

Table of Contents

List of tables		I
List of figures		II
List of Annexes		III
Abbreviations		IV
<i>Chapter 1</i>	Introduction	1
	1.1 Background	1
	1.2 Statement of the Problem	2
	1.3 Objectives	3
	1.4 Skeleton of the Thesis	3
<i>Chapter 2</i>	Literature Review	4
	2.1 Introduction	4
	2.2 Modeling Approaches	4
	2.2.1 Historical Extrapolation	4
	2.2.2 Statistical Approach	4
	2.2.3 Mathematical Programming	5
	2.3 Choice of modeling approach	6
	2.4 Previous studies	6
<i>Chapter 3</i>	Description of the Study Area	8
	3.1 Topography	8
	3.2 Soil	8
	3.3 Meteorology	8
	3.4 Population	8
	3.5 Water Supply	9
	3.6 Agriculture in Tubas Area	9
	3.6.1 Zone 1	9
	3.6.2 Zone 2	9
	3.7 Irrigation Systems	11
	3.7.1 Water Use Efficiency	12
	3.7.2 Application Efficiency of Irrigations Systems	12
	3.7.3 Irrigation Scheduling	13
<i>Chapter 4</i>	Methodology	14
	4.1 Data Collection	14
	4.2 Objective function	17
	4.3 Constrains	18
	4.3.1 Availability of Agricultural Land Constrain	18
	4.4 Ground Water Availability Constrain	19
	4.4.1 Ground Water Quantity Estimation	19
	4.4.2 Crop Water Requirements	20
	4.5 Local Market Demand Constrain	21
	4.6 National demand of agricultural production	22
	Constrain	22
	4.7 Labor Constrain	24
<i>Chapter 5</i>	Results Discussion	28

5.1	Results Discussion	28
5.1.1	Scenario 1; Existing Situation	29
5.1.2	Scenario 2; Adjustment of Irrigation Water Use	30
5.1.3	Scenario 3; Doubling Irrigated Area	32
5.1.4	Scenario 4; Changing Labor for Both Zones	33
5.1.5	Scenario 5; No Labor Effect	35
5.1.6	Scenario 6; Doubling Agricultural Water Use Efficiency	36
5.1.7	Scenario 7; Using the Typical Crop Water Requirements	38
5.1.8	Scenario 8; Forecasting Water And irrigation In the year 2023	39
5.1.9	Scenario 9; Serious Water Shortage	41
5.1.10	Scenario 10; Water Is Available	43
5.2	Demonstration of Results Graphically	44
<i>Chapter 6</i>	Conclusions and Recommendations	47
6.1	Research Conclusions	47
6.2	General Conclusions	47
6.3	Research Recommendations	47
6.4	General Recommendations	47
<i>References</i>		49
<i>Annex</i>		52