

INTRODUCTION

The Upland Watershed Specificities

This resource book is aimed at preparing facilitators of upland watershed management to give orientation to farming communities and other land users. Upland watersheds consist of all sloping and rainfed lands in which mountains are the most fragile and difficult to manage.

Watershed management in the mountain environment has become one of the most significant challenges to humankind in this century. To understand the mountain environment and organize environmentally friendly and sustainable development programmes oriented to people's needs are both complex and Herculean tasks as these areas have their own unique features, known as mountain specificities. This means that we have to deal with mountain environments within the parameters of their uniqueness.

The mountainous upland watersheds constitute about 20 per cent of the surface of the earth, but there will hardly be any area on the earth not affected by their environmental characteristics. One of the unique niches of the mountains is their ability to act as orographic barriers to the flow of moisture-bearing winds resulting in rainfall in the mountains and the plains. Also, many upper mountain regions contain large volumes of stored water in the form of ice which provides the necessary melt-flows into the rivers during hot and dry seasons. Furthermore, the sociocultural and ecological importance of mountain waters is vital, since they provide water to all living beings. Apart from being the home of mountain communities, the other economically important uses of mountainous watersheds include forestry, medicinal plants, ornamental plants, agro-horticulture, mineral extraction, livestock-rearing, tourism, and recreation.

Over hundreds of years and, in particular, in the current century, the impact of human activities on mountain environments has increased considerably. Upland mountainous watershed areas are currently inhabited by more than one-tenth of the world population. Their environments and livelihoods are threatened by an increasing imbalance between population and the available productive land. In many places, the activities have exceeded the carrying capacity of the land, leading to an ever-increasing demand for new agricultural and forest lands and for land-based products. Consequently, the forested upper slopes of these young mountain watersheds are being cleared for cultivation, grazing, fodder, fuelwood, and timber. Removal of vegetation on steep slopes, in conjunction with intense monsoon rainfall, is triggering massive erosion and landslides resulting in soil impoverishment and soil losses and a deteriorating biophysical environment. This is leading to increasing poverty in mountain communities because the natural resource bases of forests, soil, water, plants, and animal life, on which the people depend for their continued survival, are decreasing at an alarming rate. Measures to control this degradation are required before the ecological balance is irreversibly damaged.

These recent human interventions have given rise to disturbing impacts on the mountain environment. The negative impact of such interventions is due to a low level of understanding of the mountain specificities by the people who inhabit these mountains.

Large-scale changes occurring in the mountain environment have resulted in widespread human miseries. The impact of such changes is not restricted to mountain areas but has also had socioeconomic impacts on the plains. Because of the deterioration of the mountain environment,

as well as the urgent need to ensure a sustainable habitat, national and international institutions have made the mountain environment a matter of increasing concern.

Managing the mountain environment is a complex task due to their specific characteristics. Notwithstanding the contribution these can make, the concepts and methods of natural resource management for mountain environments are in a rudimentary, evolving stage. Serious analytical and integrative contributions are needed to strengthen this vital area. Accordingly, natural resource management in mountain environments cannot, at present, be a fully prescriptive guide to human activities. It is the accumulation of knowledge from various mountain areas and their several resource strategies that will provide the background for a more comprehensive prescriptive tool for the future. One of the major challenges for integrated mountain development or upland mountain watershed management is to ensure that the needs and aspirations of the hill communities are met without compromising the ability of future generations to meet their own needs. A comprehensive strategy for natural resource management in mountain environments might, therefore, be based on a holistic and interdisciplinary understanding of both society and habitat within a dynamic framework.

The framework within which human societies have evolved in mountain environments has several peculiarities. Due to their isolation, distance, poor communication facilities, and poor accessibility to goods and services, mountains have remained relatively inaccessible. The mountains' natural environment makes it prone to rapid degradation in the face of intensive and improper use, thereby turning it into a fragile one. Similarly, soils in the mountain watersheds are marginal in their productive capacity. The people of the mountains are not included in mainstream decision-making for national development policies and programmes. Hence, the mountains have limitations due to their inherent marginality. However, mountains also possess incomparable assets by virtue of their unique suitability for hydropower, tourism,

horticulture, medicinal plants, and other high-value crops which have given them a comparative advantage, a niche, over the plains. Hence, mountains provide a wide range of attractive and unique opportunities. Despite socioeconomic and cultural diversities, the mountain communities have coped with the harsh environment by developing mountain-specific adaptation mechanisms; thus demonstrating that the mountain people themselves are a great asset.

Against the background of isolated settlements in mountain watersheds, each area has evolved specific socioeconomic parameters. These are normally rooted in the specific environmental parameters of mountain areas, because to a large extent they influence the socioeconomic organizations pursued by these societies.

Environmental characteristics of the mountain areas can largely be understood through mountain-specific features which lead to changes in altitude and variations in rainfall. The altitude and rainfall provide micro-conditions for vegetational as well as agroclimatic characteristics of mountain areas. On a macro-scale, this provides the basis for the rich biodiversity of the mountains.

Environmental parameters have interacted with socioeconomic parameters in the mountains. Specific climatic advantages of rainfall or of a cool climate provide unique conducive environments for developing temperate forests and medicinal plants of high commercial value. The creation of such environments will be a boon for developing the tourism industry. They can also provide a basis of agroclimatic advantages for the production of fruits and vegetables of commercial value to be sold to markets in the plains. A comprehensive and minute understanding of these specific parameters, therefore, becomes an essential factor in the planning of mountainous watershed development and analysis of mountain transformations.

The Need for a Resource Book on Farmer-Led Upland Watershed Management

Neglect of mountain areas by policy-makers in the past has resulted in a general lack of understanding of the natural and human

processes affecting these mountains. Few development interventions that have been designed are of a sectoral nature. These addressed more the symptoms than the causes of the problem and largely ignored the opportunities for development that the mountain watersheds provide. What is needed now is an integrated approach to sustainable development in which farmers are in the forefront reconciling their socioeconomic needs and aspirations with the requirements for enhancing environmentally-friendly biological productivity. Such development programmes also need to be gender-sensitive and socioculturally in harmony with the taboos and traditions of the local system. In these activities, the promoters of development programmes should act as facilitators and catalysts of development processes.

This trainers' resource book tries to address the vital issues in adopting an integrated approach for developing upland watersheds. It deals with mountain specificities and processes of farmers' empowerment. It emphasises that farmers should be in charge of their development programmes. It strongly advocates that development programmes should be sociocultural and gender sensitive for them to be effective. The module also deals with livelihood options that the mountains offer. The manual also attempts to bring home the message that degraded upland watersheds, even under mountainous and harsh climatic conditions, can be rehabilitated in an environmentally-friendly way with attractive biological and economic returns through the use of appropriate technologies. Inclusion and consideration of all these issues will be crucial for an environmentally-friendly sustainable upland watershed development. While going through the manual, the reader should avoid thinking about technologies mentioned and their transfer, but should rather concentrate on processes and principles behind each of these modules and think of their implications in respective cases.

The Resource Book

This resource book contains eight modules covering the above-mentioned issues. It is, thereby, a package on the processes of upland watershed development. To make

the contents of each module simple and easy to follow, it has been presented under points and sub-points. For an easy grasp of the contents of these modules, the main points are posed as questions. In this manner, it is hoped that this resource book can be used as a participatory training manual rather than for lectures, which generally result in one-way communication. The principal theme of each module is given below.

Module 1

Module 1 begins by synthesising some of the key elements which make up participatory processes for farmer-led integrated watershed management. It brings out those underlying features that need consideration for farmers' empowerment and ownership and which are essential for sustainable participatory, upland watershed management. It also talks about how farmers' organizational institution-building can be achieved and their networking materialized. It also illustrates the importance of gender concerns in integrated watershed management programmes. The module ends with emphasising how farmer-led processes lead to sustainable and need-based watershed management practices.

Module 2

Since management of upland mountainous watersheds needs to be based on its specificities, Module 2 describes past and present conditions of mountain ecosystems in relation to their inhabitants. It describes the unique features of mountains which are better known as mountain specificities. It also outlines the comparative advantage of mountain areas over the low-lying plains' areas. It stresses the need to bring about an overall conceptual change in watershed development approach and moving beyond its physical dimensions. The module concludes with a suggestion that a mountain watershed should not be taken just as a means of livelihood but as a 'catchment of economic activities' for the welfare of its farmers and other communities.

Module 3

Module 3 begins with an attempt to delineate the role of social science and its integration in integrated watershed management programmes. It presents

farmers' empowerment as a prerequisite through which disadvantaged groups of people will attain self-reliant status. The module also takes a look at some of the participatory methods and their basic principles with emphasis on their importance for farmer-led integrated watershed management.

Module 4

Module 4 begins with the responsibilities and burdens women share in managing households and the natural resources of a watershed. However, it points out that women are ignored both as participants and as beneficiaries in all development programmes. It stresses the need for gender analysis to identify needs and priorities and to clarify the relevance of gender in conjunction with socioeconomic and cultural variables which are crucial for integrated watershed management programmes. The module attempts to highlight gender causes through case studies showing how gender-insensitive programmes are bound to fail.

Module 5

Module 5 begins with a presentation on environmental degradation-induced food security and livelihood concerns in Asian developing countries. It further illustrates how action to alleviate these problems has led to agricultural transformation in some parts of the Hindu Kush-Himalayas (HKH). The module also attempts to explain what is meant by food security in relation to mountain communities. The module also describes institutional weaknesses and suggests ways to overcome them; and it emphasises that these are crucial for farmer-led watershed management programmes. The module concludes by indicating priority areas for participatory planning and offers suggestions to mitigate the existing livelihood problems.

Module 6

Module 6 is designed to bring out the main features of some of the relevant experiences gained while managing natural resources through the participation of the local people. For this, it begins by highlighting environment-induced degradation effects on human beings and their surroundings.

Through case studies, the module presents how natural resources were conserved and used through local initiatives in the past and also makes comparisons with the present initiatives. The module concludes with some suggestions for future implications.

Module 7

Module 7 begins with the present upland watershed development priorities in the context of land resources' conservation, production, and productivity. It also describes what mountain people are doing to make a living against the rapidly deteriorating land-based resources' situation. The module gives examples of how species of seabuckthorn and cardamom are being used successfully for both soil conservation and entrepreneurial purposes. It concludes by emphasising the unique niche-based farming opportunities that mountains provide.

Module 8

Module 8 describes how some sustainable watershed management processes and practices are being implemented successfully by farmers in some parts of the Asian region. It also gives an account of the impact of the processes and practices on both the local people and the environment. The module concludes by drawing lessons for future implications/testing for farmer-managed watershed development programmes.

This trainers' resource book attempts to present, through the eight modules, a scenario for facilitating upland, integrated watershed development led by the farmers and other land users. Thus, these eight modules deal with a range of issues from a mountain perspective: processes of development; sociocultural factors; and gender concerns. It also describes the changing scenarios of the livelihood options being pursued by mountain farmers to manage common property resources effectively through a community approach to development in some parts of the upland mountain watersheds in the Asian region. It also presents successful cases of rehabilitation of marginal lands and upland farm management processes which are proving to be both environmentally friendly and economically enterprising for farmers.

The aim of this trainers' resource book is to emphasise integrated upland watershed development processes for facilitating farmers' ownership of the programmes rather than to give appropriate technologies for upland watershed management. Some technologies are there in the manual as an example pertaining to the case in question. Post-analysis of the case studies/ technologies provided has been carried out to assess their overall impact. This has been done with a view to drawing lessons for

future implications. It is hoped that upland watershed management professionals will find it useful reference material for conducting training programmes of a similar nature.

The modules are presented as dialogues, questions, and responses, so that this trainers' resource book can facilitate participatory methods of training leading to a dialogue between trainers and trainees.