

Framework for Community-Based Climate Vulnerability and Capacity Assessment in Mountain Areas

FOR MOUNTAINS AND PEOPLE



Summary

This Framework for Community-Based Climate Vulnerability and Capacity Assessments in Mountain Areas provides an analytical framework and methodology for assessing environmental and socioeconomic changes affecting the livelihoods of rural, natural resource dependent communities living in mountainous environments. It also gives guidance on how to gain a better understanding of the various forces which shape mountain communities' vulnerabilities, and places a special focus on the capacities inherent to these communities for coping with and adapting to environmental and socioeconomic changes. The rationale of the framework is based on the assumption that in order to identify the key determinants for future adaptation, we need to have a much better understanding of current climate change impacts, of mountain communities' perception of these changes, and of their traditional repertoire of response strategies. The framework is intended primarily for development practitioners and institutions working on climate change vulnerability and adaptation in mountainous environments.

Acronyms and Abbreviations

FGD	focus group discussion
IO	international organisation
IPCC	Intergovernmental Panel on Climate Change
NGO	non-government organisation
PRA	participatory rural appraisal
SLA	sustainable livelihoods approach
VCA	vulnerability and capacity assessment

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Introduction

People living in mountain ecosystems in the developing world are particularly vulnerable to climate change as a result of their high dependence on natural resources for their livelihoods, comparatively higher exposure to extreme events, and widespread poverty and marginalisation. Already there is evidence of change related to global warming in mountain areas, for example, temperatures rising at disproportionately higher rates at higher altitude, changing precipitation patterns, glacier recession, and the thawing of permafrost, with mountain areas becoming relative 'hotspots' of climate change. These changes have potentially serious consequences for mountain ecosystems and people, as well as for the areas downstream. At the same time, mountain social-ecological systems have a great potential for adaptation with comparative advantages, including a high degree of diversity of species and cultures, niches for specific activities and products, and a wealth of adaptation mechanisms developed by mountain communities over the course of history for their survival. However, little is known about the impacts of climate change on the livelihoods of mountain communities, their perception of these changes, or their capacity to adapt to climatic variability and change.

The framework described here has been developed to provide development practitioners and institutions working in mountainous environments with a practical participatory tool that they can use to conduct assessments of vulnerability and capacity (VCAs) in relation to climate change in mountain areas. The main objective of such VCAs is to gain a better understanding of how mountain communities are affected by climate variability and change, how they perceive these changes, and how they cope with or adapt to these changes. The knowledge gathered through VCAs can be used to help enhance the resilience and support the adaptation of mountain communities vulnerable to environmental and socioeconomic change.

Some definitions of key concepts and terms are provided in the box on the next page.

Some Key Concepts

Adaptation: Adaptation to climate change is the adjustment of a system to moderate the impacts of climate change to take advantages of new opportunities or to cope with the consequences (Adger et al. 2003, p 192)

Adaptive capacity: Adaptive capacity is the ability of a system to adjust to climate change (including climate variability and extremes), to moderate potential damage, to take advantage of opportunities, or to cope with the consequences (IPCC 2007b). Adaptive capacity is shaped by available resources, institutions, skills and knowledge, and others.

Climate change: 'Climate change' means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (UNFCCC 1994).

Coping strategies: Coping strategies are short-term actions to ward off immediate risk, rather than to adjust to continuous or permanent threats or changes – strategies usually rely on selling or using up assets and reserves. Coping strategies are often the same set of measures that have been used before. When using coping strategies as a response to stress, it is possible that vulnerability will increase in the long term (ICIMOD 2009).

Hazard: A potentially damaging physical event, phenomenon, or human activity that may cause the loss of life or injury, property damage, social and economic disruption, or environmental degradation (Mehta 2007).

Maladaptation: An action or process that increases vulnerability to climate change-related hazards. Maladaptive actions and processes often include planned development policies and measures that deliver short-term gains or economic benefits but lead to exacerbated vulnerability in the medium to long-term (UNDP 2011).

Mitigation: In the context of climate change, mitigation is a human intervention to reduce the sources or enhance the sinks of greenhouse gases (UNFCCC 2011).

Resilience: Resilience is the ability of a social-ecological system to absorb disturbances without losing its fundamental structure and function (combination of different definitions).

Risk: The probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted, or environment damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions. Conventionally, risk is expressed by the notation 'risk = hazards x vulnerability'. Some disciplines also include the concept of exposure to refer particularly to the physical aspects of vulnerability (ICIMOD 2007).

Vulnerability: In the context of climate change, vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity (IPCC 2007 b).

Research Design

Objective and goals of the vulnerability and capacity assessment

VCA's are mainly conducted at the community level, focusing on the experiences and perceptions of stakeholders from different mountain communities. The general objective of a VCA is to improve understanding of how environmental and socioeconomic changes affect the livelihoods of rural, natural resource dependent women and men living in mountainous environments, what shapes their vulnerabilities, and what assets they have for coping with and adapting to environmental and socioeconomic changes.

The main goals of a VCA are to identify the most vulnerable social groups and the underlying causes of their vulnerability, as well as to assess community-based coping and adaptation mechanisms to the past and current impacts of change in order to understand the feasibility of future adaptation initiatives and to formulate recommendations (for planners and policymakers) to improve individual and collective assets, with the aim of enhancing the adaptive capacity and resilience of vulnerable mountain communities in their responses to climatic change.

Hypothesis

VCA's should be guided by the following hypothesis:

- Climate change is already happening, is noticeable to communities in mountain areas, particularly in the Hindu Kush-Himalayan region, and is directly affecting their livelihoods and means of production.
- Environmental variability and change are not new phenomena, and mountain communities have developed a wide range of adaptive strategies over centuries. However, the accelerated pace of climate and socioeconomic change and the increasing frequency and intensity of climate-induced hazards may exceed the capacity of mountain communities to adapt on their own. They may need external support to expand their existing knowledge and skills to respond adequately to these changes in a timely way.
- Changes happening in mountain areas are driven by a variety of environmental and non-environmental drivers of change, and not only by climate.
- Vulnerability to climate change is unevenly distributed across and within mountain communities. Especially women and other marginalised groups (such as the elderly, children, the physically challenged, and indigenous communities, among others) are particularly vulnerable to the adverse impacts of climate change.

Research questions

The main research questions in a VCA include the following:

1. How do different individuals and social groups in mountain communities perceive and interpret climatic and socioeconomic changes?
2. What are the major climatic and socioeconomic impacts of these changes on the livelihoods of mountain communities?
3. What are the underlying causes of vulnerability shaping mountain communities?
4. How do mountain communities respond (with coping or adaptive strategies) to the perceived changes, and are these responses adequate and sufficient?
5. What are the main livelihood assets of mountain communities for coping with, and adapting to, environmental and socioeconomic changes, and what are their needs?
6. Are there any differences between different social groups (men and women, different castes and ethnic groups, indigenous people, and so forth) in terms of their perception of change and its implications, and with regard to their vulnerabilities, adaptive strategies, assets, and needs?
7. What actions (technological, institutional, policy) are necessary to reduce the vulnerability and enhance the resilience of mountain communities?
8. Which institutional mechanisms and main policy areas are facilitating or hindering the capacity of mountain people to adapt?

Main outcomes of the vulnerability and capacity assessment

- Climate variability and trends assessed (using primary and secondary data)
- Impact of changing conditions on mountain people, and their perception of change, identified
- Underlying causes of vulnerability, and the most vulnerable communities and groups within a community, identified
- Existing traditional and innovative coping and adaptation strategies documented, and evaluation made of whether these strategies are adequate today and for the future in view of actual and expected climatic change
- Livelihood assets and needs assessed with respect to coping with and adapting to environmental and socioeconomic changes
- Institutional mechanisms relevant for mountain communities to cope with climate and socioeconomic change analysed
- Main policy areas facilitating or hindering the capacity of mountain people to adapt analysed
- Recommendations formulated on how to reduce vulnerability and enhance the adaptive capacity and resilience of mountain communities

Vulnerability and Capacity Assessment Approach

The vulnerability and capacity assessment approach is a combination of the vulnerability assessment and sustainable livelihoods approaches (SLA). VCAs are carried out applying a gender perspective and paying attention to marginalised social groups (e.g., based on caste or ethnicity).

The objective of the VCA approach is to identify not only the key vulnerabilities of mountain communities and the underlying causes of these vulnerabilities, but also the community's inherent livelihood assets and capacities, and then to suggest ways to strengthen these assets and capacities to enhance the community's resilience.

Vulnerability assessment approach

The vulnerability assessment approach emerged over the past decade from an evolution of different approaches for assessing vulnerability to climate change. Vulnerability approaches came out of (natural) science-driven assessments, which attempted to estimate potential (mainly biophysical) climate impacts. Due to the growing comprehension that vulnerability to climate change is driven not only by climatic factors but by many other variables, and because it is still not possible to predict climate change impacts on even a regional scale, and certainly not at a local scale, these impact assessments later developed into more integrated, policy-driven vulnerability assessments. Thus for the present framework an approach is suggested that not only considers impacts driven by climate change, but also by non-climatic factors (environmental, economic, social, demographic, technological, and political factors) that may have beneficial and/or adverse effects on the exposure, sensitivity, and adaptive capacity of communities (Figure 1). Furthermore, this approach not only takes the existence of adaptation options into account, it also considers the community's inherent capacity to adapt (Füssel and Klein 2006).

Sustainable livelihoods approach

The sustainable livelihoods approach (SLA) is a tool to improve understanding of livelihoods, especially of the poor. "A livelihood comprises the capabilities, assets (including both material and social resources), and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base." (DFID 1999, p 1)

The SLA presents the main factors that affect people's livelihoods and the different assets people have. It distinguishes five types of assets:

- **Human capital:** Includes health, nutrition, education, knowledge, and skills
- **Social capital:** Comprises networks and connections, relationships of trust and mutual support, formal and informal groups, common rules and sanctions, collective representation, mechanisms for participation in decision making, and leadership

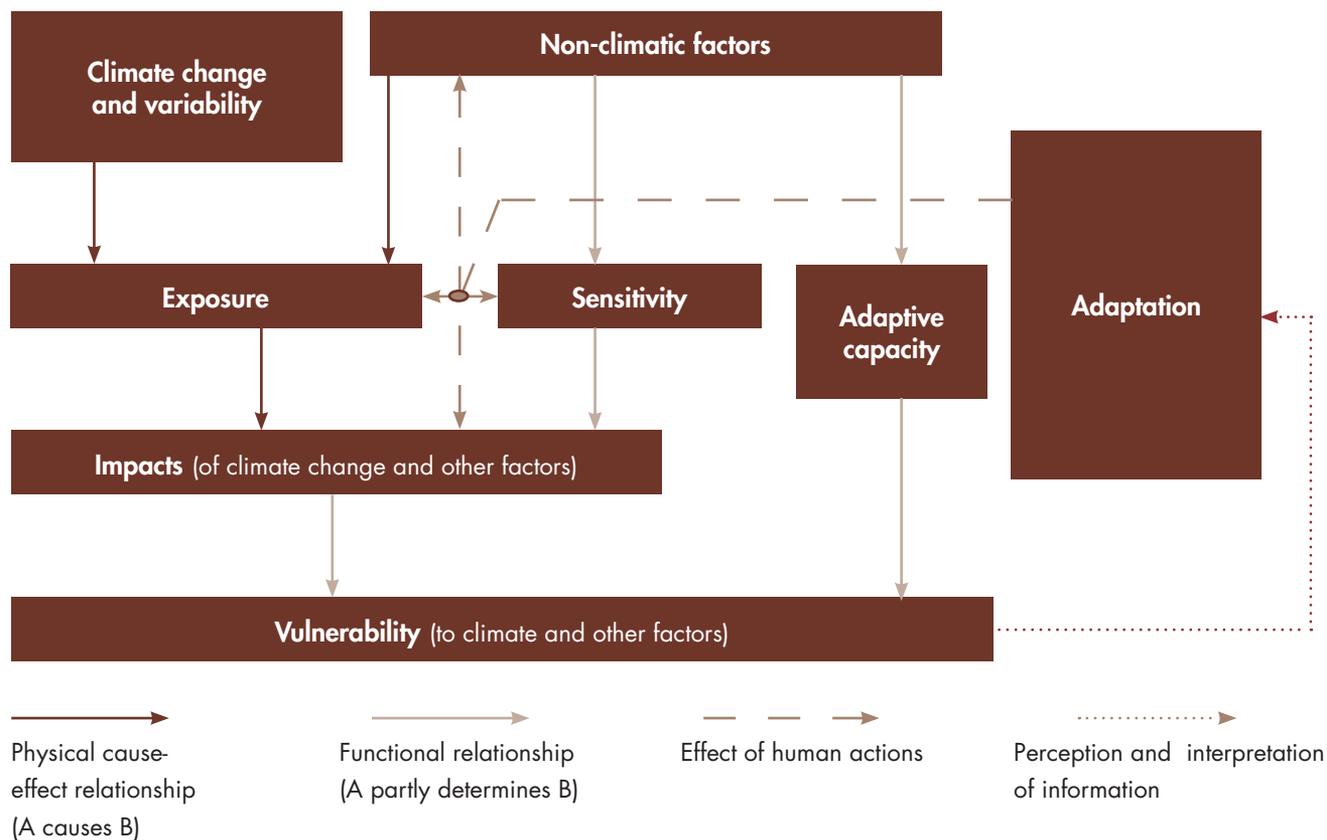


Figure 1: **Conceptual framework for vulnerability assessments**

Source: Adapted from Füssel and Klein 2006

- **Natural capital:** Encompasses access to land and produce, wild foods and fibres, water and aquatic resources, biodiversity, trees and forest products, environmental services, and wildlife
- **Physical capital:** Consists of infrastructure, tools, and technologies
- **Financial capital:** Covers savings, credit, remittances, pensions, and wages

Further, the SLA helps to analyse a community's vulnerability and adaptive capacity, as livelihood assets are important determinants of a community's capacity to adapt to climate and socioeconomic change.

In a mountainous context, adaptation to environmental change is not a new concept, but a survival practice. Mountain communities have a long record of adapting to extreme environmental conditions, have multiple livelihood strategies, and have highly developed adaptive strategies that build upon their livelihood assets, in particular their human, social, and natural capital. Equally, they often lack access to financial and physical capital as a result of their marginalisation, isolation, and the fragility of the ecosystems they dwell in, which hampers their capacity to adapt. It is, therefore, important to assess critically, through the VCA approach, which livelihood assets are well developed in mountain communities' livelihoods and which need to be strengthened in order to reduce their vulnerability and improve their resilience to climate and socioeconomic change.

When assessing a mountain community's livelihood assets, it should be kept in mind that these are not homogeneously distributed within and across communities, and that especially women, children, the elderly, and other marginalised social groups, such as indigenous peoples, generally have weaker asset bases than others.

Gender sensitivity

In the present framework, a special focus has been placed on gender and climate change as, generally, there is a wide consensus that women will suffer disproportionately from the impacts of climate change as a result, among others, of their comparatively weaker set of livelihood assets (IPCC 2007b; UNFPA 2009). Furthermore, with the increasing feminisation of mountain agriculture, women are becoming the main food producers, and adaptation strategies need to be based on

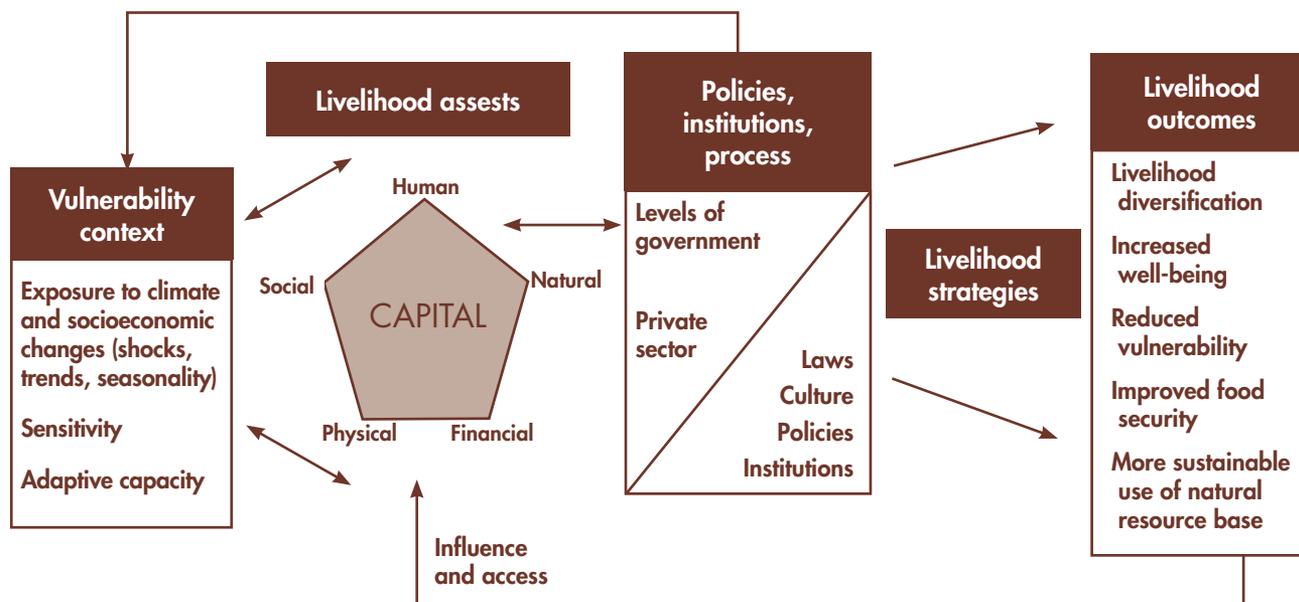


Figure 2: **Sustainable livelihoods approach**

Adapted from a guidance sheet from the UK Department of International Development (DFID 1999)

women's knowledge and capacities. For this reason, a gender analysis has been integrated into the present framework. Gender analysis is considered to be one of the most effective approaches to attaining gender equity in interventions related to community-based climate change adaptation. Integrating a gender analysis will add to the quality and legitimacy of the findings and recommendations drawn from the VCAs (Lambrou and Piana 2006).

Data Collection

In a VCA, primary data is collected at the community and household level applying different research methods and tools including participatory rural appraisal (PRA), in-depth household interviews, and focus group discussions (FGDs). When conducting the assessment, the key questions listed below should be covered. However, these are not the actual questions that should be asked to the community members or the representatives of different institutions in interviews or focus group discussions (FGDs), rather they outline the main topics that should be covered when conducting the field studies. Detailed interview guidelines can be found in Annex 1. The timeframe given in the questions (10/20 years) can be adjusted depending on the age of the respondents and the interviewers' experience in the field, as well as how far back respondents can remember. Note that the notion 'climate change' should not be mentioned during the interviews or FGDs as this might bias the answers. The primary data collection needs to be complemented by an extensive study and analysis of secondary literature and policy documents.

Key questions for the vulnerability and capacity assessment

Activities profile

- What is the division of work between women and men in the household, in farm production, and in the community?
- What changes have occurred over the last 10/20 years in terms of activities and workload?
 - Are there new activities now performed by men/by women? Which ones? Why?
 - Are there activities that men/women used to perform before (when) that are not performed anymore? If so, why?
 - Are there activities that used to be performed by men that are now performed by women, or vice versa, and what caused these changes?

- Has the community changed their livelihood strategies in the last 10/20 years?
 - If yes, which new livelihood options have been adopted, which ones have been abandoned? Why have they been adopted or abandoned, and who within the household/community takes on the main responsibility for them now?
 - What is the impact of these changed livelihood options on women's and men's workload?

Resource, access and control profile

- How do women and men use productive resources and for what purposes?
 - To which resources do men mainly have access? To which resources do women mainly have access?
 - Who (men or women) has control over the different resources? In what way?
 - Are there any traditional institutional arrangements within the community for the management of, and control over, productive resources? How do women and men participate in these traditional institutions? How are decisions taken within these institutions?
- Are there any resources the mountain community used to use, but can no longer access? Which resources? Why?
- Has the seasonal availability and abundance of any resources the mountain community is dependent on changed? Which resources? In what way? How does this impact on the mountain community's livelihoods?
 - Are there any new resources the mountain community has started to use?
- How do women and men use land? Which types of land do women mainly have access to and which types do men mainly have access to? Who has control over different types of land?
- In what way do women and men have access to off-farm income and loans? How do they use such income and loans, and who decides on the use of income and loans?

Perception of change

- What climatic and socioeconomic changes have been observed by women and men over the past 10/20 years (e.g., changes in rainfall, temperature, dry periods, biodiversity, incidence of pests, and so on, and changes in education, employment, livelihoods, infrastructure, conflict, migration, and so on)?
- How do these changes impact on the availability of productive resources and the infrastructure they depend on?
- What are the (positive and negative) implications of these changes on their livelihoods (e.g., on different agricultural activities, animal husbandry, off-farm activities, migration patterns, and so on)?
- What impacts do the perceived changes have on the community's overall wellbeing (including health, food and water, and income security)?
- What are the most severe changes the community is currently facing?

Adaptive capacity assessment

The main goal of this section is to find out whether the interviewees have the capacity to adapt to change, and what kind of mechanisms they use to cope with, or adapt to, changes and hazards. Which mechanisms and strategies did they develop themselves? Which ones have been introduced by others? Which ones still work, and which ones don't? Where do they need support?

- Is the community aware of the impacts related to climate variability and change and the related risks?
- Is the community aware of appropriate mechanisms (including indigenous adaptation and coping strategies) to address adverse climate change impacts and related risks?
- Does the community have appropriate coping or adaptation strategies to deal with the identified changes and are they able to apply them? What roles do women and men play in these strategies? Are these strategies still adequate in view of perceived and expected climatic and socioeconomic changes?
- Do women and men or different social groups cope with perceived changes differently? Have they developed any gender specific strategies?
- Which livelihood assets (natural, human, technical, financial, social capital) do women and men have access to for coping with, or adapting to, the perceived changes? What are their drawbacks?

- Do women and men have access to information related to alternative income opportunities, new technologies, infrastructure, early warning systems, and so on?
- Do women and men have access to information and technology related to how other communities adapt to, or cope with, changes?
- What are the obstacles for women and men to take part in decision making regarding climate change adaptation (within the household and the community, as well as in external institutions)?

Needs assessment

- What are the main difficulties women and men are facing in their daily lives at present (with regard to the changes identified above)?
- Do these difficulties differ from the ones they faced 10/20 years ago or the ones their parents faced?
- How could existing coping and adaptive strategies be strengthened and further developed in order to overcome these difficulties?
- Which additional coping and adaptive mechanisms (including technologies, infrastructure, information, livelihood options, services, and institutional mechanisms) would help to alleviate the current difficulties the community is facing?
- What type of institutional support would the community need to overcome the current difficulties?

Assessment of institutional opportunities and constraints

Adaptation to climate change never occurs in an institutional vacuum, and institutions play a key role in supporting communities in their process of adapting to climate and socioeconomic change (Agrawal and Perrin 2008). It is particularly important to focus on the social capital of mountain communities in order to understand better the roles (formal and informal) of institutions at different levels in shaping adaptation and improving or hindering the capacities of the most vulnerable social groups to adapt.

- What types of traditional institutional arrangements exist within the community with regard to natural resource management?
- What type of institutional support has the mountain community received from traditional or informal organisations within the community (e.g., social safety nets)?
- What type of institutional support have mountain communities received from formal or private organisations (e.g., local government representatives, non government organisations (NGOs), international organisations (IOs)?
- Which social groups have access to, or participate in, these organisations, and who benefits from them?
- What understanding do these organisations have of climate and socioeconomic change and impacts related to these changes, and how do they see their role in supporting adaptation?
- What kind of concrete support do they offer to mountain communities (e.g., extension services, knowledge transfer, technological support, loans)?
- To what extent are they aware of the differential vulnerabilities and needs that different social groups may have with regard to climate change adaptation, and are they addressing these?
- Are there any linkages between the different institutional arrangements of organisations (traditional, informal, civic, public, private)?
- Where do these organisations see a need to improve the services provided to mountain communities?

Research team

A VCA is best carried out by a multidisciplinary research team of natural and social scientists. It is important that the study team has a good understanding of the study area and the communities living in this area, as well as the climatic and socioeconomic trends affecting the area and the linkages between these changes and the livelihoods and resources that these communities depend on. Furthermore, the research team should ideally have experience in conducting interviews and FGDs, as well as with different PRA tools, and should, whenever possible, be gender balanced and speak the local language. The research team should be composed of at least two people, one facilitator and one note taker.

Methodology

Mainly qualitative methods are suggested for collecting and analysing data in community-based VCAs. The suggested methods are summarised in Table 1. Qualitative methods make it possible to analyse the history and the layers of identity that people have including gender, race, age, ethnicity, and religion, which is crucial for investigating the root causes of social vulnerability to environmental and other changes (Birkmann and Wisner 2006). FGDs, individual semi-structured interviews, and PRA tools enable the vulnerable to express their multiple realities. PRA methods make it possible to focus on the assets of the poor, enable local



Women in Uttarakhand participating in a PRA exercise

communities to conduct their own appraisal and analysis, and help them to identify what they have, rather than what they do not have. According to Chambers (1994), participatory assessments can be used in this way to empower the vulnerable.

In the context of climate change adaptation, FGDs and PRAs are a way for communities to reflect on, and to sensitise themselves to, any changes that are taking place, while at the same time gaining knowledge on potential risks that are impacting on their livelihoods. Knowledge and awareness of climate change risks are key determinants of adaptive capacity. Only informed individuals or groups are able to implement planned adaptation strategies. Furthermore, the adaptation process requires vulnerable communities to learn from previous experiences to cope with current climate changes and to apply these lessons to cope with future climate change related risks, including surprises (Brooks and Adger 2005). The set of methods and tools described in the following enables them to do this. A PRA toolkit with a more elaborate description of the different tools has been developed and field tested by ICIMOD, publication is planned. Longer descriptions and additional tools can also be found in SNV/Nepal (2004).

Notwithstanding the positive aspects, qualitative methods also have shortcomings: quantification is only possible in a limited way, and replication and comparison of data is often difficult. In order to meet this challenge, the data gathered through the participatory tools should be complemented by an extensive review of secondary literature and data (see below).

Table 1: Overview of the assessment tools

Assessment tool	Purpose	Source of information
Literature review	To gain a solid knowledge of the context that the VCA is set in (climate data, study site characteristics) as well as an overview of what assessments have already been carried out and what knowledge has already been generated in the study area	Existing climate change data, census data, assessment reports of NGOs or IOs, project baseline studies, evaluation reports, policies, maps, scientific articles, grey literature, and others
Participant observation <ul style="list-style-type: none"> Transect walk 	To become familiar with the mountain community and their daily practices in dealing with climate and socioeconomic change through intensive involvement with them in their natural environment	Community members (men and women)
Focus group discussions (FGDs) <ul style="list-style-type: none"> Community historical timeline Seasonal calendar Livelihood seasonal monitoring calendar Community ranking of hazard severity Venn diagram of institutions 	To obtain a better understanding of the livelihood strategies and assets of the communities in the study area, their dependence on different resources, the changes they perceived, their capacity to cope with these changes, and their needs, as well as to gain information on the role of different institutions in supporting them to cope with and adapt to perceived changes	Community members (men and women), representatives of local organisations
Semi-structured interviews	To obtain a greater depth of information on the implications of climate and other changes on the lives of mountain people and on their capacity to deal with these changes	Community members (men and women), representatives of local organisations

Literature review

A thorough study should be made of secondary literature on climate and socioeconomic change and major related policies that have an influence on the environment and the livelihoods of mountain communities, as well as studies that have been conducted previously in the study area, before collecting empirical data using the participatory methods and tools. This review will provide researchers with solid background information on the topic and the general context of the study site. It will reveal what is already known and what is not yet known about climate and socioeconomic change in the study area, existing vulnerabilities and livelihood assets, and adaptive strategies. For VCAs focusing on climate change, sources of secondary data may include meteorological and climate data (on temperature, precipitation, seasonality, extreme events, and so on), data on climatic trends, main policies that facilitate or hinder adaptation, census data, assessment reports of NGOs or IOs on poverty, vulnerability, and adaptive mechanisms, project baseline studies, evaluation reports, maps, scientific articles, and grey literature, among others.

During the literature review, sources written in the local language should also be considered. Furthermore, it is very important to consider not only information about the selected study sites, but also pertinent studies and literature from places outside the study area with similar features that can provide valuable information.

Participant observation

While visiting the study areas and implementing the PRA tools described below, the findings should be complemented with participant observation. The aim of participant observation is to become familiar with a given mountain community and their practices through intensive involvement with them in their natural environment, usually over an extended period of time. Even though extensive observations are often not possible due to time and financial constraints, it is nevertheless recommended that the research team keeps a journal during the data collection phase in which they note any peculiarities or special observations encountered in the field. These notes can be very helpful when interpreting the data that has been collected at a later stage. It is also very useful to document observations with photos.

Transect walk

A transect walk is an observation tool for understanding the location and distribution of resources, features, landscape, and major land uses along a given transect. The research team walks with selected community members along a previously defined route, observing and listening to their explanations and asking questions. A walk usually takes around two to three hours. Some of the questions related to the activities profile and the resource access and control profile listed in Annex 1 can be linked to this exercise. This tool should be used at the beginning of a field visit to gain an overview of the village and its surroundings. It is advisable to do two transect walks, one with women and one with men, to learn about their daily activities, mobility, use of resources, land, and so forth. It is important to acknowledge that this tool only gives a snapshot of a situation in a village, which changes over the course of the seasons and years.

Focus group discussions

Focus group discussions (FGDs) are an interactive way of collecting in-depth information on concepts, perceptions, and ideas from a group of approximately 6 to 12 persons guided by a facilitator. The participants are generally chosen based

Focus group discussion in Kabhre district, Nepal



on their ability to provide specialised knowledge or insight into the issue under study. For VCAs, FGDs can be carried out as a stand-alone exercise focusing on the questions given in the interview guidelines in Annex 1 of this framework, or in combination with the other PRA tools described below (community historical timeline, seasonal calendar, livelihood seasonal monitoring calendar, community ranking on hazard severity, Venn diagram on institutions). Participants are asked to explain their perceptions of changes, events, and phenomena indicated in the seasonal calendar or timeline, discuss the implications of these changes and events on their livelihoods, and identify their strategies to cope with, and

adapt to, any perceived changes. At least two stand-alone FGDs should be held in every community: one with women and one with men. More groups may also be appropriate. The groups should be composed of both older and younger representatives of the community and include people who have lived in the village long enough to talk about the changes over time. It is important to be sensitive to the high level of illiteracy in many mountain areas; clearly identifiable symbols should be agreed upon with the participants in the discussion and used instead of text whenever possible. A FGD takes about two to three hours depending on the tools used. It should not exceed three hours; it is better to conduct more than one focus group with the same participants than have a very long discussion.

Community historical timeline

The aim of this tool is to capture incisive changes and events that have happened in the community over the past 10/20 years that have had a major influence on the livelihoods, activities, and wellbeing of the community. These changes or events may include climatic phenomena (very heavy snowfall, droughts, floods), as well as other things like major outmigration, changes in livelihood activities (e.g., new livelihood strategies), pests, diseases, and conflict. When conducting this exercise, it may help the participants if a few historical milestones are identified in a participatory way (important events in the history of the region, historic climatic events, or a major natural disaster). These milestones will help people as an 'aide-memoire' to which they can relate the major changes and events experienced over the past 10/20 years. When conducting this exercise, it is important to make sure that the majority of participants have been living in the community for at least the span of the historical timeline. Developing a timeline usually takes about two hours.



Historical timeline in Kabhre district, Nepal

Seasonal calendar

A seasonal calendar is a participatory tool for documenting regular cyclical periods and significant events that occur during a year and influence the life of a community. Major climatic and environmental periods and hazards should be marked in the calendar (see Table 2 for examples). The seasonal calendar allows participants to represent their understanding of the seasons, which usually differs significantly from our understanding of seasons. Before starting the

Table 2: Example of a seasonal calendar (the number of stars indicates intensity)

	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Rainfall	*		**	***	**	*			**	*		
Hailstorm				**	*					**		
Dry period	***	**									*	*
Snowfall								*	**	*		
Flood				**	*							
Landslide				*	*			**				
Avalanche									*	**		
Livestock disease/pests					*	*						
Crop disease/pests				**	***	**						
Food shortage										**	*	***
Water shortage	***	**										**
Human disease				***	**				*	**		
Other												

exercise, the facilitator should ask participants when, in their perception, the year starts (this does not have to be January); the seasonal calendar should be set up accordingly and in the local language. Once the seasonal calendar (usually the last 12 months) is established, the facilitator asks the participants whether they have experienced any changes in the listed major climatic and environmental periods and hazards over the past 10 to 20 years (depending on the age of the participants). For example, is the dry season longer, shorter, or more variable today? Are community members experiencing more crop pests or diseases than before? Has the overall water availability changed? This exercise can provide insight into the community's perceptions of change. It is recommended to conduct this exercise in gender-differentiated groups with a mix of older and younger participants to reveal the gendered differences in the perception of changes. Furthermore, if the VCA is being conducted in different communities, the same environmental and climatic phenomena should be included in the seasonal calendar to ensure the comparability of results. The questions listed in Annex 1 on perception of changes can be linked to this tool. Developing a seasonal calendar will usually take around one to two hours.

Livelihood seasonal monitoring calendar

The livelihood seasonal monitoring calendar documents through the year the important seasonal livelihood activities on which mountain communities depend. The concept is very similar to the seasonal calendar described above. The months are listed across the top of the matrix and the different livelihood activities on the left, organised by the production system. This too identifies the key production and income earning periods throughout the year that are most relevant to the food and livelihood security of the community, as well as periods when the community's livelihoods could be under pressure (USAID 2010). It can also be useful for identifying which livelihood activities men and women are responsible for. The questions listed in Annex 1 regarding the activities and control over, and access to, resources can be linked to this exercise. Developing the calendar usually takes around one to two hours. Table 3 shows an example of a livelihood seasonal monitoring calendar.

Table 3: Example of a livelihood seasonal monitoring calendar

Livelihood activity	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Agriculture												
Rice		n	n	p	p	w	w	h				
Millet	p	p	w	w	h	h						
Other												
Home Garden												
Pumpkin	p	h	h	h	h							p
Other												
Forestry												
Fodder	c	c	c	c	c	c	c	c	c	c	c	c
Non-timber forest products	c/s	c/s	c/s	c/s	c/s	c/s	c/s	c/s	c/s	c/s	c/s	c/s
Firewood	c	c	c	c	c	c	c	c	c	c	c	c
Animal husbandry												
Milk												
Butter												
Meat												
Wool (lamb, cashmere)												
Calves/lambs												
Tourism												
Running lodges												
Guiding, portering, etc.												
Migration												
Domestic migration												
International Migration												

n - nursery; c - collecting; h - harvesting; p - planting; w - weeding; s - selling

Once completed, the seasonal calendar and the livelihood seasonal monitoring calendar can be merged (see example in Figure 3). The impacts of the climatic and environmental phenomena identified in the seasonal calendar (e.g., prolonged dry periods, floods) on the different livelihood activities can then be discussed with the participants. The merger of the seasonal calendar and the livelihood seasonal monitoring calendar offers an excellent basis for discussing and identifying the key vulnerabilities with participating community members, as well as existing traditional or innovative coping and adaptive mechanisms. For example, the merged calendar in Figure 3 shows that the community usually sows rice in June; whereas the seasonal calendar shows that there has been no rain or very scanty rain in June over the past few years. Thus, the facilitator should ask the community members what they are doing in such a situation, how they are responding to this problem and whether they have already adapted their livelihood activities according to the changed or variable precipitation patterns (e.g., by delaying the planting season).

Community ranking of hazard severity

After identifying the major environmental periods and hazards and livelihood activities using the above calendars, the facilitator asks the communities to identify the hazards that have the greatest impact on their lives and livelihoods. This can be done through a simple ranking exercise using a radar chart. In the example shown below, 1 stands for 'has a negligible impact' and 5 stands for 'has a severe impact' on the lives and livelihoods of the community. The matrix can be drawn on a flip chart or on the ground. The participants receive a stone for each identified hazard or phenomenon and have to agree on where to place them on the radar chart. In the fictional example illustrated in Figure 4, the participants identified floods and dry periods as the two hazards that have the strongest influence on their lives and livelihoods, whereas scanty snowfall was identified as having the least impact.

Venn diagram on institutions

A Venn diagram on institutions is used to identify the key institutions that are supporting the mountain communities' decision making with regard to agriculture, animal husbandry, and climate variability and change. A Venn diagram on institutions shows organisations, groups, and important communities within an area or in an individual community, as well as the community's view of the importance of different institutions, groups, and organisations. The diagram demonstrates who participates in these groups in terms of gender, wealth, caste, age, and so forth. The diagram can also be used to show the institutional relationships between the different organisations, groups, or individuals. It is suggested that this tool be used both with the communities, and with organisations that are relevant to the communities (FAO 1999). Preparing a Venn diagram takes around one and a half to two hours.

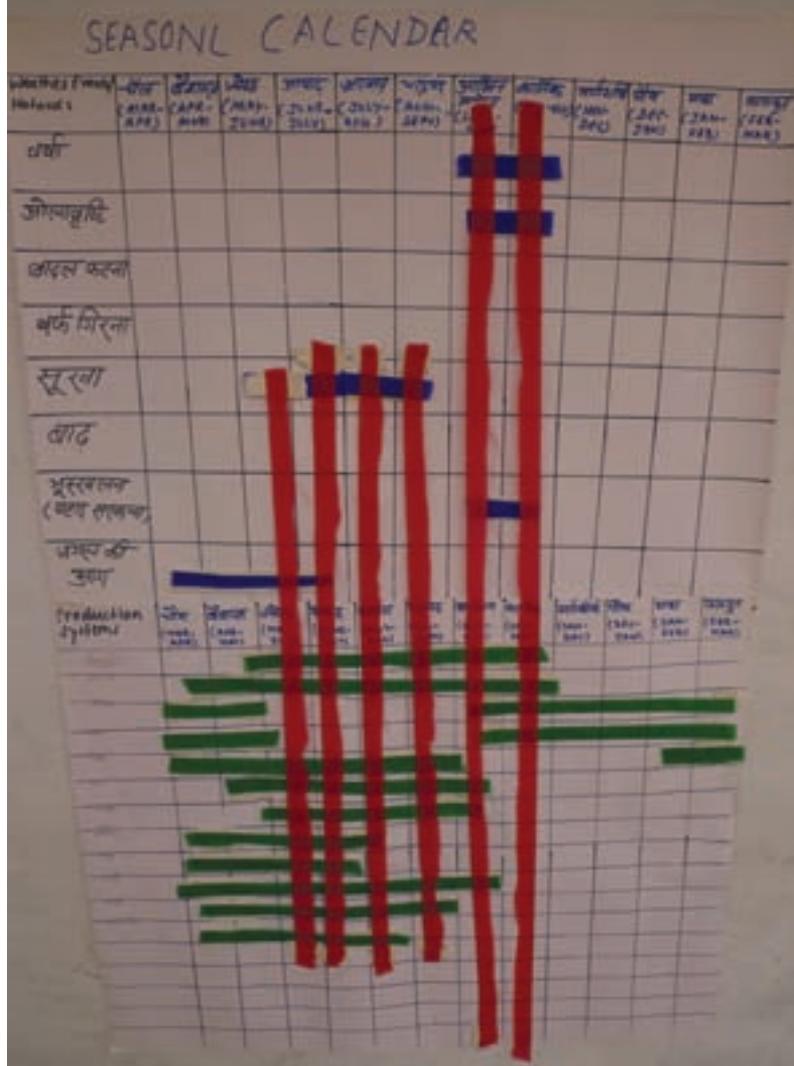


Figure 3: Merger of seasonal calendar and livelihood seasonal monitoring calendar

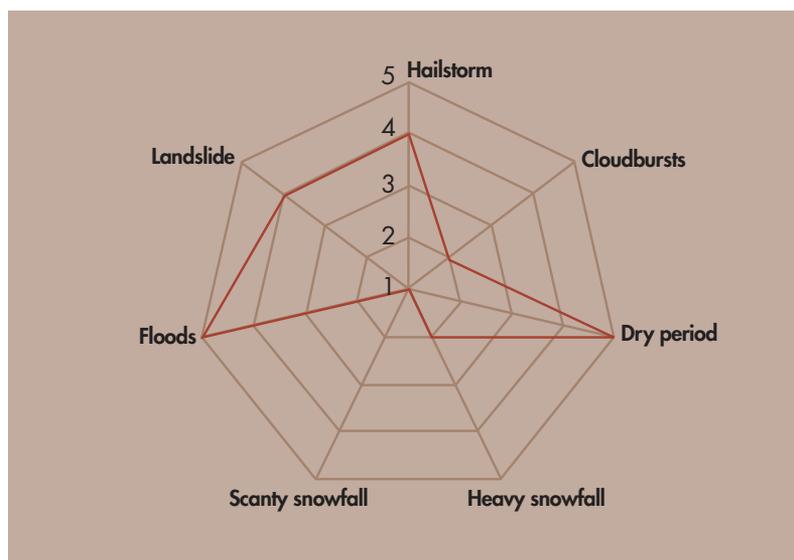
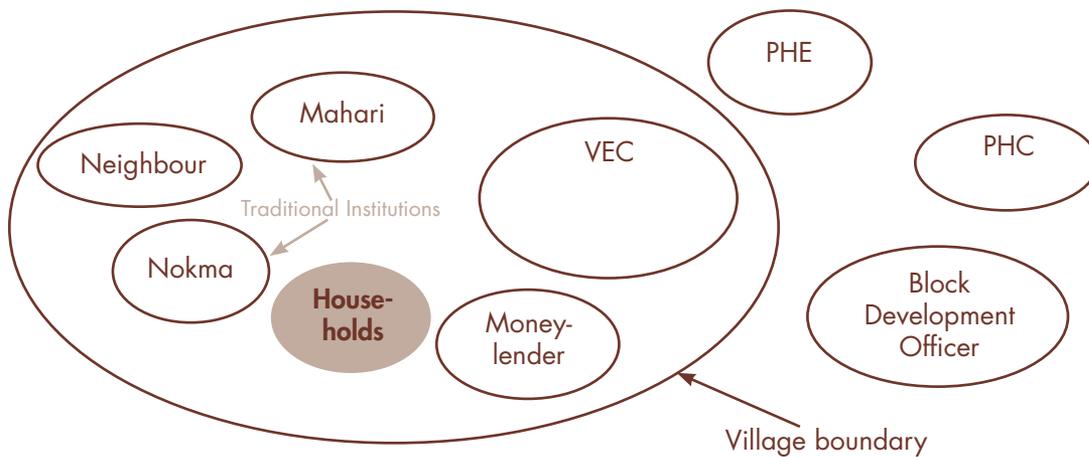


Figure 4: Radar chart for hazard severity ranking



Note: VEC = village employment council; PHE = public health engineering; PHC = public health centre

Figure 5: **Example of a Venn diagram (Tura, West Garo Hills of Meghalaya, India, produced during a training workshop in February 2010)**

Semi-structured interviews with resource persons

Semi-structured interviews are a qualitative research technique that allows person-to-person discussion. The goal of a semi-structured interview is to obtain greater depth of information on a topic of interest, for example, in the case of this study, the implications of climate changes on the lives and livelihoods of the mountain community, as a supplement to data obtained using other tools. Because this type of interview is openly structured, it permits the interviewer to encourage an informant (respondent) to talk at length about the topic of interest. In the type of study described here, semi-structured interviews are recommended to be carried out with identified resource persons within the community, e.g., an elder who has been pointed out by the community to have an exhaustive knowledge of the community and the surrounding environment, using the interview guidelines given in Annex 1. Semi-structured interviews should also be carried out with representatives of different institutions working with the community on the topic of interest. The interviewer can allow a certain degree of flexibility during the interview (e.g., in terms of the order of questions), making sure that the main points outlined in the section on data collection are touched upon. The interview should take around two hours.

Data Analysis and Interpretation

The data gathered through the different PRA tools should be documented, e.g., by copying the different matrices (seasonal calendar and livelihood seasonal monitoring calendar) or by taking pictures of the outcomes of the different exercises (historical timeline, community ranking of hazards, Venn diagram on institutions). The originals remain with the community as they increase the awareness of the local community, contributing to their capacity to adapt. The data gathered through FGDs, interviews, participant observation, and transect walks need to be transcribed, summarised, and coded into themes, and then analysed using qualitative data analysis. When analysing the data, answers to the research questions defined in the sub-section above should be shown with a gender and social perspective, i.e., disaggregated by gender and different social groups.

When interpreting the data, keep in mind that climate change is only one driver of change among many others influencing mountain areas (globalisation, male outmigration and related feminisation of agriculture, changes in land use patterns, and construction of roads, among others). Care should be taken not to attribute every change identified through a VCA to climate change. It is crucial that during the interviews and discussions, and also when interpreting the data, participants, or the analyser, are asked to reflect on what main driver is responsible for the change. However, it may not be possible to attribute change to a single driver, as many drivers together might trigger a certain change.

It should also be kept in mind that climate change may bring new opportunities (e.g., longer growing seasons, two cropping seasons in a year, the possibility of growing crops at higher altitudes, less fuel for heating in the winter months, less respiratory diseases). These new opportunities should also be documented in the report.

Case Study: Results from a VCA in Uttarakhand, India

The framework has been tested by ICIMOD in various locations across the Himalayas. The following findings stem from a VCA conducted under the framework of the International Fund for Agricultural Development (IFAD) funded project: 'Livelihoods and Ecosystem Services in the Himalayas: Enhancing Adaptation Capacity and Resilience of the Poor to Climate and Socioeconomic Changes'.

Study area: The VCA was carried out in spring 2010 in three districts in the state of Uttarakhand in northwest India: Tehri Garhwal, Bageshwar, and Almora. The people living in these districts follow a predominantly traditional lifestyle and guard a vast body of local knowledge. They sustain themselves from a combination of activities including agriculture (mixture of rain-fed and irrigated agriculture), pastoralism, and the seasonal processing of forest products. Seasonal transhumance involving pastoralism is also typical in the area using the favourable conditions provided by the seasons at different altitudes to optimise resource availability for subsistence agriculture. The communities are exposed to multiple stresses including a trend towards the increasing feminisation of agriculture.

Results of the VCA: Climate change is already perceptible in the study area. The communities reported that they have experienced an overall decrease in rainfall and a trend of longer dry spells. In some places, particularly in the low altitude villages of Tehri Garhwal and Almora, the communities have experienced drought like conditions. They also reported that temperatures have increased and that especially the winters are warmer with significantly less snowfall. They also feel that the onset of the monsoon has become less predictable with a tendency towards a delayed onset and that there is a trend towards an increase in short spells of very heavy rainfall and in storm events. Because there is only one weather station in the Tehri Garhwal district, and the data from this station only goes back four or five years, these community perceptions could not be validated with existing climate data. Nevertheless, the trends observed by the communities could be possible pre-indicators of the changes expected for South Asia, and specifically for northwest India, as predicted in the Intergovernmental Panel on Climate Change report (IPCC 2007a), including temperatures likely to warm above the global mean in South Asia; overall increased monsoonal precipitation (with persistent uncertainty about monsoon processes); fewer very cold days; overall summer precipitation likely to increase, winter precipitation likely to decrease; overall increase in the frequency of intense precipitation events; low rainfall amounts coupled with high variability and increase in heavy rainfall events over northwest India.

"Due to changes in the climate sometimes it is difficult to distinguish between the various seasons. Even in the month of October it is as warm as in June." Community member from Naikena village, Almora district, Uttarakhand

"I think this issue is much more serious than we thought. We also realise that we need to work towards long term responses." Woman from Pagna village Bageshwar district, Uttarakhand

The communities are already reacting to the perceived changes. The table shows some of the different coping and adaptation mechanisms that communities are implementing to respond to the changes experienced.

Coping and adaptation mechanisms implemented by the communities

Communities' perception of change	Experienced impacts on livelihood systems	Coping and adaptation	Potential future risks
Decrease in rainfall and unpredictable onset of monsoon	Overall decline in agricultural productivity	Replacement of rice with finger millet; purchasing rice; barter; improvising with new (cash) crops; delayed sowing	Growing food and livelihood insecurity
Longer dry spells; in some places drought like conditions	Drying up of springs; less flow in springs and streams	Irrigation systems opened on a rotational basis; traditional water sharing system in Almora Delayed sowing time in irrigated fields at the far end of channels	Scarcity of water for drinking and agriculture; increase in health problems; increased workload for women and children; children staying away from school Crop failure
Higher temperatures linked with decreased water availability	Lack of fodder; in some places lack of water for animals Land becoming less productive	Sell off dairy animals; shift to smaller livestock, particularly goats (mala daptation?); barter fodder for manure Less land area under cultivation; buying food	Risk of malnutrition; increased drudgery Dependence on cash income; food insecurity
Warmer winters and significantly less snowfall	Increased incidence of pests and diseases, e.g. white grub 'kurmula' attacking roots Double flowering of Malta orange and apple trees	Installation of kurmula traps; increased use of insecticides and pesticides; use of ash and salt No coping strategy	Increased food and livelihood insecurity Degradation of orchards; income insecurity

When analysing the questions related to different coping and adaptation mechanisms (capacity analysis), the researchers should try to relate the different coping/adaptation mechanisms to the livelihood assets a community or household has and ask themselves which livelihood assets the community or household uses the most and which ones need to be strengthened in order to enhance the community's/household's capacity to adapt. Again, care should be taken not to interpret any new livelihood strategy as a coping strategy or adaptation strategy to climate change. There may be many other reasons why a community or a household decides to change its livelihood strategy.

Validation of Data

During the data analysis and interpretation process it is very important to triangulate the data gathered using different research methods: e.g., information collected from the mountain communities should be compared with information collected from institutions working with these communities and compared with information obtained from the literature review. In particular, perceptions and observations of people on climate change should be triangulated with existing scientific data on climate change (rainfall and temperature patterns, and so forth). Data triangulation ensures that all findings are included in the analysis and also serves to validate collected data. When interpreting the findings, conclusions should be drawn as to the necessary actions to be taken and policy implications to enhance the resilience of the livelihoods of mountain communities.

Reporting

An indicative outline of a report has been designed to facilitate the reporting process and to make sure that all the important components of a vulnerability and capacity assessment are covered (Annex 2).

The different perceptions and the coping and adaptation mechanisms identified should be presented in a community disaggregated format in order to enable the findings to be related to individual communities, and to facilitate a certain degree of data quantification and comparison (e.g. x community found that there is a shift in the onset of the rainy season, or x community is applying coping strategy y). The report should be illustrated with individual case studies and pictures that demonstrate the different mechanisms that individuals or communities are using to cope with, or adapt to, climate and other changes.

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WWF (nd) *Climate witness community tool kit*. Suva (Fiji): WWF South Pacific. www.worldwildlife.org/what/wherewework/coraltriangle/WWFBinaryitem7771.pdf (accessed 11 October 2010)

Useful links on web-based climate data platforms

Tyndall Centre (2010) *Climate series by countries*. <www.cru.uea.ac.uk/~timm/cty/obs/TYN_CY_1_1.html>

University of Oxford School of Geography and Environment (2010) *UNDP Climate Change Country Profiles*. <country-profiles.geog.ox.ac.uk/>

World Bank Climate Change Data Portal <sdwebx.worldbank.org/climateportal>

Annex 1: Interview guidelines for focus group discussions and household interviews

General information about village and respondent(s):

Interview/FGD ID: _____

Date of interview: _____ day _____ month _____ year

Name of interviewer: _____

Country: _____

Name of district: _____

Name of village: _____

Climatic conditions: _____ mean annual rainfall

Altitude: _____ m above sea level

Coordinates: _____

No. of households: _____

Types of households: mostly poor some poor, some above average
 mostly above average

Access to electricity: mostly yes mostly no

Access to improved source of drinking water: mostly yes mostly no

Distance to paved road: _____ minutes walking time

For household interviews only

Name of respondent: _____

Age of respondent: _____

Sex of respondent: male female

Ethnicity of respondent: _____

Education: no formal education primary secondary higher

Head of respondent's household is: male female

Household status: very poor poor not poor above average

Guidelines for Interviews

Please note: The following interview guidelines can be used for interviews with individual resource persons, or to guide focus group discussions (FGDs) in combination with different PRA tools. Some sections (especially those on perception of changes and coping strategies) are probably better discussed in FGDs. The appropriate PRA tools to accompany the questions are indicated in each section. Women and men should be interviewed separately in individual interviews; in general focus groups should also be composed of all women or all men, but this can depend on the topic.

The timeframe for questions (10 to 20 years) depends on the age of the interviewees. Younger interviewees may only remember what happened 10 years ago or less, whereas older respondents may have a longer memory.

Activities profile

- Could you please describe your daily activities? What are your main activities from the morning when you get up until the evening when you go to bed?
- Which activities in the house and in farm production are performed by women? Which are performed by men? Which are performed by both women and men and to what extent?
 - Do these activities change over the course of the year? In what way?
 - How much time is needed to carry out each of these activities?
- When you think back, have there been any major changes between now and 10/20 years ago in terms of activities and workload?
 - Are there any different or new activities you are carrying out now (e.g., production of cash-yielding crops, off-farm activities)? Why? Who in the household takes responsibility for these activities?
 - Are there any activities you used to carry out that you are not carrying out any more? Why?
 - Does it take more or less time to complete your daily activities today? Why?
 - Do you find your activities easier or more difficult to perform now than it was for your mother/father? Why?
 - Are there activities that used to be performed by men and are now performed by women, or vice versa? What caused these changes?
- In which activities performed by the community are men involved? In which are women involved? In which activities are both men and women involved?

Resource, access and control profile

☞ **PRA tools:** These questions can be linked to a transect walk.

- What kind of natural resources do you depend on for your daily activities?
 - Which natural resources do men mainly use? For what purpose?
 - Which natural resources do women mainly use? For what purpose?
 - Which decisions concerning the management of natural resources are taken by men, which by women, which by men and women together, and which by the community?
- Are there any resources that you used to use, but can no longer access (e.g., water, firewood, plants, animals)? Which ones? Why?
- Has the seasonal availability and abundance of any resources you are dependent on changed? Which ones? In what way? How does this influence your activities and your wellbeing?
- Are there any new resources that have appeared and that you have started to use (e.g., plants, animals, materials for energy production, and so forth)? Which ones? For what purposes?
 - Why did you start using these new resources?

- To which types of land do women mainly have access? To which types of land do men mainly have access (homestead, irrigated land, rainfed agricultural land, pasture land, rangeland, or other)?
 - What are the main activities women/men are carrying out on this land?
 - Who decides what to grow/how to use the different types of land?
- Which decisions within the household related to the management of small livestock/big livestock are taken by women, which by men, and which by men and women together?
- Which decisions within the household related to the management of crops are taken by women, which by men, and which by men and women together?
- Are there any traditional institutional arrangements within the community for the management of, or decision making about, common resources (e.g., pasture land, water bodies, forest products, and so on)?
 - What is the role of women and men in these institutional arrangements?
- Mobility: What are the daily, seasonal, or yearly migration patterns you follow in pursuing your daily and seasonal activities?
 - Have these migration patterns changed? If so, why?
 - Have members of your household migrated to larger cities or even abroad? Who has migrated and where? Why? When? Do they send money home?
- Do you have access to off-farm income and loans? How do you use the income and loans?
 - Which decisions within the household related to the use of income and loans are taken by women, which by men, and which by women and men together?

Perception of changes

☞ PRA tools: The following questions can be combined with the seasonal calendar, the livelihood seasonal monitoring calendar, and the historical timeline. Do not mention the idea of 'climate change' as this might bias the answers.

- Please describe the **main weather events** that happen during the year (e.g., rainy season, dry season, snowfall, hailstorms, cloudbursts, and so forth).
 - When do these events usually occur? How long do they last?
 - Have you observed any changes in the past 10/20 years? What kind of changes (timing, duration, intensity, frequency)?
 - How do these changes influence your activities and workload?
 - What do you think are the reasons for these changes?
- Have you experienced any major **hazards** over the past 10/20 years (e.g., floods, droughts, landslides, avalanches)?
 - If yes, what kind? When did they occur?
 - How did they affect you and your family?
 - Have these hazards become more frequent or more intense over the past years?
- Have you noticed any changes in the size of **glaciers**? If yes in what way?

(☞ only ask this question if there are glaciers in proximity to the study site)
- Have you noticed any difference in **temperature** over the past 10/20 years?
 - If yes, in which way did the temperature change?
 - What do you think is the reason for this change?
- In your perception, has the **availability of water** from rain, snowfall, and water in water bodies (lakes, streams, springs and so on) changed over the past 10/20 years?
 - How has it changed (e.g., less or more rainfall, snowfall, glaciers are melting, lower water levels in rivers, lakes)?
 - What do you think are the reasons for these changes?
 - Does this have any influence on your daily activities/your workload?

- Do you know of any **traditional ways of predicting the weather** (e.g., when the monsoon starts, when the first snow will fall, and so forth)?
 - If yes, please describe these methods.
 - Are these methods to predict the weather still reliable today? If not, why not, and what are the implications for your lives?
- Have you noticed that some **species** (plants, animals) are **appearing earlier or later in the season** or in places where they did not appear before?
- Have any **species** (plants, animals) **disappeared** or become less/more abundant? If yes, which ones?
- Have you observed any **new diseases** affecting your livestock and crops over the past 10/20 years? Which ones? When did they occur for the first time? Do they occur every year? Why do you think they occur?
- Have you observed any **new pests** affecting your livestock and crops? Which ones? When did you notice them for the first time? Do they occur every year? Why do you think they are occurring?
- Have you observed any new **health problems** that have affected you and your family? Which ones? Are there any health problems which have diminished or disappeared? Which ones and why do you think they have diminished or disappeared?
- Are there any **positive changes** you can think of that make things easier (e.g., prolonged cropping season, warmer winters with lower energy consumption, warmer streams for washing, hygiene, modern technologies, remittances, health posts? and so forth)?

☞ The following questions should only be asked at the household level

- Do the changes you have mentioned impact on the availability of food for your household throughout the year?
 - If yes, in what way?
 - less food more food no change uncertain
- Has your overall food production changed? If yes in what way and why?
 - less harvest output more harvest output no change uncertain
- For how many months a year does your family have enough food?
 - 0-3 months 3-6 months 6-9 months 9-12 months
- Has this changed over the last 10/20 years? If yes, how and why?
- How is the food diversity (multiple response possible)?
 - Sufficient grains (rice, cereals, bread, pasta) and/or legumes Sufficient roots and/or tubers
 - Sufficient meat and/or fish and /or dairy Sufficient vegetables and/or fruits and/or nuts
- Has there been any change in terms of food diversity?
 - less diverse more diverse no change uncertain
- What are your main sources of income? (multiple response possible)
 - mostly agriculture mostly industry mostly remittances mostly services
 - combination of different sources
- Do the changes you have mentioned impact on your income opportunities (on-farm and off-farm)?
 - If yes in what way?
 - Are there any income opportunities you no longer have?
 - Are there any new income opportunities that have arisen over the past 10/20 years?

- Has your overall income changed, and, if yes, in which way?
 less more no change uncertain
- What are the reasons for these changes?
- Is your income sufficient to cover your basic needs (food, clothing, schooling, healthcare)?
Income is more than sufficient less than sufficient sufficient

Capacity analysis: Coping and adaptation mechanisms

☞ The questions in this section need to relate to the answers given in the previous section on perception of changes. The interviewer should refer to the specific examples of changes mentioned by the respondents during the interview or FGD (e.g., less rainfall, more rainfall, floods, landslides, longer dry seasons, diseases, pests, food shortages, and so forth). The interviewer should only ask questions about the examples of changes that the respondents have actually experienced. For example, the interviewer should not ask questions about crop pests if the respondents have not experienced any changes in crop pests. Sample questions are listed below.

☞ PRA tools: These questions can be asked when the seasonal calendar and the livelihood seasonal monitoring calendar are being merged together (see Figure 3 in section on Data Collection).

- What do you do when there is **too little rain/water** or there is an unusually long dry period?
 - What do you do with your crops (e.g., do you change varieties, timing of sowing/planting or harvesting, irrigate the land)?
 - What do you do with your animals?
 - What do you do in your household/in the community? Who is dealing with this problem (you, your husband/wife, other family members, or the community as a whole)?
 - Are these strategies still useful today? Or what, in your view, needs to be done? Who could help you?
- What do you do when there is **too much rain/water**?
 - Ask same sub-questions as above
- What do you do when the **weather** is extremely **hot** over a long period of time?
 - Ask same sub-questions as above.
- What do you do when it is extremely **cold** over a long period of time?
 - Ask same sub-questions as above.
- What do you do when there is a **flood**?
 - How do you protect your crops, your animals, your children, and your houses and personal belongings?
 - Are these measures still sufficient today? Or what, in your view, needs to be done?
 - How long does it take you to get back to normal life after a flood?
 - Who is responsible for which measures? Do you help each other out within the community? Do you get support from outside? What kind of support would you need?
- What exactly do you do when there is a **landslide**?
 - Ask same sub-questions as with flood.
- What do you do when there is a **hailstorm**?
 - Ask same sub-questions as with flood.
- What do you do if there is **a lot of snow**?
 - Ask same sub-questions as with flood.
- Have you **introduced** any **new crops** or **given up** planting some crops?
 - If yes, which ones and why?

- What do you do when your **crops are affected by pests/diseases**?
 - Do you have any remedies for this? Are these remedies still useful?
 - Who is dealing with this problem (you, your husband/wife, or the community as a whole)? Can you get any support from the community, from outside (e.g., extension services)? What kind of support would you need?
- What do you do when your **livestock are sick**?
 - Ask same questions as with pests.
- What do you do when **members of your family get sick**?
 - Do you have any traditional remedies?
 - Can you go and see a doctor/ health worker?
 - Who is taking care of those who are sick? Do you get assistance (also in monetary terms) from other members of the community or from outsiders?
- What do you do if there is a prolonged period of **food shortage**?
 - Do you have to go to a moneylender?
 - Do you engage in off-farm activities?
 - Do you sell any personal goods?
 - Do some of your household members migrate? If yes, where to and for how long?
 - Do you get assistance from other members of the community or from outside?
 - What kind of support would you need?
- What do you do if there is a **shortage of fuel** for cooking or heating?

Social safety nets

☞ PRA tools: The following questions can be linked to the Venn diagram on institutions

- When you try to resolve these problems, are there any specific community groups or arrangements from which you receive help (e.g., when your crops are affected by pests, when there is a water shortage, when you need assistance because of food shortage, or you need money for a veterinarian or to see a doctor)?
 - Could you please describe these groups/arrangements?
 - Who participates in these groups/arrangements?
 - Do you also help others if they have any problems? How?
- When you and your family/community are trying to resolve these problems can you get help from outside (e.g., from local government representatives, IOs, NGOs)?
 - If yes, from whom exactly? What is their role? What kind of help do you receive and for what problems?
 - Who within the community can get help from these organisations/sources? For whom is it particularly difficult to gain access to these organisations/sources?
- Do you know what other communities/villages are doing to resolve the problems you mentioned? Do they take the same measures as you/your community? If different than yours, have you tried some of their practices in your community? Which ones? Why or why not?

Needs assessment

- Of the changes, problems, and challenges you have mentioned, which ones are the most important ones that you are facing in your daily lives at present?
- Do these difficulties differ from the ones you were facing 10/20 years ago, or from the ones that your parents were facing? In what way? What do you think the reasons are for these changes?

- Which strategies and mechanisms (including technologies, information, infrastructure, livelihood options, and institutional mechanisms), in addition to the ones you have already mentioned, do you think would help you most to alleviate the current difficulties you are facing?
- Who could help you to overcome these challenges?
- What do you think about the interventions that have already happened in your village (if any)? Which ones worked and which ones did not? Why?
- What would help you most to improve your life?

Institutional constraints and opportunities analysis

☞ The following questions should be asked to representatives of civic, public, and private organisations active in the study area.

- What are the most important climatic and socioeconomic changes observed in the region?
- In your view, how do climate change related hazards affect the livelihoods of the people living here?
- What impacts do climate and socioeconomic change have on daily activities and living conditions?
- What do the communities do in response to these changes?
- What concrete role does your organisation play in supporting the local people in their efforts to adapt to, or cope with, climate and socioeconomic change?
- What kind of concrete support do you offer (extension services, knowledge transfer, technological support, income opportunities, loans, and so on)?
- Who is directly benefitting from your organisation's services? Who participates in your initiatives? How do they benefit from your initiatives? Do women and men benefit equally?
- Do you think that there are any differences between the needs of women and men, and different social groups, with regard to climate change adaptation? If yes, what do you think these different needs are?
- What is your opinion about the importance of informal traditional institutions (safety nets) within mountain communities in the adaptation process to climate change?
 - What role do informal traditional institutions within communities play in the adaptation process to climate change?
 - Are there any linkages between your organisation and traditional informal institutional arrangements within the communities? Please explain these linkages.
- Does your institution have any linkages to other institutions active in the area (civic, public, private)?
 - Could you please explain the way you are collaborating with these other institutions?
- In your opinion, what is the biggest challenge facing local communities at present?
 - Have these challenges changed from the ones that they faced in the past?
 - What should be done first to overcome these challenges?
- How could particularly women and other vulnerable groups be supported in their struggle to cope with, or adapt to, climate and socioeconomic change?
- How can your organisation support these communities?
- In what way would your organisation need external support to help local communities to overcome these challenges?

Thank you!

Annex 2: Outline of Vulnerability and Capacity Assessment Report

1. Introduction
2. Description of study area
 - 2.1 Geography (location, topography, resource profile, map, and so forth)
 - 2.2 Climate
 - 2.3 People and livelihoods
 - 2.3.1 Ethnicity
 - 2.3.2 Livelihood activities
 - 2.3.3 Overall wellbeing (poverty rate, literacy, food security, infant mortality, infrastructure, and so on)
 - 2.3.4 Gendered division of work and access to and control over resources
3. Methodology
4. Climatic trends in the study area
 - 4.1 Records on climate variability, hazards, and trends
 - 4.2 People's perception of climate variability, hazards, and trends (including differences in perceptions between men and women)
 - 4.3 Comparison of climate records and people's perceptions
5. Socioeconomic vulnerability to climate variability and change
 - 5.1 Impacts of climate change on productive resources and infrastructure (including land, water, forest and forest products, biodiversity, and so on)
 - 5.2 Impacts of climate change on livelihoods (including land-based and non land-based activities)
 - 5.3 Impacts of climate change on daily activities and workload
 - 5.4 Impacts of climate change on overall wellbeing (health, food security, income security, and so on)
 - 5.5 Perception of underlying causes of vulnerability
 - 5.6 Differences in vulnerability between men and women and different social groups within the community
6. Existing capacities and technologies to cope with and adapt to climate change
 - 6.1 Existing indigenous or traditional coping and adaptive strategies
 - 6.2 Existing innovative coping and adaptive strategies
 - 6.3 Evaluation of the relevance and resilience of existing traditional and innovative coping strategies with regard to perceived and expected climatic and socioeconomic changes
 - 6.4 Gendered livelihood assets, capacities, and shortcomings (human capital, natural capital, social capital, institutional capital, financial capital, off-farm work opportunities, and so on) with regard to climate change adaptation

[Case studies illustrating traditional and modern adaptive strategies (can be inserted into the report in the form of boxes; should to be illustrated with photos)]
7. Opportunities emerging from climate change
8. Identified needs in the climate change adaptation processes
9. Social and institutional constraints and opportunities
 - 9.1 Traditional and informal structures, formal political institutions, NGOs, and so on working with the communities, and their roles
 - 9.2 Concrete support offered by these institutions to the communities with regard to climate change adaptation
 - 9.3 Shortcomings of these institutions in addressing the needs of communities

10. Main policy areas facilitating or hindering adaptation
11. Recommendations for enhancing the capacity and resilience of mountain communities for future adaptation – especially women and other disadvantaged groups
 - 11.1 Recommendations for concrete, location-based adaptive and coping mechanisms, as well as innovative livelihood options, to be strengthened or introduced at the different study sites
 - 11.2 Institutional implications
 - 11.3 Policy implications
12. Conclusion
13. Bibliography

Annexes

- Annex 1: Photos documenting the study sites and concrete adaptive and coping strategies
- Annex 2: Interview guidelines
- Annex 3: List of communities, households and institutions interviewed
- Annex 4: References and bibliography – including the policies reviewed

Acknowledgements

The author wishes to thank the many colleagues in ICIMOD for their indispensable contributions to this framework. Special thanks go to Dr Michael Kollmair, Programme Manager Sustainable Livelihoods and Poverty Reduction, and Dr Brigitte Hoermann, Action Area Team Leader Innovative Livelihood Options, for their valuable support and feedback during the development and testing phase of this framework; to Ms Brigitte Leduc, former Division Head of Gender and Governance, for her important contributions and critical feedback especially at the early stage of the development phase; Dr Dhrupad Chaudhury, Coordinator IFAD Programme, for his critical contributions during the development and testing phase of the methodology; and Dr Nani Ram Subedi and Dr Rajan Kotru for testing the methodology in the framework of the Himali Project and providing feedback. Special thanks also go to those who reviewed the framework, especially Dr Eklabya Sharma, Director of Programmes, and Mr Daan Boom, Programme Manager Integrated Knowledge Management, for their many comment, and support; to the editorial team at ICIMOD, especially Dr A Beatrice Murray, for their help in bringing the document to its present form; and to the many others who helped make the publication possible.

The author is particularly thankful to the International Fund for Agricultural Development (IFAD), whose strategic partnership with ICIMOD provided the opportunity to field test the framework within the TAG 1113 activities, and to the Swiss Agency for Development and Cooperation (SDC) who provided the funding for the work under the Junior Professional Officer Programme. Last, but by no means least, I thank the communities in northwest India and Nepal who openly shared their rich knowledge with us and actively participated in the testing phase.

Publication details

Published by International Centre for
Integrated Mountain Development
GPO Box 3226, Kathmandu, Nepal

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ISBN 978 92 9115 182 0 (printed)
978 92 9115 184 4 (electronic)

LCCN 2011-312001

Production team

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Cover photo: Focus group discussion in Bajhang, Nepal
Amanda Gurung

Photos: pp 10, 11 Zoe Lüthi; pp 9, 13 Mirjam Macchi

Printed by Hill Side Press (P) Ltd. Kathmandu, Nepal

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This publication is available in electronic form at
www.icimod.org/publications

Citation: Macchi, M (2011) *Framework for community-based climate vulnerability and capacity assessment in mountain areas*. Kathmandu: ICIMOD

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ISBN 978 92 9115 182 0