

Desertification

**Environmental Degradation
in and around Arid Lands**

edited by Michael H. Glantz

with a Foreword by Viktor A. Kovda

**Westview Special Studies in
Natural Resources and Energy Management**

Desertification

Environmental Degradation
in and around Arid Lands

edited by Michael H. Glantz
with a Foreword by Viktor A. Kovda

Westview Press
Boulder, Colorado

Contents

<i>Foreword</i> , Viktor A. Kovda	xiii
<i>Preface</i>	xv
<i>The Contributors</i>	xvii
1. The U.N. and Desertification: Dealing with a Global Problem, <i>Michael H. Glantz</i>	1
Definitions of Desertification	2
Cycles of Interest in Desertification	2
Definition of a Global Problem	4
Global Problems and Desertification.....	5
The International Setting.....	9
The National Setting.....	11
2. The Nature and Causes of Desertization, <i>H. N. Le Houérou</i>	17
The Desert and Its Limits	18
The Nature of the Phenomenon	19
Is Desertization Irreversible?.....	21
Importance of Desertization	22
Causes of Desertization.....	23
Is There a General, Long-Term Increase in Aridity?.....	23
Man and Human Actions:	
Deterioration of the Ecological Equilibrium.....	25
Conclusions	28
3. The Other Energy Crisis, <i>Erik P. Eckholm</i>	39
An Economic Burden	41
Ecological Consequences.....	43
Dangerous Substitutes	44
A Closing Circle	46
A Renewable Resource	47

Political, Cultural, and Administrative Tangles.....	49
Alternative Fuels.....	51
Back to the Basics.....	53
4. Ecological Deterioration: Local-Level Rule-Making and Enforcement Problems in Niger, <i>James T. Thomson</i>	57
Economic and Legal Aspects of Ground Cover Use.....	58
Use Patterns.....	59
Consumptive Uses: Farming.....	59
Consumptive Uses: Herding.....	60
Logic of Regulated Common Property Resource.....	62
Logic of Unregulated Common Property Resource.....	63
National Policy in Practice:	
Local-Level Forestry Cases.....	64
Analysis of Cases.....	68
Reform Proposals.....	71
Individual Ownership of Trees.....	72
Village-Level Ownership of Trees.....	74
Summary.....	75
5. Rainfall Statistics, Droughts, and Desertification in the Sahel, <i>Richard W. Katz</i> and <i>Michael H. Glantz</i>	81
Perceptions of "Normal" Rainfall.....	82
Sahelian Rainfall Statistics.....	85
Shape of the Distribution.....	87
Central Tendency.....	90
Trends.....	93
Other Factors Affecting the Social Value of Rainfall.....	94
Desertification.....	95
Playing the Odds.....	97
6. Ocean Deserts and Ocean Oases, <i>J. Dana Thompson</i>	103
Ocean Deserts and Ocean Oases:	
The Biological Evidence.....	104
Upwelling, Climate, and Coastal Deserts.....	108
Ocean Desertification.....	119
Concluding Remarks.....	132

7.	Climate, Desertification, and Human Activities, <i>William W. Kellogg and Stephen H. Schneider</i>	141
	Deserts of the Past	142
	What Makes It Rain in a Desert?	148
	Human Influence on Deserts	150
	Global Effects	152
	Concluding Comments.....	156
8.	Desertification and Population: Sub-Saharan Africa, <i>Helen Ware</i>	165
	The Demography of the Sahelian Countries.....	168
	Agriculture and Population Growth	173
	The Nomads	182
	Conclusion.....	194
9.	Principal Problems of Desert Land Reclamation in the U.S.S.R., <i>A. G. Babayev</i>	203
	Water Supply	206
	Irrigation.....	208
	Pastures	210
	Plant Cover.....	211
	Blowing Sand	211
	Solar/Wind Energy.....	211
	Conclusion.....	213
	Appendix: Abstracts from <i>Problems of Desert Development</i> (Ashkhabad, U.S.S.R.).....	215
10.	Interim Report of the South African Drought Investigation Commission, April 1922	233
	Introduction.....	233
	Rainfall.....	236
	Kraaling of Stock.....	239
	Overstocking.....	242
	Water Supply.....	244
	Deterioration of Vegetal Covering	246
	Soil Erosion	252
	Improvement of Farming Methods and Conditions.....	258

Indigency Arising out of Drought Losses.....	261
Recommendations	264
Organisation of Farming Community.....	265
Extermination of the Jackal.....	267
Provision of Cheap Fencing Material.....	269
Development of Water Supply for Stock	270
The State and Soil Conservation	271
Propaganda and Investigation by the Department of Agriculture.....	273
11. Pastoral Development in Somalia:	
Herding Cooperatives as a Strategy against Desertification and Famine, <i>Jeremy Swift</i>	275
The Somali Pastoral Ecosystem.....	276
Development of Commercial Pastoralism	285
The Consequences of Increased Commercial Pastoralism.....	287
Planning the Future.....	291
12. Climate and Weather Modification in and around Arid Lands in Africa, <i>Michael H. Glantz</i>	307
The Sahara.....	308
Vegetation Modification.....	311
Atmospheric Circulation Modification.....	315
Creation of African Seas.....	318
Precipitation Modification.....	325
Concluding Remarks.....	331
<i>Index</i>	339