



Environmental Sustainability, Growth Trajectory and Gender



Contemporary Issues of Developing Economies



Edited by

**Chandrima Chakraborty
Dipyaman Pal**

Environmental Sustainability, Growth Trajectory and Gender

This page intentionally left blank

Environmental Sustainability, Growth Trajectory and Gender: Contemporary Issues of Developing Economies

EDITED BY

CHANDRIMA CHAKRABORTY

Vidyasagar University, India

AND

DIPYAMAN PAL

Bethune College, India



United Kingdom – North America – Japan – India – Malaysia – China

Emerald Publishing Limited
Howard House, Wagon Lane, Bingley BD16 1WA, UK

First edition 2022

Editorial matter and selection © 2022 Chandrima Chakraborty and Dipyaman Pal.
Individual chapters © 2022 The Authors.
Published under exclusive licence by Emerald Publishing Limited.

Reprints and permissions service

Contact: permissions@emeraldinsight.com

No part of this book may be reproduced, stored in a retrieval system, transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise without either the prior written permission of the publisher or a licence permitting restricted copying issued in the UK by The Copyright Licensing Agency and in the USA by The Copyright Clearance Center. Any opinions expressed in the chapters are those of the authors. Whilst Emerald makes every effort to ensure the quality and accuracy of its content, Emerald makes no representation implied or otherwise, as to the chapters' suitability and application and disclaims any warranties, express or implied, to their use.

British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

ISBN: 978-1-80262-154-9 (Print)

ISBN: 978-1-80262-153-2 (Online)

ISBN: 978-1-80262-155-6 (Epub)



ISOQAR certified
Management System,
awarded to Emerald
for adherence to
Environmental
standard
ISO 14001:2004.

Certificate Number 1985
ISO 14001



INVESTOR IN PEOPLE

This book is dedicated to our parents

This page intentionally left blank

Contents

List of Figures and Tables	<i>xi</i>
About the Editors	<i>xv</i>
About the Contributors	<i>xvii</i>
Foreword	<i>xxiii</i>
Acknowledgments	<i>xxv</i>
Introduction	<i>1</i>
Section I: Issues of Environment and Growth	
Chapter 1 Has International Trade Increased Carbon Dioxide Emission in Asia?	
<i>Nneamaka Ilechukwu and Sajal Lahiri</i>	<i>11</i>
Chapter 2 Sustainable Energy Development in Emerging Economies: A Study on BRICS	
<i>Sebak Kumar Jana</i>	<i>23</i>
Chapter 3 Interactive Effect of Population Growth and Institutional Quality on Environmental Sustainability in West Africa Region	
<i>Richardson Kojo Edeme and Emeka Ekene Thank God</i>	<i>37</i>
Chapter 4 Sustainable Socio-intercultural Governance	
<i>José G. Vargas-Hernández</i>	<i>51</i>

Chapter 5 Green Nuclear Energy: A Solution of Environmental Sustainability for Emerging Economies <i>Hasan Dinçer, Serhat Yüksel, Gülsüm Sena Uluer and Çağatay Çağlayan</i>	63
Chapter 6 The Shape of Environmental Kuznets Curve: The Dynamic and Cross-country Variation <i>Krishnendu Maji</i>	75
Chapter 7 CO₂ Emissions Analysis and Underlying Emission Trend in Selected Emerging Countries <i>Denizhan Guven, Gizem Kaya Aydın and M. Ozgur Kayalica</i>	89
Chapter 8 Is Growth of Output and Productivity in Indian Manufacturing Industries Sustainable? A Cost Function Approach with Adjustment for Capacity Utilization: 1980–1981 to 2016–2017 <i>Mihir Kumar Pal and Pinki Bera</i>	105
Chapter 9 Factors Behind Economic Growth for BRICS Nations: An Examination within the Neoclassical Growth Framework <i>Aloka Nayak and Ramesh Chandra Das</i>	119
Chapter 10 Corruption, Democracy and Growth: Evidence from Emerging Market Economies <i>Amrita Chatterjee</i>	137
Section II: Linkage between Environment, Gender and Growth	
Chapter 11 Gender Gap, Intensive Growth and Economic Welfare in Sub-Saharan African Countries <i>Ebikabowei Biedomo Aduku, Ogochukwu Christiana Anyanwu and Richardson Kojo Edeme</i>	153
Chapter 12 Status of Women Empowerment: A Comparative Study Among the SAARC Countries <i>Pinaki Das and Shama Firdaush</i>	167
Chapter 13 School Dropout of Girls: A Study on Selected Indian States <i>Tanusree Mishra and Tanmoyee Banerjee (Chatterjee)</i>	181

Chapter 14 Gender Equality and Women Empowerment: South Asian Perspective <i>Sudin Bag and Deboshree Barman</i>	195
Chapter 15 Does an Increase in Enrollment of Girls Relative to Boys Stimulate Technical Efficiency of Secondary Education? Empirical Evidence Using Non-parametric Data Envelopment Analysis With Indian State Level Data <i>Sangita Choudhury and Arpita Ghose</i>	207
Chapter 16 Gender Gap and CO₂ Emissions in Emerging Markets Economies: A Panel Data Study <i>Gizem Kaya Aydın, Denizhan Guven and M. Ozgur Kayalica</i>	219
Chapter 17 Gender Equity and Politics for the Enhancement of Environmental Sustainability: Empowerment of Women for the Fight Against Climate Change <i>Egemen Sertyesilisik</i>	233
Chapter 18 Environment Sustainability Development Through Cost-effective Elimination of Hazardous Gases for Gender Development <i>Suparna Banerjee and Aparna Banerjee</i>	243
Chapter 19 Empowerment of Women and Increasing Women Employment in the Construction Industry to Support Environmental Sustainability and Sustainable Development <i>Begum Sertyesilisik</i>	255
Chapter 20 An Analysis of the Impact of Environmental Degradation on Female Health Status and Their Labor Force Participation Rate in Urban India: A Simultaneous Panel Approach <i>Kaushiki Banerjee and Arpita Ghose</i>	267
Index	281

This page intentionally left blank

List of Figures and Tables

Chapter 1

Table 1.1	Data Sources	17
Table 1.2	Summary Statistics	17
Table 1.3	Trade's Impact on the Environment	18

Chapter 2

Fig. 2.1	Emission–GDP Ratio in BRICS (kg/2015\$ GDP PPP) During 1992–2018	31
Table 2.1	Percentage Share of Different Sources in Energy Production in BRICS	27
Table 2.2	Panel Regression Results	32

Chapter 3

Table 3.1	Summary Statistics of the Variables for Empirical Analysis	42
Table 3.2	Arellano–Bond Test for Zero-order Autocorrelation and Sargan Test of Over-identifying Restrictions	44
Table 3.3	Result of the Effect of Population Growth on Environmental Sustainability and Interactive effect of Population Growth and Institutional Quality on Environmental Sustainability	45

Chapter 5

Table 5.1	The Evaluations of the Experts	69
Table 5.2	Analysis Results	70

Chapter 6

Fig. 6.1	Relationship Between Environmental Degradation and Economic Activity	87
Table 6.1	The EKC: An Overview of Empirical Literature	79
Table 6.2	Estimated Regression Coefficients	83

Chapter 7

Fig. 7.1	UET of Selected Developing Countries	100
Table 7.1	Diagnostic Test Results	94
Table 7.2	Estimation Results	98

Chapter 8

Table 8.1	Estimates of Productivity and its Components (Annual Average)	113
Table 8.2	Annual Average Estimates of CU and its Trend	114
Table 8.3	Comparative Analysis Between the Estimates	114

Chapter 9

Table 9.1	Average Values of the Indicators for 1991–2020 and All the Sub-periods	128
Table 9.2	Unit Root Test Results and the Regression Results in all the Phases	132

Chapter 10

Fig. 10.1	Average Value of Corruption and Democracy Index	142
Table 10.1	Impact of Democracy and Corruption on Growth	144

Chapter 11

Table 11.1	Results of Unit Root and Cointegration Tests	161
Table 11.2	GMM Estimates of the Effect of Gender Gap in Labor Force Participation on Intensive Growth and Economic Welfare	163

Chapter 12

Table 12.1	Status of Women Across the Indicators of Women Empowerment	171
Table 12.2	WEI in SAARC Countries	172
Table 12.3	Results of Panel Data Regression	174

Chapter 13

Fig. 13.1	State-wise Distribution of the Incidence of School Dropout of Daughters	183
Table 13.1	Sex of First Born, Son Dominance and School Dropout Among Daughters	185
Table 13.2	Descriptive Statistics of the Variables and Result of Mixed Effect Probit Regression	188

Chapter 14

Table 14.1	GII in South Asian Countries	201
Table 14.2	Unit Root Test of ADF	202
Table 14.3	Results of Panel Data Regression	203

Chapter 15

Table 15.1	OUTTE of GCS for ISE	214
Table 15.2	OUTTE of SCS for ISE	215
Table 15.3	Significant Determinants of OUTTE for GCS and SCS Considering ISE	216

Chapter 16

Table 16.1	Descriptive Statistics of Variables	225
Table 16.2	Result of Panel Data Stochastic Frontier Regression	226
Table 16.3	CO ₂ Emissions Inefficiencies of Emerging Markets Economies	228

Chapter 17

Fig. 17.1	GE-based Humanity's Fight Against Climate Change as a Key for the Victory in this Fight	238
Fig. 17.2	Relationship Among Empowered Women, Climate Change Fight and Mitigation of its Effects	239

Chapter 18

Fig. 18.1	Different Characterizations of As-prepared Cerium (III) Oxide Nanoparticles	249
Table 18.1	Procedure Conditions and Physicochemical Properties of Ceria Nanoparticles	250
Table 18.2	Results of Economic and Mathematical Analysis	251

Chapter 19

Fig. 19.1	Relationship Among Women Empowerment in the CI, Increasing Women Employment in the CI and SD	259
Fig. 19.2	Relationship Between Women Employment in the CI and Achievement of the SDGs	261

Chapter 20

Table 20.1	Estimated Result of FLE	274
Table 20.2	Estimated Result of FLFPR	275

This page intentionally left blank

About the Editors

Chandrima Chakraborty is currently serving as an Assistant Professor in the Department of Economics, Vidyasagar University in West Bengal, India. She did her postgraduate degree in Economics from the University of Calcutta, India and then obtained her MPhil and PhD degrees in Economics from Jadavpur University, India. Her major areas of academic interest include industrial growth, productivity and efficiency. She is also interested in environmental economics, gender issues, agricultural economics as well as health and economics of education.

Dipyaman Pal is currently serving as an Assistant Professor in the Department of Economics, Bethune College, West Bengal, India. He did his postgraduate degree, MPhil and PhD degrees in Economics from Jadavpur University, India. His major areas of academic interest include agricultural growth, productivity, volatility and efficiency. He is also interested in environmental economics and gender issues.

This page intentionally left blank

About the Contributors

Ebikabowei Biedomo Aduku is a Researcher. He is the General Overseer of the “Opportunity Research Team,” Bayelsa state Nigeria. He is also a PhD student at Department of Economics, Nnamdi Azikiwe University, Awka, Nigeria. He has attended several national and international conferences. He has publications in books and journals of reputation.

Ogochukwu Christiana Anyanwu is a Lecturer in the Department of Economics, University of Nigeria, Nsukka. She is currently a PhD student in the same department. She has attended several national and international conferences. She has publications in journals of reputation. Her areas of interest include development economics and environmental economics.

Gizem Kaya Aydın was a Research Assistant. She was a Member of Istanbul Technical University. She has a BA in Statistics from Yıldız Technical University, MA in Economics from Istanbul Technical University and PhD in Econometrics from Marmara University. Her research areas include income distribution and consumer economics.

Sudin Bag is an Assistant Professor, Department of Business Administration, Vidyasagar University, India. He has more than 10 years of working experience in colleges and university. He has published 18 research papers in the reputed national and international journals, and authored three books. He has awarded a research project from ICSSR under special call for studies focusing on Social Science Dimension of Covid-19.

Aparna Banerjee, PhD, is currently working as an Assistant Professor of Economics in Serampore College, India. She had been awarded Doctoral degree in Economics from Calcutta University. She presented various papers in workshops, seminar and conferences. She had many publications in reputed journals and books. She has research interests in various fields of Economics.

Kaushiki Banerjee is currently Assistant Professor of Economics, Barasat Government College, and Research Scholar, Department of Economics, Jadavpur University, India. She was a UGC-NET Junior Research Fellow (1st-class-2nd in B.Sc.). She has presented papers in National/International Conferences, reviewed articles. Research interests include gender, social sector and econometrics.

Suparna Banerjee, PhD, is currently working as an Assistant Professor in Bangabasi Evening College, India. She had been awarded a doctoral degree from Jadavpur University. She presented various papers in workshops, seminar and conferences. She has published in many reputed journals and books. She has research interests in various fields of Nanoscience.

Tanmoyee Banerjee (Chatterjee) is a Professor in Department of Economics, Jadavpur University, India. Her areas of interest are industrial organization, microeconomic theory, micro econometrics, microfinance, financial inclusion and gender analysis and economic growth. She has undertaken various empirical research projects funded by national agencies of India like ICSSR, UGC. She has published extensively in reputed international journals.

Deboshree Barman is a Research Scholar, Department of Business Administration, Vidyasagar University, India. She has research interests in Marketing, HR and Business Management. She has published many research papers in reputed national and international journals and presented a good number of research papers in different conferences.

Pinki Bera is a PhD Scholar of Department of Economics, Vidyasagar University, India and obtained MPhil degree in Economics from Vidyasagar University in 2019.

Çağatay Çağlayan is a 2nd grade Economics & Finance Student in Istanbul Medipol University. He is also student of Health Management Department in Istanbul Medipol University. His research interests are sustainable energy economics, renewable energy and nuclear energy.

Amrita Chatterjee is an Assistant Professor at Madras School of Economics. She received her PhD from Jadavpur University, Kolkata in 2011. Her primary research interest is development economics with special inclination toward financial inclusion. She has both national and international peer-reviewed journal publications.

Sangita Choudhury is a PhD Scholar (State-Senior Research Fellow) in the Department of Economics, Jadavpur University.

Pinaki Das, PhD, is an Associate Professor and Former Head, Department of Economics, Vidyasagar University. He was awarded with the Gold Medal in MSc in Economics. He has conducted three MRP funded by UGC and ICSSR. He has published six books and 50 research papers. He has guided 14 research scholars.

Ramesh Chandra Das, PhD, is currently an Associate Professor at the Department of Economics, Vidyasagar University, India. He has more than 20 years of teaching and research experience in the areas of theoretical and applied macroeconomics, environmental economics and political economics.

Hasan Dinçer is a Professor of Finance at Istanbul Medipol University, Faculty of Economics and Administrative Sciences, Istanbul-Turkey. He has BAs in Financial Markets and Investment Management from Marmara University. He received his PhD in Finance and Banking from the same university.

Richardson Kojo Edeme is an Associate Professor in the Department of Economics, University of Nigeria and also Research Fellow Institute of Business Research, University of Economics Ho Chi Minh City Vietnam. He holds a PhD in Economics. His research interest includes public finance and policy, trade analysis, infrastructure, environmental sustainability, poverty and human development.

Shama Firdaush, ICSSR Fellow, is currently pursuing her PhD research from Department of Economics, Vidyasagar University. She continues to publish actively and has seven publications in international and national refereed journals. Her research interests include women empowerment, economic and social well-being.

Arpita Ghose, is currently Professor in Economics, Jadavpur University, Chair Professor (Honorary), Planning and Development Unit, JU (NITI Aayog), Government of India. A PhD of ISI, she authored/edited books/published many journal-papers from renowned International publishers, completed renowned national/International-Institution's funded projects, supervised PhDs, with research interest includes econometrics, macroeconomics, productivity, efficiency, empirical studies on international trade, applied development economics and social sector.

Denizhan Guven is a Member of Eurasia Institute of Earth Sciences at Istanbul Technical University (ITU). He received MS degree in Energy Science and Technology from ITU. He is still a PhD candidate at ITU and his research areas include energy and data analysis for climate change and air quality sciences.

Nneamaka Ilechukwu earned her doctorate from Southern Illinois University Carbondale in 2021. Before joining the PhD program at Southern Illinois University Carbondale, she worked as an Assistant Lecturer at Nnamdi Azikiwe University, Awka in Nigeria. She is now an Assistant Professor of Economics at Snow College Ephraim, Utah.

Sebak Kumar Jana is currently Professor of Economics in the Department of Economics, Vidyasagar University, India. His major areas of research interest include environmental and resource economics. He, as Principal Investigator, has completed research projects funded by ICSSR, UGC and NABARD, IWMI and IFPRI.

M. Özgür Kayalica is a Senior Lecturer in the Energy Institute and at Istanbul Technical University. His research focuses on environmental economics, energy economics and trade theory. He is the Co-author of International Environmental

Efficiency: A Critical Analysis (Routledge, 2017). He also published numerous articles in SCI/SSCI indexed journals.

Sajal Lahiri earned his doctorate from the Indian Statistical Institute (1977). He worked at the University of Essex in England (1978–2002) and joined Southern Illinois University Carbondale in 2002 as the Vandeverer endowed Chair in Economics and is a Distinguished Scholar at SIUC. He has written extensively on issues in international and development economics.

Krishnendu Maji is an MPhil in Economics (Specialization: Econometrics) from University of Calcutta and Masters in Applied Economics (Specialization: Econometrics & Finance) from Presidency University. He has more than 10 years of experience in Teaching & Research.

Tanusree Mishra is an Assistant Professor of Economics in Sister Nibedita Government General Degree College for Girls in Kolkata. Her research interest primarily lies in women empowerment, child marriage, violence against women and other women-oriented socioeconomic problems.

Aloka Nayak is presently a Research Scholar at the Department of Economics, Vidyasagar University, India. She has research interests in growth economics and environmental economics.

Mihir Kumar Pal, PhD, is a Professor of Economics, Vidyasagar University, India. He was awarded Gold Medal at both UG and PG level from University of Kalyani. He has completed a number of research projects and published several books, articles in reputed national and international journals. His areas of research interest are industrial productivity, capacity utilization, environmental economics, and applied econometrics.

Begum Sertyesilisik is a Professor in Izmir Democracy University. She has received her PhD degree at the Middle East Technical University, her MSc, MBA and BSC degrees at the Istanbul Technical University. Her specialization areas include sustainable construction project management, construction contracts, project management, green marketing, sustainability and sustainable built environment, contract and dispute management.

Egemen Sertyesilisik, PhD, has been awarded a BA degree on Political Science and Public Administration at the Bilkent University, a MA degree on the Politics and the Mass Media at the University of Liverpool, a MBA degree at the Yıldız Technical University, and a PhD at the Marmara University on the Political Economy of the Middle East. He has publications on political economy, water resources and sustainability.

Emeka Ekene Thank God is currently a PhD student in the Department of Economics, University of Nigeria, Nsukka. His area of research interest includes development and environmental economics.

Gülsüm Sena Uluer is a 4th grade Business Administration student in Istanbul Medipol University. She is also student of Business Administration Integrated Master with Thesis student in Istanbul Medipol University. Her research interests are sustainable energy economics and project finance, electricity, renewable energy and nuclear energy.

José G. Vargas-Hernández is a Research Professor at Instituto Tecnológico Mario Molina, Unidad Académica Zapopan, Member of the National System of Researchers of Mexico. He completed his PhD in Public Administration and also did PhD in Organizational Economics.

Serhat Yüksel is an Associate Professor of Finance in İstanbul Medipol University. He has a BS in Business Administration (in English) from Yeditepe University (2006) with full scholarship. He got his Master's degree in Economics at Boğaziçi University (2008). He also has a PhD in Banking from Marmara University (2015).

This page intentionally left blank

Foreword

Several recent global assessments, scientific literature and expert opinion seeking surveys are showing that one of the 17 sustainable developmental goals (SDG) which has the most likely potential and chance to constraint developmental objectives for many countries in this century is the SDG 13, which focuses on the climate action. State of the climate system will determine economic outcome while economic development model of each country makes a choice for determining the state of the climate system. However, other local environmental issues, like water quality, air quality, soil quality, biodiversity, and so on, are equally important determinants of economic growth trajectories and human well-being. In a globally connected world that shares same global common good like climate system, consumption-induced externalities and production externalities need disruptive technological change, innovative governance and new institutions to enable accelerated societal transformation toward sustainable development. It is well established now in the literature that human well-being is a much broader concept than economic well-being measured by single-dimensional metric like gross domestic product. How various social groups participate in decision-making process defines not only political agency but also creates social trusts among various actors within a governance system and enhances productive base of the economy. In this century, productive base of the economy is no longer confined to a single-dimensional array of man-made physical capital but is a portfolio of capital assets that includes additionally human capital, natural capital, social capital and knowledge capital. Persistent policy blindness and lack of appropriate institutions to manage overlapping risks across economic, social and environmental dimensions exacerbate current threats to sustaining growth outcomes due to increasing natural hazards, exposure and vulnerabilities. On these issues regional examples based on good quality scientific evidence-based analysis within a clear analytical frame from the developing world are abysmally low compared to developed counterparts.

This book can be considered as a major contribution from the experts based on regional analysis from Asia, Africa and emerging economies of the world in bridging this knowledge gap. Various articles chosen for compiling this volume brings out one point very clearly that the developing region is caught up structurally in economic growth dilemma with rising environmental constraints, lack of state-of-the art technologies and social inequities. Regional diversity in authorship and study contexts provide a very rich set of information and wide-angle lens to see the developmental challenges.

Conclusions based on empirical evidence from various studies at various scales in this book support the triple bottom line of sustainable development. The new granular insights brought in by the various articles in this book are very useful for informing larger global debate. From intellectual point of view compilation of articles by the editors from across various regions and arranging them thematically helps in understanding the complexities and multidimensional challenges of sustainable development. The articles in this book will be of considerable interest and use to the authors of various regional and global assessment reports, future researchers, decision-makers like national governments, bilateral and multilateral funding agencies, civil societies engaged in developmental actions in the region and will generate more interest for taking forward more in depth studies to advance deeper regional debate, struggle and understanding of the challenges for turning the current development processes on sustainable development trajectories.

Joyashree Roy
Bangabandhu Chair Professor
Asian Institute of Technology, Thailand
Professor of Economics (On lien) and Founder Advisor to Global Change
Programme & SYLFF-JU Programme of Jadavpur University, India

Acknowledgments

With long-term efforts on the stages from submission of the book proposal to final submission of the proposed book titled, Environmental Sustainability, Growth Trajectory and Gender: Contemporary Issues of Developing Economies, it is a great pleasure for the editors as well as the chapter contributors that the book is now published.

In carrying out the entire project, the help and support of different organizations, academicians and other members of the society who are directly or indirectly associated to the project cannot be forgotten.

First *and foremost*, we must acknowledge the cooperation and support of the Emerald Publishing Ltd. Team for approving the proposal and continuously guiding us at all stages of developments of the book.

Secondly, we are highly grateful to all the contributing authors for their valuable chapter contribution and adding to the existing literature through this volume. *We would like to express my special thanks to the contributors for helping me to complete the project and effectively on time.*

Thirdly, we are indebted to our little daughter for the support and sacrifice in carrying out this lengthy project.

At last but not in least, we would like to thank everyone who helped and motivated us to work on this project.

Although all care has been taken, no one other than us, as the editor, discloses to remain entirely responsible for any errors that still stay behind this book.

Chandrima Chakraborty
Dipyaman Pal
The Editors