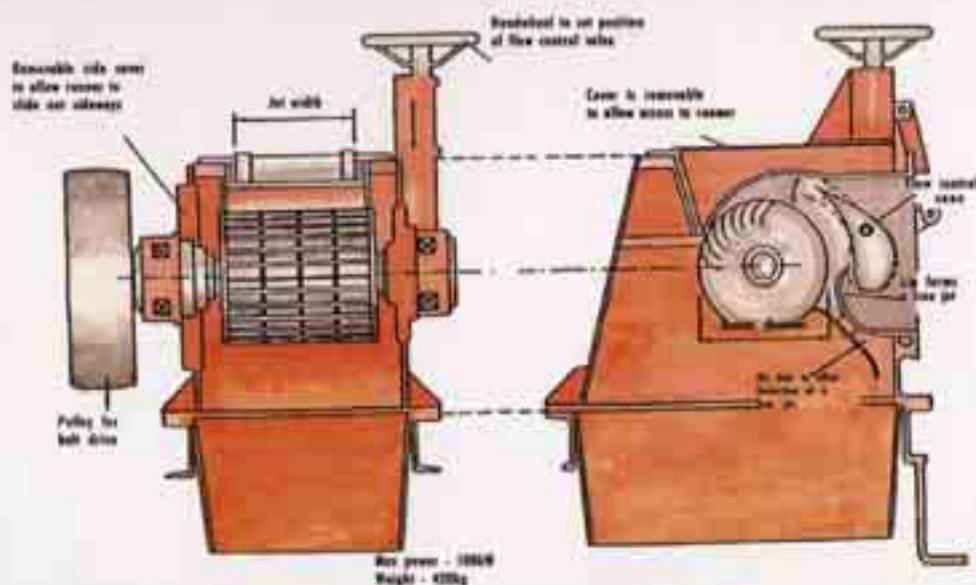


Operation and Management Manual for Private Micro-hydropower Plants



International Centre for Integrated Mountain Development
Kathmandu, Nepal
1999

Operation and Management Manual for Private Micro-hydropower Plants

Prepared by

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International Centre for Integrated Mountain Development (ICIMOD)
Kathmandu, Nepal
1998

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Published by

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

ISBN 92-9115-886-0

Typesetting at

ICIMOD Publications' Unit

Layout by

Dharma R. Maharjan

Cover design

A.K. Thaku

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Preface and Acronyms

This manual on the management and operation of private or community owned/managed mini- and micro-hydropower (MMHP) plants (especially micro-hydropower) is intended to provide assistance to managers and operators faced with the problem of running such systems in isolated areas. The managers and operators of MHP plants have often not had the benefit of extended education, may have little experience of working with machinery, and have often had very few opportunities to participate in relevant, high quality, training programmes.

The preparation of the manual was visualised, initiated, and sponsored by ICIMOD as a component of the NORAD sponsored project 'Capacity Building for Mini- and Micro-hydropower Development in Selected Countries of the Hindu Kush-Himalayan Region, Phase II'. It is one of four manuals aimed at the various groups of implementers of MMHP projects, including site surveyors and layout designers; manufacturers of indigenous equipment; installers; managers and operators; and repairers. The first draft of this manual was prepared by DCS-Technology Development, Butwal, Nepal, and was revised at ICIMOD. This is the first concerted indigenous effort to write quality manuals for MMHP which have a specific regional, rather than a general, perspective. DCS, in particular, deserves acknowledgement and encouragement for this work.

The main focus of this manual is on the isolated, indigenous, local entrepreneur-owned plants in the micro-range. Most of these plants installed in Nepal, Pakistan, and India have a capacity of less than 60kW. The manual has been kept simple and brief so that it can be used by managers and operators with limited formal education and training and little technical knowledge. The manual does not cover the specific details of different types of machines and management systems, rather it provides general information that can be applied to all schemes. Any attempt to cover all the managerial and operational aspects in one manual would result in it becoming so unwieldy as to lose its usefulness in the situations for which it is intended. Since this is the first time a manual of this type has been compiled, however, it is quite possible that some important aspects have been overlooked, or some information not provided in the most effective way. We would very much welcome receiving any suggestions for improvements or additions for subsequent editions from implementing agencies and operators/managers working with MHP plants and hope in this way to increase the usefulness of the manual in the future.

These remarks notwithstanding, it is hoped that, translated into the relevant languages, the manual will be a significant source of help for practising managers and operators in India, Nepal, and Pakistan. It is also hoped that some training agencies will find it to be useful supporting material for their training programmes.

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Coordinator, MMHP Project
ICIMOD

Abbreviations and Acronyms

ACSR	: Aluminium Conductor Steel Reinforced	1
ADB/N	: Agricultural Development Bank/Nepal	3
AVR	: Automatic Voltage Regulator	3
DP	: Double Pole (switch)	4
ECC	: Electronic Current Cut-out	5
ELC	: Electronic Load Controller	6
HDPE	: High Density Polyethylene	7
ITDG	: Intermediate Technology Development Group	8
HKH	: Hindu Kush-Himalayas	10
kVA	: kilo volt-amperes	11
kW	: kilowatt	13
LH	: Left Hand	14
MCB	: Miniature Circuit Breaker	15
MHP	: Micro-hydropower	16
MMHP	: Mini- and Micro-hydropower	17
NGO	: Non-government organization	17
NORAD	: Norwegian Agency for Development Cooperation	19
PTC	: Positive Thermal Coefficient	19
PVC	: Polyvinyl Chloride	20
Rs	: Rupees	21
SWG	: Standard Wire Gauge	21
TRS	: Tough Rubber Sheathed (insulation)	23
VIR	: Vulcanised Indian Rubber (insulation)	23

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