ICIMOD

Implications of National Policies on Renewable Energy Technologies

Report of the Regional Experts' Consultation

Editor
Kamal Rijal

International Centre for Integrated Mountain Development
and
Canadian Cooperation Office
Kathmandu, Nepal

Implications of National Policies on Renewable Energy Technologies

Report of the Regional Experts' Consultation

3-4 July, 1997
Nagarkot, Kathmandu
Nepal

Editor
Kamal Rijal

Organized by
International Centre for Integrated Mountain Development

with Support from

Canadian Cooperation Office
Kathmandu, Nepal

Photo Credits : *K. Rijal*
Cover Photoes :
1) A Series of Wind Turbines(50-250 Watt) Installed at the Energy Demonstration Site, Badling, China - *K. Rijal*
2) Solar Photovoltaic Home System Installed in Kabhre District, Nepal - *CRT*
3) Dome Type Biogas Plant Installed in Panchkhal Valley, Nepal - *K. Rijal*
4) Five Hundred Litre Solar Water Heater Employed to Preheat Boiler Feed Water on a Dairy Farm, Near Solan, H.P., India - *K. Rijal*

Published by
International Centre for Integrated Mountain Development
G.P.O. Box 3226,
Kathmandu, Nepal

ISBN 92 - 9115 - 807 - 0

Typesetting at
ICIMOD Publications' Unit

Foreword

Renewable energy technologies (RETs) have considerable potential to contribute to environmental conservation and reduction of drudgery in the household tasks of mountain women. They can also act as engines of growth for mountain enterprises and off-farm employment. This has been widely demonstrated by individual actions and programmes promoting RETs such as improved cooking stoves, mini- and micro-hydropower, biogas, and solar photovoltaic equipment. Given the specific constraints to and opportunities for development that mountain regions are faced with, several of these technologies have comparative advantages for use in the mountains rather than the non-renewable fossil fuel-based technologies widely adopted in the plains.

Unfortunately, the wider adoption of RETs in the Hindu Kush-Himalayas has been hampered by the lack of or inadequate policies at the national level to promote RETs in a holistic manner or to give due recognition of mountain specificities with respect to both the choice of technologies and institutional mechanisms for their promotion. As a result the energy resources and technologies were not always appropriately matched with the needs of mountain households and mountain enterprises. Failure of some of the programmes has also been attributed to the lack of technical, financial, and organizational backstopping as well as the lack of proper understanding of the spatial characteristics of the mountains and the socioeconomic and cultural diversity of the region – which calls for a sensitive choice of energy mix and institutions.

In view of this, as part of its energy programme, ICIMOD initiated a study on 'Implications of National Policies on the Use of Different Renewable Energy Technologies in Nepal and Selected Other Countries of the Hindu Kush-Himalayas' with financial support from the Canadian Cooperation Office, Kathmandu. The study had three components: a) National Policy Studies in China, Nepal, India, and Pakistan; b) Case Studies on Four RETs in Nepal; and c) a Regional Experts' Consultation. The Regional Experts' Consultation was organized with a view to: a) assessing the implications of national policies on RETs in the context of the Hindu Kush-Himalayas; b) identifying factors that influence the adoption of RETs with particular reference to socioeconomic conditions and the biophysical setting; and c) recommending policies for the development of RETs in the mountains of Nepal. The meeting greatly benefitted from the contents of the commissioned studies and the additional inputs of the authors and other participants.

This report of the meeting, besides being a concise compilation of pertinent issues that various types of energy technology encounter, also provides useful insights to desirable policy shifts to promote use of renewable energy resources and the technologies that are available and suitable for mountain areas in a sustainable way.

I would like to extend my sincere appreciation to the study team from the Centre for Rural Technology, Kathmandu: Mr. V.B. Amatya, Mr. G.R. Shrestha, Mr. R.N. Gongal, Mr. S. Shrestha, and Ms. K. Bajracharya — who presented the findings of the study entrusted to them. I would also like to express my appreciation to Mr. Zhang Mi of China, Ms. Soma Dutta of India, and Mr. Tajjamul Hussain of Pakistan for the review studies carried out by them in their respective countries. My sincere thanks go to all the experts who presented

their opinions on various issues relating to RETs and provided suggestions that helped us arrive at conclusions and recommendations.

I would like to express my sincere appreciation to the Canadian International Development Agency (CIDA) for their generous funding of the consultation. Special thanks to Mr. Jaipal Shrestha, Environment Advisor and SPEF Coordinator, and Mr. Andrew Spezouuka, Environment Advisor, Canadian Cooperation Office, Kathmandu, for their active participation in the meeting.

Thanks are also due to Dr. Kamal Rijal who, as the coordinator of the programme, was responsible for organizing the meeting and preparing this report and to other ICIMOD staff, both professional and administrative, for their contribution and support.

Egbert Pelinck
Director General

Abstract

This report summarises the discussions held and recommendations made at the Regional Experts' Consultation on Implications of National Policies on Renewable Energy Technologies organized by ICIMOD from 2 - 3 July 1997 with support from the Canadian Cooperation Office in Kathmandu. The objectives of the consultation were to assess the implications of national policies on Renewable Energy Technologies (RETs) in the context of the HKH Region, to identify factors that influence the adoption of RETs in relation to particular socioeconomic and biophysical settings, and to recommend policy packages for the development of RETs for the mountain areas of Nepal.

The meeting reviewed and discussed various policies that had hampered the sustainable growth of RETs in the mountain communities of the HKH region with particular reference to China, India, Nepal, and Pakistan. The meeting helped to clarify the role energy can play in reducing drudgery, in reducing environmental degradation, and in providing linkages between energy and income generation. Also identified during the meeting was the necessity of compatibility of technology design to suit local conditions, private sector participation in the development of RETs, and the affordability of RET devices by mountain communities. All of these factors are critical for improving the financial viability of RETs. The meeting was instrumental in proposing a framework for policy recommendations to promote the development of renewable energy resources and technologies in the Hindu Kush-Himalayan Region.

During the meeting, four case studies carried out in Nepal were discussed:

a) Mini- and Micro-hydropower;
b) Solar Photovoltaic Technology;
c) Biogas Plants; and
d) Improved Cooking Stoves.

The meeting also charted out policy and institutional measures suitable for Nepal.

Contents

1	**Background**	1
2	**Opening Session**	3
3	**Implications of National Policies on RETs**	7
	3.1 Country Presentations: Nepal	7
	Himalayan Region of India	12
	The Hindu Kush-Himalayan Region of Pakistan	15
	The HKH Region of China	18
	3.2 Clarifications, Issues Raised and Suggestions Made	20
	Role of Energy in Reducing Drudgery	21
	Linkage between Energy and Income Generation	21
	Compatibility of Technical Design: Technology for Whom?	22
	Private Sector Participation versus Affordability	22
	Creation of a Management Fund	23
	3.3. Chairperson's Remarks	23
4	**Case Studies on Renewable Energy Technology**	25
	4.1 Nepal Case Study Presentations	25
	Micro-hydropower	25
	Clarifications and Discussions	27
	Issues Identified and Suggestions Made	30
	Biogas Technology	32
	Clarifications and Discussions	33
	Issues Identified and Suggestions Made	34
	Improved Cooking Stoves	35
	Clarifications and Discussions	37
	Issues Identified and Suggestions Made	38
	Solar Photovoltaic Technology	39
	Clarifications and Discussions	39
	Issues Identified and Suggestions Made	41
	4.2 Technology Dissemination and Adoption Approach: A Case Example of Passive Solar Housing in Himachal Pradesh	42
	Clarifications	44
	4.3 Chairperson's Remarks	44
5	**Policy Recommendations**	47
	Discussions and Suggestions Made	49
	General Recommendations	50
	Nepal-Specific Recommendations	50
	Technology-Specific Recommendations	51

6 Closing Session 53

Annex 1 : Programme 55

Annex 2 : List of Participants 57

Annex 3 : List of Studies Commissioned by ICIMOD and Papers Presented at the Meeting 59