

**Assessment of Water focused Climate Change Adaptation
Actions of 101 LAPAs and its integration into Local Planning
Process in a selected District**

Final Report

Jalsrot Vikash Sanstha/GWP Nepal
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Disclaimer

The findings, interpretations and conclusions expressed herein are those of the author(s) and do not necessarily reflect the views of the institutions.

Foreword

This research was done under WACREP activity of Jalsrot Vikas Sanstha (JVS)/GWP Nepal. It is one of the research included under WACREP in the field of water resources. JVS/GWP Nepal highly appreciates the contribution of Mr. Thakur Devkota for doing this research and report preparation and Mr. Batu Krishna Uprety for providing feedback. JVS/GWP Nepal also acknowledges the contribution from JVS staffs Mr Tejendra GC and Ms Anju Air during the preparation of this publication.

Jalsrot Vikas Sanstha/GWP Nepal

Executive Summary

Climate change is a global discourse and its impacts are local. Nepal realized the urgency of supporting the climate vulnerable communities to adapt to climate change impacts and prepared the National Adaptation Programme of Action (NAPA) in 2010. At present, the Government is implementing Local Adaptation Plans for Action (LAPAs) in 90 VDCs and 7 municipalities in most climate vulnerable 14 districts of mid- and far west Nepal with support from DFID and EU.

The Jalsrot Vikas Sanstha (JVS), a dedicated NGO engaged in action research for policy inputs in water resources sector, realized to understand the nature of adaptation actions in water resources sector and conducted this study as a part of the WACREP GWP SAS programme for 2015 and 2016. The objective of this study is to assess the water resource conservation-related adaptation actions in existing LAPAs, and locate 'entry points' for the integration of adaptation activities into local planning processes. Literature review and consultations were the key methods used for this study.

Each LAPA reviewed includes impacts of climate change on water resources. They are: drying-up of water sources; effects of landslides on irrigation and drinking water supply; decrease in agriculture production from floods, landslides and drought; increase in drought-induced barren land; damage to agricultural land due to river and stream floods and bank cutting; infestation of disease and pest; damage to infrastructure from natural disasters such as landslides and floods; and decrease in groundwater table. In order to address these impacts, the prioritized adaptation actions in LAPAs are: (i) construction and maintenance of water and storage tanks; (ii) construction of irrigation canal and improved water mill; (iii) bioengineering for landslide control and plantation; (iv) construction and maintenance of drinking water supply system; (v) deep boring, tube well, pond construction, and water source conservation; and (vi) farming of drought and flood tolerance varieties of crops. Hundred LAPAs proposed to invest about NRs. 5 billions to address climate change impacts in the target VDCs and municipalities. Of this, NRs 2.7 billion or 53 percent is allocated for water resources sector as per the LAPA report. Most of the budget (about 44 percent of the total) is allocated to infrastructure only. In terms of district wise budget allocation, 10 districts have allocated over 50 percent of their total district budget for water sector while Dolpa, Humla and Mugu districts have allocated less than 1 percent of the total LAPA budget. Based on interactions with NCCSP implementers such as Executive Officer of the Rajapur Municipality, LAPA officer and LAPA facilitator and local stakeholders in Bhimapur (former VDC and now merged into Municipality), LAPA activities are selected, prioritized, included in the plan and implemented by the local people and it needs to expand in all parts of the Municipality. The Municipality faced difficulty in planning and releasing budget initially as other previous VDCs of Rajapur Municipality did not have LAPA activities. Lack of technical support, non-availability, and non-delivery of required materials timely for the implementation of adaptation actions were raised as major issue. Stakeholders opined about some duplication of LAPA activities with other development activities. LAPA has been effective to respond local needs. The Ward Citizen Forum would be an 'entry point' for integration of adaptation actions into the local planning cycle. This study recommends, inter alia, to: (i) expand and implement LAPA activities with people's participation; (ii) enhance and improve indigenous practices of water collection & storage technologies; (iii) promote forest

conservation and plant species with high water holding capacity; (iv) promote inter-agency coordination at the district and village levels; (v) establish core technical unit in district, municipality and VDC levels for timely support in planning, budget releasing and implementing LAPAs; (vi) provide necessary funds for maintenance; and (viii) initiate documentation to replicate good practices and learn from mistakes or failure practices.

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1 Chapter One

Introduction

1.1 Background

Scientists and development workers perceive climate change and its impact differently. Change in the climate system is a natural process but industrial development and anthropogenic activities consume more fossil fuel which made this change faster. Fossil fuel-based industries are the main causes of greenhouse gas (GHG) emission and the concentration of the GHGs in the environment determines the situation of global warming. Higher concentration of GHGs in the atmosphere will have a higher rate of climate change and vice-versa. Climate change is global in nature with local impacts and it requires local initiatives to adapt to its impacts. Climate change has direct and indirect impacts in human civilization and affects human life. Small changes in the pattern of climate variables bring huge change in the natural systems, and impacts on ecosystem services, favor a shift in biodiversity habitats, accelerate natural disasters, changes in farming and cultural systems, landscape pattern, human settlement, knowledge system etc. It also plays a major role in changing the existing pattern of cultural systems.

Reflection of climate change varies at local or community levels. Impact of climate change will be more pronounced in affecting the livelihood of those who depend on forests, land or nature for their food, shelter and income. The Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) states that communities who live in marginal land and whose livelihood is highly dependent on natural resources are among the most vulnerable to climate change. The IPCC has reported that warming of the climate system is unequivocal. During the 21st century, average temperatures could rise by 1.1 to 6.4 degrees centigrade (°C) and sea level would rise in between 0.09 and 0.88 cm depending upon the extent to which environmental policies and programmes are in place and implemented (IPCC, 2007).

Nepal has experienced the effects of climate change over the years. All Nepal maximum temperature has increased by 1.8°C between 1975 and 2006, with high-altitude areas showing an annual increase of 0.12°C during the dry season and lower altitude areas experiencing an average rise of 0.06°C between 1991 and 1994 (NPC, 2011). Days and nights are becoming warmer and cool days and cool nights are becoming less frequent (Shrestha et al., 1999; Baidya et al., 2008). High increment in temperature is projected in western and central Nepal than eastern Nepal for the years 2030, 2060, and 2090 (MoE, 2010). Annual average summer precipitation was predicted to increase 15-20 % in the Mid-hills and the Terai. It is expected that winter precipitation in western Nepal will not experience any change but in eastern Nepal, it will increase by 5-10 percent (MoE, 2010). In the last few years, monsoon starts about two weeks late compared to the preceding years and there was virtually no winter rain in 2005 and 2008. Even though precipitation records have not shown any significant change in the overall trend, an analysis of daily precipitation records for 46 years from 1961 to 2006 shows that number of events of precipitation extremes is on the rise. In particular, number of days with 50mm or more of precipitation has increased (MoE, 2010). Furthermore, mountain ecosystems are inherently prone to natural hazards, and climate change has exacerbated their vulnerability.

This change in climate system and its variability will affect directly or indirectly various sectors of development, ecosystems and livelihood.

Some studies have been carried out to understand the nature of climate vulnerability and magnitude and extent of their impacts. The climate scenario demands to make development plans and programmes climate-resilient by integrating climatic risks in such plans and programmes to ensure sustainability of development interventions so that they can adapt to changing situation and context (NPC, 2011).

The climate change risk derives meaning and significance from social values, which defined communities for worth protecting (Granderson, 2014). Location, resource availability, distribution system, community access to public services and facilities are affected by climate change phenomenon in the recent years. The climate change-induced disaster directly and indirectly impacts to livelihood. Nepal is experiencing such disasters frequently and it is on the rise in the recent years. In response to them, it would be appropriate to integrate adaptation into mainstreamed development planning including sector specific planning and implement them accordingly (MoE, 2011).

International community agreed to address the effects of climate change individually or jointly by adopting the UN Framework Convention on Climate Change (UNFCCC) in 1992. The Least Developed Countries, Parties to the UNFCCC, started preparation and implementation of the National Adaptation Programme of Action (NAPA) to help local communities to adapt to the adverse effects of climate change. Nepal being a Party to this Convention and also a LDC prepared NAPA in September 2010 and started implementation of most urgent and immediate adaptation actions at the local level through a National Framework on Local Adaptation Plan for Action (LAPA), 2011.

The Nepal Climate Change Support Programme (NCCSP), an undertaking of the Ministry of Population and Environment in collaboration with the Ministry of Federal Affairs and Local Development with the support from the Department for International Development (DFID-UK) and European Union, has prepared LAPAs for 93 Village Development Committees (VDCs) and 7 municipalities in 14 most climate vulnerable districts of mid- and far west Nepal. All LAPAs are under implementation from the last three years. In addition, Jalsrot Vikash Sanstha (JVS) under the Water and Climate Resilience Programme (WACREP) of the Global Water Partnership South Asia (GWP SAS) has prepared in 2014 a LAPA for Lamatar VDC, located within the Kathmandu Valley. In Nepal, some institutions are engaged in developing Local Adaptation Plans (LAPs) to address climate change impacts in different sectors such as forestry and agriculture sectors. A number of community forestry user groups have prepared such local adaptation plans in the last few years.

The JVS, a dedicated national non-governmental organization engaged in action research for policy inputs on water resources, realized the importance of documenting water-related adaptation actions as included in LAPAs prepared by the end of 2014. It also realized the need to identify nature of adaptation actions, state of implementation, and integration of such LAPAs and/or adaptation actions into local plans in one of the NCCSP target districts. This resulted to conduct this study a part of the WACREP GWP SAS programme for 2015 and 2016.

1.2 Objectives

The objective of this study is to assess the water resource conservation-related adaptation actions in existing LAPAs, and locate entry points for the integration of adaptation activities into local planning processes.

In order to meet the above objectives, water-related adaptation activities were identified in the existing 101 LAPAs and budget allocated to implement them were documented.

1.3 Methodology

LAPAs were collected from NCCSP and reviewed to document the water-related adaptation activities. A field visit was conducted to one of the LAPA-implemented Village Development Committees (VDCs) –the Bhimapur (previous VDC and now merged with Rajapur Municipality) of the Bardiya district to understand the nature of adaptation activities and priorities. It focused in enhancing understanding on how local people are adapting to climate change impacts. Furthermore, Executive Officer of the Municipality and local people, including LAPA officer and facilitator were contacted to understand the state of implementation of adaptation activities and integration of water-related adaptation actions, as specified in LAPAs, into local planning processes. This also helped to locate 'entry point' for future integration.

After the preparation of the draft report, a consultation programme was organized on 17 June 2016 to inform multi-stakeholders and seek their inputs to make study outcome practical and easily implementable. About 45 participants representing government institutions and non-governmental organizations, including NCCSP official attended the half-day workshop. After presentation of the outcomes of the study and 11 participants raised issues and concerns and asked for clarifications. Inputs of the participants and peer reviewers have been incorporated to finalize this report.

1.4 Limitation of the study

In total, 99 LAPAs were collected from the NCCSP Office. Adaptation actions and budget was not seen in one LAPA of Humla district (Saya VDC). Hence, adaptation activities and budget estimated in LAPAs of 100 local bodies (VDCs and municipalities) have been considered and documented in this review. Furthermore, this outcome is documented primarily based on extensive review and two days consultations with local stakeholders, including half-day discussion in Kathmandu with key stakeholders.

2 Chapter Two

2.1 Adaptation Actions in LAPAs

Impact of climate change is localized and impact varies with local geography and other environmental, economic and socio-political factors (OECD, 2009). Nepal's low level of development, complex topography and climate variability renders vulnerability to climate change. Climate change poses crosscutting impacts and triggers chain effects by adding socio-economic and environmental stresses, which has direct and indirect relationship with different development activities. Majority of population in Nepal depend on agriculture and livestock for their livelihood and impact of climate change has threatened their productivity and production thereby further impacting livelihood of large section of population. The change in climatic variability like precipitation and temperature has increased climate-induced disasters such as landslides, floods, soil erosion, hailstone, and drought that affect economic sectors adversely.

As mentioned in chapter one, Nepal introduced bottom-up planning process for the effective implementation of NAPA through national framework on LAPA. The LAPA process provides opportunities to assess site-specific climate vulnerabilities, identify and prioritise adaptation options, and implement urgent and immediate adaptation actions with the participation of local communities and households (MoE, 2011).

The LAPA has approached to bridge gap between national and local levels in development practices and it helps to mainstream climate change adaptation into the development planning process. The LAPA framework was developed by piloting in 10 districts to promote and ensure people's participation and ownership. The LAPA framework clearly mentions that adaptation actions can be integrated into local development planning process at levels of VDCs, municipalities and/or district. The LAPA framework also provides opportunities to mainstream climate change into national development planning processes. LAPA is a local instrument that ensures vulnerable people's participation, right from the local adaptation planning to implementation and monitoring. There is an opportunity for local actors to developing a common understanding and effective communication channel, transferring knowledge, supporting innovation and experimentation, ensuring meaningful participation from community level actors, and integrating effectively the adaptation actions into plans at different levels (Lamsal, 2013).

Local people have traditional and indigenous practices to adapt to climate change impacts in water sectors as well. The LAPAs include several adaptation-related activities in the water sector. Conservation and sustainable management of water and watersheds is realized. However, maximum budget has been allocated to infrastructure construction like dam, concrete wall, gabion wall, water supply, and concrete canal as they are the most urgent and immediate priorities of the climate vulnerable communities NCCSP target districts.

2.2 Impact of climate change on water resources

Each LAPA includes impacts of climate change on water resources and related sectors such as agriculture and forests. Accordingly, LAPA includes adaptation practices and actions to minimize such impacts. Based on LAPAs, potential impacts on water and water-related sectors

are grouped as follows. These impacts are accelerated due to unpredictable rainfall and drought as well.

- a. Drying-up of water sources;
- b. Effects of landslides on irrigation and drinking water supply;
- c. Decrease in agriculture production from floods, landslides and drought;
- d. Increase in drought-induced barren land;
- e. Damage to agricultural land due to river and stream floods and bank cutting;
- f. Infestation of disease and pest (domestic plants and animals);
- g. Damage to infrastructure from natural disasters such as landslides and floods, including from fire and ice melting; and
- h. Lowering down of groundwater table.

For example, in target VDC of Dang district, drying-up of water sources, damage to agriculture land from river and stream, including from irregular rainfall, and flood and drought-induced reduction in agriculture production are considered the major impacts of climate change on water and its related sector. In hill and upland districts, similar types of climate change impacts have been mentioned in LAPAs except flooding and river/stream-bank cutting. The hill districts experience landslides and its pronounced damage to agriculture land.

2.3 Adaptation actions in LAPAs

Based on responses from local people and review of 100 LAPAs, the following are the prioritized activities to address climate change impacts in NCCSP target areas and Lamatar VDC:

- a. Construction and maintenance of water tank and storage facilities;
- b. Construction of irrigation canal and improved water mill (grinder);
- c. Bioengineering for landslide control, plantation and low cost soil conservation activities;
- d. Dam construction and repair of drinking water supply system;
- e. Deep boring, tube well, pond construction, and water source conservation;
- f. Farming of drought and flood tolerance varieties of crops; and
- g. Construction of concrete and gabion wired dams.

In response to climate change impacts in target VDCs of Dang district, adaptation actions proposed in LAPAs include the construction and repair of drinking water system, storage tanks and ponds, including irrigation canal and improved water mills, farming of drought tolerance crop variety, plantation and source conservation. In hill districts, local people have identified similar adaptation actions. Bioengineering and soil conservation activities are considered important to rehabilitate landslides and landslide-prone areas. Local people have practiced to collect rainwater and construct plastic ponds in the recent years to meet their drinking water and household requirements. Similarly, emphasis has been given to select and plant species that has high water-holding capacity and soil conservation property. Some of the adaptation actions are also related to capacity building on efficient use of water.

Of the above activities, high priority is accorded to infrastructure development such as construction of irrigation, water supply scheme and dams, and use of water collection technology. Local people have prioritized dam construction to protect buildings from floods. Other activities are related to community grain storage, plantation of banana and sugarcane farming to control flood in flood-prone areas.

2.4 Budget allocation for adaptation actions

Hundred LAPAs proposed to invest NRs. 5,014,703,525/ (NRs. 5 billion) to address climate change impacts in the target VDCs and municipalities. Of this, NRs. 2,671,280,500.00 (NRs 2.7 billion or 53 percent) is allocated for water resources sector (Table 2.1).

As local people have prioritized infrastructure-related adaptation actions, budget allocated for infrastructure development is highest (44.4 % of total budget). Major infrastructures include construction of irrigation, drinking water supply, drainage and micro-hydro facilities, including suspension and other types of bridges. Irrigation-related activities include canal construction and repair, solar pump, deep boring, shallow tube well, pump set drip irrigation, sprinkle irrigation, pipe irrigation, and *dhiki* pump. Similarly, drinking water supply and management related adaptation actions include the construction of water supply system such as water tap and intake.

LAPA also prioritized capacity-building activities in order to build and/or enhance people's capacity to best utilize local knowledge's and skills in addressing climate change impacts. In order to increase agriculture production and productivity, LAPA emphasizes to promote flood and drought-tolerant and resistant varieties of crops, including cold wave and disease resistant varieties. It also emphasizes to expand *bagar* (riverbank sandy areas) farming and fish farming to improve livelihood of the climate vulnerable communities. About 0.45 percent of the total budget is allocated for adaptation activities in the agriculture sector.

Construction and maintenance of ponds for rainwater harvesting, *ghaito* (bucket) for rainwater collection, and conservation of water source and lakes are also the prioritized adaptation activities for water sector. About 4.3 percent of the total budget is allocated for this sector. Similarly, activities and budgets for community protection from climate-induced disasters such as landslides and floods provide opportunities to minimize climate change impacts on human beings. About 1.23 percent of the total budget is allocated for landslide and flood control, and conservation of stream bank for the protection of agriculture land and settlement.

Table 2.1: Budget Allocation for Adaptation Actions in LAPAs

SN	Water-related Adaptation Actions	Budget Allocation (NRs)	Percent of budget
A	Infrastructure: Total budget is NRs. 2,207,337,500/ or 44% of total LAPA budget; and 82.6% of water-related budget		
a	Irrigation	505,450,000	10.07
b	Drinking water supply and management	267,434,000	5.33
c	Concrete and organic dam construction	881,713,500	17.58
d	Micro-hydro	279,950,000	5.58
e	Suspension bridge	116,490,000	2.32
f	Wooden bridge	16,310,000	0.32
g	Concrete bridge	35,000,000	0.69
h	Culvert construction for drainage system	67,340,000	1.34
i	Spur construction	2,000,000	0.03
j	Concrete wall	24,300,000	0.48

k	High tap and toilet	11,350,000	0.22
	Sub-total	2,207,337,500	44.00
B	Community protection: Total budget is NRs. 74,425,000/- (1.48% of total budget) and 2.78% of water related budget		
a	Early warning system	900,000	0.01
b	Safe building	41,300,000	0.82
c	Emergency materials distribution	4,575,000	0.09
d	High tap and toilet	3,800,000	0.07
e	Water inspection, treatment and rule formulation	10,250,000	0.20
f	Emergency fund	9,000,000	0.17
g	Resettlement plan for landslide affected community and water management in landslide-prone areas	5,000,000	0.09
	Sub-total	74,825,000	1.4
C	Water resource conservation and rainwater harvesting: Total budget is NRs. 216,086,000/- (4.3% of total budget) and 8.08 of water-related budget		
a	Conservation of water source	39,446,000	0.78
b	Rain water harvesting and ponds construction	175,960,000	3.50
c	Ghainto construction	5,880,000	0.11
d	Wire fencing for lake conservation	100,000	0.001
	Sub-total	221,386,000	4.3
D	Agriculture: Total budget is 22,961,000/ or 0.45%		
a	Drought, cold wave & flood tolerant variety of crops	20,301,000	0.40
b	Bagar (riverside sandy area) Farming	1,875,000	0.03
c	Fish farming	785,000	0.01
	Sub-total	22,961,000	0.44
E	Landslide and flood control: Total budget is NRs. 62,055,000 (1.23%)		
a	Landslide control by plantation	58,037,000	1.15
b	Stream bank control	2,018,000	0.04
c	Hailstone	2,500,000	0.049
	Sub-total	62,555,000	1.1
F	Indigenous knowledge and water mill: Total budget is NRs. 74,047,000/ (1.45%)		
a	Water mill (grinder)	29,346,000	0.58
b	Bio-engineering	38,001,000	0.75
c	Community (managed) water mills	6,700,000	0.13
	Sub-total	74,047,000	1.4
G	Capacity building		
	Grand Total	2,671,280,500/	53.1

Source: LAPAs of VDCs and Municipalities, 2013-2015, Nepal Climate Change Support Programme, and JVS/GWP Lamatar VDC LAPA Report

2.5 District-wise budget allocation

Mugu district has allocated only 8 percent of the total district budget in water resources sector while Jajarkot district has allocated highest percentage (nearly 85 percent) of the district budget. The NCCSP's ten districts have allocated over 50 percent of their total budget for water resources sector. This also indicates the severe impacts of climate change on water resources sector. Dolpa, Humla and Mugu districts have allocated less than 10 percent of the total budget to address climate change impacts in water resources sector (Table 2.2). Of the LAPA's total budget, allocation for water sector adaptation activities are less than 10 percent in all districts. Bardiya, Jajarkot, Jumla and Dailekh districts have allocated budget in between 5 to 10 percent and remaining districts have less than 5 percent of the total budget. It is interesting to note that Dolpa, Humla and Mugu districts have allocated less than 1 percent of the total LAPA budget. Allocation of budget also indicates the impacts of climate change on water resources sector in different districts.

Table 2.2 Budget Allocation in LAPA for each District

SN	Name of District	% of District budget (NRs)	Budget for water resource (NRs)	% of district budget (NRs)	% of LAPA's total budget
1	Achham	351,071,000/-	203,315,000	57.91	4.05
2	Bajura	262,249,500/-	141,107,500	53.80	2.81
3	Bardiya	577,799,000	376,438,000	65.15	7.50
4	Dolpa	286,710,000	26,200,000	9.13	0.50
5	Dang	254,952,000	157,771,000	61.88	3.14
6	Rolpa	198,104,225	98,301,000	49.62	1.96
7	Kalikot	321,800,000	62,755,000	19.50	1.25
8	Rukum	192,477,500	122,660,000	63.72	2.44
9	Jajarkot	518,590,200	438,635,000	84.58	8.74
10	Kailali	275,641,000/-	192,755,000	69.92	3.84
11	Jumla	721,129,800	494,492,000	68.57	9.86
12	Humla	256,200,000	20,500,000	8.00	0.40
13	Mugu	301,400,000	12,800,000	4.24	0.25
14	Dailekh	403,014,300	281,531,000	69.85	5.61
15	Lamatar VDC	94,425,000	42,020,000	44.5	0.83
	Total	5,014,703,525/	2,671,280,500/		

Source: Calculation from 100 LAPA except Saya VDC of Humla district

3 Chapter Three

3.1 Integrating LAPA into Planning Process: A Case of Bhimapur of Bardiya

Bhimapur, previously a VDC of Bardiya district, now merged to Rajapur Municipality. This area is frequently and severely affected by floods from Karnali River and Budhi Kulo stream. LAPA was prepared for Bhimapur VDC in 2013. The Municipality took little more time to integrate climate change adaptation into its planning process and to allocate budget due to recent merging of Bhimapur VDC. It happened so as other previous VDCs of Rajapur Municipality did not have LAPA. The study team discussed with officials of the Executive Officer of the Municipality, local people and LAPA officer and facilitator. The following sections provide updates on concerns, feelings, ideas and achievements on LAPA activities and efforts on integrating them into local planning processes based on discussion with local stakeholders.

3.2 Opinion of LAPA officer

Bardiya is one of the 14 districts where NCCSP is under implementation to help local people and ecosystems to adapt to, and build resilience to climate change. Each district has NCCSP-supported LAPA Officer who stations at the District Development Committee. The Officer is responsible to support NCCSP's target VDCs and municipalities to implement adaptation activities effectively and timely by ensuring people's participation and facilitating for budget release as well. Outcome of discussion with the LAPA Officer in the Bardiya district is summarized below:

1. Initially, adaptation activities as included in the LAPA were implemented through top-down approach. From second year onwards, proposed adaptation activities follow 14 steps planning process and Ward Citizen Forum, VDC Council, Area Committee, and DDC Council, approves them. This exactly follows the planning process as other development activities.
2. Some adaptation actions are also revised based on demand of the local people such as irrigation canal. However, all demands are not prioritized and funded. Local people re-priorities activities as included in LAPA from Ward Citizen Forum and most of such activities are related to floods, drought, hot wave and cold wave.
3. At the district level, the Forest and Environmental Committee formed as per the Local Self-Governance Act and its Rules reviews the adaptation activities as included in LAPA. The District Forest Officer leads this Committee. Furthermore, the District Environment, Energy, and Climate Change Coordination Committee (DEECCCD) also coordinates adaptation activities. Similar coordination committees are also established at VDC and municipality levels in order to ensure and promote coordination and effective implementation of the prioritized adaptation actions.
4. The LAPA activities are also prioritized in the DDC organized integrated planning workshop. Finally, DDC Council approves programmes /activities related to LAPA implementation and budget is channeled from the NCCSP to implement adaptation actions.

Key gaps and needs are as follows:

- LAPA activities neither include technical design and estimation nor DDC has sufficient technical expertise to support for technical design and implementation. Furthermore, line agencies have not been able to make their programme consistent with locals needs to

adapt to climate change impacts.

- Almost all activities lack future maintenance cost. Budget release is time-consuming due to existing lengthy system.
- In order to address these gaps, a core technical body should be in place in the district and its clusters. Allocation of maintenance fund would contribute to make the investment on LAPA activities sustainable. It is equally necessary for easy transfer of budget to the programme areas.

3.3 Understanding of the LAPA facilitator

A separate discussion with the LAPA facilitator in Bhimapur of Rajapur Municipality informed the state of implementation of the adaptation activities as contained in the LAPA document. Her experience shows the engagement of local bodies in selection, prioritization and implementation of adaptation actions as follows:



1. Implementation of about 50 percent of LAPA activities is completed in this area. Local people also confirmed it.
2. Village Environment, Energy and Climate Change Coordination Committee (VEECCCC) and VDC Council are responsible for the selection, prioritization and approval of the LAPA activities while the Ward Citizen Forum is engaged in planning.
3. Lack of technical work force has created a problem in implementing activities timely due to low level of knowledge about the quality of tools, machines and materials. Furthermore, local mobilizer is asked to supply technical work force but it is difficult to deliver labor charge due to knowledge gap and existing laws and practices.
4. Timely approval of the budget from the Municipality would ease the implementation process. Furthermore, Executive Officer is unable to allocate necessary time for decision and implementation of LAPA prioritized activities as s/he is much engaged in several other activities.
5. In order for smooth implementation, a local unit should be established in the village with necessary authority and the Municipality needs to have a technical unit with responsible person for LAPA activities.

3.4 Concerns of the Executive Officer of Rajapur municipality

Interaction with the Executive Officer of the newly established Rajapur Municipality informs to expand the coverage of LAPA activities in other previous VDCs of this Municipality in order for consistent overall planning and implementation. The LAPA planning process starts from Ward Citizen Forum and MEECCCC, and is approved by the Municipality Council. The key issues are:



1. Timely implementation of LAPA activities is hindered by the lack of necessary technical work force, including appropriate machines and tools.
2. Inadequate coordination and information sharing between DDC and Municipality has also

created misunderstanding.

3. It is necessary to establish a cluster to provide technical work force for proper implementation of LAPA activities at different wards.
4. Merging of VDCs with and without LAPA activities created problem in planning and budget allocation and it demands to extend LAPA activities in remaining areas of the Municipality.

3.5 Community consultation

Local people of the Shankarpur village in Bhimanpur were contacted to understand key issues related to LAPA preparation and implementation. The outcomes of the discussion are as follows:



1. The Ward Citizen Forum is the main entry point for the preparation and implementation of adaptation activities in the form of LAPA. In some cases, local demand-based programmes are not considered as only few and elite people play role in selecting and decision-making of adaptation activities.
2. Implementation problem starts with non-availability and non-delivery of required materials, and fund disbursement practices, including timely procurement of goods and services.
3. There is no permanent structure to look after LAPA preparation and implementation. Furthermore, LAPA and other activities overlap each other and make confusion during their planning and implementation.



Interaction with the 'Tharu community' – an indigenous group – in Chainpur of Bhimapur indicates their low participation in LAPA activities. Local people are continuously facing the problems of climate-induced disasters due to severe flooding from Budhikulo and Karnali River. Local people emphasized the need to construct culvert and check dam to save building, tap water and toilet, and introduce flood tolerance variety of crops, and emergency materials to protect people and resources from flood. They opined some duplication of LAPA activities with other development activities and informed that important activities such as for flood control are included in the LAPA. Based on discussion, local people are utilizing their traditional knowledge and practices to adapt to the adverse effects of natural disaster.

Interactions with stakeholders clearly inform the need for expanding LAPA activities as climate vulnerable local people are fully engaged in selecting, prioritizing, planning and implementing climate change adaptation activities to adapt to the adverse impacts of climate change. The Ward Citizen Forum is the appropriate 'entry point' for integration of adaptation actions into the planning cycle.



The LAPA has been effective to respond local needs. For example, in lowland and plain areas, people suffer each year from flooding and riverbank cutting which claims life of the

local people. In respond to this, buildings are constructed in flood-prone areas to protect people during such floods.

4 Chapter Four

4.1 Conclusion and Recommendation

The LAPA is an important document to address climate change impacts and help people to adapt to and build resilience to climate change. Local people are fully engaged in identifying and prioritizing adaptation actions, which are later framed in the form of a plan. Local people are equally involved in implementing the plan with technical and financial supports from NCCSP. It seems that local people have prioritized on infrastructure development like dam, irrigation, drinking water supply, micro-hydro etc to address climate change impacts. Review of LAPAs informs that about 44 percent of the total budget is allocated for infrastructure development and least budget for capacity building (0.15 percent of the total budget). Furthermore, least budget is allocated for natural resources conservation activities. Similarly, only 0.45 percent is allocated for agriculture sector while water resource conservation and rainwater harvesting activities has budget allocation of 4.3 percent of the total budget.

Local people understood landslides and floods as the key climate-induced disasters and LAPA has allocated 1.23 percent of the total budget to protect people and resources from these events. In a nutshell, LAPA emphasizes on infrastructure development. Capacity building and use of traditional adaptation practices gets little attention.

Interactions with stakeholders and implementers in Bhimapur village of Rajapur Municipality in Bardiya district inform that more than 50 percent of the LAPA activities have been implemented with people's participation. Initially, Rajapur Municipality faced difficulty to integrate LAPA activities into its planning process and budget allocation and disbursement. It happened so due to merging of former Bhimapur VDC into this Municipality having LAPA activities, and other previous VDCs without such activities in place. Realizing it, Executive Officer of the Municipality underscored the need for expanding LAPA activities in previous VDCs for smooth Municipality planning process and budget allocation and disbursement. The maintenance cost needs to incorporate right from the planning phase.

The Ward Citizen Forum (WCF) could be considered as an 'entry point' for adaptation actions and provide opportunities for bottom-up planning and to integrate adaptation into local planning process. Once, adaptation actions are selected and prioritized at the WCF and inter-agency coordination is ensured through VEECCCC and/or MEECCCC, it is most likely that the plan gets approval from the Municipality Council, Area Committee and DDC Council. However, local people face difficulty in implementing some activities due to late/untimely technical and financial supports. Some of the adaptation actions overlap with regular development activities and lack of proper coordination among line agencies create confusion and misunderstanding.

4.2 Recommendations

Taking into considerations the outcomes of the review process, and stakeholder consultations in Bhimapur village of Bardiya district, this study recommends to:

1. expand and implement LAPA activities with people's participation and with proper budget allocation, including use of local adaptation knowledge and practices;
2. plan water management and resources conservation practices in hilly region to manage excess water;
3. enhance and improve indigenous practices of water collection & storage technologies;

4. promote forest conservation and plant species with high water holding capacity for soil and water management;
5. promote inter-agency coordination at the district and village levels;
6. establish core technical unit in district, municipality and VDC levels for timely support in planning, budget releasing and implementing LAPAs;
7. provide maintenance funds to continuously benefit from implemented adaptation actions; and
8. Initiate documentation to replicate good practices and learn from mistakes or failure practices.

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