## TRAVBILLE OUF COMMITTEINITIS

Preface xv About the Author xxv Study Skills xxvii

PART :	
	*
*** ** *** ***************************	**********
1264 4 4 4 4 4 5 5 5 6 6 6 6 6 6 6 6 6 6 6	(4) 6 * * * * * * * * * * * * * * * * * *
aternation is a subserver	5 . 5

# Chapter 1 Environmental Science, Sustainability, and Critical Thinking......2

- 1.1 Encouraging Signs/Continuing Challenges 3
- 1.2 What Is Environmental Science? 8
- **1.3** Science and Scientific Method: Keys to Understanding Environmental Issues and Creating Lasting Solutions 8
- 1.4 Critical Thinking Skills 12

#### Spotlight on Sustainable Development 1-1

The Netherlands' Green Plan Revolutionizes the Way Industries Function 4

### Spotlight on Sustainable Development 1-2

The Philadelphia Eagles Go Green! 7

## Chapter 2 Environmental Protection and Sustainability......17

- **2.1** Environmental Protection and Sustainable Development 18
- **2.2** Meeting Human Needs While Protecting the Environment 21
- **2.3** Human Settlements: Networks of (Unsustainable) Systems 29
- 2.4 Why Are Human Systems Unsustainable? 29
- **2.5** Applying the Principles of Sustainable Development 31

### Spotlight on Sustainable Development 2-1

Treading Lightly on the Earth: Creating Sustainable Homes for the 21st Century and Beyond 32

## Chapter 3 Understanding the Root Causes of the Environmental Crisis . . . . . . 38

- 3.1 Roots of the Environmental Crisis 39
- 3.2 Leverage Points 48

# Spotlight on Sustainable Development 3-1 Ashland, Oregon Shows That Water Conservation Works 52

## 

### 

- 4.1 Humans and Nature: The Vital Connections 57
- **4.2** Ecology: The Study of Natural Systems 57
- 4.3 The Structure of Natural Systems 58
- 4.4 Ecosystem Function 69

Point/Counterpoint: Controversy over Extinction 65

### Spotlight on Sustainable Development 4-1

Sustainable Sewage Treatment: Mimicking Nature 67

### Spotlight on Sustainable Development 4-2

Colleges and Universities Go Green 72

## Chapter 5 Principles of Ecology: Biomes and Aquatic Life Zones......80

- 5.1 Weather and Climate: An Introduction 81
- 5.2 The Biomes 84

<b>5.3</b> Aquatic Life Zones 95	Chapter 9 Stabilizing the Human Population: Strategies for Sustainability166
Spotlight on Sustainable Development 5-1 Dreaming of a Green Christmas 99	
Chapter 6 Principles of Ecology: Self- Sustaining Mechanisms in Ecosystems105	<b>9.1</b> Achieving a Sustainable Human Population: The Challenges 167
<b>6.1</b> Homeostasis: Maintaining the Balance 106	<b>9.2</b> Stabilizing the Human Population: Some Strategies 168
<b>6.2</b> Natural Succession: Establishing Life on Lifeless Ground 113	<b>9.3</b> Overcoming Barriers 175
<b>6.3</b> Evolution: Responding to Change 119	9.4 Ethics and Population Stabilization 177
<b>6.4</b> Human Impact on Ecosystems 122	9.5 Status Report: Progress and Setbacks 178
Point/Counterpoint: Environmentalism: On Trial 107	Spotlight on Sustainable Development 9-1
Spotlight on Sustainable Development 6-1	Controlling Urban Sprawl: The Other Kind of Population Control 171
Restoration Ecology: Sustaining the Biosphere 124	Spotlight on Sustainable Development 9-2 Cleaning Products Go Green 174
Chapter 7 Human Ecology: Our	Section 17
Changing Relationship with the Environment130	17.4371 41
<b>7.1</b> Human Biological Evolution: Some Highlights 131	alegatelelikuma establea aleberelelika astelem
<b>7.2</b> Human Cultural Evolution: Our Changing Relationship with Nature 132	A4149498494-A41444
7.3 The Population, Resources, and Pollution Model 139	
7.4 The Sustainable Society: The Next Step 141	Chapter 10 Creating a Sustainable System of Agriculture to Feed the
Spotlight on Sustainable Development 7-1 Agroforestry: Tapping Ancient Wisdom 135	World's People184
Spotlight on Sustainable Development 7-2  Monfort Boys' School: Mining Human Wastes to Feed	<b>10.1</b> Hunger, Malnutrition, Food Supplies, and the Environment 185
People 141	10.2 Understanding Soils 187
	10.3 Barriers to a Sustainable Agricultural System 189
	<b>10.4</b> Solutions: Building a Sustainable Agricultural System 196
*:\$	Spotlight on Sustainable Development 10-1 The Green Wall of China: Stopping the Spread of Desert 201
Chapter 8 Population: Measuring Growth and Its Impact146	Spotlight on Sustainable Development 10-2 Community-Supported Agriculture 206
	Chapter 11 Preserving Biological
8.1 The Growing Human Population 147	Diversity215
<ul><li>8.2 Understanding Populations and Population</li><li>Growth 153</li></ul>	<b>11.1</b> Biodiversity: Signs of Decline 216
<b>8.3</b> The Future of World Population: Some Projections and Concerns 162	<b>11.2</b> Causes of Extinction and the Decline in Biodiversity 218
Point/Counterpoint: The Population Debate 151	<b>11.3</b> Why Protect Biodiversity? 225
Spotlight on Sustainable Development 8-1	11.4 How to Save Endangered Species and Protect

Thailand's Family Planning Success Story 154

Biodiversity—A Sustainable Approach 227

Point/Counterpoint 11-1 Preserving Wildlife, Usurping Private Property Rights? 230	<b>14.7</b> Establishing Priorities 344
	Spotlight on Sustainable Development 14-1
Point/Counterpoint 11-2 Controversy Over Wolf Reintroduction 233	Controversy Over Oil Exploration in the Arctic National Wildlife Refuge 310
Spotlight on Sustainable Development 11-1 Predator Friendly Wool and Wolf Country Beef: You	<b>Point/Counterpoint 14-1</b> Should We Drill for Oil in the Arctic National Wildlife Refuge? 312
Must Have Read the Label Wrong 236  Spotlight on Sustainable Development 11-2	Point/Counterpoint 14-2 Should Nuclear Power Be Revived? 337
Debt-for-Nature Swaps 240  Chapter 12 Grasslands, Forests, and	Spotlight on Sustainable Development 14-2 Coca-Cola Goes Green 344
Wilderness: Sustainable Management Strategies245	Chapter 15 Foundations of a Sustainable Energy System: Conservation and
<b>12.1</b> The Tragedy of the Commons 246	Renewable Energy347
<b>12.2</b> Rangelands and Range Management: Protecting the World's Grasslands 247	<b>15.1</b> Energy Conservation: Foundation of a Sustainable Energy System 349
12.3 Forests and Forest Management 252	<b>15.2</b> Renewable Energy Sources 358
12.4 Wilderness and Wilderness Management 265	<b>15.3</b> Is a Renewable Energy Supply System Possible? 375
Spotlight on Sustainable Development 12-1 Saving the World's Tropical Rain Forests 254	Spotlight on Sustainable Development 15-1 Reinventing the Automobile 353
<b>Point/Counterpoint:</b> Controversy Over Old-Growth Forests in the Pacific Northwest 262	Spotlight on Sustainable Development 15-2
Chapter 13 Water Resources:	A Solar Giant Grows Taller 365
Preserving Our Liquid Assets and Protecting Aquatic Ecosystems270	<b>Viewpoint</b> Bird Kills from Commercial Wind Farms: Fact or Fiction? 368
<b>13.1</b> The Hydrological Cycle 271	<b>Point/Counterpoint</b> The Debate over Hydrogen Energy 376
<b>13.2</b> Water Issues Related to Supply and Demand 273	Chapter 16 The Earth and Its Mineral
<b>13.3</b> Flooding: Problems and Solutions 286	Resources383
<b>13.4</b> Wetlands, Estuaries, Coastlines, and Rivers 290	<b>16.1</b> The Earth's Mineral Riches 384
Spotlight on Sustainable Development 13-1 Undoing the Damage to Florida's Kissimmee River 278	<b>16.2</b> Environmental Impacts of Mineral Exploitation: A Brief Overview 387
Spotlight on Sustainable Development 13-2 Ecological Solutions to Flooding and Water Supply Problems 281	<b>16.3</b> Supplying Mineral Needs Sustainably 388
	<b>16.4</b> Expanding Reserves 394
Chapter 14 Nonrenewable Energy	<b>16.5</b> Finding Substitutes 397
Sources302	<b>16.6</b> Personal Actions 397
<b>14.1</b> Energy Use: Our Growing Dependence on	Point/Counterpoint Reforming the 1872 Mining Act 390
Nonrenewable Fuels 303	Spotlight on Sustainable Development 16-1
14.2 What Is Energy? 305	Antarctica: Protecting the Last Frontier 395
14.3 Fossil Fuels: Analyzing Our Options 307	Chapter 17 Creating Sustainable Cities,
<b>14.4</b> Fossil Fuels: Meeting Future Demand 322	Suburbs, and Towns: Sustainable
<b>14.5</b> Nuclear Energy 325	Community Development and Environmental Protection400
<b>14.6</b> Guidelines for Creating a Sustainable Energy System 343	<b>17.1</b> Cities and Towns as Networks of Systems 401

17.2 Land-Use Planning and Sustainability 404	19.5 Noise: The Forgotten Pollutant 468
17.3 Shifting to a Sustainable Transportation	19.6 Indoor Air Pollution 471
System 410  Spotlight on Sustainable Development 17-1  Cohousing: Building a Community 408	Spotlight on Sustainable Development 19-1 Germany's Sustainable Approach Pays Huge Dividends 467
Spotlight on Sustainable Development 17-2 Curitiba, Brazil—A City with a Sustainable Vision 414	Chapter 20 Global Air Pollution: Ozone Depletion, Acid Deposition, and Global Climate Change
Spotlight on Sustainable Development 17-3 Car Sharing: On the Road—Cheaper and Greener 416	<b>20.1</b> Stratospheric Ozone Depletion 477
Spotlight on Sustainable Development 17-4 Masdar City: A Solar Oasis 418	<b>20.2</b> Acid Deposition 483
	<b>20.3</b> Global Climate Change 492
PART S	Spotlight on Sustainable Development 20-1 Intel Pledges Huge Purchase of Green Energy 497
**************************************	Chapter 21 Water Pollution: Sustainably Managing a Renewable Resource
	<b>21.1</b> Surface Water Pollution 512
Chapter 18 Principles of Toxicology and Risk Assessment	<b>21.2</b> Groundwater Pollution 522
	21.3 Ocean Pollution 524
<b>18.1</b> Principles of Toxicology 423	21.4 Water Pollution Control 529
<b>18.2</b> Mutations, Cancer, and Birth Defects 428	Spotlight on Sustainable Development 21-1
<b>18.3</b> Reproductive Toxicity 433	Cleaning Up the Great Lakes 532
<b>18.4</b> Environmental Hormones 433	Chapter 22 Pests and Pesticides:
<b>18.5</b> Case Studies: A Closer Look 434	Growing Crops Sustainably541
<b>18.6</b> Controlling Toxic Substances: Toward a Sustainable Solution 436	<b>22.1</b> Chemical Pesticides 542
18.7 Risk and Risk Assessment 440	<b>22.2</b> Controlling Pesticide Use 551
Spotlight on Sustainable Development 18-1 Getting the Lead Out: Steps to Reduce Lead Exposure	<b>22.3</b> Integrated Pest Management: Protecting Crops Sustainably 555
in the United States 438  Point/Counterpoint Are Current Procedures for Determining Carcinogens Valid? 444	Spotlight on Sustainable Development 22-1 Indonesia Turns to Biological Pest Control 554
Chapter 19 Air Pollution and Noise: Living and Working in a Healthy	Chapter 23 Hazardous and Solid Wastes: Sustainable Solutions
Environment	<b>23.1</b> Hazardous Wastes: Coming to Terms with the Problem 567
19.1 Air: The Endangered Global Commons 451	23.2 Managing Hazardous Wastes 571
<b>19.2</b> The Effects of Weather and Topography on Air Pollution 455	23.3 Solid Wastes: Understanding the Problem 580
19.3 The Effects of Air Pollution 457	23.4 Solving a Growing Problem Sustainably 581
<b>19.4</b> Air Pollution Control: Toward a Sustainable Strategy 461	Spotlight on Sustainable Development 23-1 Plants Clean Up Toxic Chemicals 576

(ARIG	<b>25.6</b> Environmental Protection versus Jobs: Problem or Opportunity? 637
- Algerial (1948) (1984) - France (1984) - Fra	Spotlight on Sustainable Development 25-1 A Small Business Park Unpaves the Way to a Sustainable Future 616
Chapter 24 Environmental Ethics: The Foundation of a Sustainable Society596	<b>Spotlight on Sustainable Development 25-2</b> Cultural Survival: Serving People and Nature Sustainably 630
<b>24.1</b> The Frontier Mentality Revisited 597	Spotlight on Sustainable Development 25-3 Principles of Natural Capitalism 635
<b>24.2</b> Sustainable Ethics: Making the Transition 598	Chapter 26 Law, Government, and Society641
24.3 Developing and Implementing Sustainable	
Ethics 600 <b>24.4</b> Overcoming Obstacles to Sustainability 606	<b>26.1</b> The Role of Government in Environmental Protection 642
24.5 Sustainable Ethics: How Useful Are They? 609	<b>26.2</b> Political Decision Making: The Players and the
Viewpoint Why We Should Feel Responsible for Future	Process 646
Generations 601  Spotlight on Sustainable Development 24-1  First Publisher in North America to Go Carbon  Neutral 602	<b>26.3</b> Environment and Law: Creating a Sustainable Future 649
	<b>26.4</b> Creating Governments That Foster Sustainability 656
Spotlight on Sustainable Development 24-2 Students Put Rotting Garbage to Use Heating	<b>26.5</b> Global Government: Towards a Sustainable World Community 661
School 608  Chapter 25 Economics and the	Spotlight on Sustainable Development 26-1 Greening the White House 645
Environment612	<ul> <li>Point/Counterpoint Direct Action: Does It Help or Hinder the Environmental Movement? 651</li> <li>Spotlight on Sustainable Development 26-2         <ul> <li>Earth Summit II: The Follow-Up to Rio 664</li> </ul> </li> </ul>
<b>25.1</b> Economics, Environment, and Sustainability 613	
<b>25.2</b> The Economics of Pollution Control 619	
25.3 The Economics of Resource Management 622	
25.4 What's Wrong with Economics: An Ecological	Glossary667

Index ......678

Perspective 624

**25.5** Creating a Sustainable Economic System: Challenges in the Industrial World 630