

Contents

Forewordxiii
Preface	xv
Acknowledgements	xvii
Abbreviationsxxi
CHAPTER 1. Background and Overview	1
Definitions, Concepts, and Challenges for Policymaking	1
Overview of the Book	7
PART I	
<i>The Need for Environmental and Natural Resource Policy</i>	
Consequences of Economic Growth	11
Institutional and Policy Failure	13
CHAPTER 2. Classical Causes of Environmental Degradation	15
Growth and the Environment	15
Welfare and Policy Reform	18
Market Failure	21
Externalities	23
CHAPTER 3. Public Economics and Information	27
Public Goods, Club Goods, and Common Property	27
Congestion	30
Asymmetric Information and Uncertainty	31
CHAPTER 4. Adapting Models to Ecosystems:	
Ecology, Time, and Space	36
A Simple Bioeconomic Model of a Fishery	36
Bioeconomics and the Management of Ecosystems	40

Management in an Intertemporal Setting 45

Spatial Heterogeneity and Land Use 49

CHAPTER 5. The Evolution of Rights. 53

Real Property 55

Common Property Resources 58

Water Law 59

Lessons for Environmental Externalities and Commons 61

PART II

Review of Policy Instruments

CHAPTER 6. Direct Regulation of the Environment 71

Optimality and Policy Instruments 71

Direct Provision of Public Goods 74

Regulation of Technology 75

Regulation of Performance 79

CHAPTER 7. Tradable Permits 82

U.S. Emissions Trading Programs 85

Other Emissions Trading Programs 91

Trading Programs for Other Resources 92

CHAPTER 8. Taxes 94

Pigovian Taxes 94

Taxes, Charges, and Earmarking 97

Taxes on Inputs and Outputs 99

Taxing Natural Resources 101

**CHAPTER 9. Subsidies, Deposit–Refund Schemes,
and Refunded Emissions Payments 102**

Subsidies and Subsidy Removal 102

Deposit–Refund, Tax–Subsidy, and Other Two-Part Tariff Systems 104

Refunded Emissions Payments 106

**CHAPTER 10. Property Rights, Legal Instruments,
and Informational Policies 109**

Creation of Property Rights 109

Common Property Resource Management 111

Liability and Other Legal Instruments 115

Environmental Agreements 119

Provision of Information 122

CHAPTER 11. National Policy and Planning 128

PART III

Selection of Policy Instruments

CHAPTER 12. Efficiency of Policy Instruments 136

Heterogeneous Abatement Costs 136

Heterogeneous Damage Costs	141
Efficiency in an Intertemporal Sense	145
Technological Progress, Growth, and Inflation.	146
CHAPTER 13. Role of Uncertainty and Information Asymmetry.	150
Uncertainty in Abatement and Damage Costs (Price vs. Quantity)	150
Uncertainty Concerning Type of Polluter or User	154
Uncertainty Concerning Polluter or User Behavior	157
CHAPTER 14. Equilibrium Effects and Market Conditions	167
Goal Fulfillment, Abatement, and Output Substitution.	167
General Equilibrium, Taxation, and the Double Dividend	171
Adapting to Market Conditions.	175
CHAPTER 15. Distribution of Costs	180
Distribution of Costs and Rights between Polluters and Society	181
Allocation of Rights	184
Incidence of Costs between Polluters	186
Income Distributional Effects and Poverty	189
CHAPTER 16. Politics and Psychology of Policy Instruments	193
Politics of Policy Instrument Selection.	194
Enforcement, Monitoring, and the Psychology of Instrument Choice	197
Policymaking in Severely Resource-Constrained Economies	199
CHAPTER 17. International Aspects	203
International Environmental Issues	203
Trade, International Relations, and Local Policymaking	206
Competitiveness and the Porter Hypothesis	210
CHAPTER 18. Design of Policy Instruments.	212
Environmental Policy Selection Matrix	212
Interaction between Policies	217

PART IV

Policy Instruments for Road Transportation

CHAPTER 19. Environmental Damage Caused by Transportation	222
Vehicles.	222
Location	223
Combining Vehicle Age and Location.	224
Engine Temperature and Other Factors.	225
CHAPTER 20. Environmental Road Pricing	228
Calculating Environmental Damage from Road Transportation	228
Simpler Pricing Schemes.	230
CHAPTER 21. Taxation or Regulation for Fuel Efficiency	239
Fuel Taxation.	239
Regulations Instead of Price Mechanisms	248

CHAPTER 22. Fuel Quality, Vehicle Standards, and Urban Planning . . .	252
Fuel Quality and the Phaseout of Lead	252
Policies for Fuel Quality in Sweden and Other Countries	259
Vehicle Standards, Efficiency, and Distributional Concerns	261
Urban Pollution in Developing-World Cities	267
CHAPTER 23. Lessons Learned: Transportation.	273

PART V

Policy Instruments for Industrial Pollution

CHAPTER 24. Experience in Developed Countries	278
Abating Sulfur Emissions	279
Reducing NO _x Emissions from Combustion.	285
Green Tax Reform in Sweden and Germany	290
Prohibition Compared with Other Policies: Trichloroethylene	294
Liability and Superfund	300
Information Provision and VAs on U.S. Toxic Emissions	302
Global Policymaking: Protecting the Ozone Layer	304
Global Climate Change: Domestic Policies and New Technology	305
CHAPTER 25. Experience in Developing Countries.	316
Environmental Funds and Other Instruments: CEE Countries	317
Environmental Fees and Funds: China	320
Environmental Charges: Rio Negro, Colombia.	323
Voluntary Participation in Emissions Control: Mexico.	325
Differentiated Electricity Tariffs: Mexico and Zambia	327
Information Provision and Institutional Capacity: Indonesia.	331
Two-Tier Pollution Regulation: India	336
Lessons Learned.	342

PART VI

Policy Instruments for the Management of Natural Resources and Ecosystems

CHAPTER 26. Water	346
Water Management and Tariffication	348
Tariff Structures in Some Middle Eastern Economies.	350
Water Tariffs in Chile	350
Water Management, Laws, and Pricing in Southern Africa.	352
Pricing Water When Metering Is Not Possible	354
CPR Management of Water	359
CHAPTER 27. Waste	362
Economic Incentives in Waste Management	363
Waste Management in Developing Countries	365
Tourism and Waste Management in the Caribbean	366
Eco-Labeling of Soaps and Detergents	369
Tradable Packaging Waste Recovery Notes	371

CHAPTER 28. Fisheries	373
Management of Small-Scale Subsistence Fisheries	377
ITQs in Fishery Management	381
Conclusions	387
CHAPTER 29. Agriculture	390
Managing Agricultural Runoff	392
Property Rights, Population Growth, and Soil Erosion	394
Risk in Sharecropper Agriculture	396
Eco-Taxes in Agroindustry	400
CHAPTER 30. Forestry	406
Subsidies	408
Taxes	409
Regulations	410
Forest Concessions and Timber Contracts	410
Certification	411
Carbon Offsets and Other Forms of International Payment	412
Clarification of Property Rights	413
CHAPTER 31. Ecosystems	416
CPR Management of Wildlife in Zimbabwe	417
Protection of Marine Ecosystems	420
Shaping Ecosystem Policy	427

PART VII

Conclusion

CHAPTER 32. Policy Issues and Potential Solutions	432
Policymaking Criteria	433
Efficiency	434
Uncertainty, Risk, and Information Asymmetry	436
Ecological and Technical Complexities	438
The Provision of Environmental Public Goods	439
Feasibility, Market Structure, and General Equilibrium Effects	441
Cost Distribution and the Politics of Policymaking	443
National and International Policymaking	444
Conclusion	445
References	449
Index	483
About the Author	504