

1 Introduction

Mountain Communities and Climate Change

Mountain communities in the developing world are often marginalised from political influence and economic opportunities and generally face high levels of poverty. The ecosystems they dwell in are among the Earth's most sensitive. Mountain ecosystems and mountain people are exposed to multiple drivers of change including globalisation, economic policies, and increasing pressure on land and mountain resources resulting from economic growth and changes in population and lifestyle. Climate change is expected to place additional stress on these already challenged ecosystems and livelihoods.

The present study was designed to investigate how climate and socioeconomic change is affecting mountain people's livelihoods, what makes them vulnerable, and how they are coping with and adapting to change. ICIMOD conducted a community-based vulnerability and adaptive capacity assessment in four different areas under the framework of the International for Agricultural Development (IFAD) Technical Assistance Grant (TAG) 1113 on 'Livelihoods and ecosystem services in the Himalayas: Enhancing adaptation capacity and resilience of the poor to climate and socioeconomic changes (AdaptHimal)'. The four study areas from west to east were in Uttarakhand in northwestern India (two districts); Nepal (two districts), Eastern Bhutan (two districts), and North East India (one district in Assam and one in Meghalaya). The general objectives of the assessments were

- to identify people's perceptions of climate variability and change;
- to identify underlying causes of vulnerability of mountain communities;
- to assess existing coping and adaptation mechanisms and their sustainability in view of predicted future climate change; and
- to formulate recommendations on how to improve individual and collective assets.

The overall aim is to contribute to enhancing the resilience of vulnerable mountain communities in the Hindu-Kush Himalayan (HKH) region to change.

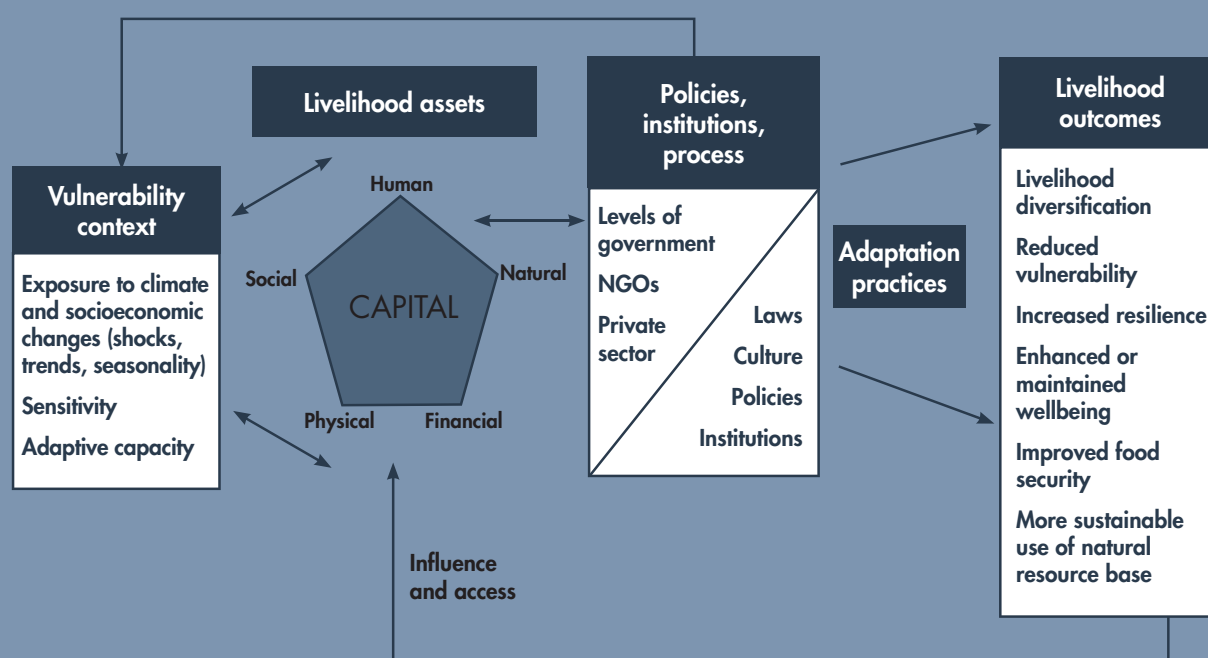
The field studies were conducted between June 2010 and June 2011 and included focus group discussions at the community level and in-depth interviews at the household level. They followed a more extensive participatory rural appraisal exercise undertaken in March to August 2010.

It is important to keep in mind while reading this report, that not all the identified responses should be interpreted as direct responses to climate-related risks. Many may rather be interpreted as responses to the challenging life that mountain communities are already living, which is being aggravated by climate change. The findings demonstrate that the livelihoods of mountain communities are already seriously affected by climate and socioeconomic change and that they have developed a repertoire of response strategies to these changes.

Approach and Methodology

The analytical approach applied for this study was the community-based vulnerability and capacity assessment (VCA) approach described by Macchi (2011) which is based on the sustainable livelihoods approach of the Department for International Development (DFID 1999) (Figure 1). The VCA approach recognises that the ability of a community or an individual to implement adaptation strategies requires livelihood assets including entitlements to financial, social, and physical capital as well as human and natural resources (Brooks and Adger 2005), and depends on different types of institutions (Agrawal and Perrin 2009). In contrast to a classic climate change impact assessment, the VCA approach not only considers impacts driven by climate change, but also impacts driven by non-climatic factors (environmental, economic, social, demographic, technological, and political) that may have beneficial and/or adverse impacts on

Figure 1: Sustainable livelihoods approach



Source: Adapted from DFID 1999

communities' livelihoods. Furthermore, it places a special focus on the communities' local knowledge and capacity to adapt. The objective of a VCA is to improve our understanding of how environmental and socioeconomic changes affect the livelihoods of rural, natural resource dependent women and men, what shapes their vulnerabilities, and what livelihood assets they have for coping with and adapting to climate and socioeconomic changes (Macchi 2011). Special attention was paid to potential differences in the vulnerability and adaptive capacity of women and men and of different social groups. The general role of formal and informal institutions in the adaptation process was also considered. ICIMOD is planning further studies focusing specifically on the complex role of institutions under the Himalayan Climate Change Adaptation Programme (HICAP).

The following assumptions were made in the preparation phase of the study: climate change is already happening, it is noticeable to communities in mountain areas, and it is directly affecting their livelihoods and means of production; environmental variability and change are not new phenomena and mountain communities have developed a range of adaptive strategies in response; changes happening in mountain areas are driven by a variety of environmental and non-environmental drivers of change, not only by climate; vulnerability to climate change is unevenly distributed across and within mountain communities.

The findings of a VCA are intended to contribute to informed decision making on how to improve individual and collective assets with the aim of enhancing the resilience of mountain communities in the Himalayas.

The following research questions guided the study:

- How do mountain communities perceive and interpret climate and socioeconomic change?
- What are the major impacts of these changes on their livelihoods?
- How do mountain communities respond to the perceived changes, and are these responses sustainable in view of predicted future climate change?

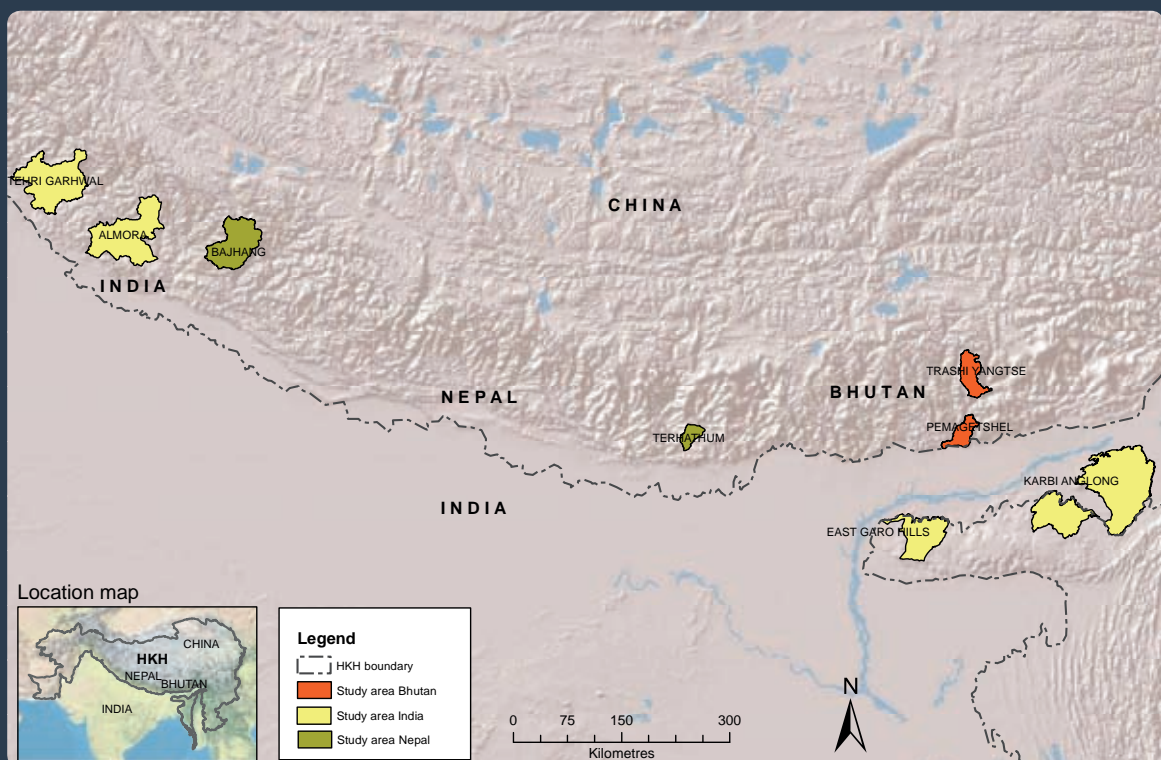
- What are the mountain communities' main assets and needs for coping with, and adapting to, environmental and socioeconomic changes?
- Are there any differences between different social groups (in particular men and women) in terms of their perception of change and its implications, and with regard to their vulnerabilities and adaptive capacities?
- How do different institutional mechanisms and policies influence the capacity of mountain people to adapt?
- What actions are necessary to increase the resilience of mountain communities?

In order to answer these questions, primary data were collected at community and household level through in-depth household interviews and partly gender disaggregated focus group discussions (see guidelines in Annex 1). Representatives of different socioeconomic strata and different ethnic groups and castes were addressed in the in-depth interviews in order to identify potential differences in vulnerability and adaptive capacity. The time frame in which the communities were asked to report perceived changes was between 10 and 20 years or more, depending on the age of the respondent. In Nepal and Bhutan, the communities' perceptions of climate change were compared and validated with trend analyses of observed climate data derived from the closest hydro-meteorological station. No recent climate data were available from India.

Study areas

The field studies were conducted by experienced regional and international consultants at four study areas in the Himalayas in three countries: Almora and Tehri Garhwal in the Indian hill state of Uttarakhand; Bajhang in the far west and Terhathum in the far east of Nepal; Trashi Yangtse and Pemagetsel in Eastern Bhutan; and Karbi Anglong in Assam and the East Garo Hills in Meghalaya both in North East India (Figure 2). The sites were selected on the basis of a number of factors such as altitude, culture, degree of accessibility, and geographic location, and were situated between 400 and 2,400 m above sea level (masl). All the selected sites overlapped with IFAD project areas that had previously been identified as particularly vulnerable.

Figure 2: The study sites



The boundaries represented on this map are not political.

