CONTENTS

TABLES, FIGURES, AND BOXES x

PREFACE xix

CHAPTER 1

Introduction: Distributional Effects of Disasters and Climate Change – Economic and Food Security Implications 1

Venkatachalam Anbumozhi, Meinhard Breiling, and Vangimalla Reddy

1.1 Economic and Distributional Impacts of Disasters 2

1.2 Measuring the Vulnerability and Distributional Impacts of Disasters 4

1.3 Technology Adaptation 5

1.4 Institutional Adaptation 6

1.5 Policy Adaptation 7

1.6 Knowledge Gaps, Policy Equities, and Vulnerability Reduction 8

PART I ASSESSMENT METHODS 15

CHAPTER 2

Innovative Methodology for a Regional Assessment of Economic Losses and Damage Caused by Natural Disasters 17

Yumi Shiomi, Takahiro Ono, Seiichiro Fukushima

2.1 Introduction 17

2.2 Establishment of Methodology to Evaluate Economic Loss at the Regional Level 20

2.3 Sample Application 26

2.4 Conclusion 34

CHAPTER 3

ASEAN Food Security under the 2°C – 4 °C Global Warming Climate Change Scenarios 37

Srivatsan V. Raghavan, Jiang Ze, Jina Hur, Liu Jiandong, Nguyen Ngoc Son, and Liong Shie-Yui

3.1 Introduction 37

3.2 Climate Data, Models, and Scenarios 39

3.3 Studies of Southeast Asia for 2°C–4°C Warming 41

3.4 Discussions on Policy Perspectives 45

3.5 Summary and Conclusions 48

CHAPTER 4

Effects of Disasters on Intra ASEAN Trade of Agriproducts 53

John K. M. Kuwornu

4.1 The Theory of International Trade 53

4.2 International Trade Policies in Thailand, Indonesia, and Viet Nam 54

4.3 Natural Disasters and Trade 59

4.4 The ASEAN Framework on Free Trade and its Integration into the Sendai Framework and ASEAN Socio-Cultural Community 63

4.5 Methodology 65

4.6 Overview of Trends in International Trade in Selected Agricultural Products and Food Security Indicators in Thailand, Indonesia, and Viet Nam 67

4.7 Conclusions and Recommendations 73

PART II TECHNOLOGY ADOPTION 107

CHAPTER 5

Successful Adaptation Measures for Inland and Coastal Food Security 109

Budi Indra Setiawan and Eiji Yamaji

5.1 Introduction 109
5.2 Threats of Natural Disasters 110
5.3 Threats of Climate Change 112
5.4 The system of Rice Intensification 124
5.5 Concluding Remarks 129
5.6 Policy Implications 130

CHAPTER 6

Effects of Disasters and Climate Change on Livestock Sector and Implications for ASEAN food security 137

Hyeon T. Kim

6.1 Introduction 137
6.2 Climate Change Impacts on Livestock Production 138
6.3 Status of Korean Livestock Production 141
6.4 Food Insecurity 143
6.5 Adaptation to Climate Change and Food Security 146
6.6 Government Support for Disaster Prevention and Restoration 152
6.7 Adaptation Programmes by Institutions in Korea 152
6.8 Recommendations for ASEAN Countries to Overcome Food Security 153

CHAPTER 7

Effects of Disasters and Climate Change on Fisheries Sectors and Implications for ASEAN Food Security 161

Thayalan Gopal and Venkatachalam Anbumozhi

7.1 Introduction 161

7.2 Fishery Production and Food Security Trends in ASEAN 163

7.3 Economics of Fish Production, Planetary Limits, and Food Security 167

7.4 Effects of Disasters and Climate Change on Fishery Production in ASEAN 170

7.5 Adaptation Choices for Improved Resilience in ASEAN Fisheries Sector 175

7.6 Costs of Adaptation Measures and Public Policies for Improved Resilience 181

7.7 Conclusion 184

PART III INSTITUTIONAL ADOPTION 189

CHAPTER 8

Distributional Effects of Disasters in Food Value Chains and Change of Risk Management Strategies: Experience from Europe and Implications for ASEAN 191

Meinhard Breiling

8.1 Introduction 191

8.2 The Disaster Threat 194

8.3 Disasters and Resilience Strategies for the Food System 197

8.4 The Food Scarcity Threat 200

8.5 The Food Supply Chain 205

8.6 Adjusting for Global Food Distribution 209

8.7 Different Disaster Risk Strategies According to Scale of Food Production 213
8.8 Change in Disaster Risk Strategies in ASEAN 216
8.9 Conclusions 219

CHAPTER 9

Adaptive Solutions: What is the Role of Financial Institutions and Insurance Industry? 231

Tomonori Sudo

9.1 Introduction 231
9.2 Disasters, Food Security, and the Sustainable Development Pathway 235
9.3 Roles of Financial Institutions 240
9.4 Financial Instruments for Disaster Risk Management and Food Security 245
9.5 Possible Collaborative Financial Mechanism amongst ASEAN Countries 258
9.6 Conclusions and Policy Recommendations 261

CHAPTER 10

Strengthening Institutional Capacity for Disaster Management and Risk Reduction through Climate Resilient Agriculture 270

Suresh Chandra Babu, Alessandro De Pinto, and Namita Paul

10.1 Introduction 270
10.2 Strengthening Institutional Capacities for Disaster Management and Risk Reduction 272
10.3 Institutional Strengthening Framework for Disaster Management and Risk Reduction 280
10.4 Conclusion 282

CHAPTER 11

Ensuring Food and Nutritional Security in the Face of Disasters and Climate Change: What is the Adaptation Solution? 290

Vangimalla Reddy, Mura Jyostna Devi, and Venkatachalam Anbumozhi

11.1 Introduction 290

11.2 Food Security 292

11.3 Adaptation Strategies 307

11.4 Adaptive Strategies to Nutritional Security 317

11.5 Summary 318

PART IV POLICY ADOPTION 331

CHAPTER 12

Disasters, Health, and Food Security in Cities: Adaptation Options for ASEAN 333

Jacob Kumaresan and Sadhani Rajapakse

12.1 Disasters 333

12.2 Role of Food Security 339

12.3 Impact on Health: (Immediate, Medium-Term, Long-Term) 353

12.4 Integration Strategies to Reduce Impact on Health 364

12.5 Recommendations for ASEAN 376

CHAPTER 13

Mainstreaming Resilience into SDGs and AgriculturalTrade Pacts: Why and How? 385

Venkatachalam Anbumozhi, Yousri Marie Kenza, and Dian Lutfiana

13.1 Introduction 385

13.2 Interlinkage Amongst Disaster Risks, Climate Change, and Food Security in ASEAN 387

13.3 Interconnectedness of Resilience, Food Security, and Agricultural Trade 391

13.4 Opportunities to Enhance Resilience with Current Agriculture Trade Pacts 394

13.5 Advancing Resilience and Trade Agendas in the Sustainable Development Goals 398

13.6 Enhancing the Capacity of ASEAN through the SDG Nexus Approach 402

13.7 Conclusion 405