

CHAPTER 1

Introduction

Proper resource mobilisation, whether of human or natural resources, plays a vital role in the development of any village, region, or even country. In the Hindu Kush-Himalayan (HKH) region there are few natural mineral resources of worth, but there are abundant water resources and a large pool of human resources, although unskilled. Micro- and mini-hydropower (MMHP) plants can be installed to harness these water resources using currently available technology that is based on practical installation experience. Combined with development of human resources through training, MMHP can play a significant role in the enhancement of living standards in remote and underdeveloped mountain areas.

As we approach the 21st century, electricity is no longer considered to be a luxury, but a basic need of people everywhere. It is synonymous with a better standard of living and is vital for better communications, health care, and reduction of physical labour. In the HKH region, most settlements and houses are scattered and remote from road heads and the national grid. Transmission of electricity or transport of fuel to many of these locations is prohibitively expensive. Old forest trees are felled to provide firewood for cooking, commercial uses, and even lighting. Few new plantations are made to replace cut forests, and deforestation contributes towards problems such as flash floods and landslides. The practical options to mitigate these problems include both new plantation programmes and increased use of MMHP to meet local energy needs.

The capital required for investing in MMHP is beyond the reach of most people in mountain communities, and loans must be taken out for investment. If these loans are not to be a burden, the MMHP schemes must be carefully scrutinised and installed and wisely operated and managed (including proper repair and maintenance) to give long-term benefits. If properly installed, an MMHP plant can provide energy for lighting and for grinding grain, expelling oilseed, and other milling facilities; as well as for use in communication by telephone, radio, and television; and for industries such as sawmills, papermills, and workshops. MMHP may even encourage the development of facilities such as ropeways to reduce the burden of physical portering.

Installation of equipment is not the end of the job in any construction project. Proper operation and management of the plant and organization of repair and maintenance are also essential for satisfactory performance. These can only be achieved through training

and back-stopping. Indeed, proper management of these stages is the main determinant of the success or failure of a project.

This manual has been prepared to assist people in the management of MMHP plants so as to ensure maximum returns and benefits from the investment. It assumes that the survey, design, installation, and hand-over work have been completed amicably. The roles of operator and manager now become as important to the investors in the project as the role of a bus driver is to the safe operation of a bus. Carelessness on behalf of either may result in an accident.

The manual is intended for the use of managers and operators of micro-hydropower (MHP) plants of up to 100kW in capacity. However, many chapters may also be relevant for larger MMHP plants of, say, up to 200kW in capacity. Since the manual does not contain chapters on transformers or high-tension transmission lines, such information would have to be acquired from other sources.

Ideally, managers and operators should have attended a training programme based on the manual to obtain maximum benefit from it. However, managers and operators already working in the field who know MHP plants and their parts reasonably well, and who have good comprehension of technical texts, will also find the manual useful. Basically, the manual has been written for electrification schemes. However, the manual can also be used for MHP plants (prime movers) powering other industrial applications such as agro-processing.

The manual is divided into two parts. The first part deals with the general management of the plant: how to manage the operator, dealing with customers, financial management, and organization of maintenance and repairs. The second part describes the actual operation procedures, procedures for routine inspection and maintenance, keeping of the log book, the procedure to be followed during extended shutdowns, and some basic safety considerations and first aid procedures.