## Contents

Chapter Particular Page No.

### 1. Introduction

1.1 The Main Sources of Water for Irrigation

1.2 Agro-Economic Profile of Gujarat State

1.3 The Main Objectives of DPAP Programmes in Gujarat State

1.4 The Micro Irrigation Technology

1.5 The Objectives of the Present Study

### 2. Review of Literature

2.1 Introduction of Water as Resource

2.2 Agriculture in India

2.3 Competition and Challenges

2.4 Present Status of Water Resources in Gujarat
   2.4.1 Surface Water Resources of the Gujarat State
   2.4.2 Ground Water Resources of the Gujarat state

2.5 Region wise Fresh Water Availability in the State of Gujarat
2.6 Overall Water Availability and Demand in Year - 2010

2.7 Agro-Climatic Zones of the State

2.8 Ground Water Recharge Movement in North Gujarat

2.9 Issues for Discussion: Governance in Water Sector

2.10 Water Scarcity

2.11 Water Management

2.12 Watershed Development

  2.12.1 Advantages of Watershed Development

2.13 Micro Irrigation System

  2.13.1 The Advantages of Drip Irrigation System

  2.13.2 The Advantages of Sprinkler Irrigation System

3. Water Resources Development for Irrigation in the State

  3.1 Introduction

  3.2 Status of Surface Water and Ground Water Potential in the Gujarat State

  3.3 Ground Water Development

    3.3.1 Details of Talukas According to its Category in the State
3.4 District wise Summary of an Irrigation Potential
3.5 Ground Water Quality
3.6 Irrigation Systems in the State of Gujarat
3.7 Traditional Irrigation Systems and Problems

4. Micro Irrigation System (MIS) in Gujarat

4.1 Analysis Based on Whole Population
4.2 District Covered and Number of Beneficiaries
4.3 District Wise Distribution of Types of Micro Irrigation Systems
   4.3.1 District Wise Drip Area
   4.3.2 District Wise Sprinkler Area
   4.3.3 Relative Dominance of the System
4.4 Crop Wise Contribution of MIS
   4.4.1 District Wise – Crop Wise Distribution of MIS
      (a) Drip Systems
      (b) Sprinkler Systems
   4.4.2 Crop Wise Concentration
4.5 Subsidy and Investment
4.6 Gujarat Green Revolution Company (GGRC)
4.6.1 Objective behind the Formation of GGRC

4.6.2 Benefits for the Farmers: New MIS Scheme of GGRC

4.7 Field Observation on the Sample Farmers

4.7.1 Design Aspects

4.8 Water Saving – Drip Irrigation System

4.8.1 Water Saving Percentage

4.9 Scope of Micro Irrigation in Gujarat

4.10 MIS Projects, Problems, Prospects and Suggestions

4.11 Adoption of Salt Resistance Varieties of Crops in Gujarat State

4.11.1 Sami and Harij Block

5. **Objectives, Data Base, Definitions and Methodology  145-156**

5.1 Problems facing W. U. E.

5.2 North Gujarat Zone: A Background

5.3 Objectives of the Present Study

5.4 Data Requirement

5.5 Methodology

5.6 Collection of Secondary Data
5.7 Selection of Samples
   5.7.1 Analysis
   5.7.2 Data Collection
   5.7.3 Limitations

6. The Study Area: A Profile

6.1 Background Information and Characteristic Feature
   6.1.1 Banaskantha District
      6.1.1.1 Deesa and Deodar Talukas
   6.1.2 Mehsana District
      6.1.2.1 Visnagar and Kadi Talukas
   6.1.3 Patan District
      6.1.3.1 Siddhapur and Sami Talukas

6.2 Socio Economic and Agrarian Features
   6.2.1 Social Class Composition
   6.2.2 Level of Education
   6.2.3 Membership of Co-Operative Societies
   6.2.4 Channels of Communications
   6.2.5 Occupation
6.2.6 Time-Lag between Awareness and Adoption

6.2.7 MIS Adopter Attitudes

6.2.8 Size of Holding

6.3 Asset Structure and Income Status

6.4 Cropping Pattern

6.5 Cropping Intensity

6.6 Crop Productivity

6.7 Irrigation Status of Study Districts

6.7.1 Irrigation in Sample Farms

7. Irrigation Systems: Planning and Farm Management in North Gujarat

7.1 Economics of MIS Adoption Irrigated Crops

7.2 Cost of Cultivation of Irrigated Crops

7.3 Cost of Cultivation under MIS and Surface Irrigated Conditions

7.4 Net Income per Hector

7.5 Net Income- Expenditure Ratio

7.6 Net Incremental Farm Income
7.7 Comparison of Different Parameters

8. Cost Benefit Analysis of MIS

8.1 Water Saving and Increase in Irrigation Areas

8.2 Saving in Fertilizer and Pesticides

8.3 Saving in Other Cost Items

8.4 Productivity Gain

8.5 Benefit Cost Ratio (BCR)

8.6 Investment Cost

8.7 Sample Farmers Opinions on Benefits

9. Socio-Economic Impacts of MIS Project and Common Property Resource (CPR) and Common Accessible Resource (CAR)

9.1 Micro Irrigation System (MIS)

9.1.1 Income

9.1.2 Expenditure

9.2 Common Property Resource and Common Accessible Resource

10. Recommendations
11. Conclusions and Policy Implications 291-293

11.1 Introduction

Annexure: A - Flow Chart

Annexure: B - Graphs

Annexure: C - Maps

Annexure: D - Photograph

Annexure: E - Tables

Annexure: F – Set of Questionnaire

Bibliography