

## Contents

<b>Topic</b>	<b>Page No</b>
Acknowledgment	i
Abstract	iii
List of Tables	vi
List of Figures	xv
List of Maps	xx

<b>Chapter No.</b>	<b>Title</b>	<b>Page No.</b>
<b>1</b>	<b>INTRODUCTION</b>	<b>1 - 13</b>
<b>1.1</b>	General	1
<b>1.2</b>	Climate Change and Drought	1
<b>1.3</b>	Definitions of Drought	2
<b>1.4</b>	Classification of Drought	3
<b>1.5</b>	Drought: Causes and Effects	6
<b>1.6</b>	Impact of Drought	7
<b>1.7</b>	Disaster Management Framework	8
<b>1.8</b>	Drought Scenario in India	9
<b>1.9</b>	Drought Scenario in Gujarat	10
<b>1.10</b>	Need of the Present Study	12
<b>1.11</b>	Objectives of the Present Study	12
<b>1.12</b>	Outline of the Thesis	13
<b>2</b>	<b>LITERATURE REVIEW</b>	<b>14 - 31</b>
<b>2.1</b>	General	14
<b>2.2</b>	Literature Review on Meteorological Drought Analysis	14
<b>2.3</b>	Literature Review on Hydrological Drought Analysis	22
<b>2.4</b>	Literature Review on Agricultural Drought Analysis	25
<b>2.5</b>	Literature Review on Trend Analysis of Drought Indices	29
<b>2.6</b>	Literature Review on Drought Forecasting Methods	31
<b>3</b>	<b>STUDY AREA AND DATA COLLECTION</b>	<b>33 - 43</b>
<b>3.1</b>	General	33

<b>3.2</b>	Water Resources of Gujarat	33
<b>3.3</b>	Water Resources of North Gujarat	34
<b>3.4</b>	Climate of Gujarat	34
<b>3.5</b>	Agriculture Scenario of North Gujarat	35
<b>3.6</b>	Subagroclimatic zones of Gujarat	35
<b>3.7</b>	Details of North Gujarat districts	37
<b>3.8</b>	Data Collection and Sources	41
<b>4</b>	<b>METHODOLOGY</b>	<b>44 - 70</b>
<b>4.1</b>	General	44
<b>4.2</b>	Meteorological Drought Indices	44
<b>4.3</b>	Climatic Drought Indexes	52
<b>4.4</b>	Aridity Indexes	54
<b>4.5</b>	Hydrological Drought Indices	57
<b>4.6</b>	Agricultural Drought Indices	59
<b>4.7</b>	Trend Analysis Test	64
<b>4.8</b>	Drought forecasting Models	67
<b>5</b>	<b>RESULTS AND ANALYSIS</b>	<b>71 - 338</b>
<b>5.1</b>	Estimation of various meteorological drought indices over the study area	71
<b>5.2</b>	Estimation of drought by different climatic index over the study area.	116
<b>5.3</b>	Estimation of various aridity index over the study area.	135
<b>5.4</b>	To determine frequency of meteorological drought indices.	159
<b>5.5</b>	Estimation of various hydrological drought indices	171
<b>5.6</b>	To determine frequency of hydrological drought indices over the study area.	186
<b>5.7</b>	To estimate different agricultural drought indices.	190
<b>5.8</b>	Computation of vegetation stress by remote sensing techniques.	218
<b>5.9</b>	Trend and correlation analysis of drought indices.	239
<b>5.10</b>	Generation of drought severity maps.	260
<b>5.11</b>	To construct comparisons matrix of various developed drought indices over study area.	288

<b>5.12</b>	To develop drought forecasting model of area considered for the study.	299
<b>6</b>	<b>CONCLUSIONS AND RECOMMENDATIONS</b>	<b>339 – 348</b>
<b>6.1</b>	General	339
<b>6.2</b>	Banaskantha district	339
<b>6.3</b>	Gandhinagar district	340
<b>6.4</b>	Mehsana district	342
<b>6.5</b>	Patan district	344
<b>6.6</b>	Sabarkantha district	346
<b>6.7</b>	Recommendations	348
	<b>References</b>	<b>349 – 356</b>
	<b>Plagiarism report</b>	<b>357 - 364</b>
	<b>List of Research Papers Published from the present study</b>	<b>365 – 366</b>