

Solar PV Electrification Programs in Developing Countries: Towards an Holistic Approach



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I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary education institution.

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Solar PV Electrification Programs in Developing Countries: Towards an Holistic Approach Abstract

Rural renewable electrification programs are increasingly being used as a means of providing the rural poor in developing countries with access to electricity. Those programs have varied significantly in design and implementation, as well as in their degrees of success. The explanations for the lack of success and the non-sustainability of the earliest programs are widely accepted as these tended to be technical demonstration projects that relied totally on funding from donor organisations or governments. These projects ignored or overlooked the vital question of how ongoing operational, maintenance and replacement costs would be met. Many genuine programs, however, also met with limited success and much effort has been invested in attempting to understand the reasons for this lack of success. To increase the rates of success of these programs, best practice guidelines were developed. Despite these efforts, many programs have continued to meet with limited success. These points required better explanations of the reasons for program success and failure, which requires a greater understanding of these programs.

This thesis looks more closely at solar PV electrification programs being undertaken in the Asia-Pacific region to understand why some programs continue to be more successful than others. It aims to understand the decisions behind the planning and implementation of the programs and the reasons that are being implemented in the way that they are, the selection of program objectives, the actual benefits of the programs the and causes of any factors that contribute to their apparent success or lack of success. This understanding is obtained by undertaking in-depth comprehensive field surveys to obtain the views of all program stakeholders. The outcomes of these field

surveys are then used to develop a comprehensive set of success criteria and a set of indicators that can be used to measure the success of rural renewable electrification programs. A roadmap that could be followed by the program planners and implementers to ensure program success is also provided.

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List of Abbreviations

AUSAID	Australian Government Overseas Aid
BAEC	Bangladesh Atomic Energy Commission
BCSIR	Bangladesh Council of Scientific and Industrial Research
BDT	Bangladeshi Taka
BIWTA	Bangladesh Inland Water Transport Authority
BPDB	Bangladesh Power Development Board
BRAC	Bangladesh Rural Advancement Committee
CFL	Compact Fluorescent Light
CI	Corrugated Iron
CMES	Center for Mass Education in Science
DBP	Development Bank of the Philippines
DFID	Department for International Development
ESCO	Energy-Service-Company
FDoE	Fijian Department of Energy
FEA	Fiji Electricity Authority
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GEF	Global Environment Facilities
GoB	Government of Bangladesh
GS	Grameen Shakti
IDA	International Development Association
IDCOL	Infrastructure Development Company Limited
IEA	International Energy Agency
IPP	Independent Power Producers
IREP	Integrated Rural Energy Program
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau
kWh	Kilowatt hour
LED	Light Emitting Diode
MEMR	Ministry of Energy and Mineral Resources
MFIs	Microfinance Institutions
M&M	Maintenance and Monitoring
MOA	Market Oriented Approach
MOU	Memorandum of Understanding
MW	Megawatt
NEP	National Energy Policy
NGO	Non-Government Organization
O&M	Operation and Maintenance
PBS	Palli Biddult Samity
PICHTR	Pacific International Center for High Technology Research
POs	Partner Organizations
PPP	Public Private Partnership
PSL	Prakaushali Sangsod Limited
PV	Photovoltaic
PVPS	Photovoltaic Power System
PWD	Public Works Department
RCF	Revolving Credit Fund
RE	Renewable Energy

REB	Rural Electrification Board
RERC	Renewable Energy Research Centre
REREDP	Rural Electrification and Renewable Energy Development Project
RES Ltd	Renewable Energy System Limited
RESCO	Rural Electrification Service Companies
REU	Rural Electrification Unit
RPGs	Recommended Practice Guidelines
SJCU	Saint Joseph's Credit Union
SEC	Solar Energy Company
SHS	Solar Home System
SPGP	Small Power Generation Policy
TCF	Trillion Cubic Feet
TMSS	Thengamara Mohila Songsad Somity
VAT	Value Added Tax (VAT)
VSSPV	Village Scale Solar Photovoltaic
WB	World Bank
WBREDA	West Bengal Renewable Energy Development Agency

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