TABLE OF CONTENTS

		Page No.
	PART A – BACKGROUND INFORMATION	
Chapter 1	**INTRODUCTION**	**1-9**
	1.1 Purpose and scope	1
	1.2 Objectives	3
	1.3 Study area	3
	1.4 Approach and methodology	7
Chapter 2	**REGIONAL STRUCTURE AND GEOLOGY**	**10-25**
	2.1 Structural and tectonic settings	10
	2.1.1 Major Faults	11
	2.1.2 Major rifts	12
	2.1.3 Precambrian trends	12
	2.2 Regional geology & stratigraphy	13
	2.2.1 Sedimentary Cretaceous rocks	13
	2.2.2 Deccan Trap Formation	15
	2.2.3 Laterites	16
	2.2.4 Tertiary rocks	16
	2.2.5 Quaternary sediments	19
	2.3 Geophysical studies	20
	2.4 Earthquake swarm activity	22
Chapter 3	**MORPHOTECTONIC DOMAINS**	**26-34**
	3.1 Morphotectonic domain – I	27
	3.1.1 Geomorphic characteristics	28
	3.2 Morphotectonic domain – II	31
	3.2.1 Geomorphic characteristics	31
	PART B – MORPHOTECTONIC DOMAIN - I	
Chapter 4	**TECTONIC GEOMORPHOLOGY**	**35-42**
	4.1 Topographic analysis	36
	4.2 Digital Elevation Model (DEM) analysis	38
	4.2.1 Slope data	39
	4.2.2 Aspect data	39
	4.3 Lineament analysis	40
Chapter 5	**PALEOSTRESS PATTERN**	**43-63**
	5.1 Major faults	44
	5.1.1 Katar Fault (F1)	44
	5.1.2 Fault (F2)	47
	5.1.3 Fault (F3)	50
	5.1.4 Fault (F4)	51
	5.2 Fault slip analyses	53
	5.2.1 Katar Fault (F1)	53
	5.2.2 Fault (F2)	56
	5.2.3 Faults (F3 and F4)	58

	5.3 Paleostress analyses of Tertiary and Quaternary joint sets	58
	5.4 Interpretation of stress pattern	62
Chapter 6	**FLUVIAL SYSTEM**	**64-70**
	6.1 Drainage basin morphology	64
	6.1.1 Dhantarvadi River	65
	6.1.2 Raidi River	68
	6.1.3 Malan River	68
	6.2 Longitudinal river profiles	69
Chapter 7	**MORPHOTECTONIC ANALYSIS**	**71-86**
	7.1 Methodology	71
	7.1.1 Geomorphic indices	71
	7.1.2 Morphotectonic Parameters	74
	7.2 Geomorphic indices results	77
	7.3 Morphotectonic parameters results	80
	7.3.1 Stream length-gradient (SL) index	80
	7.3.2 Valley floor width-to-height ratio (Vf ratio)	82
	7.3.3 Basin Asymmetry Factor (AF)	82
	7.3.4 Hypsometric Integral (HI)	84
	7.3.5 Hypsometric curve	85

PART C – MORPHOTECTONIC DOMAIN - II

Chapter 8	**TECTONIC GEOMORPHOLOGY**	**87-94**
	8.1 Topographic analysis	87
	8.2 DEM analysis	89
	8.2.1 Slope data	90
	8.2.2 Aspect data	90
	8.3 Lineament analysis	92
Chapter 9	**CONTROLS ON LANDSCAPE CONFIGURATION**	**95-112**
	9.1 Geomorphic zones	95
	9.2 Aeolianite ridge system	96
	9.3 Evidences from DEM analysis	97
	9.3.1 Slope data	98
	9.3.2 Aspect data	99
	9.4 Field expression	100
	9.4.1 Aeolianite ridges	101
	9.4.2 Aeolianite ridges around Hiran River	107
	9.5 Morphostratigraphy	110
Chapter 10	**FLUVIAL SYSTEM**	**113-123**
	10.1 Drainage basin morphology	114
	10.1.1 Rivers originating in trappean terrain	114
	10.1.2 Rivers flowing mostly in miliolitic terrain	118

10.2 Longitudinal river profiles 121
Chapter 11 MORPHOTECTONIC ANALYSIS 124-144
11.1 Geomorphic indices - results 124
11.1.1 Rivers originating in trappean terrain 124
11.1.2 Rivers flowing mostly in miliolitic terrain 129
11.2 Morphotectonic parameters - results 133
11.2.1 Stream length-gradient (SL) index 133
11.2.2 Valley floor width-to-height ratio (Vf ratio) 137
11.2.3 Basin Asymmetry Factor (AF) 138
11.2.4 Hypsometric Integral (HI) 140
11.2.5 Hypsometric curve 142

PART D – MORPHOTECTONIC EVOLUTION

Chapter 12 DISCUSSION 145-161
12.1 Tectonic influences on landscape 146
12.1.1 Morphotectonic domain-I 146
12.1.2 Morphotectonic domain-II 151
12.2 Morphotectonic evolution of SW Saurashtra 155
12.2.1 Paleostress scenario 155
12.2.2 Neotectonic evolution 159
Chapter 13 CONCLUSIONS 162-164

APPENDIX - A 165-168

APPENDIX - B 169

REFERENCES 170-190

LIST OF PUBLICATIONS 191-193