

List of Figures	x
List of Plates	xii
List of Tables	xiii
Series Editors' Preface	xv
Preface	xvi
Acknowledgments	xviii
ONE Land Degradation: Human and Physical Interactions	1
Introduction	1
Land Degradation: its Definition	2
Long-term (Nonreversible) and Short-term (Reversible) Land Degradation	5
Stability and resilience	5
Time	6
Human Causes of Degradation	14
Introduction	14
The ecological transition	16
Intentional and unintentional change	18
The limitations of economic evaluation	20
Governmental contradictions	23
Summary	23
TWO Land Use and Degradation in Historical Perspective	25
Human Causation in Land Degradation	25
Run-on Farming in the Negev	29
Irrigation in the Mesopotamian Lowland	41
Summary	52
THREE The Physical Domain and Land Degradation	55
Introduction	55
Climatological Factors	57
Precipitation factors	58
Temperature factors	69
Evapotranspiration	73
Salinization	77

Geomorphological Factors	83
Degradation potential and tectonic processes	84
Degradation potential and exogenic (surface) processes	89
Summary	96
FOUR The Physical Domain: Catalysts of Change	98
Introduction	98
The Soil Component	100
The soil system	102
Soils and some responses to low- and high-intensity events	109
The Climatic Component	114
The Biological Component	116
The Geologic/Tectonic Component	119
Summary	121
FIVE Unintentional Destructive Change in Interactive Systems	123
Introduction	123
Human Attempts to Stabilize Natural Dynamic Systems	124
Variability	124
Environmental deficiencies	125
Food Production	127
Irrigation	128
Animal husbandry	146
Rainfed agriculture	153
Summary	174
SIX Unintentional Destructive Change in Interactive Systems: Impacts of Water Demands, Energy, Transportation, and Urbanization	175
Introduction	175
Common Property Resources	176
Characteristics of common property resources	177
Conclusions	187
Urban Growth	189
Superficial land changes associated with urban areas	190
Satisfying the needs of urban areas	193
Energy Production and Other Raw Materials	204
Mining	204
Nuclear energy production	209
Wood and other biomass utilization	212
Transportation	220
Highways	221
Harbors and coasts	223
Summary	226

SEVEN Creative Destruction	228
Introduction	228
Low-intensity Systems	230
Hunting and gathering	231
Shifting cultivation	236
Pastoral nomadism	242
Moderate-intensity Systems	249
Terracing and creative destruction	251
Creative destruction in the Chinese pond–dike integrated system	257
Drainage and creative destruction in the American Midwest	263
Conclusions	268
High-intensity Systems	269
The Broads and accidental creative destruction	270
Drainage, flood protection, and creative destruction	273
Summary	285
EIGHT Land Degradation and Creative Destruction: Retrospective	288
Introduction	288
Nature, Society, and Variability	288
Nature, Society, and Technology	292
Commandments for the Minimization of Land Degradation and for Sustainable Development	297
References	306
Index	329