

## CONTENTS

		Page No
	Preface	i
	Acknowledgement	ii
	List of tables	iii
	List of figures	v
	List of photographs	vii
i	<b>Introduction</b>	1-9
ii	Scope of work	1
iii	Hypothesis	3
iv	Objectives	4
v	Study Area	4
vi	Methodology	5
<b>1.0</b>	<b>Geographical Set-up of the Study area</b>	<b>10-44</b>
1.1	Introduction	10
1.2	Geological set-up	10
1.3	Physiography	14
1.4	Climate	18
1.5	Drainage	23
1.6	Soil	30
1.7	Natural Vegetation	34
1.8	Land use	40
1.9	Demography	42
1.10	Conclusion	42
1.11	References	43
<b>2.0</b>	<b>Historical Developments of Darjeeling Hills</b>	<b>45-56</b>
2.1	Introduction	45
2.2	Pre-British Period	45
2.3	The British Period	45

2.4	Independent Period	50
2.5	The DGHC Period	52
2.6	Conclusion	55
2.7	References	56
<b>3.0</b>	<b>Comparative Study of Past and Present Environment</b>	<b>57-85</b>
3.1	Introduction	57
3.2	Reconstruction of British Period Environment	58
3.3	Reconstruction of early Independent Period environment	61
3.4	Reconstruction of Pre DGHC Period environment	65
3.5	Comparison among them	63
3.6	Reconstruction of DGHC environment of Darjeeling Hill.	69
3.7	Climate change and its impact	71
3.8	Conclusion	79
3.9	References	81
<b>4.0</b>	<b>Nature and Extent of Environmental Degradation in Darjeeling Hill</b>	<b>86-117</b>
4.1	Introduction	86
4.2	Deforestation	87
4.2.1	Consequences of deforestation	90
4.3	Edaphic Drought ness of hill slopes	92
4.4	Landslides	93
4.4.1	The Landslide Occurrences	93
4.4.2	Nature and Processes	100
4.4.3	Landslide Prone Areas	100
4.4.4	Corrective and Preventive Measures	103
4.5	Soil Erosion	107
4.5.1	Assessment of soil erosion	109
4.5.2	Strategies for soil conservation	110
4.5.3	Proposed soil conservation plan for the Darjeeling Himalaya	112
4.6	Conclusion	113

4.7	References	115
<b>5.0</b>	<b>Causes and Consequences of Environment Degradation</b>	<b>118-133</b>
5.1	Introduction	118
5.2	Causes of Environmental Degradation	119
5.2.1	Economic Causes of Environmental Degradation	119
5.2.2	Social Causes	121
5.2.3	Political Causes	121
5.2.4	Natural Causes	122
5.3	Consequences of Environment Degradation	123
5.3.1	Economic Consequences	124
5.3.2	Social Consequences	128
5.3.3	Political Consequences	129
5.4	Conclusion	129
5.5	References	132
<b>6.0</b>	<b>Development of Tourism in Darjeeling Hills and its Impact</b>	<b>134-170</b>
6.1	6.1 Introduction	134
6.2	Evolution of Tourism	135
6.2.1	Tourism in British Period	135
6.2.2	Tourism in Independent period (1947-1988)	139
6.2.3	Present Tourism activities (1988 onwards)	141
6.2.3.1	The Trend of tourism	141
6.2.3.2	Spatial distribution of tourist arrival	143
6.2.3.3	Seasonality of tourism	146
6.2.3.4	Tourism Resources in the Darjeeling hills	147
6.3	Environmental Impact of Tourism	152
6.3.1	Physical Impacts	154
6.3.1.1	Positive physical impact	155
6.3.1.2	Negative physical impact	156
6.3.2	Economic Impact	158

6.3.3	Socio-cultural impacts	160
6.4	Environmental Impact	163
6.4.1	Statistical analysis	163
6.4.1.1	Environmental Impact variables	164
6.4.1.2	Environmental Impact of tourism variables	166
6.5	Conclusion	167
6.6	References	169
<b>7.0</b>	<b>Land Use Change and its Impact on Environment</b>	<b>171-190</b>
7.1	Introduction	171
7.2	Nature and extent of land use transformation	171
7.2.1	Land use transformation in British Period	173
7.2.2	Land use transformation in Independent Period	175
7.3	Nature and extent of human encroachment	179
7.3.1	Human encroachment in British period	180
7.3.1.1	Tea industry	180
7.3.1.2	Cinchona Industry	181
7.3.2	Human encroachment in Independent Period	182
7.3.3	Human encroachment since 1980s	184
7.4	Spatial and temporal extent	185
7.5	Misuse and overuse of fragile hill environment	187
7.6	Conclusion	188
7.7	References	190
<b>8.0</b>	<b>Development Programmes and its Environmental Impact</b>	<b>191-225</b>
8.1	Introduction	191
8.2	Development Road Network and its Impact	193
8.2.1	Forest road	196
8.2.2	Impact of road construction	198
8.3	Development of Settlement and Urban centres and its Impact	201
8.3.1	Water supply system in Darjeeling town	204

8.3.1.1	Genesis of Problems	204
8.3.1.2	Present Status of Water Supply	205
8.3.1.3	Future Requirement	206
8.4.2	Development of Public Utility Structures and its impact	209
8.4.1	Education Infrastructure	209
8.4.2	Pisiculture	211
8.4.3	Rural development programme	211
8.4.4	Environmental Impact	212
8.5	Development of Hydroelectric Project and its impact	214
8.5.1	Impact of mini/micro and medium hydroelectricity projects	214
8.5.2	The Tista Hydroelectric Projects	215
8.5.3	Environment Impact	217
8.5.3.1	Case Study of proposed Helipad site at Mirik	221
8.6	Conclusion	222
8.7	References	224
<b>9.0</b>	<b>Environmental Impact Assessment</b>	<b>226-245</b>
9.1	Introduction	226
9.1.1	Methodology	228
9.2	Impact identification	229
9.3	The Impact Magnitude	230
9.4	The Impact Significance	233
9.5	Conclusion	236
9.6	References	236
<b>10</b>	<b>Summary and Conclusions</b>	<b>246-251</b>
	Bibliography	252-262