



MOUNTAIN INFRASTRUCTURE AND TECHNOLOGY

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**ENERGY PLANNING AND MANAGEMENT IN KULU DISTRICT, H.P., INDIA**

A CASE STUDY

School of Planning and Architecture

*MIT Series No. 4*

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INTERNATIONAL CENTRE FOR INTEGRATED MOUNTAIN DEVELOPMENT

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**International Centre for Integrated Mountain Development (ICIMOD)**

**Kathmandu, Nepal**

## PREFACE

A programme on 'Strengthening Rural Energy Planning and Management in the Mountain Districts of the Hindu Kush-Himalayan Region' was organised during the period from January 1987 to November 1988, funded by the European Economic Community. Various activities were conducted under this programme. Six case studies, relating to 'Energy Management and Planning', covering five regional countries (Bhutan, China, India-2, Nepal, and Pakistan) were also conducted. These case studies provided inputs to develop energy management and to plan guidelines that could be used for training district level officers working in the field of energy-related issues. Dr. Ganesh Bahadur Thapa, a consultant, reviewed and improved the presentation of these six case studies.

This study is one among these six case studies and was carried out in Kulu District of the Himachal Pradesh Province in Northern India. It analyses issues in energy use and planning in Kulu District.

1. Agricultural and Livestock Characteristics, Fuel Consumption Systems, Wood Stoves, and Types of Working Materials Used in the Sample Villages of Kulu District	1
2. Availability of Educational and Medical Facilities in the Sample Villages of Kulu District	2
3. Assessment of Energy Requirements (a) Livestock Methods in the Sample Villages of Kulu District	3
4. Guidelines Used in Designing Livestock System	4
5. Guidelines Used in Designing Wood Heating in Areas of Medical Facilities	5
6. Guidelines Used in Designing Wood Heating in Areas of Educational Facilities	6
7. Guidelines Used in Designing Wood Heating in Rural	7
8. Status Matrix of Sample Villages in Kulu District	8

## CONTENTS

	<i>Page</i>
<b>Introduction</b>	1
<i>Background</i>	1
<i>Objectives of the Study</i>	1
<i>Methodology</i>	1
<i>Introduction to the Study Area</i>	2
<i>Socioeconomic Profile</i>	2
<i>Transportation and Communications</i>	3
<i>Social Infrastructure</i>	3
<b>Major Findings of the Survey</b>	
<b>Estimation of Biomass Requirements</b>	8
<b>Formation of Stress Matrix</b>	9
<b>Summary and Conclusions</b>	12

### LIST OF TABLES

<b>1: Household Characteristics Occupation, and Income Expenditure Patterns in the Sample Villages of Kulu District</b>	4
<b>2: Agricultural and Livestock Characteristics, Fuel Consumption Patterns, Water Sources, and Type of Building Materials Used in the Sample Village of Kulu District</b>	5
<b>3: Availability of Educational and Medical Facilities in the Surveyed Villages of Kulu District</b>	6
<b>4: Estimation of Biomass Requirements (by Litterfall Method) in the Surveyed Villages of Kulu District</b>	7
<b>5: Gradings Used in Denoting Locational Stress</b>	9
<b>6: Gradings Used in Denoting Stress Relating to Access to Medical Facilities</b>	9
<b>7: Gradings Used in Denoting Stress Relating to Access to Educational Facilities</b>	10
<b>8: Gradings Used in Denoting Stress Relating to Fuel</b>	10
<b>9: Stress Matrix of Surveyed Villages in Kulu District</b>	11

## List of Abbreviations

<i>Tehsil</i>	=	Sub-district
<i>Chulla</i>	=	Cooking stove
<i>Tandoor</i>	=	Furnace to heat the room
<i>Pucca road</i>	=	All weather macadam
<i>Kutchha road</i>	=	Seasonal road

## Energy Content and Conversion Factors

	Natural Units	kcal ( '000)	TOE	TOE	Others
<u>Non-commercial</u>					
Fuelwood	ton	4,000	0.57	0.39	1.43 m <sup>3</sup>
	m <sup>3</sup>	2,800	0.40	0.27	700 kg
Dried Dungcake	ton	2,600	0.37	0.25	--
Agricultural Residues	ton	3,000	0.43	0.29	--
<u>Commercial Fuels</u>					
Diesel	kl	9,080	1.29	0.88	0.826 ton
	ton	10,960	1.57	1.07	1,210 litre
Light Diesel Oil	kl	9,350	1.34	0.91	0.853 ton
	ton	10,960	1.57	1.07	1,172 litre
Petrol	kl	8,000	1.14	0.78	0.709 ton
	ton	11,290	1.61	1.10	1,411 litre
Kerosene	kl	8,660	1.24	0.84	0.778 ton
	ton	11,130	1.59	1.08	1,285 litre
Liquefied Petroleum Gas	ton	11,760	1.68	1.14	--
Coal	ton	6,000	0.86	0.59	--
Electricity	MWh	860	0.12286	0.083576	--
<u>Other Conversion Factors</u>					
1 TOE			1.00	0.680272	
1 TOE			1.47	1.00	

### Heat Content of Different Fuel Types

1 kg wood	=	15 Megajoules (MJ)
1 kg coal	=	26.5 MJ
1 litre of kerosene	=	43.6 MJ
1 kWh of electricity	=	3.57 MJ