

## **Nepal's Approach to Climate Change Adaptation with Local Adaptation Plans for Action (LAPAs): a Water Resource Perspective**



# Nepal's Approach to Climate Change Adaptation with Local Adaptation Plans for Action (LAPAs): a Water Resource Perspective

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### **About Global Water Partnership**

The Global Water Partnership's vision is for a water secure world. Our mission is to advance governance and management of water resources for sustainable and equitable development.

GWP is an international network that was created in 1996 to foster the implementation of integrated water resources management: the coordinated development and management of water, land, and related resources in order to maximise economic and social welfare without compromising the sustainability of ecosystems and the environment.

The GWP Network is open to all organisations which recognise the principles of integrated water resources management endorsed by the Network. It includes states, government institutions (national, regional, and local), intergovernmental organisations, international and national non-governmental organisations, academic and research institutions, private sector companies, and service providers in the public sector.

The Network has 13 Regional Water Partnerships, 85 Country Water Partnerships, and more than 3,000 Partners located in 182 countries.

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## **1. Background**

In South Asia, the Global Water Partnership (GWP) has been tackling the challenges of climate change through the Water and Climate Resilience Program (WACREP) since 2013. WACREP includes a portfolio of programs and projects aiming to build climate resilience through better water management. The programs and projects are developed by GWP Country Water Partnerships (CWPs) in collaboration with the respective governments, international and regional economic development communities, and citizens. The activities identified by the CWPs are in line with the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement and Nationally Determined Contributions (NDCs) shared by the National Governments of each country while being a Party to the Paris Agreement.

GWP Nepal is one of five CWPs in South Asia with projects outlined in the current 2017-2019 planning cycle. Jalsrot Vikas Sanstha (JVS) is the host organization of Global Water Partnership's Nepal country office, and the partnership is referred to as JVS/GWP-Nepal. JVS is a registered non-governmental organization focused on encouraging the adoption of integrated water resources management within Nepal across local, regional, and national levels (JVS, 1999).

## **2. Introduction**

The impacts of climate change are already being witnessed globally and adaptation has thus been identified as a necessary consideration for current and future effects. In particular, Least Developed Countries (LDCs), as defined by the United Nations (UN), "are highly vulnerable to economic and environmental shocks and have low levels of human assets" (UN, 2016) and have thus been a focus of climate change adaptation planning. LDCs receive prioritized support such as in the form of funding and specialized programmes. One such example is that beginning in 2001, Parties to the UNFCCC decided upon a package of decisions to assist LDCs in preparing and implementing National Adaptation Programs of Action (NAPAs) (UNFCCC, 2014).

The development of a NAPA requires a LDC to follow its country-driven process and NAPA preparation guidelines, with an emphasis on local stakeholder engagement (UNFCCC, 2001). Ultimately, the NAPA identifies the most urgent needs of a country to adapt to climate change and is activity-based. LDCs rank the most important actions and projects to be undertaken; once approved, the LDC country has access to the Least Developed Countries Fund (LDCF) for financial support and the Least Developed Country Expert Group (LEG) to support on technical aspects of preparation and implementation of NAPA (UNFCCC, 2014).

This case study will examine one LDC's approach to the NAPA process: Nepal. Nepal has been on the LDC list since 1971 (UN CDP, 2017) and their NAPA was submitted to UNFCCC in 2010. Though Nepal was the 45th LDC to submit its NAPA (Chaudhury et al., 2014), it has since become a pioneer in climate change adaptation planning. This is because, in 2011, it was the first LDC to issue a national framework on Local Adaptation Plans for Action (LAPAs) to strengthen and implement their NAPA prioritized adaptation actions (GoN, 2011). The Government of Nepal (GON) endorsed the National Climate Change Policy in 2011 that supports NAPA and LAPA implementation (Maharjan & Maharjan, 2017). The Policy specifies to "allocate at least 80% of available funds for field level climate change activities" (GoN, 2011).

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The LAPAs that ensure full participation of climate vulnerable local communities to adapt to climate change will be the focus of this case study. Specifically, the case study will examine the LAPAs and their climate change adaptation actions from a water resources perspective, based on a study completed by JVS/GWP-Nepal of 101 LAPAs.

### 3. Description of the Problem

#### 3.1 Nepal and Climate Change

Nepal is particularly vulnerable to climate change impacts for a variety of environmental, social, and economic reasons. Average temperatures have been rising steadily since the 1970s (Shrestha et al., 1999). Most of the mountain ranges within Nepal are home to extensive glaciers which are experiencing widespread retreat. Glacial discharge in turn impacts the hydrological regimes of rivers downstream and causes rapid growth of glacial lakes; glacier lake outburst floods (GLOFs) are one of many climate change phenomena with the potential to pose extreme risk to populations, infrastructure, etc. (Shrestha & Aryal, 2011). In addition, Nepal's landscape has extreme elevation variation over short distances and it experiences heavy monsoon events which contribute to natural disasters such as landslides and slope failures. Last but unfortunately not least, Nepal experiences high seismic activity and large magnitude earthquakes have been a reality in its recent history. Natural disasters such as those described are anticipated to increase in frequency and intensity (GoN, 2015).



**Figure 1.** Dharahara (Icon of Kathmandu) – before and after the Gorkha 2015 earthquake (from GoN, 2015)

These biophysical phenomena described are particularly influential due to the socioeconomic and political context of Nepal. Poverty and a lack of individual and institutional capacity are the primary reasons that the population of Nepal is particularly vulnerable to climactic changes (Tiwari et al., 2014). Eighty-three percent of Nepal's population lives in rural and



**Figure 2.** Before and after the Seti River flood disaster in 2012 (from GoN, 2015)

often remote mountainous regions, with many of the poorest residing in areas prone to flooding or landslides (GoN, 2015). In addition, three-quarters of the population relies on agriculture for their livelihood and the sector contributes one-quarter of Nepal's gross domestic product; regrettably, agriculture is highly sensitive to climactic and biophysical changes (Thapa et al., 2016). The population concentrated in the mid- and far- western regions of Nepal are the most vulnerable, largely due to poverty and high reliance on subsistence agriculture (GoN, 2010). Economic losses from natural disasters in Nepal



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between 2005 and 2015 have been estimated to be more than 1.3 trillion US dollars (GoN, 2015).

## 3.2 Nepal and Climate Change Adaptation

The Government of Nepal has an extended history of attempting to reduce poverty and increase the capacity of local communities to adapt and built resilience to natural disasters and climate change impacts (Ojha et al., 2016). Despite these initiatives, Nepal lacks long-term baseline data on climate change, monitoring capacity, and forecasting systems; without these, climate change risk assessments are difficult (YONSED, 2012). The LAPA initiative is regarded as a positive step forward to promote location- and context-specific people centric adaptation actions that are identified, prioritized, and implemented by local communities to address climate change impacts.

As a focal point to UNFCC and based on Business Allocation Rules of Nepal, the then Ministry of Environment (MOE) coordinated and prepared the NAPA document (GoN, 2010). The Ministry of Science Technology and Environment (MoSTE) prepared and finalized the National Framework on LAPA in November 2011. LAPAs could be prepared for and implemented in any geographical or administrative areas such as watersheds, ecosystems, administrative districts, municipalities, villages, wards, or settlements. At present, district offices of the Ministry of Federal Affairs and Local Development (MoFALD) are engaged in coordinating LAPAs under implementation by municipalities and Village Development Committees. Within the MoSTE (now MoPE), the Nepal Climate Change Support Program (NCCSP) implements NAPA prioritized adaptation actions through LAPA framework. The NCCSP prepares and implements LAPAs in most climate vulnerable 14 districts of Mid- and far-west Nepal. The LAPAs fall within the existing two-tiered local government structure. The top of the local government tier includes 75 district development committees (DDCs) whom are ultimately responsible for LAPA implementation. Each DDC contains municipalities (for urban areas) and/or village development committees (VDCS; now called rural municipalities); municipalities and VDCs are split into wards which also have ward committees (WCs). Thus, while the overarching responsibility of Nepal's LAPAs implementation are coordinated by ministries at central level (now MoPE and MoFALD for NCCSP) the actual political entities implementing the LAPAs are VDCs and municipalities (GoN, n.d.; Chaudhury et al., 2014).

The MoE produced a National Framework on LAPAs (the Framework). The Framework provides guidance on the LAPA process including how to prepare, integrate, implement, and assess each LAPA. There are seven steps identified for each LAPA, as can be seen in Figure 3. These steps are supported by a variety of recommended tools to encourage participation and translate meaningful local information into the

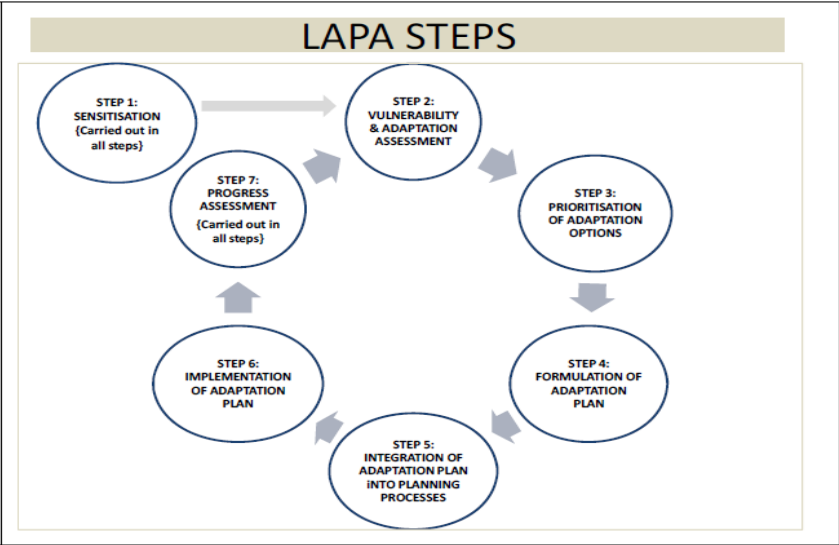


Figure 3. Steps of LAPA (from GoN, 2011)

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prioritized actions of each LAPA (GoN, 2011).

As of 2016, 93 LAPAs for VDCs and 7 LAPAs for municipalities have been prepared and are under implementation. These represent 14 of the most climate vulnerable districts out of the 75 DDCs and include approximately 3 million of the most marginalized and disadvantaged people of Nepal (JVS/GWP Nepal, 2016; GoN, n.d.). The primary funders of the entire LAPA process have included the UK's Department for International Development (DFID) and the European Union. The United Nations Development Programme (UNDP) provides technical support to this project (GoN, n.d.). Approximately USD 23 million have been allocated thus far (Maharjan & Maharjan, 2017).

### 3.3 Progress of LAPAs

In addition to the substantial mobilization required to create each LAPA, there have been many other positive outcomes of the LAPA process. Regmi & Star (2014) interviewed community members within three VDCs and found that 20-25% of the households within each VDC were involved in the design of their LAPAs. Local stakeholders whom were previously excluded from climate change discussions are being increasingly sensitized to some of the predicted climate change impacts, an integral step to build resilience and eventually adapt (Regmi & Star, 2014). Furthermore, communities with raised awareness can then demand increased climate change adaptation action from their local representatives, whom will be more inclined to act (Chaudhury et al., 2014).

The LAPA process has indeed been criticized by some. Ohja et al. (2016) lament a lack of true vertical integration of local concerns from the national to local level, perhaps due to an "absence of decentralized executing unites". While it is considered advantageous that the LAPA process was implemented without the creation of new agencies, Chaudhury et al. (2014) are concerned that existing local entities such as VDCs have prioritized ongoing commitments over building resilience to climate change; in addition, many municipalities and VDCs lack technical capacity to plan and implement climate change adaptation actions.

Though there are evidently many challenges faced as the LAPAs progress from development to implementation, there is one in particular that has lacked attention. Many of Nepal's climate change impacts faced are highly or directly related to water resources. As mentioned, Nepal is administratively divided into 75 districts. The 2010 NAPA identified that of these 75 districts, 22 are highly vulnerable to drought, 12 to GLOFs, and 9 to flooding. The increased risk posed from these water-related calamities is just one aspect of the acute requirements for water resource management due to climactic changes within Nepal (GoN, 2010). Now that over 100 LAPAs have been produced, it is necessary to understand how the actions proposed reflect and address water resource sensitivities in the face of climate change.

## 4. Actions Taken

Beginning in late 2015, JVS/GWP-Nepal began to design a study to further Nepal's understanding of the relationship between its climate change adaptation priorities and water resource management. 101 of the LAPAs produced were reviewed to identify adaptation actions and associated budgets related to water resources (JVS/GWP-Nepal, 2016). The report preparation also required extensive consultation with community members and government agencies. This is one of the first attempts to thoroughly examine the progress of LAPAs under a water lens.

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Each LAPA includes detailed descriptions of the largest threats faced by their locality due to climate change. The first approach of the study was to examine these identified threats. JVS/GWP-Nepal grouped these into 8 of the most commonly identified potential impacts ((JVS/GWP-Nepal, 2016):

- “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 (domestic plants and animals);
- damage to infrastructure from natural disasters such as landslides and floods, including from fire and ice melting; and
- lowering down of groundwater table”

The next step of the study was to review all of the funding allocated in each of the 101 LAPAs for climate change adaptation actions. This revealed that 53%<sup>1</sup> of the funding for the climate change adaptation actions identified across those LAPAs reviewed is allocated for water-related projects (JVS/GWP-Nepal, 2016).

JVS/GWP-Nepal next categorized all the water-related adaptation actions proposed in the reviewed LAPAs into 7 categories: infrastructure; community protection; water resource conservation and rainwater harvesting; agriculture; landslide and flood control; Indigenous knowledge and water mill; and capacity building. These 7 water-related adaptation action categories were used to further observe the budget allocated for each one (JVS/GWP-Nepal, 2016), as summarized in Table 1.

**Table 1.** Water-Related Adaptation Actions Categories from 101 LAPAs and Budget Allocations (modified from JVS/GWP-Nepal, 2016)

Water-Related Adaption Action	Percent of Water-Related Adaptation Actions	Percent of LAPA Budget
Infrastructure	82.6 %	44.00 %
Community protection	2.78 %	1.4 %
Water resource conservation and rainwater harvesting	8.08 %	4.3 %
Agriculture	0.45 %	0.44 %
Landslide and flood control	1.23 %	1.1 %
Indigenous knowledge and water mill	1.45 %	1.4 %
Capacity building	3.41 %	0.5 %

## 5. Outcomes

This case study has two broad outcomes: the study findings themselves, and how the findings were used practically.

### 5.1 Study Findings

One of the most important study findings was that more than half of the climate change adaptation action funding within those LAPAs reviewed has been allocated for water-related projects and activities. Recalling that LAPAs are principally produced by local community

<sup>1</sup> It is important to note there is diversity in the budgets of each LAPA and some of the VDCs/municipalities allocated much less for water-related actions (JVS/GWP-Nepal, 2016)



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members, this large percentage of allocated budget to water actions demonstrates the perceived vulnerability of water resources in the face of climate change in Nepal. In other words, this finding ascertains that local community members and government authorities have already begun to recognize the importance of prioritizing water resource management alongside climate change adaptation.

Another principal finding of the study was that most of the water-related budget allocated across the LAPAs is infrastructure-related (82.6%). This grouping of adaptation actions calls for the development of various water infrastructure such as irrigation canals, groundwater wells, drinking water supply, micro-hydroelectricity, and bridges (JVS/GWP-Nepal, 2016). Water-related adaptation actions which received considerably less priority include those related to capacity building and agriculture (JVS/GWP-Nepal, 2016). However, capacity building has been identified as a crucial component of successful climate change adaptation. This is widely referred to as adaptive capacity, or “the ability of different socio-ecological systems and agents to respond and recover from climate impact” (Lemos et al., 2013). Without this capacity to adapt and build resilience, other adaptation efforts may be futile (Eisenack et al., 2014).

Biagini et al. (2014) reviewed climate change adaptation activities being implemented across 70 countries funded by the Global Environment Facility (GEF), which includes the funding of NAPAs through the LDCF. Adaptation actions at various stages of implementation were grouped into ten categories. The most commonly adopted and implemented actions were within the category of capacity building. The second most prevalent was management and planning, while the physical infrastructure categorization was sixth of the ten categories. The results suggest that, globally, stakeholders believe capacity building is an integral climate change adaptation measure. The authors reflect that this finding is unsurprising because many of the most vulnerable countries receiving funding lack an “enabling environment”, without which further adaptation actions would not be as successful for increasing resilience to climate change impacts (Biagini et al., 2014).

Comparison between the studies completed by JVS/GWP-Nepal (2016) and Biagini et al. (2014) could be misleading, particularly because the adaptation actions examined by Biagini et al. (2014) were those within NAPAs instead of LAPAs. In addition, Biagini et al. (2014) only assess priority by number of word occurrences within NAPA text, while JVS/GWP-Nepal (2016) examine priority based on budget allocated. However, because 80% of Nepal's NAPA prioritized adaptation project funding from the LDCF is disbursed to LAPAs (Maharjan & Maharjan, 2017), it is conceivable to draw some comparison.

Firstly, Nepal's actions listed within their NAPA indeed name and prioritize capacity building over infrastructure (GoN, 2010), concurring with Biagini et al. (2014)'s results. Why is it that, locally, capacity building is not prioritized and rather infrastructure is? Perhaps one reason is that infrastructure requirements are locally-derived. Another consideration is that while building adaptive capacity may be costly, water infrastructure projects such as those proposed in the LAPAs are expensive. Finally, it is possible that many of the local communities hope to spend most of their LAPA budgets on infrastructure due to a lack of funding for these projects otherwise.

This analysis highlights a crucial concept: capacity building may not be receiving the funding support it deserves for climate change adaptation. While adaptation planning documents often

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identify capacity building as one of the primary priorities, during budgeting stages it is only offered a minimal budget compared to other adaptation mechanisms. In the case of Nepal, this is true since the majority of budget is allocated locally. Another note should be made that an examination of budget allocation is likely a better indicator of prioritization of adaptation actions, rather than word mentions within a policy or planning document.

### 5.2 Practical Use of Study Findings

More practically, JVS/GWP-Nepal wanted to ensure that the study's findings were disseminated and used appropriately. Though all of the LAPA actions are critical – water-related or not – to increase Nepal's resilience to climate change, JVS/GWP-Nepal has been utilizing the reports' findings to advocate for the prioritization of water-focused adaptation actions. As discussed, the impacts of climate change on water resources in Nepal include everything from flooding to drought; in combination with the socioeconomic and political context faced by its citizens, primarily agriculture-based livelihoods and general quality of life are threatened. Thus, prioritization of water is purposeful since it influences many aspects of Nepal's adaptive capacity in the face of climate change. Put in another way, the water lens utilized to examine the LAPAs was purposeful because managing Nepal's waters in an integrated and holistic approach will have multiple benefits on its citizens and other natural resources.

Since its completion, the report has been communicated to all water-related government institutions and the Nepal Climate Change Support Programme, who is responsible for implementing LAPAs. The purpose of this communication was to ensure that these entities are aware of the importance of water resources when discussing climate change adaptation in Nepal locally and nationally. A workshop was also organized in mid-2016 in Kathmandu to highlight the water-focused climate adaptation actions in LAPAs (Figure 4).



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Figure 4: Workshop in Kathmandu on water-focused climate adaptation actions in LAPAs (Provided by Uprety, 2016)

Attendees represented governmental agencies, international non-governmental organizations, and academic institutions. The study has provided renewed focus to many of these bodies as they move forward in their parallel pathways implementing climate change adaptation activities. As participants reflected in the workshop, these concerned organizations are now promoting adaptation activities to address the adverse impacts of climate change on water resources sector (B. Uprety, personal communication, August 27, 2017).

The report findings also informed the need for capacity building locally, and as discussed, building adaptive capacity is integral to ensure that other adaptation actions are successful. JVS/GWP-Nepal should encourage for focused capacity building-related activities related to water resources for local stakeholders.

Since late 2016, Nepal has been in the process of developing its National Adaptation Plan (NAP), which differs from the NAPA. While the NAPA was primarily to address immediate climate change adaptation needs of Nepal, the NAP “takes a medium- and long-term approach to reducing vulnerability to the adverse effects of climate change that is integrated with national development planning processes and strategies” (LEG, 2012). The NAP thus builds upon the progress of the NAPAs – and LAPAs – in the case of Nepal. The first step and current stage for the development of each LDC’s NAP is to complete “stocktaking” of all available climate change vulnerabilities and adaptations to date (LEG, 2012). The JVS/GWP-Nepal report has proven to be valuable resource for Nepal’s government as it enters its NAP development.

Furthermore, JVS/GWP Nepal organized an interaction program on reducing climatic vulnerability in the water sector through the National Adaptation Plan (NAP) sector in December 2016. Multi-stakeholder attendees included both governmental and non-governmental organizations. This interaction provided an opportunity to share study findings and experiences on adaptation to climate change in the hydro-electricity sector, approaches of integrating adaptation to the water resource sector, and governmental initiatives on NAP process. The outcome of the interaction has provided inputs to the NAP team, including thematic working groups on water resources and energy coordinated by the Ministry of Energy, to address climate change concerns related to the water resources sector (B. Uprety, personal communication, August 27, 2017).

## **6. Lessons Learned**

- Monitoring and evaluating national initiatives, as they are developed and implemented, can reveal useful information. Reviewing these initiatives from a broad perspective allows reflection to ultimately improve outcomes. In this case, putting a water lens on Nepal's climate change adaptation planning revealed important evidence which will shape future climate change adaptation action planning.
- Strategic communication plans, which can for example include workshops and identification of key partners, should be paired with any study carrying important information in order to support evidence-based decision-making.
- A simple strategy to broadly understand priorities of stakeholders and/or government representatives is to examine how funding has been allocated. Ask questions such as why certain functions get priority, who will be impacted, and what the implications are for poorly funded initiatives.
- 'Hard' climate change adaptation actions such as infrastructure development are often prioritized but must be supported by 'soft' strategies including capacity building. Developing adaptive capacity of individuals and groups to respond and recover from climate change impacts supports all other climate change adaptation efforts.
- Non-governmental organizations and other third-party organizations can be used to provide a critical and objective review of governmental initiatives.

## **7. Conclusion**

This study presents a case where a local organization took initiative to re-frame climate change adaptation actions in a water resources perspective. The LAPAs reviewed represent the most marginalized and disadvantaged people in Nepal; this is the group with the greatest need to build resilience from the impacts of climate change on water resources. The retrospective study of 101 LAPAs prepared with full consultation of local communities in Nepal revealed a number of lessons which will shape local and national efforts towards building adaptive capacity for climate change. While it was discovered that adaptation actions related to water resources have already been given some priority, the focus on building water infrastructure may not be advantageous without adaptation actions focusing on capacity building as well. The report also established evidence for local and national decision-makers that communities recognize water resource management to be a crucial consideration for climate change adaptation going forward. This signals to Nepal that as it develops its NAP, it should be sure to plan and fund climate change adaptation accordingly. The case study has affirmed the value of third-party monitoring and evaluation. Nepal is developing her NAP based on the progress, experiences, and lessons learned from NAPA and LAPAs implementation, along with multi-stakeholder engagement in NAP. These same lessons can also be considered amongst other LDCs in their climate adaptation planning and NAP formulation processes.

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