



CARIIA
*Collaborative Adaptation Research
Initiative in Africa and Asia*

Review of Current and Planned Adaptation Action in Nepal

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Titles in this series are intended to share initial findings and lessons from research and background studies commissioned by the program. Papers are intended to foster exchange and dialogue within science and policy circles concerned with climate change adaptation in vulnerability hotspots. As an interim output of the CARIAA program, they have not undergone an external review process. Opinions stated are those of the author(s) and do not necessarily reflect the policies or opinions of IDRC, DFID, or partners. Feedback is welcomed as a means to strengthen these works: some may later be revised for peer-reviewed publication.

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Abstract

Nepal is addressing its vulnerability to climate change by advancing adaptation action at the local, subnational, and national levels. Of particular concern for the country is the need to address adaptation requirements in sectors such as agriculture, water resources, energy, health, and urban planning. The Government of Nepal's leadership in adaptation planning, despite decades-long political instability and poor performance of the economy, has been recognized as a good example of a country-driven and country-owned initiative. Key climate policy initiatives include the 2010 National Adaptation Programme of Action and the 2011 Climate Change Policy, which have been instrumental in facilitating inter-ministerial coordination and learning to better integrate adaptation as part of regular development planning. The ongoing Local Adaptation Plans for Action process has demonstrated the potential of bottom-up, inclusive, and decentralized adaptation planning. These integrated institutional mechanisms, coupled with the country's growing political commitment and leadership on climate change issues, provide ample opportunities to facilitate adaptation initiatives at various levels in a more cohesive and systematic way. This report is one in a series of country reviews prepared to provide the Collaborative Adaptation Research Initiative in Africa and Asia with a snapshot of adaptation action in its countries of engagement.

Résumé

Examen des mesures d'adaptation actuelles et prévues au Népal

Le Népal remédie à sa vulnérabilité face aux changements climatiques en favorisant les mesures d'adaptation à l'échelle locale, infranationale et nationale. Le pays doit notamment aborder sans tarder les exigences d'adaptation dans les secteurs tels que l'agriculture, les ressources en eau, l'énergie, la santé et l'urbanisme. Le leadership du gouvernement du Népal relativement à la planification en matière d'adaptation a été reconnu comme étant un bon exemple d'une initiative menée et entreprise par un pays, et ce malgré des décennies d'instabilité politique et de faible rendement économique. Le Programme d'action national aux fins de l'adaptation et la politique sur les changements climatiques, mis en œuvre en 2010 et 2011 respectivement, comptent parmi les initiatives clés liées aux politiques en matière de climat. Ces initiatives ont grandement facilité la coordination interministérielle et ont permis d'apprendre à intégrer les mesures d'adaptation dans la planification du développement. Les plans d'action continus en matière d'adaptation à l'échelle locale ont démontré le potentiel de la planification de mesures d'adaptation ascendante, inclusive et décentralisée. Ces mécanismes institutionnels intégrés, associés à l'engagement et au leadership croissants du gouvernement envers la problématique des changements climatiques, créent de multiples occasions propices à la facilitation des initiatives d'adaptation à divers niveaux, et ce de manière plus cohérente et systématique. Ce rapport fait partie d'une série d'examen des pays préparés pour donner à l'Initiative de recherche concertée sur l'adaptation en Afrique et en Asie un aperçu des mesures d'adaptation dans les pays où elle est déployée.

Acronyms

APTP	Approach Paper to the Thirteenth Plan
CARIAA	Collaborative Adaptation Research Initiative in Africa and Asia
CCNN	Climate Change Network Nepal
CIA	Central Intelligence Agency
DFID	Department for International Development (United Kingdom)
GLOF	glacial lake outburst flood
GON	Government of Nepal
HDI	Human Development Index
ICIMOD	International Centre for Integrated Mountain Development
IDRC	International Development Research Centre
IPCC	Intergovernmental Panel on Climate Change
LAPA	Local Adaptation Plan for Action
MOAC	Ministry of Agriculture and Cooperatives
MCCICC	Multi-stakeholder Climate Change Initiatives Coordination Committee
MDG	Millennium Development Goal
MSTE	Ministry of Science, Technology and Environment
NAP	National Adaptation Plan
NAPA	National Adaptation Programme of Action
NCVST	Nepal Climate Vulnerability Study Team
ND-GAIN	Notre Dame Global Adaptation Index
NPC	National Planning Commission
OECD	Organisation for Economic Co-operation and Development
SPCR	Strategic Program for Climate Resilience
TWG	Thematic Working Group

UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development

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Synopsis

Climate risks	<ul style="list-style-type: none"> • Increasing temperatures • Increasing rainfall variability and intensity • Increasing precipitation (during summer months) • Greater monsoon and post-monsoon rainfall • Decrease in winter precipitation • Glacial lake outburst floods 	Key sources of vulnerability	<ul style="list-style-type: none"> • Largely natural resource–dependant agrarian economy • Almost half of the population is multi-dimensional poor • Significant disparities between rural and urban areas and along lines of caste and ethnicity • Low levels of gender equality • Political instability and inadequate governance structures • High reliance on groundwater resources and insufficient irrigation systems • Increasing dependency on foreign aid • Large numbers of squatter settlements due to urban migration 	
Vulnerable sectors	Illustrative potential impacts on vulnerable sectors	Illustrative priority adaptation measures in each sector		Projects in sector¹
Agriculture and food security	<ul style="list-style-type: none"> • Declining crop and livestock production • Major loss in subsistence farm production • Decline in production of winter and spring crops 	<ul style="list-style-type: none"> • Improve access to agricultural services • Improve adaptive capacity by improving production and marketing systems • Strengthen highland and lowland linkages • Promote sustainable underground water management for irrigation and improved animal breeds adaptable to a changing climate 		30%
Water resources and energy	<ul style="list-style-type: none"> • Water stress, excessive water during heavy precipitation, and floods • Changes in river flow will impact micro-hydro projects and lead to a shortage of power and a consequent increase in blackouts • Precipitation, snowfall, and hailstorms will affect solar power systems 	<ul style="list-style-type: none"> • Conserve lakes that are supplying water and ecological services • Promote rainwater harvesting and improve water mills for multi-use • Establish and improve micro-hydropower projects affected by water shortages and conserve water supply sources 		52%
Forests and biodiversity	<ul style="list-style-type: none"> • Temperature and rainfall variability will lead to a shift in agro-ecological regions 	<ul style="list-style-type: none"> • Promote agroforestry practices and community-based management of forest fires 		48%

¹ Percentage of total identified discrete adaptation projects and programs based upon research undertaken as part of this review. Note that individual projects may address more than one sector.

	<ul style="list-style-type: none"> • Higher incidences of pest and diseases • Increase in risk of forest fires • Increase in the emergence of alien and invasive species • Changes in flowering and fruiting timings of horticultural crops • Decline in ecosystem services such as wetlands and forests 	<ul style="list-style-type: none"> • Meet rural households' energy needs through plantations that balance fuelwood produced and scaling-up biomass energy technologies • Promote improved pasture and rangeland management techniques in degraded mountain ecological zones • Promote integrated wetland management and improve management of biological corridors 	
Public health	<ul style="list-style-type: none"> • Existing poor health care infrastructure increasing vulnerability to impacts of climate change • Greater risk of outbreaks of vector-borne diseases • Higher incidence of water-borne diseases 	<ul style="list-style-type: none"> • Support evidence-based research and pilot projects • Improve public education about responding to the adverse effects of climate change on health • Investigate disease outbreaks and scale up emergency response • Strengthen forecasting and early warning on climate change and health 	4%
Urban settlements and infrastructure	<ul style="list-style-type: none"> • Key infrastructure at risk of being impacted by natural disasters such as landslides and floods • Water and energy systems in urban areas at greater risk • Large influx of people from rural areas affected by disasters will result in overcrowding of urban slums, leading to public health challenges 	<ul style="list-style-type: none"> • Enforce building codes in municipal areas that incorporate climate change considerations • Rehabilitate vulnerable communities • Increase efficiency of underground water resources • Establish municipal compost plants • Build capacity of local institutions for efficient water and energy planning 	4%
Particularly vulnerable regions	Particularly vulnerable groups	Status of climate governance (policies, institutions)	
<ul style="list-style-type: none"> • Districts in high mountain areas 	<ul style="list-style-type: none"> • Lower-caste Dalit and Janajati communities • Women • People in remote communities, with small land holdings and/or with livelihoods dependent on natural resources 	<ul style="list-style-type: none"> • Climate change recognized in development plan • National-level coordinating entity established and active • National Adaptation Programme of Action and <i>National Framework on Local Adaptation Plans for Action</i> published • National Adaptation Plan process launched in 2015 • National-level climate change policy is in place • Climate change integrated into some national sectoral policies 	

Introduction

Nepal is located in the mid-Himalayan region of the Hindu Kush–Himalayan range, surrounded by China to the north and India on the south, west, and east. It is a landlocked country and has some of the world’s highest mountain peaks, including Mount Everest. Nepal’s topography contributes to its unique biogeography: the country has among the highest shares of the world’s biodiversity. Relying on its abundant natural resources, notably freshwater and forests, the country is a predominantly natural resource-dependent agrarian society. Approximately two-thirds of the population lives in rural areas, and about three-quarters of the country’s workforce is engaged in small-scale and subsistence agriculture. Persistent inequalities exist between regions of the country and within communities based on caste and ethnicity.

Nepal has experienced significant changes since 2006, which marked the end of a decade-long civil war. Political stability has begun to return with the introduction of multi-party politics, but challenges remain in terms of reaching political agreement on critical matters such as a new constitution and improving governance capacity. Additionally, the country continues to face a number of economic challenges. Although Nepal has experienced modest economic growth in recent years, it has become increasingly reliant on international development assistance and remittances. It remains one of the world’s least developed countries, with an estimated 44% of Nepalese living in multi-dimensional poverty. The earthquakes of April 2015 slowed economic growth and are expected to have a continued impact in years to come.

The high dependence of Nepal’s economy and its people on natural resources, its weak governance capacity, and its poor economy, combined with its location in the heart of the Hindu Kush–Himalayan region (a climate change hot spot), leave it particularly vulnerable to climate change impacts. Of particular concern is the potential for changes to the flow and quality of water derived from glaciers, snowmelt, and rainfall that supplies the large rivers of Koshi, Gandaki, and Kamali. These in turn feed into the Ganges River system, which supports the livelihoods of more than 500 million people (World Bank, 2015b). Floods, landslides, and glacial lake outburst floods (GLOFs) are additional risks.

The Government of Nepal (GON) has recognized climate change and its impacts as a key risk to the country’s economy and its citizens, and has undertaken a series of climate risk management policies and strategies at the national, district, and local levels. This paper provides a snapshot of Nepal’s current and planned efforts to support adaptation to climate change. Drawing upon available literature, it has been prepared to support the work of the Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA). Jointly funded by the UK Department for International Development (DFID) and the International Development Research Centre (IDRC), CARIAA aims to help build the resilience of poor people to climate change in three hot spots in Africa and Asia: semi-arid areas, deltas in Africa and South Asia, and glacier- and snow-fed river basins in the Himalayas. To achieve

this goal it is supporting four consortia to conduct high-calibre research and policy engagement activities that will inform national and subnational planning processes in 17 countries, including Nepal.

The paper begins by summarizing current understanding of existing and projected climate risks in Nepal, followed by a discussion of the factors that contribute to its vulnerability to climate change and its most vulnerable sectors, regions, and groups. An overview is then provided of the critical policies and plans shaping Nepal's efforts to address climate change adaptation at the national and subnational levels. To assess the extent to which efforts to address the country's critical adaptation priorities are presently under way, section 5 paints a general picture of the scale, type, and focus of current and planned adaptation-focused programs and projects in Nepal, as well as the level of adaptation finance flowing into the country. A profile of in-country efforts to advance adaptation learning and knowledge sharing, as reflected in the presence of networks and communities of practice active in this field, is provided in section 6. The paper concludes with an assessment of the general status of adaptation planning at the national and subnational levels in Nepal.

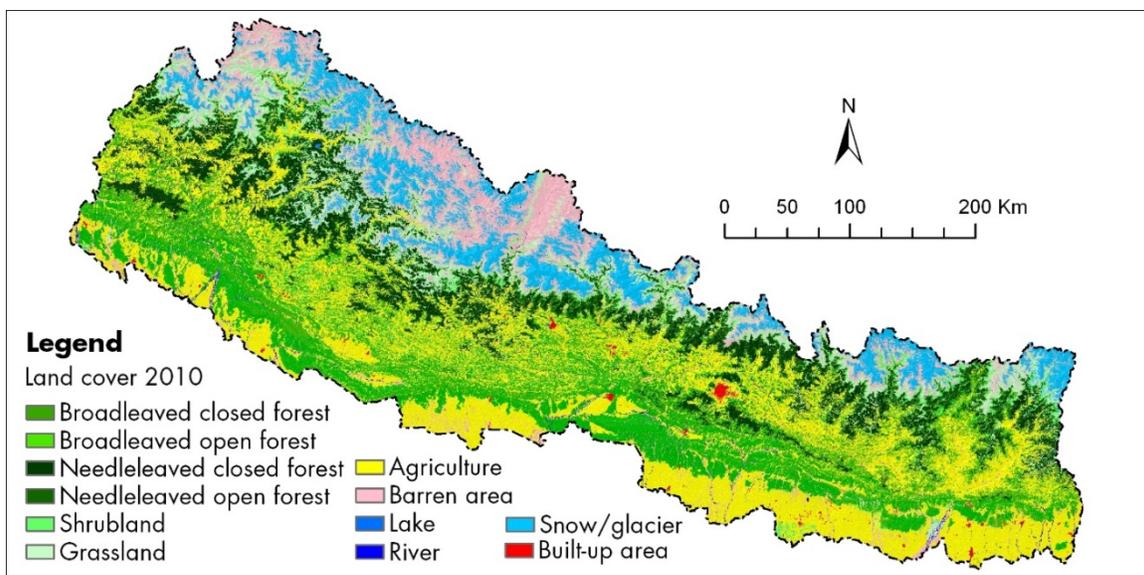


Figure 1 – Land cover map of Nepal (Uddin et al., 2015)

1. Current climate and projected changes

This section provides an overview of the climate context in Nepal, beginning with a general description of the country's current climate and climatic zones. This description is followed by a discussion of observed trends and projected changes in Nepal's climate.

1.1 Nepal's climate

Nepal, with its unique geographic location in the climate-sensitive Hindu Kush–Himalayan region, has five climatic zones based on altitude (see Table 1). These run roughly north to south within the country, from the High Himal zone in the north to the Terai zone in the south, along the border with India. Because of the extreme variations in elevation within such short distances, Nepal's climate varies significantly from region to region, ranging from alpine and arctic in the north to tropical in the south.

The country has four seasons: pre-monsoon, occurring from March to May; monsoon, in June to September; post-monsoon, in October to November; and winter, in December to February. The country's climate variation is largely influenced by the monsoon, originating in the Arabian Sea, during which almost 80% of annual rainfall occurs. Its climate is influenced to a lesser extent by disturbances from the Mediterranean Sea. Average annual rainfall is 1,530 mm; however, this also varies depending on topography. Altitude further affects rainfall patterns: total annual rainfall increases with altitude up to approximately 3,000 m above sea level and then diminishes at higher elevations (Ministry of Science, Technology and Environment [MSTE], 2014). As illustrated in Table 1, the temperature gradient varies strongly with altitude. The highest temperatures occur during the pre-monsoon period (MSTE, 2014).

Zone	Elevation	Climatic zone	Average annual precipitation	Average annual temperature
Terai (low-lying plains)	< 500 m	Hot monsoon and tropical	1,100 mm to 3,000 mm	20°C to 25°C
Siwalik Hills (Churia)	500 m to 1,000 m	Hot monsoon and subtropical		
Middle Mountains	1,000 m to 3,000 m	Cool to warm temperate monsoon	275 mm to 2,300 mm	10°C to 20°C
High Mountains	3,000 m to 5,000 m	Alpine and subalpine	150 mm to 200 mm (snow)	< 3°C to 10°C
High Himal	> 5,000 m	Tundra and arctic		

Source: Ministry of the Environment, 2010b; MSTE, 2014

The significant temporal and spatial variability in the country's hydrologic patterns, both in rainfall and runoff, results in excess water at certain times of the year and prolonged dry periods in others. For example, less than 50% of the average annual precipitation level fell during the period of November 2008 to February 2009, resulting in one the worst winter droughts in the country. Production of two winter crops, wheat and barley, suffered significantly, with a decline of 50% below 2007 levels (Wang, Yoon, Gillies, & Cho, 2013).

The country was already struggling with the global food crisis of 2008, and this unseasonal drought affected more than 300,000 people in nine hill districts of the western and mid-western regions (IRIN, 2008). Such devastating winter droughts in western Nepal are attributed to variability in the Arctic Oscillation and persistent warming of the Indian Ocean (Wang et al., 2013).

Glacial lake-related risks are also quite high, with GLOFs posing significant threats to livelihoods and key infrastructure, such as road networks and hydropower dams. More than 1,466 glacial lakes, with a total geographic area of 64.78 km², have been identified in the Koshi, Gandaki, Karnali, and Mahakali Basins of Nepal (International Centre for Integrated Mountain Development [ICIMOD], 2011). Floods, both riverine and those linked to glacial lake outbursts, are frequent in many parts of the country. Extreme flooding caused by heavy rains has occurred in the West Rapti River Basin on an increasingly frequent cycle since the late 1970s (Integrated Development Society Nepal, Practical Action Consulting, & Global Climate Adaptation Partnership, 2014).²

The risk of natural disaster-induced displacement is quite high in Nepal, with approximately 4,152 Nepalese per million at risk of being displaced each year (International Displacement Monitoring Centre, 2015). Nepal is also one of the 11 countries globally that is most at risk of disaster-induced poverty (Shepherd et al., 2013). Nepal's economy is highly exposed to such climate-related natural hazards, the direct economic costs of which have been estimated in the range of 1.5% to 2% of the country's current GDP, which is equivalent to almost US\$270 million to US\$360 million per year, in 2013 prices (Integrated Development Society Nepal, Practical Action Consulting, & Global Climate Adaptation Partnership, 2014).

1.2 Observed climate trends

Analyses of observed climate trends, including temperature and precipitation data, are limited by the relatively short length of meteorological records in Nepal (about 30 years). Existing data indicate consistent and continuous warming after the mid-1970s, with maximum temperatures rising at an annual rate of 0.04°C to 0.06°C. The rate of warming has been greater in the winter compared to other seasons. Warming seems to be more pronounced in high-altitude regions such as the Middle Mountains and the High Himalayas compared to the Terai and Siwalk regions, where warming is significantly lower or lacking (World Wildlife Fund–Nepal, 2005). This suggests that the elevated regions of Nepal are more sensitive to and affected by climate change.

Further, a small, but statistically significant, increase in the frequency of hot nights has been observed. The average number of “hot”³ nights per year went up by nine additional nights between 1960 and 2003. In contrast, the annual frequency of “cold”⁴ days and nights has

² Extreme floods in the West Rapti River Basin were recorded in 1977, 1981, 1983, 1999, 2000, 2003, 2005, 2006, 2009, and 2012.

³ Defined by the temperature exceeded on 10% of days or nights in the current climate of that region or season.

⁴ Defined as the temperature below which 10% of days and nights are recorded in the current climate of that region or season.

decreased significantly since 1960: the annual average number of “cold” days decreased by 19 days between 1960 and 2003, and the average number of “cold” nights per year decreased by 32 nights over the same time period (McSweeney, New, & Lizcano, 2012). Nepal’s cities are warming faster than the surrounding outskirts and the countrysides and villages as a result of the urban heat island effect. In Kathmandu, temperatures increased at a linear rate of 0.05°C per year between 1975 and 2005, with each decade being warmer than the previous one (Baidya, Regmi, & Shrestha, 2007).

A decrease in light rain events (Christensen et al., 2013) and an increase in the frequency and intensity of extreme rainfall events has been observed in the glacial-fed river basins of South Asia (Kilroy, 2015). This pattern can be seen in Nepal, where an increase in the frequency of heavy precipitation events was recorded between 1971 and 2005. A decadal cycle for the occurrence of these events has also been observed. A statistically insignificant increase in monsoon rainfall also has been observed during this time (Baidya et al., 2007). At the same time, though, there has been an observed decrease in total annual precipitation since the 1960s. Precipitation rates are recorded to have decreased by an average of 3.7 mm per month per decade, with the largest decrease having occurred in the June to August period (McSweeney et al., 2012).

1.3 Climate change projections

Mean annual temperatures are expected to continue to increase in Nepal over the remainder of this century. According to McSweeney et al. (2012), the increase is projected to be 1.3°C to 3.8°C by the 2060s, and 1.8°C to 5.8°C by the 2090s. Similarly, the Nepal Climate Vulnerability Study Team (NCVST) has reported that mean annual temperatures could increase by a mean of 1.4°C (with a range of 0.5°C to 2.0°C) by the 2030s, rising to a mean of 4.7°C (3.0°C to 6.3°C) by the 2090s (NCVST, 2009).

With respect to precipitation, available global circulation models demonstrate uncertainty regarding changing precipitation patterns in Nepal. Although mean annual precipitation projections averaged over the country suggest that there will be an increase in precipitation levels (McSweeney et al., 2012), there is significant variability. In its synthesis of available projections, the NCVST found that models suggested that mean annual precipitation levels could decline by 34% or rise by 22% by the 2030s, decline by 36% or rise by 67% by the 2060s, and decline by 43% or rise by 80% by the 2090s (NCVST, 2009).

Projected changes in monsoon patterns for South Asia, including Nepal, are also uncertain but more commonly suggest that there will be an increase in monsoon rainfall by 2100 (see Table 2). It is also generally expected that there will be an increase in interannual variability in monsoon rainfall, and an increase in the occurrence of extreme (or heavy) rainfall events (Bartlett, Bharati, Pant, Hosterman, & McCornick, 2010; Christensen et al., 2013). The Intergovernmental Panel on Climate Change’s (IPCC’s) findings also indicate that there could be earlier onset and later retreat of the Indian summer monsoon, and that a greater

proportion of increases in mean annual precipitation in South Asia will take place between June and August (Christensen et al., 2013).

Climate change has already begun to affect runoff patterns in Nepal by accelerating glacial melt and retreat and reducing the amount of permafrost (Bartlett et al., 2010). In the near term, this process will lead to increased downstream water flow and greater risk of GLOFs. In the longer term, the loss of glacial snow and ice in the Himalayas will result in lower downstream water flows, which will have significant consequences for agriculture and other livelihood strategies (Bartlett et al., 2010; World Wildlife Fund, 2005).

It must be cautioned that considerable uncertainty remains regarding how Nepal’s climatic regime will be altered in the future by global climate change. This uncertainty reflects, in part, limited understanding of the complex factors that govern the monsoon patterns of South Asia and the difficulties associated with modelling climate projections for Nepal given its topography (Bartlett et al., 2010; NCVST, 2009). As such, climate projections for Nepal should be treated with care.

Table 2 – Anticipated climate changes in Nepal	
Temperature	<p>Significant rise in temperature:</p> <ul style="list-style-type: none"> • 0.5°C to 2.0°C by 2030 • 1.3°C to 3.8°C by 2060 • 1.8°C to 5.8°C by 2090 • Increase in the number of days and nights considered hot by current climate standards • Highest temperature increases during the months of June to August and at higher elevations
Precipitation	<p>Wide range of mean annual precipitation changes:</p> <ul style="list-style-type: none"> • –34% to +22% by the 2030s • –36% to +67% by the 2060s • –43% to +80% by the 2090s <p>Increase in monsoon rainfall toward the end of the century:</p> <ul style="list-style-type: none"> • –14% to +40% by the 2030s • –40% to +143% by the 2060s • –52% to +135% by the 2090s
Runoff	<ul style="list-style-type: none"> • Higher downstream flows in the short term, but lower downstream flows in the long term due to retreating glaciers, snowmelt, and ice melt • Shift from snow to rain in winter months • Increased extreme events, including floods, droughts, and GLOFs

Source: Adapted from Bartlett et al., 2010, p. 6

2. Vulnerability to climate change

Nepal's vulnerability to climate change is influenced not only by its exposure to a range of current climate hazards and its likelihood of being more exposed to these risks in the future, but also by its capacity to adapt to changing climatic risks. This section provides an overview of Nepal's existing economic, social, and political circumstances that influence its adaptive capacity, and identifies those sectors, regions, and groups expected to be particularly affected by climate change.

2.1 Current drivers of vulnerability

Nepal's status as a least developed country is reflected in some of its key development indicators, which can be found in Table 3. More than 25.2% of the population lives below the national poverty line, and an estimated 44.2% of the population is multi-dimensionally poor (Oxford Poverty and Human Development Initiative, 2013). The country's poor development performance is also reflected in its score on the Human Development Index (HDI), which was 0.458 in 2011 — the lowest score in the South Asian region (Sharma, Guha-Khasnobis, & Khanal, 2014). There are significant regional disparities in development progress, with the mountain regions lagging behind. In addition, quite significant development gaps exist between rural and urban areas that have been attributed to “persistent discrepancies in income and education between urban and rural areas” (International Fund for Agricultural Development, 2014, p. 5). Apart from these regional disparities, human development inequalities along the lines of caste and ethnicity are quite stark: HDI scores for the majority of castes and ethnic clusters were found to be significantly higher than those of the lower castes and minorities (Sharma et al., 2014).

Category	Indicator	Year	Value	Source
Human development	Human Development Index (score ^e)	2013	0.540	United Nations Development Programme (UNDP) (2014)
	Human Development Index (rank ^d out of 187 countries)	2013	145	
	Population in multi-dimensional poverty (%)	2013	41.4	
	Under-five mortality rate (per 1,000 live births)	2013	42	
	Adult literacy rate (15 years of age and above) (%)	2013	57.4c	
	Improved water sources, rural (% of population with access)	2012	88	
	Improved sanitation facilities (% of	2012	37	

	population with access)			
	Access to electricity (% of population)	2010	76.3	
Gender	Gender Inequality Index (score ^e)	2013	0.4791	UNDP (2014)
	Gender Inequality Index (rank ^d out of 187 countries)	2013	145	
Demographics	Total population (in millions)	2013	27.797a	UNDP (2014)
	Average annual population growth rate (%)	2010	1.2	
	Population, urban (% of population)	2011	17.7b	
Economic development	GDP (in current USD, millions)	2013	19,294.34	World Bank (2015a)
	GDP growth (annual %) (average of period from 2010 to 2013)		4.3	
	Agricultural land (% of land area)	2012	28.7	
Governance	Corruption Perceptions Index (score ^f)	2014	29	Transparency International (2014)
	Corruption Perceptions Index (rank ^d out of 174 countries)	2014	126	
	Fragile States Index (score out of 120 ^g)	2014	91.0	Fund for Peace (2014)
	Fragile States Index (status)	2014	Alert	
	Expenditure on education, public (% of GDP)	2012	4.7c	UNDP (2014)
	Expenditure on health (% of GDP)	2011	5.4	
Environment	Population living on degraded land (%)	2010	2.3	UNDP (2014)
	Change in forest area, 1990/2011 (%)	2013	-24.7	
^a Projections based on medium-fertility variant ^b Because data are based on national definitions of what constitutes a city or metropolitan area, cross-country comparison should be made with caution ^c Data refer to the most recent year available during the period reviewed by the source; the year listed is the final year of this time period ^d Where 1 or first is best ^e Where 0 is best ^f Where 0 is highly corrupt and 100 is very clean ^g Where 120 is very high alert and 0 is very sustainable				

Some of these deeply entrenched regional and social inequalities were key drivers of the decade-long civil war in Nepal (1996–2006), which created more than 200,000 internally displaced persons (Wennmann, 2009). The Comprehensive Peace Accord of 2006, a bilateral peace accord between the GON and the Maoists, has been instrumental in

establishing relative political stability within the country. Multi-party political processes have been re-established that include participation by the Maoists. In 2008 the monarchy ended and Nepal's first Constituent Assembly was elected, which witnessed large-scale victory for the Communist Party of Nepal (Maoist). This process has been described as a critical step toward peace and reconciliation in the country (Carter Center, 2014a).

However, the ongoing political transition has been marred by frequent civil unrest, political instability, and ideological confrontations. This continuing instability is illustrated by the country's ongoing efforts to establish a new constitution. The first Constituent Assembly (2008–2012) set a goal of developing a new constitution for the country, but it could not complete the process, and the task was subsequently taken over by the second Constituent Assembly, elected in November 2013. The new constitution was adopted in September 2015 (Central Intelligence Agency [CIA], 2015). The country's governance challenges have often led to very low public perception of and trust in local government. The situation has improved, though, with more support for local-level participation in development planning, including more representation of women and other marginalized groups (Carter Center, 2014b). Governance reforms, including a decentralized system of governance and granting more administrative and financial autonomy to local governments, have been high on the agenda of the government.

This complex and dynamic situation of political instability and inadequate governance structures has “negatively affected the quality of development at the local level” (GON & United Nations Country Team Nepal, 2013, p. 11). The resultant impacts are more pronounced for poor and marginalized communities who rely on natural resources for their livelihoods, as their access to and benefits from these resources are severely constrained.

Nepal is predominantly an agrarian society, in which more than 80% of the total population lives in rural areas (CIA, 2015). More than 70% of the country's workforce is engaged in small-scale and subsistence agriculture — despite the fact that only around 15% (or around 2.6 million hectares) of Nepal's total geographic area is arable due to its topography (CIA, 2015). Of Nepal's total irrigated land, nearly 30% is irrigated using surface water and groundwater sources (World Bank, 2015a). A significant proportion of these irrigated areas (more than 75%) use Nepal's traditional farmer-managed irrigation systems (Nepal National Committee of the International Commission on Irrigation and Drainage, n.d.).

Nepal's rural to urban migration rate is estimated at approximately 3% per year (CIA, 2015). This pattern has resulted in the growth of urban centres such as those in the Kathmandu Valley. Recently, there has been a proliferation of squatter settlements in the valley: these settlements increased from 17 in 1985 to more than 40 in 2008. Almost 60% of these settlements are located on the floodplains of rivers in the valley, in areas vulnerable to floods and landslides (United Nations Nepal Information Platform, n.d.). In addition to this in-country migration, many Nepalese migrate to India, the Persian Gulf, the Middle East, and Southeast Asia for employment, resulting in a net migration rate of 2.2 migrants per

1,000 people (International Organization for Migration, 2015). Remittances from migrants contribute approximately 29% of Nepal's GDP (CIA, 2015), and it has been estimated that the incidence of poverty would rise considerably if remittances were cut off. Increasing the level of productive employment in the country is a key development challenge before the government.

Natural disasters are another significant factor influencing Nepal's development. Between 1990 and 2014, approximately 3.4 million Nepalese were affected by floods, droughts, and landslides. During this period, the most extensive damage was caused by floods, which represented almost 98% of internationally reported economic losses and 70% of mortality (PreventionWeb, 2015). The GON estimates that climate-related disasters caused economic losses of over US\$5 billion between 2000 and 2010 (Ministry of Environment, 2010b). In the Himalayas, the number of glacial lakes is increasing, leading to an increased risk of GLOFs (MSTE, 2014). Although not related to climate change, the risk of earthquakes is also a factor in Nepal's overall vulnerability, as evidenced by the April 2015 earthquakes, which affected approximately 5.6 million people and destroyed almost half a million homes (Goldberg, 2015).

At the macro level, the country's political instability and weak governance have resulted in an unfavourable investment environment and a gradual decline of interest among investors. To meet the development challenges of the country under these circumstances, Nepal has increased its dependence on foreign aid, which rose from 3.13% to 4.24% of the country's GDP between 2002 and 2011. More importantly, there has been a significant shift in the sectoral distribution of this foreign aid, with the share allocated to the agriculture, irrigation, and forestry sectors declining from 22.8% in 2002 to 5.1% in 2011. In spite of these prolonged challenges, Nepal has been able to make substantial progress in critical development areas. As of 2013, the country was on track to meet its Millennium Development Goals (MDGs) in the areas of poverty and hunger eradication, primary education, child mortality, maternal health, and reduction in biodiversity loss, among others (GON & United Nations Country Team Nepal, 2013b). However, achievement of the country's MDGs may be affected by the 2015 earthquakes' impact on economic growth and development progress.

Nepal is considered to be highly vulnerable to climate change, but also to be relatively ready to address its impacts, according to the University of Notre Dame Global Adaptation Index (ND-GAIN). The ND-GAIN provides a quantitative evaluation of a country's vulnerability to and preparedness for climate change. As shown in Table 4, Nepal ranks 128th out of over 180 countries included in the index, with a higher vulnerability score than its neighbours in South Asia. Its readiness to respond, however, is ranked higher than both India and Pakistan, while lower than China and Bhutan (ND-GAIN, 2015). Analysis by the Nepalese government found that more than 1.9 million people are highly vulnerable to climate change, while 10 million are at increasing risk from climate impacts (Ministry of Environment, 2010a).

Table 4 – Comparison of Global Adaptation Index scores for Nepal and neighbouring countries					
Country	Vulnerability*		Readiness**		Overall
	World rank	Score	World rank	Score	World rank
Nepal	128	0.495	115	0.393	122
China	30	0.317	71	0.512	52
India	118	0.473	122	0.377	120
Pakistan	115	0.469	142	0.341	126
Bhutan	120	0.476	93	0.449	105

* A lower score indicates lower vulnerability. The vulnerability score is determined based on indicators of exposure, sensitivity, and adaptive capacity, taking into consideration indicators related to six life-supporting sectors: food, water, health, ecosystem services, human habitat, and infrastructure.

** A higher score indicates a higher degree of preparedness. The readiness score takes into account measures of economic readiness, governance readiness, and social readiness to pursue adaptation actions.

Source: ND-GAIN, 2015

2.2 Vulnerability of key sectors

Nepal has identified a number of sectors as particularly vulnerable to climate change: agriculture and food security, water resources and energy, forests and biodiversity, public health, and urban settlements and infrastructure. The likely impacts of climate change in these sectors are presented in Table 5.

Table 5 – Likely impacts of climate change in key sectors (Ministry of Environment, 2010b)	
Sector	Likely impacts of climate change
Agriculture and food security	<ul style="list-style-type: none"> • Declining crop and livestock production • Major impact on subsistence farming, which is more vulnerable to erratic monsoon rains and floods • Decline in the production of winter and spring crops because of temperature and precipitation anomalies • Decline in rice yields, with serious implication of food security for a large section of the population, particularly in the western region • Loss of local and traditional crop varieties, leading to negative impacts on food and nutrition security
Water resources and energy	<ul style="list-style-type: none"> • Water stress will negatively impact agricultural productivity, human health, nutrition security, and sanitation facilities • Excess water, such as during heavy precipitation and flooding events, will damage infrastructure, human settlements, and crops

	<ul style="list-style-type: none"> • Changes in river flow will impact micro-hydro projects, disrupt the power generation system, and decrease the system’s efficiency, leading to large-scale power shortages and blackouts, given that 90% of the country’s electricity is derived from hydropower • Solar power systems will be affected by heavy precipitation, prolonged cloudy days, heavy snowfall, and hailstorms • Increased incidence of forest fires will lead to loss of forest resources and biodiversity, and result in a fuelwood crisis
Forests and biodiversity	<ul style="list-style-type: none"> • Temperature and rainfall variability have resulted in shifts in agro-ecological regions • Higher incidences of pests and diseases have been reported • Emergence of alien and invasive species is increasing, leading to habitat loss and the loss of biodiversity in many regions • Increasing occurrence of forest fires has caused damage to critical habitats and affected human settlements • Changes in flowering and fruiting timings of many horticultural crops have been observed • Decline in the provision of ecosystem services by vital ecosystems such as wetlands and forests
Public health	<ul style="list-style-type: none"> • Nepal’s already poor health care infrastructure makes it more vulnerable to climate change • Greater risk of outbreaks of vector-borne diseases such as malaria, Kala azar, and Japanese encephalitis • High incidence of water-borne diseases due to a lack of access to clean sources of water during disasters such as floods or droughts
Urban settlements and infrastructure	<ul style="list-style-type: none"> • Key infrastructure, such as roads, water and sanitation, hospitals, schools, and public buildings, is at risk of being damaged by natural disasters such as landslides and floods • Water and energy systems in urban areas are at greater risk • Large influx of disaster-induced migrants displaced from rural areas will result in overcrowding in slums and informal settlements, leading to public health challenges

2.3 Vulnerable regions and groups

Nepal’s geographic and social diversity creates variations in vulnerability to climate change among different regions and for different groups within the country. To better understand regional differences in vulnerability, Nepal’s National Adaptation Programme of Action (NAPA) process included a mapping exercise that evaluated climate vulnerability at the district level. The assessment evaluated districts based on their sensitivity, adaptive capacity, and exposure to climate risks, namely landslides, floods, droughts, and GLOFs, as well as ecological risk and combined exposure. The districts identified through this process as having high or very high vulnerability, organized by region, are presented in Table 6. The

assessment indicated that over one-third of Nepal's 75 districts can be characterized as having high or very high vulnerability. High mountain districts (in bold text) represent almost half of these vulnerable districts (Ministry of Environment, 2010a).

Table 6 – Vulnerable districts in Nepal (high mountain districts are indicated with bold type)		
Region	Districts with very high vulnerability	Districts with high vulnerability
Eastern	Udayapur, Saptari	Taplejung , Siraha, Solukhumbu , Okhaldhunga , Khotang
Central	Kathmandu, Bhaktapur, Ramechhap , Dolakha	Mahottari, Dhading , Chitwan, Dhanusha, Parsa
Western	Lamjung	Gorkha , Manang
Mid-western	Mugu , Jajarkot	Dolpa , Kalikot, Dailekh, Salyan
Far western		Accham

Source: Ministry of Environment, 2010a

As mentioned earlier, social and ethnic inequalities exacerbate the vulnerabilities of marginalized people. Gender inequality remains a challenge in Nepal, and the country's Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) highlights the specific adaptation needs of women based on their typical roles and responsibilities in relation to, for example, agriculture, water, and household energy (MSTE, 2014). Social position in terms of caste also plays a role in vulnerability. For example, the Dalit and Janajati (excluding Newar) communities have lower scores on the HDI when compared to the high-caste communities (Sharma et al., 2014), which will inevitably limit their adaptive capacity. The NAPA also highlights the vulnerability of communities that are dependent on natural resources for their livelihoods, have small land holdings, and/or lack access to basic infrastructure and social protection services (Ministry of Environment, 2010b).

3. Adaptation planning context

This section discusses the overall policies, plans, and other development strategies that shape Nepal's climate change adaptation planning context. It identifies key policy and institutional mechanisms at various levels of governance in the country that further facilitate adaptation planning and action. As reflected in Table 7, overall Nepal has established a set of very progressive and forward-thinking climate policies and plans, and an adequate institutional architecture to ensure adaptation planning is inclusive and bottom-up.

Table 7 – National adaptation planning context: Summary of progress as of October 2015	
Indicator	Progress
Climate change recognized in country's guiding development vision or plan	Yes, in the Thirteenth Plan for 2013/14 to 2015/16
National-level coordinating entity for climate change established and active	Yes, the Climate Change Council chaired by the prime minister
Climate change policy and/or law in place	Yes, its Climate Change Policy was released in 2011
Climate change strategy published	Not present
Climate change action plan published	Not present but developing a low-carbon economic development strategy
Adaptation plan published	Yes, the NAPA published in 2010, National Framework on Local Adaptation Plans for Action (LAPAs) published in 2011, and National Adaptation Plan (NAP) process launched in 2015
Climate change fund or adaptation fund operational	Not present
Climate change units established in key ministries	Some, such as the Sustainable Development and Adaptation Section of the MSTE
Climate change integrated into national sectoral policies	Yes, such as policies focused on agriculture, irrigation, health, and urban development

3.1 National-level development policy context

As a least developed country located in the climate change hot spot of the Himalayas, Nepal has been one of the leading countries in the global south in recognizing climate change-related threats to its economy and initiating relevant actions. For example, Nepal's 2001 MDG initiatives and its 2003 Sustainable Development Agenda both included addressing climate change issues as key to achieving its goals. The Sustainable Development Agenda was based on longer-term development goals of the country's Ninth (1997–2002) and Tenth Plans (2002–2007), the Poverty Reduction Strategy Paper (2003), the MDGs, and Agenda 21 (National Planning Commission [NPC] & Ministry of Population and Environment, 2003).

Nepal's overall development planning is guided by three-year plans that provide a road map for the achievement of specific sectoral, social, and environmental targets and timelines. The National Planning Commission (NPC), with the prime minister as its chairperson, is the designated agency responsible for the preparation, negotiation, and implementation of these plans. The current plan is the Thirteenth Plan for 2013/14 to 2015/16. The overall

objective of the Thirteenth Plan is “[t]o bring about a direct positive change in the living standards of the general public by reducing the economic and human poverty prevalent in the nation” (NPC, 2013, p. 10). To achieve this objective, the Approach Paper to the Thirteenth Plan (AFTP) identified a set of seven strategies, one of which is to “[i]mplement development programmes which support climate change adaptation” (NPC, 2013, p. 11). This strategy spells out the common understanding among the country’s policy-making and planning communities about the larger dividends, both economic and environmental, that could be accrued through integrated adaptation-centric development planning.

The AFTP also outlines plans under a number of themes, including one focused on cross-sectoral development policies that includes comprehensive sectoral objectives, strategies, operating policies, and expected outcomes for environment and climate change, disaster management, and water-induced disaster prevention. The AFTP, through other related sectoral policies, such as those for agriculture and irrigation, tries to establish linkages across the development, climate adaptation, and poverty alleviation continuum. For example, under the environment and climate change component, one of the operating policies notes that “[t]hrough the Local Adaptation Programme of Action, the National Adaptation Programme of Action will be executed at the local level and efforts to alleviate poverty will be expanded” (NPC, 2013, p. 116).

3.2 National-level climate policy context

Nepal’s NAPA was approved by Cabinet in September 2010. It serves as a strategic tool to assess climate vulnerability and systematically respond to climate change adaptation issues through the development of appropriate adaptation measures. The NAPA is set within Nepal’s development goal framework, five-year national plans, and three-year interim plans that focus on the overarching goal of poverty reduction. It was developed through multi-level consultations, out of which the following emerged as priority areas for action: agriculture and food security, water resources and energy, climate-induced disasters, forests and biodiversity, public health, and urban settlements and infrastructure. Priority adaptation actions focus on building the capacity of the most vulnerable households by providing information, skills, technology, and knowledge. The NAPA also aims to help Nepalese improve their adaptive capacity through better governance and service delivery mechanisms, livelihoods supports, access to technology and financing, and collective responses.

Nepal released its Climate Change Policy in 2011 (GON, 2011). Its content is influenced by the NAPA, and it was developed out of a need to address climate change impacts. It also aims to take advantage of opportunities arising from efforts to address climate change to in turn improve livelihoods while driving climate-friendly physical, social, and economic development. The Climate Change Policy outlines seven principal policy objectives, of which three are specifically related to adaptation-oriented activities:

- 1) Implement climate adaptation–related programs
- 2) Improve local communities’ adaptative capacity and resilience to enable better use and more efficient management of natural resources
- 3) Improve capacity to identify, quantify, and adapt to climate risks and climate change impacts

To achieve these objectives, a wide range of policies have been or are to be adopted related to climate adaptation and disaster risk management; low-carbon development and climate-resilience measures; access to and use of financial resources; public participation, empowerment, and capacity building; research; technology development and transfer; and climate-oriented natural resource management. Eight specific policies are identified in relation to climate adaptation. These focus on themes such as implementing medium- and long-term actions from the NAPA; linking adaptation with economic and social development; improving early-warning systems; identifying the most highly impacted communities; developing mechanisms for vector-borne disease prevention and control; and improving multilateral cooperation for risk reduction and adaptation along international transboundary areas.

The NAPA and the Climate Change Policy both place significant emphasis on local adaptation plans, including implementing mandatory provisions to use at least 80% of their available budget for local adaptation activities. To better facilitate adaptation at the local level, Nepal developed its National Framework on Local Adaptation Plans for Action (LAPAs) in 2011 (GON, 2011). The purpose of the LAPAs is to more effectively implement the NAPA by leveraging public participation to identify and execute local adaptation action, and to integrate climate change adaptation into sectoral plans and policies. The LAPAs also ensure that the process of integrating climate change resilience from local to national planning is governed by the four guiding principles of being bottom-up, inclusive, responsive, and flexible. The framework supports local- to national-level planning to do the following:

- Identify the village development committees, municipalities, wards, and communities that are most climate vulnerable, as well as their adaptation challenges, opportunities, and possible activities
- Identify and prioritize adaptation actions in simple, participatory ways to help communities prioritize their needs
- Develop and implement LAPAs and incorporate adaptation options into local and national plans in accordance with the Local Self-Governance Act (1999)
- Identify and mobilize essential resources and service delivery agents for the implementation of the LAPAs

- Ensure that adaptation actions are adopted and implemented by service providers in a timely and efficient manner
- Undergo monitoring and evaluation by ensuring effective implementation of the LAPAs
- Identify cost-effective adaptation alternatives for scaling-up and incorporation into planning at the local and national levels (Ministry of Environment, 2011)

Adaptation planning in Nepal has been further supported by the fact that Nepal is one of the nine countries originally invited by the World Bank to participate in the Pilot Program for Climate Resilience. Through the program, Nepal developed a Strategic Program for Climate Resilience (SPCR) in 2011, which is being implemented in partnership with relevant multilateral development banks. While the NAPA identified an extensive list of short-term interventions, the SPCR focused on highest-priority risks and long-term interventions aimed at enhancing climate resilience in Nepal (Climate Investment Funds, 2011). The current components of the SPCR are

- 1) Building the climate resilience of watersheds in mountain eco-regions
- 2) Building resilience to climate-related hazards
- 3) Mainstreaming climate change risk management in development
- 4) Building climate-resilient communities through private sector participation (Climate Investment Funds, n.d.)

The Ministry of Population and Environment is the national implementing agency responsible for coordinating development and implementation of the strategy (Ministry of Population and Environment, n.d.).

Building on the NAPA and LAPAs, Nepal started its National Adaptation Plan (NAP) process in September 2015. The two main objectives of the NAP are to reduce vulnerability to climate change impacts by improving resiliency and adaptive capacity, and to integrate climate change adaptation into new and current policies, programs, activities, and development strategies across all sectors and levels of government. The NAP process will frame the adaptation needs and challenges for Nepal and structure the country's future post-2020.

Alongside these policies and plans, Nepal released its First National Communication to the UNFCCC in 2004 and completed its Second National Communication in 2014. The Second National Communication aligns its priority areas for climate adaptation with the content of the NAPA and LAPAs, providing a vulnerability assessment and information on efforts to reduce vulnerability within each priority area. The document also outlines an Adaptation Action Plan for major sectors that identifies stakeholders, lines of responsibility, time

frames for implementation, financial means, and measures to identify barriers and risks (MSTE, 2014).

Additionally, the NPC established the Climate Change Budget Code in September 2012 to ensure accountability and transparency in climate change spending from domestic and international sources. The budget code will track all government spending on climate change across ministries and at local, state, and national levels, though spending will only reflect a partial picture of climate financing, as it does not include financing of any projects outside the government (NPC, 2012).

3.3 Institutional structure for climate governance

There has been a fair amount of restructuring in the Nepali government in recent years, which has led to a dynamic situation in relation to responsibilities for climate change. At the highest level is the Climate Change Council, a 25-member apex political body established in 2009 under the chairmanship of the prime minister. It has responsibility to:

- Provide coordination, guidance, and direction for the formulation and implementation of climate change-related policies;
- Provide guidance on the integration of climate change-related aspects in long-term policies, perspective plans and programmes;
- Take necessary measures to make climate change a national development agenda;
- Initiate and coordinate activities related to additional financial and technical support to climate change-related programmes and projects; and
- Initiate and coordinate measures to achieve additional benefits from climate change-related international negotiations and decisions (Climate Investment Funds, 2011, p. 12).

Following a government restructuring in 2015, the Ministry of Population and Environment was designated as the nodal agency to coordinate climate change planning in the country, as well as Nepali engagement in the UNFCCC process. Prior to this restructuring, this responsibility was held by the Ministry of Science, Technology and Environment (MSTE). The ministry plays an important role in overall coordination between adaptation policy and on-the-ground implementation, as well as between donor support avenues, climate change projects, and activities across ministries.

Within the Ministry of Population and Environment, the Climate Change Management Division, established in 2010, holds the key responsibility for advancing policy and action on climate change. It leads the established Multi-stakeholder Climate Change Initiatives Coordination Committee (MCCICC). The membership of the MCCICC includes the Thematic Working Group (TWG) coordinators (see below) as well as representatives from the NPC, the Ministry of Finance, NGOs, academia, local government associations, and donor

agencies. It is a coordination body that reports to the Climate Change Council and contributes to mainstreaming climate change into development planning and implementation. Further, the GON has constituted the MCCICC to serve as the key national platform for ensuring regular dialogue and consultation on climate change–related policies, plans, finance, programs, projects, and activities.

Six TWGs initially established during the development of the NAPA have been institutionalized as part of the climate governance structure. They are composed of experts representing relevant subsectors. The TWGs are each led by a different ministry and cover the following themes: agriculture and food security, forests and biodiversity, water resources and energy, climate-induced disasters, public health, and urban settlements and infrastructure. Each TWG has around 15 members, comprising representatives from government agencies, NGOs, academic institutions, and relevant UN agencies (Ministry of Environment, 2010b). These TWGs have the potential to play a key role in future cross-sectoral integration and coordination of climate change adaptation initiatives (Ayers, Kaur, & Anderson, 2011).

Also worth mentioning is the Nepal Climate Change Knowledge Management Centre, established by the Academy of Science and Technology and the MSTE as an outcome of the NAPA process. The centre aims to enhance public access to climate change and related information in order to build capacity to address the challenges posed by climate change. It further seeks to strengthen collaborative and interdisciplinary climate change research and facilitate an interface between scientific research and policy-making.

3.4 National-level sectoral policies

Nepal's sectoral policies are designed and implemented in line with the development priorities set through the Three-Year Plan documents, including the Thirteenth Plan (2013/14 to 2015/16). Climate change–related risks, as well as opportunities for low-carbon development, have been incorporated in many of the country's sectoral development policies and planning documents. This includes policies related to water, agriculture, disaster risk management, urban development, and biodiversity (see Table 8).

Nepal's National Water Resources Strategy, developed in 2002, recognizes climate variability and its potential impacts on the country's water resources. The strategy recognizes water-induced disaster as one of the main types of disaster in Nepal and aims to lay out activities that will effectively manage and mitigate these events. The document established strategic targets for five-year, 15-year, and 25-year time frames. In regard to climate change adaptation it identifies specific activities, including risk and vulnerability mapping, floodplain action plans, integrated water management, public education, and the establishment of a Himalayan climate change study centre. Proposed activities are linked to quantifiable indicators and specific timelines (Water and Energy Commission Secretariat, 2002).

Similarly, the National Water Plan from 2005 enhances institutional capabilities and measures for managing water-induced disasters and mitigation of their adverse effects. The plan makes mention of climate change and the requirement for research and studies to better understand climate-induced changes and their impact on the environment, particularly on ecological water requirements, water quality, and functioning glacier lakes (Water and Energy Commission Secretariat, 2005). No specific adaptive measures to reduce vulnerability in the sector are identified in the document.

The National Strategy for Disaster Risk Management in Nepal (2008) is an integrated effort to reduce disaster risk by defining five main priorities and associated activities. The strategy also analyzes policy frameworks, legal provisions, and institutional structures Nepal has adopted in relation to disaster management. Climate change is recognized as a serious risk that intensifies the problem of GLOFs and increases climatic variations that lead to frequent floods and droughts, which create severe threats to human safety and health. Climate risk management and the need to adapt to climate variability are highlighted as significant priorities within the document (GON, 2008).

The strategy proposes and recommends approaches and activities that aim to ensure that disaster risk reduction is a national and local priority; to identify, assess, and monitor disaster risk and enhance early warning; to improve knowledge management for building a culture of safety; to reduce risk in key sectors; to establish mechanisms for disaster risk reduction; and to enhance preparedness for effective response. Some of the outlined activities include mapping exercises; the formulation of district, municipal, and village disaster mitigation and adaptation plans for shelter, infrastructure, and physical planning; disaster impact assessments for buildings and infrastructure; and the design of community-level disaster preparedness courses and training programs (GON, 2008). Some of these listed measures are consistent with adaptation actions.

The Nepal National Biodiversity Strategy and Action Plan, 2014–2020, is a guiding framework for the management of the country's biodiversity. It has been prepared to meet the country's need to manage biodiversity on a sustainable basis for the benefit of present and future generations, as well as to fulfill international obligations. It includes a long-term vision (35 years), medium-term strategic goals (15 years), and short-term priorities for plans and actions up to 2020. Climate change is considered a cross-sectoral issue with profound implications. The plan outlines some of the likely impacts of climate change on biodiversity, along with some of the main climate change mitigation and adaptation gaps, issues, and challenges Nepal is facing.

The strategy and action plan seeks to enhance the resilience of ecosystems, species, and human communities to the impacts of climate change, and outlines strategic goals and priority actions. These are supported by a number of indicators, means of verification, monitoring responsibilities, and schedules. It suggests incorporating climate change adaptation measures into the design and implementation of biodiversity management

programs. Some priorities for action include the development of climate-smart biodiversity plans, the development of guidelines for biodiversity adaptation, the identification of conservation targets, and the development and adoption of climate risk assessments for biodiversity (Ministry of Forests and Soil Conservation, 2014). Budget lines are not included for the proposed actions.

Nepal's National Urban Development Strategy (2015) identifies climate change as a major risk factor, particularly in the context of increasing poverty trends in urban areas and the likelihood of increased numbers of refugees moving to urban areas due to disasters. In response, the strategy commits to improving the urban environment through the promotion of multi-hazard approaches to deal with disaster and climate change. It also commits to the internalization of resilience perspectives in land use regulations, building codes, and bylaws, as well as to enhancing awareness and preparedness to deal with disaster risks and vulnerability at different levels of government (Ministry of Urban Development, 2015). The strategy identifies a number of activities and indicators to achieve the above but fails to establish specific timelines for their implementation.

Nepal's National Agricultural Policy from 2004 makes no mention of climate change but recognizes the need to ensure food security and alleviate poverty along with the conservation, promotion, and use of natural resources and the environment (Nepal Law Commission, 2004). No specific objectives or actions address climate risks to agricultural production. This observation is most likely a result of the time period in which the policy was written.

More recently, in 2011, the Climate Change Adaptation and Disaster Risk Management in Agriculture: Priority Framework for Action 2011–2020 was developed by the Nepalese Ministry of Agriculture and Cooperatives (MOAC), with a 10-year timeline ending in 2020 (MOAC, 2011). The document was written with the technical assistance of the Food and Agriculture Organization of the United Nations. The purpose of the framework is to provide a road map for the MOAC to shift its approach from reactive emergency response to proactive climate adaptation and climate risk management in the agriculture sector. It also seeks to improve coordination between various government ministries, NGOs, and development partners. The Priority Framework for Action incorporates actions set out in the Hyogo Framework for Action, the NAPA, and the National Strategy for Disaster Risk Management in Nepal. It also outlines short-, medium-, and long-term priorities for action in five priority areas:

- 1) Strengthening institutional and technical capacity
- 2) Improving early-warning systems and climate risk monitoring and assessment
- 3) Enhancing knowledge management and education about climate change adaptation and disaster risk management

- 4) Implementing technical options for agriculture and livestock to reduce climate-related risks and vulnerabilities
- 5) Improving capacity and procedures for disaster preparedness, response, and rehabilitation, and integrating climate change adaptation interventions into agriculture

The framework describes specific actions to be taken and identifies gaps that need to be addressed and strategies to do so. Cross-cutting priorities through the five areas include capacity development, knowledge and communication, strategic partnerships, and gender equity (MOAC, 2011).

Table 8 – Integration of climate change into national sectoral strategies, policies, and plans: An assessment of progress				
Policies	Absent	Climate change mentioned as potential risk	Possible actions for reducing risk identified	Targets identified for specific adaptation measures
<i>National Agricultural Policy, 2004</i>	✓			
<i>Climate Change Adaptation and Disaster Risk Management in Agriculture: Priority Framework for Action 2011–2020</i>			✓	
<i>National Urban Development Strategy (2015)</i>		✓	✓	
<i>National Water Resources Strategy (2002)</i>		✓	✓	✓
<i>National Water Plan (2005)</i>		✓		
<i>Nepal National Biodiversity Strategy and Action Plan, 2014–2020</i>		✓	✓	✓
<i>National Strategy for Disaster Risk Management in Nepal (2008)</i>		✓	✓	

3.5 Subnational policies

Local bodies in Nepal comprise 75 district development committees, 191 municipalities, and 3,915 village development committees. Nepal's Local Self-Governance Act (1999) provides institutional space and support for development planning and decisions at the

district, village, and municipal levels. Identification of climate adaptation needs and priorities at these subnational levels has been primarily undertaken through the National Framework on Local Adaptation Plans for Action (2011). Many external donors and NGOs have been supporting the development of LAPAs.

To date, more than 100 LAPAs have been developed through, for example, the ongoing Nepal Climate Change Support Programme jointly funded by UK Aid, the European Union, and the United Nations Development Programme (UNDP) (MSTE, n.d.). The priority actions identified in LAPAs generally fall under the broad themes of agriculture, livestock, and food security; water resources and energy; forest management and biodiversity; infrastructure; human resources; and health. Almost half of the priorities identified focus on adaptive actions for agricultural livelihoods (Chaudhury et al., 2014).

4. Current and planned adaptation programs and projects

Nepal, through its domestic development and climate change policies, has initiated a series of adaptation-focused plans and projects. The country's own initiatives and other supporting institutional mechanisms have further facilitated a number of externally supported adaptation projects and programs. This section presents an overview of current and planned adaptation initiatives and presents a snapshot of climate finance from domestic and international sources that are supporting adaptation in Nepal.

4.1 Adaptation projects and programs

Adaptation programs and projects in Nepal were primarily identified through a review of the websites of UN agencies, multilateral development banks, bilateral development agencies, and international NGOs. The research focused on projects and programs that aim to support climate change adaptation, as reflected in their title, goals statement, and/or objectives statement. All relevant projects and programs were captured in a database and classified according to their type and area(s) of focus. For a detailed description of the methodology used in the review, please see Annex A.

The review process identified 23 significant ongoing or recently completed projects and programs in Nepal that aim to support climate change adaptation. Of the projects and programs identified, nine are being implemented at the national level, eight at the regional level, and six at the global level. An overview of these adaptation project and programs is presented in Table 9, and a full list is provided in Annex B.

Table 9 – Sector of focus of current adaptation projects and programs identified in Nepal					
Sector of focus	Priority sectors for adaptation	Number of projects*	Percentage of total projects**	Geographical characteristics	
Agriculture	✓	7	30%	National projects	9
Forestry	✓	3	13%	Regional projects	8
Biodiversity protection	✓	2	9%	Global projects	6
Ecosystem conservation		4	17%	Total	23
Ecosystem restoration		2	9%		
Watershed management	✓	6	26%		
Freshwater supply	✓	4	17%		
Disaster risk management	✓	4	17%		
Gender		0	0%		
Energy	✓	2	9%		
Urban areas	✓	1	4%		
Human health	✓	1	4%		
Climate information		3	13%		
Government		9	39%		
Civil society		2	9%		
Multi-sectoral		2	9%		
*Individual projects may address one or more sectors.					
**Calculated by the number of projects active in this sector relative to the total number of projects identified, reflecting the potential for a single project to address adaptation needs in more than one sector.					

Current projects and programs in Nepal focus on a wide range of sectors, though the primary emphasis is on agriculture, food security, governance, and the water sector, often in combination with disaster risk management. Biodiversity and forestry adaptation are other priority sectors being addressed. This correlates with most of the priority areas identified in Nepal's NAPA. That said, vulnerabilities related to human health and urban settlements do

not appear to be receiving significant attention, although they also were identified as priority areas for adaptation action.

Regions that are a particular focus for national adaptation projects include the Karnali mountain districts in the mid- and far-western part of Nepal, and the central districts, including Nawalparasi, Rupandehi, Kapilvastu, Syangja, Kaski, Parbat, Dang, and Rolpa. Other areas of interest include districts located in the Terai Arc Landscape along the border with India, as well as the Chitwan Annapurna Landscape in the central and mid-eastern part of the country, which is particularly vulnerable to GLOFs. A number of regional adaptation projects focus on the Asian Highlands, including the high mountain area stretching from west to east along Nepal's northern border. Regional water initiatives including adaptation are targeted at the Brahmaputra Basin, the Ganges Basin, and the Indus Basin.

Projects and programs implemented at the national level primarily seek to build capacity and support community-based adaptation. These are further complemented by initiatives aimed at knowledge communication and strengthening policy formation and integration. Adaptation in the agriculture sector is a major focal point among national projects. Noteworthy programs include the Anukulan: Driving small farmer investment in climate-smart technologies project, which aims to help 500,000 rural Nepalese build resilience to climate change risks like floods and drought. It helps smallholder farmers take advantage of economic opportunities and investments in climate-smart technologies such as drip irrigation, conservation agriculture, essential oil production, multiple-use water systems, and community-based renewable energy (Building Resilience and Adaptation to Climate Extremes and Disasters, n.d.). Similar to the former, Building Climate Resilient Communities through Private Sector Participation, one of the initiatives under Nepal's SPRC, seeks to build the capacity of farmers to adopt improved seeds and climate-resilient practices and technologies. The long-term goal of the project is to build a sustainable business case for private actors to invest in climate-resilient agricultural practices beyond the project's life (Climate Investment Funds, 2014).

The Nepal Initiative for Climate Change Adaptation, funded by the United States Agency for International Development (USAID), provides support to the Nepalese government for local adaptation planning and aims to develop sustainable livelihood opportunities for over 20,000 smallholder families through sustainable use and management of non-timber forest products, high-value crops, coffee, and essential oils (USAID, 2013). Additionally, Adapting to Climate Induced Threats to Food Production and Food Security on the Karnali Region of Nepal, implemented by the World Food Programme, seeks to increase the adaptive capacity of climate-vulnerable, food-insecure, poor households by improving the management of livelihood assets and natural resources (Adaptation Fund, 2015).

A number of national initiatives are also aimed at supporting adaptation efforts related to biodiversity and water. The Hariyo Ban project, implemented by a consortium of four conservation and development organizations, addresses threats to biodiversity in targeted

landscapes across Nepal. The initiative seeks to build the structures, capacity, and operations necessary for effective sustainable landscape management, and to increase the ability of targeted human ecological communities to adapt to the adverse impacts of climate change (World Wildlife Fund, n.d.). Building Climate Resilience of Watersheds in Mountain Eco-Regions supports implementation of the country's SPCR. This particular project will enable communities in mountainous ecosystems that are significantly vulnerable to climate change impacts to have improved access to and reliability of watershed and water resources (Asian Development Bank, 2013).

Three initiatives aimed at addressing disaster risk reduction and policy integration are the Mainstreaming Climate Change Risk Management in Development project, the Building Resilience to Climate Related Hazards project, and the Community-based Flood and Glacial Lake Outburst Risk Reduction in Nepal project. As part of the SPCR, the first project focuses on the integration of climate change risks, adaptation, and results management into Nepal's development planning and climate change programming (Asian Development Bank, 2011). Complementing the former, the second project targets government capacity to mitigate climate-related hazards by improving the accuracy and timeliness of weather forecasts, flood forecasts, and flood warnings for climate-vulnerable communities. It also seeks to improve agricultural management information system services to help farmers mitigate climate-related production risks (World Bank, 2013). The Community-based Flood and Glacial Lake Outburst Risk Reduction in Nepal project, funded by the Least Developed Countries Fund, focuses risk reduction efforts mainly on structural, hydrological, and geotechnical engineered interventions to reduce human and material losses from catastrophic flooding events (UNDP, 2013).

Nepal is involved in several regional projects and programs, a number of which target the water sector. The South Asia Water Initiative, implemented by the World Bank, supports the integration of climate change adaptation into water resource management; transboundary dialogue between countries; the enhancement of basin and water resource knowledge; and the strengthening of water institutions and investments that lead to sustainable, fair, and inclusive development (South Asia Water Initiative, 2015). The overall goal of the Himalayan Adaptation, Water and Resilience (HI-AWARE) project is to contribute to enhancing the climate resilience and adaptive capacities of vulnerable women, men, and children living in the river basins of the Himalayas by leveraging research and pilot outcomes to influence policy and practice (HI-AWARE, 2015). Building Effective Water Governance in the Asian Highlands, a smaller project funded by IDRC, aims to facilitate effective water resource management by integrating climate change impact analysis with assessments of vulnerability, livelihood options, and water policy (Centre for Mountain Ecosystem Studies, HELVETAS Swiss Intercooperation Nepal, & International Development Research Centre, n.d.).

Two more notable regional programs taking place in Nepal are the Kailash Sacred Landscape Conservation and Development Initiative, financed by Deutsche Gesellschaft für

Internationale Zusammenarbeit, and the Climate Proofing Growth and Development in South Asia project. The Kailash Sacred Landscape Conservation and Development Initiative is a transboundary collaborative program between China, India, and Nepal that aims to achieve long-term conservation of ecosystems, habitats, and biodiversity while encouraging sustainable development, enhancing the resilience of communities in the landscape, and safeguarding the cultural linkages between local populations (ICIMOD, n.d.). The second project is being implemented by the UNDP and funded by the DFID, with a focus on integrating climate change mitigation and adaptation into development planning, budgeting, and delivery in national and subnational governments (UK Aid, 2015).

In addition, Nepal is involved in a few global projects. The vast majority of these are research-oriented activities that seek to inform adaptation planning and decision-making. One such project is the Building Adaptation to Climate Change in Health in Least Developed Countries through Resilient Water, Sanitation and Hygiene, being implemented by the World Health Organization. Despite the implications of climate change for human health in Nepal, this is the only major adaptation initiative identified in the health sector. The project seeks to establish a clear framework for protecting health and reducing the risk of disease as a consequence of climate change in four selected countries, including Nepal. This will be achieved by transforming the way participating countries integrate climate change into health programming, which will then serve as the foundation to target risk reduction for climate-related diseases and reduce the vulnerability of the poor in a wider set of low- and lower-middle-income countries (World Health Organization, 2015).

A number of other relevant global projects are being implemented in Nepal. Among these is the Ecosystems Protecting Infrastructure and Communities project, the overall goal of which is to catalyze and promote improved management of ecosystems and harness multiple ecosystem services to protect vulnerable communities (International Union for the Conservation of Nature, 2014). Another is the High Mountains Adaptation Partnership, which aims to increase awareness of highland–lowland interactions, ecosystems services, and the critical importance of high mountain watersheds in the context of climate change (Mountain Institute, n.d.). Lastly, Nepal is a target country of the Climate-Smart Villages program being implemented by the CGIAR Research Program on Climate Change, Agriculture and Food Security. It is developing climate-smart villages as models of local action that ensure food security, promote adaptation, and build resilience to climatic stresses (CGIAR Research Program on Climate Change, Agriculture and Food Security, 2015).

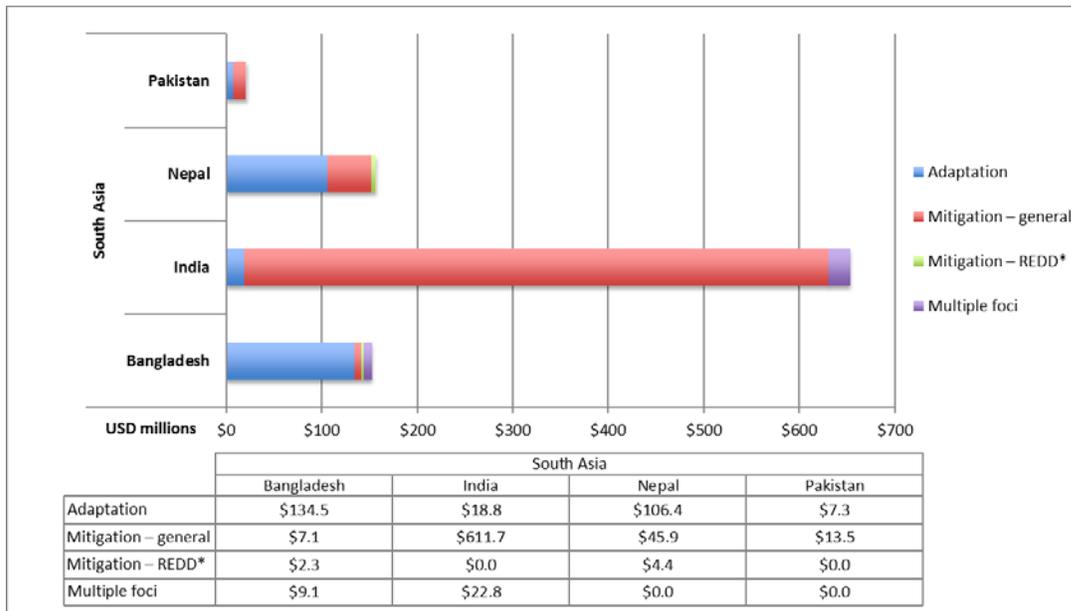
4.2 Climate finance

Nepal has been able to mobilize domestic and international financial resources to meet its adaptation needs. With respect to domestic sources, as previously noted, the GON approved a Climate Change Budget Code in 2012 to facilitate tracking of climate expenditures. According to the country's Climate Public Expenditure and Institutional Review, annual

expenditures on all climate change-related activities constitute approximately 2% of Nepal's GDP and around 6% of total government expenditures. Of this amount, three-quarters is related to adaptation activities (Karanjit, Lee, Pant, & Steele, 2014). While recognizing the importance of this domestic financing for adaptation, the remainder of this section aims to provide a picture of the scale, sources, and orientation of climate finance flowing into the country from international public sources.

An indication of the scale of adaptation financing received by Nepal is provided by the Climate Funds Update (2015), which tracks climate financing through designated bilateral and multilateral climate funds. According to this source, from 2003 to April 2015, Nepal received a total of US\$156.7 million in climate finance. Of this amount, US\$106.4 million (or about 70%) was allocated to adaptation, provided through 12 projects. Notable multilateral sources of funding include the Pilot Programme for Climate and Resilience, the Global Environmental Facility, the Adaptation Fund, the Least Developed Country Fund, and the Global Climate Change Alliance through the European Union. Bilateral funding for Nepal came from Germany's International Climate Initiative and the United Kingdom's International Climate Fund. Major multilateral-funded projects include Building Resilience to Climate Related Hazards (US\$31 million), Building Climate Resilience of Watersheds on Mountain Eco-Regions (US\$23.5 million), and Adaptation for Smallholders in the Hilly Areas (US\$15 million). A further US\$9.5 million was provided to each of the Building Climate Resilience in Nepal project and the Adapting to Climate Induced Threats to Food Production and Food Security in the Karnali Region of Nepal project.

As illustrated in Figure 2, which provides a regional picture of financing tracked by the Climate Funds Update, Nepal has received significantly less overall climate financing and mitigation-targeted resources than its neighbour India. However, strictly looking at financing dedicated to adaptation, Nepal received the second largest amount, after Bangladesh, for the period of 2003 to April 2015.



*Reducing emissions from deforestation and forest degradation

Figure 2 – Comparison of approved funding from designated multilateral and bilateral climate funds in South Asia between 2003 and April 30, 2015, in USD millions (based on Climate Funds Update, 2015)

A different perspective on climate financing in Nepal can be gained through an examination of the Organisation for Economic Co-operation and Development (OECD) Rio Markers, which, in part, reports on climate-related bilateral development assistance. As shown in Figure 3, it discloses that Nepal received US\$290.13 million in funding from bilateral sources for projects and programs with a principal or significant focus on climate change adaptation between 2010 and 2013. Primary bilateral funders for climate adaptation included the United Kingdom, Finland, Switzerland, Germany, and Denmark.

According to the OECD Rio Markers, the vast majority of bilateral aid contributing to adaptation targeted the transport and storage, water supply and sanitation, and agriculture sectors. Other sectors, classified as multisectoral, general environment protection, government, and civil society, also received funding for initiatives tagged as having adaptation as a significant objective. Despite the fact that forestry and biodiversity, disaster prevention, and public health have been identified as key vulnerable sectors to climate change, they have received relatively little support from climate-related bilateral aid, as reported by the OECD Rio Markers.



Figure 3 – Bilateral development aid to Nepal identified as having as its principal or significant objective⁵ support adaptation, between 2010 and 2013, in USD millions, constant 2012 prices (based on OECD, 2015)

5. Networks and communities of practice

As civil society organizations can play an active role in influencing adaptation planning and action, this section identifies prominent knowledge-sharing networks established in Nepal that are fostering capacity building, research, knowledge exchange, and advocacy related to climate change. Of particular prominence is the Climate Change Network Nepal (CCNN), one of the oldest climate change networks in Nepal. It started as an informal task group in 2003, with the intention to convince the national government to ratify the Kyoto Protocol. Later the task group was expanded and renamed as the CCNN. The goal of the network is to facilitate the process of informing, empowering, and influencing the Nepalese people and government to take effective actions toward addressing climate change and its impacts. To achieve its goal, the CCNN seeks to become an information and knowledge manager, capacity builder, advocate, and champion of climate change action. Particular activities related to climate change adaptation include building capacity on issues such as adaptation and technology transfer among key stakeholders, institutionalizing adaptation measures in regular programs of government and development agencies, promoting climate resilience

⁵ Based on the definitions used by the OECD Rio Markers system, activities are considered to have supporting adaptation as their “principal” objective “when promoting the objectives of the UNFCCC is stated in the activity documentation to be one of the principal reasons for undertaking the activity. In other words, the activity would not have been funded but for that objective. Activities marked ‘significant’ have other prime objectives, but have been formulated or adjusted to help meet climate concerns” (OECD, 2011, p. 3).

and low-carbon economic development, and encouraging the government to take advantage of funding mechanisms related to clean development and adaptation.

A further national network worth mentioning is the Nepalese Youth for Climate Action group, a nationwide youth network established in 2009. It aims to inspire, educate, empower, and mobilize young Nepalese to create a future that is economically prosperous, environmentally sustainable, and socially just. Its mission is to protect Nepal from the adverse impacts of climate change through a diverse, nationwide, youth-led movement. One of the group's key objectives is to advocate for adequate and predictable financial support for adaptation and the transfer of technology from industrial countries to developing countries (Nepalese Youth for Climate Action, n.d.).

6. Conclusions

Nepal's vulnerability to climate change is multi-dimensional. Its very location in the climate change hot spot of the Himalayan region and its predominantly natural resource-dependent economy places the country and its communities at high risk from climate change impacts. Deeply entrenched social inequalities along caste and ethnic lines, and prolonged political instability have exacerbated the vulnerabilities of marginalized and minority populations in the country. Nepalese living in particular regions, notably in the high mountains, face additional development challenges that further increase their vulnerability. Increasing urbanization and high dependence on foreign remittances are emerging challenges that will need to be considered in Nepal's response to climate change.

The risk profile of the country has become more complex and dynamic because of these multi-level interactions among climatic and non-climatic stresses. The GON has realized such risks and demonstrated significant political leadership and engagement in climate change issues, both adaptation and mitigation. The country's Three-Year Plans, its overarching development planning framework and guidelines, have not only recognized climate change as a threat but also proposed actions to build on the opportunities associated with making Nepal's development process and investments more climate resilient. The current Thirteenth Plan (2013/14–2015/16) makes climate change adaptation a key development parameter at the national, district, and village levels. The attention to climate change reflected in this document is linked to and based on lessons from the government's adaptation planning efforts, including its NAPA and ongoing LAPA and NAP processes.

Nepal has also constituted some high-profile national political institutions to advance its climate change response, such as the Climate Change Council chaired by the country's prime minister. It has also instituted suitable platforms to facilitate multi-stakeholder engagement and collaboration to address adaptation needs and gaps, as identified in the NAPA, the

LAPAs, and the National Climate Change Policy. The MCCICC at the national level is one such initiative. This diverse array of domestic initiatives has put in place the institutional framework required to mobilize the financial and technical resources needed, from both domestic and international sources, to advance adaptation action.

Due in part to this policy and institutional environment, a number of external donors, development agencies, and private foundations are supporting many innovative and cross-cutting adaptation initiatives in the country. The primary focuses of the projects examined through this review are agriculture, food security, governance, and water resources — sectors identified by the GON as being particularly vulnerable to climate change. Other priority areas for adaptation, such as human health, urban settlements, and infrastructure, appear to be less addressed through current projects and programs.

The study also suggests two areas in which there could be significant opportunities to further partner with associated stakeholders and leverage adaptation planning. The first is the vast opportunities for ecosystem-based adaptation in Nepal, which is endowed with a diverse and unique mix of mountain and riverine socio-ecological systems. Ecosystem-based adaptation approaches applied in past and ongoing projects have been found to be effective in fostering gender equality and social inclusion (World Wildlife Fund–Nepal, 2013).

The second opportunity relates to engagement with and through the private sector in mobilizing resources, innovation, and efficiency in climate change adaptation initiatives at various levels. For example, lessons from the ongoing SPCR program on Building Climate Resilient Communities through Private Sector Participation could help identify the entry points and opportunities to forge long-term partnerships with the private sector at the community, municipality, and district levels. These partnerships could promote innovative business practices such as agri-business in the mountains and basins, and the provision of resilient and affordable infrastructure — physical, social, and financial — in the flourishing urban settlements in the country. At present, there is minimal private sector participation in adaptation projects in the region. For example, a systematic review of adaptation policy and practice in the glacier-fed river basins of South Asia, including Nepal, found dominance of national governments in project execution and “not a single project with private sector involvement” (Sud, Mishra, Varma, & Bhadwal, 2015, p. 833).

Overall, despite the challenges and upheaval in the government, Nepal has made considerable progress with respect to understanding its climate risks and initiating planned adaptation that provides a solid foundation on which Nepal can advance further action on adaptation in the years to come. The country has begun to effectively integrate climate change adaptation into its overall development agenda, sector strategies, and sector plans, providing additional opportunities to influence adaptation policy and practice. One of the strengths of Nepal’s approach to climate change adaptation planning and implementation is its emphasis on community-led processes, notably through its LAPAs. The challenge now is

to ensure that these experiences and the priorities identified are reflected in higher-level decision-making, including in the country's emerging NAP.

7. Annexes

Annex A: Methodology

This section presents the research parameters established to guide development of the standardized reviews of current adaptation action in the CARIAA program's countries of engagement. It sets forward definitions used in this study, particularly with respect to the identification, selection, and classification of programs and projects considered in the review. This methodology was previously developed by the International Institute for Sustainable Development to support a review of current and planned adaptation action in 12 regions, which was completed in 2011 for the Adaptation Partnership. Modest updates to this original methodology were made to support the current review undertaken for the CARIAA program. For more information, see Adaptation Partnership (2015).

A.1 Adaptation actions included in the review

Within the review, adaptation action was defined as "policies, programs, and projects designed and implemented specifically to address the current and projected impacts of climate change." Therefore, the review focused on examining policies, programs, and projects in which specific reference has been made to supporting adaptation to climate change or climate risk reduction.

Consistent with this definition, the review gave attention to discrete, time-bounded programs and projects designed and implemented specifically to support preparation for or implementation of practical adaptation actions within the broader context of achieving development objectives. Therefore, at least one of the following terms appeared in the title, goals statement, or objectives statement of each program or project included in the review: "adaptation," "climate change adaptation (CCA)," "climate risk management," or "climate vulnerability reduction."

Based upon these parameters, the following types of programs and projects were not included in the review: disaster risk reduction, prevention, or management projects, unless they specifically reference that this activity is being undertaken in support of CCA; primary scientific research studies (for example agronomy, botany, or meteorology) on the potential impacts of climate change (for example on changes in crop production, glacial melt rates, or typhoon patterns); long-term monitoring efforts (whether climatic or socioeconomic) needed to inform decision-making; stand-alone workshops, conferences, and training programs; and capacity building to support participation in processes related to the UNFCCC (such as training for negotiators, enabling activities to prepare reports).

The following additional parameters were established to guide the selection of programs and projects incorporated in the study:

- *Official start date.* To ensure that only “current” projects were included in review, selected projects needed to have begun on or after January 1, 2012, with the exception of projects that began before this date but were still ongoing as of January 1, 2015.
- *Official end date.* Ongoing projects are those who official completion day is on or after January 1, 2015. Projects completed after January 1, 2012, were classified as completed.
- *Funding characteristics.* Projects with a value of US\$100,000 or more were included in the study. However, reflecting the greater level of adaptation action underway in Bangladesh and India, the minimum value of projects included in the reviews for these two countries was raised to US\$250,000. Projects financed by international and domestic sources of funding were considered.

Additionally, identified projects were classified by geographical scale in accordance with the following definitions:

- **Global:** Projects involving countries throughout the world, including the profiled country.
- **Regional:** Multi-country projects within a particular subregion, be it a continent or subcontinental area (such as South Asia or West Africa), that includes the profiled country.
- **National:** Projects occurring within one country.

A.2 Type of project being undertaken

To better understand the orientation of the projects underway in the countries examined as part of the review, projects were classified by type using the following definitions:

- *Research.* Encompassing efforts to develop new knowledge or organize existing information so as to increase understanding of the links among climate change, human society, and ecosystems and inform adaptation decision-making.
- *Assessment.* Encompassing risk, impact, and vulnerability assessments, as well as monitoring of ecological and societal trends.
- *Capacity building.* Encompassing the provision of technical training, technical assistance, institutional strengthening, and education.
- *Knowledge communication.* Encompassing efforts to share information, knowledge, and practices related to CCA, including awareness raising and engagement of media.
- *Policy formation and integration.* Encompassing efforts to inform, develop, and implement CCA plans, strategies, frameworks, and policies at the local, subnational, national, and international levels.
- *Field implementation.* Encompassing physical measures to reduce vulnerability to the impacts of climate change, including the implementation of pilot projects,

construction of infrastructure, development and modification of technologies, and management of physical resources.

- *Community-based adaptation*. Encompassing actions that directly engage community members in efforts to understand, plan for, and respond to the impacts of climate change.

A.3 Sector or area of focus

To further inform analysis of the range of adaptation action taking place in each country reviewed, programs and projects examined in the study were classified by sector using the following definitions:

1. **Food, fibre, and forests.** Defined as the management and use of terrestrial natural resources to directly improve human well-being. Its subcategories are:
 - *Agriculture*. Encompassing subsistence agriculture, commercial agriculture, and the rearing of confined domestic animals.
 - *Pastoralism*. Encompassing the use of domestic animals as a primary means for obtaining resources from habitats (UNEP, 2007), particularly in nomadic and semi-nomadic communities.
 - *Forestry*. Encompassing afforestation, reforestation, agroforestry, commercial forestry, community-based forest management, and woodland management.
 - *Fire management*. Encompassing monitoring, planning, and management to address the impact of fires on settlements and ecosystems, including forested and grassland ecosystems.
 - *Aquaculture*. Food production through the rearing of aquatic animals, such as fish, crustaceans, and molluscs, or the cultivation of aquatic plants in natural or controlled marine or freshwater environments.
2. **Ecosystems.** Defined as a system of living organisms interacting together and with their physical environment, the boundaries of which may range from very small spatial scales to, ultimately, the entire Earth (IPCC, 2001). Its subcategories are:
 - *Biodiversity protection*. Encompassing activities related to the maintenance of living organisms at various spatial scales, including the establishment and protection of parks and bioserves.
 - *Ecosystem conservation*. Encompassing efforts to *maintain* the health of particular ecosystems, such as wetlands, grasslands, forests, mangroves, and coral reefs.
 - *Ecosystem restoration*. Encompassing efforts to *restore* the health of particular ecosystems, such as wetlands, grasslands, forests, mangroves, and coral reefs.
3. **Freshwater resources.** Defined as the management and use of freshwater contained in terrestrial ponds, lakes, rivers, and watersheds, among others. Its subcategories are:
 - *Freshwater fisheries*. Encompassing the catching, packing, and selling of fish and shellfish derived from lakes, rivers, and ponds, as well as through freshwater aquaculture.

- *Watershed management.* Encompassing management of the basins that supply water to different streams, rivers, lakes, and reservoirs, including integrated watershed management.
 - *Freshwater supply.* Encompassing efforts to access and preserve freshwater for human consumption and use, including drinking water sources, groundwater resources, rainwater harvesting, and water infrastructure such as wells, dams, and dikes.
4. **Oceans and coastal areas.** Defined as the management and use of coastal areas and oceans. Its subcategories are:
- *Coastal zone management.* Encompassing the management of land and water resources in coastal areas, including through integrated coastal zone management and the establishment and maintenance of coastal infrastructure.
 - *Marine management.* Encompassing the management and use of offshore ocean and sea resources.
 - *Marine fisheries.* Encompassing the catching, packing, and selling of fish, shellfish, and other aquatic resources found in the oceans and seas, including through marine and coastal aquaculture.
5. **Disaster risk management.** Defined by the United Nations International Strategy for Disaster Reduction (2009) as the “systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster” (p. 10). It includes emergency response measures, preparation for extreme events and early warning systems. No sub-categories were established in relation to this macro project category.
6. **Migration and security.** Defined as efforts to support the movement of people and maintain their personal security in the face of incremental climate changes or climate shocks.
- *Migration.* Encompassing preparations for and responses to the potential movement of people from one location to another due to climate change impacts.
 - *Security.* Relating to personal security and freedom from violence, crime, and war due to natural and human-induced disasters (UNEP, 2007) and encompassing peace building, conflict reduction, and conflict avoidance.
7. **Gender.** Defined as the social attributes and opportunities associated with being male and female and the relationships between women and men, and girls and boys, as well as the relations among women and among men. These attributes, opportunities, and relationships are socially constructed and are learned through socialization processes (United Nations Entity for Gender Equality and the Empowerment of Women, n.d.). This category includes efforts to understand the vulnerability of women to the impacts of climate change, gender-sensitive adaptation strategies, and measures to improve the

situation of women at the local and policy level, including through gender mainstreaming. No subcategories were established in relation to this macro project category.

8. **Business.** Defined as the purchase and sale of goods and services with the objective of earning a profit. Its subcategories are:
 - *Tourism.* Encompassing the adjustment and development of tourist facilities and operations to account for current and future vulnerabilities, including these actions in relation to ecotourism.
 - *Private sector.* Encompassing potential impacts of climate change and potential adaptation strategies on the diverse activities underway in the portion of the economy in which goods and services are produced by individuals and companies including industry, mining, and other economic sectors.
 - *Trade.* Encompassing the exchange of goods and services within and between countries.
 - *Insurance.* Encompassing the development, testing, and adjusting of insurance and risk-management schemes, including weather-based index systems.

9. **Infrastructure.** Defined as the basic equipment, utilities, productive enterprises, installations, institutions, and services essential for the development, operation and growth of an organization, city or nation (IPCC, 2001). Its sub-categories are:
 - *Energy.* Encompassing energy-related systems and infrastructure, including small-scale and large-scale energy generation through hydroelectric power generation, wind, solar, and other forms of traditional and new energy sources, as well as transmission networks.
 - *Transportation.* Encompassing the components of the system required to move people and goods, including roads, bridges, railway lines, shipping corridors, and ports.
 - *Waste management.* Encompassing sanitation, sewage systems, drainage systems, and landfills.
 - *Buildings.* Encompassing actions related to built structures such as houses, schools, and offices, including changes to building codes, building practices, and green ways of construction.

10. **Human settlements.** Defined as a place or area occupied by settlers (IPCC, 2001). Its subcategories are:
 - *Peri-urban areas.* Encompassing the outskirts of urban centres and the transition zones between rural and urban areas.
 - *Urban areas.* Encompassing municipalities, towns, and cities, as well as areas in these centres (such as slums).
 - *Rural areas.* Encompassing villages and other small settlements, as well as rural landscapes and integrated rural development.

11. **Human health.** Defined as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (WHO, n.d.). It includes efforts to assess vulnerabilities to and the impacts of climate change on human health directly and indirectly, and the development and implementation of appropriate adaptation strategies at the local, regional, and national levels. No subcategories were established in relation to this macro project category.
12. **Climate information services.** Defined as the production and delivery of authoritative, timely, and usable information about climate change, climate variability, climate trends, and impacts to different users at the local, subnational, national, regional, and global levels. It includes efforts to develop, adjust, and provide short- and long-term climate forecasts, including climate change projections, to different audiences. No subcategories were established in relation to this macro project category.
13. **Governance.** Defined as the institutions (laws, property rights systems, and forms of social organization) through which societies define and exercise control over resources (UNEP, 2007). Its subcategories are:
- *Government.* Encompassing efforts to build the capacity of government officials, either at the national or subnational level, to prepare for and facilitate adaptation to climate change, including through the development of policies, plans, frameworks, and strategies, as well as the establishment and operation of climate change trust funds.
 - *Civil society.* Encompassing efforts to build the capacity of the public, including NGOs, to understand, prepare for, and respond to climate change.
14. **Social protection.** Based on DFID's definition of social protection, projects within this category focus on three sets of instruments to address chronic poverty and vulnerability:
- *Social insurance.* Referring to "the pooling of contributions by individuals in state or private organizations so that, if they suffer a shock or change in circumstances, they receive financial support."
 - *Social assistance.* Encompasses "non-contributory transfers that are given to those deemed vulnerable by society on the basis of their vulnerability or poverty."
 - *Workplace safety.* Involves the "setting and enforcing of minimum standards to protect citizens within the workplace" (DFID, 2006, p. 1).
- Adaptation projects that focus on labour market interventions and social assistance would be included in this category. No subcategories were established in relation to this macro project category.
15. **Multisectoral.** Defined as actions that simultaneously address more than one sector in one or multiple locations. It includes efforts that address more than one sector, which are challenging to tease apart, and in the context of this review includes large, multi-

country projects in which the specific sector of focus is nationally determined and, therefore, varies from country to country. No subcategories were established in relation to this macro project category.

16. **Other.** To capture areas of focus not clearly identified in the previous categories.

Annex B: Projects and programs

Projects working to address vulnerability to the impacts of climate change in Nepal are presented alphabetically in the table below.

Name of project	Objectives	Funder(s) and budget	Implementing agencies	Type of project	Sectors	Duration	Scale and location(s)
Adapting to Climate Induced Threats to Food Production and Food Security in the Karnali Region of Nepal	The project aims to increase the adaptive capacity of poor, food-insecure, and climate-vulnerable households living in the Karnali mountain districts of Nepal. It will improve the management of livelihood assets and natural resources by increasing local capacity to identify climate risks, diversifying livelihoods and improving food security, and increasing the resilience of the natural systems on which local livelihoods depend.	Adaptation Fund US\$9.53 million	World Food Programme, MSTE, Ministry of Federal Affairs and Local Development	Capacity building; policy formation and integration; community-based adaptation	Agriculture; government	April 2015–2019	National
Anukulan: Driving small farmer investment in climate-smart technologies	The project aims to help 500,000 rural Nepalese build their resilience to climate change impacts like floods and drought. It will help smallholder farmers take advantage of small farm economic opportunities and investments in climate-smart technologies such as drip irrigation, conservation agriculture, essential oil production, multiple-use water systems, and community-based renewable energy.	DFID through the Building Resilience and Adaptation to Climate Extremes and Disasters program	iDE UK (lead)	Field implementation; community-based adaptation	Agriculture; disaster risk management	January 2015–2018	National
Kailash Sacred Landscape Conservation and Development Initiative (also called Biodiversity Conservation in	The project is working in the Kailash region of Nepal to ensure the sustainable use of transboundary natural resources by local communities living in the context of climate change and promote the conservation of transboundary biodiversity in the	German Federal Ministry for Economic Cooperation and Development, DFID	International Centre for Integrated Mountain Development (ICIMOD) in partnership with	Research; capacity building; policy formation and integration; community-based adaptation;	Biodiversity protection; ecosystem conservation; government; civil society	February 2012–February 2017	Regional India, Nepal, China

the Kailash Region)	region. It will achieve this objective by strengthening regional, transboundary cooperation between China, India, and Nepal; mainstreaming sustainable ecosystem management practices that enhance local incomes; building key institutions' capacity to engage in long-term socioeconomic research and environmental monitoring; and establishing a regional knowledge-sharing platform.		national ministries, scientific institutions, and community-based organizations	knowledge communication			
Building Adaptation to Climate Change in Health in Least Developed Countries through Resilient Water, Sanitation and Hygiene	The primary goal of this pilot project is to reduce disease risk and improve health in four countries, including Nepal. The project focuses on integrating climate change considerations into health care. Once the project is complete, its outcomes will be used to reduce the risk of climate-related diseases in other low- and middle-income countries.	DFID through the International Climate Fund £8.5 million	World Health Organization	Policy formation and integration; field Implementation	Freshwater supply; human health	2013–2016	Global Bangladesh, Nepal, Ethiopia, Tanzania
Building Climate Change Awareness in the South Asian Media	This initiative aimed to improve media coverage and public debate around climate and development in South Asia by strengthening the capacity and understanding of journalists and other members of the media.	DFID and the Netherlands through the Climate and Development Network £250,000	ICIMOD and Panos	Capacity building	Communications and media	May 2012– March 2014	Regional Bangladesh, India, Nepal, Pakistan, Bhutan, Sri Lanka
Building Climate Resilience of Watersheds in Mountain Eco-Regions	A project identified for implementation as part of Nepal's SPCR, it will enable vulnerable communities in mountainous ecosystems to have improved access to reliable water resources. This outcome will be achieved by improving and integrating watershed management, installing or improving water storage infrastructure, and strengthening knowledge management within government.	Asian Development Bank Strategic Climate Fund and Nordic Development Fund Grant US\$28.17 million	Department of Soil Conservation and Watershed Management	Capacity building; knowledge communication; field implementation; community-based adaptation	Watershed management; freshwater supply; government	September 2013–July 2020	National

Building Climate Resilient Communities through Private Sector Participation	As part of Nepal’s Pilot Program for Climate Resilience, the project aims to improve rice, sugarcane, and maize production while also strengthening the capacity of the private sector to manage climate risks. Elements of the project include efforts to: (1) build the capacity of farmers to adopt climate-resilient practices; (2) strengthen the resiliency of hydroelectric plants to the risk of GLOFs; and (3) assess the feasibility of low-cost, climate-resilient housing.	Climate Investment Fund US\$34.2 million	MSTE	Assessment; capacity building; field implementation; community-based adaptation	Agriculture; private sector; energy; buildings	January 2013– present	National
Building Effective Water Governance in the Asian Highlands	Working in the Asian Highlands, the project aimed to promote effective water resource management and integrate climate change impact analysis with vulnerability, livelihood options, and water policy assessments.	IDRC’s Adaptation Research Initiative in Asia CA\$1.526 million	HELVETAS Swiss Intercooperation Nepal, Kunming Institute of Botany	Assessment; knowledge communication	Watershed management	January 2012– July 2013 (approximately)	Regional Nepal, Pakistan, China
Building Resilience to Climate Related Hazards	The project aims to enhance the capacity of the GON to mitigate the risks associated with climate-related hazards by improving the accuracy and timeliness of flood forecasts, weather forecasts, and disaster warnings. To this end it is strengthening the capacity of the Department of Hydrology and Meteorology, modernizing the country’s hydrometeorological observation networks and forecasting capacity, and improving service delivery. The project is also working with the Ministry of Agricultural Development to develop an agricultural management information system that will help farmers reduce climate-related risks to agricultural production.	World Bank, GON US\$31.0 million	Department of Hydrology and Meteorology	Assessment; capacity building	Agriculture; climate information; government	January 2013– November 2018	National
Climate Proofing Growth and	This project is working to integrate climate change adaptation and	DFID	UNDP, Oxford Policy	Capacity building; knowledge	Government	October 2012– 2019	Regional

Development in South Asia	mitigation into development planning, budgeting, and delivery in national and subnational governments in Afghanistan, Bangladesh, India, Nepal, and Pakistan. It is doing this by strengthening planning, budgeting, and delivery mechanisms; building awareness and capacity of stakeholders; providing technical and some implementation support; helping leverage domestic finance; and actively sharing knowledge.	£28.5 million	Management	communication; policy formation and integration			Bangladesh, India, Nepal, Pakistan, Afghanistan
Climate-Smart Villages	This project aims to sustainably increase productivity and incomes, build resilience to climate change, reduce greenhouse gas emissions, and enhance national food security and development goals. It will do this by establishing climate-smart villages that will act as models of local actions that ensure food security, promote adaptation, and build resilience to climatic stresses. Researchers, local partners, farmers' groups, and policymakers will collaborate to select the most appropriate technological and institutional interventions that support climate-smart agriculture, taking into consideration global knowledge and local conditions.	CGIAR Research Program on Climate Change, Agriculture and Food Security	Led by International Center for Tropical Agriculture and Earth First	Assessment; capacity building; knowledge communication; community-based adaptation	Agriculture; climate information	2011–unknown	Global Bangladesh, India, Nepal, Ethiopia, Kenya, Tanzania, Uganda, Burkina Faso, Ghana, Colombia, Guatemala, Honduras, Nicaragua, Vietnam, Laos, Cambodia
Community Based Flood and Glacial Lake Outburst Risk Reduction in Nepal	The objective of this project is to reduce human and material losses from GLOFs through community-based risk reduction approaches in the high mountains of Solukhumbu District and from recurrent flooding events in four districts in the Terai and Churia Range through structural and non-structural measures. The project will also promote knowledge sharing at the	Least Developed Countries Fund US\$22.47 million	GON, ICIMOD High Mountain Glacial Watershed Program, UNDP	Capacity building; knowledge communication; field implementation; community-based adaptation	Disaster risk management; government	2013–2017	National

	local and central levels between practitioners from different disciplines.						
Ecosystems Protecting Infrastructure and Communities	The overall goal of this project is to catalyze and promote improved management of ecosystems and harness multiple ecosystem services to protect vulnerable communities from risks associated with climate change and natural hazards. Its objectives are to: (1) demonstrate the effectiveness and economic value of environmental management for disaster risk reduction and climate change adaptation; (2) raise awareness on the potential of environmental management to address disaster risk reduction and climate change adaptation; (3) work with communities to identify and implement local, nature-based measures for disaster risk reduction and climate change adaptation; (4) assist national and local governments in establishing and facilitating policy mechanisms; (5) disseminate lessons learned; and (6) build national, subnational, and local capacities for the implementation of ecosystem-based disaster risk reduction and climate change adaptation.	Germany's Federal Ministry of the Environment, Nature Conservation and Nuclear Safety's International Climate Initiative €4,004,645	Coordinated by International Union for the Conservation of Nature working closely with the University of Lausanne (Switzerland); l'Institut National de la Recherche Agronomique (France); the Mangrove Action Project (Thailand); and the Swiss Federal Institute for Forest, Snow and Landscape Research	Research; capacity building; knowledge communication; community-based adaptation	Ecosystem conservation; ecosystem restoration; disaster risk management; multisectoral; ecosystem-based adaptation	September 2012–August 2017	Global Nepal, Burkina Faso, Senegal, China, Chile, Thailand
Global Ecosystems Based Adaptation in Mountains Programme	The objective of this program was to strengthen the capacities of local communities and governments to reduce their vulnerability to climate change through the use of ecosystem-based adaptation measures in fragile mountain ecosystems. In Uganda the project was focused on the Mount Elgon ecosystem, while in Nepal it was active in Panchase. The project tested ecosystem-based adaptation methods	German Federal Ministry of Environment, Nature Conservation and Nuclear Safety €11.5 million	UNDP, United Nations Environment Programme (UNEP), International Union for Conservation of Nature In Nepal: Ministry	Research; assessment; capacity building	Ecosystem conservation; ecosystem restoration; government	2011–2015	Global Nepal, Uganda, Peru

	and tools, monitored and evaluated ecosystem resilience, and enhanced the knowledge and capacities of involved stakeholders.		of Forests and Soil Conservation, MSTE				
Groundwater Resilience to Climate Change and Abstraction in the Indo-Gangetic Basin	The project aimed to develop a strategic overview assessment of the occurrence and status of groundwater resources in the Indo-Gangetic Basin and strengthen the evidence base linking groundwater resources, climate change, and abstraction rates with emerging policy responses.	DFID £565,200	British Geological Survey, Indian Institute of Technology Kharagpur, Institute for Social and Environmental Transition–Nepal, Institute for Social and Environmental Transition–International, MetaMeta, National Institute of Hydrology (Roorkee, India), Overseas Development Institute, University College London, University of Dhaka	Research; knowledge communication	Freshwater supply; climate information	June 2012–September 2014	Regional Bangladesh, India, Nepal, Pakistan
Hariyo Ban	The initiative seeks to reduce climate change–related risks and threats to biodiversity by restoring forests, improving livelihoods, and building the capacity needed to effectively engage in sustainable landscape management. It is active in the Terai Arc and Chitwan-Annapurna Landscapes.	USAID US\$30 million	World Wildlife Fund, CARE, Federation of Community Forestry Users Nepal, National Trust for Nature Conservation	Capacity building; community-based adaptation	Forestry; biodiversity protection	2011–2016	National
High Mountains Adaptation Partnership	The project aims to increase awareness of the critical importance of high mountain glacial watersheds in the context of climate change. It will promote improved management of dangerous glacial lakes through	USAID	The Mountain Institute, the University of Texas at Austin	Capacity building; knowledge communication	Ecosystem conservation; watershed management; disaster risk management	2013–unknown	Global Nepal, Peru

	participatory processes, highland–lowland interactions and south–south exchange, donor coordination, and creation of a community of practice.						
HI-AWARE	Its overall goal is to contribute to enhanced climate resilience and adaptive capacities of the poor and vulnerable women, men, and children living in these river basins by leveraging research and pilot outcomes to influence policy and practice to improve their livelihoods.	DFID and IDRC through CARIAA CA\$13.5 million	ICIMOD; Bangladesh Centre for Advanced Studies; Energy and Resources Institute; Climate Change, Alternate Energy and Water Resources Institute of the Pakistan Agricultural Research Council; Wageningen Environmental Research (Alterra), Wageningen University and Research Centre (the Netherlands)	Research; capacity building; knowledge communication	Watershed management; multisectoral	2014–2019	Regional Bangladesh, India, Nepal, Pakistan
Initiative for Climate Change Adaptation	The project will build the capacity of poor rural communities to plan and adapt to climate change impacts, improve their food security, and increase their incomes through the implementation of climate change–resilient opportunities. It will promote the assessment and adoption of community-appropriate technologies, diversify rural livelihoods, support sustainable use and management of non-timber forest products, and strengthen the GON’s capacity to implement climate change adaptation policies.	USAID US\$2 million	International Development Enterprises, Rupantaran Nepal, Resource Identification and Management Society Nepal	Capacity building; knowledge communication; community-based adaptation	Agriculture; forestry; government	March 2012– March 2017	National

Mainstreaming Climate Change Risk Management in Development	The project aims to ensure that climate risks are integrated into Nepal's infrastructure development programs and policies. Priority focus is being given to roads, irrigation, urban planning, water supply and sanitation, and water-induced disaster prevention. Actions to support achievement of this goal include developing and applying knowledge management tools, and incorporating lessons learned into climate change programming.	Asian Development Bank Strategic Climate Fund and Nordic Development Fund US\$7.76 million	MSTE; Ministry of Agricultural Development	Capacity building; knowledge communication; policy formation and integration	Freshwater; transportation; government	March 2012–January 2017	National
Monitoring the Impacts of Urban Agriculture on Climate Change Adaptation and Mitigation in Cities	This project aimed to draft a monitoring framework to measure the mitigation, adaptation, and other development benefits that may be derived from urban and peri-urban agriculture and forestry. Indicators and tools were developed and field tested in four participating cities in collaboration with local and provincial authorities.	DFID and the Netherlands through the Climate and Development Knowledge Network £200,299	RUAF Foundation	Research; policy formation and integration	Agriculture; forestry; urban areas	February 2013–November 2014	Global Nepal, Burkina Faso, Sri Lanka, Argentina
South Asia Water Initiative	This project aims to help several Asian countries integrate climate change adaptation into integrated water resource management as part of a broader focus on improving transboundary water management and collaboration, improving the knowledge base related to basin and water resources, strengthening water institutions, and supporting investments that promote sustainable development.	United Kingdom through the South Asia Water Governance Programme (£11.5 million), Australian Department of Foreign Affairs and Trade's South Asia Sustainable Development Investment Strategy, Norway	World Bank	Research; capacity building; knowledge communication; policy formation and integration	Watershed management; energy	2013–2017	Regional Bangladesh, India, Nepal, Afghanistan, China, Bhutan
Support to Rural Livelihoods and Climate Change Adaptation in the Himalayas	Working in the Hindu Kush–Himalayan region, the project aims to help poor and vulnerable mountain communities adapt to the impacts of climate change. Specifically, it aims to reduce	European Union €10 million	ICIMOD Local partners in Nepal: Bird Conservation	Research; capacity building; community-based adaptation	Watershed management; rural areas	January 2013 to December 2018	Regional Bangladesh, Nepal, Pakistan,

<p>poverty, increase resilience, and ensure equity and greater well-being between men and women. To achieve these objectives, it is working to build the capacity of local institutions, promote new livelihood options, and encourage regional cooperation.</p>	<p>Nepal, Centre for the Study for the Labour and Mobility, Ministry of Agricultural Development , National Association of Village Development Committees in Nepal, and Nepal Development Research Institute</p>	<p>Bhutan, Myanmar</p>
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