Sustainable Rural Electrification Sustainable Development

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Renewable Energy-based Rural Electrification
Implementing the Summit of the Americas: Building sustainable development partnerships

This book brings together several systems-level approaches to the consideration of the interaction of livelihood choices, natural resource management and participatory action research on sustainable development. By focusing on these approaches to community change, the volume hopes to encourage readers to consider how they might adopt methods such as Sustainable Livelihoods Approach (SLA), Community Capitals Framework (CCF) and Participatory Action Research (PAR) in their own research, practice and teaching. Thus, this volume will engage readers in reflection about the importance of systems-level approaches that address poverty from the perspective of the poor, natural resource management that maintains the resource for future generations, and the engagement of local people in designing and implementing, and thus owning, strategies that address equity as well as economic security and the environment. This book was originally published as a special issue of Community Development.

Renewables for Sustainable Village Power

This short open access book investigates the role of renewable energy in East Africa to provide policy-relevant inputs for the achievement of a cost-effective electrification process in the region. For each country, the authors review the current situation in the domestic power sector, adopt a GIS-based approach to plot renewable energy resources potential, and review currently planned projects and projects under development, as well as the key domestic renewables regulations. Based on such information, least-cost 100% electrification scenarios by 2030 are then modelled and comparative results over the required capacity additions and investment are reported and discussed. The authors also inquire into some of the key technological, economic, policy, cooperation, and financing challenges to the development of a portfolio of renewables to promote energy access in a sustainable way, including a discussion of the challenges and opportunities that might stem from the interaction between local RE potential and natural gas resources currently under development in the region. To conclude, policy recommendations based on the book’s results and targeted at international cooperation and development institutions, local policymakers, and private stakeholders in the region are elaborated.

Sustainable Access to Energy in the Global South

Approximately 1.5 million Mexicans lack access to electricity, and most of them live in rural and remote
areas with high levels of marginalization and poverty. Access to secure, affordable and modern energy is central to poverty reduction as it is a critical enabler of development (IEA, 2017). However, in most cases, rural electrification implementation has not yielded the expected outcomes. This thesis explores under what conditions can electricity help to alleviate poverty and achieve sustainable development in rural areas. I examine these concerns as also central to addressing the root causes of unevenness and marginalization in these areas. Through fieldwork with off-grid providers and semistructured interviews of beneficiaries in the rural localities of Oaxaca and Chiapas in Southern Mexico, as well as with government officials, I explore how off-grid electrification improves wellness. By examining the implementation of two rural electrification programs, I reflect on what can be done to strengthen these efforts. In particular, I highlight the essential role that context plays when designing and implementing programs aimed at alleviating poverty. In conclusion, I propose combining systems-level coordination with place-based policies to better address vulnerabilities for the sustainability of rural off-grid programs and coordination challenges revealed in the projects I studied.

Rural Infrastructure from a World Bank Perspective

To maintain a healthy ecosystem for contemporary society and for future generations, policies must be implemented to protect the environment. This can be achieved by consistent evaluation of new initiatives and strategies. The Handbook of Research on Renewable Energy and Electric Resources for Sustainable Rural Development is a critical scholarly resource that examines efficient use of electric resources and renewable energy sources which have a positive impact on sustainable development. Featuring coverage on cogeneration thermal modules, photovoltaic (pv) solar, and renewable energy systems (RES) application practices, this publication is geared towards academics, practitioners, professionals, and upper-level students interested in the latest research on renewable energy and electric resources for sustainable rural development.

Sustainable Development in the Sectors of Electric Power, Information, Urban and Rural Areas, and Social Welfare

Sustainable Energy for Sustainable Development

For those in developed nations, suddenly being without electricity is a disaster: power cuts have us
fretting over the food stored in the freezer, and even a few hours without lights, televisions, or air conditioning is an ordeal. However, for an estimated 1.6 billion people worldwide, the absence of electricity is their daily experience. An untold number of others live with electricity that is erratic and of poor quality. How can electric power be brought into their lives when the centralized utility models that have evolved in developed nations are not an economically viable option? Poor, rural communities in developing nations cannot simply be ‘plugged in’ to a grid. Small-scale Distributed Generation (DG), ranging from individual solar home systems to village level grids run off diesel generators, could provide the answer, and this book compares around 20 DG enterprises and projects in Brazil, Cambodia and China, each of which is considered to be a "business model" for distributed rural electrification. While large, centralized power projects often rely on big subsidies, this study shows that privately run and localized solutions can be both self-sustaining and replicable. Its three sections provide a general introduction to the issue of electrification and rural development, set out the details of the case studies and compare the models involved, and discuss the important thematic issues of equity, access to capital and cost-recovery. Hisham Zerriffi shows that in each case, it is not simply a matter of matching a particular technology to a particular need. Numerous institutional factors come into play including the regulatory regime, access to financial services, and government/utility support or opposition to the DG alternative. Despite this, in many countries, the question is not whether DG has a role to play. Rather it is a question of how it will play a role.

Renewables for Energy Access and Sustainable Development in East Africa

First published in 1998, this book provides a broad but in-depth description of the issues, concepts, methods of analysis, and empirical results related to the sustainable development of agriculture and rural communities. Specifically, it examines the relationships between sustainability and individual topics such as technology, information, population, gender, land use, community, and public policy. A unique aspect of this book is that the topics addressed have not previously been explored together in one publication. With sustainability as the common link, data and evidence are presented and then interpreted in light of individual perspective and experience, in the process advancing our knowledge of this important field. The book comprises of 12 chapters written by prominent authors who come from government and non-government organizations as well as from various academic institutions and disciplines. This book is ideal for a seminar course. It is particularly intended for students in production agriculture, rural sociology, economics and public policy, environmental sciences, geography and land use planning, and other social sciences. Its rich insights make it a useful source of
information for policy makers. It can also be used as a reference by professional economists and other researchers interested in issues relating to sustainable agricultural and rural development. While the coverage of some topics is, by necessity, more technical, the book is compiled with a general audience in mind. Thus, it should be of interest to anyone concerned with agriculture, natural resources and rural issues, particularly as they relate to the future of agriculture and of rural communities.

White Paper on sustainable energy projects in Africa

More than 1.3 billion people worldwide lack access to electricity. Although extension of the electricity grid remains the preferred mode of electrification, off-grid electrification can offer a solution to such cases. Rural Electrification through Decentralised Off-grid Systems in Developing Countries provides a review of rural electrification experiences with an emphasis on off-grid electrification and presents business-related aspects including participatory arrangements, financing, and regulatory governance. Organized in three parts, Rural Electrification through Decentralised Off-grid Systems in Developing Countries provides comprehensive coverage and state-of-the-art reviews which appraise the reader of the latest trend in the thinking. The first part presents the background information on electricity access, discusses the developmental implications of lack of electricity infrastructure and provides a review of alternative off-grid technologies. The second part presents a review of experiences from various regions (South Asia, China, Africa, South East Asia and South America). Finally, the third part deals with business dimensions and covers participatory business models, funding challenges for electrification and regulatory and governance issues. Based on the research carried out under the EPSRC/DFID funded research grant for off-grid electrification in South Asia, Rural Electrification through Decentralised Off-grid Systems in Developing Countries provides a multi-disciplinary perspective of the rural electrification challenge through off-grid systems. Providing a practical introduction for students, this is also a key reference for engineers and governing bodies working with off-grid electrification.

Decentralized Rural Electrification for Sustainable Development

In recognition of the fact that billions of people in the developing world do not have access to clean energies, the United Nations launched the Sustainable Energy for All Initiative to achieve universal energy access by 2030. Although electricity grid extension remains the most prevalent way of providing access, it is now recognized that the central grid is unlikely to reach many remote areas in the near
future. At the same time, individual solutions like solar home systems tend to provide very limited services to consumers. Mini-grids offer an alternative by combining the benefits of a grid-based solution with the potential for harnessing renewable energies at the local level. The purpose of this book is to provide in-depth coverage of the use of mini-grids for rural electrification in developing countries, taking into account the technical, economic, environmental and governance dimensions and presenting case studies from South Asia. This book reports on research carried out by a consortium of British and Indian researchers on off-grid electrification in South Asia. It provides state-of-the-art technical knowledge on mini-grids and micro-grids including renewable energy integration (or green mini-grids), smart systems for integration with the central grid, and standardization of systems. It also presents essential analytical frameworks and approaches that can be used to analyze the mini-grids comprehensively including their techno-economic aspects, financial viability and regulatory issues. The case studies drawn from South Asia demonstrate the application of the framework and showcase various successful efforts to promote mini-grids in the region. It also reports on the design and implementation of a demonstration project carried out by the team in a cluster of villages in Odisha (India). The book’s multi-disciplinary approach facilitates understanding of the relevant practical dimensions of mini-grid systems, such as demand creation (through interventions in livelihood generation and value chain development), financing, regulation, and smart system design. Its state-of-the-art knowledge, integrated methodological framework, simulation exercises and real-life case analysis will allow the reader to analyze and appreciate the mini-grid-related activities in their entirety. The book will be of interest to researchers, graduate students, practitioners and policy makers working in the area of rural electrification in developing countries.

How Power Shapes Energy Transitions in Southeast Asia

Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to the Kingdom of Bhutan for the Sustainable Rural Electrification Project

With almost 600 million people having no access to energy in Sub-Saharan Africa, rural electrification is a major challenge for the development of the continent. This White Paper highlights 25 energy projects currently being developed in Africa. Its aims is to analyse their best practices and understand the key success factors. This eBook is offered by the Fondation Schneider Electric.
**Sustainability in Agricultural and Rural Development**

The development of four different sectors, electrical power, information, urban and rural areas and social welfare from 1988 to 2005.

**Sustainable Rural Development**

**Economic Evaluation of Sustainable Development**

**Proceedings of the African High-level Regional Meeting on Energy and Sustainable Development**

Most people don't think much about electricity. They just flick a switch to light a room or turn on their computers to browse the internet. This is not true for over one billion of the poorest people in the world, who incredibly still do not enjoy the advantages of having electricity. Despite much progress, even today many still question the exact nature of electricity's benefits for the world's poor? Is rural electrification important for education and quality of life? Does it improve rural productivity? Can the poor afford electricity? The new edition of the classic book Electric Power for Rural Growth answers these questions and more. This second edition of a classic study on the impact of rural electrification on development is entirely rewritten. The book is faithful to the original household surveys from India, Colombia and Indonesia, but has a brand new chapter summarizing current research and tracing the development of benefit evaluation techniques over three decades. With the new international mandate to provide Sustainable Energy for All, Electric Power for Rural growth is perhaps more important today than when it was first published several decades ago.

**An Assessment of the Effect of Participation on Sustainable Development in a Rural Electrification Project**

**Rural Electrification Through Decentralised Off-grid Systems in Developing Countries**
Infrastructure, Sustainability and Unevenness

Energy Access, Poverty, and Development

Presenting the best papers of the 3rd EPFL-UNESCO Chair Conference on Technologies for Development, this publication offers a valuable collection of innovative case studies exploring access to energy and renewable energy technologies in the Global South. It investigates the key determinants for successfully providing energy to resource-poor communities and examines a wide range of technologies for energy production, distribution, storage and efficient use. Taken together, these case studies deal with the entire life cycle of products and solutions, as well as the complete value chain including all relevant stakeholders. The collection also draws upon empirical research conducted in Africa and South America to present critical perspectives on women’s access to technologies in the renewable sector. This publication serves as a bridge between engineers, economists and other scientists involved in research on the interface between technology and human, social and economic development. It also provides a valuable resource to academics and researchers of the natural sciences, computer science, information management, quantitative social sciences and business studies.

Off-grid Renewable Energy Options for Rural Sustainable Development

Rural Electrification Planning

Access to reliable electricity and clean cooking facilities is crucial to human well-being and to a country’s economic development (IEA, 2016). These two forms of modern energy services are essential for providing basic human needs such as clean water, sanitation and healthcare, and for reducing poverty (IEA, 2016). Over the past two decades, China has provided hundreds of millions of rural people with access to these two forms of modern energy services. Despite the accomplishments, still many people in China have no access to electricity, and more than 1/3 of China’s population relies on biomass for cooking (NEA, 2016; IEA, 2016). Finding appropriate ways to provide modern energy services to these populations has been a key issue for Chinese government. To serve this aim, this dissertation examines off-grid renewable energy options for rural electrification and clean cooking services in rural China.
Electric Power for Rural Growth

Rural Energy Services addresses the policy, market and sustainability aspects of defining and selecting technologies that will meet the demands for energy services by rural villages in a sustainable and reliable way. It offers a participative approach to the supply of energy services with a clear emphasis on the need for energy services, putting needs rather than technology first, and advocating that rural people, above all, know what they need and what will work for them. The handbook contains a full survey of energy resources and technologies and covers, in detail, the issues surrounding the decision-making processes involved, the implementation of energy schemes and an exploration of the policy, market and sustainability issues which are vital to the success of a scheme. The last section contains real case studies, covering projects which meet the energy service needs of rural people across the world today. The book was written as a resource for a series of workshops commissioned by the British Council and the UK Department for International Development, and provided the basis for workshops in countries such as Uganda, Brazil and India. Governmental and non-governmental energy strategists, donors, international and national development agencies, academics and financial institutions with responsibility for investment strategy will find this practical handbook highly valuable in their work.

Renewable Energy for Unleashing Sustainable Development

This book showcases how small-scale renewable energy technologies such as solar panels, cookstoves, biogas digesters, microhydro units, and wind turbines are helping Asia respond to a daunting set of energy governance challenges. Using extensive original research this book offers a compendium of the most interesting renewable energy case studies over the last ten years from one of the most diverse regions in the world. Through an in-depth exploration of case studies in Bangladesh, China, India, Laos, Indonesia, Malaysia, Mongolia, Nepal, Papua New Guinea, and Sri Lanka, the authors highlight the applicability of different approaches and technologies and illuminates how household and commercial innovations occur (or fail to occur) within particular energy governance regimes. It also, uniquely, explores successful case studies alongside failures or "worst practice" examples that are often just as revealing as those that met their targets. Based on these successes and failures, the book presents twelve salient lessons for policymakers and practitioners wishing to expand energy access and raise standards of living in some of the world's poorest communities. It also develops an innovative framework consisting of 42 distinct factors that explain why some energy development interventions accomplish all of their goals while others languish to achieve any.
This book presents new research on solar mini-grids and the ways they can be designed and implemented to provide equitable and affordable electricity access, while ensuring economic sustainability and replication. Drawing on a detailed analysis of solar mini-grid projects in Senegal, the book provides invaluable insights into energy provision and accessibility which are highly relevant to Sub-Saharan Africa, and the Global South more generally. Importantly, the book situates mini-grids in rural villages within the context of the broader dynamics of national- and international-level factors, including emerging system innovation and socio-technical transitions to green technologies. The book illustrates typical challenges and potential solutions for practitioners, policymakers, donors, investors and international agencies. It demonstrates the decisive roles of suitable policies and regulations for private-sector-led mini-grids and explains why these policies and regulations must be different from those that are designed as part of an established, centralized electricity regime. Written by both academics and technology practitioners, this book will be of great interest to those researching and working on energy policy, energy provision and access, solar power and renewable energy, and sustainable development more generally.

Rural Energy Services

Solar Energy, Mini-grids and Sustainable Electricity Access

NREL has developed the RSVP team to address the enormous opportunity of bringing electricity to rural villages with economic and environmentally sustainable renewables solutions. While the program is only several years old, it is well positioned to help develop, communicate, and implement RE-based rural applications. A critical aspect of this effort is the partnerships with industry, in-country organizations, international development institutions, government agencies, national labs, and universities. The electrification of the rural world is an overwhelming challenge, but with international cooperation and ingenuity we intend to "make a go of it."

Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to the Kingdom of Bhutan for the Sustainable Rural
Electrification Project

A Regional View Towards Sustainable Renewable Energy Development in the Pacific

The book analyzes energy technologies, business models and policies to promote sustainable development. It proposes a set of recommendations for further activities and networking on access to energy and renewable energies and promotes an integrated approach to sustainable resource management. The book discusses access to energy, as a precondition for socio-economic progress. It depicts the global dimension of the challenge in terms of access to electricity and other forms of energy in developing countries. The three main interlinked topics related to energy and sustainable growth are separately discussed: appropriate technologies for modern energy services, business models for the development of new energy markets, and policies to support new energy systems. The description of activities and programmes of some public and private Italian stakeholders is also included.

Geothermal Energy Resources for Developing Countries

The problem of this study was propelled by the need to empirically assess Ghana's energy needs, and hence ways of meeting its net demand to support industrialization, or commerce that will foster growth. The production of Crude Palm Oil (CPO), will serve as a double edge sword to bring about economic development on one hand and also produce renewable energy to power a rural community. The prospects of the waste from CPO as the alternative energy source that can power rural development in a sustainable manner were researched. Research questions that sought to examine Ghana's present energy source vis-a-vis rural electrification as well as a sustainable alternative energy source available for rural energy demand that will supplement the existing national grid, using Kokofu, and NGL as a case study was analysed. It is a fact that, the energy demand of Ghana is not met, as supply of electricity falls short of the increasing demand and that the distribution system does not reach all corners of Ghana. The research concluded that a renewable energy source generated from the processes of CPO will be of prime importance to the nation as a whole with its minimal impact on the environment."

Meeting Challenges, Measuring Progress
This text aims to be a driving force for an economically sound and sustainable development of developing countries. It looks at the provision of geothermal energy within the framework of sustainable energy development for power generation, rural electrification and so forth.

**Powering Rural Development**

This book is open access under a CC BY 4.0 license. This book presents methods to evaluate sustainable development using economic tools. The focus on sustainable development takes the reader beyond economic growth to encompass inclusion, environmental stewardship and good governance. Sustainable Development Goals (SDGs) provide a framework for outcomes. In illustrating the SDGs, the book employs three evaluation approaches: impact evaluation, cost-benefit analysis and objectives-based evaluation. The innovation lies in connecting evaluation tools with economics. Inclusion, environmental care and good governance, thought of as “wicked problems”, are given centre stage. The book uses case studies to show the application of evaluation tools. It offers guidance to evaluation practitioners, students of development and policymakers. The basic message is that evaluation comes to life when its links with socio-economic, environmental, and governance policies are capitalized on.

**Yearbook 2013 - Energy and Sustainable Development**

"Rural infrastructure is critical to both economic and social development. Its absence thwarts growth and, typically, the poor are those hurt the most. The purpose of this paper is to serve as a basis for knowledge management on rural infrastructure." In the 1970s, the primary, if not the unique, objective of rural infrastructure lending was to get rural infrastructure built. However, the institutional aspects of how this infrastructure was to be built, and later how it would be operated and maintained, did not receive much attention. Only recently has poverty alleviation through employment creation become an explicit objective of rural infrastructure investments. This review tracks the poverty alleviation objective of rural infrastructure projects using three criteria: 1. whether poverty was an explicit criterion in the selection of specific sub-projects; 2. whether poverty was addressed in the pricing of rural infrastructure services; and 3. whether poverty was addressed through the creation of employment.
**Mini-Grids for Rural Electrification of Developing Countries**

As this book demonstrates, it is essential to involve stakeholders in assessments of hydropower development. The author targets policy formation after the UNCED and UNSSD conventions. By drawing on some dozen project cases, the author shows how policy changes have gradually influenced project design and implementation. Readers gain new insights into the reality behind hydropower policy changes as they have evolved over the last decade.

**Handbook of Research on Renewable Energy and Electric Resources for Sustainable Rural Development**

**Off-Grid Electrical Systems in Developing Countries**

Energy access is an essential prerequisite for economic, social, and human development. The 2015 United Nations Sustainable Development Goals (SDGs) explicitly recognized affordable and clean energy as a key factor in development, alongside education and poverty alleviation. The UN Sustainable Energy for All initiative (SEforALL) mobilizes international donors, countries, and the private sector to help people in developing countries gain access to modern energy services. To assist in support of SEforALL goals, this joint study of the Inter-American Development Bank (IDB) and the United Nations Development Programme (UNDP) provides a comprehensive review of energy poverty policies and programs in Latin America and the Caribbean (LAC). This report measures the progress and impact of energy-access programs and also documents the experience of successful projects. This study reviews cutting-edge methodologies to assist in program design, shares of experiences of successful programs and develops a vision for reaching sustainable energy for all in the LAC region. With electricity coverage at more than 96 percent, LAC is close to becoming the world’s first developing region to achieve universal access to electricity. Despite recent progress, within LAC there are still substantial pockets of energy poverty. Approximately 21.8 million people are without electricity access. More than 80 million people rely on firewood and charcoal for cooking that is burned in fuel-inefficient, primitive stoves. These traditional cooking technologies emit a significant amount of indoor air pollution (IAP), which has been linked to respiratory illnesses and adverse environmental impacts. Thus, in addition to promoting electricity, energy access programs also might give priority to the promotion of cleaner methods cooking by making available better stoves and cleaner burning fuels at reasonable costs. The report also
explores ways to measure energy poverty and monitor energy access in developing countries. The accuracy and effectiveness of tools such as the IEA’s household energy data efforts and the Global Tracking Framework depend on collecting information through standardized national surveys. Approaches to measure energy poverty and monitor energy access have increasingly focused on the provision of energy services such as lighting, space conditioning and cooking. The transition from low-quality energy services to more modern forms can be accomplished in different ways. As households in developing countries adopt electricity and clean methods of cooking, they benefit from higher quality, lower cost and convenient to use appliances. However, measuring the societal and developmental benefits of energy investments—though difficult—is important. Two basic approaches have evolved over the years to measure the benefits of energy access: (i) consumer surplus and (ii) regression-based techniques. The consumer surplus approach evaluates the economic benefits of energy services through measuring increased demand resulting from lower costs of such energy end uses such as lighting, radio and television. When possible, rigorous impact evaluation techniques based on multivariate models can be used to more directly measure the socioeconomic benefits associated with energy access and modern energy services including higher income and improved education. In recent years, new approaches for meeting the requirements of modern and sustainable energy services have emerged. Due to technical and market changes, new types of equipment have become available for providing energy services to rural areas. In LAC, three basic models have been developed to provide rural populations with electricity service: (i) main grid extension, (ii) community networks, and (iii) individual home-based systems (including clean cookstoves).

Rural Electrification

Rural Electrification and Sustainable Development in the Bolivar Province, Ecuador

This book provides students and practicing engineers with a comprehensive guide to off-grid electrification: from microgrids and energy kiosks to solar home systems and solar lanterns. As the off-grid electrification industry grows, universities are starting and expanding courses and programs in humanitarian engineering and appropriate technology. However, there is no textbook that serves this growing market. This book fills that gap by providing a technical foundation of off-grid electrical systems, putting into context the technical aspects for developing countries, and discussing best practices by utilizing real-world data. Chapters expertly integrate the technical aspects of off-grid systems with lessons learned from industry-practitioners taking a pragmatic, data-driven perspective. A
variety of off-grid systems and technologies are discussed, including solar, wind, hydro, generator sets, biomass systems, battery storage and converters. Realistic examples, case studies and practical considerations from actual systems highlight the interaction of off-grid systems with the economic, environmental, social and broader development aspects of rural electrification. Whole chapters are dedicated to the operation and control of mini-grids, load and resource estimation, and design of off-grid systems. Special topics focused on electricity access in developing countries are included, such as energy use in rural communities, technical and economic considerations of grid extension, electricity theft, metering, and best practices devoted to common problems. Each chapter is instructor friendly and contains illustrative examples and problems that reinforce key concepts. Complex, open-ended design problems throughout the book challenge the reader to think critically and deeply. The book is appropriate for use in advanced undergraduate and graduate courses related to electrical and energy engineering, humanitarian engineering, and appropriate technology. Provides a technical foundation of off-grid electrical systems; Contextualizes the technical aspects for developing countries; Captures the current and state-of-the art in this rapidly developing field.

Turning Hydropower Social

An understanding of the role of energy-related governance systems and the conditions required for a shift towards renewables in developing countries is urgently needed in order to tap into the global potential of low-carbon development. Although renewable energy sources have become technically feasible and economically viable, social and political factors continue to persist as the most critical obstacles for their dissemination. How Power Shapes Energy Transitions in Southeast Asia conceptualizes power for the field of sustainable energy governance. Based on empirical findings from the Philippines and Indonesia, the book develops an analytical approach that incorporates power theory into a multi-level governance framework. The book begins with a profound background on renewable energy development around the world and presents major trends in development cooperation. A power-based multi-level governance approach is introduced that is rooted in development thinking. Examining how coordination and power relations shape the development and dissemination of renewable energy technologies, the book also shows how decentralization affects low carbon development in emerging economies. Sparking debate on the ways in which energy transitions can be triggered and sustained in developing countries, this book will be of great interest to students and scholars of renewable energy development and environmental politics and governance as well as practitioners in development cooperation.