



# LOCALLY LED ADAPTATION

A Call for Local Climate Action

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## FOREWORD

Nepal is among the nations that are most vulnerable to the impacts of climate change. Given the increasing severity of climate change impacts, it is crucial that the most vulnerable and affected people and communities have access to the necessary tools, resources and technology to develop resilience. In this regard, different examples of locally led adaptation (LLA) have been successfully used by communities for a long time. This report has been prepared based on the information collected on local climate impacts and case studies of community members from three municipalities that have been practicing local adaptation actions.

The research findings showed that vulnerability to climate change has added another degree of stress to the limited institutional capability at the local level. However, local adaptation actions that communities are practicing can help reduce the possible loss and damage from extreme climate events. Local practices are being gradually and continuously improved to respond efficiently to the effects of climate change. Methods like ecosystem-based adaptations, nature-based solutions and cultural practices such as those of indigenous Tharu communities have proved to be effective adaptation strategies. As Nepal is already a pioneering country when it comes to designing and implementing local adaptation plans, a more widespread and formal adoption of the principles of locally led adaptation further demonstrates its direction and priorities in undertaking local climate action. However, greater acknowledgment and support of such local action would add value to Nepal's efforts to promote LLA.

The research also showed that local communities and their local institutions, such as forest user groups, women's groups, youth groups, indigenous groups and community leaders such as the "Badghar" of Tharu communities are the key actors in promoting LLA. Building their capacity to improve and share their local knowledge will improve their ability to meet the challenges of building resilience. Similarly, financial assistance plays a vital role in the sustainability of local initiatives. However, the minimal budget allocation by all three municipalities shows some gaps in terms of the promotion of LLA. The conclusions of the paper are therefore clear that LLA can significantly lower the community's exposure to climate risk, but to promote such knowledge, skills and technology Nepal requires more investment from all tiers of government and international funding agencies.

Finally, I would like to thank Rajan Thapa, who oversaw and coordinated this study, as well as Samjhana Bista and Bharati Ojha, members of the technical team. I would also like to thank Sidsel Koordt Vogensen, Mattias Söderberg, Lars Jacobsen, Alma Garcia, Ayshna Rajbhandary, Sunjuli Singh Kunwar and Wricha Sharma Uprety for their valuable contributions in reviewing and finalizing the publication.



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# LIST OF ABBREVIATIONS

<b>AFOLU</b>	Agriculture, Forestry and Other Land Use
<b>ASHA</b>	Adaptation for Smallholders in Hilly Areas
<b>CBO</b>	Community-Based Organisation
<b>CC</b>	Climate Change
<b>CCA</b>	Climate Change Adaptation
<b>COP</b>	Conference of the Parties
<b>DHM</b>	Department of Hydrology and Meteorology
<b>DRRM</b>	Disaster Risk Reduction and Management
<b>EbA</b>	Ecosystem-based Adaptation
<b>FGD</b>	Focus Group Discussion
<b>FY</b>	Fiscal Year
<b>GCA</b>	Global Center on Adaptation
<b>GCF</b>	Green Climate Fund
<b>GEF</b>	Green Environment Facility
<b>Ha</b>	hectare
<b>ICIMOD</b>	International Centre for Integrated Mountain Development
<b>IIED</b>	International Institute for Environment and Development
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IUCN</b>	International Union for Conservation of Nature
<b>KII</b>	Key Informant Interview
<b>LAPA</b>	Local Adaptation Plan for Action
<b>LDCRP</b>	Local Disaster and Climate Resilient Plan
<b>LLA</b>	Locally Led Adaptation
<b>MoF</b>	Ministry of Finance
<b>MoFE</b>	Ministry of Forests and Environment
<b>MoHA</b>	Ministry of Home Affairs
<b>NAP</b>	National Adaptation Plan
<b>NAPA</b>	National Adaptation Programme of Action
<b>NCCSP</b>	Nepal Climate Change Support Programme
<b>NDC</b>	Nationally Determined Contribution
<b>PFM</b>	Public Finance Management
<b>REDD</b>	Reducing Emissions from Deforestation and forest Degradation
<b>UNDP</b>	United Nations Development Programme
<b>UNEP</b>	United Nations Environment Programme
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change

# EXECUTIVE SUMMARY

## Context

Nepal is among the countries that are most affected by climate change, where global warming has increased in severity to an average temperature increase of 0.056°C. Frequent floods, landslides, intense rains and drought have been experienced in various forms nation-wide. To combat these impacts, the Government of Nepal has formulated various legislative frameworks, including provisions on locally led adaptation such as endorsing the principle of locally led adaptation at COP26 in Glasgow and drawing up and mainstreaming a Local Adaptation Plan for Action (LAPA). Over the years, various adaptation practices, such as community-led adaptation, ecosystem-based adaptation and ecosystem-based disaster risk reduction, have been practiced. Similarly local people are using their local knowledge and practices to adjust to the various impacts of climate change. To measure their effectiveness, few studies focusing on Indigenous and local knowledge for climate resilience and locally-led adaptation have taken place. Studies focusing on case studies are rare, despite being crucial for replication, wider scaling up and increasing climate resilience financing initiatives globally.

This document describes the findings of a study on local climate change adaptation (CCA) practices adopted in three municipalities in western Nepal. The overall objective of the study was to understand the knowledge local people have about climate change and its adaptation, and the local efforts being made in respect of it. It applies the modified version of the framework produced by the Ministry of Science, Technology and Environment (MoSTE) in 2015 for framing indigenous and local knowledge

and practices strengthening climate resilience in Nepal. For this, ten days of fieldwork were carried out, which included focus-group discussions, key informant interviews and the collection of CCA stories. The study area covered the Middle Hills, Chure and Terai regions of Nepal, selected on the basis of their vulnerability to climate change and climate-induced disaster: Dullu Municipality in Dailekh, Rajapura Municipality in Bardiya, and Bheemdatt Municipality in Kanchanpur District.

## The National Adaptation Narrative

The study team reviewed the national policies and frameworks on climate change adaptation and the provisions they have made for local adaptation practices. Mainly, the Climate Change Policy (2011, revised 2019), the National Adaptation Plan of Action (NAPA, 2010), the Local Adaptation Plan for Action (LAPA 2011, revised 2019) and the National Adaptation Plan (NAP 2021-2050) were considered. The Climate Change Policy was found to address both mitigation and adaptation, with the components focusing on adaptation and resilience for local communities. The study also recognises that NAPA 2010 and LAPA 2011 emphasize the urgency of adaptation needs, practices and adaptation frameworks both nationally and locally. The revised LAPA framework has elaborated its focus to integrate local people's needs to adapt for climate resilience into local planning systems. The NAP 2021-2050 was found to be crucial in the context of this study, as it aims to reduce the country's vulnerability to climate change and facilitate the integration of climate change adaptation in policies and programmes across both sectors and levels of government.

## Research Findings

The majority of local people were found to be familiar with the term “climate change” and had experienced its impacts in the forms of drought, extreme, unpredictable rainfall, landslide flooding, inundations, increasing temperatures, shorter winter periods, the continued reduction of agricultural productivity and siltation.

The respondents shared their experience with examples, such as cases of drought: thus, a water spring in Badapokhara, Dullu, was reported to have dried up completely, resulting in a walk of 1.5 to 2 hours to fetch drinking water. Similarly, the locals in Rajapur stated that, in the last 38 years, they have witnessed seven major flood events (1983, 2009, 2012, 2014, 2017, 2020, 2021) with an approximate loss of USD 1.5 million in 2021 alone (record of Rajapur Municipality). Similarly, the Tharu community in Rajapur revealed evidence of climate change impacts in their lifestyle, agriculture and socio-cultural traditions. In Bheemdatt, between 1991 and 2020 the mean annual maximum and minimum temperatures increased by 0.063° C/year and 0.072° C/year respectively, and the average annual rainfall increased by 12.329 mm each year, resulting in increases in flooding (39%), windstorms (13%) and drought (10%).

The study identified some very interesting local adaptation practices in the study area. Communities in Dullu have built solar water-lifting schemes to meet the demand for drinking and irrigation water. Similarly, they have constructed plastic ponds in the fields to collect rainwater, which allows them to irrigate during the dry season. Similarly, they were found to practice drip irrigation for off-season vegetable farming, were sowing hybrid seeds and restoring forests to allow the water to be recharged. They were also found to practice organic farming, applying biofertilizers and biopesticides on their vegetables and crops. In Rajapur, collective efforts were quite visible. They cleaned the irrigation canal right before the monsoon and constructed bio-check dams to prevent flooding. The “Badghars, locally chosen and recognised Tharu community leaders, were hugely influential in mobilizing the community to operate an early warning system

during emergencies and had designed plans for adaptation among others plans. People in Bheemdatt were found to have introduced various nature-based solutions, including ecosystem-based adaptation such as the restoration of ponds and forests, the planting of alternative cash crops, such as lemons, bananas and medicinal herbs, and the management of community forests. Similarly, dams and irrigation canals were also constructed using local knowledge and materials to prevent flash flooding and landslides.

### Identified Gap

Vulnerability to climate change has added another degree of stress to the limited institutional capability at the local level. The study shows that the local communities have limited knowledge, information or skills allowing them to upscale their practices. However, it was also observed that the local initiatives that have the potential to be integrated into the local adaptation strategies and programmes have received very little attention from local government. To address climate change vulnerabilities, local communities and their institutions, such as forest user groups, women’s groups, youth groups, indigenous groups, and the Badghar, must be ready, which was not the case in the study area. Furthermore, the communities in the research areas were found to employ livestock and take out crop insurance as a way to transfer climate risk, but the lengthy and demanding administrative procedures for obtaining compensation have rendered this practice less successful. To increase sustainability and promote such local initiatives, financial assistance plays a vital role. However, budget analyses of the three municipalities revealed that the local government had allocated a very minimal amount to these initiatives, less than 2% of the total annual budget. All three local governments have affirmative plans

and policies to deal with the impacts of climate change, which, however, is not reflected in the annual budget.

## Call for Local Climate Action

### A. GOVERNMENT AND POLICYMAKERS IN NEPAL

- **Create a common platform.** Government should bring together indigenous and local knowledge holders, practitioners, researchers and decision-makers by creating a common forum where they can share best local practices and push for the scaling up of local adaptation actions and the provision of adequate funding to local stakeholders.
- **Access to international funding through coordination and networking.** The government should focus on networking and cooperation with international climate-funding mechanisms such as the Green Climate Fund (GCF) and Adaptation Funds to channel funds where they are required.
- **Integrate climate change adaptation into local development planning.** The government should focus on capacity-building and technical support activities to identify and integrate the essential adaptation strategies into local development planning.

### B. INTERNATIONAL AND NATIONAL FUNDING AGENCIES AND DEVELOPMENT PARTNERS

- **Call on more donors and development partners to endorse the principles of LLA.** There are still only a small number of institutions that have endorsed the principles of LLA. This

means that the principles of LLA should be accepted globally and the importance of local knowledge and expertise in addressing climate risk should be highlighted.

- **Scale-up finance to promote locally led adaptation.** It is recommended that donor agencies and development partners first scale up their funding and channel it more quickly and efficiently so that local partners have easy access to funding and can deploy it to support long-term LLA on the ground.
- **Partnership to scaling up LLA.** It is recommended that donors and development partners, especially climate finance providers and intermediaries, hear stories and solutions from the ground and invest in scaling up and spreading local adaptation skills and knowledge.

### C. LOCAL GOVERNMENT AND CBOS

- **Participation in local policy formulation.** Indigenous and local communities that are taking local adaptation action should be heard by the local government. In order to ensure that the community's voice is heard in the policies and strategy, local government should ensure that they engage in such processes.
- **Empowering communities to raise their voices.** CBOs and local organisations should empower communities to raise their voices and should create an enabling environment for them to promote LLA.





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CHAPTER I

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**BACKGROUND**

## Introduction



Community Solar Water Lifting Scheme in Bardiya.

Climate change is threatening lives and ecosystems around the world. Nepal too is very vulnerable to climate change and natural disasters. Climate-related natural disasters, such as floods, landslides, droughts and extreme weather events, are on the rise and have resulted in lost lives, properties and livelihoods.

They have also caused significant damage to all climate-sensitive sectors, such as agriculture, infrastructure, the ecosystem and the country's economy (MoFE 2018). Climate-related calamities alone claimed 438 lives in 2021 and losses of over 2.5 billion NPR in property, and destroyed 3678 individual residences (MoHA, 2022). A 2.08% drop in GDP was caused by climate-induced disasters in FY2017–18. Because of Nepal's fragile geography and biophysical, social and economic characteristics, climate change impacts manifested themselves in unique ways. Climate

events differ greatly from one site to another, and only local communities have the knowledge and experience of adaptation techniques that are appropriate and in use locally. Over the years, people have used their knowledge and practices to adapt to the changing economic, ecological and social dynamics in their localities. People continue to do this to reduce the hazards and risks imposed on them by climate change, and over time these adjustments have evolved into indigenous adaptation practices (Anik and Khan 2012). This local knowledge can help produce

robust and cost-effective solutions that are more equitable for responding to community needs. However, those local actors who need adaptation funding the most rarely receive it, and the crucial knowledge and skills they provide are frequently ignored (IIED 2020; Restle-Steinert et al. 2019).

This report describes the mechanisms of suitable governance strategies for climate change adaptation that are specific to Nepal and other Least Developed Countries (LDCs). It also argues the need to adopt an adaptive co-management approach, where the government and all stakeholders identify common local and national mainstreaming strategies for knowledge management, resource mobilization and institutional development, ultimately using adaptation as a tool to handle global change.

### **Rationale for locally led adaptation actions (LLAs)**

The Intergovernmental Panel on Climate Change (IPCC) has issued a warning encouraging the international community to take rapid action on climate change. Nepal is among the countries that are most affected by climate change. Global warming has increased the severity of change, with an average yearly increase in the maximum temperature of 0.056 °C (DHM 2017), as well as frequent floods, landslides, intense rains and drought. Even though the Paris Agreement sets an adaptation target, and although adaptation issues have gained a priority, the response still requires effective natural resource management, functional institutions with increased capacity and capability, and improved literacy on climate change. However, adaptation is becoming complicated in practice as climate change and its impacts are coming faster than natural processes can cope with, and they are interlinked with and embedded in a range of social, economic and political processes. For example, in October 2021, massive flooding from the Babai River damaged thousands of hectares of land. It is estimated that around a thousand farmers in Barbardiya municipality alone lost over 2,643 hectares of rice, with economic losses of about USD 2.16 million (Barbardiya Municipality, 2021). With limited knowledge about climate change

adaptation and community capacity, such losses can be predicted to rise in the coming years. Thus, the adaptations are also link with the population's food security. Similarly, to ensure that locally led adaptation (LLA) is resilient to future climate risks and that it addresses the combination of structural inequalities experienced by various groups, including women youth, and marginalised ethnic groups, Nepal endorsed the principle of LLA at the COP26 in Glasgow. LLA is controlled by local people, grounded in local realities, ensures equity and inclusivity, and is facilitated by local networks and institutions (WRI, 2022). It is also rooted in an existing shift in the development field, whereby practitioners and academics alike are moving away from both "externally led" and "community-based" approaches in different ways (Movement for Community-led Development 2019).

However, effective LLA does not happen spontaneously: strong local leadership and institutions are required. On top of that, it is crucial to understand the knowledge and awareness levels of such leadership, as well the local population, so that appropriate projects and programmes can be designed. Projects led by the government, such as the Nepal Climate Change Support Programme (NCCSP) and Adaptation for Smallholders in Hilly Areas (ASHA), are examples of fostering local adaptation measures. Reviewing the adaptation techniques that communities have been using for a long time by combining them or adjusting them to scientific knowledge is required to provide communities with the appropriate capacity and resources to cope with the impact of climatic challenges and become climate resilient. Resilience varies according to local conditions, cultures, ecosystems and impacts. One community may require early warning systems, another may adopt integrated agricultural practices, another may control river-cutting through nature-based solutions like bio-check dams. Similarly, in support of local adaptation plans, communities in Nepal are coming up with locally led solutions to help communities adapt to the impacts of climate change. However, the challenge of the decade is how to support and finance initiatives promoting climate resilience globally and urgently.



CHAPTER II

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**CONTEXTUALIZING  
LOCAL CLIMATE ACTION**

This chapter offers a brief synthesis of several bodies of literature, with a focus on LLA for climate change adaptation on the ground and government policies, plans and local mechanisms. This chapter also reveals some of the similarities between the LLA's guiding principles and Nepal's LAPA framework.

## 2.1. Nepal's policy initiatives on local climate action

Nepal has undertaken several initiatives in response to the increasing impacts of climate change in various sectors, affecting both the economy and ecosystem services. These initiatives range from policy formulation to institutional strengthening to programme/project development and implementation. At the policy level, Nepal developed a Climate Change Policy in 2011, which it then revised in 2019. The policy addresses both mitigation and adaptation, with the adaptation component focusing on adaptation and resilience for local communities, in line with the priorities identified in the National Adaptation Programme of Action (NAPA), which was developed in 2010. The overall goal of the policy is to “contribute to the socio-economic prosperity of the nation by building a climate resilient society.” It has set policy, strategy and working policies recognising eight thematic areas: 1) agriculture and food security, 2) forests, biodiversity and watershed conservation, 3) water resources and energy, 4) rural and urban habitats, 5) industry, transport and physical infrastructure, 6) tourism and natural and cultural heritage, 7) health, drinking water and sanitation, and 8) disaster risk reduction and management. It has also set policy targets focusing on four inter-thematic areas: 1) gender equality and social inclusion (GESI), livelihoods and good governance, 2) awareness raising and capacity development, 3) research, technology development and expansion, and 4) climate finance management (MoFE, 2019).

Nepal's 2010 National Adaptation Programme of Action (NAPA) and 2011 Local Adaptation Plan for Action (LAPA) placed the emphasis on the most urgent and immediate adaptation needs, practices and adaptation frameworks from the national to

the local levels in terms of programmes, plans and frameworks. The LAPA framework was updated in 2019 to reflect changes to the political system and to regional, national and global policies. The LAPA framework provides a way to integrate local people's adaptation needs for climate resilience into the local planning system and to localize the implementation of local climate actions.

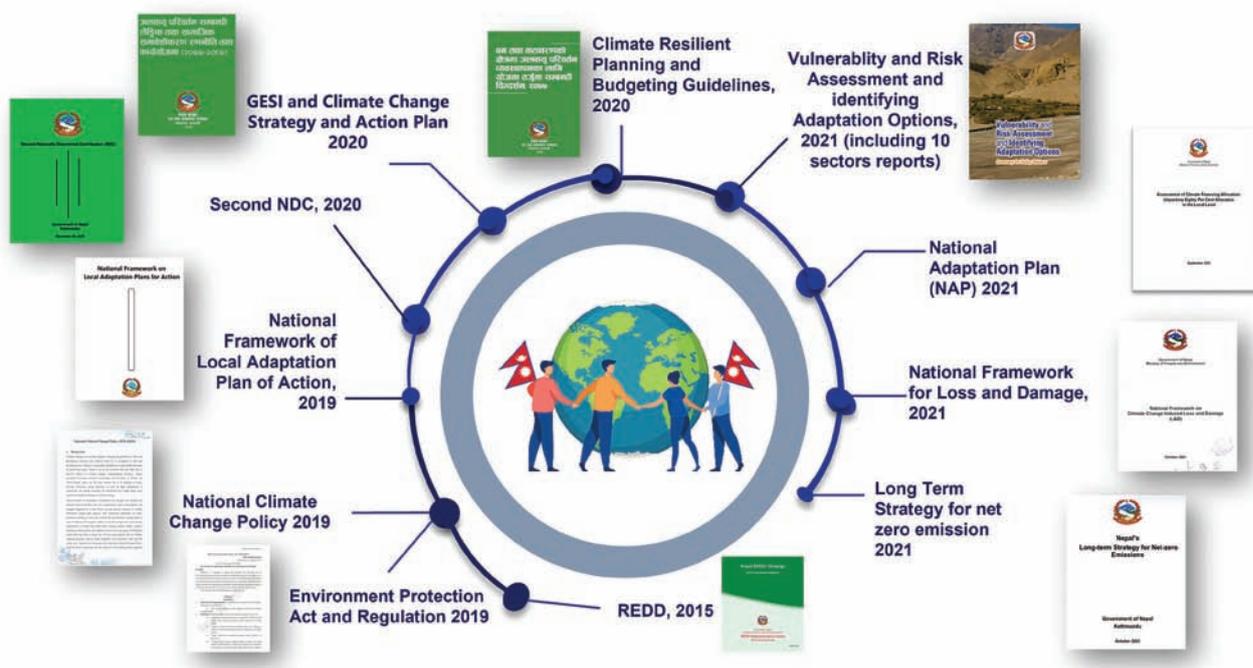
In 2015, the government submitted its first Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC). The Nepalese government has set itself the goal of building sufficient capacity to withstand the effects of climate change and reduce greenhouse gas emissions. In 2020, the government approved and submitted a second NDC to the UNFCCC. Nepal's second NDC features a short-term (2025) and a medium-term (2030) mitigation target that incorporate different sectors, including energy, waste, agriculture, forestry and other land use (AFLOU). Many targets for mitigation are associated with the energy, transportation, residential and AFLOU sectors. This document emphasizes the importance of adaptation and resilience building in protecting lives, livelihoods and ecosystem services from the impacts of climate change and highlights the NAP as a key mechanism for articulating the country's adaptation needs. By 2030, all 753 local governments in Nepal are expected to have prepared and implemented gender-responsive and climate-resilient adaptation plans in line with the country's second NDC. The plans will address the vulnerability and risks associated with climate change and prioritise adaptation and disaster risk reduction and management measures focusing on women, people with disabilities, children, seniors, the young and indigenous peoples, as well as communities that are economically disadvantaged and/or that live in

climate-vulnerable regions. Similarly, Nepal aims to achieve net zero emissions by 2045. A Long-term Strategy for Net-zero Emissions (2021) envisions bold policy-making, social transformation and technological advances that will lead to a carbon-neutral, inclusive and climate-resilient future.

Nepal recently developed its National Adaptation Plan (NAP) 2021-2050 with the goal of reducing the country’s vulnerability to climate change and facilitating the integration of climate change adaptation in policies, programmes and activities across sectors and at all government levels. The plan outlines short-term priority actions through 2025, as well as medium-term priority programmes through 2030 and long-term adaptation strategic goals through 2050. Similar to this, Nepal has also developed a National Framework on Loss and Damage (2021), which offers more insights into the pertinent approaches, methodology and tools with which to assess the risks associated with climate change consequences that cannot be avoided, mitigated or averted. In addition, this framework would give Nepal a unique opportunity to create national-driven, inclusive, participatory strategies to address climate change risk and vulnerability.

On the financial side, Nepal introduced a climate change budget code in the 2012–13 fiscal year. A technical committee on climate finance has been established, with leadership from the Ministry of Finance. Although the country’s ability to mobilise funds from international sources is considered to be low, Nepal has been successful in accessing climate finance from mechanisms under the UNFCCC, including the Least Developed Countries Fund (LDCF) and the Adaptation Fund, as well as approval for NAP readiness funding from the Green Climate Fund in 2016. As a further step, Nepal drew up a Climate Change Financing Framework in 2017. The Framework provides a road map to integrate CC in planning and budgeting by identifying entry points based on legal, institutional and processual analysis of the existing public finance management (PFM) system. It also helps to create a monitoring system that enables reporting on CC-related expenditures and their effectiveness and thereby provide feedback to the decision makers in directing the climate budget to much needed sectors and areas in order to reach the poor and vulnerable (MoF, 2017).

**Figure 1:** Nepal’s initiatives on climate change related law policies, plan, and strategies



Source: MoFE, 2022

## 2.2 Principles for locally led adaptation and Nepal's commitment

LLA is characterised by local people and their communities having individual and collective agency over their adaptation priorities and over how adaptation takes place (Soanes et al. 2020). Principles for Locally Led Adaptation have been developed by the Global Commission on Adaptation and were launched at the 2021 Climate Adaptation Summit to guide efforts to promote locally led adaptation. Locally Led Adaptation (LLA) is a strategy that helps communities generate and apply solutions by enabling, fostering and utilizing their enormous potential and innovation. These eight principles stimulate effective, fair and transparent adaptation by giving authority to local stakeholders without assuming that they carry the burden of adaptation actions (GCA, 2021). At COP26, global leaders and funders mobilised more than US\$450 million for efforts targeted at implementing locally led approaches to building climate resilience (WRI 2022). Similarly, the Glasgow Climate Pact (an outcome document

of COP26) also recognises the important role of indigenous peoples and local communities, as well as their cultures and knowledge, in addressing climate change. Increasing global commitments to LLA, at COP26 in November 2021 Nepal endorsed the Principles of Locally Led Adaptation and became one of the first LDC nations to endorse principles for LLA. As of 18 August 2022, around eighty institutions, including governments, have endorsed the Principles for LLA (IIED 2022). Moreover, Nepal's LAPA is closely tied to the LLA principle, particularly in terms of delegating decisions from the central to the local level and allocating adaptation funds to the latter. For a country like Nepal, which is a pioneer in designing and implementing local adaptation plans, these principles can serve as touchstones for a variety of actors who can commit to change their current behaviour and thus enable more sustainable and successful adaptation locally. Furthermore, it provides disadvantaged and excluded groups with an opportunity to prioritise and design adaptation solutions, transforming them from recipients into empowered agents of change.



## **The Eight Principles of Locally Led Adaptation from the Global Commission on Adaptation**

Principle 1: Devolving decision-making to the lowest appropriate level: Giving local institutions and communities more direct access to finance and decision-making power over how adaptation actions are defined, prioritised, designed, implemented; how progress is monitored; and how success is evaluated.

Principle 2: Addressing structural inequalities faced by women, youth, children, people living with disabilities, the displaced, Indigenous peoples, and marginalised ethnic groups: Integrating gender-based, economic, and political inequalities that are root causes of vulnerability into the core of adaptation action and encouraging vulnerable and marginalised individuals to meaningfully participate in and lead adaptation decisions.

Principle 3: Providing patient and predictable funding that can be accessed more easily: Supporting long-term development of local governance processes, capacity, and institutions through simpler access modalities and longer-term and more-predictable funding horizons to ensure that communities can effectively implement adaptation actions.

Principle 4: Investing in local capabilities to leave an institutional legacy: Improving the capabilities of local institutions to ensure they can understand climate risks and uncertainties, generate solutions, and facilitate and manage adaptation initiatives over the long term without being dependent on project-based donor funding.

Principle 5: Building a robust understanding of climate risk and uncertainty: Informing adaptation decisions through a combination of local, traditional, Indigenous, generational, and scientific knowledge that can enable resilience under a range of future climate scenarios.

Principle 6: Flexible programming and learning: Enabling adaptive management to address the inherent uncertainty in adaptation, especially through robust monitoring and learning systems, flexible finance, and flexible programming.

Principle 7: Ensuring transparency and accountability: Making processes of financing, designing, and delivering programmes more transparent and accountable downward to local stakeholders.

Principle 8: Collaborative action and investment: Collaboration across sectors, initiatives, and levels to ensure that different initiatives and different sources of funding (e.g., humanitarian assistance, development, disaster risk reduction, green recovery funds) support each other, and their activities avoid duplication, to enhance efficiencies and good practice.

Source: IIED, 2021

### 2.3 LLA Practices in Nepal

The IUCN, United Nations Environment Programme (UNEP) and United Nations Development Programme (UNDP), in collaboration with the Government of Nepal, implemented the Ecosystem-based Adaptation in Mountain Ecosystems (Mountain EbA) Project in the Panchase Protected Forest region within the districts of Kaski, Parbat and Syangja from 2011 to 2016. The EbA Project aims to address both livelihood and ecosystem-based issues. The Project was more focused on restoring ecosystems to reduce the risk of landslides and soil erosion; restoring wetlands, springs and ponds to help ensure continued water supplies; and maintaining and improving soil health and nutrition to increase productivity and soil moisture. According to the project's report, EbA activities were cost-effective, helped vulnerable mountain communities in maintaining or enhancing their adaptive capacity, and reduced their vulnerability to climate change. Similarly, the government has started EbA II, "Catalyzing Ecosystem Restoration for Climate Resilient Natural Capital and Rural Livelihoods in Degraded Forests and Rangelands of Nepal" (2019-2022), with support from the Global Environment Facility (GEF) and the United Nations Environment Programme (UNEP). This project was financed through the Least Developed Countries Fund (LDCF). Its main objective was to reduce the climate vulnerability of local communities and to enhance the capacity of the Government and local communities to adapt to climate change by implementing EbA in degraded forests and rangelands in the mid-hills and high mountain areas. To ensure that the EbA strategy is owned

and promoted locally, EbAII piloted Community Livelihood Improvement Plans (CLIPs). As a result, EbA has become a strategy for the rural poor that can incorporate and address many of the concerns and priorities identified by the most vulnerable populations.

The GoN's Nepal Climate Change Support Programme (NCCSP) started bringing LAPAs into practice in 2013 as one of the measures to support locally driven adaptation. A hundred LAPAs were implemented in the western region of Nepal throughout the period of the project. These activities were designed with the objective of changing locals' behaviour as a starting point for supporting climate adaptation and mitigation efforts in the community. The projects integrated community needs and the local skills in the construction of irrigation canals, drinking water supplies, drainage and micro-hydro facilities, suspension and other types of bridges. Similarly, activities like improving a variety of seeds and livestock breeds, and organizing training sessions and orientations on integrated pest management, DRRM and CCA were also integrated into the LAPA. In 2019, the government started implementing NCCSP phase II (2019–2023) in the thirteen municipalities in the provinces of Karnali, Lumbini and Sudurpaschim. By delegating decision-making from the federal to local levels, NCCSPII seeks to address four key climate risks: risks to infrastructure (resilience, loss and damage); quality and quantity of water; agricultural yields and food security; and biodiversity and natural resources.

## 2.4 Climate change adaptation finance for promoting LLA

Nepal has started a number of adaptation-focused initiatives and projects through its domestic development and climate change policies. Numerous adaptation projects and programmes that receive outside funding have also been made possible by national initiatives and other supportive institutional frameworks. According to Oxfam Nepal (2014), Nepal received commitments of over USD 236 million between 2009 and 2012. From 2013 to 2017, Nepal received commitments for a total of 609 climate-related projects worth USD 1.92 billion, of which USD 643 million were made in 2017. In addition, Nepal received 640 million in adaptation and mitigation funding, of which 53% is dedicated to adaptation projects and the remaining 47% to mitigation projects (CARE Nepal, 2020). As part of its National Adaptation Plan (2021–2050), a framework was established to integrate adaptation across all sectors and levels of government. The National Adaptation Plan acknowledges the role of provincial and local governments in addressing climate change adaptation and to contribute

to achieving the national goals. In addition to facilitating the local adaptation efforts, Nepal approved the Local Climate Adaptive Living facility (LoCAL) in 2014. By integrating climate finance into the system of intergovernmental as well as local planning and budgeting, the aim of LoCAL-Nepal was to demonstrate the role and ability of local government in promoting investments in climate change resilience. LoCAL-Nepal Phase I, which ran from 2014 to 2017, was linked with the former District Development Fund and was focused on two districts (Dhading and Rupandehi). The main actions of LoCAL Phase I in Nepal included creating awareness, involving communities and local governments, and allocating funds for investments in climate resilience. As a result, USD 1.6 million (NPR 191.9 million) was invested in the environment and climate change by 22 local governments in Kavre and Sindhuli (LoCAL-UNCDF, 2022). This demonstrates that a small grant accompanied by technical assistance can motivate local governments to increase their climate-resilience investments.



CHAPTER III

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**RESEARCH  
METHODOLOGY**

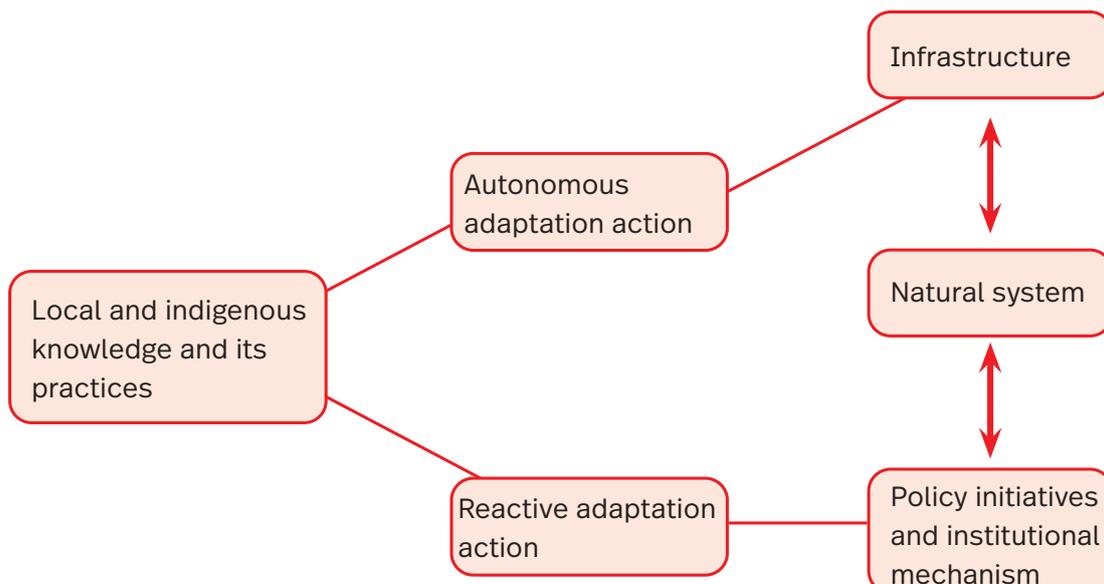
This study attempts to examine adaptation action that are locally led and adopted by local communities to cope with the adverse impacts of climate change.

It adopts a qualitative analytical approach involving focus-group discussions, interviews with key informants and case studies of selected respondents. To reduce the possible threats caused by climate change, a variety of practices have been observed on the ground. These adaptive responses by the community tend to be either 'autonomous' or reactive (autonomous means to having the right and power to act on one's own; reactive means reacting in response to a situation). To bring in the different lens of adaptation action, this study has adopted a modified version of framework produced by MoSTE in 2015, which provides a clear picture of how indigenous and local knowledge and practices have been used in different sectors in a form of adaptation action.

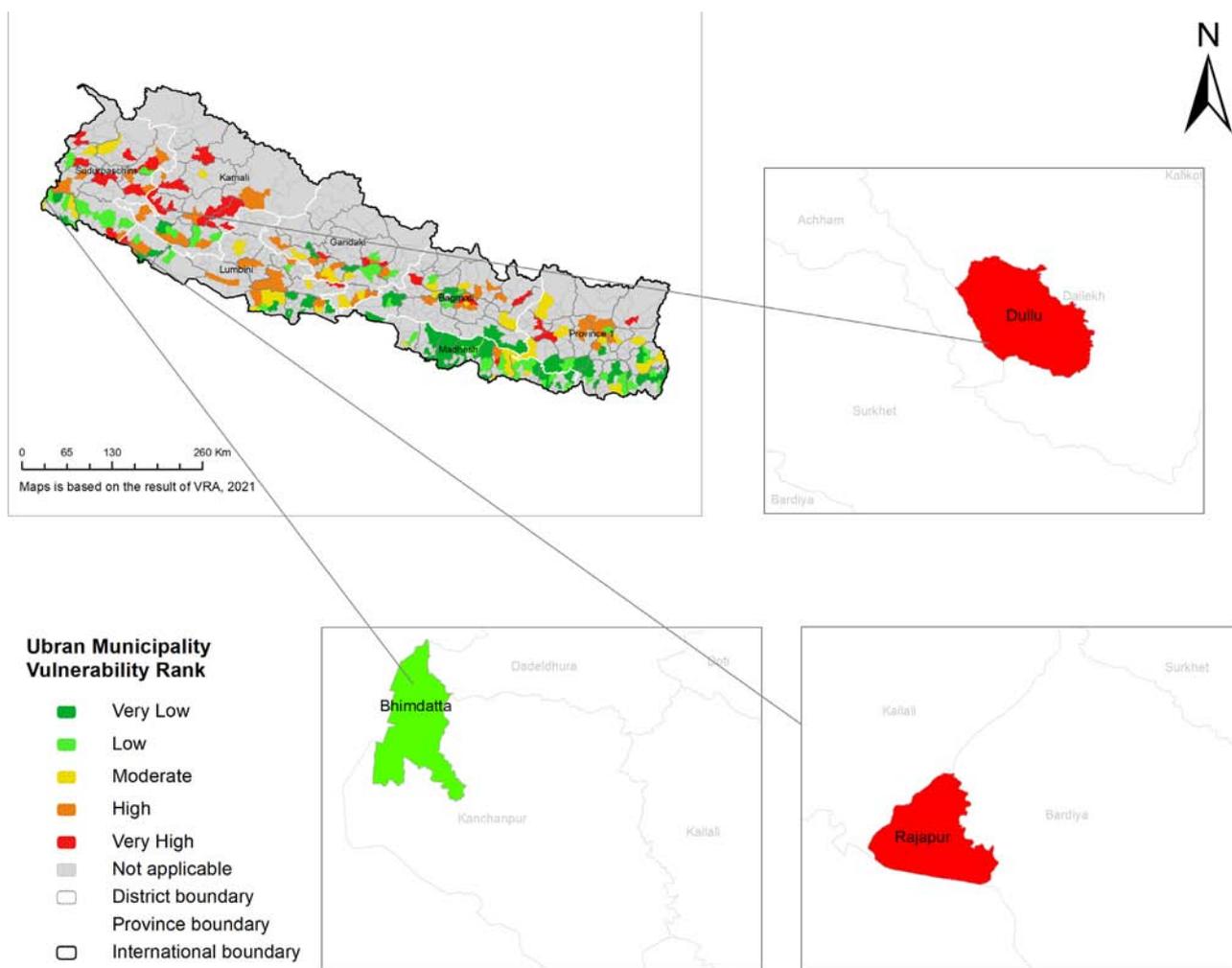
### 3.1 Study area

The study was conducted by focusing on three provinces of western Nepal: Karnali, Lumbini and Sudurpaschim, which are also the strategic focus areas of DCA. The study includes the three municipalities: Dullu in Dailekh, Rajapura in Bardiya and Bheemdatt in Kanchanpur District, representing the Middle Hills, Chure and Terai regions of Nepal. Dailekh ranks very high (0.778-1) in climate vulnerability of Nepal, whereas the baseline context of flood hazards shows Rajapur Municipality in Bardiya District to be flood-prone (MoFE, 2021). Similarly, Bheemdatt municipality is connected with Chure in the north and the Mahakali River in the west, which is also at a high risk of climate-induced disaster. In response to the high likelihood of the negative effects of climate change, residents in the selected municipalities are implementing a variety of adaption measures. In additional, this study has explored those less evident best practices that need to be promoted and shared with a wider range of stakeholders.

**Figure 2:** Framework to Assess Local Adaptation Practices



**Figure 3:** Study area and its climate change vulnerability ranking



### 3.2 Research framework

Based on the framework outlined above, the study design was conducted in the following five steps; a) gap analysis through literature review; b) focus-group discussion to identify the problems associated with climate change, with examples of locally led adaptation practices; c) key informant interviews for accessing policy gaps; d) selection of case stories; and e) data analysis and report preparation. For the case studies, this research employed the approach used by the World Resources Institute (WRI) and the International Institute for Environment and Development (IIED) in their research study “Locally Led Adaptation: From Principles to Practice”, which was released in June 2022.

Literature review. The literature review was conducted to collect information on the best practices and lessons learned from ongoing initiatives promoting local adaptation practices on the ground. Similarly, the review also helped us understand the scope of institutional knowledge and capacity, key policy initiatives and barriers locally to localizing climate actions. Moreover, this study also reviewed similar kinds of initiatives or research studies such as indigenous and local knowledge and practices for climate resilience in Nepal, the LAPA framework, the National Climate Change Policy and the second NDC.

Focus Group Discussions (FGD). FGDs were conducted in ten different locations covering three

municipalities, namely Dullu Municipality, Dailekh; Rajapur Municipality, Bardiya; and Bheemdatt Municipality, Kanchanpur. Each FGD consisted of approximately fifteen people at a time. A set of semi-structured questions was used to conduct the FGD. Case study-focused conversations were also conducted in order to obtain a more comprehensive understanding of the impacts of climate change and the coping mechanisms already in use. The groups included permanent residents of the selected area aged 20-65 years as respondents and had nearly 80% female participation.

Key Informant Interviews (KII). KIIs were conducted with at least two personnel (at least one local government representative and another from the community practicing adaptation work on the ground. In particular, local governments'

annual plans and budgets on climate change-related activities, key policy initiatives and future plans were collected from local representatives.

Case stories. Altogether we collected seven different locally practiced adaptation actions from three municipalities. These cases were identified based on the observed climate change impact, community knowledge and practices, and their success stories in adapting climate change.

Data analysis and report preparation. The information collected in the field was validated through consultation with local government representatives from all three municipalities. After validation, the information was compiled in a case-study format, and other scientific findings were analysed by means of different charts and figures.

**Figure 4:** Research Framework



CHAPTER III

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**RESEARCH FINDINGS**

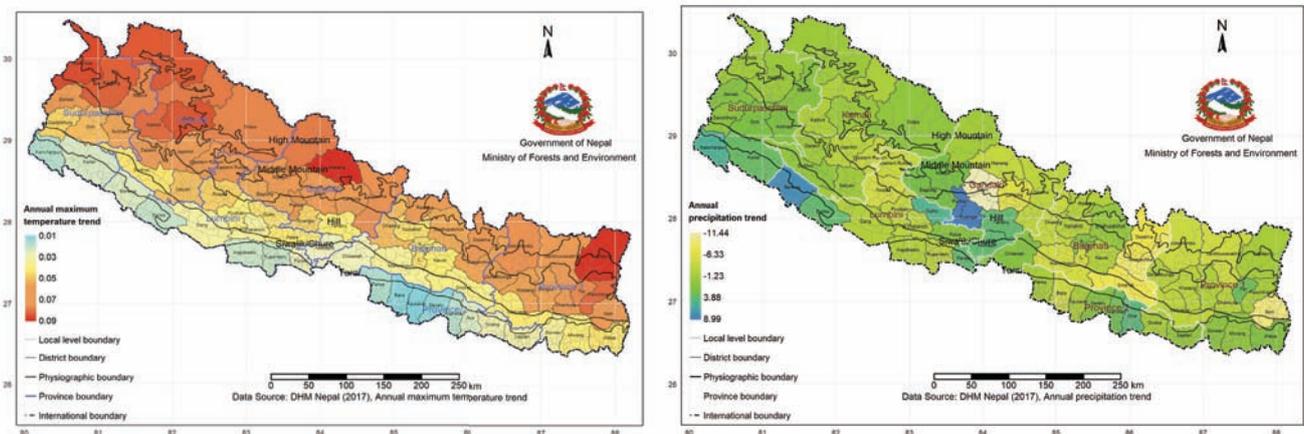
This chapter summarizes major findings from the field research conducted in three municipalities: Dullu, Rajapur, and Bheemdatt. The chapter discusses people’s understanding on climate change, the frequency of extremes rainfall and disaster occurrences in the past, problems, an overview of local adaptation techniques and initiatives taken by local governments. This chapter also presents case stories about peoples’ struggles to adapt climate change.

#### 4.1 Scenario and impact of climate change in the study area

Nepal is witnessing the increasing effects of climate change, such as rapid temperature rises, extreme precipitation events and an increase in the frequency of floods, landslides and droughts, which have resulted in massive economic and non-economic losses and damage (MoFE, 2021; NAPA, 2010). According to a report released by the Ministry of Forests and Environment (MoFE) and the International Center for Integrated Mountain Development (ICIMOD) in 2019, average annual precipitation is expected to rise in both the short term (by 2030) and long term (by 2050). In addition, the average temperature may rise by 0.92-1.07°C in the medium term and 1.30-1.82°C in the long term,

and it might increase by 1.72-3.58°C until the end of the century. As the global temperature target is to limit temperature growth to 1.5°C, the above projection shows that the future will be harsh even for Nepal. The IPCC’s Special Report on Global Warming at 1.5°C that every fraction of a degree of warming matters. Similarly, annual trends in precipitation in Nepal show the differences across the districts and provinces. Precipitation is increasing in research study district Bardiya (7.86 mm/yr), and in all the districts, including Kanchanpur District in Sudurpaschim Province and Dailekh District in Karnali Province. In Sudurpaschim Province, Kanchanpur has seen the highest increase in annual rainfall. Figure 7 gives annual precipitation trends for Nepal’s 77 districts (1971-2014).

Figure 5: All-Nepal annual maximum temperature trends and precipitation trends



Source: MoFE, 2021

## 4.2 Climate Extreme Events and Impacts

### Dullu Municipality, Dailekh

Climate-induced drought has far-reaching implications in the Nepal Himalayas, particularly for the Middle Hills farming system and the rural livelihoods that rely on it. Dailekh is a hilly area in Karnali province that is extremely vulnerable to climate change (0.778-1). The study in Dullu, Dailkeh, observed that all four FGD participants had heard the term “climate change”. However, nor are these communities being left behind by the effects of climate change. The main climatic changes that Dullu had experienced were a shift in the monsoon, higher summer temperatures and shorter winters. Despite the shorter rainy season, the rainfall is intense and causes landslides. Similarly, as the drought intensifies, water resources run out, making life for local communities incredibly difficult. During the FGD in Dullu Municipality, all the participants agreed that agricultural productivity has reduced and that extreme events like landslides and drought had significant impacts on maintaining their lives and sources of livelihood. There used to be a water spring in Badapokhara, Dullu, but due to the drought it has entirely dried up, so now the local residents must walk for 1.5 to 2 hours just to fetch drinking water. Similarly, people in Bhandari Tole and Tariya said that diseases in crops and cattle are increasing.

### Rajapur Municipality, Bardiya

The Rajapur Municipality is home to around 70,000 people who live in constant fear of flooding. Rajapur is situated just beneath the Chisapani gorge into which the river Karnali plunges. Rajapur has a diverse population, with over 80% belonging to the Tharu indigenous community. The study conducted four focus-group discussions with about fifteen participants in each group and observed that approximately 75% of participants had heard

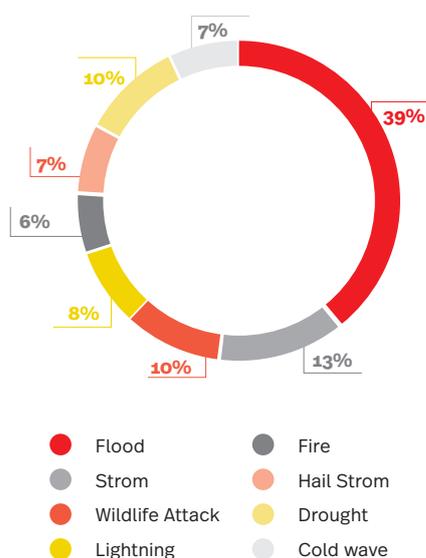
the term “climate change”, and almost all of them had experienced the effects of climate change. The community felt that flooding, inundation, unpredictable rainfall, increasing temperatures, short winter periods, decreases in agricultural productivity, siltation, and increasing diseases in crops and animals are the main climatic events. In the last 38 years they have witnessed big flooding events in Rajapur (1983, 2009, 2012, 2014, 2017, 2020, 2021). Rajapur Municipality’s report for the previous year (2021) states that they recorded a loss of USD1.5 million as a result of the flooding and inundation of paddy land. Climate change has a direct impact on the Tharu community’s lifestyle and culture. Their reliance on nature, particularly soil and water, has been acknowledged for a long time. However, changes in climatic conditions are hurting ethnic farming techniques and their way of life. Tharu perform puja (ritual) before and after sowing, which corresponds to the beginning and ending of the monsoon season. However, the unexpected rains make it difficult for them to celebrate puja. Fishing, on which they rely, is also under threat. During festivals like as Dasain, Tihar, Maghi and Holi, they traditionally go fishing, collect snails or ghungi and collect crabs. However, the numbers taken are currently dwindling.

### Bheemdatt Municipality, Kanchanpur

The municipality of Bheemdatt has witnessed climatic change over time. Climate change manifests itself in the form of shifts in precipitation patterns, as well as extreme hot and extreme cold days. Between 1991 and 2020, the mean annual maximum and minimum temperatures increased by 0.063°C/year and 0.072°C/year respectively. The average annual maximum temperature for the past thirty years was found to be 30.88°C. Similarly, the average annual rainfall increased by 12.329 mm each year (Thagunna et al. 2022). The study conducted two focus group discussions with about fifteen participants in each group and

observed that approximately 80% of participants had heard the term “climate change”. According to the focus-group participants, the main effects of climate change on their communities include flash floods, landslides, reduced crop production and unpredictable, extreme rainfall. In the group discussion, participants noted that temperatures are rising, water sources have dried up and rainfall is becoming very unpredictable. In Chure, flash floods and landslides are triggered by heavy rains. One of the most frequent and intense climate-induced disasters for this municipality is flooding (LDCRP, 2076), which accounts for around 39% of disaster events, followed by windstorms (13%) and drought (10%).

**Figure 6:** Prevalence of disaster in Bheemdatt Municipality



Source: LDCRP, 2020

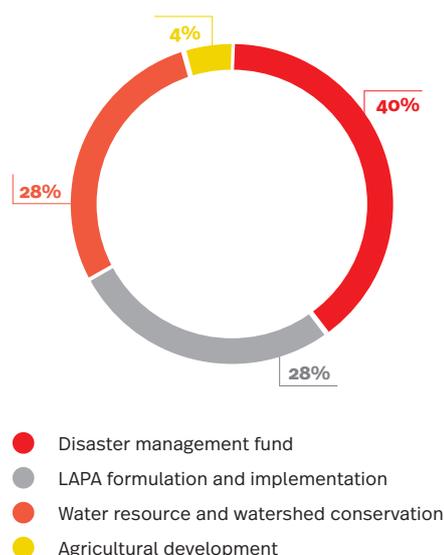
### 4.3 Municipal budget allocations to local adaptation action

Nepal’s National Adaptation Programme of Action (NAPA) implementation framework offers policy provisions ensuring the flow of climate funds to the local levels. In addition, the Local Adaptation Plans of Action (LAPA) framework mandates that 80% of all climate change funds will be allocated

at the local level. In both the 2011 and 2019 climate change policies, it was specified that local governments would receive 80% of climate funding. However, the National Climate Change Policy 2019 prioritises transferring at least 80% of climate funding acquired through the international mechanism, whereas the 2011 policy focused on allocating all available funds to the local level. In order to ascertain how the three municipalities prioritise climate change and intend to mainstream locally led adaptation on the ground, the annual budgets and plans of all three municipalities were also evaluated on the same node.

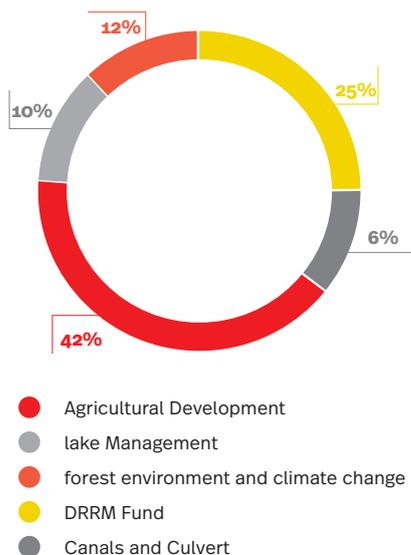
Dullu Municipality published its annual policy and plan for fiscal year 2022/23, with a total budget of USD 9,033,333. (NPR 1,08,40,00,000). However, the entire budget allocation for climate change and disaster risk reduction programmes is just about 1.66%, or USD 150,250 (NPR 1,80,30,000). Whereas the climate-specific budget is approximately 1.1%, the climate-related budget is approximately 0.5%, which appears to be relatively low in contrast to the entire budgeted amount and adaptation needs on the ground. Figure 7 below shows activities under the budget allocated to climate change disasters.

**Figure 7:** Budget allocation for climate change and DRRM in Dullu Municipality



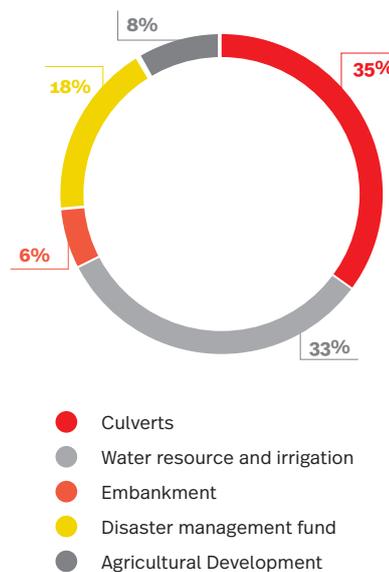
Rajapur Municipality is situated near a flood-prone location in Bardiya, between two major rivers, the Geruwa and the Karnali. Given the circumstances, they should have allocated a substantial budget to promote LLA work as a critical tool for mitigating the effects of climate-induced disasters, but this has not happened. Rajapur Municipality's entire budget for FY (2022/2023) is around USD 8,645,775 (NPR. 1,03,74,93,000). The budget allocated for climate change and disaster management is only 1.94% of the entire budget. Within this portfolio only 0.91% is found to be climate change- and DRR-specific, while only 1.03% is climate-related. Figure 8 below shows the fund allocated to climate change-specific and climate change-related activities.

**Figure 8:** Budget allocation for climate change and DRRM in Rajapur Municipality



Similarly, Bheemdatt Municipality has allocated a total estimated budget of USD 15,335,008 for FY 2022/23. Around 1.5% of the overall budget is dedicated to climate change disaster-related activities. However, the climate change-specific budget is about 0.27%, and the climate change-related budget is around 1.23%. The figure below shows a detailed breakdown of the budget allocated for climate change and disaster-related and specific activities.

**Figure 9:** Budget allocation for climate change and DRRM in Bheemdatt Municipality



The budget analyses of these three municipalities revealed that the local government allocated some funds for climate change-related activities, but they were uninformed by policy laws, allocation procedures or budget-allocation criteria. Similarly, all three municipalities have developed Local Disaster and Climate Resilient Plans (LDCRPs) as part of an attempt to promote LLA. Furthermore, Dullu and Rajapur municipalities have already formulated their LAPAs, but have yet to fully implement them. Likewise, in KII, all three municipal representatives stated that, while the LAPA was intended to allow for decentralization from the federal level to local levels and for the proper distribution of climate funds, there has been a delay in the flow of funds. The work under the LAPA has focused more on promoting development projects than on climate change adaptation initiatives. Thus, despite favourable policies and plans, this local government has failed to commit appropriate finances for climate change adaptation on the ground. Furthermore, it was revealed that there is a strong requirement for climate budget codes with sufficient funds to bridge the gap in adaptation needs on the ground.

## Differentiated Impact of Climate Change

According to the residents of Badapokhara, Dullu, “climate change has had dire consequences on men as compared to women, as they are compelled to migrate overseas owing to unproductivity, drought, and financial insufficiency. Migrant workers often have to work in poor working conditions, which have resulted in their death.” They claim that in the past year, 4 men from the same area have died abroad. If Dullu had not experienced drought, low productivity, changing rainfall patterns, and plant diseases, then men would not have been compelled to leave their country and endure working in unsafe condition, eventually resulting in their death. This is a reality for many who are mourning a family member and finding it difficult to support themselves.

### 4.4 Locally led adaptation examples on the ground

#### 4.4.1 Dullu Municipality, Dailekh

Dullu Municipality has been influenced by climate change in numerous ways, with drought being one of the most significant. Landslides, a lack of productivity, changes in rainfall patterns, short monsoon periods, the drying up of water supplies, livestock fatalities due to heat, the emergence of new diseases in plants and animals, and human migration are the major effects of climate change. Communities in Dullu are coping with and experiencing climate change on a

daily basis. They are involved in different farmer groups, village development activities, cooperatives and volunteer work. Besides, community-based organisations (CBOs) have institutional arrangements in place through which they collaborate to carry out local adaptation initiatives on the ground.

To deal with water scarcity caused by climate change, communities have installed solar water-lifting schemes to meet the demand for drinking and irrigation. Similarly, they have built a plastic pond in the field to collect rainwater, which allows them to irrigate during the dry seasons. They have also adopted diversification in their agricultural systems, including the use of drip irrigation for off-season vegetable farming in tunnels, the construction of irrigation canals, the use of hybrid seeds and afforestation to maintain water recharge and thus cope with changing climatic conditions. Communities also practice organic farming, applying biofertilizers and biopesticides to their vegetables and crops. In addition, they have built and upgraded sheds for buffaloes and participated in manure preparation training sessions arranged by different organisations. They are also engaged in goat farming as a secondary source of income. Communities have insured their crops, vegetables and goats in order to shift the risks associated with climate-related loss and damage. Similarly, they have also formed a collective fund where all the farmers make monthly payments (1HH = Rs. 100/month in Tariya), the money from the fund being used as a loan in times of need or disaster.



Improved Shed in Dullu Municipality

## Case 1

### Ecosystem-based Adaptation (EbA): a hope for the climate migrants of Dullu

This story is a great illustration of how communities can manage and restore ecosystems as an important aspect of their adapting to climate change. It describes how a displaced community transformed a flood-prone location into a habitable one by implementing an ecosystem-based adaptation strategy.

Communities in Badapokhara (Dullu-2) were forced to leave their native land because of climate extremes like drought, extreme rainfall, landslides, water scarcity and a continued decline in crop productivity. Thirty households slowly began to migrate to Tariya, despite it being severely affected by landslides, as it had potential for agriculture.

In order to return the land to vegetable and animal production, the community enforced ecosystem-based approaches which are also cost-effective and reduce vulnerability to climate-induced disaster. In 1998, the community began carrying out specific ecosystem-based adaptation measures, such as building an 1800-meter irrigation channel for irrigation and protection from soil erosion.

Later, several types of seedlings and trees were planted in various layers for the restoration of the ecosystem. They constructed retention walls and introduced bioengineering as a method to prevent landslides in some cases, which eventually turned out to be their success story.

The increase in climate variability, such as extreme rainfall and drought, have compelled the community to shift away from traditional crop-farming towards activities like raising goats, tunnel farming and other types of agricultural practice. The community has recognised diversity in agriculture and vegetation as a new source of income. Every household is engaged in off-season vegetable growing, has constructed plastic ponds for rainwater collection, planted varieties of grass for feeding goats, improvised sheds, and produced biofertilizers and biopesticides from grey water. The market offers a fair price for all the organic vegetables that are produced and distributed. Eleven quintals of onions were sold last year at a competitive price. In addition, each family keeps



Bioengineering Practice in Dullu Municipality

## Case 1 Contd..



Slope Protection through Plantation

at least fifteen goats in the shed, which they use as an additional source of income.

Those in the community are active and have created a small group, called the off-season fresh vegetables group, which collects NPR.100 a month from each household in the group. The group has provision for funding and providing loans to enhance the livelihoods of farmers or help in times of need. With the ecosystem-based adaptation, the community acquires multiple benefits in terms of the environment, society and the economy. On the one hand, the land has become stable and

fertile, and landslides have been prevented. On the other hand, the community generates an income from local agricultural products and practices, which have helped to improve their well-being and economic status.

This is a success story for ecosystem-based adaptation where the shift in the area with restoration brings positive change in the lives of farmers. Even though the thirty households now have to travel to Badapokhara for other services and amenities (schools, markets, hospitals), they have permanently relocated their village to Tariya.

## Case 2

### A new way of vegetable farming

Changes in the patterns and intensity of rainfall have resulted in increased landslides and soil erosion in Dullu, as well as the drying up of water sources. As a result, soil fertility and crop productivity have declined. As water becomes scarce, farmers in Dullu municipality are experimenting with alternative irrigation techniques, plastic ponds and tunnel farming or growing in tunnels.

Mr Dharam Bahadur Thapa (42) is President of the Bhagwati Badapokhara Agriculture Group, Dullu

ward number 2. Previously, he depended only on the traditional farming of maize and wheat, but due to decreasing productivity it became hard for him to cover his household's expenses. As maize and wheat were very dependent on rainfall at particular periods of cultivation, he tried to expand his agricultural production by cultivating other crops, which unfortunately did not succeed due to erratic rainfall, a poor irrigation system, diseases and a lack of knowledge of climate-resilient cropping systems. He was then introduced to

## Case 2 contd..

tunnel farming supported by the CBOs, who made him aware of climate change impacts and relevant adaptation techniques. He started the tunnel farming (or greenhouse farming) of off-season vegetables, which was successful and sufficient to sustain his household. Although tunnel farming is not a very new technology for Nepal, he adopted integrated approaches like improvised sheds which produced organic manure, constructed plastic ponds to collect rainwater and use it as an option for irrigation, and used organic manure and bio-pesticides to produce only organic products.

His income has improved as a result of the vegetable farming, from which he is currently making a net profit of USD 416 to 500 (NPR 50,000 to 60,000), more than the amount he would have made from maize and wheat produced on a single plot per season. Initially, he owned two temporary plastic tunnels, but due to his dedication and interest, one organisation in Dullu gave him a permanent tunnel, which has increased his earnings. He is encouraging his group (which he chairs) to employ the same technology, since he has already achieved success with tunnel farming. As of now, ten households have adopted a similar technique and sell their crops collectively whenever possible.

After witnessing such a compelling story, the local government even allocated USD 33000 (NPR 3.9 lakh) to promote the same type of technology in other areas of Dullu. His example has also encouraged a young person from the same area to return from Qatar to work in the village rather than seek employment elsewhere. Utilising resources sustainably, producing food organically and generating an income all have positive effects on the environment and the economy, which eventually help society to develop their adaptive capacity to cope with climate change. The rural villagers, who depend on agriculture as a profession, are smallholders; the tunnel farming could become one of the alternatives whereby communities generate an income.

## Wishes to live hometown

“My family wants me to migrate abroad for financial security, but I will work here for a few years rearing livestock and vegetable. However, if my financial condition does not visibly improve then I will be left with no choice but to move overseas,” stated Suresh Thapa (22). Suresh is the eldest son of a family of five. He worked in Qatar for 3 years to support his family financially and later he returned to work in his native land. Upon his return, he began farming but the scarcity of water soon made it increasingly difficult. He stated that he observed variations in the weather and rainfall patterns compared to the times when his father was engaged in farming. The majority of farmland is still rain-fed, but some farmers have begun to use drip irrigation, solar water lifting, off-season vegetable cultivation, and plastic ponds to collect rainwater for irrigation with the help of various organisations.



A new way of Vegetable Farming :Tunnel Faming

### **Insuring crops and livestock to transfer climate risk**

Climate change has a significant impact on current farming techniques; the sowing and harvesting period has been shifted, and erratic rainfall, drought and various diseases have caused a problem in the communities of Bhandari tole (a small community) in Dullu. Despite the fact that climate-induced loss and damage is increasing, and although the financing of loss and damage is a prominent topic of discussion in global climate discourse, Nepal currently lacks a mechanism to deal with climate-induced loss and damage. As a result, one alternative for mitigating and transferring the risk to life and livelihood is insurance. However, insurance is not widely available or widely used, and only a few people in Dullu reported having access to crop and livestock insurance. In Dullu-3 Bhandari tole, around 31 households have insured their livestock from one of the insurance companies. The community believes that the effects of climate change will be more severe in the future, and they wanted to be relatively secure in terms of risk reduction. They were inspired to enrol in an insurance programme by successful insurance pay outs in other regions and the amount they obtained as compensation for losses and damage caused to their livestock and agricultural work. This insurance covers a variety of agricultural activities, including cattle, crops and vegetables. Agriculture insurance also covers damage to agricultural sectors caused by

non-climatic factors such as fire and earthquakes, as well as climatic factors such as flood, soil erosion, hailstones, lightning, insects or disease, among others. As a result of the various economic burdens on their families, the younger generation in Dailekh, including Dullu municipality, does not appear to be interested in farming. Such insurance systems have been cited as a necessary element to enable agricultural commercialization and motivate young people to engage in agriculture. As agricultural insurance is not a stand-alone solution to such loss and damage, it could be an important basis for developing appropriate climate-risk management approaches and frameworks.

However, there were some difficulties as well, particularly in obtaining reimbursement from the insurance because of the lengthy and complicated procedure. Claimants must prepare several supporting documents and undergo multiple verifications. Community members believed that the method itself is unreliable. As a result, even though it only affects a small number of people, the issue of easily accessible climate finance should concern all donors and development partners. Furthermore, this issue can serve as an excellent example on the ground for people to pause, reflect and figure out how to access climate funds most conveniently and make the greatest use of them locally to reduce the risk of loss and damage from climate change.

#### **4.4.2 Rajapur Municipality, Bardiya**

In Rajapur Municipality community, mobilization is observed to be the key tool of locally led adaptation. In the flood-prone area of Rajapur, all the communities gather and go to clean the irrigation canal right before the monsoon, which is a traditional practice and has reduced the monsoon-induced flooding. As monsoon rainfall is becoming more extreme, communities participate in constructing bio-check dams to prevent flooding. Similarly, the Badghar practice in the Tharu community is very common in Nepal, but in the case of Rajapur it was found to work

as a key influencer for community mobilization and a key problem-solver, especially in acting as an early warning system during emergencies, designing plans for village development etc. As an alternative livelihood option, the residents of Rajapur are involved in vegetable farming, and they have insured their paddy and cattle to reduce the risk of possible loss and damage from extreme climate events. Communities have adopted flood-resistant seeds and alternative varieties in fur use in agriculture. Due to the unpredictability of change, they plant early and harvest early.

## Case 1

### Badghar community leader as a community stress reducer

In the Tharu community, it is traditional to choose one “Badghar,” or community leader, who possesses essential skills, judgment and trustworthiness. Every year, during the Maghi festival, s/he is chosen. This person serves as the village’s administrator and spokesperson, and is responsible for finding solutions to the community’s problems. Badghars bring the community’s members together for the necessary group work, serve as facilitators in information sharing and plan meetings to formulate plans and policies. Planning is done for the community’s development, including the construction of schools, irrigation canals (Kulopani), dams and culverts etc. Another significant responsibility of the badghar is to regulate and manage bethbegari (volunteer workers) for community service projects like building roads and canals. According to Dipesh Tharu, the chairman of the Rajapur Municipality, “badghars are always included in the planning process, and their presence is required in every ward and tole meeting.”

Similarly, the badghars can be seen as a climate stress reducer, as they also work to minimise the impacts in the community. They are in charge of informing the community’s residents about the weather forecast issued by the municipality or ward offices. Similarly during the flooding emergency, they are responsible for setting off the siren alert for early preparedness. They also mobilise the local population both before and after a disaster. As a leader in the community, they

contribute to its development and risk-management planning. According to Rajapur Municipality, with the assistance of the badghar, they mobilised 10,000 members of the community during the flood in 2021 to provide rescue and relief. This contributed to the community’s quick recovery. Similarly, when the irrigation canal was damaged, the badghar assisted in mobilizing 5,000 people to rebuild it, which was also a critical in saving the community from massive loss and damage. This demonstrates the value and strength the Badghar has in the community, as they can make people commit themselves to labour for the community’s benefit. Recognising the value of such community leaders, Rajapur Municipality approved the Badghar Act and Manuals for efficient badghar mobilization. However, after a brief discussion with some badghars in Rajapur, it became clear that, if the local government truly wants to mobilise them as community ambassadors, they also require capacity-building support, particularly in the areas of climate change, disaster preparedness and reduction, as well as making them aware of laws, policies and budgets. This capacity-building can integrate the community’s actual challenges and issues into the planning process and help to establish policies for the local people. They should also be organised and trained as climate advocates for local adaptation action by establishing badghar networks throughout the region, because it is possible to increase effectiveness and reduce duplication of effort by incorporating a variety of local perspectives and acknowledging local capabilities and knowledge (Tye and Suarez 2021; Mfitumukiza et al. 2020).

## Case 2

### Tharu culture as a means of climate change adaptation

The Tharu community is experiencing the effects of climate change, which are evident in their way of life, agriculture and cultural activities. They conduct kaluwa puja or kalo khuwaune, or worshipping the god before sowing rice. It is said that only after conducting this ritual are the farmers permitted to eat off the farmland. Similarly, there is a ritual called Hardawa to mark the end of paddy-sowing and to pray for a good monsoon and a fair crop yield. Because of the uncertain rainfall and the shifting of the monsoon, several traditional festivities associated with farms are under threat, and some of them are now extinct (Gaiya berne, Ghuruwa puja). However, some good traditions remain today and are directly related to locally driven adaptation activity, such as bagauda jane (the cleaning of irrigation canals prior to the monsoon). Water distribution and canal cleaning are associated with the Tharu community's collective efforts at water management, which are guided by traditional knowledge that has endured for centuries. Every household is now required to take part in a cleaning programme right before the monsoon, when the community leader calls for the meeting, or face a fine. According to the results of the community consultation, this approach is apparently able to reduce the risk of flooding in their community. Before the monsoon, representatives from each household meet and clean all the canals to allow water to flow in a system and reach the paddy fields. According to local experience, the loss and damage from the floods in 2017 and 2021 were largely minimised due to prompt canal cleaning and ensuring a proper water-flow system.

Similar to this, the Tharu use dehari (huge earthen grain-storage vessels), a type of indigenous crop-storage method that is largely focused on flood protection. In this flood-prone community, the dehari has been altered by replacing the mud with water-insoluble materials like wood and bricks to raise the leg height. However, some people

continue to store rice and grains in the same manner, albeit in smaller vessels and with the contents lasting only one year. Moreover, the Tharu also see it as a means of food security in case any unfavourable events occur in the future that would leave them unable to cultivate their own food. In this case, they would use the harvest preserved in the storage vessels.



Earthen Grain Storage Vessel "Dehari"



Tharu Women Collecting Fish in Rajapur

These traditional and cultural practices are reliable and important, but the effects of climate change have made it impossible to follow them completely. However, with adjustment and modification, these cultures should still be conserved, both to maintain Tharu culture (e.g., by managing water resources and the risks associated with flooding communally) and traditional values (linking with weather patterns), as well as pass on indigenous adaptation techniques to future generations.

### 4.4.3 Bheemdatt Municipality

The locally led adaptation in Bheemdatt was found to be based on the principle of building a robust understanding of climate risk and uncertainty. It was observed that nature-based solutions and ecosystem-based adaptation strategies were used to reduce the effects of climate change. These methods relied on an integrated strategy to restoring ecosystems such as forests and ponds. They also feature a strong component of stakeholder involvement involving all levels of government and community-

based organisations. To expand their livelihood alternatives, communities have adopted other income-generating crops, such as banana, lemon and medicinal herbs. Similarly, dams and irrigation canals were built by the community to avert flash floods and landslides. There are eight community forests in the Bheemdatt Municipality, and as part of their local adaptation strategy, they have been active in activities such as the planting of paddy rice, pond restoration, forest rehabilitation and community empowerment programmes for income generation.

## Case 1

### Nature Based Solution as a locally led adaptation action

Actions that protect, sustainably manage and restore natural ecosystems are referred to as nature-based solutions, and the Shanti community is the best example of this. Nature-based solutions have positive effects on the environment, society and the economy, all of which help local communities adapt better to the growing challenges posed by climate change. The Shree Shanti community forest is located in Bheemdatt-10, Tilkeni, and is one of eight community forests in Bhimdutta Municipality that have been restored to the floodplain region. This place is also in the Chure region, so it must be protected. The forest was officially handed over to the Shree Shanti Community Forest User group in 1993/94 with a total area of 22 ha and only 255 trees. The area had been flooded, and there was also an issue with soil erosion. The flood and landslide prevention efforts began with the initiative of the user group, where they restricted open grazing and enclosed the forest with mesh wire for restoration. Community members also donated their abandoned agricultural land to afforestation, where they began to plant a variety of species to reduce soil erosion.

After all of these efforts of around 29 years, the 22-ha flood plain has been transformed into a massive 210 ha forest, with 17,50,00 plants in total. The forest currently has a wide variety of flora, including khaiyar, medicinal herbs like ashragandha and aarpagandha, as well as fauna including deer, peacocks, snakes and wild boar. Now the flooding and inundation are under control. Additionally, the community forest provides an income. Each year, they sell 5,000 cubic feet of wood for USD 25,000-33,000 (NPR 3,000,000-4,000,000) and USD 2,500-3,300 (NPR 3-4 lakhs) from the sale of bamboo. They share a portion of their income with nine user

groups, including women's groups, Dalits and tole development. Additionally, they conduct a fundraising campaign where they ask each member of these nine user groups for USD 1 each month. These funds have been used to upgrade the primary school into a high school and provide students with scholarships, as well as giving financial aid to those in need and to construct ponds and plant nurseries in the forest. The collective benefits of this community forest user group have reached 650 households. It has also constructed a number of ponds (15 by 10 meters) inside a forest where the animals can come to drink, thus reducing conflicts between wildlife and the community. Moreover, the community forest's concerted efforts and investments in climate adaptation play a significant role in building a society that is climate resilient. The community makes decisions on agroforestry and ecotourism to build a strong and sustainable community. The user group for the Shree Shanti Community Forest is familiar with REDD+ for carbon sequestration and its trade. They have already begun the carbon trade procedure and are anticipating receiving a sizable amount of funding from several national and international sources. Apart from that, this area has become a protector of downstream communities, as there is no more scarcity of water, soil erosion is in control, and most importantly awareness is being created in the community about the importance of community forests in dealing with the impacts of climate change.

To summarize, having such a success story is an honour and a source of pride. The government should start recognising and rewarding these outstanding efforts. The transformation of this flood plain into a large forest has not been an easy path for this forest user group. It is now up to lawmakers and the government to support such efforts and connect them to international climate finance assistance.

## Community-driven watershed restoration



One of the Dried Ponds of Barhakunda in Bheemdatt Municipality

Bhimdutta-1's Barhakunda is a historically, religiously and environmentally rich location. The word barha means "twelve," and kunda means "pond," hence this location features twelve ponds on the top of Chure. Chure is a fragile area which is crucial for regulating water in the lowlands. These ponds are located inside a community forest known as "Baijanath Rautela Bahrakunda Community Forest." Drought, landslides and flash floods are common climate stressors in this region, which have resulted in ponds drying up, triggering water crises downstream. Additionally, community residents have trouble managing water for agriculture and livelihoods.

To deal with the effects of climate change in their region, the villages of Bahrakunda established a watershed management strategy. In order to combat drought, local residents began to clean up the area, regulate open grazing, carry out afforestation projects and organise a number of awareness campaigns to bring the ponds back to life. The President of the Chure Conservation

Programme, a government project, released USD 50,000 (NPR 60 lakhs) and Bheemdatt Municipality USD 25,000 (NPR 30 lakhs) to restore water in these ponds in response to community demand. With the help of this financial support, the community forest user groups constructed a wall around the pond and dug up the previously identified water source to channel water into it. They have been successful in restoring water in three out of twelve ponds, but it is still a huge challenge to restore all of them. The Baijanath Rautela Bahrakunda Community Forest User's Group oversees these ponds, and they have built an irrigation canal where 45 households are using the restored pond for agricultural purposes. Through various organisations, people have become aware of the value of the ponds and the Chure region, and now they are working to preserve the area for its advantages to tourism, the environment and religion. Despite the limitation, the community downstream still have access to water as a result of the restoration of the ponds in the Chure area.

As climate change creates extreme weather events, and significant thresholds are approached, the story of Bahrakunda pond showed that local and indigenous knowledge practices will not be enough to address the deficit in local adaptation. Given the example of federal and local government assistance in recharging the ponds with water, it is now clear that better integrated situation-specific indigenous knowledge and practices, combined with scientific knowledge systems, must be fostered at all levels of government.



One of the Restored Ponds of Barhakunda in Bheemdatt Municipality

CHAPTER III

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**CONCLUSION AND  
RECOMMENDATIONS**

This report has described the results of a study of local climate change adaptation practices in three municipalities.

## 5.1 Conclusion

The overall aim of the study was to analyse climate change issues and adaptation priorities from the perspectives of different local communities representing diverse social groups, including women, young people, smallholders and farmers' groups as well as to expand the knowledge base that is pertinent to local knowledge and its relevance to climate change adaptation. Multiple community discussions indicated that most individuals have heard the term "climate change," and they have all personally experienced its adverse effects. Both local perceptions and scientific analyses of historical trends indicate that the average temperatures in Nepal are rising and that rainfall patterns are changing, with erratic rainfall, drought and extreme rainfall events becoming more frequent and severe.

Local communities' practices are thought to be capable of adjusting to current climate stresses under a specific threshold. Practices such as new agricultural methods, diversified agricultural production and insurance systems can be used as an alternative option in reducing the potential risks of and adapting to climate change. Methods such as nature-based solutions, ecosystem-based adaptation and Tharu culture are totally indigenous and are also proving to be effective adaptation strategies. Local practices are gradually being upgraded to respond effectively to climate change impacts. Similarly, the cultural threat and diverse implications of climate change on the community require a multifaceted approach rather than a single hazard-focused one. To address climate change vulnerabilities, there is a need to build and

upgrade local communities and their institutions' capacities to improve their local knowledge and enable them to meet the challenges of build resilience better (i.e. forest user groups, women groups, youth groups, indigenous groups, badghars, etc.). Additionally, the story from Dailekh on how climate change impacts differently on the two genders in terms of migration is crucial in starting a conversation about the gender-differentiated impacts of climate change and options for gender transformative adaptation options from a fresh set of eyes.

It can be deduced from the analysis of the annual budgets of all three municipalities that local adaptation work is not receiving enough recognition, as most of the adaptation activities were development-focused, and there was big gap in terms of allocating the budget for core local adaptation work. The community that promotes community forestry as a strategy involving a nature-based solution also revealed that they are aware of REDD+ and carbon trading but are not entirely aware how the carbon accounting is done and how they can most easily receive the funds, which acquires more capacity-building programmes so they can inspire other initiatives of the same kind. In the same way that locally led adaptation is becoming a higher priority for donors, governments and intermediate organisations to ensure that adaptation solutions are designed and implemented in a way that is equitable and inclusive of local knowledge and expertise, the Government of Nepal's endorsement of the Principles for LLA is a positive step towards taking local actions early to address the climate change

risks that are ingrained in social and economic systems. However, there is still more work to be done in disseminating the Principles for LLA to local governments in order to encourage the use of local and indigenous knowledge in developing and implementing local adaptation actions.

The findings in this report reveal that, although these communities have already felt the impact of climate change, they have never waited for someone else to arrive and take care of their problems. However, given that the severity of extreme climate events is increasing, it is highly uncertain how long they will be able to manage. There is a need for intergovernmental and public-private mechanisms or alliances that could offer both financial and technical assistance in enhancing and scaling up such local adaptation activity and build up the long-term climate resilience of these communities.

## 5.2 Call for local climate action

Based on seven different cases that were reported in Dailekh, Bardiya and Kanchanpur, the following sections offer action-oriented recommendations to various actors at various levels:

### A. Government and policymakers in Nepal

- **Create a common platform.** At COP26, world leaders and funders pledged more than USD 450 million to promote locally led approaches and actions. To take advantage of these funding opportunities, the government should bring together indigenous and local knowledge holders, practitioners, researchers and decision-makers by creating a common forum where they can share best local practices and push for the scaling up of local adaptation actions and adequate funding to local stakeholder.
- **Access to international funding through coordination and networking.** The findings indicate that the climate alarm has already been raised. Climate-related disasters do not wait for procedures, and there is a significant

financial imbalance. To close this gap, the government should focus on networking and cooperation with international climate-funding mechanisms such as the Green Climate Fund (GCF) and Adaptation Funds in order to channel funds where they are required.

- **Integrate climate change adaptation into local development planning.** Since Nepal's second NDC aimed to produce gender-inclusive local adaptation plans in all 753 local governments, the findings above indicate that municipalities that have already developed LAPAs have not fully implemented them and are not mainstreaming them into the yearly local development plan. As a result, the government should focus on capacity-building and technical support activities to identify and integrate the essential adaptation strategies into local development planning.

### B. International and national funding agencies and development partners

- **Call for more donors and development partners to endorse the principles for LLA.** Although locally led adaptation is a growing priority for donors, governments and intermediate organisations, there are still only a small number of institutions that have endorsed the principles for LLA. This means that the Principles for LLA should be accepted globally, and the importance of local knowledge and expertise in addressing climate risk should be highlighted.
- **Scale-up finance to promote locally led adaptation.** While international climate negotiations and national-level action receive a lot of attention, the effects of climate change are most seen – and felt – at the local level. Similarly, before reaching the community, adaptation funding is frequently routed through one or more intermediaries. Thus, it is recommended that donor agencies and development partners first scale up their funds and channel them more quickly and efficiently so that local partners have easy access to funding and deploy it to support long-term LLA on the ground.

- **Partnership to scaling up LLA.** It is recommended that donors and development partners, especially climate finance providers and intermediaries hear stories and practical solutions on the ground and invest in scaling up and spreading local adaptation skill and knowledge. Likewise, they should foster collaboration and engagement between local knowledge holders and the scientific community in order to develop synergies between local adaptation and new climate information and technology.

### C. Local government and CBOs

- **Participation in local policy formulations.** Indigenous and local communities that are taking local adaptation actions should be heard by local governments. In order to ensure that the community's voice is heard in the policies and strategies, local governments should ensure that they engage in such processes.
- **Empowering communities to raise their voices.** CBOs and other local organisations should empower communities to raise their voices and create an enabling environment for them to promote LLA.



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