

Second Edition

FUNDAMENTALS OF ECOLOGY



MC DASH

Contents

<i>Preface to the Second Edition</i>	vii
<i>Preface to the First Edition</i>	ix
<i>List of Symbols</i>	xv
1. Organism and Environmental Complex	1
1.1 <i>Concept of Stress and Strain</i>	3
1.2 <i>Adaptation and Concept of Limiting Factor</i>	4
1.3 <i>Concept of Habitat and Niche</i>	11
1.4 <i>Scope of Ecology</i>	21
2. Systems Concept in Ecology	35
2.1 <i>Systems Concept</i>	35
2.2 <i>Integrative Approach</i>	37
2.3 <i>Ecosystem</i>	37
2.4 <i>Functional Attributes of an Ecosystem</i>	45
2.5 <i>Primary and Secondary Production</i>	57
2.6 <i>Food Chain and Trophic Levels</i>	82
2.7 <i>Energy Flow in Ecosystems</i>	92
2.8 <i>Material Cycling</i>	109
2.9 <i>Homeostasis and Feedback</i>	121
2.10 <i>Development and Evolution of Ecosystems</i>	123
2.11 <i>Concept of Model and Ecosystem Modelling</i>	124
3. Ecosystems of the World and Distribution of Flora and Fauna	145
3.1 <i>Terrestrial Ecosystems</i>	145
3.2 <i>Aquatic Ecosystems</i>	160
3.3 <i>Principles of Plant Geography and Animal Distribution</i>	173

3.4	<i>Floristic and Zoogeographical Realms</i>	173
3.5	<i>Principles of Dynamic Phytogeography</i>	175
4.	Environment in Action	182
4.1	<i>Concept</i>	181
4.2	<i>Climatic Factors</i>	182
4.3	<i>Topographic Factors</i>	198
4.4	<i>Edaphic Factors (The Soil)</i>	199
4.5	<i>Biotic Factors</i>	208
4.6	<i>Co-evolution</i>	213
4.7	<i>Biological Clock</i>	217
5.	Community Ecology	225
5.1	<i>Concept of Community and Basic Terms</i>	225
5.2	<i>Community Structure, Composition and Stratification</i>	227
5.3	<i>Community Function</i>	245
6.	Population Ecology	254
6.1	<i>Concept of Population and Population Attributes</i>	254
6.2	<i>Biotic Potential and Natality</i>	254
6.3	<i>Mortality, Survivorship Curves, Life Table, Age Structure</i>	256
6.4	<i>Concept of Carrying Capacity and Environmental Resistance</i>	261
6.5	<i>Population Growth Forms</i>	263
6.6	<i>Life History Strategy</i>	268
6.7	<i>Population Fluctuations</i>	272
6.8	<i>Population Interactions</i>	276
6.9	<i>Concept of Density-Dependent and Density-Independent Action in Population Control</i>	289
6.10	<i>Human Population Growth</i>	289
7.	Natural Resource Ecology	295
7.1	<i>Concept and Classification of Resource</i>	295
7.2	<i>Non-renewable Resources</i>	296
7.3	<i>Renewable Resources</i>	298
7.4	<i>Conservation and Resource Management</i>	331
8.	Pollution Ecology	360
8.1	<i>Concept of Pollution</i>	360

8.2	<i>Air Pollution: Concept</i>	361
8.3	<i>Water Pollution</i>	398
8.4	<i>Solid Waste Pollution</i>	419
8.5	<i>Hazardous Waste and Toxic Chemicals</i>	430
8.6	<i>Soil Pollution</i>	436
8.7	<i>Drug Abuse</i>	439
8.8	<i>Noise Pollution</i>	440
8.9	<i>Indoor Pollution</i>	446
8.10	<i>Pollution Due to Radiation</i>	446
8.11	<i>Bioindicators</i>	448
8.12	<i>Industrial Accidents</i>	450
8.13	<i>Provisions in the Indian Constitution and Environmental Laws</i>	456
8.14	<i>Environmental Management</i>	458

9. Environmental Toxicology **461**

9.1	<i>Toxic Chemicals and Definition of Toxicology</i>	461
9.2	<i>Toxic Chemicals</i>	462
9.3	<i>Factors Affecting Toxicity</i>	464
9.4	<i>Routes and Rate of Administration</i>	465
9.5	<i>Environmental Factors/Behavioural Factors</i>	466
9.6	<i>Effect and Response</i>	467
9.7	<i>Synergism and Antagonism</i>	468
9.8	<i>Basic Principles of Dose Response</i>	468
9.9	<i>Statistical Concept of Toxicity</i>	472
9.10	<i>Translocation of Toxicants</i>	473
9.11	<i>Mechanism of Toxicant Action</i>	475
9.12	<i>Biotransformation of Toxicants</i>	477
9.13	<i>Bio-accumulation of Pollutants/Xenobiotics</i>	479
9.14	<i>Antidotes</i>	479
9.15	<i>Toxicity Tests</i>	480
9.16	<i>Some Case Studies</i>	480
	<i>Appendix I</i>	488
	<i>Appendix II</i>	488

Bibliography	490
---------------------	------------

Index	519
--------------	------------