



# Recent Concepts, Knowledge, Practices, and New Skills in Participatory Integrated Watershed Management

## Trainers' Resource Book

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# Panel of Contributors

## Panel of Experts and Contributors for the Training

The subject of the resource book—recent concepts, knowledge, practices, and new skills in participatory integrated watershed management—is so varied and of such importance and magnitude that it required inputs, knowledge, and experience from a multidisciplinary panel of specialists. Their contributions to designing and organizing the training, preparing the modules of this resource book, and carrying out the training are greatly appreciated.

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### Panel of Contributors

Names of the contributors to this resource book have been mentioned in their respective papers. More papers than are actually included in this volume were prepared and presented during the training. In spite of their importance, some papers could not be included in this volume because they were also presented at two previous training sessions and have already been published in previous resource books. We acknowledge with sincere thanks the contributors of the following topics which, for reasons explained above, are not included in this volume.

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Illustrations for this resource book were prepared by Mr Badri Ram Shrestha, Artist.



# Table of Contents

Foreword

Preface

Acronyms

Introduction

## Module 1: Recent Concepts in and Approaches to Participatory Integrated Watershed Management 1

- 1.1 An Overview of Recent Concepts and Participatory Integrated Watershed Management (PIWM) Processes  
*P. N. Sharma* 3
- 1.2 New Developments in Social and Economic Concepts, and Participatory Integrated Watershed Management  
*M. Banskota* 9
- 1.3 Factors Supporting Small over Big Watershed Development  
*N. S. Jodha* 17
- 1.4 Service Delivery versus Popular Participation and Extension  
*D. Tamang* 25
- 1.5 Ethnobotany for Biodiversity Conservation  
*Pei Shengji* 35
- 1.6 Conflicts in Community Forestry and Mechanisms/Processes for Resolution – Some Examples from Nepal  
*K. B. Shrestha* 41

## Module 2: Appropriate Technologies and Practices in Participatory Integrated Watershed Management 49

- 2.1 Rehabilitation of Degraded Lands  
*B. R. Bhatta* 51
- 2.2 Agroforestry in Participatory Integrated Watershed Management  
*Tang Ya* 69
- 2.3 Bio-engineering Practices for Soil and Water Conservation  
*M. Wagley* 77
- 2.4 Bio-engineering for Landslide Control in Upland Watersheds  
*Li Tianchi* 81
- 2.5 Biotechnology for Natural Resource Management  
*N. Joshee* 87
- 2.6 Integrated Plant Nutrient Management and Biofertilizers for Watershed Management  
*S. L. Maskey/S. P. Panday* 97
- 2.7 Water Harvesting  
*S. A. Sial* 103
- 2.8 Water Management  
*M. M. Shrestha* 109

3.1	Methods of Preparing Verifiable Environmental Impact Statements (EIS) <i>M. Ghimire and B. Upreti</i>	119
3.2	Application of Strategic Environmental Assessment (SEA) in Watershed Management <i>R. B. Khadka</i>	125
3.3	Resource Dynamics : Complex Problems, Complex Solutions <i>Hans Schreier, R. A. Allen and P. B. Shah</i>	133
3.4	Population Dynamics and Land-Use Changes: A Case Study of Jhikhu Khola Watershed, Nepal <i>B. Shrestha</i>	143
3.5	Three 'S' Technologies for Watershed Management <i>M. Myint</i>	147
3.6	Remote Sensing (RS) and Geographical Information System (GIS) Applications at Watershed, National, Regional and Global Levels <i>A. K. Myint</i>	155
3.7	Extending an Integrated GIS-based Watershed Modelling Approach to Participatory Watershed Management <i>S. H. Achet</i>	163



# Foreword

With 20 per cent of the world's population living in upland and mountainous areas and many more in the plains below, sustainable management of watersheds is of global importance. In no region of the world is this more obvious than in Asia, where nearly every country has substantive mountains and upland areas. While natural phenomena such as heavy monsoon rains and fragile geological formations in themselves are major threats to the stability of watersheds, expansion of agriculture, forest exploitation, and population growth are causing increasing degradation on steep and sloping lands. Within upland watersheds and below, landslides and floods inflict much loss of life and damage to property and infrastructure annually. However, there is now a general awareness of the problem of watershed degradation in Asia.

Various efforts are undertaken by government institutions, NGOs, and international and bilateral donor organizations, to reverse the trend of degradation and promote successful approaches to sustainable management of watersheds.

However, the rate of degradation still by far exceeds the rate of restoration, and there is an urgent need to identify successes and failures in watershed management. In recent years, there has been a remarkable change and transformation in concepts and approaches in watershed management in the fields of both institutional development and technologies. Indigenous knowledge and technologies of natural resource management have been (re) discovered as often being more effective, affordable, and appropriate in the more remote areas. At the same time, new technologies and tools for planning and implementing watershed management programmes have been developed and applied also.

A serious constraint in the widespread adoption of successful concepts, technologies, and skills has been the lack of sufficiently trained human resources to apply them.

Sharing information on indigenous and modern technologies and concepts in watershed management among institutions in Asia was the main objective of a training course held in Kathmandu, Nepal, in April 1998. During this course a draft of the present Training Resource Book was used. The course was organized by the International Centre for Integrated Mountain Development at the request of and in close collaboration with the Participatory Watershed Management Training in Asia Programme of the Food and Agriculture Organization of the United Nations (FAO).

The Participatory Watershed Management Training in Asia (PWMTA) Programme (GCP/RAS/161/NET/ of the FAO(UN)/The Netherlands) is making efforts to train manpower and to help human resource development in participatory watershed management for sustainable use and management of primary natural resources; soil, water, and forests; and by enhancing national capabilities to plan, implement, evaluate, and monitor participatory watershed rehabilitation programmes. This is being achieved by regional training courses, workshops, seminars, preparation of resource books, and manuals for training and regional and national network of trainers and institutions.

The International Centre for Integrated Mountain Development (ICIMOD) attaches great importance to watershed management and is involved in many programmes. It has joined hands with the PWMTA

programme of FAO(UN) to organize training and develop materials for human resource development. The objective of preparing this Trainer's Resource Book, which is the third and final in this series, is to help improve, upgrade, and update the skills and capabilities of the available manpower in recent concepts, knowledge, practices, technologies, and skills in participatory integrated watershed management as facilitators so that the practitioners can own and implement them successfully.

We hope that this resource book will be useful and helpful, not only to professionals and to institutions engaged in transferring and improving skills for sustainable management of watersheds, but also to the real stakeholders, the people living in those watersheds.

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# Preface

Degradation of upland mountain watersheds, particularly acute in the Asian region, is increasingly becoming a problem of world-wide concern. It is seriously undermining the economic, social and environmental security and well-being of people living in these watersheds.

Though the importance of natural resource conservation is being realised increasingly in the region, full awareness and understanding of the multiple benefits that can be achieved from the management of watersheds on a sustainable basis, and the disastrous consequences of watershed degradation on socioeconomic and environmental conditions of the people living therein, have yet to be realised fully by policy-makers, practitioners, and the ultimate beneficiaries or the sufferers – the watershed farmers and downstream inhabitants.

Various efforts by the people, governments, NGOs, INGOs and donors to manage watersheds have produced mixed results. There are many success stories that are mostly based on the active participation of local people, the application of indigenous knowledge and technologies, and the application of new concepts, knowledge, and practices that have been discovered, rediscovered, and used successfully. At the same time, new developments in today's science and technology and the availability of advanced tools and skills, such as the three 'S' technologies, which are efficient, effective, cheap and quick, can help greatly in the successful planning, implementing, monitoring and evaluation, as well as managing of watershed rehabilitation programmes.

Efforts have been made in preparing this resource book to include recent concepts, knowledge, practices, and new skills in participatory integrated watershed management (PIWM) based on the experiences and lessons learned from within Asia and other parts of the world. This book is mainly for the use of trainers and practitioners of PIWM in mountainous watersheds so that they can increase their understanding, knowledge, and skills for sustainable management of natural resources.

This resource book is organized into three modules: (1) Recent Concepts and Approaches in PIWM; (2) Appropriate Technologies and Practices in PIWM; and (3) New Methods, Skills and Tools in PIWM. These modules contain sub-modules that deal with important elements of PIWM.

We hope that this book will help to improve the understanding, knowledge, and skills of the professionals, trainers, and people involved in managing mountain watersheds in Asia.

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# Acronyms

ArcView	A GIS-based information computer software package
ATSCFS	Appropriate technologies for soil-conserving farming systems
CARL	Comprehensive Agrarian Reform Law
CBO	Community-based organization
CDO	Chief District Officer
CF	Community forestry
DD	Diagnosis and design
DENR	Department of Environment and Natural Resources
DFO	District Forest Officer
DOF	Department of Forestry
DOS	Department of Soil Conservation
EIA	Environmental impact assessment
EIS	Environmental impact statement
FAO	Food and Agricultural Organization of the UN
FD	Forest Department
FINNIDA	Finnish International Development Agency
FUG	Forest user group
GIS	Geographic information system
GL	Group leader
GO	Government organization
GPS	Global positioning system
HFC	Hamlet-level farmers' organization
HKH	Hindu Kush-Himalayas
HMG/N	His Majesty's Government of Nepal
HP	Himachal Pradesh
HVC	High-value crops
HYV	High-yielding variety
ICIMOD	International Centre for Integrated Mountain Development
IIDS	Institute for Integrated Development Studies
INGO	International non-governmental organization
INM	Integrated nutrient management
INSM	Integrated nutrient and soil management
IPM	Integrated pest management
ISFP	Integrated Social Forestry Programme
ITK	Indigenous technology knowledge
IUCN	International Union for Conservation of Nature and Natural Resources
IWM	Integrated watershed management
M & E	Monitoring and evaluation
MBRLC	Mindanao Baptist Rural Life Centre
MFSC	Ministry of Forests and Soil Conservation
NARC	Nepal Agricultural Research Council



NFT/S Nitrogen-fixing trees/shrubs  
 NGO Non-government organisation  
 NWDPPRA National Watershed Development Project for Rainfed Areas

OAT Other appropriate technologies  
 OP Operational plan

PARDYP People and Resources' Dynamics Project  
 PFT Plastic film technology  
 PIWM Participatory integrated watershed management  
 PMA Production marketing association  
 PRA Participatory rural appraisal  
 PWMTA Participatory Watershed Management Training in Asia

R & D Research and development  
 RRA Rapid rural appraisal  
 RS Remote sensing

SALT Sloping Agricultural Land Technology  
 SBT Seabuckthorn  
 SEA Strategic environment assessment  
 SEGA Socioeconomic and gender analysis  
 SRSC Sarad Rural Support Corporation  
 SWFO Small watershed farmers' organization

UG User group  
 UNDP United Nations Development Programme  
 USA United States of America

VDC Village development committee

WM Watershed management