

C O N T E N T S

VOLUME - I

<u>CHAPTER</u>		<u>PAGE</u>
I.	<u>INTRODUCTION</u>	1 - 34
I.1	GENERAL	1
I.2	PHYSIOGRAPHIC DIVISIONS	4
	1. Northern coastal plain	4
	2. South-eastern Deccan Trap hills	6
	3. Elevated table land of Okha Mandal	7
I.3	CLIMATE	7
I.4	VEGETATION	14
	1. Shore area	14
	2. Coastal belt	17
	3. Arid and semi-arid sub-coastal plain	20
I.5	FAUNA	20
I.6	AGRICULTURE	21
I.7	POPULATION	22
I.8	COMMUNICATION	22
I.9	SCOPE AND METHOD OF INVESTIGATION	23
I.10	PREVIOUS WORK	28
II.1	<u>GEOLOGY</u>	35 - 59
	II.1 INTRODUCTION	35
	II.2 DECCAN TRAP	39

<u>CHAPTER</u>	<u>PAGE</u>
II.3 - GAJ FORMATION	43
II.4 DWARKA FORMATION	50
II.5 CHAYA FORMATION	54
II.6 RECENT AND SUB-RECENT DEPOSITS	57
1. Coastal Mudflats	57
2. Sand dunes	58
3. Residual soils	58
III. <u>AIRPHOTO INTERPRETATION</u>	60 - 67
III.1 INTRODUCTION	60
III.2 OFFSHORE FEATURES	62
III.3 DRAINAGE	64
III.4 SPRINGS	65
III.5 GEOLOGIC AND GROUNDWATER CONDITIONS	66
IV. <u>INLAND GEOMORPHOLOGY</u>	68 - 77
IV.1 GEOMORPHIC SUB-DIVISIONS	68
IV.2 EASTERN MAINLAND	69
1. Southern hilly terrain	69
2. Northern and Western gently sloping region	70
3. The coastal plain	72
IV.3 OKHA RANN	73
IV.4 OKHA MANDAL BLOCK	75

<u>CHAPTER</u>		<u>PAGE</u>
V.	<u>COASTAL GEOMORPHOLOGY</u>	78 - 96
V.1	GENERAL	78
V.2	DWARKA COAST	80
	1. General features	80
	2. Coastal sand geomorphology	84
	3. Coastal sand dunes	85
	4. Backshore	86
	5. Foreshore	87
	6. Shore face	87
V.3	JAMNAGAR COAST	87
	1. General features	87
	2. Physiography and morphology	89
	3. Sedimentary structures of mudflats	90
	4. Bioturbation and fauna of mudflats	91
	5. Tidal channels in mudflats	92
	6. Surface structure of mudflats	93
	7. Vertical sequence of tidal flat deposits	94
	8. Diagnostic features of tidal deposits.	95
VI.	<u>DRAINAGE</u>	97 - 142
VI.1	MORPHOLOGY OF STREAMS	97
	1. General	97
	2. River beds	98
	3. Downflow direction	101

<u>CHAPTER</u>		<u>PAGE</u>
	4. Drainage pattern	101
	5. Drainage divides	103
	6. Longitudinal profiles	105
VI.2	DRAINAGE ANALYSIS	109
	1. General features	109
	2. Morphometric parameters	115
	3. Parameters studied	121
	4. Drainage characteristics of the mainland basins	122
VI.3	COMPARISON OF MORPHOMETRIC PARAMETERS	137
VI.4	CONCLUSIONS	140
VII.	<u>GROUNDWATER</u>	143 - 153
VII.1	INTRODUCTION	143
VII.2	HYDROLOGICAL CONDITIONS	145
VII.3	FUTURE DEVELOPMENT	152
VIII.	<u>BATHYMETRIC STUDIES</u>	154 - 177
VIII.1	INTRODUCTION	154
VIII.2	SHORELINE	155
	1. Northern shoreline	155
	2. Southern shoreline	156
VIII.3	CORAL REEFS OF THE SOUTHERN COAST	158
VIII.4	CREEKS	161

<u>CHAPTER</u>	<u>PAGE</u>
VIII.5 GEOMORPHIC FEATURES	165
1. General	165
2. Tidal observations	166
3. Current observations	166
4. Float observations	168
5. Wind	168
6. Storms and cyclones	169
7. Waves	172
8. Littoral drift	173
VIII.6 OFFSHORE SUB-SOIL INVESTIGATIONS	173
VIII.7 SUNDRY DATA	174
1. Salinity of sea water	174
2. Rainfall	175
3. Temperature	175
VIII.8 HYDRAULIC MODEL STUDIES	175
1. General	175
2. Siltation	176
3. Current	176
4. Wave observations	177
5. Tidal prediction	177
IX. TERRAIN CLASSIFICATION	178 - 202
IX.1 SCOPE AND PURPOSE	178
IX.2 PROCEDURE OF TERRAIN EVALUATION	181
1. PATTERN A Deccan Trap	183

<u>CHAPTER</u>		<u>PAGE</u>
	2. PATTERN B Alluvial Plain	187
	3. PATTERN C Muddy Shore	190
	4. PATTERN D Trap Coastline	194
	5. PATTERN E Limestone Coast	197
	6. PATTERN F Sandy Coastline	200
X.	<u>TECTONIC FRAMEWORK</u>	203 - 214
	X.1 STRUCTURAL FRAMEWORK	203
	X.2 FAULTS AND FOLDS	206
	X.3 NEOTECTONIC IMPLICATIONS	211
XI.	<u>RESUME</u>	215 - 225
	XI.1 INTRODUCTION	215
	XI.2 GEOLOGY	216
	XI.3 AIRPHOTO INTERPRETATION	216
	XI.4 INLAND GEOMORPHOLOGY	218
	XI.5 COASTAL GEOMORPHOLOGY	219
	XI.6 DRAINAGE	220
	XI.7 GROUNDWATER	221
	XI.8 BATHYMETRIC STUDIES	222
	XI.9 TERRAIN CLASSIFICATION	222
	XI.10 TECTONIC FRAMEWORK	223
	XI.11 CONCLUDING REMARKS	225
	<u>BIBLIOGRAPHY</u>	225 - 237

VOLUME - II
DISCRIPTION OF FACETS

<u>PATTERN</u>		<u>PAGE</u>
A	<u>DECCAN TRAP</u>	238 - 261
Facet	A ₁ Convex topped parabolic hill	238
	A ₂ Hill top (barren)	240
	A ₃ Hill slope (barren)	242
	A ₄ Hill slope (vegetated)	244
	A ₅ Gently sloping plain ground	246
	A ₆ River bank	248
	A ₇ River bed (rocky-sandy)	250
	A ₈ River bed (alluvial vegetated)	252
	A ₉ Shallow stream	254
	A ₁₀ Stone quarry	256
	A ₁₁ Stony wasteland	258
	A ₁₂ Ridge	260
B	<u>ALLUVIAL PLAIN</u>	262 - 267
Facet	B ₁ Marshy land	262
	B ₂ Plain barren land	264
	B ₃ Rann	266
C	<u>MUDDY SHORE</u>	268 - 281
Facet	C ₁ Backshore mudflat	268
	C ₂ Foreshore mudflat	270
	C ₃ Nar or Tidal channel	272

<u>PATTERN</u>		<u>PAGE</u>
	Facet C ₄ Mudflat with mangroves	274
	C ₅ Mudflat with mudcracks	276
	C ₆ Mudflat with rockwaste	278
	C ₇ Mudflat with ripple marks	280
D	<u>TRAP COASTLINE</u>	282 - 291
	Facet D ₁ Rocky foreshore	282
	D ₂ Broken ground	284
	D ₃ Small mounds	286
	D ₄ Coastal cliffs	288
	D ₅ Water estuary	290
E	<u>LIMESTONE COAST</u>	292 - 307
	Facet E ₁ Rocky foreshore	292
	E ₂ Karst foreshore	294
	E ₃ Wave cut cave	296
	E ₄ Stack	298
	E ₅ Island	300
	E ₆ Plain barren land	302
	E ₇ Limestone hill top	304
	E ₈ Limestone hill slope	306
F	<u>SANDY COASTLINE</u>	308 - 317
	Facet F ₁ Sandy foreshore	308
	F ₂ Sand dune	310
	F ₃ Sandy ridge	312
	F ₄ Aeolian ripple marks	314
	F ₅ Vegetated sandy terrain	316