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Hydrometeorological Measurements and Analysis in Interdisciplinary Watershed Projects

A strategy paper prepared for the PARDYP project

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Thomas Hofer undertook his PhD, at the University of Bern, on floods and the interrelationships of highland and lowland river flow regimes in South Asia, specifically in Bangladesh. Dr. Hofer was Watershed Management Advisor with the ICIMOD-PARDYP project and he is now based in Rome with FAO.

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Preface

The work described in this publication has been undertaken as part of ICIMOD's People and Resource Dynamics Project (PARDYP), a multidisciplinary watershed research-for-development project that began in October 1996.

The goal of PARDYP is to improve the understanding of environmental and socioeconomic processes associated with degradation and rehabilitation of mountain ecosystems and to generate wider adoption and adaptation of solutions proposed by stakeholders in the Hindu Kush-Himalayas (HKH).

PARDYP is funded by the Swiss Agency for Development and Cooperation (SDC), the International Development Research Centre (IDRC–Canada), and ICIMOD. It is actively supported by the University of British Columbia (Canada) for the land resource aspects and the Hydrology Group of the University of Bern (Switzerland) in the fields of hydrology and meteorology. The regional management of the project is carried out by ICIMOD.

In the first year of the project an important aspect of the research activities concerned the establishment of hydrological and meteorological stations within five watersheds of between 5,000 and 10,000 ha in four countries of the HKH. The subsequent aims of the hydrometoerological component of the project are:

a) to collect quality hydrological and meteorological data in five watersheds on an east-west transect across the HKH and build a long-term regional database,
b) to establish the relationships between on-going biophysical and socioeconomic activities and incidents at watershed level,
c) to include the hydrometeorological information in the synthesis of project findings in order to identify and recommend appropriate on-the-ground development activities, and
d) to augment the present knowledge on mountain-plains' dynamics.

This discussion paper provides details of the establishment of the hydrological and meteorological stations, the collection and storage of the collected data both in the field and in the office, and recommends the necessary programmes of analysis. The penultimate chapter looks forward and describes possible methods for synthesising data from all aspects of the project.

It is recognised that the ideas and recommendations within this paper may be adapted in the future as the project and research needs develop. As it stands, however, the present document provides useful details for both the PARDYP project and other similar watershed projects in which there are hydrological and meteorological components.

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The team members of the University of British Columbia in Vancouver
The team from the Swiss Agency for Development and Cooperation (SDC) in Kathmandu
The International Development Research Centre (IDRC) of Canada.

Abstract

PARDYP is an interdisciplinary watershed research project which begun in October 1996. It is managed by ICIMOD and operates in five watersheds located in four countries of the Hindu Kush-Himalayas: Pakistan, India, Nepal, and China. Hydrology and meteorology are very important elements of the project. This discussion paper is based on one and a half years' experience with the PARDYP project.

In order to be able to compare the results in the five watersheds, common procedures and methodologies for data collection as well as for analysis have to be developed. This document is a contribution to this task and is focussed on the hydrology and meteorology components. It provides guidelines for data collection, data handling, data processing, and analysis. The paper differentiates between compulsory activities in data collection and analysis in all the five watersheds and optional, more specialised steps to be carried out only if the necessary infrastructure and skills are available. For a rapid overview of the elements of data collection and analysis, Tables 5,7,8,9, and 10 can be consulted.

The discussion paper is based on experiences from the PARDYP project. However, the guidelines, the approaches, and the ideas discussed in the document may be useful for other watershed research projects also.

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