

Contents

| | |
|------------------------------|------|
| Preface and acknowledgements | x |
| Notes on contributors | xiii |

I The issues

| | |
|---|----|
| 1 Saving the world's tropical forests | 2 |
| <i>David Pearce and Katrina Brown</i> | |
| 1.1 Introduction | 2 |
| 1.2 Benefits of forest conservation and the impacts of deforestation | 2 |
| 1.3 Rate of loss of tropical forests | 7 |
| 1.4 The fundamental causes of tropical deforestation | 10 |
| 1.5 Testing causal explanations of deforestation | 16 |
| 1.6 Controlling tropical deforestation: creating global environmental markets | 22 |
| 1.7 Conclusion | 26 |
| 2 Tropical deforestation: rates and patterns | 27 |
| <i>Norman Myers</i> | |
| 2.1 Introduction | 27 |
| 2.2 Tropical deforestation: a summary | 29 |
| 2.3 Main agents of deforestation | 32 |
| 2.4 Regrowth and secondary forests | 33 |
| 2.5 Future outlook | 34 |
| 2.6 Likely acceleration in the deforestation rate | 39 |
| 2.7 Conclusion | 40 |

II Explaining global deforestation

| | |
|--------------------------------|----|
| 3 Population and deforestation | 42 |
| <i>Matti Palo</i> | |
| 3.1 Introduction | 42 |
| 3.2 Modelling deforestation | 43 |
| 3.3 Empirical findings | 45 |
| 3.4 Comparative country cases | 50 |
| 3.5 Discussion | 54 |

| | | |
|-----|---|-----|
| 4 | International debt and deforestation | 57 |
| | <i>James Kahn and Judith McDonald</i> | |
| 4.1 | Introduction | 57 |
| 4.2 | The conceptual model | 59 |
| 4.3 | Data | 61 |
| 4.4 | Empirical results | 63 |
| 4.5 | Conclusions | 66 |
| 5 | Tropical forest depletion and the changing macroeconomy, 1967-85 | 68 |
| | <i>Ana Doris Capistrano</i> | |
| 5.1 | Introduction | 68 |
| 5.2 | The study period | 69 |
| 5.3 | Data | 72 |
| 5.4 | Variables | 73 |
| 5.5 | Statistical estimation | 77 |
| 5.6 | Results and discussion | 79 |
| 5.7 | Conclusion | 85 |
| 6 | Macroeconomic causes of deforestation: barking up the wrong tree? | 86 |
| | <i>Nemat Shafik</i> | |
| 6.1 | Introduction | 86 |
| 6.2 | The issues: macroeconomics and deforestation | 86 |
| 6.3 | Methodological issues | 87 |
| 6.4 | Empirical evidence | 88 |
| 6.5 | Conclusions | 94 |
| 7 | Population, development and tropical deforestation: a cross-national study | 96 |
| | <i>Thomas Rudel</i> | |
| 7.1 | Introduction | 96 |
| 7.2 | Data and methods | 97 |
| 7.3 | Findings | 101 |
| 7.4 | Discussion | 103 |
| 8 | Population, land-use and the environment in developing countries: what can we learn from cross-national data? | 106 |
| | <i>Richard Bilsborrow and Martha Geores</i> | |
| 8.1 | Introduction | 106 |
| 8.2 | Conceptual linkages between population, land-use and the environment | 107 |
| 8.3 | The data, such as they are | 111 |
| 8.4 | What do the data show? | 118 |
| 8.5 | Some conclusions and recommendations | 130 |

CONTENTS

| | | |
|-------------------------------------|---|-----|
| 9 | Tropical deforestation and agricultural development in Latin America | 134 |
| | <i>Douglas Southgate</i> | |
| 9.1 | Introduction | 134 |
| 9.2 | A model of agricultural frontier expansion | 135 |
| 9.3 | Data | 137 |
| 9.4 | Regression results | 140 |
| 9.5 | How to contain agricultural colonization | 141 |
| 9.6 | Implications for conservation strategies | 143 |
| III Country case studies | | |
| 10 | The causes of tropical deforestation: a quantitative analysis and case study from the Philippines | 146 |
| | <i>David Kummer and Chi Ho Sham</i> | |
| 10.1 | Introduction | 146 |
| 10.2 | A review of quantitative work on deforestation | 147 |
| 10.3 | A Philippine case study of the causes of deforestation | 152 |
| 10.4 | Population growth and tropical deforestation | 155 |
| 10.5 | Conclusion | 158 |
| 11 | Incentives for tropical deforestation: some examples from Latin America | 159 |
| | <i>Dennis Mahar and Robert Schneider</i> | |
| 11.1 | Migration to the frontier | 159 |
| 11.2 | The paramount importance of roads | 161 |
| 11.3 | Who owns the land? | 162 |
| 11.4 | Directed settlement | 164 |
| 11.5 | Policy-induced price distortions | 165 |
| 11.6 | Lack of support for parks and reserves | 167 |
| 11.7 | Recommendations for policy reform | 168 |
| 11.8 | Conclusions | 171 |
| 12 | An econometric model of Amazon deforestation | 172 |
| | <i>Eustáquio Reis and Rolando Guzmán</i> | |
| 12.1 | Introduction | 172 |
| 12.2 | Early econometric results on tropical deforestation | 173 |
| 12.3 | An economic model of Amazon deforestation | 175 |
| 12.4 | Estimation issues: spatial autocorrelation (SAC) and seemingly unrelated regression (SURE) | 179 |
| 12.5 | The data | 182 |
| 12.6 | Estimation results | 183 |
| 12.7 | Simulation results | 189 |
| 12.8 | Concluding remarks | 191 |

CONTENTS

| | | |
|-----------|--|------------|
| 13 | An econometric analysis of the causes of tropical deforestation: the case of Northeast Thailand | 192 |
| | <i>Theodore Panayotou and Somthawin Sungsuwan</i> | |
| 13.1 | Introduction | 192 |
| 13.2 | A theoretical model of tropical deforestation | 193 |
| 13.3 | Demand for logging | 193 |
| 13.4 | The demand for fuelwood | 195 |
| 13.5 | Derived demand for agricultural land | 197 |
| 13.6 | A deforestation function | 199 |
| 13.7 | The causes of deforestation in Northeast Thailand | 201 |
| 13.8 | Data and method of estimation | 202 |
| 13.9 | Some preliminary results | 203 |
| 13.10 | Projections | 206 |
| 13.11 | Summary and policy implications | 207 |
| 14 | Deforestation in Thailand | 211 |
| | <i>Chiara Lombardini</i> | |
| 14.1 | Forests in Thailand | 211 |
| 14.2 | The causes of deforestation in Thailand | 212 |
| 14.3 | Data and methods of estimation | 215 |
| 14.4 | Regression results and indications for further research | 215 |
| 15 | Government failure and deforestation in Indonesia | 217 |
| | <i>Diane Osgood</i> | |
| 15.1 | Government policy and deforestation | 217 |
| 15.2 | A model of deforestation | 221 |
| 15.3 | Model results | 223 |
| 15.4 | Conclusions | 225 |
| 16 | An analysis of the causes of deforestation in India | 226 |
| | <i>Manab Chakraborty</i> | |
| 16.1 | Introduction | 226 |
| 16.2 | Extent and rate of deforestation | 226 |
| 16.3 | Changes in forest area | 227 |
| 16.4 | Sources of deforestation: some hypotheses | 231 |
| 16.5 | Econometric analysis of the causes of Indian deforestation | 234 |
| 16.6 | Conclusions | 238 |
| IV | The tropical timber trade | |
| 17 | The timber trade and tropical deforestation in Indonesia | 242 |
| | <i>Edvard Barbier, Nancy Bockstael, Joanne Burgess, Ivar Strand</i> | |
| 17.1 | Introduction | 242 |
| 17.2 | The timber trade and tropical deforestation in Indonesia | 242 |

CONTENTS

| | | |
|-------|--|-----|
| 17.3 | Indonesian timber trade policies | 247 |
| 17.4 | Other Southeast Asian timber trade models | 250 |
| 17.5 | Timber trade and deforestation model of Indonesia | 252 |
| 17.6 | Sawnwood export taxes | 260 |
| 17.7 | Import ban | 262 |
| 17.8 | Revenue-raising import tax | 264 |
| 17.9 | Sustainable timber management | 266 |
| 17.10 | Conclusion | 267 |
| 18 | Deforestation: the rôle of the international trade in tropical timber | 271 |
| | <i>Edward Barbier, Joanne Burgess, Josh Bishop, Bruce Aylward</i> | |
| 18.1 | Introduction | 271 |
| 18.2 | Tropical timber production and trade: a brief overview | 271 |
| 18.3 | Analysis of the links between timber production, timber trade and tropical deforestation | 278 |
| 18.4 | Prices, substitution and demand for tropical timber products | 280 |
| 18.5 | Trade policy measures and sustainable forest management | 283 |
| 18.6 | Measures to raise revenues for sustainable forest management | 287 |
| 18.7 | Conclusion | 295 |
| 19 | The tropical timber trade and sustainable development | 298 |
| | <i>Jeffrey Vincent</i> | |
| 19.1 | Introduction | 298 |
| 19.2 | Misconceptions about the tropical timber trade | 299 |
| 19.3 | Boom-and-bust as sustainable development | 303 |
| 19.4 | The first policy failure: timber concession policies | 305 |
| 19.5 | The second policy failure: log-export restrictions | 306 |
| 19.6 | Conclusions | 308 |
| | References | 309 |
| | Index | 329 |