

# Contents

|  |           |
|--|-----------|
| List of figures .....  | x         |
| List of tables .....   | xiii      |
| Foreword by Jan Sendzimir .....  | xv        |
| Acknowledgements .....   | xviii     |
| <b>Preface .....</b>   | <b>2</b>  |
| <b>Part I. Foundations.....</b>  | <b>5</b>  |
| <b>Chapter 1. The economy, society and the environment.....</b>                      | <b>8</b>  |
| 1.1. Introduction .....  | 8         |
| 1.2. The dependence of the economy and society on the environment .....              | 10        |
| Tool 1.T1. Non-market valuation methods .....  | 14        |
| 1.3. External effects .....  | 16        |
| Tool 1.T2. Internalisation of external costs .....                                   | 19        |
| 1.4. Ignorance .....   | 21        |
| 1.5. Institutions and social capital.....  | 23        |
| Tool 1.T3. Social participation .....  | 25        |
| 1.6. Summary and conclusions .....   | 27        |
| Practical resources .....  | 28        |
| Questions .....  | 29        |
| Case study 1.C1. What is the Białowieża Forest worth? .....                          | 30        |
| Case study 1.C2. Cod fishing in the Baltic .....                                     | 34        |
| Case study 1.C3. A chipboard factory, a local community and the environment.....     | 39        |
| <b>Chapter 2. Systems thinking.....</b>  | <b>42</b> |
| 2.1. Introduction .....  | 42        |
| 2.2. Systems practice .....  | 47        |
| 2.3. Causal loop diagrams .....  | 51        |
| 2.4. Simulation and role-playing games .....   | 53        |
| 2.5. Summary and conclusions: sustainability as a systems concept.....               | 54        |
| Practical resources .....  | 55        |
| Questions .....  | 55        |
| Case study 2.C1. Sustainable development in the Barycz Valley .....                  | 58        |
| Case study 2.C2. Envisioning management alternatives for the Tisza river valley..... | 64        |
| <b>Chapter 3. Basic theory of sustainable development.....</b>                       | <b>69</b> |
| 3.1. Introduction .....  | 69        |
| 3.2. Attempts at operationalisation .....  | 69        |
| 3.3. Formalised approaches to intergenerational equity .....                         | 72        |
| 3.4. Indicators of sustainable development.....                                      | 73        |
| 3.5. The concept of welfare in economics .....                                       | 75        |
| 3.6. Greening the conventional GDP .....   | 77        |
| 3.7. Sustainability and the scale of actions .....                                   | 79        |
| 3.8. Summary and conclusions .....   | 80        |
| Practical resources .....  | 82        |
| Questions .....  | 82        |

|   |     |
|---|-----|
| <b>Part II. Business .....</b>  | 83  |
| <b>Chapter 4. Sustainability management system .....</b>  | 90  |
| 4.1. Introduction .....   | 90  |
| 4.2. The preparation phase .....  | 92  |
| 4.3. Vision .....   | 93  |
| 4.4. The sustainability programme .....   | 95  |
| 4.5. Implementation .....   | 97  |
| 4.6. Evaluation .....   | 98  |
| 4.7. The process of innovation .....  | 99  |
| 4.8. Stakeholder dialogue .....   | 99  |
| 4.9. The sustainability report .....  | 103 |
| 4.10. Summary and conclusions .....   | 104 |
| Practical resources .....   | 105 |
| Questions .....   | 105 |
| Case study 4.C1. The use of GRI Sustainability Reporting Guidelines at the BRE Bank .....                                       | 106 |
| Case study 4.C2. Setting up the 'Sustainable development and corporate social responsibility strategy of the PGNiG Group' ..... | 111 |
| <b>Chapter 5. Sustainable production .....</b>  | 117 |
| 5.1. Introduction: 'let's make the most of every piece of raw material' .....   | 117 |
| 5.2. Eco-efficiency .....   | 117 |
| Tool 5.T1. Life Cycle Assessment (LCA) .....  | 122 |
| Tool 5.T2. Eco-design .....   | 124 |
| 5.3. Industrial ecology .....   | 126 |
| 5.4. Summary and conclusions .....  | 131 |
| Practical resources .....   | 132 |
| Questions .....   | 132 |
| Case study 5.C1. LCA as a tool supporting eco-design .....  | 133 |
| <b>Chapter 6. Construction and architecture .....</b>   | 142 |
| 6.1. Introduction .....   | 142 |
| 6.2. Energy .....   | 143 |
| Tool 6.T1. Thermo-modernisation and improvement of heating efficiency .....   | 145 |
| 6.3. Raw materials and water .....  | 146 |
| 6.4. Indoor air and environmental quality .....   | 147 |
| 6.5. Building construction methods .....  | 148 |
| 6.6. Architectural design .....   | 149 |
| Tool 6.T2. Building certification .....   | 154 |
| 6.7. Summary and conclusions .....  | 155 |
| Practical resources .....   | 156 |
| Questions .....   | 156 |
| Case study 6.C1. Sustainable renovation of the Turzyn Neighbourhood in Szczecin .....   | 157 |
| Case study 6.C2. The straw bale house in Przelomka .....  | 163 |
| <b>Chapter 7. Supply chain management .....</b>   | 166 |
| 7.1. Introduction .....   | 166 |
| 7.2. From environmental management systems to sustainable supply chain management .....   | 167 |
| Tool 7.T1. The supplier audit .....   | 170 |
| 7.3. The buyer who dictates delivery conditions .....   | 173 |

|  |            |
|--|------------|
| Tool 7.T2. Green public procurement.....   | 174        |
| Tool 7.T3. Eco-labelling.....  | 179        |
| 7.4. Summary and conclusions .....   | 181        |
| Practical resources.....   | 182        |
| Questions.....   | 183        |
| Case study 7.C1. IKEA: 'low prices, but not at any price' .....                          | 184        |
| <b>Chapter 8. Replacing products with services .....</b>                                 | <b>189</b> |
| 8.1. Introduction .....  | 189        |
| 8.2. An economy based on functionality .....   | 190        |
| 8.3. Product-service systems (PSS).....  | 192        |
| 8.4. Summary and conclusions .....   | 195        |
| Practical resources.....   | 196        |
| Questions.....   | 196        |
| Case study 8.C1. Public libraries in Poland.....   | 197        |
| <b>Part III. Local authorities .....</b>   | <b>201</b> |
| <b>Chapter 9. Sustainable development strategies and indicators .....</b>                | <b>205</b> |
| 9.1. Introduction: sustainable development as a strategic objective .....                | 205        |
| 9.2. Strategic documents .....   | 207        |
| 9.3. Integration of the measurement of sustainable development and quality of life ..... | 208        |
| Tool 9.T1. Local Agenda 21 audit.....  | 212        |
| 9.4. Summary and conclusions .....   | 214        |
| Practical resources.....   | 215        |
| Questions.....   | 215        |
| Case study 9.C1. Local Agenda 21 in Poland.....  | 216        |
| Case study 9.C2. The standard of the UNDP Umbrella Project.....                          | 219        |
| <b>Chapter 10. Urbanism .....</b>  | <b>222</b> |
| 10.1. Introduction: urbanisation challenges .....  | 222        |
| 10.2. Evolving concepts of the city.....   | 222        |
| 10.3. Conditions for spatial planning in Poland.....                                     | 225        |
| Tool 10.T1. Development planning and programming .....                                   | 226        |
| 10.4. The principles of sustainable spatial development.....                             | 227        |
| Tool 10.T2. Spatial management.....  | 233        |
| Tool 10.T3. Social participation in spatial planning.....                                | 235        |
| Tool 10.T4. Certification .....  | 241        |
| 10.5. Summary and conclusions.....   | 242        |
| Practical resources.....   | 243        |
| Questions.....   | 244        |
| Case study 10.C1. 'Old' Nowa Huta .....  | 245        |
| Case study 10.C2. Siewierz eco-town .....  | 249        |
| <b>Chapter 11. Urban transport .....</b>   | <b>252</b> |
| 11.1. Introduction.....  | 252        |
| 11.2. Sustainable mobility – the birth of an idea .....                                  | 252        |
| Tool 11.T1. A public bicycle.....  | 254        |
| Tool 11.T2. Restricting car traffic.....   | 257        |
| 11.3. Transport as an integrated system .....  | 258        |

|   |            |
|---|------------|
| Tool 11.T3. Integrated transfer junctions.....  | 263        |
| 11.4. Sustainable mobility as a process .....   | 270        |
| 11.5. Summary and conclusions.....  | 273        |
| Practical resources.....  | 273        |
| Questions.....  | 273        |
| <i>Case study 11.C1. The transport system of Krakow.....</i>                          | 275        |
| <i>Case study 11.C2. The Śląsko-Dąbrowski Bridge in Warsaw.....</i>                   | 279        |
| <b>Chapter 12. Municipal management .....</b>   | <b>281</b> |
| 12.1. Introduction.....   | 281        |
| 12.2. Municipal waste management.....   | 283        |
| 12.3. Water and wastewater management.....  | 283        |
| Tool 12.T1. Separating toilets .....  | 290        |
| Tool 12.T2. Constructed wetlands.....   | 293        |
| 12.4. Energy management .....   | 297        |
| 12.5. Social participation.....   | 299        |
| 12.6. Summary and conclusions.....  | 301        |
| Practical resources.....  | 301        |
| Questions.....  | 302        |
| <i>Case study 12.C1. Wastewater treatment plant for Dziewin.....</i>                  | 303        |
| <b>Chapter 13. Public-private partnership .....</b>                                   | <b>309</b> |
| 13.1. Introduction.....   | 309        |
| 13.2. PPP as a way to better public service performance .....                         | 309        |
| 13.3. Preparation of a good partnership.....  | 317        |
| 13.4. Summary and conclusions.....  | 320        |
| Practical resources.....  | 320        |
| Questions.....  | 321        |
| <i>Case study 13.C1. Termy Warmińskie: an example of a partnership creation .....</i> | 322        |
| <b>Part IV. Consumers and citizens .....</b>  | <b>327</b> |
| <b>Chapter 14. Sustainable consumption .....</b>                                      | <b>330</b> |
| 14.1. Introduction.....   | 330        |
| 14.2. The tyranny of small decisions .....  | 330        |
| 14.3. Responsibility .....  | 334        |
| Tool 14.T1. Evaluation of corporate messages.....                                     | 336        |
| 14.4. Reason .....  | 338        |
| Tool 14.T2. Eco-teams .....   | 341        |
| 14.5. Summary and conclusions.....  | 341        |
| Practical resources.....  | 342        |
| Questions.....  | 343        |
| <i>Case study 14.C1. Consumer education by NGOs in Poland.....</i>                    | 344        |
| <i>Case study 14.C2. The fair trade sector in Poland.....</i>                         | 348        |
| <b>Chapter 15. Citizen activity networks .....</b>                                    | <b>353</b> |
| 15.1. Introduction.....   | 353        |
| 15.2. Just believe: the world is changeable! .....                                    | 354        |
| 15.3. The importance of social capital and mutual trust .....                         | 354        |
| 15.4. The character of the citizen sector in Poland.....                              | 357        |
| Tool 15.T1. The internet and social actions .....                                     | 358        |

|  |            |
|--|------------|
| 15.5. Social entrepreneurship, postmaterial values and creativity.....             | 360        |
| 15.6. Summary and conclusions: citizen's activities in the times of weak ties..... | 361        |
| Practical resources.....   | 362        |
| Questions.....   | 362        |
| Case study 15.C1. A Group of Certain People (GPO) .....                            | 363        |
| Case study 15.C2. Thematic villages .....  | 368        |
| <b>Concluding remarks .....</b>  | <b>373</b> |
| Bibliography .....   | 376        |
| Index .....  | 394        |