

CLIMATE INVESTMENT FUNDS

PPCR/SC.8/7
June 6, 2011

Meeting of the PPCR Sub-Committee
Cape Town, South Africa
June 28 and 29, 2011

Agenda Item 7

**STRATEGIC PROGRAM FOR CLIMATE RESILIENCE
NEPAL**

Proposed Decision by PPCR Sub-Committee

The PPCR Sub-Committee, having reviewed the *Strategic Program for Climate Resilience for Nepal* (document PPCR/SC.8/7),

- a) endorses the SPCR as a basis for the further development of the projects foreseen in the strategic and takes note of the requested funding of USD50 million in grant funding and USD 60 million in other concessional resources. The Sub-Committee reconfirms its decision on the allocation of resources, adopted at its meeting in June 2010, that a range of funding for the country should be used as a planning tool in the further development of project and program proposals to be submitted to the PPCR Sub-Committee for PPCR funding approval, recognizing that the minimum amount of the range is more likely and that the upper limit of the range will depend on availability of funding.

The range of funding agreed for a single country pilot program is USD 40-50 million in grant resources, and USD 40-55 million in other concessional resources. The Sub-Committee also recognizes that the quality of the proposed activities will be a significant factor in the funding to be approved by the Sub-Committee when project and program proposals are submitted for approval of PPCR funding.

- b) approves a total of USD1.7million in PPCR funding as a preparation grant for the following projects to be developed under the SPCR,
 - i. USD900,000 for the project, *Building Climate Resilience of Watersheds in Mountain Eco-Regions* (AsDB)
 - ii. USD500,000 for the project, *Building Resilience to Climate Related Hazards* (World Bank)
 - iii. USD300,000 for the project *Building Climate Resilient Communities through Private Sector Participation* (IFC)
- c) takes note of the estimated budget for project preparation and supervision services for the projects referenced above and approves a first tranche of funding for MDB preparation and supervision services as follows¹:
 - i. USD487,825 for the project, *Building Climate Resilience of Watersheds in Mountain Eco-Regions* (AsDB)
 - ii. USD475,000 for the project, *Building Resilience to Climate Related Hazards* (World Bank)
 - iii. USD251,500 for the project, *Mainstreaming Climate Risk Management in Development* (IFC)
 - iv. USD250,000 for the project *Enhancing Climate Resilience of Endangered Species* (World Bank)

¹ For private sector projects, MDB preparation and supervision costs are determined at investment development stage and requested at a later point in time.

- d) requests the Government of Nepal and the MDBs to take into account all written comments submitted by Sub-Committee members by July 15, 2011 in the further development of the projects.

Nepal: Strategic Program for Climate Resilience



Prepared under the Pilot Program for Climate Resilience

List of Acronyms

ADB	Asian Development Bank
AEPC	Alternative Energy Promotion Centre
CA	Constitutional Assembly
CBD	Convention on Biodiversity
CBO	Community Based Organization
CCC	Climate Change Council
CCRMC	Climate Change Risk Management Coordination
CHG	Greenhouse Gas Emission
CNI	Confederation of National Industries
COP	Conference of Parties
CRED	Centre for Research on the Epidemiology of Disaster
DDC	District Development Committee
DFID	Department for International Development
DHM	Department of hydrology and Meteorology
DoA	Department of Agriculture
DoI	Department of irrigation
DOLIDAR	Department of Local and Agricultural Road
DPNet	Disaster Preparedness Network
DNPWC	Department of National Park and Wildlife Conservation
DoF	Department of Forest
DSCWM	Department of Soil Conservation and Watershed Management
DWIDP	Department of Water Induced Disaster Prevention
DWSS	Department of Water Supply and Sanitation
FECOFUN	Federation of Community Forest Users, Nepal
EU	European Union
FNCCI	Federation of Nepalese Chamber of Commerce and Industry
FY	Fiscal Year
GDP	Gross Domestic Product
GIS	Geographic Information System
GLOF	Glacier Lake Outburst Floods
GoN	Government of Nepal
ICIMOD	International Centre for Integrated Mountain Development
IFC	International Finance Corporation
ILO	International Labor organization
IPCC	Intergovernmental Panel on Climate Change
IWMI	International Water Management Institute
IWRM	Integrated Water Resource Management
IWRMP	Irrigation and Water Resource Management Project
LGCDP	Local Governance and Community Development Program
MA	Millennium Ecosystems Assessment
MAI	Mountain Alliance Initiatives
MCCICC	Multi-Stakeholder Climate Change Initiatives Coordination Committee
MDB	Multilateral Development Bank
MFI	Micro Financial Institution
MoAC	Ministry of Agriculture and Cooperative
MoE	Ministry of Environment
MoF	Ministry of Finance

MoFsc	Ministry of Forest and Soil Conservation
MoHP	Ministry of Health and Population
MoPPW	Ministry of Physical Planning and Works
MUAN	Municipality Association of Nepal
MUS	Multi-Use System
NAPA	National Adaptation Programme of Action
NARC	Nepal Agricultural Research Council
NAST	Nepal Academy of Science and Technology
NAVIN	National Association of Village Development Committees in Nepal
NCSA	National Capacity Self Assessment
NGO	Non-Government Organization
NPC	National Planning Commission
NSC	National Steering Committee
NTFP	Non Timber Forest Products
NTNC	National Trust for Nature conservation
PAF	Poverty Alleviation Fund
PMC	Project Management Committee
PMU	Project Management Unit
PPCR	Pilot Program for Climate Resilience
SNC	Second National Communication
SPCR	Strategic Program for Climate Resilience
TA	Technical Assistance
TYP	Three Year Plan
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
VDC	Village Development Committee
WB	World Bank
WECS	Water and Energy Commission Secretariat
WFP	World Food Programme
WMP	Watershed Management Plans

Summary of SPCR Program

PILOT PROGRAM FOR CLIMATE RESILIENCE		
Summary of Strategic Program for Climate Resilience		
1. Country/Region:	Nepal	
2. PPCR Funding Request (in USD millions)::	<i>Credit: 60</i>	<i>Grant: 50</i>
3. National PPCR Focal Point:	<i>Purushottam Ghimire, Joint Secretary, Ministry of Environment</i>	
4. National Implementing Agency (Coordination of Investment Strategy):	<i>Ministry of Environment</i>	
5. Involved MDBs	<i>Asian Development Bank (ADB), International Finance Corporation (IFC) and World Bank</i>	
6. MDB PPCR Focal Point and Project/Program Task Team Leader (TTL):	<i>Team Leaders: Cindy Malvicini (ADB), Anupa Pant (IFC), and Claudia Sadoff (World Bank)</i> <i>PPCR Focal Points: Daniele Ponzi (ADB), Noleen Dube (IFC), and Kanta Kumari Rigaud (World Bank)</i>	
7. Description of SPCR: <i>(a) Key challenges related to vulnerability to climate change/variability:</i> <p>Nepal was recently ranked the 4th most climate vulnerable country in the world due to its extraordinary geography (climbing from just 60 m to over 8,800 m above sea level); a largely poor and resource dependent population; and weak institutional capacity to manage the range of climate challenges it will face. Current climate risks such as floods, droughts and landslides are deadly and endemic, while glacial lake outbursts floods pose increasing threats. Most climate projections for the region suggest that rainfall is likely to intensify and that extreme events will become even more frequent. Retreating glaciers and changes in seasonal snow fall and melt will lead to greater uncertainty about water flows and, in the long run, diminish water availability. Rising temperatures are also predicted, which will put additional pressure on water supplies and, particularly in the high altitudes, may alter vegetation patterns that could seriously affect livelihoods and habitats. Nepal’s agriculture sector is highly rainfall dependent (only 17% of irrigable land receives irrigation water year round) and farmers are increasingly vulnerable to the uncertainties of climate-induced weather changes. Although a large part of Nepal’s land area is forested, much of these forests are degraded and increasingly prone to forest fires. In terms of health, vector-borne diseases such as malaria are rampant in parts of the country, and anecdotal evidence suggests that patterns of disease incidence are shifting as temperatures change. The investments outlined in the SPCR will help Nepal to manage many of these development challenges.</p>		
<i>(b) Areas of Intervention – sectors and themes</i> <ol style="list-style-type: none"> 1. Building Climate Resilience of Watersheds in Mountain Eco-Regions. Addresses the problem of too little or unreliable access to freshwater resources by communities in mountain eco-systems for drinking, irrigation, and other uses. 2. Building Resilience to Climate-Related Hazards. Addresses the priority risk of floods and droughts that take human lives and undermine progress on economic growth and poverty alleviation. 3. Mainstreaming Climate Change Risk Management in Development. Facilitates the integration of climate change risk management into development planning and practices. 4. Building Climate Resilient Communities through Private Sector Participation. Addresses some of the key agricultural productivity constraints including a. climate-induced stress conditions b. access to finance 		

for agri supply chain including farmers; c. climate proofing of some vulnerable infrastructure such as the hydropower sector, d. explores private sector opportunities and challenges in climate resilient housing for vulnerable communities .

5. **Enhancing Climate Resilience of Endangered Species.** Addresses the risks of climate variability and change on the habitats of endangered wildlife species.

(c) Expected Outcomes from the Implementation of the SPCR

- Improved access to and enhanced reliability of water resources
- Improved resilience through enhanced capacity to predict and respond to climate-related hazards
- Nepal’s development programs, policies, and projects are safeguarded from the effects of climate change
- Enhanced food security through promoting climate resilient agriculture; reduced vulnerability of farmers; and climate-proofing of selected vulnerable private infrastructure.
- Enhanced capacity, knowledge and incentives to improve climate resilience of critically endangered species by safeguarding their natural habitats against climate threats

8. Expected Key results from the Implementation of the Investment Strategy (consistent with PPCR Results Framework):

Result	Success Indicator(s)
<p>Component 1: Building Climate Resilience of Watersheds in Mountain Eco-Regions</p> <ul style="list-style-type: none"> • Improved participatory watershed management planning taking into account the impacts of climate change • Watershed management plans implemented in watershed significantly vulnerable to climate change • Enhance productivity water through effective and efficient use of water in farm lands/ systems • Lessons for improving access to and reliability of water resources generated and incorporated in country programs 	<ul style="list-style-type: none"> • Improved planning adopted • Reduced soil erosion and increased surface water storage within watersheds • Communities adopt effective and enhanced water use practices • Lessons fed into the SPCR global learning support program
<p>Component 2: Building Resilience to Climate-Related Hazards</p> <ul style="list-style-type: none"> • Strengthen weather and flood forecasting information systems • Establish early warning systems • Improve access to financial instruments that reduce the adverse impacts of climate induced shocks 	<ul style="list-style-type: none"> • Number of hydromet stations set up • Number of hazard forecasting tools and systems developed • Number of people/communities/female-headed households receiving hazard warnings • Number of people/women subscribing to insurance programs
<p>Component 3: Mainstreaming Climate Change Risk Management in Development</p> <ul style="list-style-type: none"> • Integration of climate change risk management into development planning 	<ul style="list-style-type: none"> • Manuals and guidelines prepared for integration of climate change in key sectors • Number of policies for key sectors revised to reflect the climate change policy 2011 • Number of people trained on climate risk management

	<ul style="list-style-type: none"> Number of community adaptation plans produced Revised curriculum integrating climate change
Component 4: Building Climate Resilient Communities through Private Sector Participation <ul style="list-style-type: none"> Enhanced agricultural productivity contributing to food security through capacity building of farmers and agri supply chain members and facilitating better access to finance Strengthened climate change risk management capacity in Nepal's private sector by climate proofing vulnerable infrastructure, mainly hydropower stations. 	<ul style="list-style-type: none"> Number of farmers adopting stress tolerant and high yielding seed varieties and other adaptive technologies Increased investments in climate proofing infrastructure Number of farmers and agri supply chain members accessing finance through appropriate financial products developed kW/MW of electricity protected.
Component 5: Enhancing Climate Resilience of Endangered Species <ul style="list-style-type: none"> Build capacity, enhance knowledge and implement activities to improve climate resilience of critically endangered species by safeguarding natural habitats 	<ul style="list-style-type: none"> Reports and plans regarding climate change impacts on the natural habitats and populations of critically endangered species Acres on which climate resilient management plans or practices are implemented Number of people/women benefitting from alternative livelihoods schemes

9. Project and Program Concepts under the SPCR:

Project/Program Concept Title	MDB	Requested PPCR Amount (\$m)	Grant or Credit	Expected co-financing (\$)	Preparati on grant request (\$m)	Total PPCR request (\$m) ¹	MDB Fee
Investment Project 1: Building Climate Resilience of Watersheds in Mountain Eco-Regions	ADB	41	16 Grant (of which 0.9 is PPG) 25 Credit	tbd	0.9	41	
Investment Project 2: Building Resilience to Climate-Related Hazards	WB	41	16 Grant (of which 0.5 is PPG) 25 Credit	tbd	0.5	41	
Technical Assistance Project 3: Mainstreaming Climate Change Risk Management in Development	ADB	10	10 Grant	tbd		10	
Investment Project 4: Building Climate Resilient Communities through Private Sector Participation	IFC	13	3 Grant (of which 0.3 is PPG) 10 Credit	tbd	0.3	13	

¹ Includes preparation grant and project/program amount.

Investment Project 5: Enhancing Climate Resilience of Endangered Species	WB	5	5 Grant	tbd		5	
TOTAL		110	50/60		1.7	110	
<p>10. Timeframe (tentative) – Approval² Milestones Investment Project 1: 2012 Investment Project 2: FY12 TA Project 3: 2011 Investment Project 4: FY12 Investment Project 5: FY12</p>							
<p>11. Key national stakeholder Groups involved in SPCR design³: Government of Nepal (MoE, PMO, NPC, MoFSC, MoAC, MoHP, MoI, MoEnergy, MoLD, MPPW, WECS, NARC), NGOs (NTNC, WWF, IUCN, IWMI, ICIMOD, Practical Action, DPNet, NAVIN, ADDCN, MUAN, IDE), and FNCCI, CNI</p>							
<p>12. Other Partners involved in SPCR: GIZ, UNDP, DANIDA, JICA, DFID, USAID, SNV, FAO, Finland, Canada, WFP, and WHO</p>							

² Expected signature of credit/grant agreement between government and MDB.

³ Other local, national and international partners expected to be involved in design and implementation of the strategy.

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Part 1 Background and Rationale

Country Circumstances

In November 2006, Nepal's decade-long conflict formally ended and the country is now in transition from conflict to peace and from a monarchy to a republic. In 2008, a constituent assembly (CA) was voted into power, a feudal monarchy was abolished, and a president and a prime minister were formally elected. A coalition government was formed and it began the process of writing a new constitution. Progress has been slow, however, and the constitution (expected in 2011) remains to be completed.

Nepal is a land-locked country in the central part of the Himalayas. With a per capita income of US\$472, Nepal is one of the poorest countries in the world⁴ - with 25% of the population lives below the poverty line.⁵ Poverty varies widely across geographic location, ethnicity, caste and gender. The population is largely rural and, naturally, is heavily dependent upon agriculture. About 66% of the population (currently estimated at around 28 million) lives in rural areas and agriculture contributes 35% of GDP⁶. Poverty is much more severe in rural areas (35%) compared to urban areas (10%) and particularly severe in mountainous areas. Nonetheless, over the past 10 years, many social indicators have improved, with the headcount poverty rate falling from 42% in FY1996 to 25% in FY2009.

Broadly, Nepal can be divided into three ecological regions: the high mountains (35% of total area), the middle mountains (42% of total area), and the lower altitude Churia/Terai range (23% of total area). Each region has distinct altitude and climatic characteristics, varying from alpine to sub-tropical conditions, yet all within a lateral span of less than 200 kilometres. Altitudes range from 8,848 meter in the north at the peak of Mount Everest, to just 60 meters above sea level in the southern plains.⁷ Although Nepal only comprises about 0.1% of the earth's terrestrial area, it harbours a high share of the world's biodiversity, confirming its unique geographic nature. A total of 118 ecosystems have been identified, with 75 vegetation types and 35 forest types. Both its floral and faunal diversity is unique.⁸

The Himalayan region, also known as the "third pole" or the "water tower of Asia," is the most glaciated area in the world outside of the Polar Regions, with vast stocks of water in the forms of snow and ice. Nepal's glaciers, snow, and ice-melt waters feed more than 6,000 rivers across the country. All of Nepal's rivers flow into the Ganges, a river of great cultural and religious significance and the most populous river basin in the world. Some 650 million people live in the Ganges basin, shared by Bangladesh, China, India and Nepal. Over 40% of Ganges waters rise in Nepal making the country's climate and hydrology significant for the region as a whole.

⁴ Approach Paper for The Three Years Plan (2010-2012), National Planning Commission, government of Nepal, (page 14)

⁵ Approach Paper for The Three Years Plan (2010-2012), National Planning Commission, government of Nepal, (page 14)

⁶ Approach Paper for The Three Years Plan (2010-2012), National Planning Commission, government of Nepal, (page 4)

⁷ From east to west the country spans a distance of 850 km.

⁸ Nepal Biodiversity Strategy, HMG/MFSC, 2002

Within Nepal, the total available surface water should be sufficient to meet the country's needs through the 21st century. Yet rainfall variability presents significant water management challenges. Rainfall largely comes in the form of floods during the South Asian monsoon season. Water is scarce during the remainder of the long, dry months, creating significant challenges for capturing and storing the monsoon rainfall for dry season usage.

Development context and climate risks

Nepal faces serious climate risks. It ranks fourth on a recently published list of country vulnerability that is based on the Climate Change Vulnerability Index, with poverty and adaptive capacity being some of the key determining factors in the ranking.⁹

Located in the geologically young and unstable rugged terrains in the Himalayas, Nepal's unique natural environment and ecosystems are diverse and vulnerable. These ecosystems are increasingly threatened by a rapidly growing population that is putting pressure on fragile natural resources, including land, water, and forests. With the majority of human settlements relying heavily on these ecosystems for their livelihood, the deterioration of the environment and natural resource bases is contributing to chronic rural poverty and migration to cities and other countries in search of income.

Climate

The greatest influence on Nepal's climate is the South Asian monsoons. The monsoons enter Nepal from the southeast, with precipitation beginning as it reaches the lower hills of the Churia range, which act as the first monsoon barrier. The high mountains of the Himalayan range act as a final barrier to the monsoon, creating a rain shadow to the north in the Himalayan Plateau. Monsoon rains are most abundant in the east and gradually decline as they move west; while winter rains are higher in the northwest, declining as they move southeast. The highest rainfall occurs in the central and mid-hills (around the Pokhara valley) and northeast and east of the Kathmandu valley. Average annual rainfall is approximately 1800 mm. Temperatures tends to increase from North to South. The highest temperatures are registered during the pre-monsoon period.

The Himalayan glaciers are another prominent feature of Nepal's climate. In addition to the effect of the high mountain range on the monsoon, the snow and ice of the glaciers act as natural water storage. Changes in the snow line and glacier melts could have very serious affects on high altitude ecosystems and downstream areas. The melting of glaciers has also led to numerous new and large lakes in Nepal. These glacial lakes form when glaciers melt and water is captured behind the glacier's terminal moraine (a natural dam of rubble and ice that forms at the tongue of

⁹ www.maplecroft.com/about/news/ccvi/html. The *Climate Change Vulnerability Index* evaluates 42 social, economic and environmental factors to assess national vulnerabilities across three core areas. These include: exposure to climate-related natural disasters and sea-level rise; human sensitivity, in terms of population patterns, development, natural resources, agricultural dependency and conflicts; thirdly, the index assesses future vulnerability by considering the adaptive capacity of a country's government and infrastructure to combat climate change.

a glacier.) As the pressure of the growing glacial lake increases, these natural dams can become unstable causing Glacial Lake Outburst Floods (GLOFs).

Nepal’s climate is characterized by four distinct seasons: pre-monsoon (March-May), monsoon (June-September), post-monsoon (October-November) and winter (December-February). These seasons vary enormously in terms of temperature and precipitation, and the climate also differs greatly across Nepal’s highly varied ecological belts.

Table 1: Climate Characteristics in Different Ecological Belts of Nepal

Physiographic zone	Ecological belt	Climate	Average annual precipitation	Mean annual temperature
High Himal	<i>High Mountain</i>	Arctic/alpine	150mm-200mm	3 ⁰ C-10 ⁰ C
High mountain				
Middle mountain	<i>Middle Moutain</i>	Cool/warm	275mm-2300mm	10 ⁰ C-20 ⁰ C
Siwalik	<i>Churia/Terai</i>	Tropical/sub-tropical	1100mm-3000mm	20 ⁰ C-25 ⁰ C
Terai				

Source: WECS, 2005

An analysis of temperatures since 1962 shows significant variations between years. However, a progressive increase in maximum temperatures is evident and confirms both global and regional records. From 1977 to 1994, the mean annual temperature is estimated to have increased by 0.04 - 0.06°C annually. Studies also indicate that the observed warming trend is not uniform across the country. Warming has been more pronounced in high altitude regions and lower in the Churia-Terai region. This is consistent with the notable global trends of temperature increases at higher altitudes.

Annual precipitation data shows a general decline in pre-monsoon precipitation in far-west and mid-western Nepal, with a few pockets of declining rainfall in the western, central, and eastern regions. In contrast, there is a general trend of increasing pre-monsoon precipitation in the rest of the country. Monsoon precipitation shows a general declining trend in the mid-western and southern parts of western Nepal, with a few pockets of declining rainfall in the central and eastern regions. In the rest of the country, monsoon precipitation has generally increased. Post-monsoon precipitation shows increasing trends in most of the mid-western and the southern parts of eastern, central and western Nepal. A general declining precipitation trend is observed in most of the far-western and northern parts of the western, central and eastern Nepal. The winter precipitation trends show an overall increase except in the northern part of mid-western, western and eastern Nepal.

Inter-annual variations in rainfall vary widely. Recent records in Nepal show increasing incidents of droughts and floods, hailstorms, landslides and crop disease.¹⁰

In terms of GHG emissions, Nepal produces only 0.025% of global greenhouse gas emissions.¹¹ While most hydropower generation qualifies as a form of “clean” energy, Nepal is also promoting other forms of renewable energy, such as solar, wind, biofuels, and biomass.

¹⁰ Food Security Atlas of Nepal, 2010, NPC

In summary, climate projections suggest that Nepal will experience higher temperatures, an increase in the intensity of rainfall, more monsoon and post monsoon rainfall, but less rainfall in the dry winter season.

Key climate risks and vulnerabilities

In preparation of the SPCR, a climate risk assessment was carried out at the sectoral, district and community levels to identify major risks.¹² A summary of these risks is presented in Annex 1. The most critical risks are

1. quantity and quality of water,
2. food security, and
3. eco-system health

Although these risks are experienced differently across the country, some common themes are evident from the assessment.

Water Resources. Climate change is expected to cause: (i) greater water scarcity in the High Mountain Region, (ii) affect water quality and availability in the Middle Mountains, and (iii) cause more water-related disasters (flooding, landslide, sedimentation, water-borne disease, vector-borne disease) in the Churia/Terai Region. These disasters are highly associated with increase in precipitation during and around the monsoon season, especially floods in the Terai and landslides. As part of the SPCR preparation process, communities were consulted on changing weather patterns and their effects. Communities confirmed that there have been more floods in recent years, resulting in deaths and damaged infrastructure, cultivated land, biodiversity, and drinking water sources. The priority concerns of all communities were in securing water for drinking and agriculture, and protecting themselves from flood and water-borne diseases. These concerns directly affect agricultural productivity and food security, as discussed below.

Agriculture and Food Security. Climate change is expected to affect agricultural productivity through three primary channels in Nepal: (i) rising temperatures, (ii) climate variability and related changes in the timing, intensity, and volume of rainfall, and (iii) rising carbon dioxide levels. The magnitude and consequences of these changes on agriculture is currently highly uncertain because of the extreme complexities of downscaling global climate models and projecting climate variables for high elevations and in monsoonal geographies. Nevertheless, evidence suggests that the observed changes in temperatures and soil moisture are negatively affecting agriculture in many parts of Nepal. Agriculture is fundamental to the livelihoods of the rural population. The effects of a changing climate on agriculture is already leaving poor people

¹¹ Initial National Communication to the Conference of the Parties of the United Nations Framework Convention on Climate Change, 2004, Government of Nepal.

¹² The methodology used for the risk assessment may be found at <http://www.ppcnepal.gov.np>

with even fewer assets, which they need to protect themselves from the shocks and stresses of change.

The Terai region, Nepal's prime agricultural belt along the entire southern region of the country, is most at risk from flooding. This could lead to inundation or depositing of sediments on agricultural land. Similarly, drought – both during winter and summer – is affecting crop production and animal husbandry. The winter drought assessment confirmed that production of the major winter crops – wheat and barley – decreased nationally in 2009 by 14.5% and 17.3 % respectively compared to previous years.¹³ The 2008/2009 winter drought-one of the worst in the country's history-destroyed crops across Nepal, with wheat crops cut by 14% and barley production by 17% respectively. Some districts in the mid-west and far-western regions received less than 50% of average rainfall for November 2008 to February 2009, and their crop yield dropped by more than half. More than two million people were highly at risk of starving.¹⁴

Only 26.5% of cultivable agricultural land in Nepal is irrigated.¹⁵ Of that irrigable land, even less has access to water supply all year round. As a result, agricultural production greatly depends on favourable weather conditions, mainly on the monsoon's timing and sufficiency. A late or erratic monsoon quickly translates into crop losses – and subsequently to food insecurity. Agriculture is also at risk of increased water scarcity due to growing demand from other sectors.. The ability of Nepal's agriculture sector to adapt to these changes is limited because of its already low productivity and high incidence of poverty, particularly amongst the rural population.¹⁶

Forest and Biodiversity (eco-system health). The threat of climate change on Nepal's rich biodiversity is evident in the shifting of agro-ecological zones, prolonged dry spells, encroachment and fast growth of alien and invasive species and increased prevalence of disease and pests. The upward shifting of ecological belts is expected with the rise in temperatures. The likewise upward movement of species, however, may be limited by environmental circumstances, such as soil and moisture conditions and hostile topographies. Tree lines will likely shift slowly because of the limited natural dispersal of seeds. Reduced snowfall, untimely rains, and increased dryness may alter the flowering and fruiting behavior of plants. Extreme climatic conditions have led to more forest fires, affecting more than 50,000 people¹⁷ in recent years along with the loss of large areas of productive forest land. Many observations suggest that recent climactic changes have already influenced animal and plant populations in a number of ways: the timing of seasonal events (e.g. flowering, migration), growth and reproduction rates, and in the distribution of species. Ultimately, these changes are leading to species and habitat loss.¹⁸

¹³ Market Watch 14, 2009/WFP

¹⁴ www.wfp.org/food-security/; posted on 31 May 2009/

¹⁵ MoAC, 2010. Selected indicators of Nepalese Agriculture and Population

¹⁶ Climate Change and Agriculture Country Note – Nepal. This Country Note was produced by a World Bank team led by Animesh Shrivastava, comprising Cristina Dengel, Jitendra Srivastava.

¹⁷ Centre for Research on the Epidemiology of Disaster (2008). Annual disaster statistical review: The numbers and trends 2007. http://www.preventionweb.net/files/2796_CREDAAnnualStatisticalReview2007.pdf.

¹⁸ Nepal NAPA (2010).

Impacts on Health Sector. Increasing trend of malaria, *Ka-lazar*, and Japanese encephalitis outbreaks are already recorded and associated with climate change in research literature.¹⁹ Subtropical and warm temperate regions of Nepal, in particular, may become more vulnerable to these diseases. Mosquitoes are now becoming more ubiquitous in Nepal, whereas historically, they were confined to the Terai and valley regions with tropical climates.

Impacts on specifically vulnerable groups. Poor and rural populations will be most vulnerable to climate risks.²⁰ The poor are already dependent upon subsistence agriculture for their livelihoods, and climate change poses an additional risk to these livelihoods. Floods, droughts, and degraded ecosystem health directly affect their livelihoods. More than any other group, they are not able to manage these changes. Within this group, women are likely to be affected the most. They typically have disproportionate access to resources and opportunities – less pay for the same work as men, less access to schools, less access to health services, less social and political status than men.²¹ Women’s daily activities, particularly in rural areas, largely relate to natural resources. Changes in precipitation and temperature patterns affect the availability of fuel wood, fodder, grasses and drinking water. Women typically collect these resources for their homes and family and will likely face longer distances to collect such supplies, which are likely to become scarce. These factors add to the daily drudgery that women face. Indirectly, physical and emotional health are also affected. This scenario is very real and present in high and mid-mountain regions. Climate induced disasters in the mid-mountain and *Churia-Terai* regions, force more and more people, mostly male, to relocate or move from the community to augment their lost livelihoods with income from cities and other countries, leaving women with additional burdens to manage their households, the elderly, the sick, and the young while continuing the farming operations needed to sustain the family.

Impact on private sector growth and sustainability. Many economic sectors, particularly those depending on climate-sensitive natural resources (water and agricultural products as primary inputs, non timber forest products (NTFP), etc.) as well as small and medium enterprises will face negative impacts of climate change, which will affect the growth rate of jobs and overall economic development in Nepal. The private sector must be included into initiatives to strengthen Nepal’s climate resiliency. The private sector can also positively contribute to adaptation initiatives by developing innovative technology, design of resilient infrastructure, development and implementation of improved information systems, management of major projects through public private partnership, and efficient delivery of goods and services to public sector undertakings.

Existing development plans and programs

The priority goal of the Government of Nepal is to reduce poverty. The government is pursuing this goal through a strategy of economic development, good governance, and an inclusive development process. A series of National Five-Year Plans and Three-Year Interim Plans

¹⁹ “Sector-Based Impact & Adaptation Brief No. 4. Building Climate Resilience in the (Nepal) Health Sector.” ADB. 2010.

²⁰ Climate change also increasingly causing risks to Nepal’s growing urban population. These risks are: urban floods, dispersion of pollutants to water bodies and outbreaks of water and vector borne diseases, landslides causing delay to transport of goods towards the city.

²¹ Case Study: Gender and Climate Change in the Hindu Kush Himalayas of Nepal, ICIMOD Unpublished report

provide a policy framework that encourages investments in those sectors that form the backbone of rural development and poverty reduction.

In recent years, government initiatives to support policy formation and implementation have increasingly emphasized environmental issues, and now climate resilience as well.²² The Interim Constitution of Nepal (2007) recognizes the “right to a clean environment” as a fundamental right of the citizens of Nepal. The government recently issued a Three Year Plan (TYP) Approach Paper (2010-2012) with broad objectives of promoting green development, making development activities climate-friendly, mitigating the adverse impacts of climate change, and promoting adaptation. The TYP also has objectives of mitigating urban pollution and protecting rural natural beauty. The key expected outcomes of the TYP are to prepare and implement a national framework on climate change adaptation and mitigation, disaster risk reduction, poverty reduction and poverty environment initiatives. The TYP has adopted the following strategies: (i) strengthen the institutional capacity related to environmental policies and regulations; (ii) internalize environmental management into the development efforts; (iii) prioritize and plan for effective implementation of national and international environmental commitments; (iv) adapt to climate change and manage natural resources sustainably; (v) make meteorological forecasting more reliable; and (vi) research environmental management and climate change issues.

In 2002, Nepal started the National Capacity Self Assessment (NCSA) Project aimed at developing a national action plan to implement the Convention on Biodiversity (CBD), United Nations Convention to Combat Desertification (UNCCD), and United Nations Framework Convention on Climate Change (UNFCCC) through an integrated and sustainable program of capacity development. Strategically, the NCSA was developed as a program of broad national stakeholder consultations to critically discuss the underlying root capacity deficiencies and opportunities to meet national and global environmental objectives. In addition to focusing on the three Rio conventions mentioned above, NCSA also pays particular attention to those capacity constraints and opportunities that are relevant to all three conventions, as well as the synergies that can be created by jointly implementing multilateral environmental agreements. The NCSA²³ highlights: (a) the absence of observation stations to collect key meteorological data (spatial and temporal) that is needed for the establishment of early warning systems; and (b) the insufficiency of funding for climate change risk management – a priority constraint that limits effective implementation of urgently needed adaptation measures under the UNFCCC.

The Government of Nepal has prepared its *National Adaptation Programme of Action (NAPA)* through a broad consultative process. The cabinet approved the NAPA document on September 28, 2010. The adaptation options that are priorities in the document include both urgent and long term adaptation strategies in key vulnerable sectors under the six thematic working groups that were formed to guide the development of the document. The strategies and actions aim to increase communities’ adaptive capacity through livelihoods support, improved governance, collective responses, improved service delivery mechanisms, and access to technology and

²² The topic of climate change is relatively new to Nepal. Research, development and adaptation work is limited in Nepal, but an insurgence of interest over the past decade is evident. A summary of climate change related activities is provided in Annex 3.

²³ *Nepal: National Capacity Self-Assessment Report and Action Plan*. Ministry of Environment, Science and Technology. 2009.

finance. The NAPA has also promoted a watershed and landscape level approach to deal with issues related to food security, biodiversity loss, water scarcity, energy use, settlements, disease outbreak, and governance. The total cost to implement urgent adaptation measures in the NAPA is estimated at USD 350 million.

Nepal's development partners have been working closely with the government and especially the Ministry of Environment by supporting climate adaptation activities, generating knowledge, and building capacity on climate adaptation. These initiatives have brought together a critical mass of experience for early adaptation planning. However, there is still a great need to strengthen capacities to integrate climate change risk management into its development planning process. Development partners demonstrated their commitment by signing a donor compact in September 2009.

The government approved a climate change policy in January 2011, which calls for a climate change centre to undertake research, monitor climate change activities and provide policy support to the government. The main goal of this policy is to improve people's livelihoods through mitigation and adaptation activities. The policy emphasizes a climate resilient and low carbon development path supported through international commitments.

Some of the targets mentioned in the policy include (i) the establishment of a climate change center within one year; (ii) implementation of community-based local adaptation actions as mentioned in National Adaptation Programme of Action (NAPA) by 2011; (iii) promotion of climate adaptation and adoption of effective measures to address adverse impacts of climate change through technology development and transfer, public awareness, capacity building and access to financial resources; (iv) and development of a reliable forecasting system to mitigate the adverse impacts of climate change on vulnerable areas, natural resources, and people's livelihood.

Rationale for PPCR Support

Nepal is one of the poorest and most climate vulnerable countries in the world. To achieve the country's priority goal of reducing poverty, Nepal needs to manage its substantial climate risks and chart a climate resilient growth path.

As a landlocked, mountainous country, Nepal faces unique challenges. Temperatures are rising fastest at the highest altitudes, affecting glaciers, snow and ice, and threatening the generally poor and isolated communities that depend upon them. Retreating glaciers and changes in seasonal snow fall and melt will lead to greater uncertainty about water flows and, in the long run, diminished water availability. Traditional knowledge and systems may not be sufficient for mountain people to cope with climate change and associated extreme climate events.

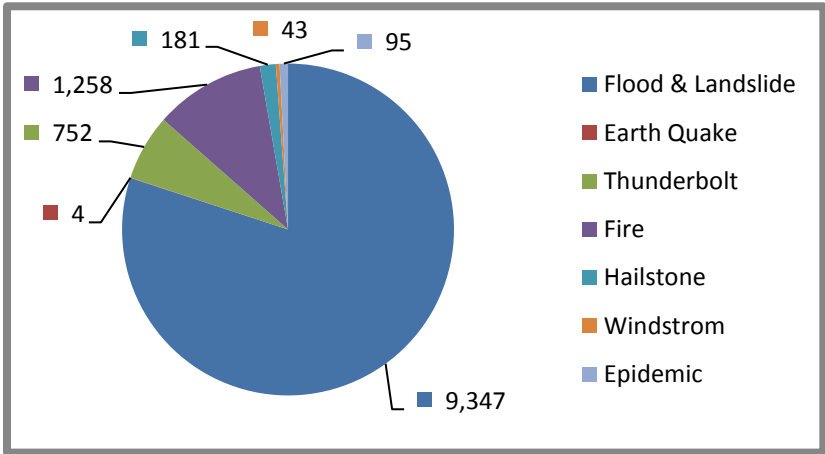
Intense and unreliable rainfall recently are reducing the water recharge, so springs that once provided year-round water supply to nearby settlements have dried or are yielding less water. Women are required to fetch water for the whole family and they face harder and longer working

hours the farther they have to walk and wait for water that may be of poor quality. With less water for sanitation, children, elderly and women are more vulnerable to diseases.

Most climate projections for the region suggest that rainfall is likely to intensify in flood-prone areas, while water-scarce regions become even more drought-prone and unproductive. Current economic costs (losses and damages) of floods and droughts reflect the likely lower bounds of increasing future economic costs of climate variability and climate change. While the Strategic Program for Climate Resilience (SPCR) will not avert these costs entirely, the resilience investments outlined in the SPCR will help Nepal manage and mitigate these development challenges.

Of all the disasters reported, floods and landslides are the most devastating in terms of the number of deaths that occur and the damages they cause. Between 2001 and 2008, floods and landslides killed 1,673 people, affected 221,372 families, killed 33,365 livestock, destroyed 52,007 houses and washed away or destroyed over 22,000 ha of land. The monetary value of damages due to floods for 2001-2008 was about US\$ 130 million (US\$ 16 million annually or 0.1% of GDP), according to government data.

Estimated Losses from Natural Disasters
(2001-2008, in millions of Nepali Rupees)



Source: Ministry Home Affairs Economic Survey 2010

Glacial lake outburst floods (GLOFs) are another major climate-related hazard Nepal faces with significant economic impacts. When these lakes have burst in the past, GLOFs have destroyed entire villages and infrastructure (bridges, roads, and power stations). In the case of the Thulagi glacial lake alone, the potential damages of a GLOF are estimated to be about US\$ 415 million (or 3.5% of GDP).

Agriculture, which accounts for 33% of GDP and 80% of the population, is the most climate vulnerable sector of the economy. The impact of drought is therefore felt both in terms of livelihoods and food security. In 2008/2009, Nepal suffered drought and unseasonable rains that caused a grain deficit on the order of 400,000 mt (some US\$ 65 million.) In Nepal’s poorest

regions, the far west and midwest, wheat and barley production declined by 14.5% and 17.3% respectively due to drought. While there are no comprehensive studies on the impacts of water stress on agricultural productivity in Nepal, a recent study for the Bagmati Basin suggests that acute water stress could cause maize yields to decline by 11% to 29%. The variability of Nepal's rains clearly has significant economic impacts, yet there is little capacity to predict weather or store water in Nepal to lessen the impacts of increasingly erratic rainfall. The unpredictable nature of agriculture together with a decade-long conflict have pushed working-age men in the rural and mountain areas to migrate to the Persian Gulf, Malaysia, South Korea, and India. This trend has added stress to the women, children and the elderly population left behind.

To address its vulnerabilities, the Government of Nepal is adopting an “ecosystem approach to building resilience in vulnerable communities,” which will provide lessons on how best to approach building climate resilience in vulnerable (mountain) regions. This approach recognizes the inter-connectivity of the different mountain regions and their ecosystems. The vision and approach adopted by Nepal in its SPCR focuses on three key elements for building resilient communities:

- a. Enhancing the resilience of natural water systems, which are the resources essential for sustained social and economic development;
- b. Enhancing the resilience of vulnerable communities and their environment;
- c. Strengthening capacity for climate change risk management as a means for the transformational change needed to integrate systematic risk management into development planning.

The PPCR would be instrumental in enabling Nepal to meaningfully shift away from “business as usual” and toward an approach that integrates climate resilience into core development planning. Nepal's wide-ranging vulnerabilities require a systematic approach toward this specific goal of resilience, rather than a series of reactive, uncoordinated, near-term interventions. To make this shift, Nepal needs capacity building, institutional strengthening and coordination among government, private sector and civil society stakeholders, as well as key investments by both the public and private sectors (see the following section). Because of Nepal's financial and technical constraints, Nepal could not undertake the systematic, transformational changes required without the support of the PPCR.

Nepal's SPCR will make a significant contribution to our sustainable development (i.e., improving water security and protecting vulnerable communities against floods), while building the fundamental systems needed to enhance climate resilience in the future (i.e., strengthening hydrological-meteorological monitoring and warning systems and mainstreaming climate risk management in key agencies.)

The PPCR would provide Nepal with valuable global learning about resilience across a range of vulnerable ecosystems, particularly high mountainous areas with isolated and vulnerable communities.

Institutional Analysis and Adaptive Capacity Assessment

The Ministry of Environment (MoE) is Nepal's focal point on issues relating to climate change, coordinating across government agencies as well as among development partners, stakeholders and civil society. MoE is a new ministry, established as an independent ministry only in 2008. Previously the Ministry of Environment was part of the Ministry of Environment, Science and Technology, prior to that it was part of the Ministry of Population and Environment.

Over the past few years, climate change has gained greater attention in Nepal. In recognition of this, the Right Honorable Prime Minister created the Climate Change Council under his own chairmanship on 23 July 2009. The Council, a high-level coordinating body, is mandated 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 programme and projects; and
- Initiate and coordinate measures to achieve additional benefits from climate change-related international negotiations and decisions.

Since its inception, the Council has provided important guidance regarding the institutional arrangement for climate change. It agreed to establish the Climate Change Management Division in the Ministry of Environment, and launched the Mountain Alliance Initiatives (MAI) as a platform to ensure that mountain issues and concerns receive due attention in the international climate negotiations. The Ministry of Environment functions as the Secretariat of the Climate Change Council. The Ministry has established the Council Secretariat Section under the Climate Change Management Division to implement activities related to the Council.

Additionally, the government formed the Multi-Stakeholder Climate Change Initiatives Coordination Committee (MCCICC) in April 2010 under the chairmanship of the Secretary of MoE. The Committee aims to foster a unified and coordinated climate change response in Nepal. The MCCICC comprises a broad group of stakeholders, including line ministries, development partners, civil society, and private sector, which builds on the broad stakeholder approach initiated by the National Adaptation Plan of Action (NAPA) process. It also builds on the Donor Compact on Climate Change, which was signed between the Government of Nepal and 14 development partners on 2 September 2009. As a coordination body at the functional level, the MCCICC reports to the Climate Change Council and contributes to mainstreaming climate change programs into development planning and implementation. The recently established Climate Change Management Division at MoE serves as the Secretariat of the Committee, which meets at least once every quarter. Through the NAPA initiative, the MoE has also supported the establishment of a Climate Change Knowledge Management Centre, which is entrusted to the Nepal Academy of Science and Technology (NAST) is entrusted for this function.

Several other key institutions have a role in managing climate change risks in Nepal. These are summarized in Annex 3. The National Capacity Self Assessment study clearly indicated that the

lack of institutional capacity for climate change risk management and poor coordination amongst the concerned agencies is the main reason why climate change risks management is not formally integrated into development planning at the national, sectoral, district, and village levels. Other capacity issues included: (i) no training, database, information or guidance exists on planning/constructing climate resilient development; and (b) insufficient financial resources to effectively integrate climate change risk management into development planning. Another important capacity gap identified by the National Capacity Self Assessment study was the lack of real-time monitoring infrastructure within the Department of Hydrology and Meteorology (DHM), resulting in limited observation data on the meteorological and hydrological parameters to support early warning systems and the identification of appropriate adaptation measures at the community level. This gap will be addressed through Component 2 of the SPCR.

As part of the SPCR planning and preparation process, an adaptive capacity assessment was undertaken.²⁴ This identified capacity gaps and needs:

- within vulnerable communities and households;
- within vulnerable sectors (e.g. water, health, agriculture);
- within key agencies/organisations (public and civil society including local government/municipalities).

Four climate change risk management indicators were used in the assessment: (i) knowledge, (ii) mechanisms, (iii) resources and (iv) impediments to assess adaptive capacity at national, district and community levels. The assessment used different methodologies: questions at the national level and focus group discussions and household surveys at the district and community level.

At the sectoral, district/community level the following issues were identified:

- Knowledge is inadequate to address climate change risks and therefore the planning of development projects follows a "business as usual" path. There exists moderate knowledge on climate change risk at the senior level in some ministries and departments, but very little exists at junior levels in key government agencies and at the district and local levels. Most public officials are unfamiliar with tools, such as climate proofing, screening etc. Technical training of district and community government officials and financial resources to implement climate change risk management measures is needed.
- Overlapping mandates among different district agencies, inadequate coordination, meager fund flows and weak resource allocation mechanisms are major impediments to effective climate change risks management. Existing policies and legal frameworks do not bar action, but need to be strengthened to address climate change risks. Both government and NGOs and community-based organizations lack adequate training and financial resources to implement climate change risk management and disaster risk reduction measures.

At the national level the following issues were identified: a) almost complete absence of climate change risk management personnel in key organizations and institutions; (b) climate change risk

²⁴ The methodology and analysis for the Adaptive Capacity Assessment may be found at <http://www.ppcnepal.gov.np>

management is not institutionalized in government, academia, civil society or in vulnerable sectors, municipalities, districts or communities; (c) no training, database, information or guidance exists on planning or constructing climate resilient development; (d) there are insufficient financial resources to effectively integrate climate change risk management into development planning; (e) development planning in key sectors (water, agriculture, physical planning) does not consider risks associated with climate change and there are no modalities to facilitate such transformational change in development planning.

Participation Process

Background

The SPCR planning process that led to the development of Nepal's strategic programme followed an extensive and in-depth participatory process, engaging a large number of people from government, civil society and private sector at national, district and local level. The complete participant list can be found through the following url: <http://www.ppcrnepal.gov.np/documents.html>

The framing of the main climate risks, impacts and resilience building options was based on a socially inclusive, and a broad consultative process. This ensures that PPCR-supported actions will build on local experiences and reflect the views and needs of a range of stakeholders, including specifically vulnerable groups and sectors (such as small farmers, women, youth, indigenous peoples and local communities, and other vulnerable groups).

The process to develop Nepal's Strategic Program for Climate Resilience was designed with the following objectives:

- To ensure compliance with PPCR Guidelines;
- To ensure the experience and needs of people directly affected at the local level are reflected in the document;
- To build upon the extensive stakeholder stocktaking and analysis undertaken under the NAPA, the National Capacity Self Assessment (NCSA), and recently developed climate change policy, and other national strategies and programs;
- To address gaps in the preparation of the NAPA, which has been developed in accordance with the "Guidelines for the Preparation of National Adaptation Programmes of Action" (UNFCCC 28/CP.7.); and
- To ensure that the SPCR builds resilience within Nepal, addressing the risks of vulnerable communities and sectors.

In developing Nepal's Strategic Program for Climate Resilience, the following activities were undertaken to address gaps in the NAPA process while ensuring compliance with PPCR Guidelines:

- Assessment of climate change risk to estimate, evaluate, and rank climate change risks affecting individual vulnerable communities and sectors;

- Adaptive capacity assessment, focussing on vulnerable communities and sectors;
- Definition of priority action needs and investments;
- Resilience assessment to ensure that the proposed investments promote and enhance resilience within vulnerable communities and sectors and at the national level;
- Design of implementation modalities to ensure the sound, transparent and timely management of PPCR programs and funds.

An inception workshop was held on 6 July 2010 where this approach was proposed, discussed, and endorsed. Additionally, the Federation of Nepalese Chambers of Commerce and Industry (FNCCI) formed a private sector working group upon the advice of the MoE to explore the possibilities for engaging the International Financing Corporation (IFC) in the SPCR process in Nepal.

After conducting a review of literature and extensive consultations with the NAPA/PPCR thematic working groups, a team of both consultants and representative government officials from the key thematic ministries visited six districts, which were selected based on the sectoral risk assessment undertaken by the thematic working groups and their ecological representation. In the districts and communities, the team undertook risk and capacity assessments. Based on these activities, the consulting team prioritized broad areas of interventions during consultations 5-7 October 2010. The MoE and key thematic ministries then agreed to the prioritized areas of interventions. The consulting team then prepared project/component concept notes to serve as basis for the joint World Bank-Asian Development Bank mission (15-21 November 2010). During the joint mission, a wide range of stakeholders (government representatives, technical experts and the private sector) were consulted on the draft concept notes. Separate consultations were held for each component and additional consultations were held with civil society and development partners. During the subsequent 9-18 February 2011 consultations, these concept notes were further refined as well as the other important sections of the SPCR. This was also done with a wide range of stakeholders (government representatives, technical experts, I/NGOs, the private sector, and development partners).

Below is a summary of the different stakeholders that have either participated or have been consulted in the SPCR preparation process.

Community participation

The SPCR preparation team visited 2-3 communities in each district and had broader consultations comprising of women groups, indigenous communities (such as Tharu and Chepang in Chitwan and Sherpa in Sindhupalchowk districts), vulnerable communities and the poor. Participatory appraisals, using focus group discussion, key informant survey, some household survey, and transect walks, were employed to understand climate change vulnerability and existing adaptive capacity. In total, about 450 people were met, a significant number of them women (about 40%) and indigenous people.

NGO participation

The planning process ensured wide participation of NGOs working in climate change and natural resources management. NGOs were involved in the process of climate change risk assessment at sectoral level and the selection of field assessment sites, as they were part of the thematic working groups. They actively contributed in designing the SPCR planning and field assessment process by participating in the inception workshop and individual meetings at the national level. They also actively participated in district-level stakeholder consultations, helping communities to identify risks and assess adaptive capacity.

Private Sector Participation

The Federation of Nepal Chamber of Commerce and Industry (FNCCI) led the private sector deliberations that were facilitated by IFC. The objective was to ensure that the private sector be fully integrated into the PPCR process and gain access to PPCR funds in order to contribute to addressing the priority risks. Following the request from the Ministry of Environment, the IFC facilitated a 15-member private sector thematic working group under the leadership of the FNCCI. The thematic group listed 13 subsectors based on the priority risks and the potential for the private sector to contribute to addressing those risks. Given the resources expected to be available and the immediate opportunities for private sector to participate in SPCR, the IFC led a scoping exercise to identify the climate change risks, vulnerabilities, adaptive capacity and opportunities of the private sector. It then formulated specific, prioritized interventions for inclusion in Nepal's SPCR. Detailed discussions were held with 34 business people from agribusiness, infrastructure, financial, insurance, tourism, housing and NTFP sectors. Consultations specifically on the private sector SPCR component was conducted in November 2010, with a follow up consultation in February 2011, which prioritized two areas -- agriculture/agribusiness and private sector-led infrastructure.

Participation of Development Partners

The SPCR preparation team was required to submit monthly progress report to the MOE, the National Planning Commission, the Ministry of Finance and key bilateral development partners apart from the Asian Development Bank, the World Bank and IFC. Separate meetings with development partners were held during each SPCR mission. These meetings helped explore synergies with existing and proposed programs on climate change.

Participation of Government Agencies and Departments

As the executing agency, the MoE led the day-to-day decision-making and coordination for the SPCR preparation. The Prime Minister's Office, the National Planning Commission, and the Ministry of Finance provided overall policy coordination among concerned line agencies and higher-level policy guidance.

Two separate committees guided the SPCR process. The SPCR Steering Committee guided the SPCR process and the prioritization. It was comprised of key ministries and representatives from the National Planning Commission, Ministry of Finance, Ministry of Local Development, Municipality Association Nepal and National Association of VDS in Nepal provided regular guidance to the SPCR team. The Ministry of Environment served as the secretariat and the Secretary of the Ministry of Environment served as chair. The Policy Advisory Committee provided guidance on resource allocation and in ensuring that the SPCR addressed national priorities. It was formed under the chairmanship of the Honorable Member of the National Planning Commission. Members of this committee comprised Ministry of Finance, the Prime Minister's Office, key ministries, Federation of Nepalese Chambers of Commerce and Industry, Federation of Community Forest Users Nepal, Municipality Association Nepal and National Association of VDS in Nepal.

Detailed discussions were held with the Component lead agencies i.e., MOFSC, MOAC, DHM, DSCWM and MOE.

Part 2: Proposed Investment Program Components

Overview of Proposed SPCR and its Components

Nepal's challenges in terms of climate change are tremendous and call for a broad set of interventions. The NAPA had identified an extensive list of short term interventions that would be needed to address immediate and urgent needs. Different development partners have already stepped in to support many of these proposed interventions.

The SPCR, on the other hand, focuses on longer term interventions aimed at enhancing climate resilience in Nepal. The SPCR cannot address all of the key risks that have been identified, but aims to address the highest priority risks identified during the preparation process and through consultation with vulnerable communities. These are (i) quantity and quality of water, (ii) food security, and (iii) eco-system health. Five interrelated components are proposed, each addressing a key risk related to climate change.

The problems of too little or unreliable water, and too much water (i.e., floods) are the highest priorities for Nepal. Neither the MDBs nor other development partner programs include investments to directly address these problems, so standalone projects have been proposed (see Components 1 and 2). The threats to food security are also significant. Food security is addressed through the MDBs and other development partners' extensive agricultural assistance programs. Activities included in SPCR Components 4, 3, and 1 will build on these programs to support making agriculture more climate-resilient, and Nepal is already starting the preparation of a climate-resilient agricultural development strategy with MDB assistance. Component 2 will provide social protection for farmers through crop and livestock insurance. Finally, Components 1 and 5 aim to address risks to eco-system health.

Indicative financial allocations have been given to each component, with a total proposed envelope of \$110 million (\$50 million in grant, \$50 million in credit, \$10 million in loans to the private sector²⁵). However, determination of the exact amount of financing needed will be made during detailed preparation of each component.

For each of the components a lead agency has been assigned in accordance with Government policies and the mandates of the respective agencies. All the lead agencies have shown strong interest in participating in the program and actively contributed to the formulation of the SPCR.

The descriptions of the five components are as follows:

1. Building Climate Resilience of Watersheds in Mountain Eco-Regions

This component addresses the problem of too little or unreliable access to freshwater resources for communities in mountain eco-systems for drinking, irrigation, and other uses. It

²⁵ US \$10 million has tentatively been designated to be channeled through the IFC for private sector investment. IFC will be responsible for repayment.

is expected that, through the provision of sufficient water, agricultural productivity will increase, human health will improve, and water may be available for other productive uses.

The component is expected to have the following key outputs or results: (i) participatory watershed management planning to improve access to and reliability of water resources demonstrated and mainstreamed into the Government programs; (ii) watershed management plans implemented in priority watersheds significantly vulnerable to climate change; (iii) productivity of water enhanced through effective and efficient use of water in farm lands/systems, and (iv) lessons for improving access to and reliability of water resources in vulnerable mountain regions generated and incorporated into country programs. The watershed management plans will aim at (i) reducing erosion to minimize downstream sedimentation, (ii) enhancing soil moisture and groundwater recharge, and (iii) enhancing surface water conservation and storage.²⁶

The Department of Soil Conservation and Watershed Management (DSCWM) of the Ministry of Forest and Soil Conservation (MoFSC) will be the Project's Executing Agency. The Ministries of Irrigation, Agriculture, and Local Development are expected to be the Project's main collaborating agencies. Since the Project will follow a decentralized approach, District Development Committees and Village Development Committees are expected to be the main government stakeholders at the district, local and watershed levels. Other important stakeholders will be NGOs and civil society organizations, community forestry groups and water users groups. Participation of the private sector will be sought, especially in promoting water saving technologies. NGOs are expected to play an important role in project implementation, especially in mobilizing and assisting communities in assuming their implementation role. An indicative budget of US \$41 million has been allocated to this component, with \$0.9 million for project preparatory technical assistance.

The concept note is in the following section, including a problem tree analysis and design and monitoring framework. The scope of work and cost estimate for the Project Preparation Grant is in Part 3 of this SPCR Proposal.

2. Building Resilience to Climate-Related Hazards

This component addresses the priority risk of floods and droughts that take human lives and undermine progress on economic growth and poverty alleviation. The component is designed to build resilience in vulnerable communities by establishing multi-hazard early warning systems to diminish the impacts of extreme events, and improving access to financial instruments such as micro-insurance/finance that help communities recover from the adverse impacts of climate induced shocks. These systems also support agricultural livelihoods by providing weather forecasts for farmers to improve productivity, and protecting lives and assets from floods and droughts.

²⁶ Examples of interventions to achieve these outcomes are: rehabilitating degraded watershed lands, regenerating forests, implementing conservation farming, protecting water infrastructure from erosion and floods, constructing or improving small-scale water storage facilities and distribution systems, and applying on-farm water conservation.

Activities will focus on the installation of real-time hydro-meteorological infrastructure, the development of weather/flood forecasting and information systems, the establishment of early warning systems for priority vulnerable communities, and the creation of climate risk insurance/finance programs for vulnerable communities and, in particular, women.

The Ministry of Agriculture and Cooperatives and the Ministry of Environment/Department of Hydrology and Meteorology will be the co-lead agencies for this component. An indicative budget of US \$41 million has been allocated to this component with \$0.5 million for project preparation technical assistance. The concept note is in the following section and the project preparation grant request is in Part 3 of this SPCR proposal.

3. Mainstreaming Climate Change Risk Management in Development

This component will facilitate mainstreaming climate change risk management into development planning by preparing climate risk management manuals, guidelines and standards for key infrastructure sectors, review major sectoral policies and curriculum in light of climate change and implement a comprehensive program of capacity building for climate change risk management at the national, sectoral, district and VDC levels, targeting students, public sector and civil society. This component will also support GON to manage results and lessons learned from the SPCR program.

The Ministry of Environment will be the lead agency. An indicative budget of US \$10 million was agreed. The concept note is in the following section.

4. Building Climate Resilient Communities through Private Sector Participation

This component will improve access to climate resilient technologies and reduce market barriers in specific sectors that prevent the private sector from playing its role in building climate resilient communities. The component includes three investment projects (one limited to a Feasibility Study on Low Cost Climate Resilient Housing) and two scoping and baseline studies.

Investment Project-1: Public and private sector collaboration to enhance food security through promoting climate resilient agriculture. The broad objective of this project is to enhance agricultural productivity contributing to food security through capacity building and better access to finance. Intervention areas include promotion of stress resilient and high yielding seed varieties, promote high value crops in specific regions, water efficient irrigation technologies and practices, early warning system for crop protection, and facilitate access to finance across the agricultural supply chain.

Investment Project-2: Climate proofing vulnerable infrastructure. The broad objective is to strengthen climate change risk management capacity in Nepal's private sector by way of climate proofing vulnerable infrastructure, mainly hydropower stations. Intervention areas include developing guidelines on climate proofing for prioritized private sector infrastructure, training/awareness programs to facilitate the integration of climate change risk

management into private sector infrastructure, and investments to support incremental costs associated with climate proofing existing operations, and the conversion to climate resilient technologies.

Invest Project 3: Feasibility Study on Low Cost Climate Resilient Housing. The objective of this feasibility study would be to assess various construction designs for the climate resilient low cost housing for vulnerable communities and to review the existing supply of finance to meet the housing finance demand of these segments.

An indicative budget of this component is \$2.7 million as a grant and \$10 million as a loan, and US \$0.3 million in project preparation (scoping studies) technical assistance. This component will be administered through the IFC. The concept note is in the following section. and two preparation grant requests are in Part 3.

5. Enhancing Climate Resilience of Endangered Species

This component addresses the risks of climate variability and change on the habitats of endangered wildlife species.

Nepal's unique geographic position and variations in altitude and climate are reflected in its rich biodiversity. Faunal and floral biodiversity is of tremendous importance to its economy. Faunal biodiversity is a key tourism asset and floral biodiversity is critically important for the livelihoods of rural people across Nepal. Nepal's mountain ecosystems are particularly highly sensitive to climate change. Apart from being early indicators of climate change, many climatologists believe that the changes occurring in mountain ecosystems provide an early glimpse of what may come to pass in lowland environments. For this reason it is important to pilot climate resilience measures in these ecosystems as these will undoubtedly assist Governments and international organizations as they develop climate change related strategies. The survival of endangered species is regarded as a key indicator of the health of ecosystems. In order to enhance their survival it is of tremendous importance to safeguard their habitats against climate change threats. This project will therefore assist the Government of Nepal to enhance capacity, knowledge and incentives to improve climate resilience of critically endangered species by safeguarding their natural habitats at landscape level against climate threats. The key outputs, around which different project activities will be structured, are: a) improved information, knowledge and capacity regarding climate change impacts and resilience measures on the natural habitats of endangered species, b) improved natural habitats and ecosystem health, and c) improved well being of natural habitat dependent communities.

The Ministry of Forests and Soil Conservation (MoFSC) will be the lead agency. The total cost of the proposed project is US\$ 5 million, to be financed as grant. The concept note is in the following section.

SPCR Institutional Arrangements, Coordination, Results Management and Knowledge Management

Management of SPCR Components. Management of SPCR project components 1 (Building Climate Resilience of Watersheds in Mountain Eco-Regions), 2 (Building Resilience to Climate Related Hazards), and 5 (Building Climate Resilience of Endangered Species) will be through designated project management units established in lead agencies, with component steering committees chaired by secretaries of the respective component lead ministries. For Component 4 (Building Climate Resilient Communities through Private Sector Participation), implementation will be managed by the International Finance Corporation (IFC). Component 3 (Mainstreaming Climate Risk Management in Development) includes TA activities that involve a range of different stakeholders and Government agencies. The Ministry of Environment will be the lead agency for the component and coordinate TA activities with other concerned agencies through its CDM Section of the Climate Change Management Division. A steering committee chaired by Secretary, MoE will be established for Component 3.

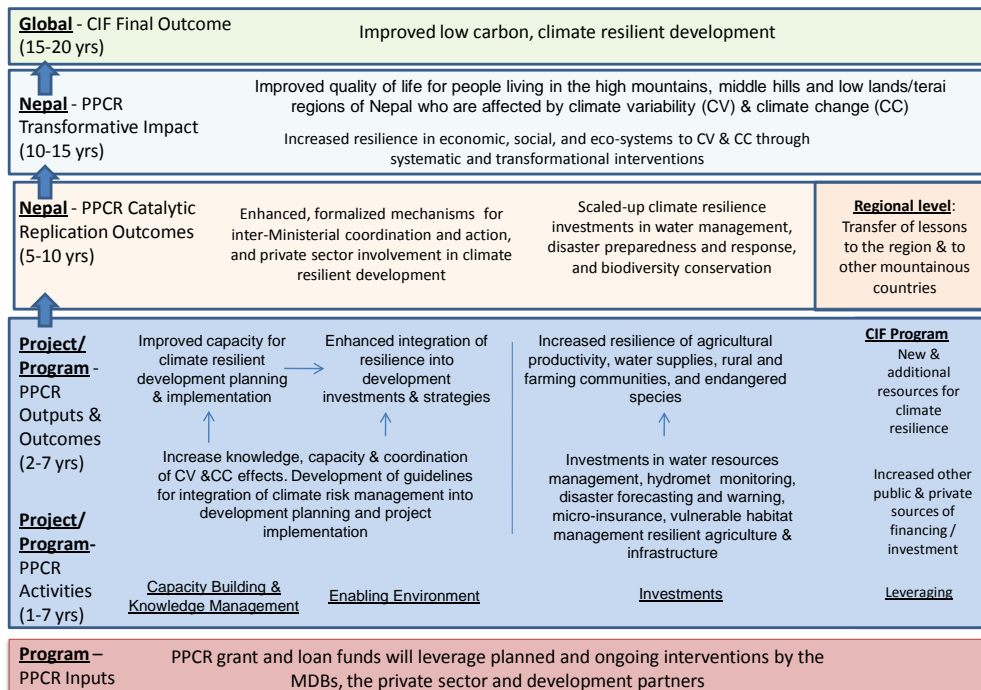
Implementation arrangements for each component will be explored in greater detail during project preparation. In particular, the roles and responsibilities of the Ministry of Agriculture and Cooperatives (MOAC), Ministry of Irrigation (MOI) and Ministry of Forests and Soil Conservation (MOFSC) will be laid out in detail and separate and/or appropriate mechanisms will be established for effective implementation of project activities, taking into consideration the activities and modalities proposed by the concerned ministries.

SPCR Program Coordination Coordination and results management for the SPCR will rest with the Climate Change Management Division in MOE, with the head of the Climate Change Section overseeing a results management system and day-to-day activities. MOE will set up a Climate Change Program Steering Committee to monitor results and provide overall coordination and guidance of all climate change programs, including the SPCR. This steering committee will be chaired by the Honorable Minister for Environment and co-chaired by the Member, National Planning Commission (Environment) and will be supported by a well-staffed Secretariat (see Climate Change Program Secretariat) in the Ministry of Environment. The Secretariat will also provide regular updates to the Climate Change Council (CCC) chaired by Rt. Hon'ble Prime Minister and the Multi-stakeholder Climate Change Initiatives Coordination Committee (MCCICC).

SPCR Results Management and Knowledge Management. One of the goals of CIF is to multiply the effect of CIF-funded investments by supporting national, regional and global replication of approaches to, and outcomes of, CIF-funded activities. The PPCR Global Support Program will facilitate knowledge sharing at the regional and global level. At the national level in Nepal, the Ministry of Environment (MOE) with support from participating multilateral development banks (MDBs) will undertake knowledge management activities and the dissemination of lessons learned through implementation of the SPCR. The Climate Change Section of MOE's Climate Change Management Division will lead knowledge management activities by (i) developing a results-based performance monitoring system for the SPCR (the SPCR results framework is provided below); (ii) tracking the status of each SPCR component; (iii) assessing and summarizing the results of SPCR implementation, and (iv) ensuring that

results and lessons learned are communicated and disseminated throughout Nepal and to the CIF. The Nepal Climate Change Knowledge Management Center (NCKMC) was recently established in partnership with MOE to serve as a platform for exchanges and dissemination of information to various stakeholders and the climate change community of practice in Nepal. The specific role of NCKMC in the SPCR will be further explored during the detailed preparation of SPCR Component 3.

MDB task teams will support knowledge management by systematically documenting lessons learned in all PPCR mission reporting. They will regularly review country processes and program design experiences, share views of what works well and what does not in each project component, and work together to synthesize lessons on project implementation that could be of use for future CIF programming. Coordination among the participating MDBs will be maintained to ensure comprehensive capture and dissemination of lessons learned in the Nepal PPCR.



Component Concept Notes

Component 1: Building Climate Resilience of Watersheds in Mountain Eco-Regions

Rationale

The Project will support the implementation of the Strategic Program for Climate Resilience (SPCR) which has been developed by the Government of Nepal in consultation with ADB, IFC and the WB. Within the overall framework of the SPCR, the Project will enable communities in mountainous ecosystems significantly vulnerable to Climate Change impacts to have improved access to and reliability of watershed and water resources.²⁷

Nepal is one of the poorest and most climate vulnerable countries in the world. Moreover, as a mountainous country belonging to the Himalaya region, also known as the ‘*third pole*’ or the ‘*water tower of Asia*’, Nepal faces unique challenges. Temperatures are rising fastest at the highest altitudes, affecting glaciers, snow and ice, and threatening the generally poor and isolated communities that depend upon them. Retreating glaciers and changes in seasonal snow fall and melt will lead to greater uncertainty about water flows and, in the long run, diminished water availability. Traditional knowledge and systems may not be sufficient for mountain people to cope with climate change and associated extreme climate events.

In a country where the impacts to water resources constitutes the principal climate change risk and the majority of the population derives considerable benefit and livelihood from such resources, SPCR support is a critical entry point to improve the resilience of water resources and associated mountain ecosystems.

Impact, Outcome, and Outputs

The overall impact of the SPCR with its five component projects is to build long-term climate resilience in Nepal through an integrated water resource and ecosystem-based approach focusing on community-based management. To support the achievement of overall SPCR impact, the Project will address the key problem of reduces water availability and reduced reliability of water, the key problem faced by communities in vulnerable mountain ecosystems (see Figure 1 for the problem tree analysis). To address this key problem, the Project’s expected outputs are: (i) participatory watershed management planning to improve access to and reliability of water resources demonstrated and mainstreamed into the Government’s programs; (ii) watershed management plans implemented in priority watersheds significantly vulnerable to climate change; (iii) productivity of water enhanced through effective and efficient use of water in farm lands/systems in combination with improved agriculture practices, and (iv) lessons for improving access to and reliability of water resources in vulnerable mountain regions generated and incorporated into country programs. The watershed management plans will aim at (i) reducing erosion to minimize downstream sedimentation, (ii) enhancing soil moisture and groundwater recharge, and (iii) enhancing surface water conservation and storage.²⁸ The Project’s Design and Monitoring Framework (DMF) summarizes the expect outcome, outputs and selected examples of likely

²⁷ Project scope, cost, financing and implementation arrangements will be firmed up through a PPTA, see Project Preparation Grant Request.

²⁸ Examples of interventions to achieve these outcomes are: rehabilitating degraded watershed lands, regenerating forests, implementing conservation farming, protecting water infrastructure from erosion and floods, constructing or improving small-scale water storage facilities and distribution systems, and applying on-farm water conservation.

interventions, see Table 1. The main project risks identified at this stage is the possibility of insufficient Government funds to expand watershed management programs in CC vulnerable watersheds.

Table 1: Preliminary Design and Monitoring Framework

Design Summary	Performance Targets and Indicators	Data Sources and Reporting Mechanisms	Assumptions and Risks
<p>Impact Long-term climate resilience in Nepal mountain communities improved</p>	<p>Livelihoods improved and CC resilient for communities within CC vulnerable watersheds</p> <p>Reduced outmigration from communities within CC vulnerable watersheds</p>	<p>District-level socio-economic data published by the Government and other institutions</p>	<p>Assumptions</p> <p>Projected CC impacts are estimated with adequate level of accuracy</p> <p>Government continues to give high priority to support communities in mountain ecosystems to build up CC resilience</p>
<p>Outcome Communities in watersheds of river systems that are significantly vulnerable to CC have improved access to and enhanced reliability of water resources</p>	<p>Water resources within watersheds increased and the watersheds' hydrologic services to downstream areas improved (increased dry season flows and reduced sediment load)</p> <p>Productivity of lands and farming systems in the watersheds enhanced</p>	<p>Hydrologic monitoring program to be established under the envisaged investment project</p> <p>Socio-economic monitoring program to be established under the envisaged investment project</p>	<p>Assumptions</p> <p>DSCWM and communities continue to maintain watershed management investments</p> <p>Risks</p> <p>The possibility of insufficient Government resources to expand watershed management programs in CC vulnerable watersheds</p>
<p>Outputs</p> <p>1. Participatory watershed management planning to improve access to and reliability of water resources demonstrated and mainstreamed into the Government's programs</p> <p>2. Watershed management plans implemented in priority watersheds significantly</p>	<p>Adoption by DSCWM and DDCs of the participatory planning approach to be developed through the PPTA and field tested under the envisaged follow-on investment project</p> <p>Reduced rain-fall run-off and soil erosion within the treated watersheds; increased surface water storage and use thereof within the watershed</p>	<p>Hydrologic monitoring program to be established under the envisaged investment project</p>	<p>Assumptions</p> <p>The PPTA and the envisaged follow-on investment project will demonstrate effective and sustainable watershed management practices</p> <p>Effective monitoring program in place to assess the impacts and lessons derived from the envisaged investment project</p> <p>Risks</p> <p>Capacity of the DSCWM</p>

Design Summary	Performance Targets and Indicators	Data Sources and Reporting Mechanisms	Assumptions and Risks
<p>vulnerable to climate change</p> <p>3. Productivity of water enhanced through effective and efficient use of water in farm lands/systems</p> <p>4. Lessons for improving access to and reliability of water resources in vulnerable mountain regions generated and incorporated into country programs</p>	<p>Communities adopt effective and enhanced water use practices in combination with improved agricultural practices</p> <p>Lessons fed into the SPCR global learning support program</p>	<p>Socio-economic monitoring program to be established under the envisaged investment project</p>	<p>may need to be increased to scale-up the watershed management interventions in critical watershed following project completion</p>

Activities with Milestones	Inputs
<p>Following activities related to PPTA and processing of envisaged investment project:</p> <p>1.1. Develop/ revise watershed management plans for critical watersheds taking into account CC impacts and using state-of-the art planning methodologies</p> <p>1.2. Raise awareness and enhance participation of watershed communities and other stakeholders (government and non-government) in watershed management</p> <p>1.3. Clarify the roles of watershed stakeholders and their rights in relation to watershed management, and improve watershed management governance</p> <p>1.4. Strengthen institutional arrangements for involvement of watershed communities and other stakeholders (government and non-government) in watershed management; provide capacity building where needed</p> <p>1.5. Revise/ develop appropriate cost and benefit -sharing arrangements for watershed investments (e.g., payment for ecosystem services) and their maintenance</p> <p>1.6. Strengthen DSCWM and implementing agencies' capacity to implement the project in particular and watershed management initiatives in general</p> <p>2.1. Control erosion to minimize downstream sedimentation (water quality)</p> <p>2.2. Enhance soil moisture and groundwater recharge (e.g. through agro-forestry, small water bodies, water tanks)</p> <p>2.3. Enhanced surface water conservation, storage and utilization of conservation techniques (e.g., on-farm water harvesting, micro-irrigation, promotion of agricultural technologies such as minimum tillage and sloping agricultural land management, and on-farm soil and water management.)</p> <p>2.4. Build socio-ecological resilience in the mountain ecosystem and enhance livelihoods of watershed communities</p>	<p>CIF tentative allocation: \$0.9 million for PPTA and \$41 million for investment project</p> <p>Government: \$25,000 during PPTA</p> <p>Beneficiaries: tbd during PPTA</p> <p>Others: tbd during PPTA</p>

Activities with Milestones	Inputs
3.1. Design, implement and monitor watershed specific productivity enhancement interventions 4.1. Monitor the impacts of project interventions, especially in terms of watershed hydrology and hydrological services 4.2. Document project implementation approaches and experiences 4.3. Share the project experiences, impact assessments and lessons learned within Nepal and globally as part of SPCR global learning support program 4.4. Replicate best practices in other watersheds	

Source: February 2011 SPCR mission

A sector approach is envisaged to provide the required flexibility to address (sub)watershed specific interventions which will be determined through a participatory process involving concerned stakeholders. A detailed assessment will be undertaken during the project preparation phase to prioritize watersheds for possible inclusion under the Project.²⁹

The Project's impact, outcome and outputs will be firmed up through the proposed \$900,000 project preparation Technical Assistance (PPTA) for which a Project Preparation Grant Request is submitted.

Investment and Financing Plans

The Project will finance the interventions needed to achieve the four outcomes described in the above and the technical assistance needed for project management and engineering, and for assisting communities in implementing project-related interventions.

A tentative allocation of \$41 million in SCF funding is proposed. The total cost of the Project will be subject to further discussions between the Government and ADB, the designated partner agency for the Project.

Table 2: Tentative Financing Plan

Source	Amount (\$ million)	Share of Total (%)
Strategic Climate Fund (SCF)	41.0	Tbd
Government	Tbd	Tbd
Beneficiaries	Tbd	Tbd
Total	Tbd	100.00

Source: February 2011 SPCR Mission.

²⁹ The number of watersheds that could be covered under the project/component would partly depend on the amount of financial resources allocated to the project and the cost estimates of various interventions.

Indicative Implementation Arrangements

It is envisaged that the Department of Soil Conservation and Watershed Management (DSCWM) of the Ministry of Forest and Soil Conservation (MoFSC) will be the Project's Executing Agency. The Ministries of Irrigation, Agriculture, and Local Development are expected to be the Project's main collaborating agencies.³⁰ Since the Project will follow a decentralized approach, District Development Committees and Village Development Committees are expected to be the main government stakeholders at district, local and watershed level. Other important stakeholders will be NGOs and civil society organizations, community forestry groups and water users groups. Participation of the private sector will be sought, especially in promoting water saving technologies. NGOs are expected to play an important role in project implementation, especially in mobilizing and assisting communities in assuming their implementation role. The proposed PPTA will develop the detailed implementation arrangements and identify required capacity building/ strengthening measures. This will be undertaken in a participatory process with all concerned government and non-government stakeholders.

Knowledge Management and Dissemination of Lessons Learned

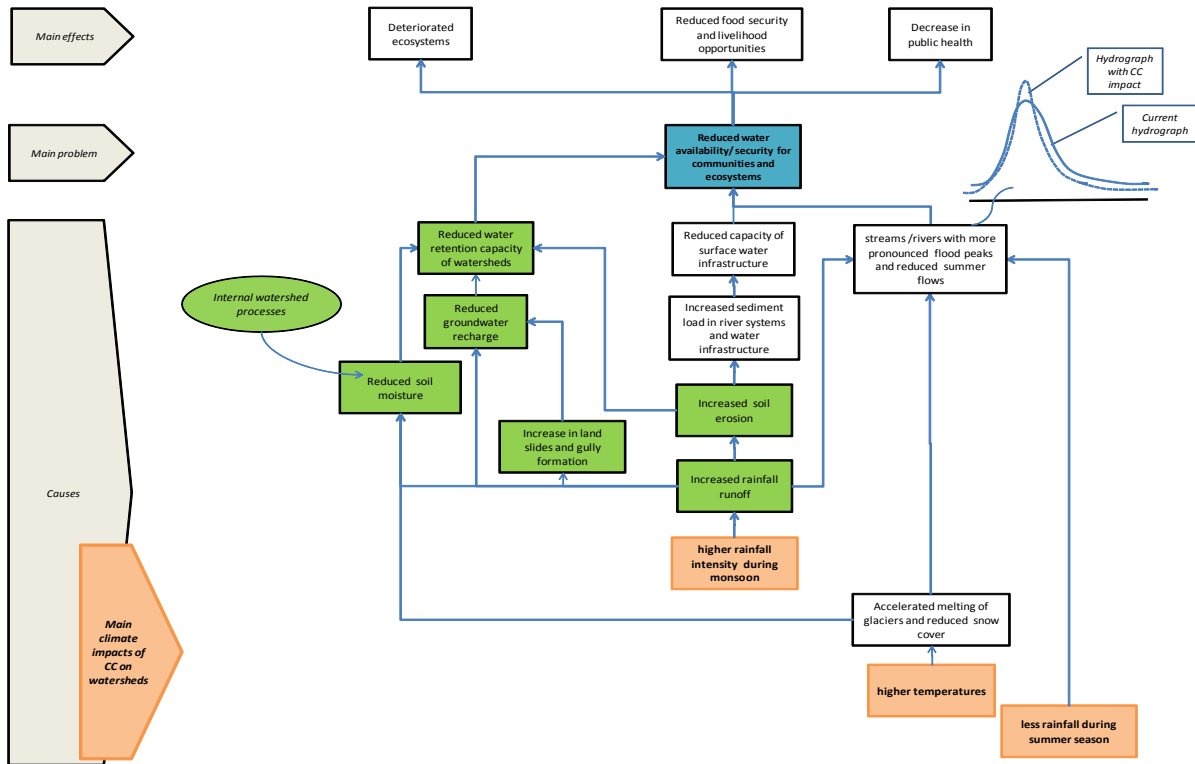
This component will generate lessons on improving access to and reliability of water resources in vulnerable mountain regions through documenting project approaches and experience in project implementation and sharing lessons learned within Nepal and globally as part of the global learning program. Since the project will follow a decentralized approach, District Development Committees and Village Development Committees and other stakeholders such as NGOs and civil society organizations, community forestry groups and water users are expected to take important roles in knowledge sharing and dissemination. DSCWM will also ensure that learning workshops are held periodically during project design and implementation that include the broad range of government and non-government stakeholders concerned with water, food, and forest management. DSCWM will develop a results management framework consistent with the overall SPCR results framework, and will capture and consolidate lessons learned from its review of progress towards building climate resilience of watersheds in mountain eco-regions. These results and lessons will be reported to MOE's Climate Change Management Division on a regular basis for wider dissemination under the SPCR knowledge management program.

Due Diligence

The process of due diligence assessments has been ongoing with the start of the preparation of SPCR, especially in terms of government policies and strategies, existing development plans and programs, and overall institutional arrangements. The Project-specific due diligence will be undertaken during the proposed PPTA.

³⁰ The PPTA will confirm the relevant collaborating agencies.

Figure 1: Problem Tree



Component 2: Building Resilience to Climate Related Hazards

Introduction and Context

Nepal's monsoon climate and mountainous topography leave it highly vulnerable to hydrometeorological disasters such as landslides, floods from rivers and glacial lake outbursts, droughts, windstorms and hail. The frequency and magnitude of these extreme events, as well as Nepal's already pronounced seasonal variability, are expected to worsen under climate change. The Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report indicated that Nepal would suffer increased flooding due to changes in hydrology, leading to an increasing loss of life and decrease in crop yields. In addition, the IPCC also stressed the existence of a "white spot" over Nepal and much of the region, indicating that the available data are inadequate for the development of reliable climate models.

These climate-related disasters not only devastate lives and livelihoods, but also undermine progress on economic growth and poverty alleviation. During the *Risk Assessment* undertaken during SPCR preparation, extreme high precipitation, increase in temperature, extreme low precipitation/drought, and increased climatic variability were identified as climate change event risks faced by all regions in Nepal. The Adaptive Capacity Assessment highlighted, amongst other priorities, the urgent need to establish community-based early warning systems to help vulnerable communities respond to climate-induced disasters, and implement actions required to provide advance warning *before* disasters strike with an early warning flood and drought system and *after* disasters strike by providing innovative financial instruments such as micro-insurance/finance to help cope with climate-related losses.

Warning of an impending flood or drought is critical to help vulnerable communities respond safely and effectively to a climate-induced disaster. While the Department of Hydrology and Meteorology (DHM) currently maintains nation-wide networks of precipitation, hydrometric, sediment, climatic, agro-meteorological, synoptic and aero-synoptic stations, limited real-time flood and drought information exist and currently do not reach vulnerable communities. Considering the extreme topographic characteristics and dense network of streams, the network of meteorological and hydrological stations needs to be improved and strengthened in both network density and data quality. The development of hydro-meteorological monitoring systems in Nepal has occurred in a piecemeal fashion, with arguably limited attention paid to the overall network design, as well as to problems associated with operating the network under conditions of limited staff and computing resources. Once the appropriate systems are in place, the DHM can also work towards effective Public-Private Partnership models that could involve the private sector (e.g., telecommunications) in disseminating the available data to communities in a user-friendly manner as a basis for early warning systems. Subsequently a similar platform may be used for agriculture-based early warning systems.

Following an adverse climate-induced event, a vast majority of farmers in Nepal are exposed to large crop damage and losses. Few have the financial safety nets necessary to absorb these adverse shocks. The agricultural sector employs approximately 80% of Nepal population, contributes approximately 33% of Nepal's GDP and plays a major role in economic growth and poverty alleviation. Similarly, over 3 million households in Nepal own livestock with that sector

contributing towards 13% of the GDP. Given the large number of households engaged in this sector for their basic livelihoods, innovative financial products to assist farmers and livestock owners in addressing shocks and risks associated with climate-induced disasters are urgently needed.

The *Adaptive Capacity Assessment* undertaken during SPCR preparation highlighted the urgent need for micro-insurance/finance aimed at farming and livestock owner communities and women as being amongst the most vulnerable groups exposed to the impacts of a changing climate. Farmers currently lack awareness and access to agricultural insurance and the legal and regulatory framework is not conducive to agricultural insurance. In addition, insurance companies have limited financial, technical and operational capacity to develop the necessary financial products. At the same time, for livestock, after 20 years of livestock-credit guarantee insurance programs, current annual uptake amounts to less than 0.2 % of the national herd. There is need to have a strong policy framework in place along with well designed crop and livestock insurance programs that cater specifically to the challenges faced by communities in Nepal.

Proposed Project Development Objectives

The objective of this component is to build climate resilience in vulnerable communities by strengthening weather /flood forecasting information and warning systems, and improving access to risk financing instruments that preserve livelihoods and reduce the adverse impacts of climate induced shocks.

The component is designed to build resilience against floods, droughts, landslides and glacier lake outburst floods (GLOFs) through enhanced knowledge, better medium to long-term weather and flood forecasting, establishing early warning systems down to the community level, and improving access to financial instruments such as micro-insurance/finance for vulnerable communities and, in particular, women. These systems will also support agricultural livelihoods by providing weather forecasts for farmers to improve productivity, and protecting lives and assets from floods and droughts.

Key outputs

Key outputs of the project will include:

- Nation-wide real-time hydro-meteorological infrastructure
- Weather and flood forecast and information systems
- Pilot community hazard warning systems
- Micro-insurance scheme targeting climate vulnerable communities and women
- Information systems required for insurance schemes, i.e., weather, crop/livestock diseases

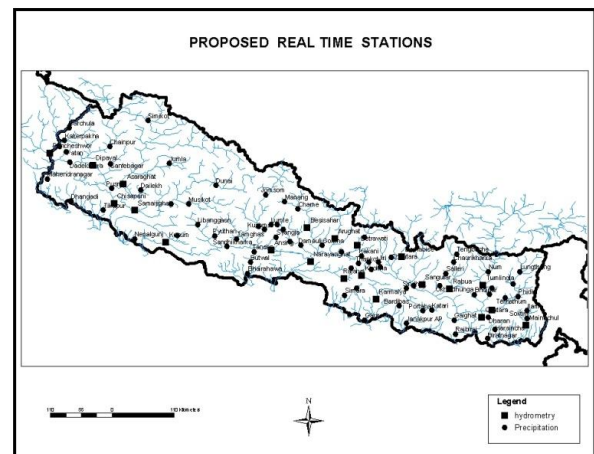
Proposed Project Activities

The project will have two subcomponents, one focusing on weather forecasting and early warning systems, and the second on risk financing tools for vulnerable groups.

Subcomponent 1: Enhance weather forecasting capabilities and establish early warning systems for priority vulnerable communities.

This sub-component will focus on enhancing medium to long-term weather forecasts including capacity building of meteorologists from DHM, installation and upgradation of necessary equipment and development of medium to long-term forecast models. These activities will be essential towards the development of a comprehensive multi-hazard early warning system. In addition the project will support the institutional strengthening necessary for the system's operation, the development of flood and drought warnings, and emergency management capacity for priority vulnerable communities including community-based preparedness programs. Specifically the subcomponent will focus on the following activities:

- Design a nation-wide real-time hydro-meteorological observation network;
- Procure and install real-time hydro-meteorological monitoring equipment (e.g. rain gauges, snow pillows/gauges, water level gauges, discharge measurement equipment, mid-atmosphere weather radars for country-wide 3-day forecasting, automatic weather stations, lightning detectors and wind profilers etc.) and appropriate telemetry and agro-met information systems.
- Strengthen GLOF monitoring and risk reduction, glacier, glacier lake and sediment monitoring, and links to community-based early warning systems;
- Upgrade/install weather and hydrological (drought, flood, climate variability) forecast models to establish effective data sharing protocols;
- Develop and refine weather and hydrological forecast models for short, medium and long-term forecasting capabilities;
- Explore the development of agro-met information systems for farmers, i.e., crop planting dates, agricultural drought indexes, diseases, pests, weather forecast and decision support for irrigation infrastructure operations.
- Through a participatory, community-driven process, design, develop, establish and test community-based early warning systems that build on local knowledge and community structures in priority vulnerable communities including protocol guidelines using real-time data and information systems that are established by DHM;
- Support the early warning system operationalization at the community level through an ICT (information, communication, training) campaign
- Support capacity building to promote effective system use, including



training, software and hardware, communication/networking systems, dataset procurement, improving business processes.

- Prepare O&M (maintenance, service, calibration, and staffing) plan and finance mechanisms for sustainability beyond life of the project/investment.

The establishment of real-time hydro-meteorological infrastructure and weather and flood forecast system will be implemented nation-wide. Exact technology will be selected based on the following criteria:

- (a) Inter-operability with current and planned systems.
- (b) New stations to be established in areas that currently have inadequate coverage but with high local impact to priority vulnerable communities and increasing the range of variables measured, (i.e. glacier, snow, sediment measurements).
- (c) Upgrade existing meteorological stations to facilitate real-time data acquisition, and the development of early warning systems for vulnerable communities using such real-time data.
- (d) Ease of use, replacement, costs and high likelihood of adoption by users.

The establishment of community based early warning systems will be focused initially in targeted areas that are most vulnerable to climate change impacts, with special attention given to areas of importance for women, indigenous communities and youth. It is anticipated that these systems would be rolled out in a phased approach as resources allow. A detailed evaluation and final decision concerning the communities will be conducted during the project preparation phase.

Subcomponent 2: Establish a climate risk insurance / finance program for vulnerable community groups, namely farmers and livestock owners and women.

This subcomponent will focus on strengthening the policy framework for insurance, designing risk insurance tools appropriate for vulnerable client groups and women, raising awareness about risk insurance among communities and exploring public-private partnerships with the aim of developing a sustainable risk insurance culture across Nepal. The operational, legal and financial modalities will be developed in dialogue with national and district level government officials.

Specifically the subcomponent will focus on the following activities:

- Development of climate change risk micro-insurance / finance options and modalities for the farming and livestock sectors³¹
- Policy reform to strengthen the overall risk insurance financing sector, including reinsurance
- Develop a drought monitoring system under the MoAC with assistance from DHM to strengthen the overall delivery of risk insurance products

³¹ This will build upon findings of the World Bank-financed study on Agricultural Insurance Feasibility for Nepal and papers from the Micro-Finance Summit. (See: *Report of Micro-finance Summit Nepal 2010*. 14-16 February 2010).

- Design, develop and launch appropriate micro-insurance programs for vulnerable farming and livestock owner communities, and women
- Establishment of the data and information systems required for the design and rating of insurance policies, i.e., long term time series crop and livestock data.
- Launch an awareness raising campaign addressing the many benefits of having risk insurance and the options available to vulnerable clients
- Strengthen ties with the private sector to eventually develop a public/private sector partnership.

A detailed evaluation and final decision concerning the appropriate risk financing and insurance instruments, and the locations for introducing these instruments and schemes, will be determined during the project preparation phase.

Existing Programs

There are many donor partners active in addressing climate-related disasters in Nepal. The SPCR interventions have been designed to complement the following ongoing or planned activities by development partners:

- The Joint Consortium Disaster Risk Management Flagship program comprising the IFRC, UNDP, UN OCHA, UN ISDR, EU, USAID, ADB and WB which focuses on 5 priority areas, especially the flood management and community based disaster management flagship components;
- Finnish-Nepalese Project for Improved Capability of the Government of Nepal to Respond to the increased Risks Related to Weather-related Natural Disasters and possible follow-on capacity building support for DHM;
- Government of India support for a single radar system (range 200 km);
- The World Bank's Irrigation and Water Resources Management (IWRMP) Project which is installing a Telemetry System for Monitoring Water Availability and Allocation in Karnali, West Rapti and Babai river basins;
- ADB's support for downscaled modeling of global climate change projections in Nepal;
- The World Bank's completed Agricultural Insurance Feasibility Study for Nepal, funded by the Global Facility for Disaster Reduction and Recovery;
- USAID/NASA/DHM support for a satellite monitoring glacial melt project;
- GIZ's support to install 5 automatic rain gauge stations across the western mountain area of Nepal;
- UNDP is preparing a Project Identification Form (PIF) for submission to the LDCF, focusing on community-based flood risk prevention;
- Possible GIZ support to extend their successful micro-insurance programs from India and China (established with support from the German re-insurance industry (MUNICH-RE) to Nepal;
- DANIDA/ADPC partnership working with DHM to pilot improved short-term weather forecasting capacity.

Key Risks

The main areas of risk to this project and the mitigation measures are summarized below:

Project Preparation / Design

Risk: Design of the hydromet system will be complex due to Nepal's challenging climate and topography. Response: A contract to design the hydromet system will be competitively bid to ensure the best available expertise, and undertaken in close partnership and under the supervision of the Department of Hydrology and Meteorology.

Project Implementation

Risk: The scale of the hydromet investment will be large relative to previous projects run by DHM and micro-insurance will be a relatively new area for MOAC. Response: Capacity building and support for the agencies will need to be designed into the project to ensure smooth implementation. Capacity building will also likely be needed at the VDC/DDC levels to ensure full implementation of the project activities.

Project Sustainability

Risk: Sustainability will depend on the technical and institutional capacity of the implementing agencies. Adequate resources to operate and maintain the hydromet system will also be required to ensure sustainability. Response: The technical and institutional capacity building will be designed into the project. A strategy for operations and maintenance will be developed, as well as financing plan for O&M which might explore a combination of government finance and revenue generation such as the eventual sale of data or commercialization of insurance schemes.

Indicative Institutional Arrangements

The lead agencies for this project will be the Ministry of Agriculture and Cooperatives and the Ministry of Environment through the Department of Hydrology and Meteorology. Other stakeholders include: MoF, MoHA, MOI, WECS, National Disaster Response Committee (facilitated by MoHA), District Disaster Risk Management Committees, DPNet, ICIMOD and the private sector (in particular FM radio, telecoms and insurance.)

NGOs may also play an important role in this project. Building on the mission consultations, the Government and MDBs will continue to consult NGOs on the design of this SPCR component. As NGOs have a comparative advantage in working at the grassroots level, an NGO or consortium of NGOs could be engaged (through competitive selection) for implementation, especially to assist communities in developing community based disaster risk management plans, implement community-based early warning systems, implementing micro-insurance / finance programs, and raising awareness.

Investment Costs and Timeframe

The indicative budget for this activity is roughly \$41 million. It is anticipated that this project will be completed within four years of effectiveness.

Knowledge Management and Dissemination of Lessons Learned

Lessons learned in this component will be systematically captured, analyzed and disseminated by the project management unit under MOAC and DHM, with support from MOE. A learning, knowledge sharing and dissemination plan will be developed for the component to ensure that information, results, and early lessons are shared in a timely fashion with national and local stakeholders. Key development partners have established a Joint Consortium Disaster Risk Management Flagship Program (see existing programs) which can serve as a key platform for knowledge sharing with the disaster management community. The knowledge management plan will also ensure that other relevant stakeholders are reached beyond this group. NGOs in particular are expected to play a central role in identifying lessons learned and disseminating information, in addition to drawing on their valuable grassroots experience in designing this SPCR component. MOAC and DHM will also develop a results management framework, consistent with the overall SPCR results framework, to track the results of this component and facilitate reporting to MOE where the lessons learned from all of the PPCR components will be consolidated and reported to CIF. Knowledge products such as learning briefs, reports and presentations on lessons learned from project implementation are expected to be produced by MOE's Climate Change Management Division as part of the SPCR knowledge management program.

Component 3: Mainstreaming Climate Risk Management in Development

1. Project Description:

Building climate change resilience and adapting to the adverse effects of climate change, as defined by the United Nations Framework Convention on Climate Change (UNFCCC), requires short, medium and long term strategies which should be cost effective, take into account important socio-economic implications, and should be implemented on a stage-by-stage basis. Recognizing that building climate resilience and adapting to the adverse impacts of climate change could not be sustained unless the foundations (or enabling environment) was first established, the first meeting of the Conference of the Parties to the UNFCCC (COP-1, Berlin, 1995), decided³² that adaptation be approached in three stages:

³² UNFCCC - Decision 11/CP.1 - *Initial Guidance on Policies, Programme Priorities and Eligibility Criteria to the Operating Entity or Entities of the Financial Mechanism*

- **STAGE 1 – *Planning for adaptation*** - which are essentially “enabling activities” required to initiate the first steps in the adaptation planning and management process, including the establishment of climate change focal point, vulnerability studies of possible impacts of climate change to identify specific vulnerable countries or regions and the identification of policy options for adaptation;
- **STAGE 2 – *Measures to prepare for adaptation***, including further *capacity building*; and
- **STAGE 3 - *Measures to facilitate adequate adaptation***, including insurance.

This phased approach, which systematically builds national capacity through strategic interventions thereby ensuring country-ownership and long-term sustainability, has been successfully initiated in Nepal through the following activities:

- i. *sensitization and building awareness* of climate change impacts and risks at national and local levels and within vulnerable sectors and population groups;
- ii. *building climate monitoring and analytical capacity*, including climate modeling and climate data/records;
- iii. *building adaptation planning capacity* at national and local levels and within vulnerable sectors and vulnerable population groups, initially by facilitating the creation of climate change coordinating mechanism (climate change focal point, climate change committee), stakeholder analysis of existing policies and strategies that may be affected by climate change impacts, and evaluation of functions and risks management capacities of institutions and organizations (at national and local levels), and identifying and prioritising opportunities for addressing identified climate change risks;
- iv. *vulnerability and adaptation assessment* to identify general strengths and weaknesses of baseline conditions and specific needs and concerns, such as potential barriers to adaptation in critical areas or sectors, and opportunities and priorities for adaptation.
- v. *assessment of national, regional and/or subregional vulnerability* to climate change, where appropriate, rely on related data-gathering systems to measure climate change effects in particularly vulnerable regions and strengthen such systems as necessary, and identify a near-term research and development agenda to understand sensitivity to climate change.
- vi. *evaluation and assessment of policy frameworks for implementing adaptation measures* and response strategies in the context of mountain ecosystem management, disaster preparedness, agriculture, fisheries, health, economic development and forestry, with a view of integrating climate change impact information, as appropriate, into national strategic planning processes.
- vii. *develop, in a participatory manner, climate change adaptation strategy* (or National Adaptation Program of Action - NAPA) which was approved by the Government of Nepal on 28 September 2010. The NAPA identifies priority programs for adaptation, methods and tools for adaptation, and prioritizes institutional capacity building requirements at the national, local and municipal levels and within vulnerable sectors.

Having successfully undertaken these Stage 1 measures, Nepal is well position to commence the transition to Stage 2 and Stage 3 measures, and the need for such transformational change has been highlighted during the Adaptive Capacity Assessment undertaken during SPCR preparation which found that climate risks are not effectively integrated in the planning and implementation of

development projects. Particularly at the district and local levels, technical training and financial resources to implement climate change risk management measures are urgently needed.

Technical guidelines and training, clarity over mandates of different agencies, enhanced coordination, adequate fund flows and effective resource allocation mechanisms are needed to integrate climate risk management in development planning and implementation. Existing policies and legal frameworks do not bar action, but should be strengthened to address climate change risks. The recently approved Climate Change Policy (2011) also emphasizes the need to address climate risks and promote climate resilient development. The Government and NGOs/CBOs need training and financial resources to implement climate change risk management and DRR measures.

SPCR will support Stage 2 and Stage 3 measures that focus on the integration of climate change risk management into development planning and implementation of activities to make development initiatives climate-resilient, and establish functional coordination of such activities.

• **Impact**

Nepal has increased resilience in economic, social, and eco-systems to climate variability and climate change through systematic and transformational interventions.

• **Outcome**

Government of Nepal safeguards its development programs, policies, and projects from the effects of climate change.

• **Outputs, Key Activities and Time Frame**

Output 1: Climate change risks are integrated into Nepal's development planning and implementation of development projects

Activity 1.1 Preparation of Climate Risks Management Manuals and Guidelines:

During the period February 2011 to February 2012, the Asian Disaster Preparedness Center (through ADB financing under TA7173) will downscale global and regional models and prepare impact scenarios for a 20- to 25-km grid in Nepal. Based on the downscaling results and international best practices, guidelines and training manuals will be prepared for use by government, private sector and NGOs/CBOs to integrate climate change risk management into major development sectors such as irrigation, roads, water supply and sanitation, disaster preparedness and urban planning sectors. Engineering design criteria, land zoning, building codes, norms and standards will be examined and revised as needed. Any tools developed will be harmonized and a national level tool will be developed, tested and made public.

Activity 1.2 Implementation of Nepal's Climate Change Policy

Nepal's 2011 Climate Change Policy will be widely disseminated through orientation workshops. Necessary strategies, studies, and action plans will be developed and implemented to make development initiatives climate-friendly and resilient. Sector policies and programs, and national development strategies and plans, will be looked at in light of the Climate Change Policy. Such policies, plans, and

strategies may be amended to reflect the new Climate Change Policy principles and/or the new standards and norms agreed to follow the implementation of Activity 1.1. The TA will support the revision, on a demand basis, of a total of eight key sectoral policies (agriculture, irrigation, water supply and sanitation, hydro-power, forestry, health, urban planning, and disaster risk reduction) under the leadership of concerned sectoral agencies. The TA project itself will not initiate any revisions of the sectoral policies, but will only facilitate and provide services for revision, if necessary.

Activity 1.3 Establish climate change risk management screening system for development projects

The TA will support the development of screening tools for development projects in the infrastructure sectors, building upon tools already developed by development partners and others. For each of the key sectors described under Activity 1.1, the TA team will work with the planning and/or environment divisions of each of the concerned ministries and departments to prepare, pilot test, and implement climate risk screening tools to ensure that proposed development projects are “climate proofed.”

Activity 1.4 Develop detailed concept notes for climate change related projects

The TA during its period will assist in identifying priority areas and in developing climate change related projects for the GON prioritized sectors in consultation with the relevant institutions, development partners and stakeholders.

Output 2: Nepal has the staffing, skills and knowledge required to understand and manage climate risks across a range of key infrastructure sectors, stakeholders, and agencies.

Activity 2.1 Training on Climate Change Risk Management

Utilizing the climate change risk management design guidelines and manuals to be developed under Activity 1.1, an intensive training package on climate change risk management will be developed. Its objective will be to train engineers and planners of different sectors to enhance their capacity in the field of climate change risk identification, assessment, analysis, quantification, prioritization, planning (management plan, implementation plan, and rehearsal plan), monitoring and evaluation.

The TA will explore opportunities to integrate existing training curricula of various training centres, in particular the Nepal Administrative Staff College, Ministries of Forests and Soil Conservation, Education, Agriculture and Cooperatives and Local Development, and provide technical and financial support to launch training programmes to the staff of these organizations on climate change in general, and climate change risk management in particular. This will hopefully support for institutionalizing and sustaining human resources development in Nepal.

Activity 2.2 Build adaptation and resilience planning capacity at national and local levels and within vulnerable sectors and vulnerable population groups

ADB TA 7173: Strengthening Capacity for Managing Climate Change and the Environment supports the Ministry of Environment to develop a Community Based Vulnerability and Adaptation Planning (CBVA) tool. The local governments (District Development Committees, Village Development Committees and Municipalities) will be trained on the use of the CBVA tool along with the use of IEC materials, sectoral guidelines and manuals produced by the TA. The local governments will adopt the CBVA tool once it is finalized and accepted as the national tool, taking into consideration

the other tools developed and used along with guidelines/manuals for the preparation of local level adaptation planning.

Activity 2.3 Provide information to, and enhance capacity of concerned stakeholders on climate change

The TA will develop and implement activities to timely and continuously inform national and international issues on climate change to parliamentarians, policy and decision-makers including local governments. The TA will also prepare necessary materials to facilitate the international negotiation process on climate change. Similarly, the TA will assist MoE - the Secretariat of the Climate Change Council, chaired by the Right Honourable Prime Minister, to develop concept papers, case studies, and other necessary documents for submission in meetings of the Climate Change Council and such support will also be provided to the MCCICC and other coordination mechanisms that might be developed on climate change-related matters.

Activity 2.4 Review and update academic curriculum to incorporate climate change and environment issues

The Strengthening Capacity for Managing Climate Change and the Environment TA is reviewing the school curriculum (grades 8-10) for environment, health and population courses. Building on both international experiences and local needs, the graduate curriculum programs of all four universities will be reviewed under this TA and a new curriculum developed (for amendment and adoption by the universities as appropriate), particularly to incorporate climate risk, climate adaptation and resilience aspects in the tertiary level of technical education such as engineering and science streams. The TA will help develop curriculum at the tertiary level and encourage for at least a 3 credit elective courses on climate change.

Activity 2.5 Provide small grant fund for climate change research

The TA will support the generation of interdisciplinary knowledge that derives information from various social, economic and technological changes. The TA will establish a small research fund on climate thematic topics for 45-60 research proposals at the graduate (masters or doctoral) level; provide trainings on appropriate research methodologies and proposal writings for scientific research. A review board will be established to identify research fund allocation themes, criteria for selection of proposals, advise the selection of research proposals and provide guidance to the researchers to employ analytical tools in the use of approach, tools and methodologies. The findings of these researches will inform relevant agencies on local challenges and help direct resources where the impacts will be highest. Once, the Government of Nepal establishes the Climate Change Fund (CCF) as included in the Climate Change Policy (2011), the TA may facilitate administration of the small grants fund for climate related research by the CCF.

Activity 2.6 Document local knowledge and best practice to address climate change impacts

The TA will equally support the initiatives of the community based and national organizations of disadvantaged and indigenous communities and civil society including women and youths to develop their capacity on climate change resilience in general, and climate change risk management in particular. The TA will identify and document appropriate local case studies and best practices for different ecological regions that are suitable for replication and scaling up. The case studies will be packaged, peer reviewed and published to be used by practitioners working on climate change and as IEC materials for trainings. These case studies will be published in English, Nepali and selected local

languages, as appropriate.

Output 3. SPCR program outputs are managed for results and lessons learned are incorporated into Nepal's climate change programming and the PPCR global learning support program.

Activity 3.1 MOE will establish SPCR results management function as part of the Climate Change Section of the Climate Change Management Division, staffed by an Under-Secretary (technical background) and supported by appropriate staff and results management experts/consultants. The Under-Secretary will be fully authorized to carry out the tasks described below. (Note: Government counterpart staff will be in place before SPCR TA effectiveness.)

Activity 3.2 With assistance of results management expert, MOE's Climate Change Section will prepare a detailed SPCR results framework with performance indicators and targets (including baselines), in consultation with lead agencies of other components.

Activity 3.3 Based on agreed upon results framework, MOE's Climate Change Section will prepare and disseminate to all SPCR executing and implementing agencies a computer-based management information and benefit monitoring system for reporting and monitoring project/TA benefits. Ensure each SPCR lead agency updates the system according to agreed-upon timeframes.

Activity 3.4 MOE's Climate Change Section will prepare and implement a communication strategy for Nepal's climate change program, including expected program benefits, performance indicators, and lessons learned. The strategy should identify means and methods for communicating regular with various stakeholder groups.

Activity 3.5 Staff of MOE's Climate Change Section will participate in periodic planning and review meetings/missions of all SPCR components as well as planning and review meetings of other climate change adaptation projects. Climate Change Section staff and consultants will update communications materials based on program progress, results achieved and lessons learned.

Activity 3.6 MOE will report results and lessons learned of Nepal's climate change program (in accordance with its communication strategy) to in-country stakeholders (including PPCR project activities to Climate Change Council, MCCICC, national stakeholders, climate community of practice, and others, as appropriate), the PPCR Global Learning Support Program, and at international fora.

2. **Implementing Agency and Arrangements**

- Proposed executing agency: Ministry of Environment (MOE)
- Institutional/organizational assessment on the executing/implementing agency previously conducted

Yes

No

MOE is the executing agency for TA7173: "Strengthening Capacity for Managing Climate Change and the Environment" (2009-2011). MOE has also administered the "Expanded National Adaptation Programme of Action" (NAPA) TA in collaboration with UNDP and supported by GEF, DFID and DANIDA. An institutional/organizational assessment of MOE will be conducted as part of ADB's due diligence in finalizing this new TA, and decisions made about the specific TA implementation modalities and actions to further build MOE's capacity to implement TA, based on

the findings of that assessment.

- Complementary inputs to be provided by Government and/or other TA providing agencies

This TA has been prepared to complement existing and proposed activities supported by other development partners, in particular: (i) EU/DFID support for the implementation of component 1 of Nepal's NAPA, which will cover development of local adaptation plans of actions (LAPAs) to implement adaptation actions for communities in 10 districts of Mid and Far West Nepal; (ii) UNDP's ongoing program on disaster risk management which includes capacity building and training at national, district and community levels; and (iii) GIZ's technical support for climate risk management.

The Nepal Climate Change Knowledge Management Center (NCCCKMC) has been established in partnership with the Ministry of Environment to serve as a platform for coordinating and facilitating regular generation, management, exchange and dissemination of climate-related knowledge and capacity building services to a multi-stakeholder climate change community of practice in Nepal. The NCCCKMC serves as a dedicated facility for providing climate change knowledge management and learning support to policymakers, researchers, students, and the general public. NCCCKMC is collecting information, reports, dissertation and other information for the use of researchers and general public. The role of NCCCKMC will be further explored during the detailed TA preparation.

GIZ is launching by June 2011 a program with the Ministry of Local Development to develop capacities of districts, municipalities and VDCs. Activities will include: (i) reviewing the present periodic planning processes and integrating climate change and environmental risk screening procedures; (ii) training programs on climate change risk management; (iii) supporting the preparation of regional and local development strategies and plans in the mid-western development corridor, including mainstreaming climate change risk management; and (iv) supporting the Town Development Fund in integrating environmental and climate change risks assessments into project appraisals for municipal infrastructure in sectors including water supply, sewerage and drainage, town extensions and other aspects of urban planning. The program will cover 6 districts (including their municipalities) and 6 other municipalities. As this proposed TA includes mainstreaming climate risk management into urban planning and development, it is important to work in synergy with GIZ's program. This will be investigated further during detailed TA preparation.

- Implementation Arrangements: Implementation of this TA will serve to capacitate all three sections (Climate Change Section, CDM Section, and Climate Change Council Secretariat Section) of the newly formed Climate Change Management Division in MOE. The MoE will designate the National Project Director, at Joint-Secretary level for overall implementation of the Component 3 along with a separate well staffed Programme Support Unit. In view of the nature of activities proposed, the technical roles will be played by the Climate Change Section, and CDM Section. The activities related to Climate Change Council and MCCICC will be performed through the CCC Secretariat Section. The specifics are outlined below.

Management of TA Outputs 1 and 2: MOE will designate a full-time TA manager at an undersecretary level with science/technical background before TA effectiveness. MOE plans to

depute the head of the CDM Section of the Climate Change Management Division (currently a vacant position) for this purpose. The TA manager/CDM Section Head will be supported by an international consultant team leader and national deputy team leader with project management and climate risk management expertise. MOE will depute a full-time accountant and procurement specialist (to manage small contracts, such as with training service providers) for TA functions, who will be trained initially by consultant financial and procurement management specialists (national).

The Climate Change Policy (2011) has made provision to establish a semi-autonomous Climate Change Center [of technical nature] which will focus on formulating and implementing programs and conduct research and studies on climate change matters. When the Climate Change Center is staffed and operational, certain climate change risk management functions will be devolved to it. The TA may also support the strengthening of the Centre as per its need.

Management of TA Output 3 (Results Management and Coordination): Management of SPCR investment components 1 (Building Climate Resilience of Watersheds in Mountain Eco-Regions) and 2 (Building Resilience to Respond to Climate-Induced Disasters) will be through designated project management units, with component coordination committees chaired by secretaries of the respective component lead agencies. For Component 4, implementation will be managed by the International Finance Corporation (IFC). This TA covers both the management of the entire SPCR program as well as the management of the specific TA activities. MOE will set up a climate change program steering committee to monitor results and provide overall coordination and guidance of all climate change programs, including the SPCR. This steering committee will be chaired by the Honorable Minister for Environment and co-chaired by the Member, National Planning Commission (Environment) and will be supported by a well-staffed Secretariat (see Climate Change Program Secretariat) in the Ministry of Environment. The Secretariat will also provide regular updates to the Climate Change Council (CCC) chaired by Rt. Hon'ble Prime Minister and the Multi-stakeholder Climate Change Initiatives Coordination Committee (MCCICC). Daily coordination and results management responsibilities will rest with the Climate Change Section of MOE's Climate Change Management Division. Before TA effectiveness, MOE will have staffed the Climate Change Section with an undersecretary from science/technical background. The Head of the Climate Change Section will be designated to coordinate climate change programs (including SPCR) full-time and will be supported by one international results management advisor (consultant) and one international (intermittent basis) and one national communications specialists, among others. The MoE will form a small team for effective delivery of this activity.

Consultant Support and Recruitment Modality: The TA requires a considerable amount of consultant support to supplement and work alongside Government staff. The specific consultant requirements will be further discussed between MOE and ADB during detailed TA preparation. All consultants required for the TA will be engaged by ADB in accordance with the Guidelines on the Use of Consultants (2007, as amended from time to time). It is anticipated that consulting services will be engaged as one international/national package through the quality- and cost-based selection method.

- 3. Nature/extent of government/beneficiary involvement in identifying or conceptualizing the assistance:**

The scope of this TA was developed through a series of discussions with MOE, other Government agencies, and other stakeholders during SPCR preparation in 2009 and 2010. The initial concept paper was prepared during the 2nd joint mission in November 2010. During the February 2011 joint mission, a 2-day workshop was held to identify the specific TA activities. The participants comprised representatives of various ministries, key departments, NGOs, academic institutes and Development Partners. The consultation process for the TA was led by the Ministry of Environment. Achievements, gaps and upcoming activities on National Adaptation Programme of Action (NAPA), TA 7173: Strengthening Capacity for the Support to the National Planning Commission in Preparing a Climate Resilient Three Year Periodic Plan and the findings of SPCR assessment were presented to the participants. The participants then worked as groups to propose indicators, activities and human/financial resources required for the proposed TA. One-to-one consultations with key infrastructure departments were also held.

4. **Timetable for processing and implementation:** Within one month following indicative approval for this proposed TA by the PPCR sub-committee, ADB will submit to its Management a request for concept clearance. Following ADB approval of the concept, ADB will field a TA fact-finding mission to (i) conduct the EA institutional/capacity assessment and (ii) finalize the expected TA outputs, activities, and specific implementation arrangements, including detailed consulting terms of reference. This mission will produce the detailed TA proposal for approval by ADB's Board of Directors.

5. **Cost Estimate**

The total cost of the TA is estimated at 10US\$ million . The cost estimate will be prepared during detailed TA preparation.

6. **Monitoring and Evaluation**

The TA will be monitored and evaluated consistent with the monitoring of the SPCR program. See Output 4 above for details.

Component 4: Building Climate Resilient Communities through Private Sector Participation

Investment Project-1: Public and private sector collaboration to enhance food security through promoting climate resilient agriculture.

Background

The agriculture sector in Nepal is the most vulnerable to climate-related risks that will significantly affect the livelihoods of the population in general and the poorer segments in particular. The sector engages approximately 74% of Nepal population contributing approximately 34% of GDP and plays a major role in economic growth and poverty alleviation. However Farmers' limited access to good quality inputs such as seed, dependence on rain-fed agriculture with only 31% irrigation coverage, poor farming practices, limited ability to cope up with disasters, very limited access to finance and also poor access to output markets result in lowering agricultural productivity creating serious food security risks for the population. Communities consulted during the SPCR planning process have also highlighted a decline in fodder and forage production and an increase in the pest attacks. Availability of seed varieties tolerant to different stress conditions such as heat, submergence, drought is a critical need of the hour. Currently only 5-10% of Nepalese farmers have access to good quality seed and the projection is that better access to quality seed itself would result in a 20 - 30% increase in yield. However, lack of affordability, supply as well as awareness make farmers use low quality input which leads to lower yields, and lower yields result in a further reduction in affordability thereby creating a vicious poverty trap for the farmers. Climate change will only further exacerbate the existing situation. Along with the stress tolerant and High Yield Variety (HYV) seeds, water-efficient irrigation options, innovative financial products and risk insurance to assist farmers in addressing shocks and risks associated with climate-induced disasters are urgently needed.

Development objective

The broad objective of this project is to enhance agricultural productivity contributing to food security through provision of better inputs, capacity building and better access to finance.

Specific objectives

- i. To support private seed companies in collaboration with National Agricultural Research Council (NARC) and other relevant organizations to build contract farming system for multiplication of stress resilient seed varieties; establish their supply chain; and promote high yielding varieties and high value crops amongst the farming communities;
- ii. To build farmers' capacity, in collaboration with local agro vets and seed companies, on improved farming practices and appropriate cropping patterns, to allow farmers produce round the year and increase their income;
- iii. To promote water efficient irrigation technologies and practices. Support in particular, smallholders' access to low cost irrigation options;
- iv. To develop an early warning system for farmers in collaboration with the relevant government agencies, telecommunication service providers and the private sector lead firms, farmers' cooperatives, etc. for protecting crops in times of extreme events;

- v. Facilitate access to finance across the agricultural supply chain including farmers to meet the investment requirements for developing adaptive capacity;

Key indicators and baseline

Base line data will be collected during the scoping study.

Anticipated components and activities

The key components of the project will be the following interventions:

- i. Public and private sector collaboration to strengthen the multiplication and distribution of stress resilient and high yielding seed varieties; Support community seed bank and seed storage schemes.
- ii. Farmers' capacity building on improved farming practices, appropriate cropping patterns;
- iii. Promotion of water-efficient irrigation technologies and practices;
- iv. Development of an early warning system for farmers;
- v. Facilitate access to finance across the agricultural supply chain including farmers.

Major activities will include identification of partners, fund requirement, project time frame, developing monitoring and results measurement framework, fund disbursement mechanism, etc. These and intervention-specific activities will be developed during the project design phase.

Scoping study and baseline data collection

A scoping study and baseline data collection will be undertaken during project design.

Implementation of project

Implementation will start as soon as the project design is complete and funds are released. Implementation arrangements with relevant organizations will be agreed upon during the project design phase.

Institutional arrangements

- The grant component shall be used to develop and implement projects in collaboration with relevant government agencies and the relevant private sector entities.
- It is expected that a genuine public-private collaboration model will emerge out of the project through mobilization of public and private sector resources and entities including organizations in national agricultural research system, companies, technology providers, financial institutions/intermediaries and other relevant service providers.

Risks

- Stress tolerant seeds specific to different stress conditions of Nepal may not be available;
- The very nascent private seed sector may not see the adequate business potential to get engaged in adaptive initiatives;
- Affordability of farmers and lack of access to finance may hinder adoption of adaptive seed and technologies;
- Lack of coordination of relevant agencies may hamper quality and timely implementation of projects.

Investment costing (from PPCR resources):

Cost categories:

Estimated Cost

Cost categories:

Estimated Cost

- *Grant*

Surveys and Commissioned Analytical Studies

\$ 0.15 million

Implementation

\$ 2.3 million

- *Concessional credit*

\$ 4.0 million

Results and Performance Framework

The table below provides only an indicative results and performance framework. A detail results and performance framework will be developed during the project design based on the scoping study and baseline data.

Component	Output	Outcome	Impact
Stress tolerant seed for climate resilient agriculture.	Number of stress tolerant and high yielding seed and adaptive technologies introduced to farmers. Number of farmers introduced to stress tolerant and high yielding seed and adaptive technologies.	Number of farmers adopting stress tolerant and high yielding seed varieties and other adaptive technologies.	Number of farmers having sustained yield from agricultural activities. Sales revenue of farmers (US\$).
Water-efficient irrigation technologies.	Number of water efficient irrigation technologies introduced to farmers. Number of farmers introduced to water efficient irrigation technologies.	Number of farmers adopting water-efficient irrigation technologies.	Increased productivity through improved access to water-efficient irrigation technologies. Hectares of land managed sustainably.
Development of an early warning system for farmers.	An early warning system for farmers developed. Number of farmers accessing early warning system.	Number of farmers reacting or acting according to early warning system.	Volume of crop protected from natural calamities. Value of crop protected from natural calamities (US\$).
Access to finance to enable farmers and supply chain members invest in adaptive agriculture.	Number of financial products developed.	Number of financial products launched. Number of farmers and supply chain members accessing finance.	Value of financing facilitated for farmers and supply chain members.

Investment Project-2: Climate proofing selected vulnerable infrastructure such as private hydropower stations

Background

If Nepal more effectively harnessed its 83,000 megawatts of hydropower potential, the country could meet its domestic demand for electricity, as well as export electricity and potentially transform the economy. Lack of electricity is a major constraint to economic development and poverty alleviation. Currently, Nepal is harnessing less than 1 percent of its potential hydropower energy and the country depends on biofuels, mainly wood, to meet its energy needs. This has serious consequences for Nepal's environment as the consumption of wood for fuel accelerates deforestation and soil erosion. This is compounded by growing hydrocarbon imports. Of Nepal's huge hydro-power potential, 42,000 MW is considered to be economically feasible under present conditions. The current hydro-power installed capacity is about 700 MW with less than half the population having access to electricity. Even in the case of the most optimistic "high growth scenario", Nepal's domestic demand will reach a level of 6,000 – 7,000 MW in the next 20 years. Hydro-power is the major source of electricity (86% of the present capacity), the rest comes from thermal generation. (source: IPPAN).

In-depth analysis of water resources in Nepal reveals two critical impacts of climate change on hydropower – Glacial Lake Outburst Floods (GLOFs) and variability of river runoff – both of which pose significant impacts not only on hydropower, but also on rural livelihoods and agriculture. A preliminary discussion on prioritization of adaptation responses highlighted potential for both synergies and conflict with development priorities. Micro-hydro, for example, serves multiple rural development objectives, and could also help diversify GLOF hazards. On the other hand, storage hydro might conflict with development and environmental objectives, but might be a potential adaptation response to increased variability in stream-flow and reduced dry season flows which are anticipated under climate change. Further, while addressing one impact of climate change (low flow), dams could potentially exacerbate vulnerability to another potential impact (GLOFs), as the breach of a dam following a GLOF might result in a second flooding event. Finally, the in-depth analysis also highlights a trans-boundary or regional dimension to certain impacts, highlighting the need for regional coordinated strategies to cope with such impacts of climate change.

Changes in hydrological cycles and the depletion of water resources are some of the top environmental challenges facing Nepal in the context of global warming. It is estimated that a temperature rise of 4°C can result in the loss of 70% of snow and glacier area due to melting of snow and ice. This melt water will contribute to the faster development of glacial lakes, and this will lead to increased potential for GLOFs.

The project would aim to sustain the hydropower generation by reducing risks from glacial melt and reduced flows in the high mountain territories of Nepal. The objective is to ensure that the hydropower industry is resilient to the likelihood of these changes, and the associated impacts on communities, in the form of floods or irregular supplies of power.

Development objective

The objective is to sustain the hydropower generation and strengthen climate change risk management capacity in Nepal's private infrastructure by way of climate proofing selected infrastructures.

Specific objectives

- i. Improve the long term profitability of the hydropower stations through the promotion of water retention structures;
- ii. Strengthen and improve the availability of GLOF early warning systems and investigate the potential for both increased upstream availability, which could increase the current warning time from 5 to 20 minutes, and downstream, protecting farmers and residential areas;
- iii. Support construction of dykes to channel water away from vulnerable communities and utilize it for irrigation or drinking water purposes;
- iv. Increase the life of existing hydropower installations by protecting them from landslide and environmental damage.

Key indicators and baseline

Base line data will be collected during the scoping study.

Anticipated components and activities

The key components of the project will be the following six interventions:

- i. *Private sector awareness and capacity building:* Guidelines will be developed on climate proofing for private hydropower stations that are currently at risk and deliver training/awareness programs to facilitate integration of climate change risk management into Nepal's private sector hydropower and financial sectors.
- ii. *Concessional financing:* At a time when the private sector is facing difficulties in raising equity as a result of the liquidity crunch, coupled with high interest rates, the interest of the private sector hydropower companies to invest in climate adaptive infrastructure may not be a high priority. However with the infusion of PPCR loans, to help leverage private sector investment, the private sector may be interested in investing in climate proofing their vulnerable infrastructure. PPCR loans will be provided to the private sector to support the incremental costs associated with climate proofing existing operations, and the conversion to climate resilient technologies.
- iii. *Building in Daily Pondage:* There has been a significant change in the rainfall pattern of the region and investments will be made to build pondage to take care of the fluctuations in the river flow. Hydropower generating units have a large role to play in building pondage structures downstream of the main catchment to avoid flood situations, which can benefit the communities by reducing their exposure to risks, damage to life and property;
- iv. *Installation of Early Warning System:* The mountainous region in Nepal is quite susceptible to disastrous hazards due to glacial lake outburst floods (GLOFs). As hydropower generation is moving gradually into the High Himalaya, GLOF hazard has

become a prominent concern. To reduce such climate change-induced risks, investments are expected to be made on installation of Early Warning Systems in hydro power stations.

- v. *Landslide protection*: Existing infrastructure is at risk from damage through increasing occurrence of landslides. Large hydro sites have the balance sheet and investment to manage these risks but smaller installations will often be off-line for extended periods of time, sometimes permanently, as a result of the damage sustained. Investments will be made in new protection schemes.
- vi. *Upgrading technology*: Deforestation has triggered landslides in Nepal causing a lot of silt overflow and damages to the underwater turbine parts. Some of the hydro power plant companies are experiencing large sediment load during the rainy season resulting in early replacement of runners. Investments are expected to be made on installation of erosion resistant inners and plazma coated inners which could withstand huge silt pressure.

Scoping study and baseline data collection

A scoping study and baseline data collection will be undertaken during project design.

Implementation of project

Implementation will start as soon as the project design is complete and funds are released. Implementation arrangements with relevant organizations will be agreed upon during the project design phase

Institutional arrangements

- The grant component shall be used to develop and implement projects in collaboration with relevant government agencies and private sector entities.
- IFC will work in infrastructure, notably the burgeoning private hydropower sector.
- National level banks could potentially act as the fund manager and disseminate credits to the applicants. In turn, IFC would strengthen the capacity of the local financial institutions in aspects related to fund management.

Risks

- The cost of water retention structure and climate proofing water supplies may prohibit wide-scale construction;
- Communities unable to get mobilized to implement disaster risk reduction procedures;
- Glacial melt and heavy intensity rainfall may result in increase in the run-off and create conditions of floods and over-spill;
- Glacial melt and water scarcity conditions affecting hydropower production.

Investment costing (from PPCR resources)

Cost categories:	Estimated Cost
▪ <i>Grant</i>	
Surveys and Commissioned Analytical Studies	\$ 0.15 million
Implementation	\$ 0.3 million
▪ <i>Concessional credit</i>	\$ 6.0 million

Results and Performance Framework

The table below provides only an indicative results and performance framework. A detail results and performance framework will be developed during the project design based on the scoping study and baseline data.

Component	Output	Outcome	Impact
Daily pondage	Number of new pondage schemes created	Number of hydro plants adopting pondage schemes	kW/MW protected
Early Warning System	Number of new early warning systems installed	Number of minutes gained for GLOF evasion	
Landslide protection	New protection schemes designed and built	Number of hydropower plants protected	
Upgrading technology	New resilient technology designed and built	Number of Early Warning Systems installed	

Investment Project 3: Feasibility Study for Low Cost Climate Resilient Housing

Nepal is classified as one of the ‘hot-spots’ for geophysical and climatic hazards. It ranks 23rd in position in terms of loss lives and physical infrastructure due to the natural hazards. Each year disaster results in a huge loss of lives and properties. The data reveals that more than 80% of loss of properties is due to the climate related disasters.

About 41 percent of the population in Nepal still lives in improper housing. These dilapidated houses are at risk as thousands of people lose them to landslides, floods and other natural disasters each year. During private sector consultations the need for low cost climate resilient housing featured prominently. However the market is still underdeveloped with significant constraints on sustainable supply of raw materials, with no substantial private sector investment. Considering the fact that the private sector sees a potential in this sector a feasibility study is being proposed to assess the market for low cost housing with particular reference to climate resilient low cost housing.

Objective

The objective of this feasibility study would be to (i) assess the demand and supply of climate resilient low cost housing finance (ii) review various construction designs for the climate resilient low cost housing for vulnerable communities and (iii) review the existing supply of finance to meet the housing finance demand of low income households.

Scope of work of the Feasibility Study

The scope of work will be as follows:

I. Market Survey to assess demand-supply gaps in low income housing in Nepal:

- i. assess the demand for housing *finance* for the low and low-middle income households in Nepal, further stratified by income levels and geographies (e.g. districts/regions within Nepal);
- ii. Review the existing supply of this finance to meet the housing finance demand of these segments, including sources, barriers to access and value of financing available, for both the organized and unorganized sectors;
- iii. assess the demand for climate resilient low cost housing *units* and the existing supply of units in this price range;
- iv. Review developers’ plans to build climate resilient low cost housing units over the next 1-5 years, and perceived barriers to growth.
- v. Evaluate climate resilient technologies appropriate for low cost housing for vulnerable communities.

II. Based on the surveys mentioned above, analyze the gap between demand for climate resilient low cost housing finance and existing supply in the market, and similarly the demand-supply gap for climate resilient low cost housing finance units; Identify 2-3 potential companies in specific focus areas (geographic focus, income focus) where maximum demand-supply gap exists.

Deliverables

The following are the key deliverables of this study:

- Baseline report
- Business plan
- 2-3 potential companies
- Financing modality

Investment costing (from PPCR resources)

<u>Cost categories:</u>	<u>Estimated Cost</u>
Grant	
Feasibility Study for Low Cost Climate Resilient Housing:	\$100,000

Rationale for and Structure of the Loan Component

Local financial institutions have little understanding of the opportunities and risks with regard to investments in climate change adaptation initiatives. Further, investments in climate change adaptation will require longer term loans which the Nepalese banks do not offer.

Consultations with private sector during the SPCR preparatory missions confirmed their interest and the capacity to absorb loan for making such investment. The potential clientele for SPCR loan have been identified as (i) farmers and agri supply chain members investing in adaptive agriculture, and (ii) financing intermediaries which provide funding to farmers and agri supply chain members, iii. Hydropower/infrastructure projects. IFC may partner with local financial institutions – commercial banks (category ‘A’ under Nepal Rastra Bank classification) and microfinance development banks (category ‘D’) – to channel the funds as credits to farmers and supply chain members. IFC may also consider providing a risk sharing facility to the financial institutions. A scoping study shall help identify what specific investment products are most

required. The final structure will depend on the findings from the market assessment. The local financial institutions will require capacity building in terms of market identification, eligibility criteria, risk management and product promotion which shall be funded by grant component of this project.

Knowledge Management and dissemination of results

This component will generate lessons on climate resilient agribusiness practices and guidelines on climate proofing infrastructure. Case studies, reports and similar learning tools will be used to capture learning and disseminate to a wider audience. IFC's South Asia communications team and the World Bank Group's public information centre will be engaged to assist in knowledge management and dissemination of results. IFC is engaged in multi-country PPCR initiatives, including Nepal, within South Asia. IFC has already established a more integrated approach to supporting and managing the two PPCR projects in South Asia, in order to learn from each other. IFC will also work with other development partners to ensure capturing of results and their dissemination.

Business associations such as Federation of Nepalese Chamber of Commerce and Industries (FNCCI), Women Entrepreneurs Association, Confederation of Nepalese Industries (CNI), and other Commodity Associations will be leveraged as vehicles for broader market awareness and market development through learning workshops. IFC will track the results of this component and report to MOE where the lessons learned from all of the PPCR components will be consolidated and reported to CIF. Knowledge products such as learning briefs, reports and presentations on lessons learned from project implementation are expected to be produced by MOE's Climate Change Management Division as part of the SPCR knowledge management program.

Component 5: Enhancing Climate Resilience of Endangered Species

Introduction and Context

There is growing evidence that climate change is one of the most serious threats to global biodiversity, environmental services and livelihoods of natural resource dependent communities. According to the Millennium Ecosystem Assessment, climate change is likely to become one of the most significant drivers of biodiversity loss and ecosystems change by the end of the century³³.

Natural habitats and functioning ecosystems are vital for assuring sustainable development. They provide services that enrich and sustain human life with both tangible and intangible economic and social value as well as life-sustaining environmental services, such as breathable air and usable water. Recent economic analysis by the World Bank demonstrates that increases in natural capital are vital for fueling sustainable increases in national wealth.³⁴

Nepal's unique geographic position and variations in altitude and climate are reflected in its rich biodiversity. The dense tropical forests of the Terai, the deciduous and coniferous forests of the subtropical and temperate, and the sub-alpine and alpine pastures and snow-covered Himalayan peaks are all habitat to a wide variety of flora and fauna. Several internationally important flagship species of which several are critically endangered, including the snow leopard Asian One-horned Rhinoceros, Red Panda, and Crocodile are found in Nepal. Important flora is birch, rhododendron, Juniper, and Walnut. Additionally Nepal is home to important medicinal plants such as Jatamansi, Kutki, Paanch-aunle.

Faunal biodiversity is a key tourism asset which is important to Nepal's sustained economic growth. Nepal's rich ecosystems and its species are attracting hundreds of thousands of tourists each year, providing direct employment to millions of people, while millions of others are indirectly involved in this sector. Floral biodiversity is also critically important for the livelihoods of rural people across Nepal. For example, high value medicinal and aromatic plants are an important source of household income for people in the Himalayas/high Mountains. They are in fact important instruments for addressing poverty issues for the marginalized, forest dependent communities as they contribute to livelihoods, including food security, income and health.

The impact of climate change on the health of ecosystems is, as discussed in part 1 of the SPCR, a key risk to Nepal. Climate change threatens ecosystems, biodiversity and people's livelihoods in a number of ways. With the increase in temperatures, vegetation is expected to shift upward, water cycles will change, encroachment of invasive species is expected to increase, and prevalence of disease and pests is expected to increase. The prolonged winter dry spells has increased the incidence of forest fires have destroyed large forest areas and forest biomass, and hastening the emission of carbon dioxide into the atmosphere. Many observations suggest that recent climate change has already influenced animal and plant populations in a number of ways.

³³ <http://www.cbd.int/climate/intro.shtml> and The Millennium Ecosystems Assessment (MA) report (2005)

³⁴ World Bank, 2006, *Where is the Wealth of Nations: Measuring Capital for the 21st Century*, Washington DC.

The influence can be seen in the timing of seasonal events (e.g. flowering, migration), in rates of growth and reproduction, and in the distribution of species. Because species react differently to climate change, climate change is also influencing species interactions (e.g. predation, parasitism, competition, symbiosis).

Mountain ecosystems are particularly highly sensitive to climate change. These same ecosystems provide up to 85% of the water humans depend on as well as a host of other ecosystem services such as timber, unique flora and fauna, and critical habitat for rare and endangered species. Climate change poses special problems for mountain protected areas, such as national parks and wilderness areas, because most of the land area within their boundaries is at higher elevations.

With upward shifting of ecological belts and the simultaneous slow tree line shifting (because of the limited natural dispersal of seeds), high tree altitude species and economically important medicinal plants are likely to become more vulnerable. Habitats for mountain fauna are increasingly threatened due to increased temperature and habitat degradation. Reduced snowfall, untimely rains, and increased dryness have altered the flowering and fruiting behavior of plants, which is closely related to the survival of wildlife and their prey. When timing of food availability changes, it changes the periodicity of life cycles of animals and insects such as reproduction, migrations, and hibernation. This results in serious vulnerability for wildlife and is a threat to the people who depend on biodiversity for their livelihoods. Additionally, it may lead to increased incidence of human wildlife conflict.

The above provides a clear overview of ecosystems' vulnerability to climate change and impacts on livelihoods. The survival of endangered species is regarded as a key indicator of the health of ecosystems. In order to enhance their survival it is of tremendous importance to safeguard their habitats against climate change threats³⁵.

Proposed Project Development Objectives

The project development objective is to assist the Government of Nepal to enhance capacity, knowledge and incentives to improve climate resilience of critically endangered species by safeguarding their natural habitats at landscape level against climate threats.

Safeguarding the natural habitats of these critically endangered species will have a significant positive impact on the health of the irrespective ecosystems. This will in turn lead to increased natural capital which is vital for livelihoods, sustained tourism and national wealth.

This project will be piloted in the habitats of endangered species in the mountain regions. Nepal is selected as one of the PPCR pilot countries because of its unique and vulnerable mountain ecosystems. A system that is more impacted by climate change than the ecosystems on lower altitude. Climatologists believe that the changes occurring in mountain ecosystems provide an early glimpse of what may come to pass in lowland environments. Information on the health of mountain environments will undoubtedly assist governments and international organizations as

³⁵ Other threats to the habitats and the survival of endangered species: loss and fragmentation, encroachment, forest fire, slash/burn, excessive grazing, migration, land degradation, invasive species etc.

they develop management strategies and mount strong campaigns to reverse current global warming trends. The lessons learnt from this pilot are of tremendous importance to enhance global knowledge and experience on climate change resilience measures in mountain ecosystems.

Key outputs and baseline

Little information is available on the climate change impacts on the natural habitat of endangered species.

Key outputs are:

- Reports and park management plans amended regarding impacts on the natural habitats and populations of critically endangered species;
- Improved information, knowledge and capacity regarding climate change impacts and resilience measures on the natural habitats of endangered species;
- Natural habitats and ecosystem health improvements³⁶;
- Alternative livelihoods for natural habitat dependent communities.

Proposed Project Activities

The project would be structured around the following set of activities:

Improved information, knowledge and capacity regarding climate change impacts and resilience measures on the natural habitats of endangered species

- Stocktaking of existing knowledge (including indigenous), information, and capacity on climate change effects and impacts. This will be done through different activities (analysis of studies and reports, surveys, mapping of activities).
- Based on this research gaps and capacity gaps will be identified. Subsequent activities will focus on improving the level of available information, increasing research activities, and strengthening the capacity on climate change impacts and resilience measures on natural habitats of endangered species.
- In selected natural habitats a climate change vulnerability and threat analysis will be done.
- Documentation of endangered flora and fauna, development of conservation and resilience strategies

Improved natural habitats and eco system health

- Based on the results of the earlier described vulnerability and threat analysis, habitat improvement activities may be initiated. These activities may include: pasture improvement programs, NTFP improvement, high altitude wetland / grassland management, zoning practice, sustainable harvesting, restore corridor & bottle neck,

³⁶ Key indicators are: managed forest, biodiversity maintained and improved, water availability and quality, gene pool (agriculture, forest, livestock, wildlife), threats minimized.

rehabilitate degraded range areas, protect and restore and provide (alternative) drinking water sources, conservation of endangered plant species, and restoration of genetic resources. Several of these activities will be done with full involvement of local communities building on their traditional knowledge and experiences.

Improved well being of natural habitat dependent communities

- As the natural habitats of endangered species are changing as a result of climate change the livelihoods of the dependent communities are also affected. It is therefore important to enhance the livelihoods of communities by providing alternative livelihood options (such as ecotourism promotion, diversification of local products, marketing high value products, such as fruits, NTFPs, medicinal, herbs, animal breeds, and on-farm fodder and forage support). The earlier described vulnerability and threat analysis will provide key inputs to this activity. Additionally, it is important to raise awareness among the local communities.
- Due to the changing habitats there may be an increased incidence of human wildlife conflict. Specific activities that could be initiated to reduce these incidences are: introducing or strengthening insurance or compensation schemes towards crops and livestock loss, fencing, and awareness / education.

Existing strategies and programs

The government has developed several strategies and plans related to the conservation of Nepal's rich floral and faunal biodiversity (such as the Nepal Biodiversity Strategy, several key species conservation action plans, and NTFP guidelines, Interim Implementation Plan for Sacred Himalayan Landscape). These action plans, however, have a limited focus on climate change risk related issues. The Department of National Parks and Wildlife Conservation and the Department of Forests are mandated to manage the natural habitats of the endangered species. Additionally, a number of international, national and local organizations are supporting the Government in effective management of those habitats. These include: USAID (Hariyo Ban (in RFP stage) which will focus on reducing threats to biodiversity in target landscape), UNDP (development of a biodiversity project for GEF funding on "Strengthening the Protected Area Management System in Nepal"), World Wide Fund for Nature (WWF) (support to Government in implementing the Sacred Himalayan Landscape Plan), National Trust for Nature Conservation (NTNC) (support to Government in implementing conservation activities). Local government and CBOs are actively supporting initiatives to conserve flagship species. This SPCR component also complements the World Bank supported regional project: "strengthening regional cooperation for wildlife protection" which focuses on strengthening regional cooperation for controlling illegal wildlife trade and addresses regional conservation threats to habitats in border areas. The regional project also focuses on wildlife conservation in Nepal and the region and supports innovative pilot projects with regional applicability, such as research projects in wildlife conservation, pilot programs in conservation of endangered flagship species, piloting human wildlife coexistence models and incentive schemes, such as payments for environmental services for those affected by human-wildlife conflict; eco tourism development and climate resilience of endangered species through habitat management.

The focus of most support, however, is mainly on the Terai region. This proposed component with its focus on the mountain habitats complements these activities. However, it remains important to do a mapping exercise as described under the activity section to look at overlap and lessons learnt.

Key risks and issues

The main areas of risk to this project and the mitigation measures are summarized below:

Project Preparation / Design

The gap in knowledge on the exact impacts of climate change on natural habitats and resilience measures to mitigate these impacts may be an impediment to a high quality project design up front. The lack of experience related to climate change risk management of natural habitats may be an obstacle as well.

The funding window approach – which allows for project proposal submission in time – is a key mitigating measure as the different subprojects can be designed based on information that becomes available through the project activities. The proposal review committee will include international experts who will help to strengthen the proposals.

Project Implementation

The implementing agencies have insufficient project management capacity which could slow the implementation down.

The regional wildlife project also focuses on capacity development within MOFSC's DNPWC and DOF. This is seen as a key mitigation measure.

Project Sustainability

At the project level, sustainability will depend on the technical and institutional capacity to maintain the initiatives after project completion.

The technical and institutional capacity will be built as part of the regional project. This key mitigating measure in addition to the Government's increased and commendable efforts related to conservation related issues will have a positive impact on the project sustainability.

Institutional Arrangements

The main agency responsible for implementation will be the Ministry of Forests and Soil Conservation (MoFSC) through the Department of National Parks and Wildlife Conservation (DNPWC) and the Department of Forest (DoF).

Investment costs and timeframe

The total cost of the proposed project is US \$5 million. The project will be prepared by December 2011.

Knowledge Management and Dissemination of Lessons Learned

The activities of this component are structured around improving information and building knowledge on resilience measures to protect endangered species. Knowledge management is an integral part of the success of this project which will identify and fill knowledge gaps on climate change and its impacts on endangered species. A stocktaking of relevant existing knowledge, information and capacity will be conducted, documented and shared across a wide range of international, national and local stakeholders. Additionally, lessons learned will be disseminated through the virtual center of excellence that will be set up under the World Bank supported regional project: “strengthening regional cooperation for wildlife protection.” A learning, knowledge sharing and dissemination plan for this component will be developed and implemented by MOFSC. MOFSC will also develop a results management framework, consistent with the overall SPCR results framework, to track the results of this component and facilitate reporting to MOE where the lessons learned from all of the PPCR components will be consolidated and reported to CIF. Knowledge products such as learning briefs, reports and presentations on lessons learned from project implementation are expected to be produced by MOE’s Climate Change Management Division as part of the SPCR knowledge management program.

Part 3: Project Preparation Grants

The SPCR proposes a comprehensive package of infrastructure projects and technical assistance and capacity development activities to be financed under the PPCR.

The Government of Nepal is requesting for US\$50 million PPCR grant financing (including US \$1.8 million for project preparation TA) and US\$60 million PPCR in credit. Concept papers are in Part 2 of this document. Part 3 provides the requests for four project preparation grants. A summary of the project costs, financing plan and specific requests for grants and concessional funding from the PPCR are summarized in the following table.

Investments and Technical assistance	Preparation Costs for Feasibility Studies (\$ Millions)	Proposed Project / TA Costs (\$ Millions)	MDB Lead	Financing / Co-Financing for Investment Projects (\$ Millions)		
				PPCR		MDB
				Grant	Credit	
Project Component 1: Building Climate Resilience of Watersheds in Mountain Eco-Regions	0.9	41	ADB	16 (0.9 of which is PPG)	25	tbd
Project Component 2: Building Resilience to Climate-Related Hazards	0.5	41	World Bank	16 (0.5 of which is PPG)	25	tbd
TA Component 3: Mainstreaming Climate Change Risk Management in Development		10	ADB	10		tbd
Component 4: Building Climate Resilient Communities through Private Sector Participation	0.3	13	IFC	3 (0.3 of which is PPG)	10	tbd
Project Component 5: Enhancing Climate Resilience of Endangered Species		5	World Bank	5		tbd
Total	1.7	110		50	60	tbd

Project Preparation Grant – Component 1: Building Climate Resilience of Watersheds in Mountain Eco-Regions

PILOT PROGRAM FOR CLIMATE RESILIENCE		
Project Preparation Grant Request For Component 1		
1. Country/Region:	Nepal	2. CIF Project ID#: (Trustee will assign ID)
3. Project Name:	Building Climate Resilience of Watersheds in Mountain Eco-Regions	
4. Tentative Funding Request (in USDmillion total) for Project at the time of SPCR submission (concept stage):	<i>Credit:</i> total funding of \$25 million	<i>Grant:</i> \$ 16 million
5. Preparation Grant Request (in USDmillion):	US \$0.9 million	<i>MDB:</i> Asian Development Bank
6. National Project Focal Point:	TBD	
7. National Implementing Agency (project/program):	Department of Soil conservation and Watershed Management (DSCWM) of the Ministry of Forest and Soil Conservation (MoFSC)	
8. MDB PPCR Focal Point and Project/Program Task Team Leader (TTL):	<i>Headquarters-PPCR Focal Point:</i> Daniel Ponzi	<i>TTL:</i> Cindy Malvicini
<p>9. Description of activities covered by the preparation grant:</p> <p>The Grant will result in a feasibility study for and an agreement with the Government and ADB on an investment project based on a <i>sector modality</i> that will assist Nepal in addressing impacts of climate change (CC) in mountainous watersheds. The project will aim to improved access to and enhanced reliability of water resources for communities in watersheds of river systems that are significantly vulnerable to CC. The following main activities will be undertaken under the Grant:</p> <ul style="list-style-type: none"> (i) identify and prioritize river basins/subbasins that are critical in terms of CC and water resources, followed by an simulation of the impact of different watershed management interventions for three candidate “sample” watershed subprojects; (ii) develop the methodology for developing watershed management plans taking into account CC impacts and state-of-the-art methodologies; (iii) prepare feasibility studies for watershed management interventions for two out of the candidate sample watershed subprojects; and (iv) formulate an investment project with associated due diligence. 		

10. Outputs:	
Deliverable	Timeline
(a) Identification of critical river basins/subbasins for selection of sample watersheds to be used for the feasibility studies	Three (3) months
(b) Feasibility studies for watershed management interventions for two sample watershed subprojects	Four (4) months
(c) Project preparation report for an investment project based on a sector modality	Two (2) months
11. Budget (indicative):	
Expenditures³⁷	Amount (USD) - estimates
Consultants	646,000
Subbasin hydrologic modeling and simulations of CC impacts	90,000
Equipment	11,700
Workshops/seminars	15,000
Travel/transportation	45,400
Others (admin costs/operational costs)	67,000
Contingencies (max. 10%)	24,900
Total Cost	900,000
Other contributions:	
• Government	25,000
• MDB	Not applicable
• Private Sector	Not applicable
• Others (please specify)	Not applicable
12. Timeframe (tentative)	
Submission of pre-appraisal document for PPCR Sub-Committee Approval: Expected ADB Management approval date:	
13. Other Partners involved in project design and implementation: Because watershed management is a cross-cutting issue, relevant ministries, district level government and non-government agencies and watershed communities will be associated in the design of the investment project. Other partners also supporting watershed management programs (including, among other partners JICA, DFID, IUCN, UNDP, USAID) will be consulted to ensure complementarity and synergies, where possible.	
14. If applicable, explanation for why the grant is MDB executed: Execution by ADB will ensure an early commencement of the PPTA and facilitate the processing and approval of the envisaged follow-on investment project by the Government and ADB. Execution by ADB is also in conformity with ADB's TA procedures.	

³⁷ These expenditure categories may be adjusted during project preparation according to emerging needs.

15. Implementation Arrangements (incl. procurement of goods and services):

The Grant activities will be implemented in two phases:

Phase 1:

Identify and prioritize river basins/subbasins that are critical in terms of Climate Change (CC) and water resources, followed by a simulation of the impact of different watershed management interventions for two “sample” watershed subprojects for which feasibility studies will be prepared.

Phase 2:

- (i). develop the methodology for developing watershed management plans taking into account CC impacts and state-of-the-art methodologies;
- (ii). prepare feasibility studies for watershed management interventions for the three sample watershed subprojects; and
- (iii). formulate the investment project with associated due diligence.

Phase 1 (First 3 months)

Step 1 - Basins and/or subbasins will be identified that are significantly vulnerable to water scarcity due to climate change. This will be done based on available data and information together with CC assessments for which CC climate information will be downscaled. Following the identification, watersheds within the basins/subbasins will be prioritized based on criteria including, among others, the level of water scarcity, the condition of the upper catchment areas within the basin/subbasin, the expected linkages between upland watershed activities and downstream hydrologic services, administrative boundaries, and the socio-economic profiles of the watersheds.³⁸³⁹ The prioritization will be verified through field visits and discussion with local-level stakeholders and key informants.⁴⁰ Following the identification and prioritization process, three subbasins (one for each mountain ecosystem) will be selected for the selection of watersheds for feasibility study assessments. The main stakeholders, i.e. the DDCs and concerned central-level ministries, will be associated with the selection process.

The impact of CC on the water cycle for the three candidate sample watersheds will be determined in terms of rainfall distribution and intensity, and watershed hydrology. A detailed water balance and accounting will be undertaken based on current baseline watershed conditions for the “with” and “without” CC impacts. Different watershed management scenarios will be simulated for each sample watershed to assess the likely impact on the watershed’s hydrology and its hydrological services as well as on erosion and sediment transport. The methodology for undertaking similar assessments and simulations will be developed for application for other watersheds.

Phase 2 (next 7 months)

Step 2 - Current watershed management strategies and approaches in water scarce watersheds in the Himalayas will be reviewed to determine their effectiveness and suitability for Nepal’s diverse watersheds. Methodologies applied by DSCWM and other agencies (government and non-government)

³⁸ It is envisaged that basin/ subbasins with an area between 30 sqkm and 80 sqkm will be prioritized.

³⁹ Within the context of socio-economic criteria, basins/subbasins with a higher portion of vulnerable groups and indigenous people may be given a higher priority.

⁴⁰ Consideration for focusing on one major basin while retaining the CC focus may be considered.

with watershed management programs will be reviewed. The methodology for developing watershed management plans under the project will then be developed.⁴¹ The methodology will be CC “proofed” using the downscaled CC impacts.

Step 3 - A review of recently completed and ongoing projects (both government and NGO implemented) with watershed management interventions will be undertaken.⁴²

Current design criteria for commonly used micro and small-scale watershed infrastructure in the prioritized watersheds will be reviewed against the projected CC impacts and design revisions will be proposed, where necessary. The feasibility-level designs will take into account the CC impacts. The cost for incorporating “CC additionality” will be assessed.

Taking into account the outcomes of the water balance and accounting assessments and simulations undertaken under Step 1, a feasibility-level watershed management plan will be developed for two out of the three watershed subprojects identified under Step 1.⁴³ The methodology developed under Step 2 will be adopted. Where watershed management plans have already been developed, these will be updated and adjusted using a similar methodology. The method’s participatory approach involving all principal stakeholders will ensure a broad-based consensus on the watershed management plans. Revisions in the methodology may be proposed based on the experience in their application for developing the watershed management plans for the three watersheds.

The plans will identify the appropriate mix of watershed interventions and essential supporting services to enhance the productivity of water within the watershed for agriculture and other uses. The plan will take into account ongoing and planned development projects and programs – both by government and non-government agencies and the private sector – which may be complementary. The institutional arrangements and governance aspects related to watershed management will be assessed and measures will be proposed in case major issues are identified. In case of significant land and/or water resources conflicts between communities, agreements will be reached on measures how to resolve them.

Following the consensus on the watershed management plan and its endorsement by the DDC, feasibility studies will be prepared for each sample watershed subproject. Feasibility-level designs and cost estimates will be prepared for proposed interventions. Communities will be involved in the development of outline plans and designs. Operation and maintenance (O&M) requirements will be discussed and responsibilities for implementation and O&M will be agreed. The principles for cost and benefit sharing for the different interventions will also be discussed and agreed. Land acquisition requirements, where necessary, will be determined based on the feasibility-level designs, and compensation mechanisms will be discussed with the communities.

The two sample watershed subproject will be subjected to economic and financial analyses. Where possible, such analyses will be undertaken for each main intervention separately and aggregated at subproject level. The economic analyses will quantify on and off-site (downstream) impacts. The economic analyses will illustrate the CC impact on each subproject by assuming two scenarios: one scenario based on the current climate conditions and the second one taking into account the CC scenarios: one scenario that assumes current trends in the watershed condition and the other scenario taking into account the CC impact on these trends for the “without- project” analysis. The financial analysis will

⁴¹ The methodology will match a bottom-up participatory approach using local knowledge and technical knowledge derived from state-of-the-art science and analytical tools. The methodology should take into account the investment project will be implemented through the Government system with appropriate use of national service providers.

⁴² One of such projects is the JICA financed Participatory Watershed Management and Local Governance Project.

⁴³ The following approach will be adopted for developing the feasibility level watershed management plan: a land use plan for the entire watershed will be prepared for the entire watershed (will also be used for the hydrologic modeling and simulations); and a watershed management plan will be developed for representative sub-watersheds covering about 50% of the watershed.

therefore also take into account these two scenarios.

Step 4 - The step 1, 2 and 3 outcomes will form the basis for the formulation of the investment project using a sector modality. To ensure complementarity/ synergy, where possible, and to avoid duplication, the formulation will take into account the scope of other projects in the sector that may be implemented simultaneously.⁴⁴ The impacts, outcomes and outputs of the two sample watershed subprojects together with a projection of additional watershed subprojects that may be included under the project will be used to approximate the Project's expected overall impact and outcome in terms of improved access to and enhanced reliability of water resources and the immediate effects with associated project-level performance indicators.

Based on the feasibility studies for the two sample watersheds subprojects, detailed criteria for the selection of additional watersheds in the prioritized basin/subbasins will be developed in line with the project's sector modality. Criteria for specific watershed management interventions to ensure the economic feasibility of the watershed subprojects will also be developed. Methodologies for economic and financial analysis will be proposed for the appraisal of additional subprojects during project implementation.

Project implementation arrangements will be proposed taking into account, among other things, the mandates and strength and weaknesses of the DSCWM and other principal stakeholders, the Government's decentralization policies, and institutional and governance aspects at district and watershed level. To ensure an integrated and participatory watershed management approach, the implementation arrangements will need to provide effective partnerships with concerned government and non-government agencies, the watershed communities, user clusters and the private sector. Proposals for piloting and/or upscaling of payment of watershed water (environmental) services will be made. Institutional strengthening and capacity building interventions will be incorporated where necessary for project design and implementation.

Consulting and NGO services required for project implementation will be determined and TORs for such services will be proposed. Project implementation procedures related to, among other things, project management, budget appropriation, flow of funds, procurement, project accounts, and disbursement will be detailed. Manuals to facilitate project implementation will be prepared.

Step 5 – As the project will be part of SPCR global learning support program, a comprehensive program to monitor the achievements of the project's principal outcome of improved water access and reliability, and the immediate effects during project implementation will be developed. Measuring the effect of subprojects on watershed hydrology and hydrologic services, and erosion control and sediment transport will be a key element of the program. The program's approach, methodology, implementation arrangements and costs will be detailed. A proposal to share the project experiences, impact assessments and lessons learned within Nepal and globally will also be developed. Collection of baseline data / overall socioeconomic benefits

Step 6 - Due diligence will be undertaken to ensure that the proposed investment project will meet the Government's and ADB safeguard requirements. The due diligence will include, among other things, the following.

Governance aspects will be assessed, especially related to project implementation, and measures will be proposed to address identified governance issues.

A comprehensive poverty and social analysis will also be carried out and interventions will be proposed to ensure that the poor and vulnerable clusters within the communities can participate and benefit from the project. A project gender analysis will be undertaken and a gender action plan

⁴⁴ One of such projects is the Hariyo Ban Project supported by USAID.

prepared to address constraints to participation by women in the design of watershed interventions will be identified and measures to address such constraints will be formulated. Considering that indigenous peoples are likely to be predominant in the target watersheds, the extent to which such clusters are vulnerable will be assessed and the need for an Indigenous Peoples Plan will be determined.

Considering the small-scale of the envisaged project interventions, subproject interventions are not expected to require significant land acquisition and resettlement. The overall environmental impact of the Project is expected to be positive but individual interventions will be subjected to an environmental assessment under the PPTA.

Proposals to address due diligence issues identified during the preparation of the subprojects and the formulation of the investment project will be made for discussion between the Government and ADB.

Required resources for undertaking the PPTA activities.

An international consulting firm in association with a national firm(s) will undertake the Step 2 to Step 7 activities. This firm will be engaged on competitive basis in accordance with ADB procedures. It is envisaged that the basin/subbasin modeling/ simulations will be outsourced to IWMI.⁴⁵

The following expert consulting services are estimated to be required:⁴⁶

Expertise	Person-months
International experts	
Team Leader/ water resources expert	6.5
Climate Change/ environment expert	3
Watershed management expert	2
Natural resources / CC economist	2.5
Social development expert	2.5
Gender development expert	1
Financial management expert	2
Subtotal	19.5
National experts	
Dep Tamd Leader/ watershed expert	8.5
Forestry expert	5.25
Hydro-geologist	4.0
Hydrologist	1.25
GIS expert	1.75
Design engineer	6.75
Agronomist	5.25
Gender specialist	6
Environment Expert	4.25
Socio-economist	5.75
Natural resources economist	3.5
Financial management expert	2.25

⁴⁵ IWMI may also assist in developing the monitoring program to be adopted during the implementation of the investment project under Phase 2.

⁴⁶ Necessary support staff will also be mobilized by the consultants.

Unallocated	2
<i>Subtotal</i>	<i>56.5</i>
GRAND TOTAL	76.0

Equipment required to undertake the step one activities will be procured through the consultants.

DSCWM will be the Executing Agency under the overall guidance of the Secretary, MoFSC and will assign a senior staff of Grade 2 as the Project Director. A PPTA Steering Committee will be established with senior representatives of relevant ministries as members and the Secretary, MoFSC as the chair. DSCWM will report progress and issues to the MoFSC and keep the SPCR Coordinator/ Results Manager in MoE appraised. DSCWM will establish an appropriate mechanism to coordinate with representatives of relevant ministries (with the Ministries of Agriculture, Irrigation and Local Development as the main collaborating agencies). and concerned District Development Committees during the PPTA phase. The same arrangement may be retained for the implementation of the investment project. DSCWM will assign counterpart staff to work with the consultant, and make available adequate office space for the consultants' team during the PPTA period.

Project Preparation Grant – Component 2: Building Resilience to Climate Related Hazards

PILOT PROGRAM FOR CLIMATE RESILIENCE			
Project/Program Preparation Grant Request			
1. Country/Region:	Nepal	2. CIF Project ID#:	(Trustee will assign ID)
3. Project Name:	Building Resilience to Climate Related Hazards		
4. Tentative Funding Request (in USDmillion total) for Project⁴⁷ at the time of SPCR submission (concept stage):	<i>Credit:</i> US \$25 million	<i>Grant:</i> US \$16 million	
5. Preparation Grant Request (in USDmillion):	US \$0.5 million	<i>MDB:</i> World Bank	
6. National Project Focal Point:	TBD		
7. National Implementing Agency (project/program):	Department of Hydrology and Meteorology and Ministry of Agriculture and Cooperatives		
8. MDB PPCR Focal Point and Project/Program Task Team Leader (TTL):	<i>Headquarters-PPCR Focal Point:</i> Astrid Hillers and Kanta Kumari Rigaud	<i>TTL:</i> Claudia Sadoff	
9. Description of activities covered by the preparation grant:			
<p>The grant will finance feasibility and design work on hydromet systems upgrading, forecasting and warning systems, and micro insurance schemes. While different specialized skills are needed for the various components of work, there are important synergies between components. For example, the hydromet, forecast and warning systems must be smoothly inter-operable, and the mirco-insurance schemes will need to be underpinned by long term time series data on weather (as well as crops and livestock.) The design process should therefore look across the range of information requirements and develop an information architecture that would efficiently meet the needs of the different components. It is therefore likely that this work would be bid competitively to a consortium of international and national firms who could carry out the tasks in an integrated, systematic manner. The following activities could be undertaken under the PPG:</p> <p>Hydromet and hazard monitoring</p> <ul style="list-style-type: none"> • design a real-time hydro-meteorological observation network, • specify appropriate forecast models, • propose effective data sharing protocols, • structure a capacity building strategy for maintaining the hydromet system, • specify needs and recommendations for operations and maintenance of the system, • explore options to develop a remote sensing lab, enhanced landslide monitoring systems and multi-hazard mapping capacities <p>Warning systems</p> <ul style="list-style-type: none"> • design DDC/VDC/community level warning systems 			

⁴⁷ Including the preparation grant request.

<ul style="list-style-type: none"> develop a phased strategy for engagement, roll out and capacity building at the local level 	
Insurance and reinsurance design/analysis	
<ul style="list-style-type: none"> design financial products design required/related information systems strategy for awareness raising, capacity building and roll out 	
Sustainability (for all components)	
<ul style="list-style-type: none"> identify needed policy and institutional reforms and recurrent resource requirements analyze potential for revenue generating opportunities such as data sales or eventual self-financed insurance 	
10. Outputs:	
Deliverable	Timeline
(a) Draft report delivered	4 months from contracting
(b) Final report delivered	6 months from contracting
...	
11. Budget (indicative):	
Expenditures⁴⁸	Amount (USD) - estimates
Consultants	500,000 (firm contract)
Equipment	
Workshops/seminars	
Travel/transportation	
Others (admin costs/operational costs)	
Contingencies (max. 10%)	
Total Cost	500,000
Other contributions:	
• Government	Tbd
• MDB	Tbd
• Private Sector	Tbd
• Others (please specify)	
12. Timeframe (tentative)	
Submission of pre-appraisal document for PPCR Sub-Committee Approval: December 2011	
Expected Board/MDB Management ⁴⁹ approval date: March 2012	
13. Other Partners involved in project design and implementation⁵⁰:	
There are many partners who will need to be involved in design and implementation, they include the VDCs, DDCs and municipalities, MoF, MoHA, WECS, MOI, MLD, the National Disaster Response Committee (facilitated by MoHA), District Disaster Risk Management Committees, DPNet and the private Sector (for example in FM radio, telecom and insurance.)	

⁴⁸ These expenditure categories may be adjusted during project preparation according to emerging needs.

⁴⁹ In some cases activities will not require MDB Board approval

⁵⁰ Other local, national and international partners expected to be involved in design and implementation of the project.

The preparation team will also liaise closely with development partners who are active in the sector, in particular the governments of Germany, Finland, US and Denmark, the International Center for Integrated Mountain Development (ICIMOD), and the Joint Consortium Disaster Risk Management Flagship program (IFRC, UNDP, UN OCHA, UN ISDR, EU, USAID, ADB and WB.)

14. **If applicable, explanation for why the grant is MDB executed:**

15. **Implementation Arrangements** (incl. procurement of goods and services):

The grant will be executed by the Government of Nepal (Department of Hydrology and Meteorology and/or Ministry of Agriculture and Cooperatives) through competitive international bidding. DHM is currently an implementing agency for the World Bank financed Irrigation and Water Resources Management Project, so financial management and procurement capacities should be consistent with the needs of this grant.

Project Preparation Grant – Component 4: Building Climate Resilient Communities through Private Sector Participation

PILOT PROGRAM FOR CLIMATE RESILIENCE		
Project/Program Preparation Grant Request		
1. Country/Region:	Nepal/SAR	2. CIF Project ID#: (Trustee will assign ID)
3. Project Name:	<i>Public and private sector collaboration to enhance food security through promoting climate resilient agriculture</i>	
4. Tentative Funding Request (in USDmillion total) for Project⁵¹ at the time of SPCR submission (concept stage):	<i>Credit:10 million</i>	<i>Grant:3 million</i>
5. Preparation Grant Request (in USDmillion):	<i>0.15million</i>	<i>MDB:IFC</i>
6. National Project Focal Point:	TBD	
7. National Implementing Agency (project/program):	<i>IFC</i>	
8. MDB PPCR Focal Point and Project/Program Task Team Leader (TTL):	<i>Headquarters-PPCR Focal Point:</i> <i>Noleen Dube</i> <i>Operations Officer</i> <i>Washington DC</i> <i>ndube@ifc.org</i> <i>Lisa Da Silva</i> <i>lsilva@ifc.org</i>	<i>TTL: Nepal</i> <i>Anupa A Pant</i> <i>apant@ifc.org</i>

⁵¹ Including the preparation grant request.

9. Description of activities covered by the preparation grant:

This grant is meant to commission a scoping study leading to a project with the objective of enhancing agricultural productivity contributing to food security through capacity building and better access to finance. The scoping study will:

- Identify key climate induced risks and other productivity constraints faced by the farming communities in different regions and identify potential solutions where private sector can play a role.
- Take stock of the current levels of stress, current agricultural practices, identify key constraints and opportunities with regard to farming particularly in reference to the climate induced stresses,
- Identify key private sector players in the market, other development partners involved in similar projects
- Recommend interventions geared towards supporting agriculture and agribusiness in different regions of Nepal.
- Identify climate change risks in agriculture/agribusiness and development of appropriate agri supply chain finance products and modalities to address the risks of the supply chain members including farmers.
- Prepare baseline on the key interventions

Note: The ToR for the scoping and baseline study will have more detail of the activities envisaged

10. Outputs:

Deliverable	Timeline
(a) Report on climate resilient agriculture technologies	Four months from contracting
(b) Report on agri supply chain finance products and modalities	Four months from contracting
...	

11. Budget (indicative):

Expenditures ⁵²	Amount (USD) - estimates
Consultants	110,000
Equipment	
Workshops/seminars	5,000
Travel/transportation	20,000
Others (admin costs/operational costs)	
Contingencies (max. 10%)	15,000
Total Cost	150000
Other contributions:	
• Government	
• MDB	
• Private Sector	

⁵² These expenditure categories may be adjusted during project preparation according to emerging needs.

<ul style="list-style-type: none"> • Others (please specify) 	
<p>12. Timeframe (tentative)</p> <p>Submission of pre-appraisal document for PPCR Sub-Committee Approval: November 2011 Expected Board/MDB Management⁵³ approval date: January 2012</p>	
<p>13. Other Partners involved in project design and implementation⁵⁴: Ministry of Agriculture, National Agriculture Research Council, Department of Irrigation, Agribusiness companies, Financial Institutions</p>	
<p>14. If applicable, explanation for why the grant is MDB executed: This scoping study will be conducted to identify appropriate climate resilient agriculture technologies and agri supply chain finance products and modalities for private sector to take a lead. IFC has a comparative advantage to meaningfully engage the private sector in the process because of its private sector mandate, its experience of working with private sector and the institutional branding. Thus this grant will be executed by IFC.</p>	
<p>15. Implementation Arrangements (incl. procurement of goods and services):</p> <p>This project will be implemented by IFC in collaboration with Ministry of Agriculture, National Agriculture Research Council, Department of Irrigation, Agribusiness companies and Financial Institutions.</p> <p>The procurement of goods and services will follow IFC’s procurement guidelines.</p>	

⁵³ In some cases activities will not require MDB Board approval

⁵⁴ Other local, national and international partners expected to be involved in design and implementation of the project.

PILOT PROGRAM FOR CLIMATE RESILIENCE

Project/Program Preparation Grant Request

1. Country/Region:	Nepal/SAR	2. CIF Project ID#:	(Trustee will assign ID)
3. Project Name:	<i>Climate proofing selected vulnerable infrastructure such as hydropower stations</i>		
4. Tentative Funding Request (in USDmillion total) for Project⁵⁵ at the time of SPCR submission (concept stage):	<i>Credit:10 million</i>	<i>Grant:3 million</i>	
5. Preparation Grant Request (in USDmillion):	<i>0.15million</i>	<i>MDB:IFC</i>	
6. National Project Focal Point:	TBD		
7. National Implementing Agency (project/program):	<i>IFC</i>		
8. MDB PPCR Focal Point and Project/Program Task Team Leader (TTL):	<i>Headquarters-PPCR Focal Point:</i> <i>Noleen Dube</i> <i>Operations Officer</i> <i>Washington DC</i> <i>ndube@ifc.org</i> <i>Lisa Da Silva</i> <i>lsilva@ifc.org</i>	<i>TTL: Nepal</i> <i>Anupa A Pant</i> <i>apant@ifc.org</i>	

⁵⁵ Including the preparation grant request.

9. Description of activities covered by the preparation grant:

This grant is meant to commission a scoping study leading to a project with the objective of strengthening climate change risk management capacity in Nepal’s private sector by way of climate proofing vulnerable infrastructure, mainly hydropower stations.

The scoping study will:

- Assess prioritized private sector infrastructure, especially hydropower that are at risk from different climatic stresses;
- Identify areas of risk management in order to design awareness raising and capacity building interventions and assess investment potential in resilient technologies.
- Calculate incremental costs and payback period associated with climate proofing existing operations, and the conversion to climate resilient technologies

Note: The ToR for the scoping and baseline study will have more detail of the activities envisaged

10. Outputs:

Deliverable	Timeline
(a) Audit report on climate proofing prioritized infrastructure	Four months from contracting
(b) Return on investment analysis on conversion to resilient technologies to climate proof infrastructure	Six months from contracting
...	

11. Budget (indicative):

Expenditures ⁵⁶	Amount (USD) - estimates
Consultants	110,000
Equipment	
Workshops/seminars	5,000
Travel/transportation	20,000
Others (admin costs/operational costs)	
Contingencies (max. 10%)	15,000
Total Cost	150,000
Other contributions:	
• Government	
• MDB	
• Private Sector	
• Others (please specify)	

⁵⁶ These expenditure categories may be adjusted during project preparation according to emerging needs.

12. **Timeframe** (tentative)

Submission of pre-appraisal document for PPCR Sub-Committee Approval: November 2011
Expected Board/MDB Management⁵⁷ approval date: January 2012

13. **Other Partners involved in project design and implementation**⁵⁸: Ministry of Energy, private sector infrastructure companies, FNCCI, Financial institutions

14. **If applicable, explanation for why the grant is MDB executed:** IFC has a comparative advantage to meaningfully engage the private sector in the process because of its private sector mandate, its experience of working with private sector and the institutional branding. Thus this grant will be executed by IFC.

15. **Implementation Arrangements** (incl. procurement of goods and services):

This project will be implemented by IFC in collaboration with Ministry of Energy, private sector infrastructure companies, FNCCI, and financial institutions.

The procurement of goods and services will follow IFC's procurement guidelines.

⁵⁷ In some cases activities will not require MDB Board approval

⁵⁸ Other local, national and international partners expected to be involved in design and implementation of the project.

Annexes

Annex 1: Synthesis of Risk Assessment

Sufficient and good quality water, food security, human health and eco-system health were the major risks identified. Disruptions in precipitation pattern have exacerbated the water availability situation. Depletion of water sources in the mid-mountains and foothills along with decreasing river base flows add stress to existing water use. Droughts have resulted in declining agricultural production and the availability of safe drinking water. Sporadic migration has increased in recent years and is expected to increase significantly. Conflicts over water resources have emerged and are likely to grow rapidly in coming years.

Floods and erosion have resulted in significant losses and affected livelihoods while the pollution of water sources has affected human health. Landslides and debris flow in cultivated land, including forests and residential areas are reported in the mid-mountain and the foothill communities. Both floods and droughts have led to declines in agricultural production. Flooding severely disrupts access to markets and other basic services such as transportation, communication, education and health services in foothill and terai communities. New pests and diseases have emerged and the prevalence of conventional diseases in plants and animals has affected crop production. Emergence of weeds has been reported across all geographic regions.

Increased prevalence of vector borne and water borne diseases, spreading of unexpected diseases and previously unknown diseases such as Dengue fever are reported. Forest fires, forest degradation, intense soil erosion, spreading of diseases, invasive and alien species, species-threat, habitat shifting and degradation are identified as major threats to the ecosystem health.

High Mountain	Middle Mountain	Churia-Terai Range
Event Risk: Increase in temperature		
Outcome Risk: Rapid melting of glaciers forming new lakes Breaching of lakes resulting GLOF Rangeland degradation (due to invasive species associate with climate variability). Increase in animal diseases / decline of livestock product. Prevalence of insect and diseases in agriculture. Habitat degradation of snow leopard and NTFP degradation Disappearing of cultural heritage (e.g worshipped-snow peaks converting into rocky mountain)	Outcome Risk: Forest fire Prevalence of insect and diseases in agriculture and forestry / decline in agricultural product Decline in cash crop productions Degradation of wild life habitat Increase in invasive species/agricultural weeds	Outcome Risk: Prevalence of insect and diseases in agriculture, Problem in human and livestock health. Increase invasive alien species (plants). Habitat degradation and species shift Spreading vector-borne diseases
Event Risk: Extreme high precipitation		
Outcome Risk: Too much water – damage to infrastructure (water supply,	Outcome Risk: Too much water- Landslide on cultivated land and residential	Outcome Risk: Too much water - Landslide and debris flows on

<p>irrigation and road) and water sources are under threat of landslides and floods resulted due to too much water. Variability in river water discharge. Food production decline causing food insecurity and migration</p>	<p>areas Flood and river bank cutting damaging infrastructures and cultivated land. Variability in river water discharge. Increase in sediment load in river water / siltation problems in reservoir. Food production decline causing food insecurity and migration. Spreading vector-borne and water-borne diseases.</p>	<p>cultivated land and forest areas Flood and river bank cutting damaging infrastructures and cultivated land. Excessive sediment deposition in cultivated land Spreading water-borne diseases</p>
<p>Event Risk: Extreme low precipitation / drought</p>		
<p>Outcome Risk: Too little water affecting small rural irrigation, rural drinking water supply, micro-hydro and water mill Causing water scarcity for drinking and irrigation Degradation of water quality Decreased in river water discharge Rangeland degradation Prevalence of insect and diseases in agriculture</p>	<p>Outcome Risk: Too little water affecting small rural irrigation, rural drinking water supply, micro-hydro and water mill Water scarcity for drinking and irrigation causing conflict, and migration. Degradation of water quality Decreased in river water discharge Prevalence of insect and diseases in agriculture and forestry causing decline in respective production Wetland degradation</p>	<p>Outcome Risk: Too little water Decline in agricultural production Spreading water borne diseases Increase in forest fire Lowering down of shallow water table Drying out of water sources Wetland degradation</p>
<p>Event Risk: Increased climatic variability</p>		
<p>Outcome Risk: Change in grazing for livestock Impact on food source for snow leopard. Increased weeds.</p>	<p>Outcome Risk: Increase in pests and disease in plants and livestock. Increased incidents of water- and vector-borne disease.</p>	<p>Outcome Risk: Heat and cold stress to plants/animals. Increased weeds. Increased health epidemics</p>

Annex 2: Summary of Climate Change and Associated Projects Supported by Developments Partners

Project	Description	Time Line	\$	Relevance to Climate Change	Supported by
National Adaptation Plan of Action (NAPA)	The NAPA process will provide a platform for the development of a multi-stakeholder framework on Climate Change Action in Nepal. Nepal NAPA has mobilized substantive co-financing from bilateral donors to ensure that the NAPA –related stakeholder processes in Nepal can be institutionalized and receives dedicated Knowledge Management and Learning support even after the NAPA document has been submitted to UNFCCC. The NAPA process will identify well defined urgent and immediate, short-term and long-term adaptation priorities for climate change action in Nepal. The process will also form the basis of a critical pathway for climate change action in Nepal, opening avenues for mainstreaming climate change adaptation into development planning.	2009-2010	US \$ 1,325,000	<i>Policy support and capacity building</i> Nepal as a party to the UNFCCC and Kyoto Protocol has to prepare and implement NAPA to access funding opportunities for adaptation programs. This project plans to identify immediate priorities that seek adaptation funding to address climate change in Nepal.	Collaboration between DANIDA, UNDP, GEF, DFID DANIDA contribution US\$200,000 DfID Contribution US\$800,000 UNDP Contribution \$1.3 million
Local Adaptation Plan of Action (LAPA)	The project will pilot different options and modalities involving government and private sectors and developing an approach for Local Adaptation Plan of Action (LAPAs), which can be scaled up through other adaptation financing.	TBC	TBC (approx. US\$ 20 million)	Mainstreaming climate change adaption at local level planning and management.	Collaboration between DFID and EU
Hariyo Ban Project	This program (currently at RFP stage) aims to: i) reduce threats to biodiversity in target landscape(s); ii) build the structures, capacity and operations necessary for an effective sustainable landscapes management, especially reducing emissions from deforestation and forest degradation (REDD+) readiness; and iii) increase the ability of target human and ecological communities to adapt to the adverse impacts of climate change.	TBC	TBC (approx. US\$30 million)	Reduce threats to biodiversity and vulnerabilities of climate change in Nepal.	Supported by USAID – currently at RFP stage
Support to the Ministry of	Preparation of the status papers on major thematic areas under negotiation process.	2009-2010		Raising awareness and capacity building of Ministry of Environment,	DANIDA, DFID

Environment in strengthening National Capacity on Climate Change: Negotiations and COP 15 Preparations	Support to the national delegation to COP15 Supporting for the post COP15 activities and for COP16 event.			Parliamentarians, journalist and civil society on climate change.	
Kathmandu to Copenhagen Regional Climate Conference	This was the first South Asia regional conference on climate change; it included official delegations from 7 countries, and focused in particular on adaptation challenges of the mountains. An agreed vision statement produced that was taken to the Copenhagen COP15.	2009		<i>Raising awareness and building capacity</i> A South Asia regional climate change conference that provided a forum for the countries to share knowledge and experience and forge a common vision of Himalayan climate challenges	Embassy of Denmark, DFID, ADB, The World Bank
Support to capacity building of MoE	Supporting national climate change capacity building with emphasis on preparing Nepal for global negotiations and focus on information generation and use.	2009-2010	US \$0.5 million	Raising awareness and capacity building of government and other key stakeholders	DFID
Reducing Climate change vulnerability of poor	The New programme will support the development of climate adaptation evidence and pilot approaches to improve adaptive capacity of communities. The programme will focus on vulnerable groups, safeguarding their livelihoods and creating employment, whilst reducing the vulnerability of people.	2009-2014	10 m £	Building climate resilience and promoting low carbon development pathways	DFID
Personnel co-operation → skilled personnel and experts placed in different priority areas	The German Development Service (DED) is one of the German governmental organisations of development co-operation responsible for personnel co-operation. Since its foundation in 1963, more than 15.000 technical assistants committed themselves to improve the living conditions in Asia, Africa and Latin America. DED combines professional and intercultural skills with social commitment in order to put democratic principles into practice. CIM (Centrum für Internationale Migration und Entwicklung) is a joint operation of the GIZ	1963-today	Non-financial matter	The issue of the environment is high on the list of DED and CIM priorities: from biodiversity, to renewable energies, to disposal of hazardous waste. Many technical experts have been placed in Nepal regarding these areas of activity.	Germany

	(German Technical Cooperation) and the International Placement Services of the German Federal Employment Agency (BA). Founded in 1980, CIM is largely financed by the German Federal Ministry for Economic Cooperation and Development (BMZ); but other ministries, state and parastatal institutions, non-governmental organisations and the private sector also participate in CIM programmes.				
International Centre for Integrated Mountain Development (ICIMOD)	ICIMOD is a regional knowledge development and learning centre serving the eight regional member countries of the Hindu Kush-Himalayas – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan – and based in Kathmandu, Nepal. Globalisation and climate change have an increasing influence on the stability of fragile mountain ecosystems and the livelihoods of mountain people. ICIMOD aims to assist mountain people to understand these changes, adapt to them, and make the most of new opportunities, while addressing upstream-downstream issues.		Germany: Multi-year commitment including financial support, but also non-financial matters (e.g. CIM) Norway: Approximately \$ 4.5 M Switzerland: CHF 5.0 M	By enabling and facilitating the equitable and sustainable well-being of the people of the Hindu Kush-Himalayas and by supporting sustainable mountain development through active regional cooperation, ICIMOD helps to cope with the effects of climate change in target areas.	Germany, Norway, SDC
CDM seminar: Development of Pins and PDDs for CDM project	-The Project aims to share the practical knowledge such as CDM key concepts, Project flow, Approval procedure, Project formulation, including the general information of Climate Changes/CDM. Seminar is combining with lecture and group works	2010		<i>Mitigation</i> -To enhance the capacity for formulating/implementing CDM project of stakeholder (Line agencies, Consultant)	JICA
Strengthening Capacity for Managing Climate Change and the Environment	The expected outcome is an improved, sustainable institutional framework for managing climate change and the environment agreed upon by the Government. The expected outputs are (i) an organizational framework is drafted and agreed upon by stakeholders; (ii) a funding mechanism for environmental management is agreed upon by stakeholders; and (iii) effective public education, information, and awareness activities on environment and climate change are developed and implemented.		\$500,000 grant	ADB will continue to strengthen capacity for managing climate change and the environment through capacity developing TA projects.	ADB

Economics of climate change	ADB is supporting a study on the regional economics of climate change study. The first phase, expected to be completed in March 2010, is an analysis of options to mitigate greenhouse gas emissions in South Asia, which will address the abatement cost curves. The second phase, expected to commence in February 2010, will involve a review of the economics of climate adaptation for South Asia.	2010-		The overall outcome is that regional and country-level decision makers will better understand greenhouse gas mitigation options and the necessary outcomes.	ADB
Regional Climate Adaptation Knowledge Platform for Asia (UNEP)	In early 2009, UNEP conducted a regional workshop in Nepal “Regional Climate Adaptation Knowledge Platform for Asia” which was later launched in October 2009 in Bangkok. The initiatives of this platform was a create a Knowledge hub on CC for Asia and substantive discussions have taken place to link Regional Centre with NAPA Knowledge Platform and Learning Center which is being planned under NAPA project for 2010.	NA	NA	<i>Knowledge building</i>	UN (UNEP)
Poverty Alleviation Fund II	The PAF project aims to improve access to income-generation projects and community infrastructure for the groups that have tended to be excluded by reasons of gender, ethnicity and caste, as well as for the poorest groups in rural communities.	2007-2012	US\$100 million	<i>Promoting Growth</i> The impacts and opportunities of climate change on income-generation projects will be explored	The World Bank
Summiteers’ Summit to Save the Himalayas	The Bank supported the COP15 side event calling attention to adaptation needs in the Himalayas.	2009	US \$80,000	<i>Raising awareness and building capacity</i> Highlighted the impacts of climate change on the Himalayas to the global community at the COP15 in Copenhagen.	The World Bank
Climate adaptation challenges in mountain states forum	The Prime Minister has requested support for creating a forum for the discussion of climate adaptation challenges in mountain states.	2010-2011		<i>Raising awareness and building capacity</i> - Aims to share knowledge on climate change adaptation with other mountain states in Central Asia and Latin America	The World Bank
Poverty Alleviation in Selected Rural Areas of Nepal	The upland and mountainous districts of Nepal, which are affected by the climate change, count among that nation’s poorest	January 2005 to December 2010	Approximately US \$22 Million	In selected rural districts of Nepal, prerequisites for social and economic development among the	Germany

(PASRA)	regions. Half of the inhabitants of these areas are unable to secure an adequate food supply for themselves from the agricultural produce they raise. The GIZ programme Poverty Alleviation in Selected Rural Areas in Nepal (PASRA) advises the Nepalese Ministry for Local Development in its efforts to establish and strengthen diversified, local systems for providing services aimed at reducing supply shortages in rural areas.			poor have improved. Some 9,000 rural households, most of them hard hit by Nepal's warring conflict and the climate change, have found short-term employment in over 100 work-intensive infrastructure improvement measures, thereby ensuring their food security.	
Reintegration and Reconstruction in Rukum and Rolpa	The project's main approaches are to create basic social and economic infrastructure, such as a rural network of paths and tracks, to provide drinking water, irrigation canals and schools, as well as to improve household incomes in the agricultural and non-agricultural sectors. In a combination of food-for-work and cash-for-work measures, the beneficiaries carry out their own independent activities in self-help groups. Project technicians and social mobilisation experts advise on the construction and maintenance of infrastructure, and on introducing innovations and improvements to agriculture, horticulture and non-agricultural activities.	2007 to 2010	Approximately US \$3 Million	The population's economic and social living conditions are improving. Focal areas of the project are the orientation toward poverty reduction and self-help measures, participatory development, good governance, gender and caste equity, conflict transformation and peace promotion. The overall stabilization of the population makes the people more resistant for any climate change consequences which might appear (drought, floods, etc).	Germany
Agricultural Training and Extension Improvement Project	The Project aimed to improve the agriculture service delivery system in 5 districts; service delivery system includes agriculture technology extension, farmers' group organization, facilitation, M&E, etc. It also provided small scale irrigation infrastructures.	2004-2009	JPY 360million	<i>Adaptation</i> Reducing vulnerability among farmers in terms of cultivation technology, water management, readiness toward change in environment, etc.	JICA
Preparatory Study for Agriculture and Rural Development Program	The Study concentrated in 5 districts along the Banepa-Bardibas Highway corridor, with the aim to identify the potential in high value agriculture production and commercialization system improvement, etc.	2009		<i>Adaptation</i> Reducing vulnerability among farmers in terms of readiness toward change in environment	JICA
Integrated Pest Management.	The Program is undertaken by the Ministry of Agriculture and Cooperatives. The Program among other things aims at increasing	2008-2013	Approximately US \$ 4.8 million	Diversification of crops. Possible climate change mitigation measure	Norway

	production and productivity.				
Promotion of fish farming in Nepal	Biodiversity of river systems in Nepal, use fisheries and breeding programs to secure the biodiversity in river systems with hydropower stations. (Initial phase)	2010 - ?	Approximately US \$ 0.5 million	Climate adaption. Diversification of food supply	Norway
Sustainable Soil Management Programme	<ul style="list-style-type: none"> - The project supports for knowledge generation through on-farm research on carbon sequestration in agricultural soil and soil improvement. - Focuses on building farmers knowledge, skills and capacities on sustainable soil management practices. Aim is to enhance agro-forestry and sustainable soil management practices that increases agricultural productivity and sink the carbon in air (through soil). 	2008-2010	CHF 6 Million	Adaptation <ul style="list-style-type: none"> - Further knowledge base on Carbon Sink through Soil - Reducing vulnerability through sustainable agro-forestry and soil mgt practices. 	SDC
Protracted Relief and Recovery Operation (PRRO) (WFP)	The PRRO Uses a Food For Asset Modality to create assets that improve agricultural production, increase market access, and other measures conducive to developing adaptive livelihoods and resilience. Some activities include Farmer Field Schools, irrigation schemes, green road development, cultivation of high value indigenous crops, and community consultations on climate change.	2007 until Dec. 2010	Part of a Larger Project	It will increase short-term food security and alleviate pressure on natural resources through food for work, while also allowing the rebuilding and construction of essential infrastructure for longer-term adaptation and resilience. The development of infrastructure such as water and irrigation systems improves agricultural production. Fish Ponds, nurseries, and orchards promote alternative livelihoods. Green roads increase market access and the development of climate-resistant cash crops improves income and food security.	UN (WFP)
Enhancing Capacities for Climate Change Adaptation and Disaster Risk Management for Sustainable Livelihoods in the	The UNDP-FAO joint programme is extension of the FAO-TCP project to additional two districts (Bhanke and Surket) focusing on district and community level activities and establishes close linkages to national level capacity building and policy support. The project aims to assist the Ministry of Agriculture and Cooperatives (MoAC) in	Sept 2009 to Aug 2011	US \$252,555	<i>Building resilience and assess economic value of adaptation</i> The UNDP-FAO joint program seeks to strengthen technical capacity of MoAC along the lines of FAO-TCP of District level functionaries that facilitates identification and demonstration of	UN (UNDP-)

Agriculture Sector (Joint programming UNDP and FAO)	testing and operationalising the process of shifting from a reactive emergency response focused intervention approach towards a pro-active natural hazard risk prevention/preparedness oriented approach in the agricultural sector. It also plans to demonstrate viable climate change adaptation practices in two selected pilot districts to address impacts of climate variability and climate change and to increase awareness and resilience needed to address the future risk by the communities. The project will employ a Training of Trainers (ToT) approach and will contribute to development of sustainable capacity enhancement at district and local levels.			location specific technologies for climate change adaptation and disaster risk management at community levels and assesses the economic value of adaptation interventions.	
Strengthening Capacities for Disaster Preparedness and Climate Risk Management in the Agricultural Sector (FAO)	The FAO TCP project aims to assist the Ministry of Agriculture and Cooperatives (MoAC) in testing and operationalising the process of shifting from a reactive emergency response focused intervention approach towards a pro-active natural hazard risk prevention/preparedness oriented approach in the agricultural sector. It also demonstrates viable climate change adaptation practices in four selected pilot districts to address impacts of climate variability and climate change and to increase awareness and resilience needed to address the future risk by the communities. The project employs Training of Trainers (ToT) approach and will contribute to development of sustainable capacity enhancement at district and local levels. The TCP project is implemented in two district clusters comprising of four districts (Siraha, Udayapur, Kapilvastu and Arghakhanchi)	May 2008 – Dec 2010	US \$ 470 000	<i>Strengthening technical capacity and Building community resilience</i> The project seeks to strengthen technical capacity of MoAC (DoA and DoLS) national and district level functionaries for climate risk management and disaster preparedness and improve basic service systems for pro-active adaptation at district levels; The programme facilitates to identification and demonstrates location specific technologies for climate change adaptation and disaster risk management at community levels. The project also contributes towards preparation of plan of Action for MoAC on DRM and CCA and facilitation of NAPA to integrate food and agriculture perspectives	UN (FAO)
Mitigating Climate Change through Implementation of	The FAO Regional TCP project (covering 4 South Asian countries including Nepal) aims to initiate a range of integrated practical strategies	Jun 2010 to May 2012	Approx. US \$500,000	Mitigation through sustainable land management.	UN (FAO)

Improved Agricultural Practices in South Asia (FAO)	to ensure achievement of multi-level wins and synergetic situations of aiding the mitigation of climate change while decreasing vulnerability and increasing the adaptation to climate change of natural resources.				
Food Security Monitoring and Analysis System and District Food Security Networks (WFP)	WFP has 32 field monitors providing real time information on food security situation of rural population in Nepal. District Food Security Networks have been formed in 53 districts to date, which bring together local stakeholders to gather information on district food security situation. The information collected through the system ranges from crop production, livelihoods, market prices, natural hazards, migration, coping strategy, health and nutrition. Food Security Bulletin is issued on a quarterly basis and crop situation updates as well as other thematic studies are conducted on a regular/ad-hoc basis. The process of transferring the Food Security Monitoring System capacity to the government of Nepal is in progress.	(ongoing) - April 2011	\$ 1 million per year	Real time information on food security includes a wide range of thematic issues including agriculture, livelihoods, natural hazards and coping strategies serves as an early warning system that is essential for adaptation measures. District Food Security Networks are instrumental to gather information about the situation and obstacles to food security. Such information is essential to prepare for and responding to emergencies and to monitor long-term adaptation process.	UN (WFP)
Social Safety Nets Project	The social safety net project aims to address the short and medium term implications of the global food crisis for the country by strengthening agricultural production and safety net mechanisms on a broad scale. The development objective is to ensure access to food and basic needs for vulnerable households in the short term in food insecure districts. The project will provide financing food for work programs and support for transporting critical agricultural inputs (seeds, fertilizer) to vulnerable populations and districts of the country.	2008-2010	US\$2.7 million IDA Credit, US\$14.0 million IDA Grant, US\$5.0 million TF Grant	<i>Building Resilience</i> The project seeks to build medium term climate change resilience along the agricultural supply chain from production to distribution.	The World Bank
Irrigation and Water Resources Management Project	The project aims to improve irrigated agriculture productivity and management of selected irrigation schemes and to enhance institutional capacity for integrated water	2007-2013	US \$14.3 million IDA Credit and US\$50 million IDA Grant	<i>Building Resilience</i> Irrigation strengthens farmers' with resilience to changing rainfall patterns.	The World Bank

	resources management				
Rani Jamara Kulariyc Irrigation Project	This project aims to rehabilitate and modernize the largest farmer managed irrigation system off Karnali River in Nepal, serving over 13,000 ha and 100,000 people.	2011-2016	US\$75 million	<i>Building Resilience</i> Climate change's impact on agriculture and the need for controlled water for irrigation purposes will be incorporated in project design.	The World Bank
Revitalizing Agricultural Research and Technology	An Agricultural Research and Technology Development TA will help develop a draft Vision for Agricultural Research and Technology for Sustainable Livelihoods	2009-2010		<i>Building Resilience</i> This can be a vehicle to guide adaptation and enhance resilience in agriculture. The PPCR in its TA phase could potentially provide additional support to this initiative.	The World Bank
Nepal: Agricultural Insurance Feasibility Study	Agricultural Insurance Feasibility Study that will provide the framework for the development of a sustainable agricultural insurance in Nepal. The study will also identify technical, operational, financial and institutional challenges and possible solutions for the development of a market based agricultural insurance, possibly through a public-private partnership between Government of Nepal and the domestic insurance industry.	2008-2009	US \$188,000	<i>Building Resilience</i> against crop failure.	The World Bank
Support to Department of Hydrology and Meteorology for strengthening the capacity for flood reduction and adaptation to climate change	a) Development of flood forecasting and warning system for Nepal b) Increase national capacity to provide flood and climate information regarding past and current flood, climate, observable trends, and future climate change. c) Enhance the capacity to translate flood and climate information into impacts outlook and response options. d) Demonstration of flood and climate information applications in Bagmati basin.	2009-2011	US \$ 400,000	Building adaptative capacity through flood and climate information to the communities.	DANIDA
Finnish-Nepalese Project for Improved capability of the	Intended to improve capability of the Government of Nepal to respond to the increased risks of natural disasters related to weather and climate.	2010 – 2012 (2.5 years)	US\$0.7 million	Enhanced capacity of the Department of Hydrology and Meteorology for hydro meteorological observations and	Finland

Government of Nepal to respond to the increased risks related to the weather-related natural disasters caused by climate change.				services. Also complementing to the Regional Flood Information System in Hindu Kush – Himalaya.	
Establishment of Regional Flood Information System in the Hindu Kush-Himalaya	The project, with ICIMOD, is intended to minimize loss of lives and livelihoods by providing timely warning information and thus reducing flood vulnerability in the HKU region, in particular in the Ganges – Brahmaputra – Meghna and Indus river basins through sharing meteorological and flood data and information amongst six regional partner countries, Bangladesh, Bhutan, China, India, Nepal and Pakistan.	2009 – 2012 (3 years)	\$US 2.9 million	Enhanced technical capacity of partner countries would improve flood forecasting, disaster preparedness and water related hazards that are expected to occur as a result of climate change. Sharing of timely and reliable flood warning systems would improve the lead time for taking risk reduction measures in the region.	Finland
Earthquakes and Megacities Initiative (EMI) Project: Mainstreaming Disaster Risk Reduction in Metro Manila and Kathmandu	Funded by the German Federal Foreign Office and jointly undertaken with the <i>Deutsches Komitee Katastrophenvorsorge</i> (DKKV), the project focuses on (a) mitigation through risk-sensitive land use planning and (b) city-level disaster management planning.	Nov.2007- Dec.2009	US \$0.67 million	The project laid foundations for minimizing potential damages from earthquake-related hazards. It aims to strengthen institutional capacities of the City Governments in disaster risk reduction practices within their basic local governance functions such as land-use allocations, urban planning, public works, social welfare, and disaster management.	Germany
Road Maintenance Strengthening Project	-The project aims to improve the road maintenance system in the following ways, (1) Technology transfer in slope stability, (2) Introduction of Road Information System, (3) Strengthening of road inspection and (4) Establishment of road maintenance funding system.	2010-		<i>Adaptation</i> -Support for establish a stable transportation infrastructure against natural disasters	JICA
Community-based vulnerability assessment, risk mapping and	The action plan will recommend jurisdictional responsibilities of various a methodology/tool to evaluate a communities' ability to adapt to climate change, identify vulnerable areas and	2010-2011	US \$300,000 grant	A methodology/tool to evaluate a communities' ability to adapt to climate change, identify vulnerable areas and determine risks faced.	ADB

adaptation planning.	determine risks faced. levels of government. To support this, a related activity for strengthening capacity among community-level stakeholders through climate change vulnerability assessments, vulnerability mapping, and adaptation planning is expected to commence in February 2010. This methodology will be agreed upon by government and non-government partners working in the area of climate change in Nepal.				
Trans-boundary Kailash Landscape Project (UNEP)	ICIMOD in collaboration with UNEP is implementing trans-boundary Kailash Landscape project which has components of climate change.	NA	NA	NA	UNEP
Disaster Risk Reduction	The WB, in cooperation with UNDP, ADP, ISDR and Red Crescent, is helping the GoN to develop a joint strategy for disaster risk management.			<i>Building Resilience</i> Anticipated climate change impacts, particularly in the form of flood and drought, will be part of this exercise.	The World Bank
Hazard Risk Management Program: Nepal	To mainstream disaster reduction in poverty reduction strategies and supporting national capacity to deal with natural disaster risk.	2007-2013	US \$914,000	<i>Building Resilience</i> The Global Facility for Disaster Reduction and Recovery (GFDRR) mainstreams disaster reduction in poverty reduction strategies and supporting national capacity to deal with climate-change natural disaster risk.	The World Bank with UNISDR and DfID
Regional Climate Risk Reduction Project (RCRRP) in the Himalayas	The Project seeks to develop and implement comprehensive risk management strategies in the Himalayan region to reduce the risks faced by mountain communities and to mitigate the impacts of hydro-meteorological/climatic hazards	October 2009-December 2010	About 0.2 Milli	<i>Capacity building and developing strategies at local level</i>	
Livelihood Forestry Programme (LFP)	The Livelihood forestry programme aims to enhance the assets of rural communities through more equitable, efficient and sustainable use of forest/ natural resources	2001-2011	19.87 million£	Promoting growth The project explore on creating green jobs and employment through better management of forest resources	DFID
National Forestry Programme (NFP)	The new National forestry programme will contribute to better livelihoods of for poor, vulnerable and disadvantaged people	2010-2020	The cost will be approximately £50m - of which	Promoting growth Enhanced assets of rural communities through more	DFID

	particularly women.		DFID's contribution will be £35m-£40m (£3-4m per year) and SDC's contribution will £15m (£1-2m per year) Possible Finnish support TBC	equitable, efficient and sustainable use of forest resources and better forest sector governance leading low carbon development pathways and creating green jobs.	
Community-based Land and Forest Management in the Sagarmatha (Everest), National Park Nepal	The project contributes to the sustainable management of natural resources in the Himalayan region, through sensitisation of the communities and private forest' owners to reduce further deforestation, and integrate the principles of sustainable development into the country policies and programmes.	2009 - 2012	US\$ 700,000 (910,000)	<i>Building Resilience</i> The project increases resilience, hence contributes to the mitigation of the impacts of the climate change. Achieving MDGs no. 7 through sustainable land and forest management.	EU
Enhancement of Sustainable Production of Lokta Handmade Paper in Nepal	The project aims to the production of "Lokta" paper and its product a sustainable economic activities, reducing the social and environmental challenges associated with the production of paper and paper products, as well as to increase the earning of the marginalized farmers and small scale entrepreneurs.	2009 - 2013	US\$ 1.8 Million (2)	<i>Building Resilience</i> Sustainable exploitation of natural resources, preventing further deforestation, finally reducing emission of the GHGs (CO ₂) emission during the production processes of hand made paper and its products.	EU
Forest Resource Assessment in Nepal (national forest inventory)	The project is designed to obtain forest information at national scale concerning Non-Timber Forest Products, Trees Outside Forests, carbon content, forest biodiversity, human and biotic pressure and the soil characteristics among others as elements of the forest characteristics	2009 -2014 (5 years)	US\$ 6.8 million	The project flags out the opportunities that exist for generating financial resources through carbon trading supporting Clean Development Mechanism (CDM) projects, supporting "Reducing Emissions from Deforestation and Forest Degradation" (REDD) mechanism, different climate change adaption and mitigation mechanisms and through payment of environmental services. The project outputs can be valuable tools to monitor climate change.	Finland
Participatory	- The Project aims to improve participatory	2009-2014		<i>Adaptation & Mitigation</i>	JICA

Watershed Management and Local Governance Project	watershed management in collaboration with DSCO and local bodies in 8 districts. Its activities include rural development sub projects.			-Soil conservation, forest management improvement -Awareness raising among local bodies	
Nepal Swiss Community Forestry Project	The project supports community forestry in four districts of central region. The project is focused on increasing forest density and reducing deforestation and degradation. It is looking at the potential of linking community forest user groups to the carbon markets and benefit from carbon trade. The project also supports Ministry of Forests for REDD strategy development and preparation of R-Plan that are pre-requisite to benefit from carbon trade. It supports civil society groups for awareness raising on CC issues related to forestry and their capacity building for negotiation related to carbon markets and equitable share of benefits.	2008-2011	CHF 4.2 Million Plus Technical (human) resources	Mitigation - Increasing carbon sequestration through better forest density and reducing deforestation - Country's readiness through policies, strategies and through awareness and capacity building	SDC
Reducing emissions from deforestation and degradation	The objectives are to: (i) raise the level of awareness among key stakeholders about the benefit of markets for ecosystem services in responding to environment and development goals; (ii) demonstrate related market and associated policy and institutional mechanisms for ecosystem service transactions in selected sites for learning and subsequent replication, especially to capture financial transfers through the carbon market under the scheme of Reduced Emission from Deforestation and Degradation; and (iii) identify levers for incorporating appreciation for and application of markets for ecosystem services in ADB investments.	2010-		ADB is providing technical assistance to promote expanded market transactions relating to the provision of ecosystem services in Cambodia, Indonesia, Lao PDR, Nepal, Papua New Guinea, the Philippines, and Thailand.	ADB
Forestry (Reduced Emissions from Deforestation and Degradation/REDD	Nepal was selected by the Forest Carbon Partnership Facility (FCPF) to prepare a Readiness Plan to Reducing carbon Emissions by decreasing Deforestation and Degradation			<i>Raising Awareness and Capacity Building</i> The program assists Nepal's efforts to reduce its greenhouse gas	UN (FAO), The World Bank

)	(REDD) activities, which would prepare the country to receive possible carbon credits in a post Kyoto environment. The REDD cell has been established and Nepal is working towards the preparation of this readiness plan.			emissions from deforestation and land degradation.	
Assessment of Role of Community Forests (CFs) in CO2 Sequestration, Biodiversity and Land Use Change Nepal Development Research Institute	This study aimed to: estimate carbon deposit in forest, document tree species diversity, map land use change areas in selected CFs, and analyze the role of CFs in CO2 sequestration, biodiversity, and land use change. The study showed that CFs have been playing crucial role in increasing forest cover and tree density in public and private lands, and contributing to a substantial increment in carbon sequestration.	July 2009- July2010	US\$ 38050	<i>Generating knowledge on role of forestry in carbon sequestration</i>	
Reducing Emissions from Deforestation and Forest Degradation (REDD)	Nepal was selected by the Forest Carbon Partnership Facility (FCPF) to prepare a Readiness Plan to Reducing carbon Emissions by decreasing Deforestation and Forest Degradation (REDD) activities, which would prepare the country to receive possible carbon credits in a post Kyoto environment. The REDD Cell has been established at the Ministry of Forests and Soil Conservation and Nepal is working towards the preparation of this readiness plan.	On going		<i>Provide knowledge on reducing carbon emission from forest sector</i>	
WWF (adaptation to climate change)	Climate Adaptation Project implemented in Langtang National Park and Buffer Zone, Planning for Climate Vulnerability in the Snow Leopard Range of Nepal, Bhutan, India, and China Reducing poverty in Nepal, through innovative and equitable carbon financing mechanism, focused on avoided deforestation and forest degradation Development of Standard vulnerability assessment methodology as part of the consortium	On going		<i>Awareness and capacity building</i>	
IUCN (Capacity building)	Vulnerability assessment at community level from climate change risks Undertook Payment for Ecosystems Services	On going		<i>Awareness and methods/tools development</i>	

	(PES) in the changing climatic conditions				
Practical Action (adaptation to climate change and disaster risk reductions)	Livelihood centred approach for DRR (disaster prone area – residence increase) Flood early warning system – Chitwan Vulnerability assessment and training component Local level impact assessment from climate change				
Climate impacts on health	The study will focus on disaster risk management and climate change impacts in the agriculture and water sectors. The objectives of the study are to (i) improve understanding of health-related implications and costs of climate change through climate-related impacts in water and agriculture sectors, (ii) examine how climate-related health risks can be better incorporated in disaster risk management strategies, (iii) assess if and how climate-related health impacts were considered and addressed in ADB water and agriculture programs, (iv) analyze how selected developing member countries (DMCs) have integrated climate change and health impacts in the national adaptation agenda, and (v) identify knowledge gaps and capacity building needs in ADB and DMCs in climate change adaptation and health planning.	2010 -		ADB will finance a study to better understand climate change impacts on health in Nepal, the Philippines, and Tajikistan.	ADB
Health sector capacity enhanced to identify, adopt and prevent public health problems resulting from climate change (WHO)	Support to national consultations, research and surveys on the effects of climate change in various climatic and topological settings in Nepal, in particular with reference to vector-borne disease and water resources. Identification evidence of effect in public health resulting from climate change Review GoN policies in agriculture, water , sanitation, infrastructure, transport, labor with respect to climate change and human health and formulate appropriate recommendations for good practice.	Feb 2010 to July 2011	US\$23,000 million	<i>Capacity building and policy support</i> This is related to WHO organizational expected result: Health sector capacity enhanced to identify, adopt and prevent public health problems resulting from climate change	UN (WHO)

Water supply, sanitation, and urban development.	ADB will support the Government in addressing climate change issues by (i) identifying and developing climate change mitigation projects, (ii) identifying and developing CDM projects to access carbon markets, and (iii) incorporating climate change projections into the design of urban infrastructure.				ADB
Support to AEPC, Government of Nepal: Energy Sector Assistance Programme (ESAP)	ESAP is a Program within The Alternative Energy Promotion Centre (AEPC). Building AEPC's capacity to function as a national resource centre for alternative energy promotion. Providing subsidies for consumers who wish to invest in alternative energy. Providing support to consumers and private sector service providers with a view to developing, manufacturing, marketing, installing and maintaining alternative energy solutions.	2007-2012	US \$ 30 Million (DANIDA) US\$22 Million (Norway)	Raising awareness on the carbon free clean energy and Improving the living condition of the rural population by strengthening their physical and economic access to alternative energy solutions, which are effective and environmentally sustainable.	DANIDA, Norway
Renewable Energy Project (REP)	The REP is one of the priority areas of EU cooperation, concentrating on the overarching objective of poverty alleviation in Nepal by creating a renewable energy infrastructure in rural areas of 21 districts, facilitating income generation, sustainable growth and delivery of social services. Additionally, the project significantly contributes to reduction of the emission of the Greenhouse Gases (GHGs), improving the environment at local and global level, ultimately contributing to the global effort to	2004 - 2012	US\$ 21 Million (22)	<i>Promoting Growth, Building Resilience and Capacity</i> Achieving MDGs no. 7 through the delivery of renewable energy services facilities, as well as assist the GoN to expand such resilient projects in other districts. Further, building capacity of national institution to tackle with the issues related to the climate change.	EU

	the mitigation of climate change.				
Small Hydropower Promotion (SHPP)	The Small Hydropower Promotion Project (SHPP) was established in 1999 as a joint project of the Ministry of Water Resources, Government of Nepal (Department of Electricity Development, DoED) and the GIZ (German Technical Cooperation). SHPP provides technical and logistic support to hydropower projects in Nepal within the range of 100kW to 10MW	April 1999 to September 2009	US\$ 7 Million	The project established a market for small hydropower development, rehabilitation and operation which in turn facilitates the expansion of rural electrification and lead to concomitant economic activities, environmental protection and rural development.	Germany
Biogas plants	The Nepal Biogas Projects promote with the support of the KfW (Development Bank of Germany - Financial Cooperation) the use of underground 'digesters' that use bacteria to generate methane gas from cattle dung. Using methane instead of wood or kerosene to power stoves or lamps can reduce a household's greenhouse gas emissions by five tonnes a year.	1997 bis 2011	US\$ 31 Million	The projects are bringing clean and efficient energy to rural communities in Nepal. Over 189000 biogas plants were installed so far, until 2011, the installation of 60 000 more is scheduled. The main advantage of biomass over fossil fuels is that it is deemed to be emissions-neutral.	Germany
Hydroelectric Power Plant Middle Marsyangdi	Since Nepal is not blessed with abundant natural resources such as oil or coal, their main source of energy is water power. Year after year, demand for electricity and	1998-2009	US\$ 245 Million	The new power plant generates 72 MW or 400 GWh per year as an alternative to fuel-fired energy plants.	Germany

	<p>peak loads of Nepalese hydroelectric power plants rise by 8-9%.</p> <p>As a result, construction began with the support of the KfW (Development Bank of Germany - Financial Cooperation) 20 years ago on three dams on the Marsyangdi River. The middle dam, Middle Marsyangdi, is located approximately 170km west of Kathmandu.</p>				
Alternative Energy Promotion Center (AEPC)	<p>AEPC is an organisation devoted to the development and promotion of renewable and alternative energy technologies in Nepal. The KfW (Development Bank of Germany - Financial Cooperation) supported the AEPC in the fields of renewable energy and energy efficiency.</p>	2008-2009	US\$ 5.5 Million	<p>AEPC popularises and promotes the use of renewable energy technology to raise living standards of the rural people, to protect the environment and to develop commercially viable alternative energy industries in the country.</p>	Germany
SAARC Energy Centre	<p>South Asian Association for Regional Cooperation (SAARC) was created in 1985. The energy cooperation is a driver for the SAARC process leading to durable peace in the region. SAARC Energy Centre has been created through Dhaka Declaration in 2005, as the Special Purpose Vehicle to realize the vision of SAARC leaders to establish an Energy Ring in South Asia. The German Development Cooperation counsels SAARC Energy Centre in the fields of renewable energy.</p>	Jan.2008-Dec.2010	US\$ 3 Million	<p>SAARC energy cooperation program provides a major substantive element for economic prosperity of South Asia through meeting the energy demand of the countries. It is converting energy challenges into opportunities for development. It is the platform involving officials, experts, academics, environmentalists and NGOs to tap potentials of cooperation in energy sector including development of hydropower, renewable and alternative energy, promoting technology transfer, energy trade, energy conservation and efficiency improvement in the region.</p>	Germany
Project for the Nationwide Master Plan Study on Strage-type Hydroelectric Power	<p>-The Study aims at preparation of the Hydroelectric Power Development Master Plan for the period of 20 years within the</p>	2010-2011		<p><i>Mitigation</i></p> <p>-Japan supports for clean energy development</p>	JICA

Development	framework of power system development plan that shall articulate development plan of selected Storage-type Hydroelectric Power projects of 100MW to 300MW in the capacity range suitable for domestic power supply.				
Project for Introduction of Clean Energy by Solar Electricity Generation System	The project aims to promote clean energy utilization and achieve emissions reduction by installing the photovoltaic system as a demonstration at Dhobighat Water Storage Pond to be connected to the national grid.	2010-2011	JPY 660million	<i>Mitigation</i> -Japan supports for clean energy development	JICA
Preparation of feasibility studies of small hydro	Cooperation between the Department for Electricity Development and the Norwegian Water Resources and Energy Directorate. Feasibility studies of small hydro power projects are undertaken. The projects are offered to commercial developers.	2002-2011	US\$1.5 million	<i>If some of the projects are developed, hydro power may replace electricity generation from diesel or coal</i>	Norway
Khimti Neighborhood Development Project	Rural electrification project with a mini-hydro power plant and also some local development activities	2007 -2010	US\$3,6 million	<i>Hydro power may replace energy generation from firewood, kerosene, diesel or coal.</i>	Norway
Irrigation and rural electrification - Butwal Power Company	Rural electrification	2006 -2010	US\$ 2 million	<i>Hydro power may replace energy generation from firewood, kerosene, diesel or coal.</i>	Norway
Vertical Shaft Brick Kiln Project /Clean Energy Building Technologies for Nepal	SDC is supporting Vertical Shaft Brick Kiln/ Program in Nepal since 2002. It aims to find local solutions through the introduction of cleaner building technologies such as clean bricks firing technologies and innovative building materials and techniques leading to the reduction of GHG emission. The project works with entrepreneurs (private sector) to promote cost effective, social and environment friendly	2008-2011	CHF 2.5 Million	Mitigation - Through clean energy technologies; - In process to link contribution of the technology on CO ₂ reduction to carbon trading- as an incentive for private sector to invest on.	SDC

	building technologies				
Integrated Water Resources Management	ADB is funding a study on IWRM in the Bagmati Basin through a regional TA entitled Supporting Investments in Water Security in River Basins. The TA will assist in implementing key aspects of the Bagmati Action Plan. The TA will be followed by a project preparatory TA to prepare an investment project called the Bagmati River Improvement Project.	2010-2011			ADB
Climate data digitization and downscaling of climate change projections	This work will be done in conjunction with the Nepal Department of Hydrology and Meteorology (DHM). The scope of work will be developed in three phases: (a) digitization of historical meteorological data, data quality control, and analysis; (b) statistical climate downscaling and web portal development; and (c) workshops and dissemination. Based on the consultants' experience in preparing the above, they will also prepare a proposal for DHM for long-term funding to improve climate data collection and management. The terms of reference for consulting services is currently being reviewed by DHM.	2010-2011	\$400,000	ADB is supporting the critical digitization and quality control for historical meteorological data in Nepal and the development of statistical climate downscaling for the country in order to generate future climate change projection data for policy development and further impact analyses at the sector level.	ADB
Power Development Project	The PDP will finance TA to update Nepal's major river basin master plans and add analysis of anticipated climate change impacts. The PDP is also funding the scaling-up of the successful Micro-hydro Village Electrification	2010-2012	US\$124.3 million IDA Credit and US\$40.5 million IDA Grant	<i>Building Resilience</i> Project will help in planning more resilient power development in Nepal where the power sector is overwhelmingly hydropower-based.	The World Bank

	Program through AEPC				
Kabeli Generation & Transmission Project	IDA funds will provide financing for the 35 MW Kabeli “A” project and transmission in the Kabeli River Corridor that will eventually evacuate up to 100 MW of low-carbon hydropower.	2011-2014 (Concept note under preparation)	USD 50 million (IDA)	<i>Promoting Growth</i> Hydropower generation displaces expensive, polluting fossil fuels that would otherwise to be used to generate electricity in Nepal	The World Bank
Biogas	Two biogas operations are being supported to increase access to modern energy sources in the rural and peri-urban areas of Nepal	2006-2015	US\$7.0 million TF Grant	<i>Promoting Growth</i> Biogas reduces global emissions of carbon dioxide, a greenhouse gas.	The World Bank
Hydropower Development and Cross-border Power Trade	The Bank is in the early stages of identifying a cross-border hydropower generation project and a cross-border transmission line that will promote a low carbon energy mix in Nepal and regionally	Concept Notes under preparation		<i>Promoting Growth</i> Hydropower generation displaces expensive, polluting fossil fuels that would otherwise to be used to generate electricity in Nepal and India.	The World Bank
Demand-Side Management and Energy Efficiency	The Bank is supporting efforts to identify demand-side management and energy efficiency opportunities in the Nepal power system through technical assistance provided to the Nepal Electricity Authority (NEA). The TA is providing both new analysis (a detailed load profile of the power grid in Nepal) and support to NEA to operationalize a new DSM cell.	Approaching completion (final workshop in February 2010)		<i>Promoting Growth</i> Improved energy efficiency (energy source from fossil fuels) reduces greenhouse gas emissions	The World Bank
Water Resource Information System	The Bank is supporting the development of a geo-referenced water resources information system and building capacity in river basin modeling to enable water managers to better track, predict and manage the future hydrological variability and future climate change.	2010-2011	\$150,000 (Partners are AusAID, DfID, and Norway)	<i>Building Resilience</i> Improved geographic information system (GIS) on water resources helps Nepal to coordinate and plan its response to climate change	The World Bank
Ganges Strategic Basin Assessment	A hydro-economic model of the Ganges River Basin (all of Nepal lies within this basin) is being developed to explore a range of	2009-2010	\$600,000 (Partners are AusAID, DfID)	<i>Building Resilience</i> By providing information for to support adaptation planning	The World Bank

	climate change scenarios and cooperative and non-cooperative basin management regimes, and assist in adaptation planning.		and Norway)		
Glacial Retreat in the Nepal Himalayas	Build understanding of the causes, scale, and near-term and long-term consequences of glacial retreat, which will have significant implications for basin-level management of cross-boundary water resources	2008-2010	(Partners are AusAID, DfID and Norway)	<i>Building Resilience</i> Greater understanding of the glacier dynamics & stream flow will help focus adaptation efforts	The World Bank

Annex 3: Key Institutions with Role in Managing Climate Change Risks in Nepal

Composition of the Climate Change Council

Right Honourable Prime Minister is the Chairman of the Council and Honourable Deputy Prime Minister is the Vice-Chair. The members of the council include, Honourable Deputy PM and Minister for Foreign Affairs, Honourable Minister for Environment, Honourable Minister for Forests and Soil Conservation, Honourable Minister for Finance, Honourable Minister for Agriculture and Cooperatives, Honourable Minister for Energy, Honourable Minister for Industry, Honourable Minister for Health and Population, Honourable Minister for Home Affairs, Honourable Minister for Local Development, Honourable Minister for Law and Justice, Honourable Vice-Chair, National Planning Commission, Honourable Member(Environment) National Planning Commission, Chief Secretary, Office of Prime Minister and Council of Ministers, Experts (8) nominated by the Government of Nepal and Secretary, Ministry of Environment.

Multi-Stakeholder Climate Change Initiatives Coordination Committee (MCCICC)

MCCICC reports to the Climate Change Council and contributes to mainstreaming the climate change programmes into development planning and implementation.

Advisory Bodies

<i>Institution</i>	<i>Major Roles and Responsibilities</i>
<i>Parliamentary Committee on Environment</i>	<ul style="list-style-type: none"> ➤ Review of bills on environment management related fields – including climate change - and make recommendations to parliament for improvement ➤ Provide guidance to line ministries in achieving the objectives of environmental and climate change related legislation ➤ Monitoring and evaluation of the performances of line ministries in regards to implementation of climate change policies and guidance for performance improvement
<i>Environmental Protection Council</i>	<ul style="list-style-type: none"> ➤ Provide advice to government on setting policies and strategies to achieve the objective of sustainable development including climate change. ➤ Coordination at the highest level in government, private sector, academia, and others to facilitate implementation of sustainable development policies
<i>National Commission on Sustainable Development</i>	<ul style="list-style-type: none"> ➤ Promote and streamline sustainable development activities in Nepal including those related to climate change.
<i>National Planning Commission</i>	<ul style="list-style-type: none"> ➤ Provide views on policies, plans, programs and projects pertaining to climate change in the broader economic context of the country.

Key Ministries

<i>Institution</i>	<i>Major Roles and Responsibilities</i>
Ministry of Environment (MoE)	<ul style="list-style-type: none"> ➤ Formulation, implementation, monitoring and evaluation of policy, plans, and programs on environment, science and technology and climate change ➤ Coordination with national and international institutions working in environment and climate change ➤ Promotion of R&D, awareness creation, and publications of environment and climate change related works ➤ Development and utilization of human resources in environment and climate change fields ➤ Promotion of alternative energy technologies ➤ Evaluation and assessment of government and non-governmental institutions in the environment and climate change fields
Ministry of Forestry and Soil Conservation	<ul style="list-style-type: none"> ➤ Formulation and implementation of policies, plans, and programs on forests, natural environment, and biodiversity (all of which would be impacted by climate change).
Ministry of Agriculture and Cooperatives	<ul style="list-style-type: none"> ➤ Formulation and implementation of agricultural and cooperative development policies and plans (most of which will be impacted by climate change) ➤ Conduct agriculture research and survey on various types of climate resistant crops. ➤ Provide extension services to farmers and communities on adaptation approaches
Ministry of Irrigation (MOI)	<ul style="list-style-type: none"> ➤ Development of policies, plan and implementation for conservation, regulation and utilization of water resources ➤ Construction, operation and maintenance and promotion of multipurpose water resources projects ➤ Conduct studies and research on improving water use efficiency including groundwater for its use in irrigation ➤ Coordinate with bilateral and multilateral dialogues, agreements and understandings regarding water resources
Ministry of Industry, Commerce, and Supplies	<ul style="list-style-type: none"> ➤ Policy formulation and planning of industry, commerce and essential commodities including petroleum products ➤ Promotion of domestic and international trade while ensuring resource sustainability
Ministry of Local Development (MLD)	<ul style="list-style-type: none"> ➤ Formulation, implementation and monitoring of policies and programs on remote area development, integrated rural development and local governance including decentralization
Ministry of Physical Planning and Works	<ul style="list-style-type: none"> ➤ Coordinate urban planning and housing development. ➤ Construct and operate water supply and sanitation services.

Key Departments and Agencies

<i>Institution</i>	<i>Major Roles and Responsibilities</i>
<i>Department of Hydrology and Meteorology (DHM)</i>	<ul style="list-style-type: none"> ➤ Collect and disseminate hydrological and meteorological information for water resources, agriculture, energy, and other development activities. ➤ Issue hydrological and meteorological forecasts for public, mountaineering expedition, civil aviation, and for the mitigation of natural disasters. ➤ Conduct special studies required for policy formulation and for the development of hydrological and meteorological sciences in the region. ➤ Promote relationship with national and international organizations in the field of hydrology and meteorology.
<i>Alternate Energy Promotion Centre (AEPC)</i>	<ul style="list-style-type: none"> ➤ Provide guidance for the formulation of alternative and renewable energy technology policies for their promotion, extension, development and dissemination ➤ Undertake applied research and recommend appropriate alternate energy technologies suitable to rural people ➤ Set standards and /or specifications for alternate energy technologies.
<i>Department of Transport Management (DOTM)</i>	<ul style="list-style-type: none"> ➤ Management of transport system in the country
<i>Department of Forest (DOF)</i>	<ul style="list-style-type: none"> ➤ Protection, management and utilization of forests and conservation of natural resources with the aim to improve livelihoods
<i>Water and Energy Commission Secretariat (WECS)</i>	<ul style="list-style-type: none"> ➤ Formulation of policies and strategies for various aspects of water resources and energy development keeping in line with the priorities and targets of Government of Nepal. ➤ Provide advice on developing laws pertaining to the development of water resources and energy. ➤ Establish coordination among national and sectoral policies relating to water resources and energy sector. ➤ Identify viable projects relating to the development of water resources and energy.

Key Institutions in Private and Non-Government Sector

<i>Institution</i>	<i>Major Roles and Responsibilities</i>
<i>Federation of Nepalese Chamber of Commerce and Industry (FNCCI)</i>	<ul style="list-style-type: none"> ➤ Plays a catalytic role in business and industrial development ➤ Creates awareness and support for business and industry efforts on issues affecting business like quality, social responsibility, corporate governance, child labor, environment, climate change risks, etc.
<i>Federation of Community Forestry Users Nepal (FECOFUN)</i>	<ul style="list-style-type: none"> ➤ Promotes and protects the rights of community forestry users through capacity strengthening, economic empowerment, sustainable resource management, technical support, advocacy and lobbying, policy development, and national and international networking and to uphold the values of inclusive democracy, gender balance, and social justice

