

CONTENTS

LIST OF FIGURES	ix
LIST OF TABLES	xi
LIST OF PLATES	xiii
 CHAPTER 1: INTRODUCTION	 1
Preamble	1
Location	
Ahmedabad-Gandhinagar Urban Complex	4
Communication	5
Physiography and Drainage	5
Climate	7
Aims and Objectives	7
Approach and Methodology	8
Presentation	9
 PART – I: CONCEPT AND STRATEGY	
 CHAPTER 2: GEO-ENVIRONMENTAL SYSTEM: FACTORS, RESOURCES AND RISKS	 11
Concept	11
Geo-environmental Attributes	14
Natural Resources	20
Environmental Risks	22
Anthropogenic Activities	26
Geo-environmental Overview of the Study Area	29

PART – II: GEO-ENVIRONMENTAL ATTRIBUTES

CHAPTER 3: GEOLOGICAL SETTING **31**

Previous Work	31
Regional Geology and Tectonics	39
Sedimentation History	47
Geology of the Study Area	49
Subsurface Geology	57
Sedimentary Structures	61
Quaternary Depositional Environments	64

CHAPTER 4: HYDROMETEOROLOGY **68**

Climate	68
Temperature	68
Humidity	70
Wind	71
Cloudiness	71
Evapo-transpiration	71
Rainfall	72
Drought Analysis	77
Special Weather Phenomena	78

CHAPTER 5: GEOMORPHOLOGY **80**

Introduction	80
Palaeogeomorphic Processes	81
Landscape Analysis	81
Landform Characteristics	88
Regional Landforms	88
Local Geomorphic Units	99
Morphostratigraphic Studies	106

PART - III: NATURAL RESOURCES AND HAZARD APPRAISAL

***CHAPTER 6: WATER REGIME* 110**

Surface Water	110
Subsurface Water	121
Groundwater Recharge	140
Hydrogeological Scenario	150
Hydrogeomorphology	151

***CHAPTER 7: SOIL AND LAND RESOURCES* 157**

Soils of the Study Area	158
Soil as a Resource	167
Land Use	171
Land Use Suitability	172

***CHAPTER 8: MINERAL AND RELATED RESOURCES* 178**

Energy Resources	178
Coal Bed Methane	179
Construction Materials	180

PART – IV: HUMAN – NATURE INTERACTION

***CHAPTER 9: GROWTH AND DEVELOPMENT OF AHMEDABAD–GANDHINAGAR URBAN COMPLEX* 183**

Introduction	183
Population	184
Land Use Pattern	188
Water Supply	196
River Water Quality	199

CHAPTER 10: GEO-ENVIRONMENTAL EVALUATION: OPPORTUNITIES, CONSTRAINTS AND ISSUES	201
Introduction	201
Hydrometeorological Factors	202
Geomorphological Factors	203
Geological Factors	206
Hydrogeological Factors	207
Human Induced Issues	208
Urbanization and Industrialization	208
Water Supply	210
Waste Disposal	211
Mitigation and Environmental Planning	212
Industry Options	215
Summary Statement	216
BIBLIOGRAPHY	217