

# Women's Empowerment at the Frontline of Adaptation

Emerging issues, adaptive  
practices, and priorities in Nepal

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The International Centre for Integrated Mountain Development, ICIMOD, is a regional knowledge development and learning centre serving the eight regional member countries of the Hindu Kush Himalayas – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan – and based in Kathmandu, Nepal. Globalization and climate change have an increasing influence on the stability of fragile mountain ecosystems and the livelihoods of mountain people. ICIMOD aims to assist mountain people to understand these changes, adapt to them, and make the most of new opportunities, while addressing upstream-downstream issues. We support regional transboundary programmes through partnership with regional partner institutions, facilitate the exchange of experience, and serve as a regional knowledge hub. We strengthen networking among regional and global centres of excellence. Overall, we are working to develop an economically and environmentally sound mountain ecosystem to improve the living standards of mountain populations and to sustain vital ecosystem services for the billions of people living downstream – now, and for the future.



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# Women's Empowerment at the Frontline of Adaptation: Emerging issues, adaptive practices, and priorities in Nepal

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# Foreword

The situation in the Hindu Kush Himalayas is rapidly changing. Mountain women and men are directly affected by the combined impact of climate change, globalization, land use change, economic liberalization, migration and others. This has posed a major challenge to the development agenda in developing and least developed countries. HKH is predicted to face a higher rate of temperature increase and an increasingly variable precipitation system and melting of the glaciers. These changes have direct bearing on the fragile mountain ecosystem, affecting the natural resource base and threatening the livelihoods of the people who depend on these resources.

The Himalayas cover 80% of Nepal's territory. Majority of the population, particularly women, depends on farming, herding or tourism for its livelihood. While men and women are likely to face many common challenges due to these changes, in many communities, climate change will have a disproportionately greater effect on women. Mountain women are often poorer and less educated than men and often excluded from decision-making processes that affect their lives. Despite these challenges, women also have a rich knowledge and skill set in managing and making wise use of natural resources and biodiversity. Although their knowledge and skills contribute to adaptation in extreme situations such as conflicts, disasters or displacement, they are not adequately acknowledged, valued and documented. These challenges vary widely across the mountain region depending on the circumstances, and our evidence base on the gendered interaction between livelihoods, natural resource management, poverty and resilience is still weak.

Gender issues and climate change is an emerging topic for research and policy makers all over HKH. To develop effective adaptation strategies, there needs to be proper documentation of the impact of various changes on women and men, how they adapt to these changes and how gender-specific conditions affect their abilities to adapt.

Under its regional programme on Adaptation to Change and specifically under the Himalayan Climate Change Adaptation Programme (HICAP), ICIMOD hopes to fill this knowledge gap by integrating gender in the various components of the programme and also focusing on gender specific studies and research. One of the key objectives of HICAP is to, "make concrete and actionable proposals for strategies and policies considering vulnerabilities, opportunities and potentials for adaptation, with particular reference to strengthening the role of women and local communities". HICAP seeks to enhance the role of women and gender in adaptation by understanding and integrating the opportunities and risks for women and men resulting from changing socio-economic and environmental conditions.

This report is an attempt to take stock of key issues, needs and gaps in the area of gender and climate change adaptation as well as the key stakeholders and organizations working in this field in Nepal. Building on extensive field work and existing knowledge at ICIMOD and WOCAN (Woman Organizing for Change in Agriculture and Natural Resource Management), the report explains how climate and other changes affect women, who are often at the frontline of grassroots level action. At the same time it advocates for integration of gender perspective in designing national policies and adaptation strategies.

I hope this report will help raise awareness and generate adaptation policies and programmes that are more gender sensitive and inclusive.



**David Molden**  
Director General  
International Centre for Integrated Mountain Development

# Foreword


The gender-related impacts of climate change are often discussed in global meetings of climate change and gender activists, where women are generally portrayed as vulnerable victims of climate change. Only rarely are such discussions based on primary research that incorporates the perspectives of women farmers and environmental managers from the global South and communicates their agency as actors who respond to such challenges.

This study provided WOCAN with an opportunity to interview women farmers of the hills and mountain areas of Nepal, to identify and analyse their challenges and responses associated with climate change. The scoping study looked at the impact of climate change on women's material conditions and the implications for their position and empowerment in terms of social, economic, and political perspectives and processes.

The key finding of the study is that there has been a significant increase in rural women's workloads due to the possible impacts of climate change brought on by the drying up of ponds and springs, erratic rainfall, and extended dry spells and drought. This increase in workload is having multiple effects on women's health, income, safety, nutrition, levels of violence against women, and, ultimately, women's social, economic, and political empowerment. Key emerging issues confirmed by the research include the increase in women's workload and drudgery; loss of traditional and new income for women; reinforcement of the exclusion of women; the backsliding of rural women's achievements and roles; declining women's leadership; an increase in violence against women; a mismatch between demand and supply; the need for alternative technologies and new knowledge; health; and access to financial resources.

The knowledge generated from this study has informed WOCAN's strategic planning based on recommendations to: increase and enhance rural women's engagement in local-level climate change planning, implementation, and decision-making processes; strengthen local-level women's organizations and networks to benefit from climate change policies and programmes; provide specific funds and resources for women; promote time saving appropriate and alternative technologies for women; establish local-level pre- and post-assessment mechanisms; invest in developing the skills of local-level service providers on climate change issues; enhance national and local-level institutional capacities for gender equality; develop the awareness of men to support women's leadership; strengthen women's leadership; mainstream gender-sensitivity in relation to climate change interventions in relevant institutions; and conduct further research.

It is hoped that this scoping study will be of use to researchers and policy makers working on the gendered impacts of climate change to inform a more gender-sensitive approach to climate change interventions and to value the input and experience of women in adapting to climate change in Nepal.



Jeannette Gurung

Executive Director

Women Organizing for Change in Agriculture and Natural Resource Management (WOCAN)

# Acronyms

AEPC	Alternative Energy Promotion Center
CFUG	community forest user group
DDC	district development committee
DFID	Department for International Development
FECOFUN	Federation of Community Forestry Users Nepal
FGD	focus group discussion
GDP	gross domestic product
GLOF	glacial lake outburst flood
HICAP	Himalayan Climate Change Adaptation Programme
HIMAWANTI	Himalayan Grassroots Women's Natural Resource Management Association
HKH	Hindu Kush Himalayas/Himalayan
ICIMOD	International Centre for Integrated Mountain Development
IFAD	International Fund for Agriculture Development
INGO	international non-governmental organization
IPCC	Intergovernmental Panel on Climate Change
LAPA	Local Adaptation Plan of Action
LI-BIRD	Local Initiative for Biodiversity, Research and Development
MEDEP	Micro Enterprise Development Project
MUS	multiple water use system
NAPA	National Adaptation Plan of Action
NGO	non-governmental organization
NTFP	non-timber forest product
REDD	Reducing Emissions from Deforestation and Forest Degradation
REDD-RPP	Reducing Emissions from Deforestation and Forest Degradation Readiness Preparedness Proposal
SDC	Swiss Agency for Development Cooperation
UNDP	United Nations Development Programme
UNDP/DRR	United Nations Development Programme/Disaster Risk Reduction
VDC	village development committee
WFDD	Women Farmer Development Division (now Gender Equity and Environment Division)
WOCAN	Women Organizing for Change in Agriculture and Natural Resource Management
WHO	World Health Organization
WWF	World Wide Fund for Nature



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Kishor Pradhan – Development Knowledge Management and Innovation Services Pvt. Ltd (DeKMIS), Nepal (data collection, analysis and presentation and contribution to Chapter 2)

Bjorn Alffthan – GRID-Arendal, Norway (Initial design and concept of the report)

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# Executive Summary

Women are a driving force for rural development in Nepal. Agriculture dominates Nepal's economy and is the main livelihood strategy for two-thirds of its population. It is also the main source of livelihood for 78% of all women in Nepal. In areas where most of the economically active Nepali men migrate in search of employment opportunities, women have become the backbone of rural development, providing most of the labour inputs.

However, Nepal is one of the countries most vulnerable to climate risks and is characterized by high levels of poverty, high population density, and high exposure to climate-related events. Climate change is threatening the livelihoods of those directly dependent on agriculture and the natural resource base. Rural women are disproportionately vulnerable to the impacts of climate change due to their socially constructed roles and responsibilities and relatively poor economic and social positions.

There is a major knowledge gap in relation to the impact of multiple drivers of change on women in Nepal and women's role in adaptation to climate change and managing natural resources. This lack of knowledge often translates into policies and practices that perpetuate unequal access to various resources and women's marginalization from development processes, policymaking, and initiatives. This scoping study addresses this gap and identifies differences in impact and adaptive capacity between and among women and men. It also identifies appropriate and sustainable adaptation strategies to ensure equitable access to resources, rights, and opportunities for marginalized, minority, and indigenous people. The study's findings are the result of extensive stakeholder consultations at the district and national levels, involving grassroots women leaders, international non-governmental organizations (INGOs), national-level government and non-governmental organizations (NGOs), and district-level NGOs.

The findings of the study reveal that, across Nepal, there has been an increase in rural women's workload rendering multiple effects on women's health, income, safety, nutrition, violence against women and ultimately on women's social, economic and political empowerment.

Variability in water availability has negatively affected women's livelihoods. The hardening of agricultural soils and the emergence of new pests and crop diseases, all widely observed, are increasing women's workloads, forcing them to spend long hours tilling the land and weeding fields. The decrease in overall productivity with reduced diversity in crop and food intake has presented a unique challenge to women as 'food managers' of their households. Challenges to agro-based micro enterprises run by women's collectives due to decline in agricultural production and decline in income from women-managed and controlled high-value crops ('pewa' crops) has affected women's economic independence. Climate-induced changes in forests and biodiversity, including the emergence of invasive species, are leading to a loss of household income and livelihood options, especially for women and people from poor, indigenous, and marginalized communities, such as the Chepang and Dalits.

The decrease in water availability as a result of climate change has increased the distance covered and time needed to collect water and worsened hygiene and sanitation for women. It has also led to greater humiliation and further exclusion of women from low and so-called 'backward' castes in accessing water facilities. Contestation over water for irrigation has marginalized women farmers.

Years of positive improvements in women's empowerment in Nepal, vital for the success of rural development, is being threatened by these changes. Due to increased workload, drudgery, and time constraints, women are being alienated from vital adaptive knowledge and unable to grab opportunities to improve their knowledge and skills. There is a declining trend in the achievements of rural women achieved through collective power of organized groups. Climate change programmes and policies often tend to present women as victims rather than as key actors in adaptation. This has increased the gap in power relations between men and women and further reinforced women's exclusion from participation in resource governing and decision making bodies.

However, across Nepal there are also positive signs of adaptation processes in action. Measures are being undertaken by individuals and organizations to reduce their vulnerability to climate change impacts, such as those

posed by water scarcity, decreasing agricultural production, early ripening of crops, and natural disasters (soil erosion, landslides), among other things.

Some of the community-level adaptive practices identified by the scoping study are:

- Use of local technology such as mobile phones to obtain information on available resources and new adaptation technologies
- Use of local networks to mobilize technical and financial resources for adaptation
- Garnering of men's support for household and community work
- Use of plastic greenhouses to protect seedlings from heavy rain, frost, and blight
- Rainwater harvesting
- Altering sowing times for crops
- Use of mixed cropping systems to reduce the risk of complete crop failure (e.g., maize planted with beans or cowpeas)
- Intensive planting of improved fodder grass
- Shifting to other cash crops such as broom grass, ginger, and sugarcane
- Use of agricultural residue and dung to make up for the fuelwood deficit particularly in Terai
- Planting of fuelwood and fodder species on private land
- Community seed banking
- Opting for wage labour and small non-farm businesses
- Saving food for disasters

Adaptive practices promoted by state and non-state institutions include:

- Use of innovative approaches like Reflect and Pathshala, which use the concept of adult literacy to disseminate new knowledge and create gender awareness
- Good agroforestry practices and stall feeding
- Non-timber forest product (NTFP) planting and harvesting methods
- Leasing land to poor, particularly women and marginalized groups, with inputs
- Agricultural subsidies and technical inputs (District Agriculture Development Office)
- Application of integrated pest management
- Construction of conservation ponds and water sources and sprinkle irrigation
- Seed conservation, seed banking, use of drought resistant varieties
- Home gardens
- Seasonal riverbank farming
- Private crop insurance
- Introduction of improved varieties of fodder grasses
- Strengthening capacity of existing community-based organizations, civil society organizations and NGOs on tackling climate change

### **Call for action: Recommendations for women sensitive adaptive practices**

Given the vital role of women as the primary actors in natural resource management and agriculture, adaptation actions need to be gender-sensitive and inclusive. This report recommends the following actions:

- Prioritize the promotion of time-saving, gender-friendly alternative technologies
- Target and sensitize men to support women's leadership
- Increase and enhance women's engagement in local-level climate change planning and implementation processes by strengthening women's organizations, leaderships and networks
- Allocate separate funds and resources to support women's adaptation
- Promote time-saving, appropriate, and alternative gender-friendly technologies
- Enhance national and local-level organizations' capacity for gender integrated planning
- Promote research and knowledge management on gender and climate change



## Chapter 1

# **Mountain Women:** Knowledge gaps and challenges for adaptation



## Introduction

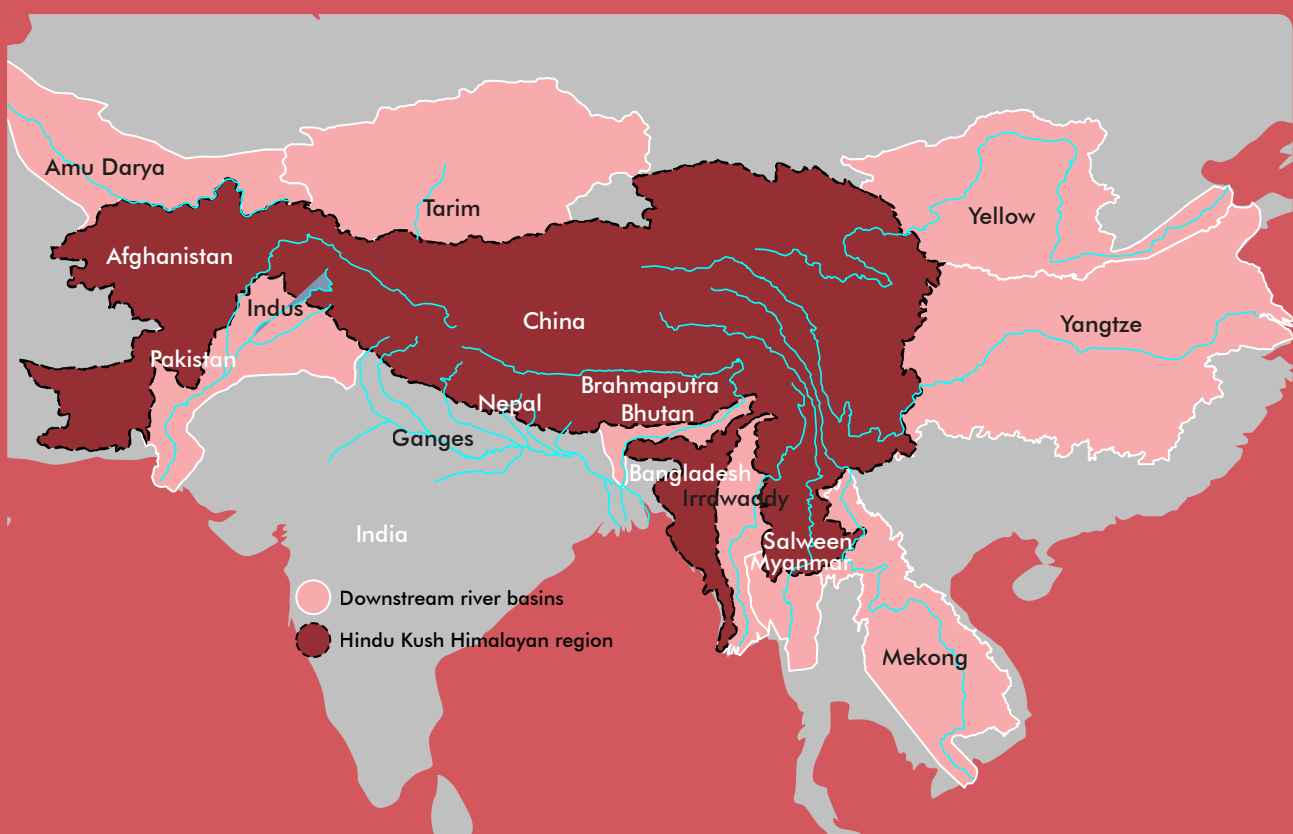
The HKH region (see map below) is undergoing rapid climatic and environmental change, which is adversely affecting glacier melting and environmental resources in ways that threaten the vast water reservoirs that serve over 200 million people in the mountains and over one billion people downstream (Benfield 2010). Livelihoods in this region are very sensitive to environmental, social, cultural, economic, and other change. These changes are already affecting the natural resource base and threatening the livelihoods of those directly or indirectly dependent on natural resources (Eriksson et al. 2009).

While there is an urgent need to support the women, men, and children of the HKH to manage these changes so they can maximize benefits and minimize risks, it needs to be done with a strong gender perspective, using gender analysis and empowerment approaches (Aguilar 2009; WHO 2011). Worldwide, women are disproportionately vulnerable to the impacts of climate change due to their socially-constructed roles and responsibilities and relatively poor economic and social positions (Bernstein 2007). This is also true for mountain women in the HKH region.

Yet, despite this vulnerability, women are also the primary users, managers, and custodians of natural resources – especially in places where there is high male out-migration for work (Kaspar 2005). As women play a vital role in the conservation of mountain biodiversity and natural resource management, it is essential that women’s knowledge systems and the constraints that women face in effectively carrying out their roles as producers and managers are well understood. This is even more necessary in light of the growing challenges posed by climate change-related impacts.

Sustainable mountain development must ensure the full and equitable participation of mountain women, men, and children in development initiatives (ICIMOD 2010). Currently, there is a major knowledge gap in relation to the impact of multiple drivers of change on women and women’s role in adaptation to climate change and the management of natural resources. This lack of knowledge often translates into policies and practices that perpetuate unequal access to resources and women’s marginalization from development processes, policy making, and initiatives (Leduc et al. 2008; Sterrit 2011).

Hindu Kush Himalayan Region



This report explores the differences in impacts and adaptive capacities between and among women and men and identifies appropriate and sustainable adaptation strategies to ensure equitable access to resources, rights, and opportunities for women and men. This report is an important step towards a rapid assessment of key issues, needs, and gaps in the area of gender, climate change, and natural resource management in Nepal with a specific focus on the Koshi river basin.

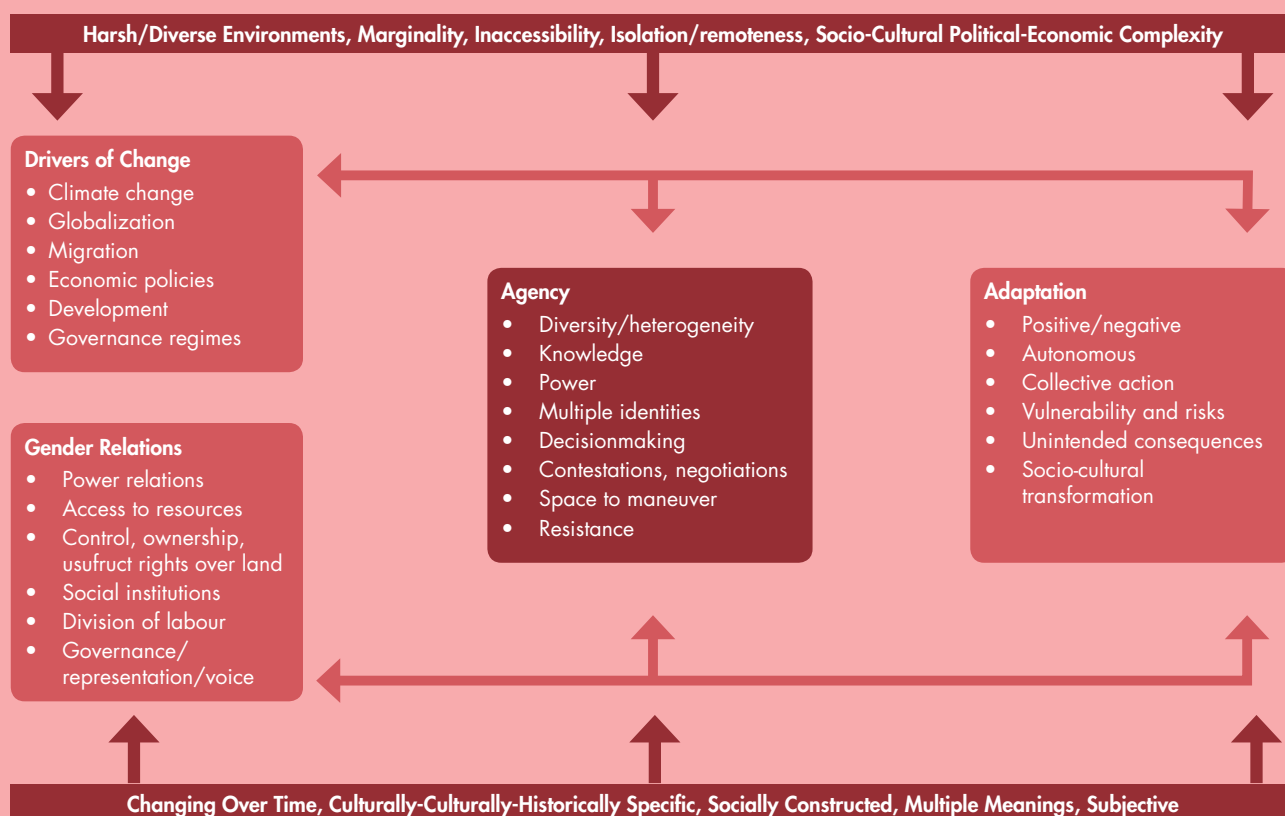
## Objectives

The report examines the impacts of climate change on gender relations keeping the broad framework of the climate risk sectors identified by the Government of Nepal's Strategic Program for Climate Resilience (which is part of the global Pilot Program for Climate Resilience) as its base. The Government of Nepal has identified quantity and quality of water; food security and; ecosystem health as the three most critical climate risk sectors. The report analyses the gaps, needs, opportunities, and emerging issues in relation to water; agriculture and food security and; forest and biodiversity in terms of women's material condition and position and the challenges these present in the process of women's empowerment. Besides these, the report looks at key governance issues in natural resource management.

## Analytical Scope

Adaptation is the result of complex and often contested negotiations entered into by individuals, communities or countries. The cornerstones of the analytical framework for gender analysis developed by the HICAP gender team (Dr Ritu Verma, Dr Asuncion St. Clair, Dr Petra Tschakert, and Dr Suman Bisht) reflect the overarching context within which adaptation takes place; drivers of change; gender relations; and agency (see Figure 1). The framework illustrates how multiple drivers of change intersect with gender relations to shape the agency of the decision makers.

Figure 1: Gender Analytical Framework





Of course the outcome of any adaptation action in itself affects agency and its determinants. Adaptation outcomes occur in an overarching geographical, politico-economic, and cultural (caste, caste, religion, ethnicity, gender regimes) context and among complexity (the outermost parameters that shape adaptation).

The HKH is an extensive geographical region that extends from Afghanistan in the west through Pakistan, China, India, Nepal, Bhutan, and Bangladesh, to Myanmar in the east – eight sovereign countries with diverse political and economic systems. The region has been marred by geopolitical tensions, cross-border as well internal conflicts, and war. Given the broad range of agroclimatic and ecological zones and production systems found in this region, the HKH houses some of the world’s richest biological and socio-cultural diversity.

The drivers of change, which include climate change and variability as well as non-climatic change, have been unfolding in the HKH region for a very long time. These drivers of change are so diverse and dynamic that they are reconfiguring people’s relationships with one another, within and across households and communities, as well as within and among institutions, states, and macro agencies.

Processes of globalization and regionalization are connecting local markets to global markets and reconfiguring economic relations, interactions, and dependencies. Populations are growing; people are moving, voluntarily and involuntarily; and infrastructural development, industrialization, and urbanization are creating an increasingly built environment. Together these myriad drivers of change are reshaping land use dynamics, changing resource bases, and, in some instances, rendering local knowledge systems obsolete while giving rise to new bodies of information, creating new livelihood systems, and setting in motion new patterns of consumption and acquisition, mindsets, and values.

Among the key gender relations are power differentials within and between households and between decision-making entities at the community and district levels which determines who has access to, and control over, resources (particularly land and finances) as well as division of labour (for example, who takes the responsibility for securing water or whose crops are covered under index-based crop insurance schemes are determined by gendered division of labour and access to resources). These power differentials have the potential to perpetuate vulnerabilities to climate change and determine who has a voice in governance issues.

The central component of ‘agency’ determines who, when, where, and how men and women of different ages, classes, castes, ethnicities, religions and other differences are able to negotiate the benefits and harms that result from the intersection of drivers of change and gendered relations. In other words, agency means how well individuals and communities are able to navigate the balance between vulnerability and resilience, when they can take advantage of an opportunity, and under what conditions they are likely to get caught in a trap. For example, women possess valuable knowledge about natural resources and, when given the opportunity, can give valuable input into adaptation strategies. However, to what extent they are able to do so depends on the process of validation of local knowledge that determines what power is exercised, by whom, and over whom (especially through gender, but also other categories that represent intersecting inequalities) and to what extent women are able to use strategies such as negotiation, contestation, or resistance in decision-making processes.

At the same time, there is also a pressing need to take into account the changing contexts of women’s lives (determined by various drivers of change) and how these changes are reconfiguring the relevance of their knowledge systems and their relations (and commitments) to their resource bases. Particularly in the HKH where infrastructural development has brought remote areas and communities into contact with a very different outside world, it is important to understand the dynamics between customary institutions, community initiatives, and government institutions and how these are redefining women’s involvement at different levels.

The dynamic interplay of shifting local and global contexts, as well as changes in social, economic, ecological, political, and institutional dynamics, governs adaptive capacity and consequently, determines which adaptation options are available and acted upon and by whom, who benefits from these actions, and who is disadvantaged.

This study focuses on the interplay between drivers of change and gender relations and examines how this interaction transforms women’s empowerment, which directly affects their adaptive capacity. The key assumption of the study is that, while climate change impacts on the material conditions and social position of women, their

## Box 1: Key definitions

**Adaptive capacity:** The combination of the strengths, attributes, and resources available to an individual, community, society, or organization that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities. Also defined as the ability of systems, institutions, and individuals to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.

**Adaptation to climate change:** In human systems, the process of adjustment to actual or expected climate and its effects, which seeks to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate.

**Capabilities:** A person's opportunity and ability to generate valuable outcomes.

**Gendered impacts and opportunities:** Differences in experienced impacts and possible responses due to distinct social and cultural roles imposed on men and women, always in combination with other dimensions of privilege and marginalization (age, class, caste, race, ethnicity, [dis]ability).

**Flexibility:** Potentialities for change and opportunities for adaptation under conditions of uncertainty.

**Resilience:** The ability of a social, ecological, or socio-ecological system and its components to anticipate, reduce, accommodate, or recover from the effects of a disturbance in a timely and efficient manner, including the human ability to learn from mistakes and be forward-looking in thinking and action, as well as the ability of ecosystems to preserve and restore their functions. It is useful to distinguish between 'engineering' or restorative resilience and 'ecological' or transformative resilience (bounce back and bounce forward).

**Uncertainty:** A state of incomplete knowledge that can result from a lack of information or from disagreement about what is known or even knowable. Uncertainty may have many sources, from imprecision in data to ambiguously defined concepts or terminology, or uncertain projections of human behaviour. Uncertainty may also be inherent in the biophysical properties of a system, such as the climate system. Uncertainty can, therefore, be represented by quantitative measures (e.g., a probability density function) or by qualitative statements (e.g., reflecting the judgment of a team of experts).

**Vulnerability:** The propensity (natural tendency) or predisposition (structurally-driven tendency or likelihood) to be harmed.

Source: Based on the scientific framing for ICIMOD'S regional programme on Adaptation to Change, existing science efforts, and the contribution of Working Groups I, II, and III to the IPCC's Fifth Assessment Report (IPCC 2013a, 2013b, 2013c).



existing material conditions and social position determines the capacity of women to adapt to climate change. ‘Material conditions’ refers to the living conditions of women determined by their access to development services, health, literacy, employment opportunities, and natural, financial, and other resources. Women’s position in this study is analysed in terms of caste, class, ethnicity, and participation and ability to influence decisions within users groups and village development committees (VDCs).

## Methodology and Data Collection

The data and supporting information for this study was collected through a variety of complementary means, including:

- The review of available research and project reports, policy documents, and peer-reviewed literature from both national and international sources on topics of climate change, gender, agriculture, and natural resource management in Nepal
- Extensive participatory field consultations in three districts of Nepal within the Koshi River basin (Morang, Dhanusha, and Sankhuwasabha) including interviews with key informants; district-level consultations with government line agencies, community based



- organizations, and federations (such as the district chapters of the Federation of Community Forestry Users Nepal [FECOFUN]); and gender-differentiated focus group discussions (FGDs) at the village level
- Two national-level consultations, including consultations with grassroots women leaders from six districts (Kavre, Sindhuli, Chitwan, Gorkha, Lamjung, and Sarlahi) and a national roundtable consultation with national and international governmental organizations (NGOs and INGOs) and district-level NGOs
- In-depth interviews with 35 key resource persons from various INGOs and NGOs, as well as independent researchers actively engaged in climate change and natural resource management at the district and national levels
- Collation of information via email, telephone, and personal contact with 76 gender experts working in 72 organizations in Nepal on climate change adaptation in agriculture, forestry, energy, water, disasters, and development

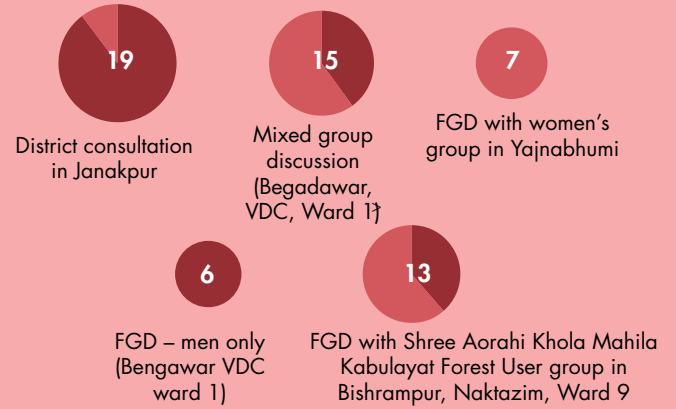
Annexes 1 to 4 provide further details on the methodology as well as a complete list of people interviewed. A summary of the consultations is provided in Figure 2.

Figure 2: **Graphic representation of methodology and data collection**

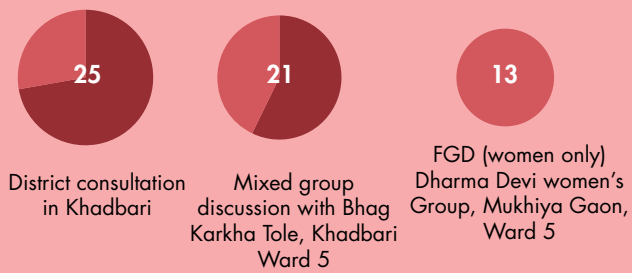
**Morang District**



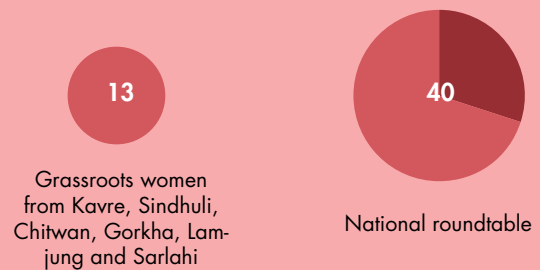
**Dhanusha District**



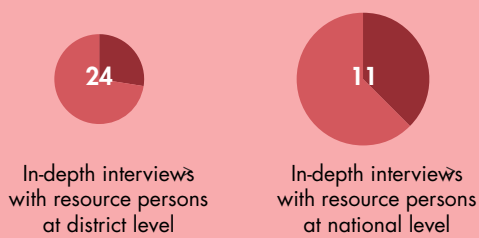
**Sankhuwasabha District**



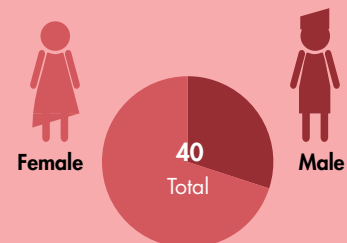
**National Consultation**



**Interviews**



**Consultation with Gender Experts**



The figure inside each circle represents the number of participants.

## Chapter 2

# Women in Nepal: The gender context



## Introduction to Nepal

Nepal is among the poorest and least developed countries in the world, with almost one-quarter of its population living below the poverty line. Agriculture is the mainstay of the economy, providing a livelihood for three-quarters of the population and accounting for about one-third of gross domestic product (GDP). Industrial activity mainly involves the processing of agricultural products, including pulses, jute, sugarcane, tobacco, and grain. The majority (83%) of the Nepali population live in rural areas where poverty is high (the poverty rate is 35% in rural areas compared to 10% in urban areas) according to the 2001 national census. Nepal's population is growing at a rate of 1.4% and is largely young (median 21 years); in 2012, the total population was 26.85 million (Asian Development Bank 2014). Unemployment is high with considerable migration to India and other countries for work. The workforce generally lacks skills to escape the poverty trap.

Nepal is undergoing a significant political transition following a 10-year civil war, which ended in 2006 and which has overshadowed economic issues in the country. Political instability is a defining feature of Nepal: since the introduction of democracy in 1990, Nepal has had 20 different governments. The country as a whole suffers due to its harsh geography and climate. Poor access to, and reliability of, electricity is one of the more serious infrastructure problems (during the dry season load shedding is up to 16 hours a day), despite Nepal having one of the largest untapped hydropower resources in the world. In terms of physical accessibility, over one-third of the people in the hills are more than four hours away from an all-weather road. More than half of primary school students do not enter secondary school and malnutrition remains very high. Despite this, Nepal has made leaps in reducing poverty in recent years: the proportion of poor people was halved in only seven years and inequality is dropping (World Bank 2014).

### The Koshi River Basin in Nepal



Base map source: SRTM, ESRI

## Women, Development, and Poverty

Women have always been an invisible force in the development of rural areas as primary actors, rather than just vulnerable groups. Current statistics, observations, and analysis confirm that the situation of women in Nepal has improved over the past ten years (see Table 1).

Nepal has an impressive female to male sex ratio and there has been considerable improvement in the literacy rate for women in the last decade. However, according to the Nepal Living Standards Survey 2010/2011 (Government of Nepal 2011a), the literacy rate among adult women still shows gender imbalance. Only 45% of the national adult female population is literate, compared to 76% of men. In rural areas, this figure is even lower with only 39% of adult women literate, compared to 67% of men.

Similarly, women's representation in the legislative body, the Constituent Assembly, elected in 2008 was at a record high at 33%, thanks to the reservation of seats for women. However, women's participation in public decision making in general is still limited, especially in rural areas (Election Commission 2008).



**Table 1: Nepal gender statistics (%)**

Year	2001		2011	
	Women	Men	Women	Men
Population	50.06	49.94	51.44	48.56
Literacy	34.9	62.7	57.4	75.1
Female Headed Households	14.87	85.13	25.75	74.25

Source: Nepal Living Standards Survey 2010/2011, Government of Nepal 2011a

The Nepal Living Standards Survey data also indicate a simultaneous increase in female-headed households in Nepal. In development discourse, female household headship is often seen as an index of the increasing 'feminization of poverty' (Kabeer 1996 and 1997; United Nations 2000). Female household headship often arises in situations of economic stress, whether through labour migration, marriage breakdown, or inability of extended kin to provide support to abandoned women and children. Women's disadvantaged position in accessing entitlements; lower income level due to a general lack of skills, education, and training; and heavy workload given their productive, domestic and reproductive responsibilities, along with constraints on mobility, put female-headed households at a disadvantage

(IFAD 1999; Rai 2002; Kabeer 2003). While it has been argued that female headship should not be equated with 'the poorest of the poor', it is generally agreed that some aspects of female headship can give rise to economic disadvantage, compared to male headship, particularly in terms of income. Female-headed households do not compete on a level playing field and require special attention (Chant 2003). However, it is essential to 'unpack' the category of 'female-headed households' within Nepal to understand the finer detail of its linkage to poverty and further research is required to determine the vulnerabilities or strengths that female headship results in.

The statistics in Table 1 mask a significant variation in women's empowerment across different population sub-groups, as defined by factors such as poverty level, geographical location, livelihoods, and caste/ethnicity. Women from vulnerable social groups face severe constraints in accessing opportunities and improving their wellbeing. These include poor and socially disadvantaged women (on the basis of caste or ethnicity), as well as those in underdeveloped regions, such as the hills and mountains and within parts of the Terai (lowland plains adjoining India). For example, according to the United Nations Development Programme's (UNDP's) Nepal Human Development Report (Tiwari et al. 2009), women in the poorest quintile (20%) of the population have on average 2.5 more children than those in the richest quintile. Geographically-speaking, young females in the mountain and hill regions spend longer hours on heavy activities than males. Women in the mountains and hills of the Mid Western and Far Western development regions, in particular, face more challenges as indicated by several



indicators, including the Gender-related Development Index (Tiwari et al. 2009), which is lowest at 0.414 in the Far Western mountains, Mid Western mountains, and Western mountains, followed by Far Western hills (0.421) and Mid Western hills (0.439), compared to the national average, which is 0.499. In addition to the inhibiting socio-cultural factors that are pervasive in Nepal, the remoteness of these regions limits the exposure of both men and women to new ideas, policies, laws, systems and attitudes (UNDP 2009).

## Participation of Women in Labour and Community Forestry

Since 1990, both the labour participation rate and employment to population ratio for women in Nepal have shown a steady increase (see Table 2). A long history of development interventions and exposure has contributed to making rural women aware, skilled, and organized. Today, rural women are more mobile and capable of earning income, owning enterprises, and holding leadership positions within community interest groups and cooperatives than ever before. These improvements have changed the status of Nepali women (particularly rural women) and this improvement has been observed in areas such as health, education, income generation, enterprises, land ownership, representation in community groups, and politics.

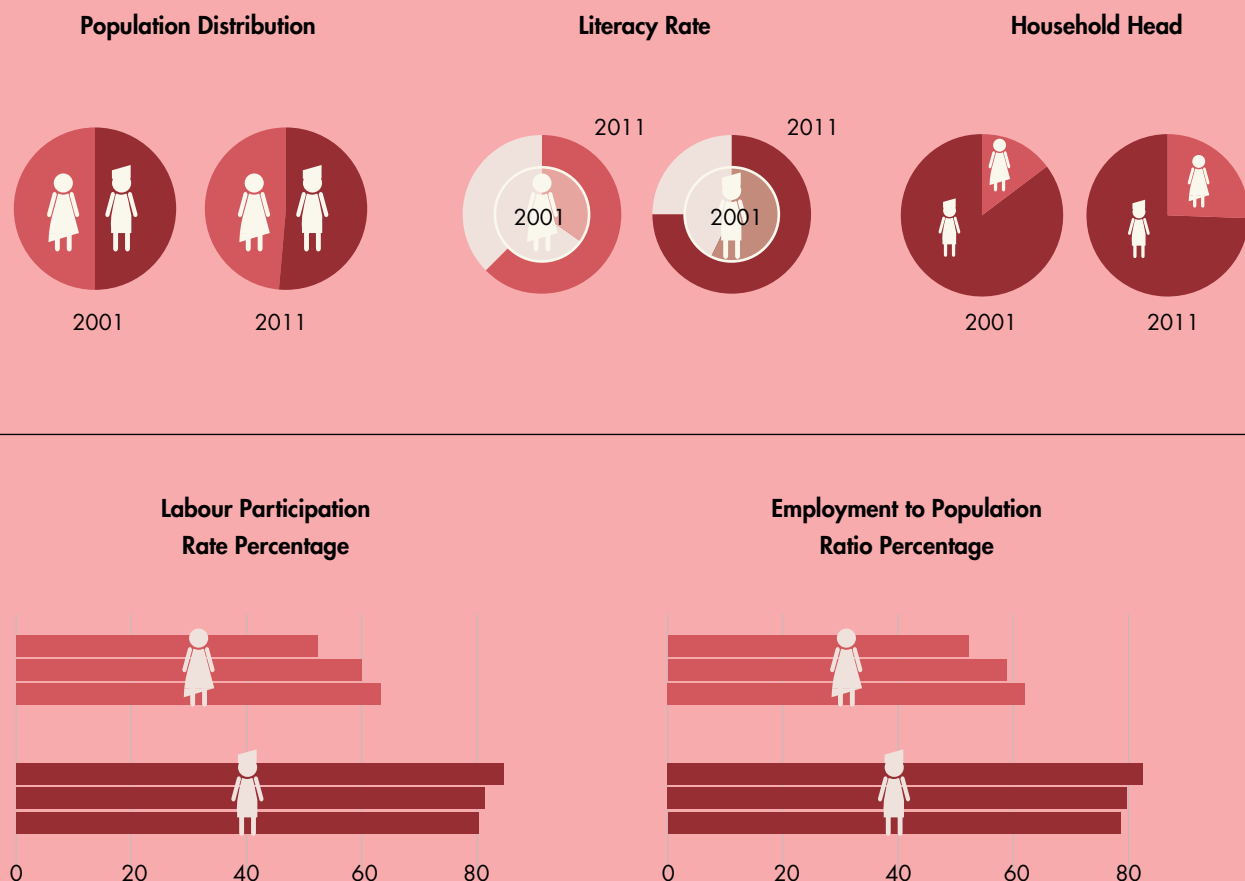
For example, in community forestry, which is one of the most successful development initiatives in Nepal, women’s participation as decision makers on the executive committees of community forest user groups (CFUGs) has, in the three decades

**Table 2: Labour participation rate and employment to population ratio**

Year	Labour Participation Rate			Employment to Population Ratio		
	1990	2000	2009	1990	2000	2009
Female	52.4	59.9	63.3	52.2	58.8	62.0
Male	84.6	81.4	80.3	82.5	79.7	78.6

Source: Asia-Pacific Human Development Report, UNDP 2012

**Figure 3: Women and Development in Nepal**



of implementation of community forestry, reached an average of 25% of membership (see Table 3).

## Women: The Driving Force in Agriculture

As per NLSS 2010/2011, agriculture

is the main source of livelihood for

women in Nepal. About 70.5% of women are employed in agriculture compared to only 56.3% of men. Women's contribution to the agriculture economy is 60.5%, compared to men's of 39.5% (see Figure 4). In areas where most of the economically active men in Nepal migrate in search of employment opportunities, women have become the backbone of rural development providing most of the labour inputs. Though more women earn their wages through agriculture, the median daily wage for women is only NRs 100, when compared to NRs. 150 for men.

Women have tremendous knowledge and skills regarding farming systems, natural resource management, and biodiversity management in different agro-ecosystems (WEDO 2014). Activities such as crop farming, kitchen gardening, livestock rearing, and forest resource management are primarily done by women, although large differences exist in gender roles between caste/ethnic groups, economic classes, and development regions in Nepal.

There is a complex relationship between gender, social equity, and agriculture in Nepal.

Despite the crucial role they have in agriculture, women often lack full rights over the use of, or decisions regarding, the sale or management of productive assets such as property and livestock. As land is the main source of economic

**Table 3: Statuses of women in community forest user groups (CFUGs)**

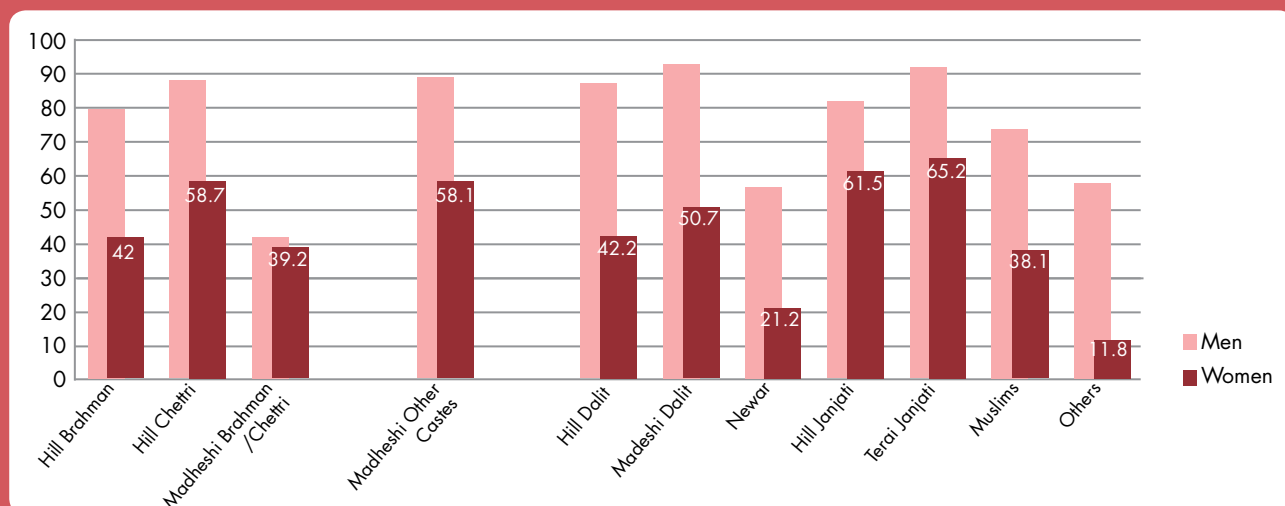
Number of Districts	Numbers of CFUGs	Number of Committee Members	Number of Women	Number of Men
74	14,227	159,876	40,227 (25%)	119,149
Number of Women only CFUGs				
66	778 (5.5%)			

Source: CFUG database report, Department of Forest, Government of Nepal 2012a

### Box 2: An agricultural life

Agriculture dominates Nepal's economy and is the main livelihood strategy for many subsistence farmers. Over 65% of Nepal's total population is engaged in agriculture. In 2009, the agricultural sector contributed 32.3% to the total national GDP (Paudyal and Khatri 2011). About 40% of the 4.17 million households in Nepal are classified as marginal farmers (owning less than 0.5 hectares), 47% of households are small-scale farmers (owning 0.5 to 2 hectares), and 13% of households have more than 2 hectares. A little more than 20% of the total cropland in Nepal is under irrigation, most of which is in the Terai. Even in high-mountain, semi-arid areas of Nepal, livestock rearing largely depends on agricultural production to produce feed for livestock as well as cereals and cash crops for human consumption (ICIMOD and Asian Development Bank 2010).

**Figure 4: Women and men involved in agriculture by caste/ethnicity/regional identity**



Source: Nepal Demographic Health Survey 2006, ADB, DFID and World Bank 2011

livelihood in Nepal, it is also an important source of power and status (Allendorf 2007). Although Nepalese women are the key workforce for agricultural production (ranging between 55–86% of the total workforce, depending on the geographical area) and rural livelihoods, they have limited land ownership (ranging from 8–10% of land ownership certificates), and this land averages less than 0.1 hectare per holding (Poudyal and Khatri 2011; Government of Nepal 2011a). About 31% of the women involved in agriculture receive first-hand extension messages (WFDD 1993) and less than 10% are involved in product marketing (CECI 2008). Their access to, and control over, income derived from the marketing of agricultural products is also very limited (Helvetas, Nepal 2008; Agriculture Information and Communication Centre [http://www.aicc.gov.np/organization/division\\_center/gender\\_equity\\_environment\\_division.php](http://www.aicc.gov.np/organization/division_center/gender_equity_environment_division.php)).

These statistics are not surprising keeping in mind that all of the District Agriculture Development Officers in the 75 districts (excepting one) are male and mostly from advantaged and higher caste groups (Gurung 2011). The frontline agriculture staff – the junior technical assistants – are mostly men and have inadequate skills and ability to cover all the village development committees in their area (e.g., because of lack of suitable transportation facilities and the inaccessibility of settlements). Consequently, they cannot meet the technical demands of the poor and excluded farmers. Only a small percentage of the agriculture staff of the District Agriculture Development Offices are female, with no women in senior or decision-making positions.

The United Nations Food and Agriculture Organization (2011) argues that, if women in developing countries had the same access to productive resources as men, they could increase yields on their farms by 20 to 30%. This could raise total agricultural output in developing countries by a factor of 2.5. In conclusion, the report claims that gender equality, in terms of access to land, can significantly increase food security and self-esteem.

## Gender Based Violence

Gender based violence is a major public health concern globally. The World Health Organization (WHO), along with the London School of Hygiene and Tropical Medicine and the Medical Research Council, used existing data from over 80 countries to conclude that 35% of women globally experience either physical or sexually intimate partner violence or non-partner sexual violence (WHO et al. 2013). Worldwide, gender based violence is the leading cause of death of women between the ages of 19 and 44 – more than war, cancer, or car accidents (Asia Foundation 2010). Intimate partner violence and sexual violence can lead to unintended pregnancy, induced abortion, gynaecological problems, and sexually transmitted infection, including HIV. It also increases the likelihood of miscarriage, stillbirth, pre-term delivery, and low birth weight babies. Violence can lead to depression, post-traumatic stress disorder, sleep difficulties, eating disorders, emotional distress, and suicide (or attempted suicide).

Gender based violence is a serious issue in Nepal. Over the period of just one month (between 14 April and 14 May 2013) the Women’s Rehabilitation Centre, a local NGO in Nepal, documented a total of 227 cases of violence against women. Of these, 105 women were victims of domestic violence, 10 women were murdered, 65 raped, and 19 were victims of social violence.

Women can even be vulnerable within their own family. According to the Nepal Demographic Health Survey 2011 (Ministry of Health and Population 2012), a third of married women reported that they have experienced emotional, sexual, and physical violence from their spouse, even though women in Nepal have a reasonable degree of control in certain key household matters. The same study reported that 53% of currently married women who earn cash income say they are the ones who decide how their cash earnings are used; 40% indicated that the decision is made jointly with their husbands; and only 5% said that the decision is made mainly by their husbands. Women’s control over their husband’s cash income is less, but two-thirds said that decisions over their husband’s earnings are made by themselves (17%) or jointly (50%).

According to the World Bank (2013), the social and economic costs of intimate partner and sexual violence are enormous and have ripple effects throughout society. Women may suffer isolation, inability to work, loss of wages due to injuries and hospitalization, lack of participation in regular activities, and reduced ability to care for themselves and their children. Conservative estimates of economic costs of lost productivity as a result of domestic violence are around 2% of GDP, which is roughly what most governments spend on primary education.

### Box 3: Initiatives for gender equality in Nepal

The positive effects of recent gender empowerment measures will take time to materialize and current key social indicators suggest that a significant gender gap still remains. Patriarchal norms and values are debilitating factors that underscore social as well as intra-household relations.

In recent decades, Nepal has adopted several important measures to promote gender equality. This trend gained momentum as the country emerged from civil conflict in 2006. The Interim Constitution of 2007 reaffirmed zero tolerance for discrimination against women and women's equal right to inherited property. Women's representation in the Constituent Assembly elected to write Nepal's new constitution in 2008 was an unprecedented 33%.

**Land ownership:** Women's land ownership is accelerating with the introduction of an incentive in the form of a tax reduction for land registered in the name of a woman. While the share of women-owned land in recent land transactions has increased significantly thanks to this tax incentive (Dhital 2010), 93% of women aged 15–49 years do not own a house and 90% do not own any land.

**Reproductive health and education:** Measures have been put in place to promote women's reproductive health and girls' education and Nepal made some impressive progress in these areas, as shown by Millennium Development Goal indicators. While child malnutrition remains a serious problem, there is little gender difference in the prevalence of stunting, underweight, and wasting, according to the Nepal Living Standards Survey data (Central Bureau of Statistics 2011).

**Agricultural development:** To promote the meaningful participation of women in agricultural development programmes, the Women Farmer Development Division (WFDD) was established in 1992 as an apex body to look after policy matters concerning women farmers in the Ministry of Agriculture and Cooperatives. Keeping in mind the emerging health and food issues, the feminization of agriculture, climate change, and greenhouse effects, the WFDD was renamed the Gender Equity and Environment Division (GEED) in May 2004. It was given the mandate of gender mainstreaming in the ongoing agriculture development programmes and projects and of preserving the agriculture environment and biodiversity. The main objective of the Gender Equity and Environment Division is to ensure women farmers' participation in agricultural development programmes and to minimize the negative impacts of environment degradation in agricultural production and productivity for sustainable agricultural development. Besides formulating gender and agricultural environment-related policies and strategies, it also initiates entrepreneurship development programmes for women farmers' groups, supports the establishment of a gender database in the agriculture sector, and monitors and supervises programmes and projects implemented to address gender and environmental issues.

Source: Nepal Demographic Health Survey 2011 (Ministry of Health and Population 2012); Nepal Living Standards Survey III (Government of Nepal 2011a); and the Agriculture Information and Communication Centre website [http://www.aicc.gov.np/organization/division\\_center/gender\\_equity\\_environment\\_division.php](http://www.aicc.gov.np/organization/division_center/gender_equity_environment_division.php)



Chapter 3

# Climate Change in Nepal



Climate change is increasingly being accepted as a major issue facing Nepal, despite limited long-term monitoring of climate change, few peer reviewed studies analysing past and potential future climate change, and the limitations of scaling down the coarse general circulation models to the needs of a mountainous terrain with adequate validation. However, general trends, corroborated by the ground-level observations of various communities in Nepal, do give a basic framework of identified and projected changes (Bartlett et al. 2010). This chapter looks at the particular vulnerability of Nepal and the impacts of changes in temperature and precipitation.

## Vulnerability

The Maplecroft Climate Change Risk Atlas 2011 (a global risk analysis map) ranks Nepal as the fourth most vulnerable country in the world, after Bangladesh, India, and Madagascar. The countries with the most risk are characterized by high levels of poverty, dense populations, high exposure to climate-related events, and high reliance on agricultural land that is flood and drought prone. According to the Pilot Program for Climate Resilience, a programme of the Climate Investment Fund designed to help countries transform to a climate resilient development path, Nepal, as a mountainous country, faces special challenges. Temperatures are rising fastest at the highest altitudes, affecting glaciers, snow, and ice. Retreating glaciers and changes in seasonal snow fall and melt will lead to greater uncertainty about water discharge patterns with likely increases in water availability in the short-term, but with increased variability. In the long-term, reduced water availability is possible. The combination of social, economic, and geographical factors, together with a high dependency on agricultural production and natural resources, all contribute to the high vulnerability of the people of Nepal to climate change.

## Temperature

Studies have found that temperatures in Nepal are increasing at a rather high rate. Shrestha et al. (1999) analysed 49 weather stations in Nepal and found that the warming was consistent and continuous after the mid-1970s. They found that the average increase in annual temperature between 1977 and 1994 was 0.06°C per year. Warming is more pronounced in the higher altitude regions of Nepal, such as the middle mountains and Himalayas and significantly lower, or even lacking, in the Terai and Siwalik hills regions. Furthermore, warming in the winter is more pronounced than in other seasons. The early analysis of Shrestha et al. (1999) was extended with more recent data and it was found that the warming trend is still continuing and that the rate of warming has not decreased. Until 2000, the two warmest years in Nepal were 1999 and 1998 (Eriksson et al. 2009). These results are consistent with the findings of National Adaptation Plan of Action (NAPA) to Climate Change report (Government of Nepal 2010a).

Baidya et al. (2008) found that the daily minimum value of maximum temperature and the daily temperature range show a typical pattern, with an increasing trend in mountainous region and decreasing trend in the Terai region. They attributed this to the occurrence of prolonged fog in the Terai.

Recent analyses conducted by ICIMOD of future climate change scenarios (developed as part of HICAP's work) suggest that temperature throughout the year will increase towards the year 2050, with less difference between maximum and minimum temperature through the day. Most warming appears to take place during late summer. Regarding the minimum temperature, a small increase of around 2°C is projected for 2030–2050. The occurrence and duration of cold days will decrease towards 2050 and the occurrence and duration of warm days will increase. The number of cool nights will decrease and the number of warm nights will increase. However, a comparison over periods shows that the growing season (6 consecutive days with an average temperature above 5°C) may increase towards 2050, as compared to the baseline period 1996 to 2005.

## Precipitation

Analysis of historical precipitation data from Nepal does not reveal any significant long-term trends, although precipitation in Nepal is influenced by, or correlated with, several large-scale climatological phenomena, including the El Nino Southern Oscillation (Shrestha et al. 2000). Climate stations in the Koshi basin show an increasing trend in consecutive dry days (Rajbhandari et al. 2014).

## Box 4: Climate change trends in Nepal

Indicator	Trends
<b>Temperature</b>	<p><b>Past and current:</b></p> <ul style="list-style-type: none"> <li>• Conflicting reports on observed changes</li> <li>• Increase in temperatures in recent years, with more pronounced warming at higher altitudes</li> <li>• Small, but significant, increase in number of hot nights and significant decline in number of cold days and nights per year</li> <li>• Maximum temperatures increased by 1.8°C between 1975–2006; higher altitudes show more pronounced warming than lower altitudes (Terai and Siwalik)</li> </ul> <p><b>Future predicted changes:</b></p> <ul style="list-style-type: none"> <li>• Future modelled trends (general circulation models) predict more frequent heat waves and less frost</li> <li>• Average temperatures predicted to rise by 0.5–2.0 C (by 2030), 1.3–3.8o C (by 2060), and by 1.8–5.8o C by 2090</li> </ul>
<b>Precipitation</b>	<p><b>Past and current:</b></p> <ul style="list-style-type: none"> <li>• Current rainfall patterns are more unpredictable than before, with higher annual rainfall</li> <li>• Less rainfall occurs during winter and spring with longer dry periods (droughts) during winter; intense rainfall now occurs during the rainy season and there is increased likelihood of extreme weather events</li> </ul> <p><b>Future predicted changes:</b></p> <ul style="list-style-type: none"> <li>• Projected mean total annual precipitation shows no clear trends regarding an increase or decrease, in part because the exact effects of climate change on precipitation in the region are not well understood</li> <li>• There is general agreement that the monsoon will become more variable in coming decades. The summer monsoon (June–August) will become more intense and more variable, with more frequent heavy rainfall events, but with fewer rainy days.</li> </ul>
<b>Glacial lake outburst floods (GLOFs)</b>	<ul style="list-style-type: none"> <li>• There are approximately 1,444 glacial lakes in the Nepal, of which 21 are categorized as potentially critical in terms of GLOF risk</li> <li>• High rates of glacial melt due to increases in temperature are adding to this threat</li> </ul>

Source: Bartlett et al. 2010; IPCC 2007; Bajracharya et al. 2007; Mool et al. 2011

Recent analyses by ICIMOD found that precipitation is not expected to change much, neither in amount nor timing. However, the number of consecutive wet days will increase. The annual distribution of precipitation remains roughly the same. There is a decreasing chance of rainy days in June, while the chance of rainy days increases slightly in October towards 2031–2050. There are no obvious changes over time to the onset or end of the monsoon, but a slight extension of the monsoon is expected towards the end of 2030.

## Impacts of Climate Change

Climate change, with rising temperatures, melting glaciers and changing precipitation systems, has great impact on Nepal. The Strategic Program for Climate Resilience of Nepal identifies the three most critical climate risks in Nepal as: quantity and quality of water; food security; and ecosystem health. The impact of these climatic changes on the Himalayan environment will have direct impact on people's livelihood which is highly dependent on agriculture. While many of the dimensions of the impact of climate change in Nepal are quite evident, still many are unknown (also see Helvetas 2009 and Helvetas 2010). Documenting the impact of these changes on the daily life of people, along with their efforts to adapt to these changes, is extremely important in developing efficient mitigation and adaptation strategies. This chapter looks at the impact of climate change in Nepal in relation to water and agriculture.



## Quantity and Quality of Water

Climate change impacts on glaciers and a resulting decline in water availability was suggested after the release of the IPCC's Fourth Assessment Report (IPCC 2007). Several studies were conducted thereafter to better understand this issue. Some of these studies used fully distributed hydrological models to investigate how glaciers and runoff would respond to an ensemble of downscaled climate model data (e.g., Immerzeel et al. 2011; Lutz et al., 2014). These projections show both an increase in temperature and precipitation and a concomitant steady decline in glacial area, which would lead to an increase in river flows. However, the challenge for the future lies in dealing with changes in the timing and magnitude of river and stream flows between seasons and potential increases in extreme weather events such as landslides, glacial lake outbursts, and floods.

### GLOFs

A significant threat in the Himalayas, and one that is directly correlated to rising temperatures, is posed by glacial lake outburst floods (GLOFs). GLOFs are caused by a rapid accumulation of water into glacial lakes, which then burst, sending a flash flood of debris and water from high elevations, wreaking havoc on downstream communities and damaging valuable infrastructure such as hydropower facilities and roads (Bartlett et al. 2010). Twenty-four GLOF events have been recorded in Nepal in the past, of which 10 were the result of flood overflows across the Nepal border. There are approximately 1,444 glacial lakes in the Nepal, of which 21 are categorized as potentially critical in terms of GLOF risk (Mool et al. 2011). Climate change is likely to increase the possibility of GLOF events in the future. Furthermore, socioeconomic development in the river corridors of Nepal also increases the risk of damage from GLOFs, as more settlements and infrastructure is put in their path. This concern has been corroborated by an Asian Development Bank concept paper (2011a), which points out that the fast rise in temperatures at the highest altitudes will affect glaciers, snow, and ice, and threatens the generally poor and isolated communities that depend upon them.

The expected climate change impacts on water resources include greater water scarcity in high mountain regions, affecting water quality and availability in the middle mountains, and causing more water-related disasters (flooding, landslides, sedimentation, water-borne disease, vector-borne disease) in the Churia-Terai region (the Churia hills adjoining the Terai) (Lama et al. 2013). The priority concerns of communities are to secure water for drinking and agriculture and to protect against flood and water-borne diseases. Only a quarter of all cultivable agricultural land in Nepal is irrigated; as agricultural production is mostly rainfed and greatly dependent on favourable weather conditions, it is likely to be greatly impacted by climatic changes.

## Agriculture and Food Security

The Strategic Program for Climate Resilience states that climate change impacts on agriculture and food security will come through rising temperatures; climate variability; and related changes in the timing, intensity, and volume of rainfall; and rising carbon dioxide levels. These factors will have the most severe negative effects on the poorest rural population, which is dependent on agriculture and which has the lowest capability to adapt.

In an agrarian country such as Nepal, where there has been a staggering increase in population and food demand, a decline in annual food production is a matter of great concern. The agriculture sector has already been adversely affected by a loss of fertile soil due to soil erosion, landslides, and floods. Soil loss is one of the major causes of the decline in agricultural production in Nepal. The negative effects of climate change may further aggravate this situation.

### Rising temperatures

As Nepal has various types of agricultural zones, changes in climatic parameters in agri-zones will lead to changes in the ecological distribution of agricultural crops within zones. Increases in temperature will cause more damage to agricultural sectors in the Terai region and will be more favourable to agriculture in the hills and mountains. As temperatures increase, cropping patterns and vector-borne diseases of humans and livestock can be expected to shift to higher ecological zones. Some land, which is presently unsuitable for agriculture because of different

weather factors, may be suitable in the near future. For example, maize, chilli, tomato and cucumber are now being cultivated in Mustang district (Malla 2008).

## Changes in water availability

The monsoon's timing and sufficiency is one of the most important factors affecting agricultural production. A delayed or irregular monsoon can result in crop losses and less production leading to food insecurity. The growing water demand of other sectors further increases the risk of water scarcity (Asian Development Bank 2011b).

Bartlett et al. (2010) divided the effects of climate change on agriculture in Nepal between systems that depend on the summer monsoon and those that depend on snow, ice, and glacial melt. The latter system will see an immediate increase in water supply in the future, but will also be in greater danger of GLOFs that threaten crops, water infrastructure, and mountain livelihoods. It is unclear whether or not this increase will lead to a simultaneous increase in productivity in the short term. Nepal has almost no ability to harvest excess water supply and, in the long term, reduced water storage and variability of supply from earlier thawing will have a serious negative impact. Unfortunately, as these effects are not likely to be felt for decades, the short-term benefits of increased runoff are likely to delay any comprehensive long-term proactive management plans.

For systems dependent on the summer monsoon, multiple scenarios are possible due to uncertainty in the models and lack of data. In the short term, it is more likely that less precipitation will occur during the summer months as the number of rainy days decreases, even though the frequency of intense rainfall events will increase (United Nations Environment Programme 2008, cited in Bartlett et al. 2010). Increasing variability of precipitation patterns will have a significant effect on crop productivity, as farmers will have to adapt to the changing onset and termination of the monsoon. The impacts of reduced water during the dry months are much easier to visualize.

Retreating glaciers and changes in seasonal snowfall and snowmelt will also lead to greater uncertainty about water discharge patterns and, in the long term, diminish water availability. This will either result in floods destroying agricultural crops, displacement of people, death of livestock, or deposition of sediments on agricultural lands, or in droughts destroying crops and affecting livestock, creating a shortage of water for drinking and sanitation. In both cases, women's vulnerability increases more than men's, as they are traditionally responsible for fetching water, firewood, and fodder, and working on agricultural lands. Furthermore, the communities' coping and adaptive capacity depends on their knowledge and awareness of climate change risks and mechanisms for addressing these risks, as well as their access to, and control over, resources. Women and disadvantaged groups, however, have less access to, and control over, resources (Asian Development Bank 2011b).

## Rising carbon dioxide levels

As it is a natural fertilizer, more food can be grown with increasing carbon dioxide. However, increased growth of food crops due to greater availability of carbon dioxide may reduce the nutrients available in the soil. An increase in temperature may lead to a reduction in the level of organic carbon and micronutrients in the soil and enhance decomposition by activating the microbial population in the soil (Malla 2008). While it is difficult to predict the exact nature of the impact of climate change on agriculture, there is little doubt that significantly more pressure will be placed on food systems that are already incapable of feeding Nepal's domestic population.

## Box 5: Agriculture and food security: Some facts and figures

In Nepal, 17% of total land area, comprising approximately 2.5 million hectares, is suitable for agriculture with a cropping intensity from one to three crops per year, much of which is cultivated in terraces on steep hillsides. Most production is at a subsistence level and farmer's holdings are small (Bartlett et al. 2010). Agricultural land in Nepal is mainly located in the lowlands of the Terai (43% of total cultivated land) and the lower hills and mountains of the upper Himalayas (World Bank 2009a, cited in Bartlett et al. 2010). Rice is the primary crop in the lower elevation regions, wheat is grown in the Terai and the valleys of the Himalayas, and corn is the principal crop of the hilly regions (Stads and Shrestha 2008, cited in Bartlett et al. 2010). Vegetables are cultivated as cash crops in a few areas in the middle hills with access to markets. The vast majority of the mountains are, however, remote and access to markets and roads is limited. Since 1980, Nepal has relied on food imports to meet its domestic cereal needs.

## Chapter 4

# Assessment of Nepal's Climate Change Policy and Responses from a Gender Perspective



Between 2010 and 2012, the Government of Nepal developed and released four significant policy documents in relation to climate change: the National Adaptation Plan of Action (NAPA), the Local Adaptation Plan of Action (LAPA), the Reducing Emissions from Deforestation and Forest Degradation Readiness Preparedness Proposal (REDD-RPP), and the Nepal Climate Change Policy 2011. This chapter looks at these policy documents from a gender perspective as well as women's role in the political and decision making structures in Nepal generally.

## Nepal Climate Change Policy 2011

The Nepal Climate Change Policy 2011 recognizes that:

*...the impacts of climate change are vivid in least developed, landlocked, and mountainous countries. Nepal is also highly affected by climate change. It has been an urgent necessity to address the issue of climate change by formulating a policy and implementing relevant programs to minimize the existing effects and likely impacts in different ecological regions - from the Southern plains to the middle hills and to the high Himalayan mountains in the north, and their peoples, livelihoods, and ecosystems. (Government of Nepal 2011d)*

The main goal of the policy is to improve livelihoods by mitigating and adapting to the adverse impacts of climate change, adopting a low-carbon emission socioeconomic development path, and supporting and collaborating in the spirit of the country's commitments to national and international agreements related to climate change. The participation of poor people, Dalits, people from marginalized indigenous communities, women, children, and youth is to be ensured in the implementation of climate adaptation and climate change-related programmes under the capacity building, peoples' participation, and empowerment aspects of the policy (also see Mainali 2012).

## National Adaptation Plan of Action

Nepal has prepared its National Adaptation Plan of Action (NAPA) for adapting to extreme climate events and variability (Government of Nepal 2010a). The document was shared with parties to the United Nations Framework Convention on Climate Change (UNFCCC) in November 2010, following an extensive country-driven consultative process in the preceding year. This consultation process involved six thematic working groups representing about 80 institutions and experts at the local, regional, and national levels. The consultations involved over 3,000 farmers, development practitioners, parliamentarians, policy makers, and thematic working group members, and the profiles developed include urgent and immediate adaptation needs to address extreme climate events and their consequences.

The NAPA provides guidelines for better adapting to and coping with the projected adverse impacts of global warming, extreme weather conditions, and climate-induced disasters, as well as opportunities to mainstream climate change issues into the development plans and programmes, thereby making a direct positive contribution to the achievement of Nepal's sustainable development goals. The preliminary estimate of the cost of NAPA implementation is about USD 350 million. Nepal intends to use all of the funds available for NAPA implementation for protecting its people, livelihoods, and ecosystems from the adverse impacts of climate change. Nepal is in the process of implementing NAPA's Profile 1 in 13 of its 75 districts, with support from the United Kingdom's Department for International Development (DFID) and the European Union, and Profiles 3 and 4 using the Global Environment Facility-administered Least Developed Country Fund. The NAPA states the following in relation to gender:

*The NAPA considers gender as a cross-cutting issue. It states that gender-related issues need to be taken into account in the process of developing adaptation strategies to climate change. Despite this, we find that gender issues are not integrated within the nine project priority profiles that have been proposed. (Government of Nepal 2011b)*

## Box 6: Priority activities under NAPA for climate change adaptation in Nepal

<b>Combined Profile 1</b>	Promoting Community-based Adaptation through Integrated Management of Agriculture, Water, Forest, and Bio-diversity Sector
<b>Combined Profile 2</b>	Building and Enhancing Adaptive Capacity of Vulnerable Communities Through Improved System and Access to Services Related to Agriculture Development
<b>Combined Profile 3</b>	Community-based Disaster Management for Facilitating Climate Adaptation
<b>Combined Profile 4</b>	GLOF Monitoring and Disaster Risk Reduction
<b>Combined Profile 5</b>	Forest and Ecosystem Management for Supporting Climate Led Adaptation Innovations
<b>Combined Profile 6</b>	Adapting to Climate Change in Public Health
<b>Combined Profile 7</b>	Ecosystem Management for Climate Adaptation
<b>Combined Profile 8</b>	Empowering Vulnerable Communities Through Sustainable Management of Water, Resource and Clean Energy Supply
<b>Combined Profile 9</b>	Promoting Climate Smart Urban Settlements

Source: NAPA 2010 (Government of Nepal 2010a)

## Local Adaptation Plan of Action

Nepal has also prepared a National Framework for Local Adaptation Plan of Action (LAPA) with the objective of incorporating climate change adaptation actions into local development planning and policy (Government of Nepal 2011c). Initiated in 2010, the LAPA was also prepared through extensive stakeholder consultations and approved in November 2011. The LAPA framework ensures that the process of integrating climate change resilience from local-to-national planning is bottom-up, inclusive, responsive, and flexible. It provides a means of implementing the NAPA and integrating adaptation options into development policy and planning processes and is in line with Nepal's Climate Change Policy 2011.

The LAPA identifies local adaptation needs that focus, among other things, on reducing local climate risks and vulnerabilities, and increasing resilience through seven steps. The LAPA has been piloted in 10 districts of Nepal to promote and ensure people's participation and ownership by involving climate vulnerable communities in adaptation activities. The LAPA framework promises to be inclusive, comprehensive and, more importantly, community centric – both in terms of its process and content – and makes a major contribution to closing the gaps left by the NAPA. However, the LAPA does not contain a gender component.

## REDD Readiness Preparedness Proposal

The REDD-Readiness Preparedness Proposal (REDD-RPP) makes 57 references to women, and states, as a principle, that gender and equity concerns will be mainstreamed at all levels. It also states that special attention will be paid to ensure the full and effective participation of women and other marginalized groups in the REDD readiness process and to make their voices heard. Women and representatives of different marginalized groups including indigenous people, Dalits, sukumbasi (landless), and poor forest-dependent communities will be invited to participate in all decision-making forums during the REDD readiness preparation process.

However, in a joint assessment case study conducted by Women Organizing for Change in Agriculture and Natural Resource Management (WOCAN) and the Himalayan Grassroots Women's Natural Resource Management Association (HIMAWANTI) Nepal in July 2012, women's representation and participation in the institutional structure of REDD+ governance, both at the national and district levels were found to be insignificant, in fact less than 10% (Upriety et al. 2012). The assessment also highlighted that benefit sharing of REDD+ initiatives would not be beneficial to women if they are not equal participants in the decision making processes. The assessment also highlighted opportunities to capitalize on existing strengths to address women's marginalization in the REDD+

process in Nepal: these include the recognition and validation of women’s knowledge and perseverance to maintain forest resources; the implementation of affirmative action policies of Community Forestry, and the support of male champions. Incorporating these elements into the REDD+ initiatives are critical to Nepal’s achievement of its goals for REDD+ (also see Gurung et al 2011).

## Inclusion of Women in National and Local Administrative Structures

While Nepal has drafted and begun implementing Policies and plans on climate change and adaptation for both the short and long term, the effective implementation of these policies and plans depends on institutions potentially involved in the adaptation process. The Ministry of Environment has been designated the focal ministry for climate change activities by the government. However, the district and village development committees at the local level are still the most crucial institutions for both strategic and autonomous adaptation. The impacts of CC will affect almost every aspect of life at the local level due to high number of climate-dependent livelihoods. As a result these institutions can play a critical role in the implementation of adaptation planning that comes from ministries at the national level (See Annex 5 for more details). These local level institutions can also play a role in encouraging autonomous adaptations, especially as the system of development administration is decentralized to the village

Figure 5: Local-level administrative structure in Nepal and inclusion of women



and municipality level (which are comprised of wards). Village development committees consist of nine wards each, while the number of wards in municipalities depends on the population and area the municipality covers. Each ward has an elected ward committee of five persons chaired by the elected ward chairperson. According to an Ordinance, later passed as the Act on Election to Local Institutions (1997), each ward must have at least one woman on the ward committee. The ward members constitute the village development committees assembly, while the ward chairpersons constitute its executive committee, which is responsible for day-to-day operations. At least one woman is nominated to each village development committee or municipality executive committee. Furthermore, village development committee chairpersons and vice-chairpersons, parliamentarians elected from the districts, and six nominated members, including one woman, constitute the district assembly, and they elect the district development committee chairperson, vice-chairperson, and members of its executive committee (see Figure 5).

The role of women leaders in panchayats and district development committees in making village and district development plans and accessing government schemes for climate change adaptation to meet the specific needs of women can be very crucial is mainstreaming gender issues at the local level. However, this is only possible if these institutions provide an enabling environment to their women members and acknowledge their leadership positions.

Nepal's Interim Constitution of 2007 (Article 20, 2007) outlaws discrimination on the basis of gender. It also advocates for special legal provisions to protect and advance the interests of women as well as recognizes women's rights as a fundamental right. Through the efforts by different agencies in the field of women rights, some positive changes have been achieved at the policy level with regards to women's participation and representation. However, despite these efforts, women's participation and inclusion in politics and structures of governance is generally restricted and often serves the mere purpose of representation.



## Chapter 5

# Impacts of Climate Change on Nepali Women: Key findings



This chapter presents the key findings of the study on the impacts of climate change on Nepali women. For the sake of simplicity, these impacts have been grouped into three major themes: availability of water; agriculture and food security; forests and biodiversity. Women's participation in governance structures and overall empowerment has been included as a cross-cutting theme.

## Challenges to Water Availability

### 1. The decrease in the quantity of water has increased the time required for women to collect water.

The increase in the time required for women to collect water was one of the most important issues raised during the consultations. During field visits to all three districts and discussions with grassroots women from six districts, it was clear that rainfall patterns are becoming increasingly unpredictable, more intense, and shorter in duration. Longer periods of drought also seem more common, resulting in the drying of wells and small springs. The resulting increase in time needed for collecting and guarding water is affecting other sectors, such as agriculture and forest management.

*The availability of drinking water sources has decreased in the past few years by up to 50%. In 2012, we had short, but heavy, pre-monsoon (March–May) rains with very little rainfall during peak monsoon months (June–early August) and heavy post-monsoon rains (late August–end of September). In the past three years, the permanent and seasonal springs have either dried up or have less water. Out of 90 households in the village, more than 70% have to spend at least 3 to 4 hours every day to fetch a bucket of drinking water. Even rich households with taps close to their house have to wait for long hours to fill their water vessels because of low water flow. We have had to cut down on bathing and washing clothes to deal with the water shortage.*

*Shova, a woman leader and farmer from Sindhuli district*

### 2. Contestation for irrigation water due to limited supply and high demand has resulted in the sourcing of water for irrigation at night, disadvantaging women-headed households.

With water sources drying up, the flow of water has been reduced in many areas, leading to long queues for water during the day. One alternative is to collect water for irrigation at night when the water supply is uninterrupted; however, this requires guarding the water channels, which is usually done by men (it not being safe for women to venture to isolated places at night). This puts women-headed households at a disadvantage.

### 3. Alternative means of accessing water, such as deep boring and rainwater harvesting, are expensive and require technical knowledge, financial resources and networking that is not available to Dalit and poor households, particularly those headed by women.

Techniques such as deep boring for drinking water and irrigation have high installation cost and require external technical inputs. Other methods like rainwater harvesting and use of small or large drums and temporary plastic ponds to store water are simple in technique but expensive. But having networks beyond the village plays a key role in mobilizing resources for adaptation. In one example, in Kavre district, a predominantly Chettri and Brahmin village (advantaged caste groups) was able to use its networks at the district and national level to mobilise almost 95,000 USD (which was double the amount required) in funding for deep boring and building water reservoirs to supply drinking and irrigation water to about 30 households. A neighbouring village, a predominantly Dalit and Tamang village (disadvantaged caste groups), which also faced severe water problems, came to know about the construction of improved water supply facilities in the next village only after they saw the construction taking place. Even though the Dalit/Tamang village has strong women leaders and a rich cooperative, they were unaware of this opportunity for improving water supply. A wider network for receiving timely and useful information regarding schemes and opportunities is important to access the financial resources required to meet development needs.

#### 4. In areas of the Terai where water is scarce, Dalit women have to rely on the favour of upper caste/class houses for drinking water and face humiliation and verbal abuse while collecting water to meet their household needs.

Dalit households and women in the Terai often do not have access to tube wells, which are generally shared between four or five households. Furthermore, for the last few years, the water taps supplied by the government are often dry for more than half the year. In many cases, Dalit households are forced to seek water from richer families.

*We cannot steal water from the village tube wells of the rich people and when we go to ask for some drinking water they scold us and say, "Now you have even started begging for water – you have no shame!"*

*A Mushar (Terai-Dalit) woman from Baijnath VDC, Morang district*

#### 5. Water scarcity impacts on the sanitation and hygiene of households.

Less access to water leads to a deterioration in sanitation and hygiene conditions for households. Women have less time and water with which to clean and wash, which often results in health related problems. The practice of 'untouchability' means that Dalit women face more acute problems in accessing water than other women (also see Asian Development Bank 2000 for more details).

The district level consultations in Sankhuwasabha, Morang and Dhanusha districts and the FGDs in these districts found increased incidences of uterus prolapse, which is more prevalent among poor and Dalit women, as they take a very short break of one week after delivery before returning to work. A study by the United Nations Population Fund (UNFPA) and Nepal's Institute of Medicine (cited in Subedi 2010) estimated that 600,000 women are suffering from prolapsed uterus in Nepal. Other studies in Nepal have shown that 30–40% of women are reported to suffer from this problem just after the birth of their first child (also see Women's Reproductive Right's Programme/ Centre for Agro-Ecology and Development CAED, [www.wrrpnepal.org](http://www.wrrpnepal.org)). There is also a strong relationship between the incidence of uterus prolapse and a household's economic conditions: women from families with land and adequate food for the whole year are less affected. With the increase in workload as a result of water scarcity and challenges to agriculture, cases of uterus prolapse may rise in the future.

During the FGD with community forest group members in Bhanka Tol in Khandbari, where agriculture is totally rain dependent, the farmers pointed out that decreasing number of rain days over the years and the shift in the time of rainfall has caused major challenges. A male farmer complained:

*"When we need the rainfall (June) it does not rain, and when we don't need water (March to May and September) it rains more. This change has been happening in the last 10 years, but in the last 5 years it has become worse."*

The impact of decreasing and erratic rainfall has been seen mostly on rice, millet, and maize during the summer months and vegetables (such as potatoes and peas) and wheat during winter. The villagers have almost stopped growing broad leaf mustard and wheat. The land where they used to grow wheat is now lying fallow. The farmers also pointed out that the rice production in the village has decreased by more than 50%. While earlier a farmer could produce up to 30 muri of rice (1 muri is around 80 kg) in a season, they now harvest only 13 muri, which is less than half. This has increased the number of poor and Dalit women seeking daily wage labour in nearby villages.

#### 6. Increases in the magnitude and frequency of natural disasters have caused problems in agriculture, substantially increasing women's workload and food insecurity.

The magnitude and frequency of natural disasters has increased in Nepal in recent years (see Table 3) leading to soil erosion and the dwindling of arable land in the hills due to flash floods and landslides. Moreover, hailstorms and prolonged periods of droughts have caused problems in agriculture (Government of Nepal 2010b). Despite the availability of data on natural disasters, there is very limited understanding of the impact of disasters on women.

**Table 3: Top ten hazards and their impact in Nepal (1971–2010)**

SN	Hazard type	No. of records/ events	No. of deaths	No. of injury	No. of affected people
1.	Epidemic	3,413	16,521	43,076	512,967
2.	Landslide	2,705	4,327	1,446	555,607
3.	Flood	3,377	3,899	461	36,65,104
4.	Fire	4,936	1,293	1,097	252,074
5.	Thunderstorm	1,034	986	1,810	66,68
6.	Accident	100	969	359	2,137
7.	Earthquake	95	873	6,840	4,539
8.	Cold wave	320	442	83	2,393
9.	Structural collapse	389	404	596	2,016
10.	Boat capsize	135	269	124	410
11.	Other events	2,651	999	1,335	928,331
	Total	19,155	30,982	57,227	59,25,587

Source: DesInventar, 2011

**7. Lack of timely information and inputs from authorities on disaster preparedness and rescue teams on relocation to safer places and sources of relief services puts women in a more vulnerable position than men during disasters.**

In the hills, prolonged dry spells are increasing the number of rat holes, which loosen the soil and cause severe damage and landslides during heavy rainfall. Both during and after disasters, it is the poor and marginalized women who suffer the most as they are engaged more in farming and fodder and fuelwood collection and, hence, more exposed and prone to accidents. People from poor and marginalized groups are also more vulnerable to natural disasters as they tend to reside in disaster-prone areas, which are often far away from the main settlement, making timely rescue and support difficult. For example, during the landslide in 2010 in Phulbari VDC in Kavre district, the houses that were swept away during the night were that of Dalit and Tamang families residing on the outskirts of the village. Although no one died in this incident, these families were rescued only on the second day as they lived far from the main village.

Although women may have more local knowledge about safe places and preparedness and can easily approach relatives and acquaintances for shelter and mobilize resources through social networks, their knowledge and skills are not recognized or used by the intervening authorities and agencies. The very nature of disaster preparedness training also typically excludes women. For example, such training often entails physical activities, such as climbing and swimming, and women’s traditional clothes (saree, lungi) make it difficult for them to perform such physical tasks. Women also feel self-conscious to attend training in mixed groups wearing non-traditional clothes such as trousers. Similarly, post-disaster gender training is seldom gender sensitive.



However, there have been some success stories, such as the training conducted by the United Nations Development Programme's (UNDP's) Disaster Risk Management project, which consciously targeted women for masonry training (for retrofitting buildings to make them earthquake resistant or rebuilding after disasters). This project trained 30 rural women in masonry and these women have started working and earning money using their new skills.

## 8. There is a lack of gender sensitivity in post-disaster preparedness.

The Koshi Victim Society, Saptari district, an organization working on disaster relief and rehabilitation, has drawn attention to the post-disaster risks for women. With the disruption of social support networks and displacement, women in post-disaster scenarios are vulnerable to rape and other forms of violence, and can even be forced into sex work. They can also suffer from nutritional deficiencies. In post-disaster relief work, the practical and medical needs of women including pregnant and lactating women, such as for safe toilets, a clean environment, access to health services, and accessible food distribution systems, are often ignored.

## 9. The destruction of hydropower stations, fuel-based mills, and other infrastructure has an immediate impact on how women use their time and on their workload.

The introduction of hydropower and fuel-based mill technologies has been a boon to rural women in Nepal, reducing women's labour and saving time. However, frequent and unpredictable disasters such as flash floods and droughts damage water mills and micro-hydro stations, as well as irrigation systems and roads, directly affecting women's workload and mobility. Damage to roads and bridges by landslides and floods causes geographical isolation and affects access to services such as health, government services, technical support, and information. The absence of information on existing flood patterns affects women's planning and preparedness.

During an FGD with women farmers from Chitwan, Shaktikhor VDC, it was revealed that, to save time and cope with the shortage of labour, women from wealthier households purchased chemical herbicides to remove weeds. They said that while such herbicides are effective, it also makes the soil harder. Most rural women are unable to read or understand the instructions and lack any knowledge on the proper use or side effects of these herbicides. The women farmers also said that villages close to the district headquarters purchased 'chemicals' from the local market, which they referred to as 'vitamins', to enhance the growth of the vegetables. While the women knew about these 'vitamins' they were unaware of their health implications.

## Challenges to Agriculture and Food Security

### 1. The hardening of the soil means that fields require additional breaking, even after ploughing, as well as more water and manure before sowing, meaning additional physical labour for women.

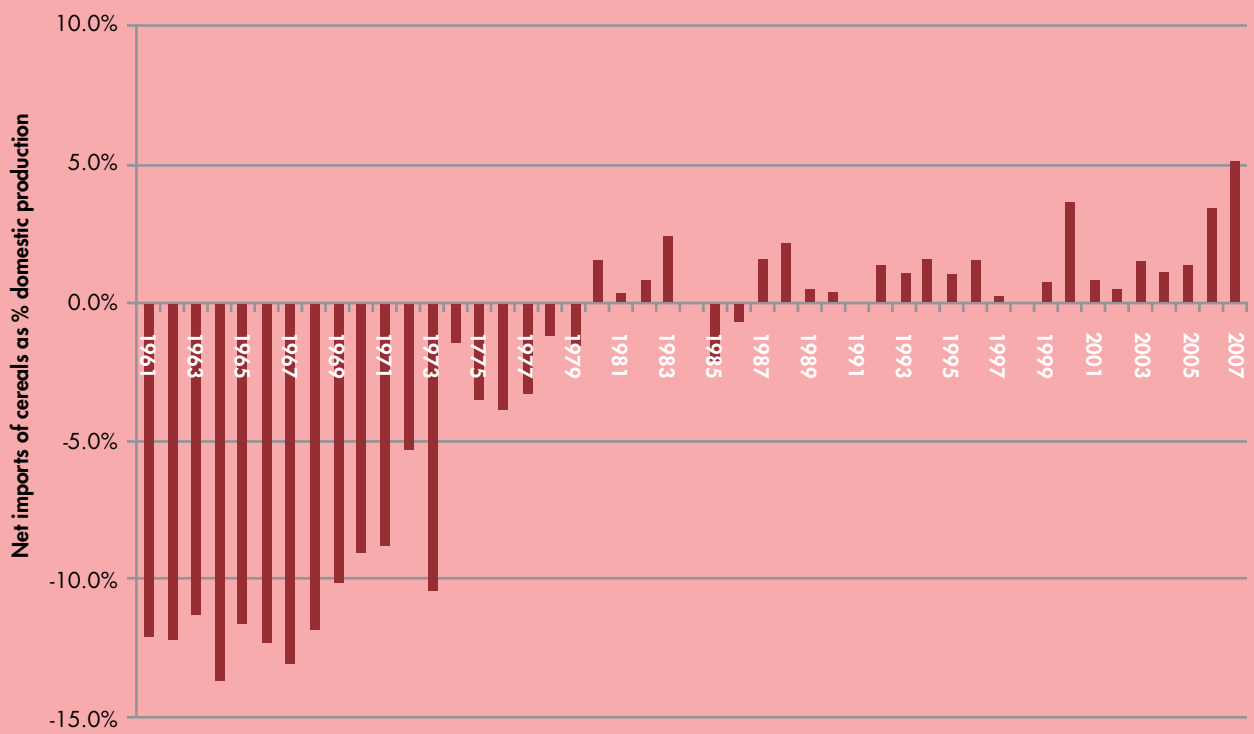
The soil quality in Nepal is generally becoming degraded as a result of unpredictable rainfall, including long spells of dry weather and short, but intense, rainfall. Hardened soils are very difficult to break and fertilise, and require more water and manure (traditionally women's work), translating into additional work and long hours of physical labour in the hot sun for women. More time spent breaking the soil also means less time for sowing the crops and other activities.

*Earlier, the ploughed fields did not require additional breaking, but nowadays the hardened soil needs to be broken further to make it suitable for sowing. It requires more water, more manure and long hours of physical labour in the hot sun by women to break the soil and carry the manure to the field.*

*Nima Lama, a woman farmer from Kavre district*



Figure 6: Net imports of cereals as a share of domestic production (1961–2007)



Source: IFPRI (2010)

## **2. The emergence of new varieties of weeds and pests has affected farms and storage, increasing women's workload, as they are the ones responsible for weeding.**

Women involved in focus group discussions in all three districts felt that the emergence of new pests and weeds could be due to long spells of dry weather and less rain. These weeds and pests have generally lowered the productivity of crops. New breeds of weeds and pests also fall outside the realm of traditional knowledge; hence, the need to connect women to agricultural and other extension services is immense. Some women farmers use off the shelf chemicals to kill weeds. While these chemicals are effective in killing the weeds, they reported observing that it makes the soil harder. They also reported suffering from headaches from the strong smell of these chemicals. The health implications of using chemical herbicides without proper precautions and knowledge are ignored in favour the results that they promise.

## **3. There is reduced diversity in relation to food intake, as farmers sell high-quality locally produced cereals (rice, maize, lentils, and wheat) for high prices in return for low quality, cheaper rice, impacting on the nutrition of women and children.**

Decline in the production of lentils and vegetables has led to food shortage. To cope with this problem, farmers are increasingly selling cereals (like rice, maize, wheat and lentils) in the local market to purchase imported and cheaper rice from the Terai in Nepal and India (Figure 6). The reduction in the diversity of food intake has major implications for family health, particularly of children and women. The eating patterns of rural people are increasingly changing and negatively affecting their nutrition. For example, one woman farmer from Phulbari village in Kavre noted that, nowadays, her household is eating imported rice three times a day, as opposed to twice a day before. The wheat, maize, and millet in their diet have decreased. The vegetables and lentils have also decreased. Their morning and afternoon snacks are largely replaced by cheap varieties of biscuits and instant noodles. Women, who generally eat after the men folk have eaten, have an even more restricted diet.



## **4. The selling of small quantities of high value crops such as lentils, beans ('pewa' crops), and vegetables is being lost as a form of personal income for women due to climate variability and low production.**

Traditionally, rural women have always set aside some high value crops, such as beans, lentils, and leafy green vegetables, to sell for personal or side income, which other family members either do not notice or question. The sharp decline in the production of these crops and vegetables has huge implications for women, particularly from poorer families, as they may lose their only source of cash income and have to depend on their husbands or fathers for every small expense.

## **5. A decrease in the number of livestock as a result of less fodder, water, and labour has meant less dung for biogas and manure creating a dependency on chemical fertilizers, which in turn has created problems with access for poor families as the supply of subsidized fertilizer is limited.**

To access government subsidized fertilizers and other technical inputs, farmers have to be registered as a 'farmers group' with the District Agriculture Development Office. Most of the poor women and disadvantaged groups are not registered in District Agriculture Development Office and, therefore, unable to access these resources. Strengthening the government and non-government service providers to be poor and gender responsive and the provision of special subsidies for the poor and women is necessary to improve access to such resources by these groups.



## Box 7: Loan trends of the Namuna Nari Chetana Batchat Karyakram cooperative in Kavre

Total savings held by cooperative in 2002: NPR 1,900,000		Total savings of cooperative in 2012: NPR 2,750,000	
Types of loan taken in 2002	Amount in NPR	Types of loan taken in 2012	Amount in NPR
Livestock (buffalo, chicken, goat, etc.)	650,000	Livestock (buffalo, chicken, goat, etc.)	150,000
Agriculture (vegetable seeds and production, fertilizer )	450,000	Agriculture (vegetable seeds and production, fertilizer)	300,000
Enterprise development	200,000	Enterprise development	400,000
Festivals, weddings, etc.	200,000	Festivals, weddings, etc.	400,000
Domestic use (education, medicine, food)	300,000	Domestic use (education, medicine, food)	700,000
Foreign employment	100,000	Foreign employment	800,000

### 6. The early ripening of crops and vegetables has created problems with pest infestations in stored seeds and crops, increasing women's workload as they have to check, dry and clean the pests out of the crops.

The early ripening of crops and vegetables has disrupted regular cropping patterns and created problems with the storage of seeds and crops because of pest infestations. These crops are more infested in storage in warm weather, than in cool weather. Crop infestations have increased women's workload as they have to spend extra time to check, dry and clean the pests out of the crops.

### 7. There has been an increase in loans taken by poor farmers (including women). The decrease in agricultural production due to climate change (increased droughts and erratic rainfall) has contributed to the increase in the debt burden.

Taking a loan to support agriculture is common practice among poorer farmers in rural Nepal. These loans are usually paid back after harvest. However, decline in agricultural production due to increased droughts and erratic winter rainfall has increased the debt burden of farmers. The inflation of food prices has further increased loan amounts. Loans from savings and credit groups, which are often taken by women to buy livestock, seeds, and fertilizers, are now being taken to purchase food items and chemical herbicides, pesticides and fertilizers. Box 8 shows the loan trend in the past ten years of Namuna Nari Chetana Bachat Karyakram, a cooperative in Kavre district. The cooperative has 600 members.

### 8. Decreasing agricultural production and increasing food security issues have fuelled already existing male outmigration, which has increased women's workload, mental stress, and risk of physical violence which also restricting their mobility and exposing them to character assassination.

Although, at the macro level, male outmigration seems to be an economic boon, with remittances constituting about 20% of the national GDP (Government of Nepal 2012a), a closer analysis reveals that the cost of the absence of the rural workforce is borne by rural women. While the outmigration of men might appear to have improved women's access to cash (remittances), their actual access depends on how much their migrating men earn and how much they are able to save and send home. During the field discussions with women it was revealed that husbands are usually only able to send money a year or two after migrating. In the meantime, women are forced to deal with significantly less cash flow. However, one advantage of male outmigration is that women in families where a male member has migrated have easier access to loans, as moneylenders consider them 'low risk' due to the expectation of incoming remittances.

In villages close to urban centres, the poorest families migrate seasonally, together with their children, to work in the brick kilns. This has not only affected the education and health of their children, but has prevented women from participating in community groups and the opportunities offered by such groups and networks. Besides the

increase in their workload, male outmigration poses several difficulties for women, both at the household and community levels, and is increasingly reversing the gains in women's empowerment. Some of the key effects of male-outmigration on women are:

- **Mental stress:** Due to male-outmigration, women in rural areas have taken on new roles and responsibilities, in addition to their existing ones. These women have not been prepared to graduate from making operational decisions to making strategic ones. In the absence of men, the women left behind have to deal with labour shortages, find out where to obtain seeds, and decide what to plant and when; these are fresh sources of stress for women. A woman from a village in one of the field study districts whose husband is in Saudi Arabia said during the FGD:

*After my husband left two years ago, I have not received any money from him. I have to deal with everything, from hiring extra labour for agriculture to deciding on my child's school. In addition, I have to represent my family in all the community meetings, weddings, funerals, and user group meetings. I am not comfortable doing this and I don't like to be deciding all the time. Besides, I have to do all the household chores, which no one helps me with. I am very stressed both mentally and physically.*

- **Restrictive mobility:** Interviews with the Safer Migration Project of Helvetas revealed that women whose husbands had migrated for work face problems of mobility. These women are subject to strict and close scrutiny by their families and communities, which is most acute for women who are active or leaders and for young women. Women who are active in the community or in leadership positions have to travel within and outside their village and sometimes have to travel with male members and ride on their motorbikes, all of which is socially difficult for women in rural Nepal.
- **Character assassination:** Character assassination is one of the biggest factors limiting women's mobility and discouraging women from being involved in community activities. There is a low level of trust for women whose husbands have migrated, which is particularly prevalent in the plains and among Terai and Muslim communities. Women whose husbands are working overseas dress well and in modern attire and have more cash in hand. Some of these women become the victims of 'dalals' (jobless men who lure married women whose husbands abroad and use them sexually and fleece them financially). There are also cases of married women who have eloped. These instances are used as 'warnings' to restrict women's mobility or to assassinate their character.

## Challenges to Forests and Biodiversity

### 1. Climate-induced changes in forests and biodiversity, such as the emergence of invasive species, are leading to a loss of household income and livelihoods options, especially for women and people from poor, indigenous, and marginalized communities such as the Chepang and Dalits.

In Nepal, nearly 60% of rural households are 'functionally landless' with insufficient land to meet their basic food requirements (Wily 2008). These families are more reliant on forests and water and suffer most when water is scarce and forest vegetation is destroyed. Literature reviews and field visits indicate that increased temperatures affect forests and biodiversity and prolong droughts. The most visible are the early sprouting, flowering, and fruiting of plants, increased number of forest fires, and increased incidence of alien invasive species and outbreaks of pests and insects. The fruiting season of many forest plants and trees has shifted by 15 to 30 days earlier than their usual time.

Women farmers in Sankhuwasabha indicated that the regeneration of forest and undergrowth is decreasing due to the rapid spread of the white flowered 'banmara', an invasive species. Unlike the existing invasive species, the purple flowered 'banmara', this white variety is neither edible to livestock, nor good for making organic pesticides. The spread of this species has reduced the yield of timber, fodder, wild fruits, seeds, and important non-timber forest products (NTFPs).

## Box 8: Different uses of the forest by women and men

Activities	Female	Male
Major activities done in forest	<p>Forest management: Plantation, lopping, weeding, forest protection. Preventive – drawing fire line, fencing, forest patrolling; labor contribution in construction inside forest; resource identification etc.</p> <p>Forest product collection: Grass, fuel wood, fodder, forage, NTFPs, water, soil (oven); transportation of forest products they collect</p>	<p>Forest management: Develop and define forest related policy for community; Fix meetings and make decisions - technical work such as forest survey, measurement, resource allocation, attend training/meeting outside the village, etc.</p> <p>Forest product collection: Logging, collection of NTFP including honey (mainly for marketing). Fixing price of the products; control fund generated by selling forest products; act as a secondary collector of NTFPs primarily collected by women.</p>
Major resources obtained from forest	<p>Household requirements: Litter, fuel wood, charcoal, forage, fodder, water, grasses and leaves (both for fodder, compost and bedding materials for livestock), soil, fish etc.</p> <p>Income generation: NTFPs (e.g., chiraito, agelo, lokta, masino, panchaule) and edible plants and herbs (e.g., mushrooms, asparagus, bhayakur, ferns); raw materials for small scale enterprise ( dry fruits, leaf plates), thatch grasses; medicinal and aromatic plants (MAPs);</p>	<p>Household requirements: Mainly timber,</p> <p>Income Generation: High value products (e.g., resin tapping, yarsagumba, panchaule, bhirmaha) mainly for marketing; raw materials for furniture, trophy hunting; allowance allotted for key posts of Community Forest Users' Group; poor and socially marginalized men also collect the same NTFPs as women</p>
Cash benefits from the forest	Selling firewood; NTFPs; raw materials for small scale enterprise – leaf for leaf plates, thatch grasses; medicinal and aromatic Plants (MAPs); eco-tourism-home stay	Timber, high value NTFPs (resin tapping), plant and animal parts; Raw materials for large scale industries: carpentry, furniture venture; Eco-tourism: large scale hotels; job opportunity as tourist guide

Source: Action Research on Gender and REDD+ in Nepal (WEDO 2013)



**2. A reduction in the yield of non-timber based forest products, such as moss, lichens, broom grass, asparagus, and several medicinal plants, has reduced the side income of poor women and the marginalized groups.**

The side income from NTFPs is usually under the direct control of women, who use it to deposit in their saving groups, for personal use, and to meet household needs, including their children’s education. Women members of the Leasehold Forestry group in Dhanusha reported that their personal income has been badly affected by this decrease in yield of NTFPs.

## Challenges in Women’s Empowerment

**1. Women are being alienated from vital adaptive knowledge as they are not able to grab opportunities to improve their knowledge and skills due to time constraints, leading to loss of adaptive capacity.**

Almost all women interviewed for the study across several villages stated that, due to increased workload and household responsibilities, balancing household and outside work was one of the key issues that hindered them from taking up responsibilities and doing justice to the positions given to them on different committees. Most of the women leaders interviewed stated that the quality of their participation has suffered, as they miss meetings and thus lose access to information and important processes. For example, if the meeting is about resource distribution, decision makers (mainly high caste men) sometimes choose not to give full and timely information to women committee members about the meeting, making it difficult for them to plan to attend. Even if women receive information about such meetings on time, they are often unable to prepare due to other prior engagements and, hence, cannot participate effectively.

**2. The quantity and quality of the participation of women in decision-making bodies is decreasing; fewer women have the time to participate and when they do participate, they are not always well informed and do not have time to network and follow up on issues.**

Women’s networks play a vital role in information and knowledge exchange and solidarity. However, these networks are also being weakened due to time constraints and women’s increased workload. Due to limited networks, time, mobility, and knowledge, women are usually deprived of information. Women are often informed of meetings or resources at the last minute, making it difficult for them to plan, participate, and use the information in their interest. In addition, most women do not have financial resources to spend on transportation to attend meetings, training programmes, and other events outside their village (also see Gale 2008).

**3. The decrease in sources of income for women has affected their mobility and participation in crucial issues that affect their livelihood.**

When it comes to resources (village funds, grants, training, consultations, workshops, etc.), related meetings, and other opportunities, women (particularly from marginalized groups) are systematically discriminated against or denied access by elite groups (both men and women). Even if a woman accesses or manages to participate in such opportunities, they are suppressed from raising their voice or concerns.

Bishnu Maya Bhujel, a women farmer leader from Baijanath VDC in Morang district and member of several user groups and chair of the cooperative and women’s saving and credit group in her village, shared:

*I have reduced my participation in community meetings. I try to attend the cooperative and saving and credit meetings, which I chair, but I keep it on the same day to save time. I miss out on the other key meetings such as the VDC council meetings and as a result I get excluded from the decision making and information about the resources and opportunities for the women in our village.*

#### 4. The decrease in agricultural production and increase in demands on women's time have negatively affected women-owned or managed agro-enterprises.

An increasing number of rural women are either supporting, or are themselves owners of, medium, small, and micro-enterprises, particularly in parts of the Terai and hills that are close to market centres. This is due in part to a number of successful agricultural and natural resource management-based interventions. Rural women are engaged in a wide range of enterprises such as vegetable and cereal seed production, making leaf plates, production of essential oils, and cultivation of cash crops. Experience in setting up these enterprises and the income earned have played a large role in increasing women's self-confidence and empowering them. However, decreases in agricultural production, limited technical support and safety nets, and the inability of women to devote time to managing their enterprises is de-accelerating this process and affecting the process of women's empowerment.

For example, Apsara Kafle, a women entrepreneur from Sarlahi, said that her bamboo product enterprise was doing well and that she was making good income from the sale of bamboo baskets used for packing fruits and vegetables. However, she had to discontinue her business because of the scarcity of the raw materials and increasing workload at home. She said that she does not have extra time to attend skill-related training courses and misses out on receiving timely information about enterprise-related resources and opportunities.



## Box 9: Impacts of climate change on women: Key emerging issues and gaps

**Increase in women's workload and drudgery:** The drudgery of rural women that may have eased a bit by several years of development interventions and modernization seems to be reappearing in different forms due to varying impacts of climate and other changes. Barring a few cases, men have not shared the increased workload and responsibilities of women.

**Loss of income of women:** With a decline in agricultural production and decrease in forest produce, rural women's traditional sources of personal income and women led or owned small and micro-enterprises are being affected. Increased household workload do not give them time to invest in income generating activities and businesses.

**Reinforcement of women's exclusion:** Increasing gap in power relations between men and women due to decreasing participation of women in resource governing and decision making bodies has reinforced women's exclusion. This has resulted in decline in the ability of women to seize opportunities for learning new skills, information and mobilize financial resources for their development.

**Backsliding of rural women's achievements and roles:** There is a declining trend in the achievements of rural women achieved through collective power of organized groups. Climate change programmes and policies often tend to present women as victims rather than as key actors in adaptation. This has also affected their status/position in the community.

**Declining women's leadership:** Over the years, development interventions had built women's capacity to take leadership positions. The space to practice leadership by rural women is, however, decreasing. The women themselves are not able to fully participate as institutions that facilitate them are not sensitive to their challenges and their dual role as public figure and home-maker. There is very little attempt to make extra efforts to enable women to participate more meaningfully.

**Mismatch between demand and supply:** Despite the concerns around climate change and its impact on natural resources, both the state and non-state development interventions are unable to address the needs at the local level. The failure to internalize the different needs, knowledge and capacities of men and women to cope with climate change have resulted in programmes that fail to meet the particular needs, demands and interests of women.

**Increase in health issues:** Lack of proper nutrition, hygiene and use of chemicals in agriculture has led to increase in women related health issues such as uterus prolapse. There is a need to revisit primary health care and women issues and services in the context of climate change impacts.

**Lack of access to financial resources:** The existing financial mechanisms such as VDC development grants and CFUGs in general have failed to work for women in the context of climate change impacts. Rural women need access to financial resources to purchase new and alternative technologies, invest in infrastructures and income generation activities to adapt to economic hardship brought about by climate and other changes.

## Chapter 6

# Existing Practices in Adaptation to Climate Change





Good practices in climate change adaptation by individuals and organizations can be derived from literature reviews and field studies. The criterion for what can be considered ‘good practices’ is those measures undertaken by individuals or organizations that reduce their vulnerability to climate change impacts, such as those posed by water scarcity, decreasing agricultural production, early ripening of crops, and disasters (soil erosion, landslides, GLOFs). This chapter presents the adaptation practices happening on the ground in the study areas in relation to water; agriculture and food security, forests and forest products, and natural disasters. A matrix of climate change specific impacts and corresponding adaptation practices (although not necessarily good practices) can be found in Annex 5.

## Water

### Adaptation practices at household/community level

- **Permanent water storage tanks:** Permanent water storage tanks (either cemented or made of stone) are being constructed at water sources to allow communities to prevent water runoff as well as collect water in order to provide controlled water supply to households as a long-term solution.
- **Rainwater harvesting:** Different techniques have been used for rainwater harvesting depending on the capacity and resources available. In some cases, artificial ponds have been constructed with plastic covered floors to prevent absorption and seepage of water. These ponds are mainly for irrigation or in biogas plants. Big and small drums are also being used to collect rainwater, usually for household consumption. Bamboo pipes are used to direct the rainwater from the roof top to the storage tanks or drums. These measures are adopted at individual and household levels and allow for only a small quantity of water storage; they do not offer a long-term solution to water scarcity.
- **Deep boring:** Deep boring is used in the hills to extract drinking water.

### Adaptation practices by organizations

- **Sustainable use of water resources and conservation of water sources:** The sustainable use of water resources and conservation of water sources is being promoted through awareness and capacity building (technical and institutional); water management; infrastructure development including the construction of water collection tanks and ponds; water recharge pits to collect water around water sources; sprinkle irrigation and drip irrigation; rainwater harvesting; and the construction of community and household level tanks. Organizations promoting such practices include Practical Action, Care Nepal, International Development Enterprise (IDE), OXFAM, National Trust for Nature Conservation (NTNC), World Wide Fund for Nature (WWF), Government of Finland, and the International Water Management Institute (IWMI).
- **Soil conservation and watershed management:** Soil conservation and watershed management, including conservation ponds used for storage of run-off water during excess rain to reduce erosion and for later use for the rehabilitation of degraded land through protection and plantation, is being promoted by the Department of Soil Conservation and Watershed Management, Government of Nepal.
- **Innovative, low-cost, piped water irrigation systems:** The International Development Enterprise has taken a lead role in the promotion of innovative, low-cost, piped water irrigation systems, including multiple-use water systems (MUS) that provide water for irrigation and domestic use. MUS are about using water efficiently to bring about maximum outcomes. The International Development Enterprise has built more than 250 MUS in Nepal reaching out to 40,000 people.

### Assessment of adaptation practices from a gender perspective

- **Adaptation practices require networks, information, skills, and investment:** Many of the alternative adaptation practices in relation to water, particularly water harvesting, require networks, information, skills, and investment to develop infrastructure, which are generally not accessible to poor and Dalit women. For example, certain techniques that depend on collecting water from roof tops excludes poor households with thatched roofs and poor and Dalit households with little or no land around their house (for the installation of water storage tanks).

## Agriculture and Food Security

### Adaptation practices at household/community level

- **Altered planting times:** Farmers have altered the time that crops are planted (particularly paddy and maize) according to the rainfall. In addition, to cope with longer dry spells or heavy late rains, farmers are planting alternative crops to reduce the risk of complete crop failure. In the mid-hills of Nepal, for example, the study found that when the monsoon is late, farmers use their fields to grow cucumbers, tomatoes, and pumpkins instead of maize and paddy, which require less water. During winter dry spells, farmers switch from growing mustard to wheat and barley and, if a dry spell is very long and does not support even wheat or barley, they grow improved organic grass called 'jai ghass' for fodder.
- **Inter cropping:** Inter cropping is also used to reduce the risk of complete crop failure; for example, maize is planted with beans or cowpeas.
- **Drought resistant crop varieties:** Farmers are replacing local crop varieties with more drought resistant or pest tolerant varieties or changing cropping systems. For example, in the hills, farmers are replacing rice crops with finger millet, fruit trees, and fodder and forage crops for improved animal husbandry.
- **Plastic tunnels to protect seedlings:** Farmers make use of plastic tunnels to protect seedlings from heavy rain or frost and grow off-season vegetables. This technology also reduces instances of blight.
- **Increased interaction with District Agriculture Development Office:** Farmers are increasing their interaction with the District Agriculture Development Office for technical inputs and drought and flood resistant seeds. For example, in the hills, Bishesh and Gresko varieties of tomato have been introduced and Annapurna 3 and 4 varieties of wheat.
- **Labour reducing adaptation for women:** Women have developed various strategies to overcome these challenges, such as reinforcing 'perma' (labour sharing system), reducing the number of livestock, and shifting to cash crops such as broom grass, ginger, and sugarcane, which are less demanding.
- **Wage labour and non-farm businesses:** Farmers are opting for wage labour and small non-farm businesses to supplement income from agriculture.
- **Sale of high-quality cereal to purchase cheaper rice:** Farmers are selling locally produced, high-quality cereal on the local market at a high price to purchase cheaper rice and food products in order to make up for the food deficit.

### Adaptation practices by organizations

- **Raising awareness on climate change:** Organizations such as WWF (Hariyo Ban project), Care Nepal, the Multistakeholder Forestry Programme (MSFP), Regional Community Forestry Training Center (RECOFTC), HIMAWANTI, FECOFUN, and others are raising awareness among communities on climate change and its impacts.
- **Agricultural subsidies and technical inputs:** The District Agriculture Development Office and other organizations are providing agricultural subsidies and technical inputs, including the promotion of crop diversification and the introduction of drought and pest resistant seed varieties (e.g., Annapurna 3 and 4 wheat varieties, Green Coroda carrot variety).
- **Home gardens, seed conservation, seed banks, and integrated pest management:** Organizations such as Local Initiative for Biodiversity, Research and Development (LI-BIRD), Sustainable Soil Management Programme of Helvetas, Swiss Agency for Development Cooperation (SDC), and UNDP's Global Environment Facility are promoting home gardens, seed conservation, seed banks, and integrated pest management through technical inputs, training, and the introduction of more drought and pest resistant varieties.
- **Seasonal riverbank farming:** Seasonal riverbank farming is becoming increasingly popular in the Terai. Both large organizations, such as Helvetas and Plan International, and local organizations such as FORWARD (a local NGO) are promoting riverbank farming with promising results, particularly from growing seasonal fruits and vegetables such as watermelon and tomatoes.

- **Crop insurance:** Crop insurance has been introduced by some private companies (e.g., in Dhulikhel).
- **Off-farm employment opportunities:** Off-farm employment and income generation opportunities are being promoted by organizations such as Helvetas (Sustainable Soil Management Programme, ILLUM projects); and UNDP's Micro Enterprise Development Project (MEDEP), among others.
- **Leasing land to the landless:** The leasing of land to landless or marginalized farmers with agricultural inputs is being promoted by LI-BIRD, World Vision, and FORWARD.

### Assessment of adaptation practices from a gender perspective

- **Women are not registered with District Agriculture Development Office:** The District Agriculture Development Office's outreach programme requires farmers' groups to register with them. Poor and Dalit women usually find it difficult to get membership in these farmers' groups and, hence, lose the entitlements, such as subsidies and technical inputs, provided by the District Agriculture Development Office.
- **District agricultural service providers do not target women:** External interventions and service providers are usually techno-centric not demand driven; hence, inputs from district agricultural service providers do not specifically target nor consult women.
- **VDC resources are highly contested:** Development or climate change-related resources that come to the VDCs or to local user groups are highly contested. Political and power interests often determine how these resources are allocated and used. Women members of these groups or committees are generally sidelined in decision-making processes in relation to such resources and, as a result, their adaptation needs are unmet.

## Forest and Forest Products

### Adaptation practices at household/community level:

- **Sustainable use and forest products:** The sustainable use and conservation of timber and other forest resources is being promoted by community forest users groups, which are developing strict guidelines for the use and collection of forest products, both for commercial and personal use.
- **Use of agricultural residue and animal dung:** Agricultural residue and animal dung are being used to make up for the firewood deficit, particularly in the Terai region.
- **Planting of fuelwood and fodder grass on private land:** Fuelwood and fodder grass species are being planted on private land, especially in the hills where there are labour shortages for agriculture due to male outmigration and water scarcity.
- **Traditional seed storage practices:** Traditional seed storage practices, including local seed banks, are being promoted among communities and households for forest biodiversity by organizations such as LI-BIRD and FORWARD (both national NGOs).

### Adaptation practices by organizations

- **Improved cooking stoves:** Improved cooking stove such as 'matribhumi chulo' are being promoted by UNDP's Global Environment Facility through its small grants programme to reduce firewood demand.
- **Good agro-forestry practices:** Good agro-forestry practices, such as growing crops inside community forests, growing fodder trees with agricultural crops, and so forth, are being promoted by organizations such as LIBRD.
- **Stall feeding:** Stall feeding is being promoted to prevent over grazing and promote forest under growth.
- **Biogas:** Biogas linked to both human and animal dung is being promoted by the Alternative Energy Promotion Center (AEPC).
- **NTFP planting and harvesting methods:** NTFP planting and harvesting methods are being promoted.

## Assessment of adaptation practices from a gender perspective

- **Alternative technologies decrease women's workload:** The use of alternative technologies, such as biogas and improved cooking stoves, has decreased women's workload.
- **Installation of biogas is expensive:** Despite government subsidies, the installation of biogas requires substantial expenditure from the user and, hence, is still out of reach for the poorest of the poor.

## Natural Disasters

### Adaptation practices at household/community level

- **Vegetation of slopes:** Broom grass and bamboo is being planted in and around landslide-prone areas to strengthen slopes and prevent landslides.
- **Food storage:** Dried food and cereals are being saved for disasters.
- **Use of women's knowledge:** Women's knowledge and networks are being used during disasters.

### Adaptation practices by organizations

- **Seed banks:** Seed banks are being promoted in safe places.
- **Disaster preparedness training:** UNDP conducted disaster preparedness training as part of its Comprehensive Disaster Risk Management Programme, which targeted women technical trainings and skill trainings (e.g., masonry).
- **Women targeted skill training:** Women have been targeted by various organizations for skill training (e.g., masonry).
- **Community disaster management committees:** Community disaster management committees have been formed in the villages.
- **Emergency fund:** Emergency funds are being created to help communities in the event of natural disaster.

## Assessment of adaptation practices from a gender perspective

- **Women's role in disaster risk reduction is not recognized:** Women's roles in, and knowledge of, disaster risk reduction are not recognized or resourced.
- **Women have no or limited access to resources:** Women have no, or limited, access to resources and services (disaster risk management committees, training, subsidies, grants, and so forth).

## Giving women a helping hand

Technological innovation: Time saving technologies for household work and agriculture are also a boon for women; these include biogas (mostly used by richer families, particularly in the Terai), mills, pressure cookers, piped water at home, and thrashers (though mostly used by men) (Gill et al. 2012).

## Men supporting women's leadership:

While women's workload has increased, there is an emerging trend of men supporting women in household work. This was particularly common in households where women are active in community work and play leadership roles. In particular, women who bring in some cash or non-cash payments to the family are respected and wholeheartedly allowed to participate by their families and men. For example, a women leader from Kavre had to struggle to get her husband's permission to attend a workshop in Kathmandu saying that it was voluntary work. However, when she brought home Rs.300 from the daily allowance that she received to participate, her husband was pleased and told that he would allow her to go anytime.

In another case in Biratnagar, it was found that a husband fully supports his wife who is today chair of her cooperative and an active member of a citizen ward forum. She has used the forum to mobilize resources for her ward. Both men and women respect her and she is a role model.

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The value of women's participation in community work and decision making processes is demonstrated to husbands and families when women bring financial and technical resources to the household and community.



## Chapter 7

# Gender-Inclusive Adaptation: The way forward



Given the vital role of women as the primary actors in natural resource management and agriculture, the following recommendations are made to make adaptation actions more gender sensitive and inclusive:

- **Enhance women’s engagement in local-level climate change planning and implementation processes:** Support and strengthen the development and implementation of practical mechanisms and systems to ensure the engagement of women, particularly from poor and marginalized groups, in local-level planning and the implementation processes of climate change adaptation initiatives, including activities under the Local Adaptation Plan of Action, Local Disaster Reduction Action Plans, and VDC plans. Particular focus must be given to women’s access to, and control over, resources and decision-making processes.
- **Strengthen local-level women’s organizations and networks:** Support and strengthen existing and new women’s organizations and networks at the local level to ensure women’s engagement to influence climate change-related decisions and programmes to meet their needs and priorities.
- **Separate or create specific funds and resources for women:** Advocate for, and provide, separate resources for poor and marginalized women in the form of either funds, seed money, grants, incentives, or subsidies to enable them to purchase appropriate and alternative adaptation technologies and establish alternative income generating activities and enterprises. These financing mechanisms must be flexible to meet women’s needs and reflect priorities.
- **Promote time-saving, appropriate and alternative technologies:** Promote coordination and linkages between alternative energy institutions such as the Government’s National Rural Renewable Energy Programme (NRREP) and sectoral agencies (working in agriculture, forestry, enterprise development) to develop, strengthen, and distribute time-saving and women-friendly technologies for drinking water, irrigation, cooking, and agro-processing.
- **Establish local-level pre- and post assessment mechanisms for climate-change interventions from a gender equality and social inclusion perspective:** Encourage the establishment of gender equality and social inclusion sensitive pre- and post-assessments/gender analysis of needs and sub-sector analysis and monitoring for the design, planning and implementation of climate change-related programmes, both before and after rolling out activities and programmes at the local level. Support the collection of disaggregated data for targeting and monitoring women (e.g., as a prerequisite for the implementation of agro-enterprises and alternative energy technologies, etc).
- **Increase investment in adequate and skilled local-level service providers (quality and quantity):** Advocate and provide for adequate local-level human resources and service providers in terms of specific climate change-related extension skills (quality) and number (quantity) to reach poor and marginalized women.
- **Enhance the capacity of national and local-level institutions for gender equality:** Strengthen the capacity of both national and local-level organizations working on climate change to address gender equality and social inclusion issues organizationally, through training, coaching, mentoring, and developing an organizational action plan for achieving gender equality (e.g., training on gender, gender analysis, organizational change for gender equality etc.) so that extension workers are gender sensitive in their actions and delivery of services (e.g., during training events, disaster response activities, and so forth).
- **Include or provide for gender experts within national and local-level climate change-related institutions:** Include professionals with good knowledge and expertise on gender equality and social inclusion issues, or train staff on these issues to ensure understanding of the issues and the gender sensitivity of these institutions in implementing activities.
- **Conduct awareness raising:** At the national and local climate change governance levels, raise awareness of the impacts of climate change specific to women, particularly among policy and decision makers. At the local or community levels, develop appropriate climate change awareness and information campaign materials that can be understood and used by local people, particularly women and marginalized groups. The language used and the advocacy materials should be gender-friendly and appropriate for rural women.
- **Strengthen and develop male gender champions:** Identify and support male gender champions at local and national levels, both within service delivery organizations and committees and groups. Train, coach, and organize these men to support women and women’s leadership.

- **Strengthen and develop women's leadership:** Identify and support rural and national-level women leaders and champions to advocate and address gender issues in climate change adaptation. Focus on strengthening youth to lead.
- **Mainstream gender-sensitive climate change adaptation into development programming and planning:** Make provision for both resources and activities specific to women in development in order to mainstream gender-sensitive climate change adaptation into development programming and planning.
- **Research and knowledge management:** Plan and undertake more applied and action research, both technical and socioeconomic, to enhance our understanding and knowledge of the impacts of climate change on poor and marginalized women. Document and disseminate the learning and knowledge generated from climate change adaptation projects. Promote specific research, such as on the:
  - documentation and dissemination of local and indigenous adaptation practices
  - socioeconomic impacts of climate change on women
  - needs and barriers to women's access to climate change funds and resources and to new energy and agricultural technologies and information
  - effects of climate change on people's health (particularly women) and key barriers in accessing health facilities
  - linkages between climate change and violence against women
  - impacts of disasters on women and best practices for –scaling up and scaling out.



## About HICAP

The Himalayan Climate Change Adaptation Programme (HICAP) is a five-year integrated programme aimed at reducing uncertainties about the impact of climate change, developing knowledge, enhancing capacities, and making concrete and actionable proposals for strategies and policies for the adaptation of mountain communities in the Hindu Kush Himalayan (HKH) region, with a special focus on women.

HICAP is implemented as a part of ICIMOD's regional programme on 'Adaptation to Change' and covers five river sub-basins in HKH region. In four river sub-basins, the Upper Brahmaputra (Tibet-China), Eastern Brahmaputra (India), Koshi (Nepal), Upper Indus (Pakistan), HICAP is supported by the Government of Norway and implemented in partnership with ICIMOD, GRID-Arendal and the Center for International Climate and Environmental Research-Oslo (CICERO). In the Mekong-Salween (China) basin the programme is supported by Swedish International Development Cooperation Agency (Sida).

One of the three major objectives of HICAP is to make concrete and actionable proposals for strategies and policies considering vulnerabilities, opportunities and potentials for adaptation, with particular reference to strengthening the role of women and local communities. Through a component dedicated to the role of women and gender, the project hopes to enhance the capacity of the mountain communities in general and women in particular to understand and integrate the opportunities and risks in order to cope with and respond to changing socioeconomic and environmental conditions (water and natural resources, land and non-land based production, household income, natural and health hazards).

For further information, visit [www.icimod.org/hicap](http://www.icimod.org/hicap).

## About WOCAN

Woman Organizing for Change in Agriculture and Natural Resource Management (WOCAN) assists agriculture and natural resource management organizations to build women's leadership and mainstream gender and social inclusion into their research and development programmes, projects, and internal structures. WOCAN is a member-based organization with members in 93 countries. In Nepal, it has a wide network of grassroots women leaders, women professionals, and NGOs through its women leadership circles (a national level platform organized to develop women's leadership, promote regular dialogues between women officials, professionals and rural women farmers, entrepreneurs, and groups to create new spaces for rural women voices to be heard at policy levels), training, mentoring, and research activities. WOCAN also works in collaboration with government and non-governmental agencies in Nepal at the national as well as district levels in capacity building, research, and organizing conferences. WOCAN works extensively on women and climate change issues such as REDD + and carbon standards for women.

For further information, visit [www.wocan.org](http://www.wocan.org).

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## Annex 1: Summary of consultations, focus group discussions, and interviews conducted

SN	Description	F	M	Total
<b>Morang District</b>				
1.	District Consultation in Biratnagar, Morang district	6	10	16
2	FGD with Men only (Baijanathpur VDC, ward 1)		5	
3	FGD with Women's Group in Katepoor/Dhanpura, Morang	16		16
<b>Dhanusha District</b>				
4.	District Consultation in Janankpur , Dhanusha district	2	17	19
5	Mixed group discussion at Begadawar VDC, Ward 1, Dhanusha dist	9	6	15
6	FGD with women's group in Yajrabhumi	7		7
7	FGD – Men only (Bengawar VDC ward 1)		6	
8	FGD with Shree Aorahi Khola Mahila Kabulayat Forest User group in Bishrampur, Naktazim Ward 9	8	5	13
<b>Sankhuwasabha District</b>				
9	district Consultation in Khandbari, Sankhuwasabha district	7	18	25
10	Mixed group discussion with Bhag Karkha Tole, Khandbari Ward 5,	9	12	21
11	FGD (women only) Dharma Devi women's Group, Mukhiya Gaon, Ward #5 Sankhuwasabha	13		13
<b>National Consultation</b>				
12	National consultation with grassroots women from Kavre, Sindhuli, Chitwan, Gorkha, Lamjung and Sarlahi	13		13
13	National Roundtable	28	12	40
<b>Interviews</b>				
13	In-depth Interviews with resource persons in 4 districts	15	9	24
14	In- depth interviews with resource persons based in Kathmandu	8	3	11
15	Consultation with gender experts			76
	Total	141	103	309

## Annex 2: List of participants in district consultations and focus group discussions

### 1. Consultation, Sankhuwasabha

S.N.	Name	Designation	Organization	Male			Female		
				T	H	M	T	H	M
1.	Vipin Gurung	Secretary	Nepal Federation of Indigenous Nationalities (NEFIN)			√			
2.	Hariswor Thapa Magar	Ex-minister	Nepal Red Cross Society			√			
3.	Kaman Singh Rai	Secretary	Society Development Center			√			
4.	Ganesh Shrestha	Chief Planning Section	Khandbari Nagarpalika		√				
5.	Jeevan Shrestha	Student	Student		√				
6.	Tika Ram Shrestha	Field Supervisor	Shilichong Club Social Development Centre (SCSDC), Khandbari		√				
7.	Maheshwor Shrestha	Secretary	Ekal Mahila Group		√				
8.	Santa Gurung	Co- Chairperson	Ekal Mahila Gurung						√
9.	Gita Khadka Karki	Treasurer	Urban drinking water					√	
10.	Ramesh Bhattarai	Executive Officer	NA		√				
11.	Nilkantha Pokharel	Forest Officer	District Agriculture Development office		√				
12.	Shyam Niraula	Chairperson	Federation of Nepali Journalists (FNJ)		√				
13.	Sita Dahal	Chairperson	Federation of Nepal Women Health Volunteer					√	
14.	Lila Adhikari	Local Development Officer	DDC, Sankhuwasabha					√	
15.	Puspa Budhathoki	Extension Officer	District Livestock Services Office (DLSO)					√	
16.	Chhindum Bhote	Member	FECOFUN			√			
17.	Tej Bahadur Tamang	Executive Officer	Shilichong Club Social Development Centre (SCSDC), Khandbari			√			
18.	Bisal KC	Junior Health Assistant	District Health Office		√				
19.	Ram Hari Devkota	Accountant	MBRN		√				
20.	Suraj K Sharma	District Coordinator	Suaraha		√				
21.	Suman Adhikari	Chief	Women Development Office (WDO)		√				
22.	Radha Devi Basnet	Secretary	Community Development Center (CDC), Janakpur					√	
23.	Binod Subba Gurung	Member	Terai Ecological Foundation(TFE), Janakpur			√			
24.	Saraswoti Karki	Member	Terai Ecological Foundation(TFE), Janakpur					√	
25.	Man Bahadur Limbu	Secretary	Terai Ecological Foundation(TFE), Janakpur			√			
Total					11	7 (18)		6	1 (7)

(T = Terai; H = Hill; M = Mountain)



## 2. Consultation, Janakpur

SN	Name	Designation	Organization	Male		Female	
				T	H	T	H
1.	Lekh Nath Adhikari	Program Officer	CARE Nepal		√		
2.	Rup Narayan Jha	Assistant Forest Officer	District Forest Office	√			
3.	Shyam Lal Mahatto	Chairperson	Jalaida CFML	√			
4.	Raj Kumar Thakur	Assistant Forest Officer	District Forest Office	√			
5.	Kari Yadav	Chairperson	NEFWAN	√			
6.	Arun Kumar Mahatto	Chairperson	Himalaya Youth Club Nakatajhij	√			
7.	Laxmi Narayan Bhujel	Fisheries Development Officer	District Agriculture Development Office		√		
8.	Umesh Mahatto	ITA	District Agriculture Development Office	√			
9.	Binay Kumar Shah	Program Coordinator	Jiwan Kendra	√			
10.	Som Prasad Sharma	Chairperson	FECOFUN		√		
11.	Phulgen Yadav	Chairperson	Kisan Sang	√			
12.	Jogendra Mahatto	Chairperson	TPFDA	√			
13.	Soni K Paneta	Secretary	WRF			√	
14.	Malata Thakur	-	WRF			√	
15.	Sanjay Kumar Jha	Assistant Soil Conservation Officer	District Soil Conversation office	√			
16.	Bipin Kumar Jha	District Soil Conversation Officer	District Soil Conversation Office	√			
17.	Bimal Thakur	Treasurer	WRF	√			
18.	Robin Jha	Account	TPFDA	√			
19.	Birendra Shah	Secretary	Federation of Local Forest User	√			
Total				14	3	2	

(T = Terai; H = Hill; M = Mountain)

### 3. Consultation, Biratnagar

SN	Name	Designation	Organization	Male			Female		
				T	H	M	T	H	M
1.	Kumari Shobha Tandukar	Health and Hygiene Coordinator	Lumanti					√	
2.	Dharma Shila Khanal	Chairperson	Mahila Adhikar Sanjal					√	
3.	Bal Krishna Pandey	Executive Director	Prayash Nepal					√	
4.	Pralhad Timilsina	Program Coordinator	Lumanti					√	
5.	Sita Poudyal	President	Bal Samaj Nepal					√	
6.	Roshan Kumar Joshi	Environment Officer	District Development Committee		√				
7.	Bhagawati Sharma Bhandari	National Project officer	GEMSIP - Japan International Cooperation Agency (JICA)					√	
8.	Umesh Bishwokarma	Chairperson	REDD Nepal	√					
9.	Mahendra Mahato	Assistant District Coordinator	Women's Rehabilitation Center	√					
10.	Ram Chandra Adhikari	Representative	Environment Forum Nepal		√				
11.	Mohan Bhattarai	Chairperson	Citizen Forum		√				
12.	Surendra Shrestha	Forest Officer	District Forest Officer		√				
13.	Madan Shrestha	Coordinator	FECOFUN		√				
14.	Yagya Sharma	Vice - Chairperson	FOHREN		√				
15.	Shankar Prashad Dahal	P.S	NEWAH		√				
16.	Saru KC	E.D	Setogurans, Morang		√				
Total				2	8	(10)	6		(6)

### 4. FGD, Begadawar VDC, Ward 1

SN	Name	Male			Female		
		T	H	M	T	H	M
1.	Kamali Devi Mahatto				√		
2.	Nage Devi Mahatto				√		
3.	Sita Devi Mahatto				√		
4.	Shiva Kumari Mahatto				√		
5.	Ganki Devi Mahatto				√		
6.	Anita Devi Mahatto Singha				√		
7.	Usha Kumari Mahatto				√		
8.	Sabitri Devi Mahatto				√		
9.	Rani Devi Mahatto				√		
10.	Shree Jageshwar Mahatto	√					
11.	Shree Jay Kumar Mahatto	√					
12.	Shree Birendra Prasad Singha	√					
13.	Shree Ram Prakash Mahatto	√					
14.	Shree Durga Singha	√					
15.	Ram Rekha Kushwaha Mahatto	√					
Total		6		(6)	9		(9)

(T = Terai; H = Hill; M = Mountain)

## 5. FGD, Bhag Karkha Tole, Khandbari, Ward 5

S.N.	Name	Male			Female		
		T	H	M	T	H	M
1.	Shyam B Rai		√				
2.	Bhim Prasad Gurung		√				
3.	Amar Bahadur Gurung		√				
4.	Pouchimaya Gurung					√	
5.	Shova Gurung					√	
6.	Maneuka Gurung					√	
7.	Ranna Bahadur BK		√				
8.	Keshar BK		√				
9.	Binod Subba Gurung		√				
10.	Laxmi Prasad Garengi		√				
11.	Bhim Bahadur Gurung		√				
12.	Chandra Prasad Gurung		√				
13.	Jit Bahadur Gurung		√				
14.	Hulimaya BK					√	
15.	Sharmila BK					√	
16.	Ganesh Gurung		√				
17.	Hem Kumar Gurung		√				
18.	Menuka Gurung					√	
19.	Devi Gurung					√	
20.	Laxmi Gurung					√	
21.	Junker Gurung					√	
Total			12		(12)	9	(9)

(T = Terai; H = Hill; M = Mountain)

## 6. FGD, Shree Aorahi Khola Mahila Kabulayat Forest User Group, Bishrampur, Naktazim, Ward 9

SN	Name	Male			Female		
		T	H	M	T	H	M
1.	Bhagwati Mahatto				√		
2.	Sudhamaiya Bhujel					√	
3.	Shree Kharga B Khatri Chhetri		√				
4.	Dhanmaya Magar					√	
5.	Shree Gyan Bahadur Bhujel		√				
6.	Dhandamaya Khatri					√	
7.	Bishnu Maya Magar					√	
8.	Ekata Maya Magar Bhujel					√	
9.	Harkamaya Bhujel					√	
10.	Manmaya Thapa Magar		√				
11.	Shree Lal Bahadur Pulami		√				
12.	Shree Nirsha Bhujel		√				
13.	Tilmaya Khaptari Magar					√	
Total			5	(5)		7	(7)

## 7. FGD, Yajñabhumi, Ward 9, Dhanusha

SN	Name	Male			Female		
		T	H	M	T	H	M
1.	Prem Lama					√	
2.	Shanti Lama					√	
3.	Muna Lama					√	
4.	Leela Lama					√	
5.	Ratna Lama					√	
6.	Reenu Lama					√	
7.	Ranjita Lama					√	
Total						7	(7)

(T = Terai; H = Hill; M = Mountain)

## 8. FGD, Women's Group, Katepur, Dhanpura

SN	Name	Male			Female		
		T	H	M	T	H	M
1.	Bishnu Maya Bhujal					√	
2.	Radha Devi Paswan				√		
3.	Sumitra Paswan				√		
4.	Sakuni Paswan				√		
5.	Phula Paswan				√		
6.	Shiva Kumari Rishidev				√		
7.	Anju Paswan					√	
8.	Rita Bhujel						
9.	Chandra Kala Paswan				√		
10.	Geeta Adhikari					√	
11.	Anita Paswan				√		
12.	Kagati Paswan				√		
13.	Sangeeta Paswan				√		
14.	Raj Kumari Paswan				√		
15.	Sumeetra Paswan				√		
16.	Amawati Thamdan					√	
Total					12	4	(16)

(T = Terai; H = Hill; M = Mountain)

## 9. FGD, Men Only, Janakpur and Morang

SN	Name	District	VDC
<b>FGD Men 1</b>			
1.	Jogendra Mahoto	Janakpur	Bengawar VDC, Ward 1
2.	Ganesh Kumar Singh	Janakpur	Bengawar VDC, Ward 1
3.	Binod Mahoto	Janakpur	Bengawar VDC, Ward 1
4.	Ram Mahoto	Janakpur	Bengawar VDC, Ward 1
5.	Krishan Mahoto	Janakpur	Bengawar VDC, Ward 1
<b>FGD Men 2</b>			
1.	Suresh Mandal	Morang	Baijanathpur VDC, Ward 1
2.	Anil Mandal	Morang	Baijanathpur VDC, Ward 1
3.	Ganesh Mandal	Morang	Baijanathpur VDC, Ward 1
4.	Mahendra Mandal	Morang	Baijanathpur VDC, Ward 1
5.	Mohan Bhujel	Morang	Baijanathpur VDC, Ward 1
6.	Balkrishna Mandal	Morang	Baijanathpur VDC, Ward 1

## Annex 3: Details of group consultations at national level

### 1. List of Grassroots Women Leaders National Consultation (National)

SN	Name	Organization	Thematic area/Position
1.	Shova Karki	Astha Sinduli	Grassroots Women Leader
2.	Shanti Khatri	Astha Sinduli	Member
3.	Menuka Rana	Astha Sinduli	Member
4.	Nanu Ghotane	HIMAWANTI/Kavre	Grassroots Women Leader
5.	Neema Lama (Tamang)	HIMAWANTI/Kavre	Grassroots Women Member
6.	Laxmi Karki	REDD+ Pilot Project, Chitwan-Shaktikhor	Local Resource Person
7.	Chami Rana Magar	Chelibati CFUG, Shaktikhor, Chitwan	Chairperson
8.	Rupa Khadka	Sarlahi	Enterprise Service Provider
9.	Apsara Kafle	Sarlahi	Entrepreneurs of bamboo stick making
10.	Pabitra Sunuwar	Sindhuli	Marin Khola MHP
11.	Budhkauri Gurung	Gorkha	Micro Hydro Power
12.	Kamala Adhikari	Gorkha	Micro Hydro Power

## 2. List of Participants for National Round-table Consultation, Kathmandu

SN	Name	Position and Organization	Sector	Gender	
				Female	Male
1.	Durga Basnet	FORWARD – Biratnagar/Morang	Agriculture – Integrated Rural Development		✓
2.	Dilip Shah	Manager, TPFDA, Janakpur	Forestry		✓
3.	Durga B Dura	Executive Director, ECARDS, Dolakha	Disaster		✓
4.	Puspa Paudel	Programme Director, CDECF Sindhupalchowk			✓
5.	GokulGautam	Regional Coordinator, REMREC, Kavre	Energy		✓
6.	Shova Karki	Aastha Sindhuli	Forestry	✓	
7.	Bhimsen Prasad Chaudhary	Program Coordinator, Koshi Victim Society, Saptari	Disaster, natural resource		✓
8.	Rupa KC	Uddham Bikash Tatha Rojgar Srijana Kendra, Sarlahi	Enterprise	✓	
9.	Sudha Karna	Coordinator, Mitra Dhanusha	Enterprise (MEDEP/UNDP)	✓	
10.	Rama Ale Magar	President/HIMAWANTI	Forestry/agriculture	✓	
11.	Poonam Pant Bhatta	Gender Equality and Social Inclusion (GESI) Officer, FECOFUN and WWF	Forestry	✓	
12.	Kamala Thapa Magar	CCMIN Officer, NEFIN	Forestry	✓	
13.	Anita Dahal	Danar Nepal	Dalits and natural resource management	✓	
14.	Anita Pariyar	Danar Nepal	Dalits and natural resource management	✓	
15.	Hema Limbu	Member, National Indigenous Women’s Federation		✓	
16.	Nirmala Sitaula	Member, Federation of Water Users Association	Water/climate change/gender	✓	
17.	Charushree Nakarmi	RHC Manager, BSP	Energy	✓	
18.	Manjeshwori Singh	Livelihood Specialist, NDRI	Gender and Livelihoods	✓	
19.	Bijaya Bajracharya	Policy and Programme Development Specialist, MEDEP/ UNDP	Enterprise	✓	
20.	Nira Bhatta	Program Associate/ Winrock International	Agriculture/climate change	✓	
21.	Shikha Shrestha	Gender and Social Inclusion Coordinator, Hariyo Ban, WWF	Climate change	✓	
22.	Niky Maskey	Researcher, International Water Management Institute	Water	✓	
23.	Shushila Thapa Magar	Gender Equality and Social Inclusion (GESI) Advisor, Netherlands Development Organisation (SNV)	Gender	✓	
24.	Shanta Upadhaya	Programme Officer, OXFAM	-	✓	
25.	Shruti Mishra	ESED Specialist, Asia Network for Sustainable Agriculture and Bioresources (ANSAB)	Climate change	✓	
26.	Manohara Khadka	Gender Specialist, ICIMOD	Gender	✓	
27.	Sarah Nischalke	Food Sector Specialist/ICIMOD	Food/climate change	✓	
28.	Laxmi Bhatta	Ecosystem Spec/ ICIMOD	Climate change		✓
29.	Ritu Verma	Strategic Lead Gender/ICIMOD	Gender/natural resource management/ climate change	✓	
30.	Neera S Pradhan	Water & Adapt Spec/ ICIMOD	INGO	✓	
31.	Valdemar	Senior CC Adaptation Spec/ICIMOD	INGO	✓	
32.	Tara Lama	National Project Manager, Food and Agriculture Organization of the United Nations	Agriculture	✓	
33.	Shanta Pant	Under Secretary, Ministry of Environment, Nepal	-	✓	
34.	Tara Shrestha	Ministry of Energy, Nepal/ National Rural and Renewable Energy Programme, Alternative Energy Promotion Centre (AEPC)	-	✓	
35.	Eak Raj Sigdel	Environment Specialist, MLDF	-	✓	
36.	Meena Khanal	Freelance consultant and former Joint Secretary, Ministry of Environment, Nepal	Freelance Consultant	✓	
37.	Yemendra Upadhyay	Under Secretary, National Women Commission	Government	✓	
38.	Lila Bati Timilsina	WLCN	Gender equality and social inclusion/ natural resource management	✓	
39.	Sagun Lawaoti	Note Taker	-		✓
40.	Arati Rana	Student, Kathmandu University	-	✓	

Total participants: 40 (28 female; 12 male; 9 Field; 9 NGOs and federations; 14 INGOs; 5 government; 3 individual experts)

## Annex 4. List of people interviewed at the national level

SN	Name	Position/Organisation
1.	Hema Upreti	Coordinator, NORMS
2.	Gita Pradhan	Communication and Gender Specialist, UNDP/DRR
3.	Deepak K.C	CBDRR, UNDP/DRR
4.	Kanchan Lama	Board Member, WOCAN
5.	Nanu Ghotane	District Chairperson, HIMAWANTI, Kavre
6.	Shova Karki	Secretary, ASTHA Sindhuli
7.	Rupa Khadka	Entrepreneur, Sarlahi
8.	Bijaya Bajracharya	Policy and Development Specialist, MEDP/UNDP
9.	Sabita Khadka	Gender Specialist, MEDEP/UNDP
10.	Amina Maharjan	Team Leader, Safer Migration Project, Helvetas
11.	Surendra	Team Leader, ELUM Project, Helvetas
12.	Tara Shrestha	NRREP/AEPC, Kathmandu
13.	Yamuna Ghale	Senior Programme Officer, SDC

## Annex 5: Structure for climate change adaptation in Nepal

### National-level structure

The Ministry of Environment has been designated by the Government of Nepal as the focal ministry for climate change activities and, in November 2009, formed a high-level body chaired by the Prime Minister to provide policy direction for climate change activities.

Several ministries, including Public Works, Irrigation, Energy, Agriculture, Environment, and Hydrology and Meteorology (among others), are also crucial in developing climate change adaptation projects, whether in terms of new, more sustainable agriculture approaches, greater storage capacity for water supplies, or early warning systems for GLOFs, etc.

However, constant restructuring amongst relevant ministries has had a detrimental effect on government effectiveness and the continuity of policy, which in turn serves to perpetuate a stagnating development process.

At the national level, water policy is primarily orchestrated through the Water and Energy Commission Secretariat (WECS), which also wrote Nepal's most current National Water Plan, published in 2005. However, Water and Energy Commission Secretariat has no budgetary power and has to go through other ministries to get projects approved, which impacts work on adaptation to climate change.

### District and community-level institutional framework

The line ministries and their departments at the local level are important in water resources development and management. The Ministry of Physical Planning and Works, which looks after rural water supply and sanitation, and the ministries of Irrigation, Energy, and Agriculture, are particularly relevant. However, because of recent structural divisions that reflect a history of constantly changing institutions and their mandates, their exact roles and departments are in a current state of flux.

The Ministry of Home Affairs is responsible for general administration at the district level and appoints the chief district officer (CDO). The CDO is also the chair of the District Water Resources Committee. The District Water Resources Committee is mainly responsible for registering water users groups for irrigation and permitting micro-hydro power construction. The District Water Resources Committee also has a mandate to handle general water resource issues including water licensing and resolving disputes, but rarely carries out these other functions (Kayastha and Pant 2001).

### District and village level structure

Although not currently functioning in their original constitutionally mandated structure, the district development committees (DDCs) and village development committees (VDCs) at the local level are still the most crucial institutions for both strategic and autonomous adaptation at the local level. Because the impacts of climate change will affect so many different aspects of life at the local level, due to such a high number of climate-dependent livelihoods, these institutions play a critical role in the implementation of any adaptation planning that comes from the Water and Energy Commission Secretariat and the ministries at the national level. These institutions could also play a role in encouraging increased autonomous adaptation.

Functionally, both the VDCs and the DDCs have their own allocated funds from the central government at the beginning of the fiscal year in July, as well as from local revenue, which they are entitled to collect according to the Local Self Governance Act of 1999. If the VDCs and DDCs are functioning properly, it is the elected individuals that make the district development plans with help from line agencies at the district level, which are then submitted to the National Planning Commission for approval. However, in their current state, all functioning is handled by the Local Development Officer (LDO), thus significantly reducing the capacity of VDCs and DDCs, which has a consequent effect of reducing the general level of development.



## Annex 6: Existing adaptation practices

Hazard	Adaptation practices by individuals/ people	Adaptation practices by organizations	Gender analysis
Erratic rainfall and temperature rise/water scarcity (for drinking, irrigation, agriculture)	<ul style="list-style-type: none"> <li>• Cemented or stone water tanks (at source)</li> <li>• Rainwater harvesting using plastic or bamboo as pipes, plastic ponds and drums (big/small)</li> <li>• Planting bananas inside orange groves to preserve moisture</li> <li>• Altering planting times for crops to gain benefit of monsoon rain, avoiding crop losses from drought/heavy late rains</li> <li>• Plastic greenhouses to protect seedlings from heavy rain/frost) and reduce instances of blight</li> <li>• Substituting chemical fertilizers for poultry and farmyard manure</li> </ul>	<ul style="list-style-type: none"> <li>• Awareness of climate change impacts, sustainable use of water resources at local level</li> <li>• Deep boring in the hills</li> <li>• Agricultural subsidies and technical inputs (District Agriculture Development Office)</li> <li>• Construction of conservation ponds and conservation of water sources</li> <li>• Sprinkle irrigation</li> <li>• Multiple water use system (MUS) promoted by organizations (for drinking and irrigation)</li> </ul>	<ul style="list-style-type: none"> <li>• Poor women cannot invest in infrastructure</li> <li>• Rainwater harvesting not feasible for poor women with thatched roof houses</li> <li>• Poor women cannot buy plastic drums</li> <li>• Women not registered in District Agriculture Development Office as farmers groups and, therefore, not entitled to government organization subsidies/technical inputs</li> <li>• Political and power interests limit women's access to resources and decision making</li> </ul>
Decrease in crop and vegetable production/ crop failure/ decline in livestock holding	<ul style="list-style-type: none"> <li>• Mixed cropping system to reduce risk of complete crop failure (e.g., maize planted with beans or cowpeas)</li> <li>• Women help each other by sharing labour ('perm' system)</li> <li>• Burning or manually remove weeds and pests</li> <li>• Hiring extra labour</li> <li>• Keeping less livestock</li> <li>• Introduction of new varieties resistant to drought or pests/ diseases</li> <li>• Intensive planting of fodder grass</li> <li>• Use of chemical pesticides, herbicides and growth hormones</li> <li>• Shifting to new cash crops (e.g., broom grass, ginger, sugarcane etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Promotion of crop diversification</li> <li>• Seed conservation, seed banking, drought resistant varieties</li> <li>• Promotion of home gardens</li> <li>• Plastic tunnel vegetable farming</li> <li>• Seasonal riverbank farming</li> <li>• Crop insurance (private. companies)</li> <li>• Planting improved varieties of fodder grasses</li> <li>• Application of integrated pest management</li> </ul>	<ul style="list-style-type: none"> <li>• Women have less time to innovate/ test new ideas</li> <li>• Limited access to new and resistant seed varieties</li> <li>• Health implication with use of off-the shelf chemicals</li> <li>• Increased workload (back-breaking labour)</li> </ul>
Natural resource management governance	<ul style="list-style-type: none"> <li>• Merging/conducting series of monthly committee meetings on one day</li> <li>• Selective and less participation in community meeting/work</li> <li>• Active women leaders directly approaching and inquiring through mobile phones about resources and opportunities</li> </ul>	<ul style="list-style-type: none"> <li>• Avoiding formation of new groups and capacitating existing groups on new issues</li> <li>• Strengthening capacity of existing community based organizations (CBOs), civil society organizations (CSOs) and NGOs on tackling climate change</li> <li>• Use of innovative approaches like Reflect sessions, 'Pathshala' for disseminating new knowledge and creating gender awareness.</li> </ul>	<ul style="list-style-type: none"> <li>• Women have less time to grab opportunities at their doorstep</li> <li>• Women excluded from key decision making processes, information/resources</li> </ul>
Decline in forest/NTFPs	<ul style="list-style-type: none"> <li>• Controlling haphazard collection of forest resources</li> <li>• Using agricultural residue and dung to make up for firewood deficit</li> <li>• Planting fuelwood species in private lands</li> <li>• Traditional seed storage practices</li> </ul>	<ul style="list-style-type: none"> <li>• Promotion of improved cooking stoves (consume less firewood)</li> <li>• Promotion of good agroforestry practices and stall feeding</li> <li>• Promotion of biogas</li> <li>• Promotion of NTFP planting and harvesting methods</li> </ul>	<ul style="list-style-type: none"> <li>• Increased women's workload in individual adaptation measures</li> <li>• Use of alternative technologies decreases women's workload</li> <li>• Biogas is affordable for rich households only</li> </ul>
Food insecurity/ malnutrition/ migration	<ul style="list-style-type: none"> <li>• Selling locally produced cereals in local market to purchase cheaper rice and food products</li> <li>• Opting for wage labour, small non-farm businesses</li> </ul>	<ul style="list-style-type: none"> <li>• Promotion of high yielding crop varieties</li> <li>• Promotion of domestic employment and income generating opportunities</li> <li>• Promotion of leasing land to poor with inputs</li> </ul>	<ul style="list-style-type: none"> <li>• External interventions and service providers not gender sensitive</li> </ul>
Disasters (landslide, drought, flood)	<ul style="list-style-type: none"> <li>• Plantation on slopes (e.g., broom-grass, bamboo to prevent landslides)</li> <li>• Saving food for disasters</li> <li>• Use of women's knowledge and networks during disasters</li> </ul>	<ul style="list-style-type: none"> <li>• Promotion of seed banks in safe places</li> <li>• Preparedness training</li> <li>• Women targeted skill training (e.g., masonry)</li> <li>• Formation of community disaster management committees</li> <li>• Creation of emergency fund</li> </ul>	<ul style="list-style-type: none"> <li>• Special attention to woman's needs not addressed</li> <li>• No/limited access of women to resources (committees, training, subsidies, grants, etc.)</li> </ul>

## Annex 7: Conclusive analysis of impact of climate and other changes on women

Key emerging issues	Women specific gaps/challenges	Specific opportunities and needs
<p><b>1. Increase in women's workload and drudgery</b></p>	<ul style="list-style-type: none"> <li>Women unable to grab opportunities: limited or no access to local level climate change and other development resources/funds, related training, skills, knowledge, technologies, including, leadership positions etc.</li> <li>Less/no time for leisure: increased fatigue</li> <li>Decrease in women's mobility: less time for community work and natural resource management/conservation</li> <li>Decline in women's participation in local level climate change-related planning and decision making processes</li> <li>Limited/no access to new knowledge, information to adapt to climate change</li> </ul>	<ul style="list-style-type: none"> <li>Support/introduce low carbon emission and time saving technologies for women (e.g., for cooking, drinking water, irrigation, agro-processing, etc.)</li> <li>Direct support for small infrastructure (development, grants, subsidies, etc. that directly support women)</li> <li>Link with larger climate change and development programmes such as National Rural and Renewable Energy Programme, Alternative Energy Promotion Centre (AEPIC); NCCSP, Local Governance and Community Development Programme (LGCDP)</li> <li>Leadership and gender training/package for rural women and men</li> <li>Promotion of insurance for crops, livestock, etc.</li> <li>Strengthen men to support women's leadership</li> <li>Needs assessments on poor and marginalized women's technology needs</li> </ul>
<p><b>2. Need for alternative technologies and new knowledge</b></p>		
<p><b>3. Limited/no access to financial resources</b></p>		
<p><b>4. Loss of traditional and new income of women</b></p>	<ul style="list-style-type: none"> <li>Women's increased dependency on men/household heads for money— resulting in loss of financial independence, increased loans and increased subordination of women</li> </ul>	<ul style="list-style-type: none"> <li>Technical support and inputs to adapt to climate change</li> <li>Targeted financial support (provision of grants, subsidies, and funds for enterprise development etc.)</li> <li>Appropriate skill training based on socioeconomic assessment</li> <li>Link time-saving energy technologies with enterprises</li> <li>Area specific in-depth analysis/studies on the needs and key barriers to women's access to new technologies, extension services, and credit facilities</li> </ul>
<p><b>5. Reinforcement of exclusion of women</b></p>	<ul style="list-style-type: none"> <li>Decreased/no access and control over local level climate funds and resources (decisions, distribution and benefit sharing)</li> <li>Exclusion from local level climate change planning processes</li> <li>De-acceleration of the momentum gained in women's empowerment process - e.g. disintegration of the women groups; decrease in women's participation, leadership in key decision-making forums, bodies etc.</li> </ul>	<ul style="list-style-type: none"> <li>Develop awareness campaign and disseminate knowledge on climate change and about the available resources</li> <li>Gender training, coaching, and mentoring for service providing agencies (e.g., on gender, gender analysis, organizational change for gender equality, etc.)</li> <li>Strengthen rural women's leadership (e.g., by training, coaching, and mentoring)</li> <li>Engage men to support women's leadership</li> </ul>
<p><b>6. Backsliding of rural women's achievements and roles</b></p>		
<p><b>7. Declining of women's leadership</b></p>		
<p><b>8. Increase in violence against women</b></p>	<ul style="list-style-type: none"> <li>Decrease in women's mobility and overall empowerment process.</li> </ul>	<ul style="list-style-type: none"> <li>Introduction and inclusion of psychosocial approaches in extension/training packages</li> <li>Awareness raising and link with existing organizations working on human and women's rights</li> <li>Analysis and studies to understand the linkages between climate change and violence against women</li> </ul>
<p><b>9. Mismatch between demand and supply</b></p>	<ul style="list-style-type: none"> <li>Specific women's needs and barriers to access resources, new technologies, funds etc. not understood and recognized by development interventions/service providers</li> <li>Service delivery mechanisms not sensitive towards poor and marginalized women</li> </ul>	<ul style="list-style-type: none"> <li>Strengthen and develop practical mechanisms between service provider institutions for coordinated inputs and services</li> <li>Strengthen local-level planning process to ensure involvement of poor women (e.g., integration/provision of gender equality and social inclusion [GESI] analysis at VDC level)</li> </ul>
<p><b>10. Increasing health issues</b></p>	<ul style="list-style-type: none"> <li>Access to timely and appropriate health services</li> <li>Diversion of financial resources for health instead of investment on income generation</li> </ul>	<ul style="list-style-type: none"> <li>Improve access to health services particularly for the poor and marginalized women (innovate mechanisms and systems)</li> <li>Qualitative scoping studies on the effects of climate change on women and barriers to health facilities</li> </ul>





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