

Table of Contents

	Page No.
Acknowledgements.....	i
List of Tables.....	ii-iii
List of Figures.....	iii-vi
List of Plates.....	vii
Abbreviations.....	viii-ix
Abstract.....	x-xi
Contents.....	xii-xv

Chapter-I:

1.0 Foundation of the Research	1-27
1.1 Introduction.....	2
1.2 Justification of the Title.....	6
1.3 Background of the Research.....	7
1.4 Research Problems and Research Gap.....	7
1.5 Objectives of the Study.....	8
1.6 Systematic Review and Meta-Synthesis of Evidence-Based Practice.....	8
1.7 Research Design.....	15
1.8 Materials and Methods.....	15
1.8.1 Data Used for This Study.....	16
1.8.2 Dark Object Subtraction (DOS).....	17
1.8.3 Conversion from Digital Number to Spectral Radiance.....	17
1.8.4 Conversion to Top of Atmospheric (TOA) Spectral Reflectance.....	18
1.8.5 Sentinel- 2 Multi-Spectral Instrument (MSI).....	18
1.8.6 Radiometric Calibration Activities.....	19
1.9 Improving our Understanding of the State of Ramnagar Coast.....	22
1.10 Consequences.....	26

Chapter-II:

2.0 Chronological Development of Coastal Landscapes	28-62
2.1 Relevance.....	29
2.2 Recent Plan Shape of Coastal Chenier Plain Topography (Ramnagar-I & II Blocks)...	29
2.3 The Contour Plan of Study Area and Topographic Characters.....	31
2.3.1 Order of Landforms.....	31

2.4 Understanding of Coastal Dynamics.....	35
2.4.1 Coastal Setup.....	35
2.4.2 Coastal Wetland Morphology.....	36
2.4.3 Beach Characters.....	36
2.4.4 General Character of Sand Dunes.....	36
2.4.5 Near Shore Dynamics.....	36
2.5 Drainage Features	38
2.6 Validation of Evolution in Studied Coast through Existing Records / Existing Dated Record.....	39
2.7 Reconstruction of Geological and Geomorphological History of Subarnarekha Chenier Delta.....	43
2.8 Tidal Prism in the Coastal Wetlands.....	48
2.8.1 Method of the Estimation of Tidal Prisms.....	49
2.8.2 Result of the Estimated Tidal Prisms.....	53
2.9 Coastal Morphometric Attributes	56
2.9.1 Relative Relief.....	57
2.9.2 Dissection Index.....	58
2.9.3 Average Slope.....	59
2.9.4 Aspect of Slope Direction.....	60
2.10 Major Findings.....	61

Chapter-III:

3.0 Species Diversity under the Topographic Variability	63-90
3.1 Relevance.....	64
3.2 Delineation of the Transects.....	64
3.3 Identification of Floral Species.....	66
3.4 Normalized Difference Vegetation Index	68
3.5 Species Categorization	71
3.6 Identification of Micro Landscape Units.....	71
3.7 Relation between Micro Topography and Floral Species.....	73
3.8 Vegetation Diversity Analysis through Shannon Weiner Diversity Index.....	75
3.8.1 Community Similarity.....	76
3.8.2 Species Richness.....	76
3.8.3 Species Evenness.....	76

3.9 Spatial Variability of Plant Community.....	77
3.10 Interrelationship between Habitats and Morphological Units.....	80
3.11 Hierarchical Cluster Analysis.....	83
3.11.1 Single Linkage	83
3.11.2 Agglomeration Schedule.....	85
3.11.3 Icicle Plot.....	85
3.12 Major Findings.....	89
Chapter-IV:	
4.0 Valuation of Landscape Units	91-125
4.1 Relevance.....	92
4.1.1 Market Based Techniques.....	92
4.1.2 Revealed Preference Techniques.....	93
4.1.3 Stated Preference Techniques.....	93
4.2 Valuation of Vegetated Land.....	93
4.2.1 Sampling Strategy for Biomass Estimation.....	93
4.2.2 Tree Diameter and Height Measurement.....	94
4.2.3 Above Ground Biomass.....	94
4.2.4 Below Ground Biomass.....	95
4.2.5 Total Biomass.....	95
4.2.6 Carbon Estimation.....	95
4.2.7 Fuel Wood Estimation.....	98
4.3 Valuation of Agricultural Lands.....	100
4.4 Land Valuation of Fishery Land.....	102
4.5 Final Ecological and Economical Valuation of Coastal Landscape Units.....	107
4.6 Land Use / Land Cover Change Detection Analysis between 1990 and 2017.....	108
4.6.1 Spectral Angle Mapper.....	109
4.6.2 Change Detection Matrix.....	113
4.6.3 Land Use / Land Cover Alteration.....	117
4.7 Population Pressure Estimation.....	119
4.8 Density-Based Spatial Clustering of Applications with Noise or Density based Clustering Algorithm.....	120
4.9 Environmental Zoning Approach.....	122
4.10 Major Findings.....	124

Chapter-V:

5.0 Conclusion and Recommendations	126-140
5.1 Conclusion.....	127
5.1.1 Essence of the Present Study.....	130
5.2 Recommendations and Suggestions.....	134
5.3 Limitation of the Research.....	138
References	141-149
Annexure	150-172