF TUBEWELL WATER	162
APPENDIX-D	AVAILABILITY OF CANAL WATER	169
APPENDIX-E	TOPOGRAPHICAL DETAILS	170
APPENDIX-F	ADDITIONAL TABLES	188
APPENDIX-G	LIST OF PUBLICATIONS	197
APPENDIX-H	BIO-DATA	198