

Contents

<i>List of Figures</i>	x
<i>List of Tables</i>	xii
<i>Preface</i>	xiii
<i>Acknowledgments</i>	xv
<i>List of Abbreviations and Acronyms</i>	xvii
<i>Table of Authorities</i>	xix

1 Introduction 1

- I. The Science of Climate Change 1
 - A. The "Greenhouse" Effect 2
 - B. Anthropogenic GhG Emissions 3
 - C. The Impacts of Increased GhG Concentrations in the Atmosphere 6
 - D. Projections 7
 - E. Ways Forward 8
- II. Climate Change Laws and Policies 10
 - A. Climate Change Mitigation 10
 - B. Adaptation to Climate Change 11
- III. The International Law on Climate Change 12
 - A. The UNFCCC Regime 12
 - B. Relevant Provisions in Other Regimes 14
 - C. Relevant Norms of General International Law 15
- IV. Outline of the Book 17

2 The Rationale for International Action on Climate Change 19

- I. The Role of Science 20
- II. The Role of Economics 22
- III. Moral Perspectives 27
 - A. Corrective Justice 27
 - B. Distributive Justice 28
 - C. Intergenerational Justice 29
 - D. Environmental Justice 30
- IV. Psychological, Social and Political Obstacles 31
- V. Conclusion 32

3	The UNFCCC Regime, from Rio to Paris	33
I.	The UNFCCC	34
A.	The Ultimate Objective	35
B.	The Principles	36
C.	National Commitments	37
D.	Institutional Developments	38
II.	The Kyoto Protocol	39
A.	Quantified Emission Limitation and Reduction Commitments (QELRCs)	39
B.	Flexibility Mechanisms	40
C.	The Reception of the Kyoto Protocol	41
III.	The 2020 Horizon	42
A.	The AWG-LCA Track: The Copenhagen Accord and the Cancun Agreements	43
B.	The AWG-KP Track: The Doha Amendment to the Kyoto Protocol	45
IV.	The Paris Agreement	46
A.	Legal Nature	46
B.	The Objective	47
C.	Nationally Determined Contributions (NDCs)	47
D.	Boosting Parties' Commitment	49
V.	Conclusion	50
4	Relevant Developments in Other Regimes	51
I.	The Regime on the Protection of the Ozone Layer	51
II.	International Transportation	55
A.	Developments in International Maritime Law	56
B.	Developments in International Aviation Law	57
III.	Other Pioneering Initiatives on Climate Change Mitigation	60
IV.	Mainstreaming Adaptation Concerns in Relevant International Regimes	62
A.	The World Heritage Convention	62
B.	The Convention on Biological Diversity	63
V.	Conclusion	65
5	Relevant Norms of General International Law	66
I.	The No-Harm Principle	67
A.	Recognition in General International Law	67
B.	Relevance to Climate Change	69
II.	Other Principles of International Environmental Law	72
A.	The Concept of Sustainable Development	72
B.	The Precautionary Approach	73
C.	The Polluter-Pays Principle	74
D.	The Principle of Cooperation	75
III.	International Human Rights Law	76
IV.	Responsibility of States for Internationally Wrongful Acts	78
A.	Conditions to Invoke the Responsibility of States for Internationally Wrongful Acts	78
B.	Secondary Obligations	79
V.	Liability of States for Transboundary Harm Arising out of Hazardous Activities	82
VI.	The Application of General International Law	84
VII.	Conclusion	87

- 6 Differentiation 89**
- I. Grounds for Differentiation 90
 - A. Responsibility-Based Grounds for Differentiation 91
 1. Current GhG Emissions 91
 2. Historical and Future Emissions 93
 - B. Capacity-Based Grounds for Differentiation 95
 1. Population 95
 2. Development Levels 96
 3. Financial Capacity 97
 4. Geographic Circumstances 98
 - II. Differentiation in International Negotiations 98
 - A. Differentiation in the Regime on the Protection of the Ozone Layer 99
 - B. The Principle of Differentiation in the UNFCCC Regime 100
 - C. Self-Differentiation as an Alternative Approach to Differentiation under the UNFCCC Regime 104
 - D. Differentiation in Civil Aviation and Maritime Transportation 105
 - III. Conclusion 107
- 7 International Action on Climate Change Mitigation 108**
- I. State Obligations under General International Law 109
 - II. Action on Climate Change Mitigation under the UNFCCC Regime 111
 - A. Collective Objectives 111
 - B. National Commitments 113
 1. Emission Limitation and Reduction Commitments 113
 2. Accounting Commitments 117
 3. Commitments to Promoting and Facilitating Further Action 118
 - III. Action on Climate Change Mitigation under Other Treaty Regimes 120
 - A. Action Specific to Particular Gases 120
 - B. Action Specific to Particular Sectors 122
 - IV. An Overview of Implementation Measures 124
 - A. Command and Control Regulation 125
 - B. Price-Based Mechanisms 126
 - C. Leadership 129
 - V. Conclusion 131
- 8 Flexibility Mechanisms 132**
- I. Joint Implementation under the UN Framework Convention on Climate Change 133
 - II. Flexibility Mechanisms under the Kyoto Protocol 134
 - III. Flexibility Mechanisms under the Doha Amendment and the Cancún Agreements 137
 - IV. Flexibility Mechanisms under the Paris Agreement 139
 - V. An Assessment of Flexibility Mechanisms 140
 - VI. Conclusion 144
- 9 Geoengineering 145**
- I. The Precedent of Weather Modification Techniques 147
 - II. Geoengineering Options 149
 - A. Solar Radiation Management 149
 - B. Carbon Dioxide Removal 151
 1. Enhancing Natural Reservoirs of GhGs 151
 2. Carbon Capture and Storage 152

III. Regulating Geoengineering	153
A. The Opportunity to Resort to Some Forms of Geoengineering	154
B. The Regulation of Geoengineering	155
1. Protection of the Marine Environment	155
2. The Convention on Biological Diversity	156
3. The UNFCCC Regime	157
4. Domestic Regulation	158
C. Decision-Making	159
IV. Conclusion	160
10 International Action on Climate Change Adaptation	161
I. The Concept of Adaptation	163
II. Developments within the UNFCCC Regime	165
A. The UNFCCC	165
B. The Kyoto Protocol	167
C. The Bali Action Plan	168
D. The Copenhagen Accord and the Cancún Agreements	169
E. The Paris Agreement	170
III. Relevant Developments in Other International Regimes	171
A. Human Rights and Development	171
B. Environmental Protection	174
IV. Emerging Principles	175
A. Contribution to Sustainable Development	175
B. The Bottom-up Approach	177
C. Effectiveness	178
D. International Cooperation	179
E. International Support	180
V. Conclusion	182
11 Loss and Damage	183
I. The Concept of Loss and Damage	184
II. Reparations under General International Law	186
III. The UNFCCC Workstream on Loss and Damage	188
IV. Possible Ways Forward	192
12 International Support	195
I. The Rationales for International Support for Climate Action	196
A. General Assistance Duties	196
B. Specific Responsibilities	198
C. Self-Interest	199
II. The General Framework on International Support for Climate Action	200
A. Financial Support	200
1. National and Collective Commitments	200
2. The Financial Mechanism of the UNFCCC	201
3. Other Developments	204
B. Transfer of Technology	204
C. Capacity Building	206
III. REDD+	208
IV. An Emerging Vision of International Support for Climate Action	212
A. Novelty and Additionality	212
B. Adequateness	213

C. Efficiency	214
D. Burden Sharing	216
V. Conclusion	217
13 Ambition and Compliance	218
I. The General Architecture of International Climate Agreements	219
II. Addressing the Gap in State Conduct	221
A. Socio-political Mechanisms to Promote Cooperative State Conduct	222
B. Transparency	223
1. Measurement	224
2. Reporting	225
3. Verification	227
C. Reviewing Compliance	228
III. Addressing the Gap in National Commitments	233
A. The UNFCCC	233
B. The Kyoto Protocol	234
C. The Paris Agreement	234
IV. Addressing the Gap in Collective Objectives	235
V. Conclusion	237
14 Adjudication	238
I. International Adjudication	239
A. The Prospects for Contentious Cases before the ICJ	239
B. The Prospects for Advisory Proceedings before the ICJ	241
C. The Prospects for Adjudication under UNCLOS	242
II. Domestic Adjudication	243
A. Litigation Addressing the Causes of Climate Change	244
B. Litigation Addressing the Impacts of Climate Change	246
C. Litigation Addressing the Impacts of Response Measures	248
III. Conclusion	248
15 Non-State Actors	249
I. Participation in the Making of the International Law on Climate Change	249
II. Voluntary Commitments	253
A. Overview	253
B. Standard-Setting	255
C. International Cooperative Initiatives	256
D. Taking Stock of Non-State Actors' Contributions	258
III. Conclusion	260
16 International Law in Times of Climate Change	261
I. Links with Other Aspects of the International Law on Sustainable Development	262
A. Synergies	262
B. Tensions	264
II. Changes in General International Law	266
A. Clarifying the Modalities of the No-Harm Principle	267
1. Geographic Scope	267
2. The Standard of Due Diligence	269
B. Reconsideration of Certain Aspects of the Law of State Responsibility	270

III. Changes to Our Understanding of International Law 271

- A. Sources 271
- B. Implementation 272
- C. Actors 272
- D. The Scope of International Cooperation 273

IV. Conclusion 274

References 275

Index 293

C. Efficiency 214
D. Burden Sharing 216
V. Conclusion 217

13 Ambition and Compliance 218
I. The General Architecture of International Climate Agreements 218
II. Addressing the Gap in State Conduct 221
A. Socio-political Mechanisms to Promote Cooperative State Conduct 221
B. Transparency 223
C. Measurement 224
D. Reporting 228
E. Verification 227
F. Reviewing Compliance 228
III. Addressing the Gap in National Commitments 233
A. The UNFCCC 233
B. The Kyoto Protocol 234
C. The Paris Agreement 234
D. The Copenhagen Accord and the Non-binding Negotiations 235
E. The Paris Agreement 235
IV. Addressing the Gap in Collective Objectives 237
V. Conclusion 237

14 Adjudication 238
I. International Adjudication 238
A. The Prospects for Contentious Cases before the ICJ 238
B. The Prospects for Advisory Proceedings before the ICJ 240
C. The Prospects for Adjudication under UNCLOS 242
D. International Investment Law 242
E. International Environmental Law 242
II. Domestic Adjudication 243
A. Litigation Addressing the Causes of Climate Change 244
B. Litigation Addressing the Impacts of Climate Change 246
C. Litigation Addressing the Impacts of Response Measures 248
III. Conclusion 248

15 Non-State Actors 248
I. Participation in the Making of the International Law on Climate Change 248
II. Voluntary Commitments 253
A. Overview 253
B. Standards-Setting 255
C. International Cooperative Initiatives 258
D. Treaty Work of Non-State Actors, Contributions 258
III. Conclusion 260

16 International Law in Times of Climate Change 261
I. Links with Other Aspects of the International Law on Sustainable Development 262
A. Sustainable Development 262
B. The Precautionary Principle 262
C. The Polluter Pays Principle 262
D. The Principle of Common but Differentiated Responsibilities 262
II. The General Framework of International Law on Climate Change 263
A. Sustainable Development 263
B. The Precautionary Principle 263
C. The Principle of Common but Differentiated Responsibilities 263
D. The Principle of Polluter Pays 263
III. The Standard of Due Diligence 263
B. Reconsideration of Certain Aspects of the Law of State Responsibility 270
A. Attribution 270
B. Causation 270
C. Breach 270
D. Remedies 270

17 International Law and the Paris Agreement 271
I. The Paris Agreement 271
A. The Paris Agreement 271
B. The Paris Agreement 271
C. The Paris Agreement 271
D. The Paris Agreement 271
II. The Paris Agreement 271
A. The Paris Agreement 271
B. The Paris Agreement 271
C. The Paris Agreement 271
D. The Paris Agreement 271
III. Conclusion 271