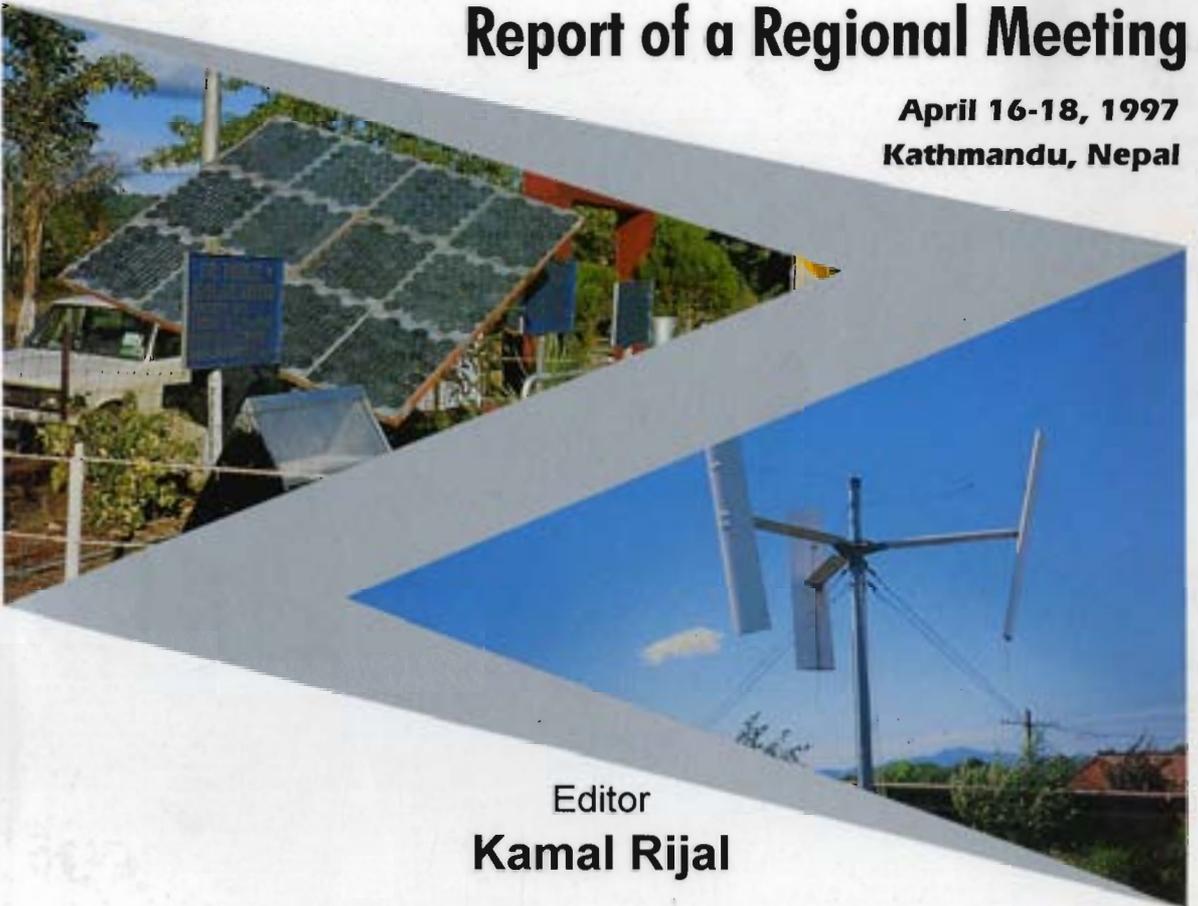




Energy Use in Mountain Areas Emerging Issues and Future Priorities

Report of a Regional Meeting

**April 16-18, 1997
Kathmandu, Nepal**



Editor
Kamal Rijal

**Organised by
International Centre for Integrated Mountain Development**

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Cover Photo

Right: Wind generator at demonstration site in China; Kamal Rijal
Left: Solar photovoltaic system exhibited in renewable energy
technology exhibition, Arunachal Pradesh, India; Kamal Rijal

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Foreword

Energy not only serves to meet the basic needs of life support systems but is a prime mover of all development endeavours. With altitude, energy requirements increase, be they for cooking, heating, or for transporting goods. In most mountain areas, a low grade of energy is required for consumptive use, thus making biomass fuels financially viable. The amount of energy required for productive purposes is low and is mainly met by animate energy in most mountain areas; and the replacement of this, in many instances, is not possible nor even desirable given the topographical features.

Lacking alternative options, Mountain people extract virtually all their energy requirements from their environment. The price they pay is deteriorating health and a worsening ecology, decreasing soil fertility, and a rise in the level of the floodplains in the adjoining plains and an increase in area. Particularly for the poor, and specifically for women and children, deforestation can be quite costly in terms of the expenditure of human effort, which is further aggravated by the low efficiency of energy end-use devices.

Matching supply and demand to energy in mountain areas is probably more complex than anywhere else, both in terms of its problems and its opportunities. As fossil fuels are not easily available or are prohibitive in cost for daily use, mountain people have traditionally relied on biomass for cooking and heating and on animal and human power for draught and transport. Energy is also recognised increasingly as a prime mover for nearly all development endeavours, be it for the processing of agricultural products, tourism, paper-making, or any number of other activities; and the mountains are endowed with sources of hydropower and solar energy which for the most part remain untapped.

Given this situation, ICIMOD has concentrated on the issue of energy in the mountains from its inception in 1984. The energy needs of mountain farming communities and of small urban centres in the mountains have been a priority. The state-of-the art reviews on rural energy carried out in the late 80s in five countries of the Hindu Kush-Himalayan (HKH) Region provided an understanding that afforestation must receive priority as a means of overcoming the fuelwood crisis, and that programmes must be introduced to create energy options (small hydro, farm biomass, biogas, and fossil fuel options). A decentralised energy planning and management approach seemed to be a possible strategy.

With these findings, a decentralised energy planning and management programme was introduced to develop methods of rural energy planning and

management in the mountain regions; to disseminate them among district level officials; and to train trainers from selected institutions. Since then ICIMOD has shifted its focus to generating more knowledge about renewable energy technologies (RETs) and their suitability in mountain areas.

Based on the knowledge generated, the lessons learned and the need for a shift in the energy development paradigm, together with the fact that environmental sustainability has become of central importance in development thinking, the need to promote appropriate policies and investment strategies for the development of a sustainable energy system in the HKH was recognised. The primary focus of ICIMOD is to understand and to document the dynamics of energy use in mountain areas and to review state-of-the-art renewable energy technologies such as (mini-/micro-) hydropower, biomass, and solar technologies.

As a first step, ICIMOD commissioned energy-use pattern studies in the HKH region in 1996 in four member countries, namely, China, India, Nepal, and Pakistan. The meeting was organised to gain a better understanding of the issues of emerging energy patterns, policies, and programmes and to identify future priorities for energy development in the mountains. The meeting greatly benefited from the contents of the commissioned studies and the additional inputs of the authors and other participants.

This report of the meeting is not only a compilation of emerging trends in energy but also provides some useful insights into future priorities for energy development in mountain areas. It will be used to guide ICIMOD's energy programme and, it is hoped, institutions and policy-makers in the Regional Member Countries will also draw inspiration from it for their own energy programmes.

I would like to extend my sincere appreciation to the study coordinators, namely, Mr. Wang Mengjie of China, Prof. N. K. Bansal of India, Dr. Kamal Banskota of Nepal, and Prof. M. Abdullah of Pakistan for carrying out the energy-use pattern studies in the HKH region of their respective countries (which are the first of their kind) and for capturing emerging trends in the HKH region. I would also like to thank all the experts who presented papers on various themes with the objective of promoting energy development for mountain communities. I enjoyed the active participation of the experts in the meeting, especially the sharing of knowledge and experiences so freely and candidly.

Thanks are also due to Dr. Kamal Rijal who, as the coordinator of the programme, was responsible for organising 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 suggestions made at the Regional Meeting on Energy Use in Mountain Areas organised by ICIMOD from 16 - 18 April 1997. The purpose of the meeting was to discuss the findings of the studies commissioned by ICIMOD in four countries, namely, China, India, Nepal, and Pakistan, and to identify future priorities for energy development. Two focal areas were covered in the discussions: i) emerging issues in energy use; and ii) energy policies and programmes. With a broadened understanding of these issues, future priorities for energy development in the mountains were discussed and several suggestions were made with regard to both policies and studies to improve understanding.

The meeting addressed issues related to database and planning, energy development and its sectoral linkages, energy resources and technological options, and subsidies and incentives for renewable energy technologies. The meeting was useful in promoting understanding of emerging trends in energy use in mountain areas. These trends are: prevailing unsustainability of the energy supply and demand in the mountains; inharmonious energy transitions, on the one hand, towards non-monetised low quality energy forms and, on the other, towards non-renewable fossil fuels; wrong choice of energy resources and technologies due to lack of a quality and quantity perspective in energy programme design; ignorance of the biophysical aspects of the mountains; and the methodological dilemma of having to internalise environmental costs. On the energy policy and programme front, the meeting identified the following issues: accommodation of multiple interest groups in decision-making; lack of technology and institutional policies; lack of sectoral linkages at the policy level; lack of vision with respect to technology choice; and insufficient focus on research and development of new energy systems. The meeting suggested that the role of every stakeholder involved be recognised and that more emphasis be given to ensure the active participation of women in the design and implementation of energy programmes.

The meeting identified important areas for ICIMOD's future activities related to the energy sector. These are related to understanding and comprehending energy use variability in those economic sectors that have comparative advantages for alleviating poverty in mountain areas. Due recognition needs to be given to possible impacts on environmental conditions in fragile mountain areas and human health in opting for a particular energy mix. In this respect, factors that promote renewable energy technologies' (RETs) adaptation need to be understood and sustainable energy policies and programmes need to be

developed. The meeting emphasised that continued efforts are needed in programme advocacy, information exchange, sharing of knowledge, and increased capacities in the field of mountain energy systems.

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