BIODIVERSITY, PEOPLE AND CLIMATE CHANGE

Final Technical Report of the Hariyo Ban Program, First Phase

Volume One
Main Report

HARIYO BAN PROGRAM

This final technical report for Hariyo Ban Program Phase One is submitted to the United States Agency for International Development Nepal Mission by World Wildlife Fund Nepal in partnership with CARE, the Federation of Community Forest Users Nepal and the National Trust for Nature Conservation, under Cooperative Agreement Number AID-367-A-11-00003.

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Hariyo Ban worked with a very large number of community based organizations (CBOs) and community members; this includes very many women, poor, and marginalized people. CBOs included community forest user groups, buffer zone user groups, conservation area management committees, leasehold forest user groups, cooperatives, community based anti-poaching units, water user groups, women's groups, ecoclubs, farmers' groups, and female community health volunteers. We also worked with networks and associations, including district chapters of the Federation of Community Forest Users Nepal (FECOFUN), community forest coordination committees, and the National Network of Community Disaster Management Committee (NCDMC). Local communities, CBOs and their networks were the backbone of the Program, and very many results in the field are due to their hard work, inspiration and resilience.

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Judy Oglethorpe, Chief of Party, Hariyo Ban Program (Phase I)
Sandesh Hamal, Deputy Chief of Party, Hariyo Ban Program

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ABBREVIATIONS AND ACRONYMS

ACA	Annapurna Conservation Area
BAFER	Balchaur Forest and Environment Resource Development Centre
BaNP	Banke National Park
BBC	British Broadcasting Corporation
BCN	Bird Conservation Nepal
BIA	Biodiversity Important Area
BNP	Bardia National Park
BZCF	Buffer Zone Community Forest
BZCFUG	Buffer Zone Community Forest User Group
BZUC	Buffer Zone User Committee
CAMC	Conservation Area Management Committee
CAPA	Community Adaptation Plan of Action
CARE	Cooperative for Assistance and Relief Everywhere
CBAPU	Community-based Anti-Poaching Unit
CBO	Community-based Organization
CCA	Climate Change Adaptation
CCN	Chure Conservation Network
CDMS	Centre for Disaster Management Studies
CF	Community Forest
CFCC	Community Forest Coordination Committee
CFDG	Community Forest Development Guideline
CFOP	Community Forest Operational Plan
CFUG	Community Forest User Group
CHAL	Chitwan Annapurna Landscape
CLAC	Community Learning and Action Center
CNP	Chitwan National Park
CO_2	Carbon Dioxide
CO-ACT	Co-Action for Community Development
CSO	Civil Society Organization
CTEVT	Council for Technical Education and Vocational Training
DADO	District Agriculture Development Office
DANAR	Dalit Alliance for Natural Resources Nepal
DAO	District Administration Office
DDC	District Development Committee
DDRC	District Disaster Relief Committee
DFID	UK Department of International Development
DFO	District Forest Office
DFRS	Department of Forest Research and Survey
DLSO	District Livestock Service Office
DNPWC	Department of National Parks and Wildlife Conservation
DoF	Department of Forests
DOFC	Development Organization for Community
DPR	Department of Plant Resources
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DSCO	District Soil Conservation Office
DSCWM	Department of Soil Conservation and Watershed Management
DUDBC	Department of Urban Development and Building Construction
EBS	Equitable Benefit Sharing
EC	Executive Committee
EFLG	Environment-Friendly Local Governance Planning

ERPD	Emission Reductions Program Document
ER-PIN	Emission Reduction Program Idea Note
FECOFUN	Federation of Community Forestry Users Nepal
FRA	Forest Resource Assessment
GBV	Gender-based Violence
GCP	Global Conservation Program
GESI	Gender and Social Inclusion
GHG	Greenhouse Gas
GIS	Geographic Information System
GoN	Government of Nepal
GRB	Gender Responsive Budget
GRR	Green Recovery and Reconstruction
Ha	Hectare
HH	Household
HIMAWANTI	Himalayan Grassroots Women's Natural Resource Management Association
HWC	Human-Wildlife Conflict
ICDC	Integrated Conservation and Development Center
ICS	Improved Cook Stove
ID	Identity
IDE	International Development Enterprises
IEC	Information, Education and Communication
IGA	Income Generating Activity
InVEST	Integrated Valuation of Ecosystem Services and Tradeoffs
IoF	Institute of Forestry
IPCC	Intergovernmental Panel on Climate Change
IR	Intermediate Result
ISWMP	Integrated Sub-Watershed Management Plan
IUCN	International Union for the Conservation of Nature
Km	Kilometer
KOSIS	Kosis Community Service Centre
LAPA	Local Adaptation Plan of Action
LDRMP	Local Disaster Risk Management Plan
LHFUG	Leasehold Forest Users Group
LIP	Livelihood Improvement Plan
LNP	Langtang National Park
LNPBZ	Langtang National Park Buffer Zone
LRP	Local Resource Person
M&E	Monitoring and Evaluation
MCA	Manaslu Conservation Area
MICS	Metal Improved Cooking Stove
MITRA	Measures for Intervention Training Research and Action
MoFALD	Ministry of Federal Affairs and Local Development
MoFSC	Ministry of Forests and Soil Conservation
MoPE	Ministry of Population and Environment
MoSTE	Ministry of Science, Technology and Environment
MoU	Memorandum of Understanding
MoUD	Ministry of Urban Development
MRC	Multi-dimensional Resource Center
MSFP	Multi-Stakeholder Forestry Project
MT	Metric Tonne
MU	Mid-Western University
NAP	National Adaptation Plan
NAPA	National Adaptation Programme of Action
NCDMC	National Network of Community Disaster Management Committee
NEA	Nepal Electricity Authority

NGO	Non-Government Organization
NRM	Natural Resource Management
NRs	Nepalese Rupees
NTFP	Non-Timber Forest Product
NTNC	National Trust for Nature Conservation
PES	Payments for Ecosystem Services
PGA	Participatory Governance Assessment
PHPA	Public Hearing and Public Auditing
PMERL	Participatory Monitoring, Evaluation, Reflection and Learning
PSC	Program Steering Committee
PVSE	Poor, Vulnerable and Socially Excluded
PWR	Parsa Wildlife Reserve
PWBR	Participatory Well-Being Ranking
RATC	Regional Agriculture Training Center
REA	Rapid Environmental Assessment
REDD+	Reducing Emissions from Deforestation and Forest Degradation Plus
RIC	REDD+ Implementation Centre
SAGUN	Strengthened Action for Governance Utilization Nepal
SAHAS	Group of Helping Hands
SAMARPAN	Strengthening the Role of Civil Society and Women in Democracy and Governance
SCAPES	Global Conservation Program and Sustainable Conservation Approaches in Priority Ecosystems
SES	Social and Environmental Standards
SFM	Sustainable Forest Management
SMCRF	Small Mammal Conservation and Research Foundation
SWR	Suklaphanta Wildlife Reserve
TAL	Terai Arc Landscape
TU	Tribhuvan University
US	United States
USAID	United States Agency for International Development
US$	United States Dollar
VCAP	Vulture Conservation Action Plan
VDC	Village Development Committee
VER	Verified Emissions Reductions
WASH	Water, Sanitation and Hygiene
WOO	Windows of Opportunity
WWF	World Wildlife Fund

EXECUTIVE SUMMARY

The Hariyo Ban Program, funded by the United States Agency for International Development (USAID), is implemented by a consortium of four partners: World Wildlife Fund (WWF), Cooperative for Assistance and Relief Everywhere (CARE), National Trust for Nature Conservation (NTNC), and the Federation of Community Forest Users Nepal (FECOFUN). This report covers the first phase of the Program which ran from August 2011 to December 2016 and aimed to reduce adverse impacts of climate change and threats to biodiversity in Nepal. Phase I had three core interwoven components – biodiversity conservation, sustainable landscapes and climate change adaptation, with livelihoods, governance, and gender equality and social inclusion (GESI) as cross cutting themes. It operated in two landscapes: the Terai Arc Landscape (TAL) and Chitwan Annapurna Landscape (CHAL). It works closely with a wide range of stakeholders and beneficiaries at different levels including Government; local communities and community based organizations; non-government organizations (NGOs); academia; other projects; and the private sector.

During the first phase of Hariyo Ban, CHAL (covering the Gandaki river basin) was formally recognized by the Government of Nepal (GoN) as a new landscape in the country and prioritized for conservation. Hariyo Ban supported the Ministry of Forests and Soil Conservation (MoFSC) to prepare a Strategy and Action Plan for the landscape taking a river basin approach. It also supported the preparation of the next TAL ten-year Strategy and Action Plan. Together these landscapes cover over five million hectares of biodiverse area. Both Strategies mainstream climate adaptation. They now guide Hariyo Ban's work as it collaborates with GoN, communities and other stakeholders to help implement them, with a major focus on protected areas, corridors, biodiversity important areas, critical subwatersheds, and areas with high climate vulnerability.

Under the biodiversity component there was a major focus on reducing threats to biodiversity, conserving rare and endangered species, and restoring and conserving important ecosystem services and critical watersheds, endeavoring to build climate resilience of species and ecosystems throughout this work. In collaboration with various departments of the Ministry of Forests and Soil Conservation (MoFSC), other ministries and local partners as appropriate, Hariyo Ban tackled priority threats: overharvesting of forest resources; human-wildlife conflict; poaching and illegal trade of wildlife; uncontrolled fire; poorly designed infrastructure development; and wildlife disease. For example, human-wildlife conflict was tackled by supporting the creation of a National Level Relief Fund for Human-Wildlife Conflict, along with conflict reduction measures on the ground.

Working with partners, conservation of focal species was supported through long-term research, inventory and monitoring as a basis for management, and development of conservation action plans for selected focal species. Some wildlife species were translocated to parts of their former ranges to re-establish replicate populations, to make them less vulnerable to catastrophic events such as floods or disease. Habitat improvement for focal species was also supported: for example, restoration of grasslands and wetlands, and provision of water holes. Hariyo Ban provided support for the declaration of the Pokhara lake cluster as a Ramsar site, and preparation of a climate smart management plan for the site. Fourteen integrated sub-watershed management plans (ISWMPs) were prepared and implementation started. To promote a better enabling environment for biodiversity conservation, ten biodiversity related policies and strategies were supported.

Hariyo Ban I worked closely with local communities in biodiversity conservation, both supporting community management of biodiversity, and promoting improved livelihoods to help reduce unsustainable pressure and encourage community buy-in. Work included the formation of new community based anti-poaching units (CBAPUs), and strengthening and mobilization of existing

ones. This was complemented by livelihood development support for 79,830 poor, marginalized, forest-dependent people, and establishment of several ecotourism ventures and green enterprises.

The Program also played an important role in promoting better natural resource management (NRM) governance and GESI in biodiversity conservation, sustainable landscapes and climate change adaptation to help achieve these program objectives and improve the lives of poor and marginalized people, and women. This was done through enhancing participation and leadership of women and marginalized people in community forest user groups, and promoting equitable sharing of conservation benefits. Natural resource management (NRM) groups are gradually leveraging resources for the benefit of forest dependent people. Hariyo Ban also supported GoN to develop country-specific indicators for social and environmental standards in its work on reducing emissions from deforestation and forest degradation (REDD+). Major GESI results include: improved internal governance of forest groups; increased engagement by men and decision makers in promoting leadership of women and marginalized groups; early progress in reducing gender based violence (GBV) in NRM; and mobilization of change agents for social transformation. GESI was mainstreamed in the climate adaptation component through addressing differential impacts of climate change on women, poor, marginalized, and other vulnerable groups.

In the Sustainable Landscapes component the Program supported efforts to promote several types of payments for ecosystem services (PES), innovative ways to promote conservation and sound development through payments for services that ecosystems provide. The main focus was on REDD+, for which the Program supported GoN to develop enabling policies for REDD+ Readiness in Nepal. This included support to the Forest Policy 2014, Forestry Sector Strategy 2016, REDD+ Strategy, and seven other strategies and guidelines for sustainable forest management. Hariyo Ban also supported development of the REDD+ Emission Reductions Program Idea Note (ER-PIN) and REDD+ Emission Reductions Program Document (ER-PD) for a subnational REDD project in the Terai (the World Bank endorsed the ER-PIN; the ER-PD is still under preparation with World Bank funding). While the REDD+ policy work moved very slowly, much capacity was built for REDD+ from national to local level, and extensive work was undertaken to reduce priority drivers of deforestation and forest degradation in the landscapes, especially overharvesting of forest resources (including firewood); uncontrolled forest fires; and overgrazing. Hariyo Ban worked closely with communities and GoN to restore degraded forest areas and to improve management practices in community forests. An estimated 4.9 million metric tonnes (MT) of carbon dioxide equivalent (CO_2e) of greenhouse gas (GHG) emissions were reduced or sequestered, 3,184 hectares were brought under new plantation and 173,860 people benefitted from alternative energy support.

Hariyo Ban collaborated with stakeholders to pilot two payments for ecosystem services (PES) schemes involving payment for sediment retention through improved land use and road construction practices, as well as support to GoN to develop a National Policy on PES and built much capacity from local to national level to create an enabling environment for future PES implementation. It also supported development of a Gold Standard biogas project.

People and biodiversity in Nepal are facing increasing climate change impacts, which are affecting the way people use the environment and the services it provides. Ecological and human communities are vulnerable to various hazards like floods, landslides, droughts, irregular rainfall, and decreased water supplies. Impacts on people are already apparent; impacts on ecosystems are taking longer to manifest and may suddenly appear in the future as tipping points are reached. To reduce vulnerability, Hariyo Ban has made significant achievements by implementing climate change adaptation (CCA) activities in TAL and CHAL. At local level capacity was built in target communities and stakeholders to conduct vulnerability assessments and prepare adaptation plans; 331 community adaptation plans of

action (CAPAs) and 90 local adaptation plans of action (LAPAs) were prepared and the majority (328 CAPAs and 70 LAPAs) were implemented at least in part, benefitting 288,499 vulnerable people. While Hariyo Ban provided seed funding, further financial resources for this (over 30%) were raised from communities, village development committees (VDCs), and government line agencies. Adaptation covered a range of activities depending on vulnerabilities, and ranged from agriculture and livelihoods; disaster risk reduction (DRR); infrastructure development; water, sanitation and hygiene (WASH) and health; to forestry and ecosystem resilience building.

Successful innovations included: integration of ecosystem and human adaptation; incorporation of governance and differential vulnerability assessment in the LAPA framework; mainstreaming of CAPAs and LAPAs into local planning process as well as into CHAL and TAL landscape strategies and action plans; piloting the integration of CCA and DRR, and their mainstreaming in local planning processes; and promotion of upstream-downstream collaboration for adaptation and resilience building. Projections were made of the potential impacts of climate change on biodiversity, forests and human communities with recommendations for future actions to improve adaptive capacity and resilience. Implementation of four climate change related polices was also supported.

The operating environment over the last five years presented many challenges to the Program. The political situation evolved rapidly, with a Constituent Assembly election and passing of the National Constitution; as well as frequent strikes and unrest, and a long border blockade in the winter of 2015/16 which seriously affected Program work. Two serious disasters occurred during the first phase of Hariyo Ban which also disrupted the Program: the 2014 floods in the Terai, and the 2015 Gorkha earthquake. Hariyo Ban supported recovery work on a small scale after the floods, and undertook a significant amount of post-earthquake work for which it received additional funds from USAID. In the field it did relief, recovery and reconstruction work in four seriously affected program districts (Gorkha, Dhading, Nuwakot and Rasuwa), including livelihoods recovery; rehabilitation of water supply systems, foot trails, and renewable energy; and DRR including soil bioengineering to stabilize landslides. 106,999 earthquake-affected people benefitted from this support including 48,094 women and adolescent girls. The Program also worked with other sectors, encouraging them to adopt practical, environmentally sound practices to reduce adverse impacts in their recovery and reconstruction, and future disaster risk, by building back safer and greener. For this it worked initially with several humanitarian clusters, and later with GoN and civil society to mainstream sound environmental practices into official assessments, guidelines, training programs and manuals. It trained over a thousand people across many sectors, with a major focus on the housing sector since it is likely to have the largest environmental impacts during reconstruction.

The Windows of Opportunity (WOO) grant funds enabled a wide range of stakeholders to undertake innovative projects that added value to Hariyo Ban's results through applied research, piloting of promising approaches, policy development, capacity building or scaling up activities. The Program provided 58 grants to government agencies and 53 to NGOs, CBOs, academia and research institutions for innovative projects on the thematic and cross-cutting components. The Program also had a student research grant program, which supported 65 students.

The first phase of Hariyo Ban tested innovative new approaches and tools in its biodiversity, sustainable landscapes and climate adaptation work, as well as supporting tried and proven traditional approaches to conservation and forest management. Much learning took place over five years, a lot of it documented in reports and publications, forming part of the Program's legacy. The first phase helped create a solid foundation for phase two of Hariyo Ban, including the two GoN landscape strategies which Hariyo Ban II will help to implement. Much capacity has been built, and the enabling

policy environment has been strengthened. Hariyo Ban II will build on pioneering approaches such as the long-term climate monitoring plots in CHAL; payments for ecosystem services (PES) pilot schemes in Phewa and Marsyangdi; integration of CCA and DRR to build resilience of people and ecosystems; and the river basin approach with a holistic and long-term strategy for conservation, sound development and resilience building at different scales.

Phewa lake from Bhakarjung, the sedimentation of the lake clearly visible
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INTRODUCTION

This is the final report of the first phase of the Hariyo Ban Program (also referred to as Hariyo Ban, which means Green Forests in Nepali). The Hariyo Ban Program is a United States Agency for International Development (USAID) funded initiative implemented by a consortium of World Wildlife Fund (WWF) (lead organization), Cooperative for Assistance and Relief Everywhere (CARE), National Trust for Nature Conservation (NTNC), and the Federation of Community Forestry Users Nepal (FECOFUN). The first phase of the Program ran from August 2011 to December 2016; a second phase will continue till 2021. The Program works through multiple-level interventions in two priority landscapes with high biodiversity value: Terai Arc Landscape (TAL) and Chitwan-Annapurna Landscape (CHAL). The first phase had three core, interwoven themes: biodiversity conservation, sustainable landscapes, and climate change adaptation. Crosscutting themes were livelihoods, governance, and gender equality and social inclusion (GESI).

Goal and Objectives

The overall goal of Hariyo Ban Program Phase I was **to reduce adverse impacts of climate change and threats to biodiversity in Nepal.**

The three objectives were to:

1. Reduce threats to biodiversity in targeted landscapes
2. Build the structures, capacity, and operations necessary for effective sustainable landscape management, with a focus on REDD+ readiness
3. Increase the ability of targeted human and ecological communities to adapt to the adverse impacts of climate change

Beneficiaries, Stakeholders and Partners

Hariyo Ban worked with many government and non-governmental partners from local to national and sometimes international level to achieve its results. Forest dependent and climate vulnerable people belonging to poor and marginalized groups in the two landscapes were the primary beneficiaries, with a special focus on women and youths who were heavily dependent on forest resources for their livelihoods and wellbeing.

Major beneficiary, stakeholder and partner groups included:

- **Local community members and groups** with a focus on poor, vulnerable and socially excluded people; natural resource management (NRM) groups; local resource persons; citizen scientists; and earthquake-affected communities
- **Government of Nepal** including several ministries and departments at national and sub-national level, with the Ministry of Forests and Soil Conservation as the focal ministry
- **Civil society, research institutions and academia** including networks of natural resource management groups; local and national NGOs; local universities and colleges; and research institutions
- **Private sector organizations and media**
- **National and regional programs and projects** in Nepal.

A more detailed list of beneficiary groups and stakeholders is given in Annex 1.

Operating Environment

Nepal's highly varied physiographic and climatic conditions and location at the crossroads of the Indo-Malayan and Palearctic biogeographic regions have resulted in a very rich diversity of flora and fauna (MoFSC 2014a). The country has three main ecological zones running east to west: the flat plains of the Terai in the south, the mid-hills in the center, and the high mountains and desert plateau to the north, with several protected areas. In 2015, the country had over 44% forest and other wooded land cover (Department of Forest Research and Survey (DRFS) 2015). Many people are dependent on forests for resources and ecosystem services. Nepal has a very strong community forestry tradition which developed over the last few decades to improve local livelihoods and forest health, with strong support from civil society organizations and government, and donor projects such as the USAID-funded Strengthened Action for Governance Utilization Nepal (SAGUN), Global Conservation Program and Sustainable Conservation Approaches in Priority Ecosystems (SCAPES), and many years of support from United Kingdom's Department of International Development (DFID), Swiss Agency for Development and Cooperation and Government of Finland. More recently Nepal adopted a landscape approach to conservation, enabling management of forests, ecosystems and species at appropriate scales and enabling landscape linkages. Hariyo Ban works in two landscapes (TAL and CHAL), with strong support for community forestry and protected areas.

Although Nepal produces a negligible amount of the total global GHG emissions it is highly vulnerable to climate change. An increase in average annual temperature has been reported over the past few decades (Ministry of Environment 2010). Climate projections for Nepal suggest that monsoon precipitation will increase, especially in eastern and central Nepal, but actual rainfall patterns will be highly variable, both spatially and temporally. Extreme weather events are expected to become more frequent, and extended droughts will become interspersed between periods of intense precipitation while winters are predicted to become warmer (Xu 2007).

The first phase of Hariyo Ban operated within a rapidly changing political, economic and social context in Nepal. Extensive out-migration from rural areas continues, with a large absentee male population who send home remittances from employment in cities and foreign countries. Rural labor has decreased, with corresponding effects on agriculture, livestock husbandry and forest management. Infrastructure development is advancing fast, often resulting in adverse environmental impacts in Hariyo Ban landscapes from poorly designed roads and hydropower (WWF Nepal 2014). Human development indicators show improvement, but marked social inequalities continue (United Nations Development Program 2016), and discrimination against socially excluded groups and women is common, as is gender-based violence.

After a decade of armed insurgency a peace agreement was signed in 2006; the second Constituent Assembly was successfully elected in 2013 and the national Constitution was passed in 2015. Border blockades protesting the Constitution in the winter of 2015/16 caused extensive fuel and other shortages. The April 2015 earthquake caused massive loss of life and property, with 8,790 people dead, over 700,000 people pushed into poverty, and the total value of the disaster estimated to be around US$ seven billion (National Planning Commission 2015). The country is now in a long process of recovery and reconstruction, stretching government capacity between regular development and reconstruction work and changing the needs and focus of forest-dependent communities in earthquake-affected areas. The ongoing political instability and frequent change of national government has detrimental effects in all aspects including the development sector.

On the positive side, Hariyo Ban was able to respond to the earthquake with relief, recovery and reconstruction support, as well as collaborating with multiple sectors to promote environmentally

sustainable recovery and reconstruction practices. The government has significantly increased the budget for local bodies (VDCs and District Development Committees (DDCs)), creating an opportunity for resource leverage and continuity of Hariyo Ban results.

Structure of the Report

This report is in two volumes, which contain the main report and key annexes (Volume One), and detailed annexes (Volume Two). Volume One includes an introduction to Hariyo Ban and its operating environment (this section), followed by an overview of the two landscapes the Program works in. A summary of results is then presented, followed by the Program's strategic approach, progress and impacts across the three thematic components and three cross-cutting ones, including the post-earthquake relief, recovery and reconstruction work and the Windows of Opportunity grants fund. The next section covers major lessons, factors contributing to success, and sustainability of the Program. Finally, the conclusions section covers challenges and obstacles, gaps, and opportunities and proposed next steps. Success stories are incorporated in relevant sections to illustrate selected activities. Activity tools and methods are outlined in relevant sections, including existing tools and tools developed by Hariyo Ban, with discussion of their effectiveness as relevant.

CLAC members in a participatory exercise
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OVERVIEW OF PROGRAM LANDSCAPES

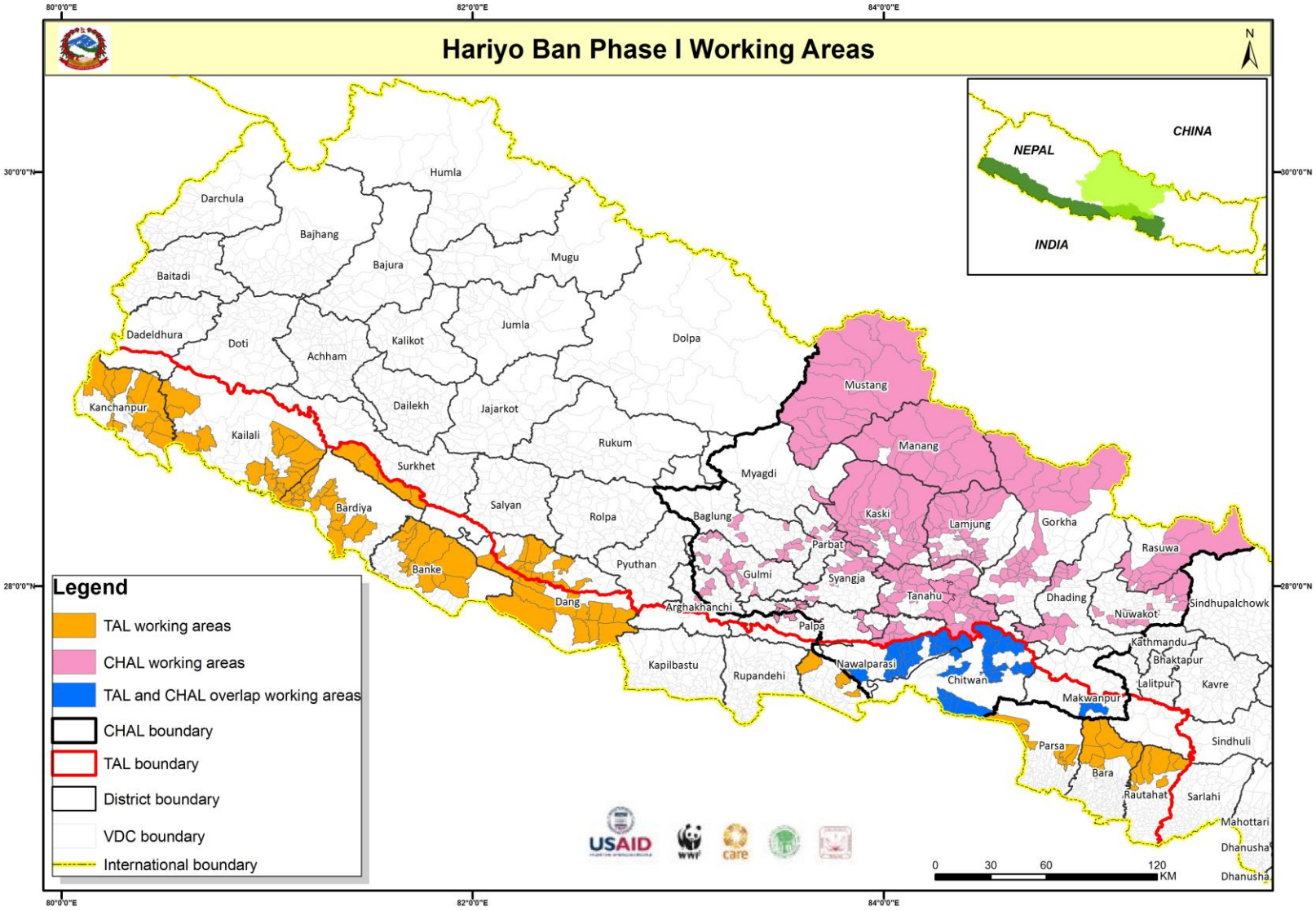
Landscape Approach

Hariyo Ban I took a landscape conservation approach to reducing threats to biodiversity and vulnerabilities of ecosystems and human communities to climate change. It worked in two very different landscapes.

The low-lying TAL's strategy is based on conservation of wildlife, creating original assemblages of focal wildlife species in their original ranges with reduction of threats, drivers and vulnerabilities in the protected areas, buffer zones and biological corridors; with promotion of climate smart approaches.

CHAL is one of four large river basins in Nepal, ranging from around 200 to over 8,000 m in altitude. The approach there aimed to improve both biophysical and socioeconomic conditions in critical catchments, north-south corridors, and river basin areas to maintain or restore natural processes.

Within the two landscapes Phase I worked in 9 protected areas, and partnered with 1,569 Community Forest User Groups (CFUGs), 64 Conservation Areas Management Committees (CAMCs), and 51 Buffer Zone User Committees (BZUCs) in 355 VDCs, 46 Municipalities, and 4 Sub-Metropolitan cities of 28 districts in CHAL and TAL. The working areas in the two landscapes are shown in Map 1.



Map 1: Hariyo Ban Program Working Area

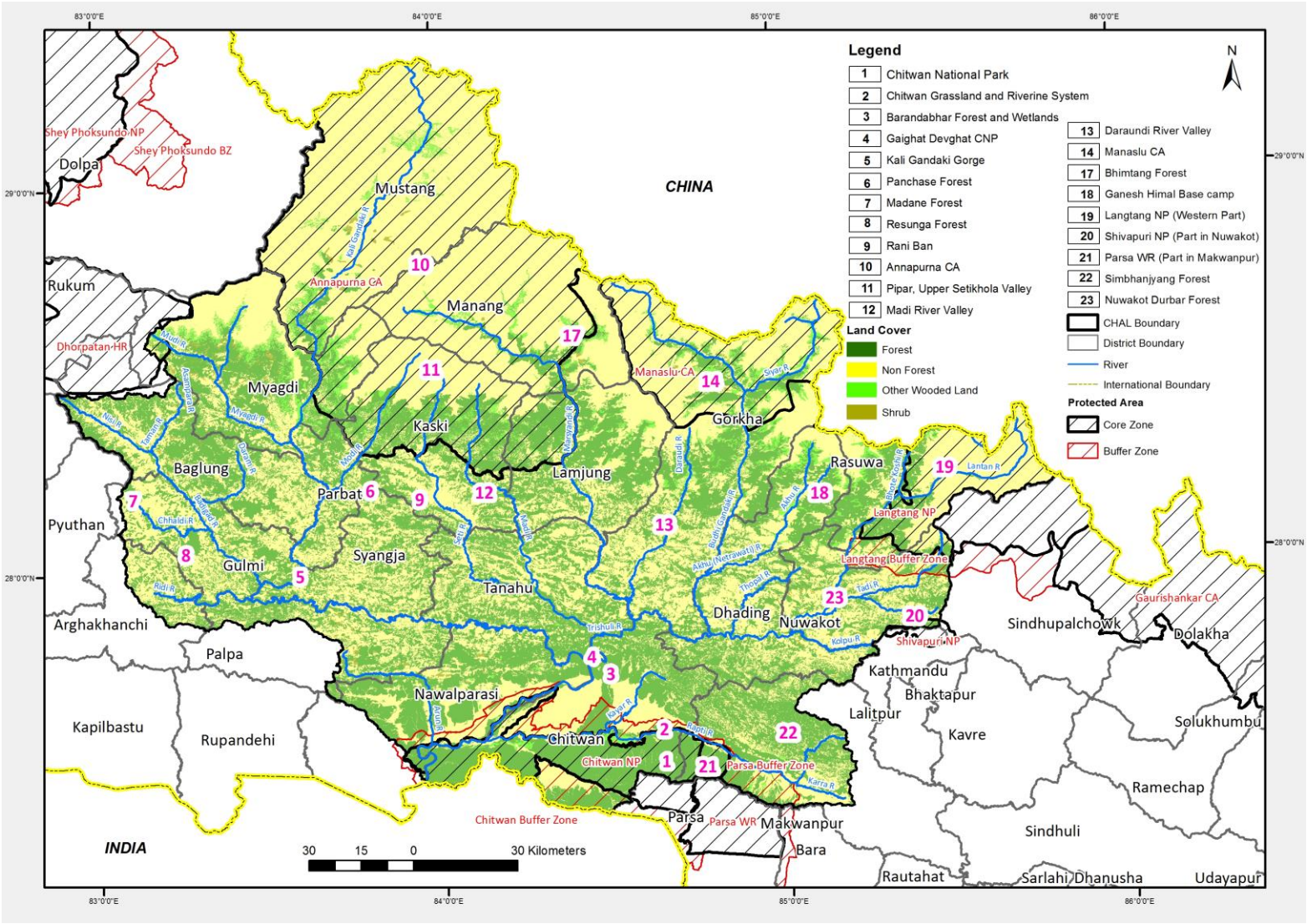
Chitwan Annapurna Landscape

CHAL covers 32,057 square kilometers, comprising all of the Gandaki basin in Nepal. It encompasses a varied topography from lowland Terai in the south, through the mid-hills, to the snowcapped high mountains and trans Himalayan desert in the north. Elevation ranges from 200 meters above sea level to 8,091 m at the peak of Annapurna I, the tenth highest mountain in the world. The basin has important water resources, with several major perennial rivers: Kali Gandaki, Seti, Marsyangdi, Daraundi, Budhi Gandaki, Trishuli, and Rapti. Its biodiversity includes parts of four WWF Global 200 Ecoregions: The Eastern Himalayan Alpine Scrub and Meadows, the Eastern Himalayan Broadleaf and Conifer Forests, the Terai-Duar Savannas and Grasslands, and the Western Himalayan Temperate Forests. The landscape is home to a huge number of endangered and protected flora and fauna such as Bengal tiger, one horned rhinoceros, snow leopard, and red panda. About 35.5% of its area is covered by forests, and community based management regimes such as community forestry, buffer zone community forestry and leasehold forestry make up 29% of the management regimes of these forests. 16.7% of the landscape is covered by grassland while 1% is covered by water and 21.1% is agricultural land (MoFSC 2015a). Map 2 shows important biodiversity areas in CHAL.

CHAL is home to over 4.5 million people of diverse ethnicities, cultures and religions; between 2001 and 2011 the population was growing at an annual rate of 0.41% (WWF Nepal 2013a; Central Bureau of Statistics 2011). Remittances from employment are the major source of household income (46%), as migration from high altitudes to lowlands, rural to urban areas, and to other countries in search of better livelihood opportunities is common in the region. Agriculture, tourism, salaried jobs/services and wage labor are the next largest income sources. People are still heavily dependent upon forests and ecosystem services for their livelihoods and wellbeing. Inequality persists in the region, in terms of both income and access to natural resources and public services, particularly land, forests and capital.

At the start of Hariyo Ban I very little was known about CHAL as a landscape except for one ten-year-old report on the linkage between Chitwan National Park (CNP) and Annapurna Conservation Area (ACA) (WWF Nepal 2000). Hence the Program started by undertaking several assessments; these provided a basis for both the Program's work in CHAL, and for a landscape Strategy and Action Plan 2016-2025 which Hariyo Ban subsequently supported GoN to develop for the CHAL (MoFSC 2015a). The strategy's goal is: *to manage the landscape through an integrated, river basin planning approach which is built on the foundation of climate-smart conservation and sustainable development practices to promote persistence of biodiversity and sustainable management of natural resources, for continued provision of ecosystem services that support equitable and inclusive economic prosperity.*

Hariyo Ban adopted a river basin/watershed approach at multiple scales in its interventions for reducing threats to biodiversity and forests, and tackling climate change vulnerability. During the first phase it focused in three sub-river basins in CHAL (Seti, Marshyangdi and Daraudi), as well as working in key north-south corridors and other strategic places in CHAL (identified in WWF Nepal 2013b), to promote species and ecosystem conservation, ecological connectivity, improved forest condition, increased resilience to climate change, and improved human wellbeing and livelihoods. The three river basins were deliberately selected to complement the geographical focus of other projects at that time, including the Multi-Stakeholder Forestry Program which planned to work in the west of the basin.



Map 2. Biodiversity important areas in the Chitwan-Annapurna Landscape (from WWF 2013b)

View of the Annapurna Range with the Seti river from Sarangkot, Kaski in CHAL
© WWF Nepal, Hariyo Ban Program/Nabin Baral

An assessment of threats to biodiversity and ecosystems undertaken by the Program in the landscape in 2012 identified poaching and illegal trade, invasive species, encroachment, forest fires, over/open grazing, unsustainable harvesting, and climate induced/exacerbated disasters as major threats and vulnerabilities. The major threats to rivers and wetlands were identified as invasive species while for forests, the major threats were forest fires followed by encroachment, overgrazing (open grazing) and illegal/unsustainable harvesting of forest products. Likewise, encroachment was the major threat to pastures and grasslands, followed by illegal open grazing. Poaching and illegal trade, and human-wildlife conflict (HWC) were major threats to wildlife.

The main drivers of deforestation and forest degradation in CHAL vary by region. In the Churia and Terai unsustainable harvesting of forest products; encroachment of forestlands for agricultural expansion, infrastructure development, resettlement and urban expansion; forest fires; overgrazing; invasion of alien plant species; and recreational activities are the main drivers. Agricultural expansion includes both permanent agriculture, and shifting cultivation in the hilly parts of the Churia. The main driver in the mid-hills is unplanned and unregulated opening of local roads by VDCs; others include unsustainable harvesting, forest fire, invasion by alien plant species, agriculture expansion, landslides, and settlement and urban expansion. In the high mountains drivers are overgrazing, landslides, infrastructure development, unsustainable harvesting, forest fires, and agricultural expansion (WWF Nepal 2013c).

At landscape level the most climate vulnerable socio-ecological units are considered to be: the subtropical broadleaf forests of the Churia hills and the semi-desert coniferous forests of the trans-Himalayan region; spring sources in the Churia range and all floodplains in the Gandaki basin; migratory birds in the Gandaki Basin and gharial in the lowlands of the Terai; *pakho* agriculture in the

middle mountains and irrigated *tar* in the middle mountains and Churia; the Seti and Rapti rivers; and the rural settlements and local roads across the basin. As a general trend, the most vulnerable systems are in the lower region of the CHAL, especially in the Churia and mid-hills (WWF Nepal 2016a). The most common human vulnerabilities to climate change that were identified at local and community level in CHAL in vulnerability assessments (VAs) supported by Hariyo Ban were: increased incidence of landslides, riverbank erosion, floods and droughts; declining agricultural production and rising food insecurity; spread of invasive species and diseases; and depleted livelihood resources (WWF Nepal 2016a; 2016b).

After assessing and prioritizing biodiversity threats and drivers of deforestation and forest degradation for the landscape as a whole as well as for selected sub-river basins, the Program prioritized critical watersheds, north-south corridors and biodiverse areas in which to tackle key biodiversity threats/drivers of deforestation and forest degradation. Similarly, following climate vulnerability assessments at landscape level and in Manaslu Conservation Area (MCA), and in certain VDCs and communities identified as likely to be particularly climate vulnerable, the Program supported development of CAPAs and LAPAs, and the climate-smarting of the MCA management plan. Plans were then implemented, tackling key climate vulnerabilities at relevant scales. Some activities worked at landscape level, for example a carbon inventory which was undertaken as part of a foundation for a possible sub-national REDD+ project.

Hariyo Ban Phase I worked in 266 VDCs, 27 municipalities and 2 sub-metropolitan cities in the 18 districts of CHAL, including 1 sub-metropolitan city, 10 municipalities and 31 VDCs that overlap with TAL in Chitwan and Nawalparasi districts. See Annex 5 for a detailed list of working areas.

Terai Arc Landscape

TAL is a low-lying landscape that spans parts of southern Nepal and northern India. The portion of TAL in Nepal lies between the Churia hills and the southern border with India, reaching from the Bagmati river in the east to the Mahakali river or the Indian border in the west. The portion in Nepal covers an area of 24,710 square kilometers, providing ecological connectivity through habitat corridors linking 6 protected areas and 3 Ramsar sites. The landscape includes the globally important biodiversity ecoregion of the Terai Duar Savanna and Grasslands. It is home to several endangered or vulnerable wildlife species including one horned rhinoceros, Bengal tiger, Asian elephant, blackbuck, swamp deer, Gangetic dolphin, and gharial, as well as tree species such as champ, vijay sal and satisal. About 54% of its area is covered by forests, mainly tropical forests of sal (*Shorea robusta*) and riverine forests of sissoo (*Dalbergia sissoo*) and khair (*Acacia catechu*). About 5% is grassland/shrub land, 1% comprises water bodies, and 35% is agricultural land. Between 2000 and 2013, the area of grassland was declining and the area under agriculture increased, as documented in the revised TAL strategy (MoFSC 2015b).

TAL supports a culturally diverse population of over 7.5 million people, with over 45 ethnic groups and indigenous communities, growing at a rate of 2.1% per annum between 2001 and 2011 (Central Bureau of Statistics 2011; MoFSC 2015b). Even though the region is regarded as the food basket of the nation, food production has not been able to keep pace with demands of a growing population. The average farmland per capita is declining, landlessness is on the rise and nearly 20% of the population live below the poverty line (MoFSC 2015b). As a result, many people of employment age are absent due to migration to cities or other countries for employment. Remittances are a major source of income followed by tourism, agriculture, service jobs and wage labor. Discrimination against the indigenous residents of TAL based on caste, gender, ethnicity and economic class result in immense inequality, particularly in terms of social mobility, access to resources and inclusion in decision making. Multiple threats as well as conflicting interests in management of public or community managed resources such as forests exists, challenging effectiveness and sustainability of conservation initiatives.

The conservation approach in TAL uses corridors to link biodiversity important areas within Nepal and between Nepal and India, enabling critical wildlife movement for conservation and ensuring survival of viable populations (Map 3 shows the corridors in Nepal). Hariyo Ban initially followed the first TAL Strategy and Action Plan (2005-2015) (MoFSC 2005) in designing its approach in TAL, aiming to complement existing conservation and climate change investments in TAL; it used a multi-faceted priority-setting system to select broad working areas. The Program focused its interventions mainly in Barandabhar, Basanta, Brahmadev, Kamdi, Karnali, and Laljhadi-Mohana corridors, as well as providing support to several of the protected areas. When the period of the first strategy ended the Program provided technical inputs to GoN for a second, climate-smart TAL Strategy and Action Plan 2015-2025, whose goal is: *to conserve the ecosystems of the Terai and Churia hills in order to ensure integrity of ecological, economic, and socio-cultural systems and communities* (MoFSC 2015b).

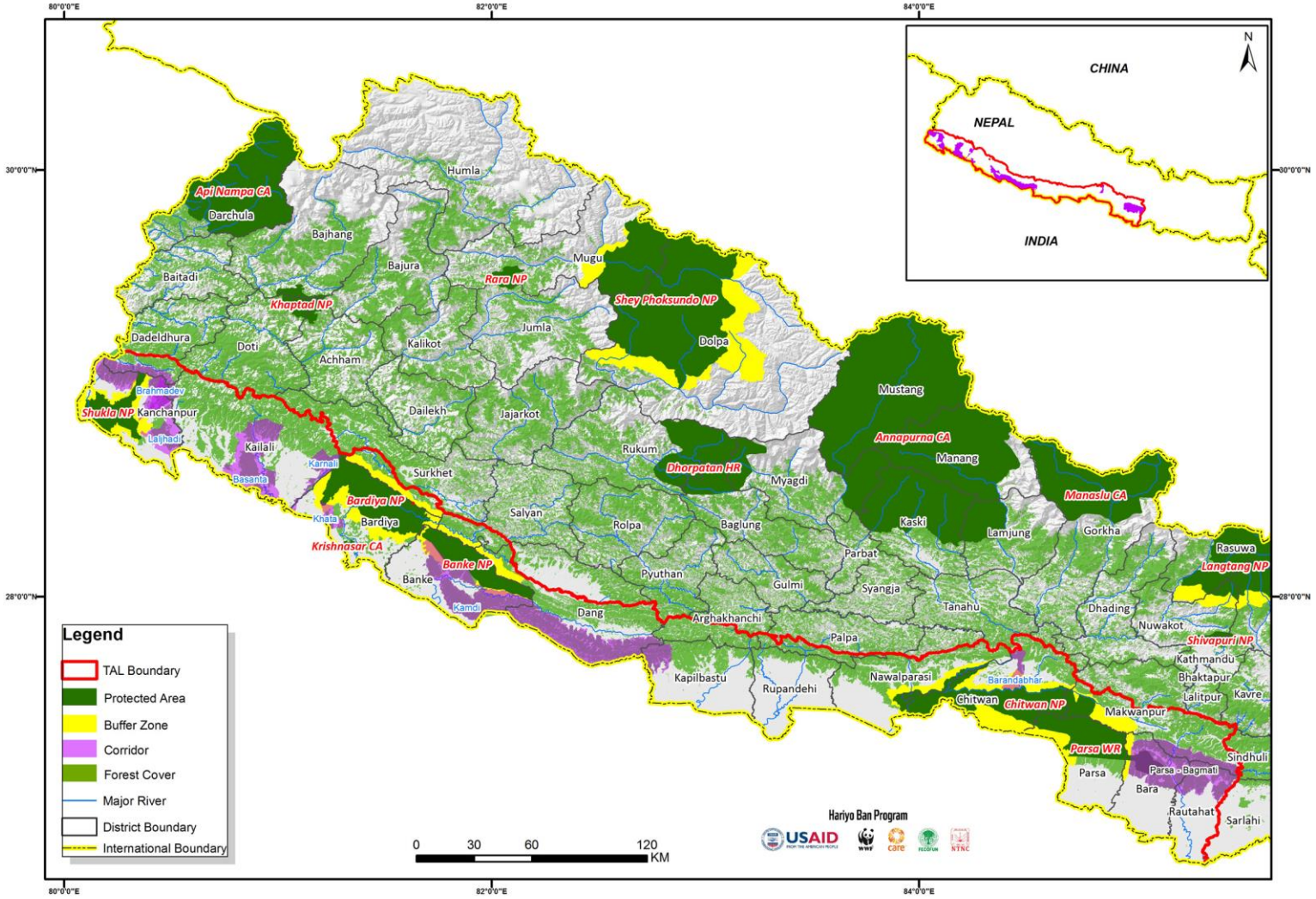
An assessment of major threats to biodiversity and ecosystems in the landscape identified large infrastructure development, droughts, severe floods, landslides, river water diversion, changes in river courses, poaching and illegal trade, human-wildlife conflict, illegal harvesting of forest products, encroachment, invasive species, illegal fishing with river poisoning, overgrazing, invasive species, and pests and diseases (MoFSC 2015b).

Drivers of deforestation and forest degradation were identified and prioritized for the TAL by the subnational REDD+ project in the Emission Reductions Project Idea Note (ER-PIN) (MoFSC 2014b) using results from a drivers analysis and other studies, and discussing them in depth at several district and national level consultations. Priority drivers were: unsustainable and illegal harvest of forest products; overgrazing; forest fires; encroachment; and conversion of forests to other land uses (encroachment, resettlement and infrastructure).

Several elements in the landscape are vulnerable to climate change. More intense precipitation resulting in severe floods could cause habitat loss and degradation. People may become displaced over large areas, with loss of life, livelihoods, and property. Agricultural crops could be destroyed by flood, drought or hail storms, causing loss of food and food insecurity. Infrastructure could be damaged or destroyed, with loss of social and economic connectivity. Increasing temperatures when coupled with intervening periods of droughts could increase the likelihood of more frequent forest fires and the spread of invasive species that could cause changes to habitat and loss of palatable food, nesting, and roosting plants and trees for wildlife, especially for those focal species with specialized habitat and food requirements. As food insecurity grows and/or people are displaced they could exert more pressure on protected areas, corridors, and watershed protection forests, causing environmental degradation and disrupting ecosystem services that previously helped to reduce natural hazards, creating feedback loops that exacerbate poverty and food insecurity, vulnerability to disasters, loss of natural forest resources, and wildlife population declines. The most vulnerable animal species in TAL are thought to include vultures, dolphin, and gharial. Across the TAL, urban areas, rural settlements, rural and some national roads, and irrigation systems are the most vulnerable infrastructure types (WWF Nepal 2016b and c).

The first phase of Hariyo Ban worked to tackle priority threats, drivers and climate vulnerabilities in the corridors, buffer zones and protected areas it prioritized. Overall in TAL it worked in 120 VDCs, 29 Municipalities and 3 sub-metropolitan cities, in 12 districts in TAL: Banke, Bara, Bardia, Chitwan, Dang, Kailali, Kanchanpur, Makwanpur, Nawalparasi, Parsa, Rautahat, and Surkhet. Chitwan and Nawalparasi districts overlap with CHAL.

Grassland in Suklaphanta National Park, Kanchanpur
© WWF Nepal, Hariyo Ban Program/Nabin Baral



Map 3. Corridors and protected areas in the Terai Arc Landscape

SUMMARY OF PROGRAM RESULTS

Table 1: Summary of Program results based on the performance monitoring plan

Outputs and outcomes	Unit	Target	Achievement	Description
Total number of people benefitting from Hariyo Ban	**Number of people**		**284,548**	
Biodiversity Conservation				
Research and monitoring for focal species conducted	Number of focal species researched	19	18	bijay sal, sati sal, champ, tiger, rhino, elephant, dolphin, gharial, mugger crocodile, swamp deer, musk deer, blackbuck, water buffalo, snow leopard, common leopard, grey wolf, red panda, and pangolin
Wildlife species translocated/reintroduced	Number of species	n/a	4	5 rhinos, 28 blackbucks, 10 swamp deer, and 2 water buffalo
People trained in sustainable natural resource management and/or biodiversity conservation	Number of people	27,595	33,509	
Community based anti-poaching units (CBAPUs) formed	Number of CBAPUs	205	201	164 TAL; 37 CHAL
CBAPUs mobilized	Number of CBAPUs	411	351	2,572 people engaged
Water reservoirs constructed for wildlife	Number of reservoirs	n/a	81	

Outputs and outcomes	Unit	Target	Achievement	Description
Poaching of rhino reduced	Years of zero rhino poaching	2	2	Poaching was high in the previous decade: e.g. 12 rhinos were poached in 2010. For this result, no rhinos were poached between May 2014 and May 2016
Length of solar powered electric fence repaired and/or newly constructed	Kilometer (km)	208	218.87	
People perceiving that HWC has been reduced	Percentage of people	50%	62.41%	
Biodiverse areas under improved management[1]	Hectares (ha)	5,919,923	5,919,923	
Biodiverse areas demonstrating improved biophysical conditions[2]	Ha	60,000	75,376	TAL: 56,480; CHAL: 18,896
Integrated sub-watershed management plans (ISWMPs) developed and implemented	Number of ISWMPs	12	14	
Biodiversity related policies/strategies/plans supported	Number of policies	7	10	
Sustainable Landscapes				
People trained in carbon inventory, adaptation	Number of people	7,814	8,257	

[1] Biodiverse area under improved management was calculated as cumulative areas covered by specific assessments such as CHAL carbon assessment, tiger survey, as well as revised protected area management plans, revised community forest operational plans, and development of governance improvement plans in CFUGs (avoiding overlaps in areas).

[2] Biodiverse area under improved management demonstrating improved biophysical condition is calculated based on the areas under specific interventions such as plantation establishment; natural regeneration protected by fencing and/or trenching; fire management; removal of invasive species; grazing control; and grassland and wetland management.

Outputs and outcomes	Unit	Target	Achievement	Description
analysis, REDD+, PES, and equitable benefit sharing (EBS) mechanisms				
People benefitting from alternative energy	Number of people	140,477	173,860	
Biogas units supported	Number of units	n/a	6,143	
Improved cook stoves (ICSs) supported	Number of stoves	n/a	20,974	18,006 regular program; 2,968 recovery work
Metallic improved cook stoves (MICSs) supported	Number of stoves	n/a	3,065	1,309 regular; 1,756 recovery
Quantity of GHG emissions reduced/sequestered[3]	Metric tonnes (MT) CO_2e	3.73 million	4.902 million	
Community forest operation plans (CFOPs) revised	Number of CFOPs	434	481	
Areas under new plantations made	Hectares	n/a	3,184	
Area with invasive species removed	Hectares	n/a	293	Mostly invasive species such as *Mikania, Lantana, Ageratum, Eichhornia*
Length of fire lines constructed/maintained	Kilometers	n/a	1030	
PES schemes piloted	Number of schemes	2	2	Excluding two from Windows of

[3] The quantity of GHG emissions reduced/sequestered was calculated as the cumulative: 1. carbon saved from alternative energy interventions through biogas and improved cook stove installation; 2. carbon stock enhanced through plantation and natural regeneration; 3. Carbon saved through reduction in deforestation and forest degradation. Carbon saved through alternative energy use per year was calculated as each biogas unit saving 4.06 MT, and each ICS saving 1.5 MT. Enhanced carbon stock from Hariyo Ban supported plantation was calculated annually as total average carbon stock per hectare in mature forests divided by the number of rotation years for each major forest type. Enhanced carbon stock from natural regeneration was calculated as 1% of the average carbon stock of degraded forest (10-20% canopy) for each forest type. (Hariyo Ban M&E Plan, 2016).

Outputs and outcomes	Unit	Target	Achievement	Description
				Opportunity (WOO)
REDD+ related policies and strategies supported	Number of policies	10	10	
Climate Change Adaptation				
People trained to plan and implement climate change adaptation (CCA) activities	Number of people	18,664	18,831	
Climate vulnerability assessments (VAs) conducted	Number of VAs	527	529	
People with improved adaptive capacity to cope with adverse impacts of climate change[4]	Number of people	225,276	288,499	
Adaptation plans prepared	Number of plans	300	421	331 CAPAs and 90 LAPAs
Implementation of adaptation plans supported	Number of plans	300	398	328 CAPAs and 70 LAPAs
Amount of resources leveraged for implementing adaptation plans	Nepalese rupees	21,453,761	28,502,175	
Vulnerable people benefiting from the implementation of adaptation plans	Number of people	226,176	288,499	
Vulnerable sites with improved biophysical condition after implementing adaptation plans	Number of sites	64	77	
Climate change adaptation policies supported	Number of policies	4	4	

[4] The number of people with improved adaptive capacity was calculated as the number of people benefitting from adaptation plan implementation (CAPAs and LAPAs).

Outputs and outcomes	Unit	Target	Achievement	Description
Green Recovery and Reconstruction				
People benefitting from green recovery and reconstruction (GRR) activities	Number of people	n/a	106,999	9,080 Dalits; 74,730 Janajatis; 10,068 youths
Women-headed households benefitting from GRR	Number of households	1,200	5,767	1,860 women-headed households benefitting through cash for work
Single women and adolescent girls benefitting from GRR	Number of people	500	9,326	1,723 single women; 7,603 adolescent girls
Pregnant and new mothers supported with hygiene kit and nutrition package	Number of women	n/a	140	
People employed through cash for work	Number of people	n/a	16,651	101,380 person days of employment against target of 105,000; 5,972 women; 1,250 youths; 1,441 Dalits; 11,090 Janajatis
Recovery of ecotourism sites supported	Number of sites	n/a	11	Includes only trail/camp site improvement after the earthquake; 6,325 people benefitting
Livelihoods				
Forest dependent people benefitting from livelihood interventions	Number of people	92,913	79,830	40,486 are women (from LIP, IGA, skill based training, ecotourism, green enterprises)
Livelihood improvement plans (LIPs) supported	Number of household	n/a	3,667	312 through recovery
Income generating activities (IGAs) supported	Number of household	n/a	6,082	1,872 through recovery
Ecotourism ventures established	Number of household	n/a	12	1,591 people benefitting (regular funding only)

Outputs and outcomes	Unit	Target	Achievement	Description
Green enterprises established	Number of enterprises	n/a	26	13,428 people benefitting
People supported to receive skill based training	Number of household	n/a	1,127	
Governance and GESI				
NRM groups with strengthened good governance practices	Number of groups	300	328	
% of NRM groups with women in at least one of the two key positions (chairperson and/or secretary) in NRM groups	% of NRM groups with women in key position	At least 60%	70%	47% baseline (2013)
% of NRM groups with marginalized and excluded people in any two (out of the four) key decision making positions	% of NRM groups with marginalized and excluded people in executive committee	At least 60%	64%	52% baseline (2013)
GESI mainstreamed in national government policies	Number of policies	4	4	

PROGRAM STRATEGY AND IMPACTS

Biodiversity Conservation

Strategic Approach

Hariyo Ban used a threat based approach to biodiversity conservation, identifying and ranking threats at appropriate levels to focal species, ecosystems, critical forest corridors, protected areas, sub-basins and landscapes. Results chains (theories of change) were developed to identify threat causality and the best points along the chains at which to intervene in tackling the threats (Annex 2). Provisions for land and water corridors, sound river basin management, and climate refugia were incorporated into climate-smart landscape approaches to facilitate species conservation, hydrological flows, and continuation or restoration of other ecosystem functions. Hariyo Ban tackled priority threats in partnership with GoN, local communities and other stakeholders as relevant. Since forest-dependent communities are key stewards of forests and biodiversity the Program had a major focus on helping improve local livelihoods and internal governance of NRM groups, and empowering women and marginalized people to participate in and benefit from forest management, to improve forest condition and human wellbeing. In many cases capacity had to be built to tackle the threats effectively. When the policy enabling environment was a significant limiting factor, Hariyo Ban supported GoN to improve it. Since basic knowledge was sometimes inadequate or out of date the program also worked to improve understanding of focal species, ecosystems and landscapes.

Threats to Focal Species Reduced

Hariyo Ban selected several focal species to work on, based on their conservation importance, level of threat, and the opportunity to improve their conservation status.

Blackbuck: At the start of Hariyo Ban, there was only one small isolated wild population of blackbuck in Blackbuck Conservation Area in Khairapur, Bardia district. A new population was established by translocating 28 captive animals from the animal facility in Nepalgunj and the Central Zoo in Kathmandu to a 37-ha fenced grassland area in Suklaphanta Wildlife Reserve (SWR) (part of the species' former range from which it had disappeared). The new population has since grown to 48 animals, and will be released from the enclosure when it is a bit larger. The value of establishing replicate populations was realized when the Khairapur population was seriously affected by flooding in 2014, with loss of over 40 animals. Hariyo Ban subsequently supported creation of earth mounds in Khairapur as refuges to build

Selected Species Results

- Tiger numbers increased from 121 to 198 between 2008/09 and 2013 through efforts of many stakeholders – Nepal is already half way to meeting its commitment at the 2010 St Petersburg Tiger Summit to double its tiger numbers by 2022
- Rhino numbers increased from 534 to 645 between 2009 and 2015
- Five rhinos and ten swamp deer translocated to Bardia to increase viability of their populations there, and build the species' resilience in Nepal
- Tibetan wolf, steppe polecat, and Pallas cat recorded for the first time in Nepal

resilience of that population against future flooding, through Windows of Opportunity funds. These types of intervention will be increasingly important for species conservation as climate change advances and more extreme weather events occur.

Tiger: The major threats to tiger in Nepal include poaching and trafficking of tiger body parts, habitat degradation, and human-tiger conflict. Hariyo Ban built capacity of CBAPUs for anti-poaching work, supported restoration of wetlands and grasslands to promote tiger prey populations, and supported solar powered fencing and development of a national HWC fund to reduce human-wildlife conflict. This has developed positive attitudes among the local communities towards conservation of tiger, prey base and prey habitats. The Program also mobilized communities to develop and maintain corridors in TAL to aid tiger dispersal, and supported WWF to reduce adverse impacts of infrastructure development on tiger. The first landscape-wide transboundary tiger census in 2013, which Hariyo Ban co-funded, indicated an increase in Nepal's adult tiger numbers from 121 in 2008-09 to 198 in 2013 (Dhakal et al. 2014). This remarkable achievement, which indicates that Nepal is making good progress towards its goal of doubling tiger numbers to 250 by 2022, is due to the work of Department of National Parks and Wildlife Conservation (DNPWC), Nepal Army, Nepal Police, local communities, and supporting projects. The field tools used in the tiger and prey survey included camera traps and line transects, which are considered to be the most effective combination for the species and terrain. See Dhakal et al. (2014) for detailed discussion of field methods and analysis.

Rhino translocated from Chitwan to Bardia National Park
© WWF Nepal, Hariyo Ban Program/Samir Jung Thapa

Greater one-horned rhinoceros: Major threats to rhino include poaching, loss of habitat, and human-rhino conflict. While rhino is thriving in CNP, numbers are low in Bardia National Park (BNP) because of past poaching which is now under control. Five rhinos were translocated to Babai valley in Bardia, where one female gave birth to a male calf. Before the translocation, water holes were constructed and the quality of 49 ha of grassland was improved by removing invasive alien plant species. The government is planning to translocate additional 20 rhinos in Bardia.

Rhino numbers increased nationally from an estimated 534 in 2009 to 645 in 2015 (NTNC 2015). To monitor the rhino population an ID based monitoring system was expanded in Chitwan and applied in Suklaphanta and Bardia, facilitating monitoring of individual animals (NTNC 2014). The ID based monitoring greatly helps to closely observe the health, condition and movements of the animals, and deter illegal intruders, thereby reducing the risk of poaching. It is a very effective tool for a relatively small population of a species where individual animals have distinguishing marks that can be easily identified by different observers.

Swamp deer: Nepal's SWR holds one of the single largest populations of swamp deer in the region (2,301 animals in 2014), but there are less than 100 in Bardia. To build genetic robustness and hence to species resilience, Hariyo Ban supported initial steps in reestablishing a viable population in BNP when ten swamp deer (5 males, 5 females) were translocated to BNP and released in Baghaura Phanta where they are adapting well, apart from known predation of one male. The translocation is documented in WWF (2016d).

Vultures: Vulture numbers have declined drastically in Nepal; a major cause is poisoning with diclofenac, a veterinary painkiller used for livestock that the vultures ingest when scavenging carcasses. Hariyo Ban provided support to Bird Conservation Nepal (BCN) to advocate for alternatives to diclofenac. As a result, GoN declared Bara, Parsa and Rautahat districts in eastern TAL as diclofenac free districts. Since then, no vulture deaths due to diclofenac poisoning have been reported there. A biodiversity learning center was established in a 'vulture restaurant' with Hariyo Ban support to provide information on vultures and their conservation, which has become a good platform for national and international students and researchers.

Goral: Goral occur in the hills including the Churia range; their numbers have been drastically declining due to hunting and habitat loss. Hariyo Ban has successfully piloted community managed goral conservation in the watershed of Kerunge Khola in Nawalparasi. Communities who traditionally hunted goral have now banned hunting of any wildlife species in the area. The population appears to be increasing: the community reported sightings of six animals in 2010, 27 in 2015 and 39 in 2016, as per unpublished research results of a student working with NTNC. Populations of other species such as porcupine and barking deer are also reported to be increasing.

Tree species

Conservation of three threatened tree species has been initiated using both plantation and natural regeneration approaches.

Sati sal: Sati sal (*Dalbergia latifolia*) is a commercially valuable timber tree that has become rare in Nepal due to overharvesting. Communities have planted many sati sal seedlings in degraded forest areas in Ban Tol Mahila Community Forest (CF) and Hariyali Community Forest in Judibela VDC in Rautahat district, with a good seedling survival rate of about 75%. Ban Tol Mahila Community Forest was selected as a model site for conservation of the species.

Champ: Champ (*Michelia champaca*) has also been over-logged for its high value timber. District Forest Offices (DFOs) in Kaski, Tanahun, Lamjung, Gorkha and Syangja were supported to produce seedlings and promote plantation. However, the seedlings had low survival rates (average 17%) for

various reasons including poor site selection, inappropriate planting techniques, lack of protection from grazing, and adverse natural conditions. Much of the failure was due to lack of knowledge on best practices (WWF Nepal 2016e). Simple guidelines for champ planting were subsequently developed by the Department of Forests (DoF), which Hariyo Ban distributed to community forest user groups (CFUGs) and farmers. DFOs in CHAL are committed to providing more technical and monitoring support for expansion of champ planting, applying a block approach.

Bijay sal: Bijay sal is threatened due to overharvesting for gum, fodder and firewood, and browsing and trampling of saplings by livestock which exacerbates the species' low seed viability and germination rates. The species has a very limited distribution in western TAL, with a small patch of bijay sal in Kapilbastu district. Local communities have been made aware, capacitated and mobilized to conserve the species; 5,647 seedlings were planted in 13 community forests in Kailali and Kanchanpur districts, zero grazing enforced in an area of 13,200 ha, invasive species removed from 50 ha of planted area, and 3 km of forest fire line maintained to help restore the species. An inventory in Kanchanpur noted better growth rates in naturally regenerated bijay sal saplings than planted saplings; survival was good when grazing was controlled. The Department of Forests prepared a conservation action plan for bijay sal with Hariyo Ban support; at the end of Hariyo Ban Phase I it was in the process of being endorsed. This is the first conservation action plan prepared for a plant species in Nepal. It provides clear guidance for *in-situ* and *ex-situ* conservation of the species.

In Situ Conservation of Bijay sal

- Total Bijay sal trees in natural forests stands at 13,400 trees
- Bijay Sal Conservation Action Plan prepared with DoF for long term sustainable conservation of the species
- 5,647 seedlings planted in 13 CFs in Kailali and Kanchanpur districts

Reducing Threats from Poaching, Illegal Extraction of Forest Products and Illegal Trade

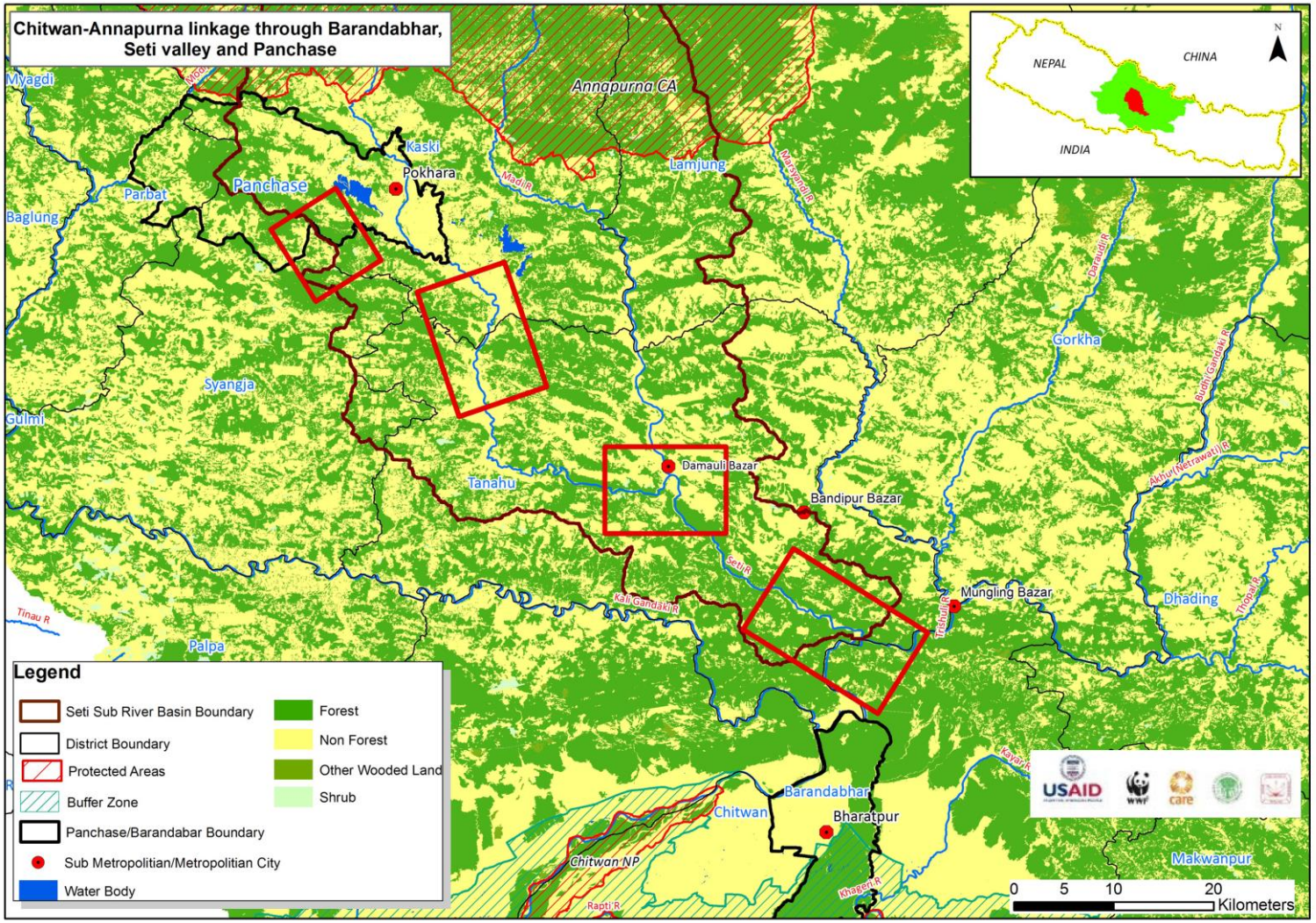
Hariyo Ban worked mainly through local communities to tackle poaching and illegal extraction of forest products. CBAPUs were a major part of this and 201 CBAPUs were formed while 351 CBAPUs were mobilized, involving 2,572 people, most of whom were local youths. The CBAPUs were engaged in patrolling to gather intelligence on illegal activities, rescue wildlife and collect information on HWC, as well as undertaking advocacy on conservation issues in their communities. Capacity building opportunities and livelihood support were provided to CBAPU members to motivate members, gain support from their families, and provide alternatives so as to reduce overharvesting of forest products. CBAPU networks were formed to improve coordination among these groups to control wildlife crime, including networks in the Brahmadev and Barandabahar corridors and the Panchase area, and networks at district level in Kaski and Tanahun, and at landscape level. CBAPU work has directly contributed to the confiscation of 73 guns and removal of 520 snares, which in turn contributed towards achieving two years' zero poaching of rhino during Hariyo Ban Phase I. They also contributed to reducing threats like encroachment, poisoning of water bodies, overgrazing, uncontrolled forest fire, and illegal mining of sand and boulders. Annex 6 gives a list of the CBAPUs Hariyo Ban worked with.

Youth Stewardship in Barandabahar

CBAPU from Bardia patrolling the forest
© WWF Nepal, Hariyo Ban Program/Nabin Baral

Barandabhar is home to endangered species such as tiger, rhinoceros and gaur. It may also function as a critical climate refugium during times of flood, and contains the Beeshhazari lakes, a Ramsar site. However, its conservation importance goes beyond this - it is also an important biological corridor linking the Terai with the upper reaches of the Gandaki river basin (Map 4). The east-west running ridges of the hills and mountains present barriers to many species, and the occasional river valleys that cut through them are very important corridors, especially in the geologically young Churia range. The Barandhabar corridor links CNP with the Naryani/Trishuli valley; this linkage continues up the Seti valley and Phewa catchment to Panchase Protected Forest and the Annapurna Conservation Area. The Trishuli/Buddhi Gandaki and Daraundi valleys link to Manaslu Conservation Area, and the Trishuli valley continues north to Langtang National Park. These valleys are known to be very important for bird and fish migrations. As climate change advances these river valleys are likely to enable the spread of other species including long-lived tree species to damper, cooler places on higher ground (WWF 2016j).

The Barandabhar corridor at the base of this tremendous system faces huge pressure from forest fires, invasive species, over grazing by domestic animals, and infrastructure development. Hariyo Ban provided a seven-day intensive training as well as firefighting tools and equipment to 25 youths who have since been actively engaged in extinguishing forest fires in the corridor, removing invasive species, and other conservation activities. Their initiatives have generated more community support for conservation of forests and other natural resources in the area. The buffer zone community forests in the corridor have established an endowment fund to support the group of youths with transport and communication for their firefighting and anti-poaching work.



Map 4. Barandabhar corridor linking Chitwan National Park along Trishuli and Seti valleys to Panchase and Annapurna Conservation Area; the red rectangles show major breaks in the north-south Chitwan-Annapurna corridor's forest cover.

Creating Conservationists for Life

Office and shelter for CBAPU in Bardia
© WWF Nepal, Hariyo Ban Program/Nabin Baral

Wildlife poaching used to be common in Panchase Protected Forest. However, with the formation and mobilization of CBAPUs affiliated with CFUGs around the forest, it has been brought under control as the CBAPUs patrol the forests in turn, informing the authorities of any suspicious activities they observe. The CBAPUs also conduct local awareness campaigns on the benefits of conservation and punishments for wildlife crimes; rescue wildlife; and collect intelligence on wildlife crimes. Their efforts have helped to capture an illegal trader with 600 grams of orchids, and rescue a barking deer fawn and several birds.

Ram Kaji Gurung, Chairperson of Panchase Protected Forest Council, Kaski, and also Coordinator of Bhadaure CBAPU, believes that one of the reasons for their success is the inclusion of former hunters in the CBAPUs. Nearly 70% of the CBAPU members are former hunters, and they are now mobilized to do antipoaching activities. Through this they have become dedicated and more accountable for conservation.

Rupesh Gurung, currently sub coordinator of Bhadaure CBAPU, is one example of a hunter turned dedicated conservationist. He shared: "*Earlier, I used to hunt for deer, leopard, bear and birds. But things changed drastically when I got an opportunity to participate in an exposure visit organized by the Hariyo Ban Program. We were taken to regions in the TAL, and I was impressed to learn that the Chitwan National Park has been generating millions of rupees annually in tourist revenue. We were informed that tourists visit the area to observe wildlife and nature. This made me realize that if only we could conserve the wildlife and their habitats in the Panchase area, we would also be able to earn money by developing ecotourism. This motivated me to join the CBAPU as a sub coordinator. The program has made me realize the importance of conserving wildlife, and of my previous wrongdoings. These days, I am fond of nature and am devoted to conservation.*"

Likewise, the Women in Conservation and Social Transformation approach that reduces poaching and other illegal activities by engaging communities and helping poachers develop alternative livelihoods has been successfully replicated and scaled up in Korak VDC, Chitwan. Six women learning centers were established and women engaged as key change catalysts from the household up to the community, VDC, and corridor levels. The premise is that changes in the livelihoods of the families previously engaged in poaching help change their perceptions of conservation and motivate them to support conservation initiatives.

The perception mapping exercise that examined Hariyo Ban I threat and driver reduction (WWF Nepal 2016f), described in more detail in the Sustainable Landscapes section, found that communities perceive that illegal hunting and fishing have been redcued in recent years; only a small group of people denied this. Almost all participants agreed that the numebr of wild animsals and/or number of species has incresed in forest land. Communities confirmed that CBAPUs have been strengthened and are regularly mobilized, but there is a need to develop skills and provide equipment to control poaching effectively.

Illegal trade needs to be tackled at multiple levels. Hariyo Ban supported transboundary cooperation between GoN and the Government of India at local level, particularly for Brahmadev and Laljhadi corridors in TAL, to help control illegal transboundary wildlife trade. This entailed support to GoN to participate in coordination and planning meetings and share information.

Reducing the Impacts of Human-Wildlife Conflict

HWC results in loss of life and injury to people, loss of livestock, and damage to crops and property. It has serious impacts on food security, livelihoods and human well-being, posing a large burden on many people who are already living in poverty. It is also a serious threat to several focal species due to retaliatory killings, restrictions on wildlife ranges, and negative attitudes of local communities towards conservation, threatening effectiveness of community conservation efforts. At the same time, rescue and management of problem animals, mainly tiger and leopard, are difficult due to limited resources. HWC appears to be on the rise as conservation and forest management efforts result in an increase in wildlife: for example, leopard and monkey are becoming more prevalent in midhills across the country. HWC is tackled by reducing contact between wildlife and people, and compensating for loss when it occurs. Hariyo Ban provided support from both angles.

Reducing Human-Wildlife Conflict

- Establishment of a new National Human-wildlife Conflict Relief and Wildlife Rescue Fund was supported – an endowment fund of NRs. 25 million
- The Seti Sub-basin Level Relief Fund was established to compensate for damage and reduce retaliatory killing of wildlife
- 109 km of power fences were erected and 230 km repaired, benefitting 42,193 households
- Chili paste ropes (1 Km) were installed in the Laljhadi-Mohana corridor to control elephants trying to enter settlements: elephants are deterred by chili
- 10 electric sirens were installed along a 2 Km front to ward off elephants and warn people away from their path
- 62% of people perceive that HWC has been reduced in sampled Hariyo Ban supported areas (WWF Nepal 2016f)

Power Fencing Helps Reduce Conflict between People and Wildlife

Power fence in Setidevi Community Forest, Mangalpur, Chitwan.
© WWF Nepal, Hariyo Ban Program/Nabin Baral

"*Our relief cannot be expressed in words. Earlier, elephants and rhinos frequently raided our village, often coming across the border from India, and we lost wheat crops worth Rs 5-8 million each year. This spelled disaster for poor families who own only a few square meters of land. But since the electric fence has been installed we sleep soundly at night, as our lives and valuables are safe*," said Bishnu Rijal, a resident of Bhimapur-6, Bardia.

Hariyo Ban Program had helped install a 21 km long electric fence through NTNC's Bardia Conservation Program, benefitting 1,453 households. Chiranjibi Pokhrel, NTNC, says, "We received numerous complaints about rhino, tiger, wild boar and deer destroying crops and threating people but since installing the fence there have been no complaints, indicating its effectiveness to steer wildlife away from human settlements and farmlands, reducing human wildlife conflict in the area." The communities have collected funds to help with fence maintenance, since the effectiveness of the fence depends on regular maintenance.

To separate wildlife from people, power fences were erected/repaired in MCA; buffer zones of CNP, BNP and Parsa Wildlife Reserve (PWR); and in Judibela-Chandranigahpur in Rautahat, between forests and human settlements/farms. Generally, in the places where power fencing was functioning well, a fencing effectiveness assessment for Hariyo Ban reported that damage by large animals has declined by at least 90%. However, crop damage by deer and wild boar has not declined much with power fencing alone (WWF Nepal 2016g). Regular maintenance is crucial to ensure fencing effectiveness. The threat reduction perception mapping exercise in 2016 found a perceived decrease in physical injury and death from HWC, and a decline in retaliatory killing of predators (WWF Nepal 2016f) (see Sustainable Landscapes section for more details of the perception mapping).

Wild animals often come into contact with people when they are seeking water in the dry season; as climate change advances, water for wildlife is likely to become a bigger issue as droughts intensify. Hariyo Ban supported the creation or improvement of several watering holes in both landscapes, some with the aim of holding wildlife in wildlife areas to reduce HWC. For example, three were constructed in Tanahun (Siddhathani-2) and Lamjung (Kalika-1) which have been frequented by many wild animals in the area including common leopard. A pump system to supply water in Donganeya of Namuna Buffer Zone Community Forest (BZCF) has converted the area into a tourist attraction, with increased sightings of animals such as rhino and hog deer.

On the compensation side, Hariyo Ban supported the creation of a new rapid-disbursing endowment fund, the National Human-wildlife Conflict Relief and Wildlife Rescue Fund, which will make the compensation system more responsive and efficient than before. NTNC contributed 20% of the funding and will manage the Fund based on GoN endorsed guidelines; the fund will be topped up with revenue from NTNC-managed conservation areas and other sources will be sought.

Hariyo Ban also supported a smaller endowment fund in the Seti basin. In Tanahu district, HWC mitigation committees were formed in most of the HWC affected villages, and communities were made aware about HWC compensation and relief funds, and mechanism to access them.

Reducing the Risk of Wildlife Disease

Wildlife disease is a relatively poorly understood threat. However, given the small populations of highly threatened species and the close contact between wildlife and people/livestock, it is a serious risk to several focal species. An international workshop on wildlife diseases was supported in coordination with the Agriculture and Forestry University and veterinary team of CNP to discuss disease prevalence and risks to wildlife populations; disease links among wildlife, livestock and people; and the need for a national strategy on wildlife health. A draft National Wildlife Health Management Strategy has been subsequently supported by Hariyo Ban, based on the recommendations from the workshop and the findings of a study by the University of California, Davis and the Agriculture and Forestry University, Nepal (Gaydos et al. 2014). Once passed and implemented, the national strategy will be a major step towards improving wildlife health. In the meantime, Hariyo Ban supported an elephant tuberculosis management program to screen and treat infected domestic elephants to avoid the risk of infecting wild herds, as well as people including elephant handlers and tourists. The Program also co-funded a wildlife disease surveillance laboratory in CNP, enhancing its facilities; it can now detect and treat diseases such as canine distemper, tuberculosis, Johne's disease, and foot and mouth disease.

Reducing the Impacts of Infrastructure Development on Focal Species

Wildlife is threatened by construction of large linear infrastructure which can fragment habitats and block traditional migration routes and corridors. For example, several ungulate deaths were reported in the steep-sided Sikta irrigation canal which traverses Banke National Park (BaNP). Hariyo Ban worked with the Department of Irrigation and park staff to pilot guiding fences along a stretch of the canal in Mahadevpuri to help wildlife find safe crossings and water access points. During the two and half years since the fences were erected, no further wildlife deaths were detected in the fenced area. This approach could be replicated on the Rani Jamara irrigation canal in the Karnali corridor. Hariyo Ban has also provided technical inputs to several other linear infrastructure projects, including national and local roads, and transmission lines, in order to help minimize adverse impacts (see also under Sustainable Landscapes).

Hydropower development is occurring rapidly in the Gandaki basin, with no overall planning to mitigate cumulative adverse environmental impacts that hydropower schemes are likely to have. Building on the infrastructure rapid assessment (WWF Nepal 2014), Hariyo Ban undertook an environmental flows study in collaboration with Kathmandu University to assess the flows that are required for key biodiversity, cultural/religious and social targets. This work is continuing in Phase II, when scenario planning will look at the cumulative impacts of planned hydropower and climate change scenarios. Hariyo Ban plans to work with the hydropower sector on identifying sound environmental and economic solutions in the basin as Nepal continues to develop its energy sector. The Program will also build on the work undertaken in the Marshyangdi valley with the hydropower sector through the PES work (see the Sustainable Landscapes section), and plans to collaborate with other projects USAID funded projects working on hydropower and river basins.

Knowledge of Focal Species and Ecosystems Enhanced

Improving understanding on the population dynamics, ecology, ecosystems and threats is essential to design strategies, build capacities, and take action for conservation of focal species, their habitats, and ecosystems at different scales. Several research and monitoring surveys were undertaken and used as a base to guide or adapt Hariyo Ban interventions. They covered selected focal species; threats such as infrastructure and HWC; and landscape-level and landscape unit assessments, under both the regular program and the WOO grant fund. Long-term monitoring systems were established in the Kali Gandaki basin to see the impacts of climate change on forests and freshwater systems. Research, baseline and assessment reports and publications are listed in Annex 4.

Capacity for Biodiversity Conservation Increased

Capacity of key stakeholders was increased to enable them to implement activities to address threats to focal species and their habitats. Awareness and advocacy campaigns and training enhanced understanding of threats and national policies/plans/guidelines for biodiversity conservation, and built skills to implement activities. Intensive training in monitoring of biodiversity; patrolling to control poaching and illegal harvesting; wildlife rescue; habitat management; and undertaking advocacy/awareness campaigns for conservation was provided to citizen scientists, ecoclub members, local resource persons (LRPs), CBAPU members, forest guards, and representatives of government agencies and NRM groups.

Building Capacity for Biodiversity Conservation

- 33,509 people trained on biodiverisity conservation
- 100 citizen scientists mobilized to monitor wildlife and habitats, with special focus on invasive plant species and HWC
- 201 CBAPUs formed and 351 CBAPUs mobilized, engaging 2,572 people to control illegal hunting and poaching of wildlife
- 306 ecoclubs with 63,615 students supported to inspire future generations for conservation

Ecoclub in action
© WWF Nepal, Hariyo Ban Program

Threats to Critical Habitats and Ecosystems Reduced

Hariyo Ban worked to restore ecosystem functions such as watersheds, corridors and provision of natural resources, and helped build resilience of ecosystems to climate change, to benefit both people and wildlife. Recognizing the importance of taking a watershed/river basin approach, particularly in the light of climate change (WWF 2015a), it increasingly moved towards this approach.

Habitat Management

Hariyo Ban supported habitat management both inside protected areas and buffer zones, and outside in corridors and other forest areas. Restoration of forest as well as river corridors, critical flood plains and grasslands was supported, in many cases to improve ecological connectivity. Details of forest restoration are given in the Sustainable Landscape section of this report.

Restoration and management of grasslands and wetland habitats has created additional habitat for several wildlife species including rhino, spotted deer, barking deer, hog deer, wild boar, rodents and grassland birds. Work included removal of invasive species, prevention of forest succession, controlled

Habitat Management

- Invasive species were removed from 323 ha of critical habitats in forests, grasslands and wetlands
- Draft National Strategy to Manage Invasive Species was supported
- 1,239 ha of critical grassland was managed, including 49 ha in BNP for translocated rhinos, and 30 ha in CNP for translocated water buffalo
- The nine lakes in the Pokhara valley were declared as a Ramsar site
- Support was provided for the Pokhara Lake Cluster management plan

burning, control of grazing livestock, control of unsustainable harvesting, and creation or deepening of waterholes. Increased use by wildlife has been observed in many of the areas, and ecotourism flourished in some places, particularly along the Rapti river corridor, with increased sightings of rhino, deer, wild boar and even tigers in grasslands managed in buffer zones and community forests. Local communities now have access to grassland resources from the restored areas.

Wetlands were restored by removing invasive alien plant species and check dams were created to retain water and control soil erosion. New waterholes were constructed in many places. Wetland restoration has helped to create additional wallowing sites for species like rhino, and habitats for resident as well as migratory birds. Floodplain restoration (264.4 ha) was mostly targeted along rivers in the Terai and streams originating from the Churia hills. Floodplain restoration sites in Deukhuri (Dang district), Chandi khola (Rautahat), Pasaha khola (Bara) and Orahi (Bardia) have been developed as model sites. Restoration of the Karnali river corridor, critical for tiger, rhino and elephant, has created additional grazing areas for ungulates. Plantation in the Daulapur bottleneck of the Karnali corridor improved connectivity between BNP and Katarniyaghat Wildlife Sanctuary in India. The Karnali corridor is now frequently used by rhino, tiger and elephant.

The Pokhara lakes were designated as a Ramsar site and a climate-smart management plan has been prepared. Implementation of the plan will help to reverse the deteriorating condition of these lakes. They are home to a diverse range of wetland bird species, and provide good habitats for many species of fish which are used by wetland dependent communities for their livelihoods.

Community Led Restoration of Pasaha Floodplain in Halkhoria Collaborative Forest in Bara District

A few decades ago a devastating flood occurred in Pasaha, in the Halkhoria Collaborative Forest in Manaharwa VDC in Bara district. The flood swept away five houses and converted several hectares of fertile land to sand flats by the Pasaha khola. To restore this area, 11,000 seedlings of jamun (Syzygium cumini) were planted with bamboo on these sandy banks with support from Hariyo Ban Program and active participation from members of local community learning and action centers (CLACs). Barbed wire fences were erected to protect the plantation from open grazing and promote natural regeneration of grasses. Now the trees, bamboo and grasses are growing well, stabilizing the flood plain, restoring the fertile soil and reducing the flood and erosion risk.

Bicharmaan Rumba, a 73-year-old local says, *"Our only desire was to protect the next generations from being displaced from their homes due to the floods. Now with plantation efforts and conservation of forests and grasslands, it seems possible."*

Integrated Sub-Watershed Management

An integrated sub-watershed management plan is an adaptive, comprehensive, integrated, multi-resource management plan that seeks to balance healthy ecological, economic, and cultural/social conditions and addresses ccritical threasts and vulnerabilities within a sub-watershed. It covers the sustainable management of natural resources in the sub-watershed and addresses critical threats and vulnerabilities, improving natural resources and ecosystem services to meet both present and future demands for people and natural communities. Hariyo Ban applied ISWMP at the operational level as part of the river basin approach to restore and manage a mosaic of sub-watersheds and micro-catchments, strengthening upstream-downstream linkages. Support was provided to prepare ISWMPs for eight critical watersheds, revise two existing plans, and implement 14 ISWMPs following the Participatory Watershed Management and Local Governance modality practiced by Department of Soil Conservation and Watershed Management (DSCWM) (shown in Figure 1). Watersheds were selected either on the recommendation of DSCWM or through a rapid assessment of bio-physical and socio-economic conditions, including the natural resource base. Implementation of the ISWMPs has helped address threats and vulnerabilities in the watersheds, benefitting both people and ecosystems. Moreover, some of these sub-watersheds lying in the Seti sub-basin are also part of river corridors and contribute to major north-south linkages. (See Annex 7 for a list of subwatersheds covered and the investments made for implementation of each ISWMP.)

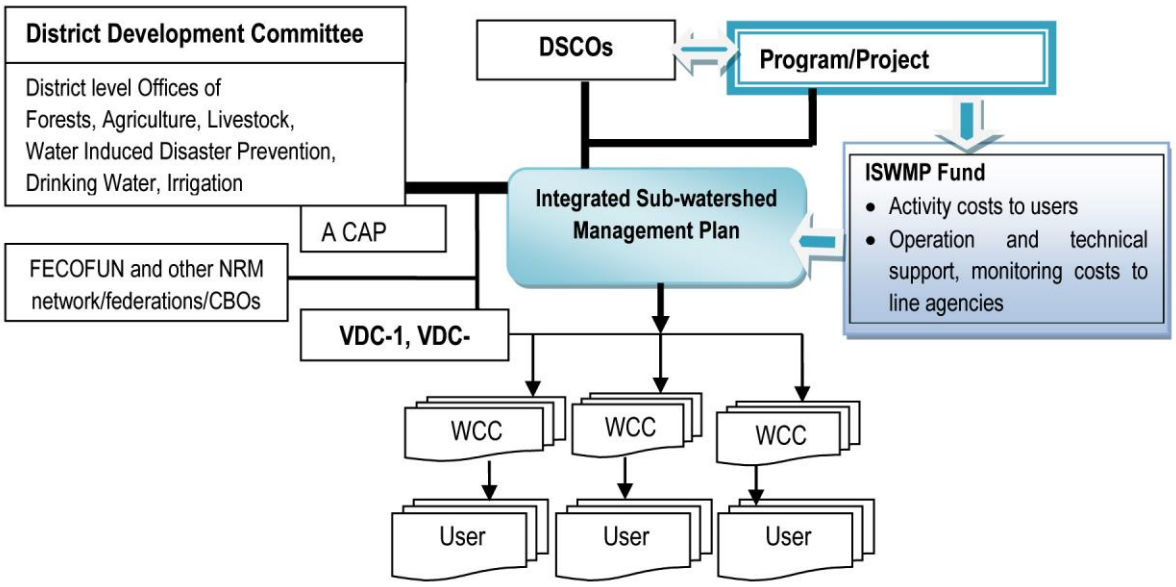


Figure 1. Participatory Watershed Management and Local Governance Modality

Achievements from implementing the ISWMPs include stabilization of landslides and deep gullies through the use of both soil bioengineering and structural engineering measures including construction of embankments. These embankments have helped to stabilize slopes, reduce river bank cutting and control floods. Tree planting has restored degraded areas and helped reduce soil and river bank erosion, stabilize slopes, and reduce sediment loads in streams. Control of forest fires and open grazing has helped to protect the planted saplings as well as promoting natural regeneration. Tree planting and natural regeneration have also helped to improve greenery in the watersheds while benefitting local communities with production of grass for livestock.

ISWMP Results

- 271,483 people directly benefitting
- Seven drinking water systems constructed
- Five irrigation canals maintained and 40.5 ha of agricultural land irrigated
- 400 m of foot trail improved
- Seven landslides and deep gullies stabilized
- 65.5 ha of agricultural lands on river banks protected through embankments
- 23.7 ha of degraded land restored through tree planting and natural regeneration
- NRs. 20,612,149 invested to implement the ISWMPs (23% from communities and 73% from Hariyo Ban)

Agricultural lands have been protected with stabilization of slopes, reduction in riverbank cutting and control of floods, while agricultural productivity has increased by providing support for irrigation systems. Livelihood options of communities have been increased with enhanced productivity of agricultural lands, and production from reforested/regenerated forest areas. In addition, foot trails have been improved, reducing soil erosion, stabilizing slopes and improving access/mobility of communities. Drinking water systems have been established, providing improved water supplies to local communities.

Before and after photographs from implementation of integrated sub-watershed management plans in Chaandi Khola (top) and Pasaha Khola (bottom)
© CARE Nepal, Hariyo Ban Program

Pasaha Khola model floodplain area restoration in Bara district (top left: before the restoration started; top right and bottom left: during restoration; bottom right: situation in 2016)
© CARE Nepal, Hariyo Ban Program

Bettini Khola Residents Controlling Erosion

Bettini khola is a seasonal stream, a tributary of Harpan khola that feeds the Phewa lake in Kaski district. Every monsoon, local people used to live in fear of losing more of their fertile fields and property due to erosion. They have planted 2,200 saplings of various tree species and 44 bamboo slips in the hope that the plants will hold the soil in place. They have stopped open grazing in the area through fencing and fines, and have constructed a series of check dams across the gullies feeding into the stream to dissipate the force of water and trap sediments. The saplings and bamboo slips are now well established and the check dams are well maintained, as a result of which there has been no recent loss of land or property from erosion in the gullies or on the stream banks.

According to Agnidhat Tripathi, Chairperson of Bettini Khola Conservation Committee, the sole irrigation canal that used to be damaged every year by the floods was finally repaired when the risk of flood damage was reduced, and farmers are now planting rice and wheat on land that they previously had to leave fallow due to limited irrigation and rampant open grazing.

Enabling Policy Environment for Biodiversity Conservation Strengthened

Hariyo Ban has provided technical inputs to GoN to prepare and update 10 biodiversity related policies, guidelines and strategies related to biodiversity conservation, making them climate smart, inclusive, pro-poor and more conservation friendly (Annex 3). Dissemination of information on these policies, strategies and guidelines was also supported. Technical inputs were provided to update the National Biodiversity Strategy and Action Plan, Ramsar Information Sheets (RISs) for Bishazari Lake and Jagdishpur Reservoir Ramsar sites, TAL Strategy and Action Plan (2015-2025), CHAL Strategy and Action Plan (2016-2025), and Wildlife Health Management Strategy (draft), while support was provided to mainstream GESI in the Community Forest Development Guideline (CFDG) 2009, develop a Vulture Conservation Action Plan (VCAP) (2015-2019) through BCN, prepare an Operational Guideline for the HWC National Relief Fund, develop a Protocol for Community Based Red Panda Monitoring, prepare the National Invasive Species Management Strategy, develop species conservation action plans for bijaya sal and pangolin, and prepare a site-specific species conservation action plan for the blackbuck population in Suklaphanta. The TAL and CHAL Strategies and Actions Plans, VCAP, Blackbuck Conservation Action Plan and the climate smart Manaslu Conservation Area Management Plan have all been endorsed. Implementation of these strategies and plans has already been initiated and Hariyo Ban has provided direct support for this, as well as helping to create or strengthen enabling environments for them.

Risking Her Life for Conservation: Nanda Devi's story

On April 21, 2012, Nanda Devi was brutally attacked by a gang involved in forest encroachment who cut her hands and tried to kill her as she attempted to stop their illegal activities in Madhumalati Community Forest. However, despite the serious injury and risk to life, she did not lose her courage and determination and she selflessly continues to work for community forest conservation. She wakes up early every morning and patrols the forest, talks to people about conservation and sustainable management of the forest, and advocates for community forest users' rights to meet their needs. She was recognized as a conservation hero by Hariyo Ban Program, WWF Nepal in 2013 for her bravery and dedication to conservation. After receiving the award, Nanda said, "*The pain in my hands has reduced but I cannot work as I used to before. I am happy to be recognized at the national level but we still have a long way to go before we overcome the conservation issues at local level. I will continue to fight for them and am positive that people will soon understand the importance of conservation."*

Sustainable Landscapes

Strategic Approach

The strategic approach of the Sustainable Landscapes component was to provide support to GoN to create the structures, operations and enabling policy environment for REDD+ readiness in Nepal, and prepare for subnational REDD+ projects to contribute to climate change mitigation. The Program prioritized capacity building on forest inventory, GHG monitoring and equitable benefit sharing. In preparation for subnational REDD+ projects, the Program identified, ranked and worked to reduce the drivers of deforestation and degradation in the two landscapes, and assessed the effectiveness of different approaches. The Program also reviewed the potential future impacts of climate change on forests, including possible exacerbation of existing drivers such as fire, and implications for forest management and silviculture including REDD+. The component also piloted a separate carbon financing mechanism, as well as non-carbon PES schemes, and worked with GoN on an enabling PES policy.

Greenhouse Gas Monitoring and Forest Inventory Capacity Building

- 4.902 million MT CO_2e emissions reduced/sequestered
- Plantation established on 3,184 hectares to restore degraded forests
- 481 CFOPs renewed in accordance with Community Forest Development Guidelines (CFDG) 2009, bringing 36,239 ha of forest under improved management
- Gold Standard Biogas scheme supported
- Two sediment reduction PES schemes piloted and in operation
- 8,257 people trained in forest inventory and GHG monitoring
- 13 LRPs, including 8 women, received Council for Technical Education and Vocational Training (CTEVT) accreditation
- CFUG database management system operationalized

REDD+ Policies, Standards and Strategies Formulated

The Program provided both technical and financial support for the development and dissemination of the following policy documents:

REDD+ Policy and Training Documents

- 10 policy documents supported
- Training manuals on REDD+ and GESI in REDD+ prepared

- Forest Policy 2014 (endorsed)
- Forestry Sector Strategy 2016 (endorsed)
- Amendment of Forest Regulation in line with the revised Forest Act
- National REDD+ Strategy
- Land Use Policy Implementation Plan
- REDD+ benefit sharing mechanism document
- National Monitoring System for REDD+ Social and Environmental Standards (SES).

The process included sensitizing and capacitating stakeholders on concepts and policy procedures relating to REDD+, free prior and informed consent, carbon benefit sharing, gender responsive budget

(GRB) analysis and community score board interface; consulting and collecting feedback on the policy processes; and building readiness with institutional strengthening for REDD+ and carbon benefit sharing. These stakeholders contributed to the formulation of the policies mentioned above, building better coordination and partnerships, and creating an enabling environment for effective interventions. The REDD+ SES document and its assessment report have been useful for the REDD Implementation Center (RIC) in developing the national Safeguard Information System, as per the requirement of the United Nations Framework Convention on Climate Change. The REDD+ SES was submitted as part of the REDD+ readiness package to the Forest Carbon Partnership Facility.

In addition, Hariyo Ban provided significant contributions to GoN to prepare the ER-PIN for a subnational REDD+ project in the Terai (MoFSC 2014b) which was approved; followed more recently by partial support to prepare the more detailed Emission Reductions Program Document (ERPD). The latter included support for awareness and capacity building of stakeholders in all 12 districts covered by the subnational project; workshops to collect their inputs for incorporation in the ERPD; and technical support for writing the ERPD document. Annex 3 lists the policy documents Hariyo Ban contributed to.

Capacity for Forest Inventory and GHG Monitoring Developed

The Hariyo Ban Program mobilized communities, including local resource persons, citizen scientists, members of NRM groups, students from the Institute of Forestry, and government staff to undertake forest surveys, inventory of forest resources and carbon stocks, and sustainable forest management. Community members were mobilized after capacity building through trainings/workshops, refresher trainings/workshops, and/or exposure visits. Traditional methods were largely used in forest inventories. The carbon inventory in CHAL (WWF Nepal 2016h) was a major undertaking in this huge landscape, for which a forest carbon assessment guideline was developed, and a training video was made.

A CFUG database management system, cofunded by Hariyo Ban, was operationalized to manage information on CFUGs in Nepal. It provides a tool to identify priority locations for preparation and leveraging of Forest Investment Program financing, as well as identifying needs for soft loans for forest-based enterprises. There will be many other uses for the large CFUG database in the future, which is managed by FECOFUN.

Forest Carbon Inventory in CHAL

The Program supported a comprehensive baseline inventory of the forest carbon stock in CHAL, with a detailed assessment of carbon sequestration potential, carbon capture, permanency, leakage, and risks from the forest coverage (WWF Nepal 2016h). It was undertaken by the Asia Network for Sustainable Agriculture and Bioresources, the International Centre for Integrated Mountain Development, and UNIQUE Forestry and Land Use GmbH. The study had three main components: a rapid baseline survey of socio-economic conditions, geospatial analysis, and forest carbon assessment. The rapid baseline survey to analyze socio-economic conditions employed focus group discussions, key informant interviews, consultations with experts and stakeholders, and a literature review. The geospatial analysis used land/forest cover mapping, change detection, simulations, stratification, and verification. Satellite data, geographic information system (GIS) data, and relevant GIS software were used to identify and distinguish the project area, to recognize the forest areas, and to classify them into different strata in CHAL. The detailed forest carbon assessment used 300 permanent sample plots in the landscape to assess three main carbon pools: above ground (trees, saplings, shrubs, herbs, and grasses and litter), below ground, and soil carbon. See the report for discussion of the methodology.

The total carbon stock in the forests of CHAL is estimated at 540.1 million MT CO_2e (147.17 million MT of carbon) with an average of 725.9 MT CO_2e per ha. The carbon stock was highest in dense needle-leaf forests and lowest in sparse needle-leaf forests. Among the different carbon pools, the live carbon pool stored above and below ground was 399.6 MT CO_2e per ha, of which trees provided 97%. The soil is also an important pool of carbon with an average of 320.3 MT CO_2e per ha.

The study concluded that a REDD+ project in CHAL would have enormous potential to contribute to the maintenance and enhancement of forest carbon benefits, as well as the co-benefits of biodiversity conservation, livelihood generation, and climate change adaptation.

Drivers of Deforestation and Forest Degradation Reduced

The Program worked to reduce the impacts of selected priority drivers of deforestation and forest degradation, mainly shifting cultivation, overgrazing, uncontrolled fire, over-extraction of firewood, and poorly planned roads. While it did not work directly on encroachment, it did support restoration of previously encroached areas as well as other degraded areas. Different drivers were tackled at different scales, depending on opportunities for intervention and scaling up of promising approaches.

An assessment of the effectiveness of Hariyo Ban's work in tackling several priority drivers and threats at community level was made at the end of Phase I using a perception mapping technique with community members and district stakeholders (WWF Nepal 2016f). The assessment worked with 291 participants in 6 districts where Hariyo Ban had interventions. Results for community members are shown in the Table 2.

Table 2: Perceptions of local communities on the contribution of Hariyo Ban I in reducing threats and drivers, and improving biodiversity and forest condition in program areas

Threat/driver/vulnerability	Rating (%)					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
Unsustainable harvesting of forest resources is reduced in our forest land	2	5	2	50	35	6
Sustainable forest fire management practices are promoted	5	10	1	52	24	8
Overgrazing in our forest lands is reduced	2	9	2	44	34	9
Poaching is reduced	2	12	2	44	28	12
Human-wildlife conflict is reduced	6	16	2	41	22	13
We have received benefits due to sustainable use of ecosystem services	2	6	1	54	32	5

Community members were generally very positive about the impacts of Hariyo Ban in tackling unsustainable harvesting, improving fire management, reducing overgrazing, poaching and HWC, and promoting ecosystem benefits such as reduced flood and landslide risk, and provision of clean water. They most strongly agreed that unsustainable harvesting had been reduced, and ecosystem services had been improved. The areas where their responses were lowest (though still predominantly positive) were in reducing poaching and human wildlife conflict. Results with district stakeholders follow a similar pattern, though there were bigger gaps in knowledge about Hariyo Ban's work. Like community members, as a group they were most positive about reducing unsustainable harvesting and increasing ecosystem services.

Interventions and results are discussed in more detail under the relevant threats in the biodiversity threats section and drivers in this section.

Reducing the Impacts of Shifting Cultivation

One of the major drivers of deforestation and forest degradation identified in the mid hills of Nepal is shifting cultivation. Poor, marginalized communities with no alternatives practice slash and burn agriculture, destroying large areas of forest to grow low-yielding crops, resulting in forest fragmentation, soil erosion, landslides, poor water quality, and downstream sedimentation. Shifting cultivation has resulted in breaks in important north-south biodiversity corridors along the Seti and Trishuli corridors. The Hariyo Ban Program worked with communities to address this driver, major interventions including planting of broom grass to promote alternative livelihoods, and tree planting to restore forests.

Broom Grass Cultivation

- 2,097,650 broom grass rhizomes planted on 201 ha in Devghat and Abukhaireni VDCs in Tanahun where shifting cultivation was previously practiced
- 338 households in 49 Leasehold Forest User Groups (LHFUGs) benefitting in Tanahun
- NRs 3,000,000 made from selling brooms in 4 years
- 2,301,615 broom grass rhizomes have been planted on 328.4 ha of degraded land in TAL and CHAL

This work, undertaken in collaboration with the DFO Tanahun, has significantly helped to reduce shifting cultivation and restore vegetation cover on steep slopes. There are anecdotal reports of reduced soil erosion and improved water quality in areas with broom grass, and communities are seeing more wild animals. Income from selling brooms made from broom grass has been critical in supporting livelihoods during the off-season for agricultural production, and women report that they use the income to feed their families better, and clothe and educate their children. Some men have stopped migrating out for work and returned home to grow broom grass. However, despite the promising market demand for brooms, the producers have not yet been able to effectively cash in on the demand (see the livelihoods section for more details). Further information is given in WWF Nepal (2015b).

While some tree planting and natural regeneration of trees and shrubs is occurring, it has not had a strong focus in the leasehold forests. Also, the planning of the leasehold forests was not done with corridor restoration in mind. Consequently the contribution of this work so far to restoring critical gaps in the north-south corridors is limited. This issue will be rectified in coming years, both in areas where broom grass cultivation is already occurring, as well as in new areas where this intervention will be expanded specifically as a corridor restoration activity in Hariyo Ban II.

Broom grass in Tanahun
© WWF Nepal, Hariyo Ban Program/Nabin Baral

Reducing the Impacts of Uncontrolled Forest Fire

Uncontrolled forest fire is a common driver of deforestation in both the TAL and CHAL. While some fire is good for most types of forest, fires that are too hot, too frequent or badly timed can be damaging. 2016 was a particularly bad fire year due to a delay in the pre-monsoon rains. As climate change advances and greater weather extremes occur, forest fire is likely to become a more important issue during dry years, and may be a tipping point causing some forests die off or undergo significant species composition changes.

Forest Fire Control

- 37% CFUGs experience forest fires regularly with 81% of them have anthropogenic causes
- 2,923 people including 1,425 women made aware on fire hazards
- 157 people including 58 women have been trained and mobilized as forest fire control squad
- 1030 km fire line constructed/maintained

The Program tackled this driver through awareness programs, capacity building for firefighting, and preventive measures in the field. Awareness on the consequences of forest fires was raised through campaigns, radio programs, and production and distribution of awareness materials. Forest fire control squads were formed which included forest guards, CBAPUs and CFUG members. They were trained and equipped to control forest fires, with a major emphasis on safety. Firefighting networks were also established. Control is easier in the plains of the Terai, but in the hills and mountains it is often difficult and dangerous to fight fires, and the major focus should be on prevention. Preventive measures applied by the Program in the field included construction of fire lines and trenches, and reducing fuel loads in forests. Technical support was obtained from the US Forest Service on control of forest fires.

53% of community members participating in the perception mapping agreed, and 24% strongly agreed, that they have been successful in reducing the incidence of forest fire in recent years, they have seen positive change in attitudes and behaviors of community people to take more care to prevent uncontrolled fire, and have developed communication and cooperation strategies with DFOs, Police and CFUG members to control forest fire and firefighting (WWF Nepal 2016f).

We also supported the Department of Forests in convening a Regional Forest Fire Workshop which featured participants from different countries across South Asia. This facilitated the formation of a regional network for sharing experiences and educational materials on forest fire control and capacity building.

Forest Fires in Dumshivir

Dumshivir community forest was named after "*Dumsi*", the porcupine which is found in the forest. The forest is home is also home to pangolin, an endangered species, and many other species of small mammals and birds. Local villagers did not know about the benefits of conserving these animals. However, Maniram Ale Magar, secretary of the CF and a citizen scientist, received training from Hariyo Ban on measures to conserve pangolin and other wild animals, and he has been actively educating his fellow villagers on the importance of forest and wildlife conservation, particularly the potential to generate income through ecotourism. He even teaches children in a local school about the value of conservation. Maniram Ale Magar shared that in the past, people did not know about the importance of conserving these beautiful creatures and used to kill them. Now his efforts have paid off and people have stopped killing the pangolins. Their growing interest in conservation was evident during a recent forest fire incident in the CF where they were concerned not just about the forest but also the wildlife. Mira Thapa, a local resident expressed,

"*Whoever started this fire should be punished. Even if it were my son, he shouldn't be spared. The fire has not just burnt off the forest – many animals such as porcupines, pangolins and wild hens have lost their home*."

Forest fires were common in the CF in the past, and put the lives of villagers at risk. However, after receiving training on how to control forest fires from Hariyo Ban, the villagers are now more aware about preventing forest fires. The whole community banded together to extinguish the last forest fire, according to Tek Bahadur Magar, Chairperson of the CF.

Members of Mukund Sen CFUG demonstrating forest fire fighting techniques
© WWF Nepal, Hariyo Ban Program/Nabin Baral

Forest fire near Lamahi in Deukhuri Valley
© WWF Nepal, Hariyo Ban Program/Nabin Baral

Reducing the Impacts of Unsustainable Firewood Harvesting

Many local households continue to be dependent on firewood for cooking, and for heating in higher altitude areas. Firewood collection is normally undertaken by women, involving much time and labor. Open fires in kitchens cause indoor air pollution, which affects the health of women and young children. Firewood extraction is the most common reason for unsustainable use of forests, which causes forest degradation and is one of the biggest threats to biodiversity.

Hariyo Ban I had a major focus on promoting fuel efficiency and alternative energy in order to reduce this threat/driver, reduce GHG emissions and improve the lives of women. These interventions benefitted 173,860 people, and included biogas for 6,143 households, ICSs for 20,974 households, and metallic ICSs for 3,065 households (including post-earthquake support). Together they reduced carbon emissions by an estimated 60,999 MT over the life of Hariyo Ban I.

Biogas brings multiple benefits for people as well as forests. In a Hariyo Ban assessment, 60% of sampled households installing biogas reported that they stopped using fuelwood; 84% reported a reduction in smoke in the kitchen; 45% reported time savings from no longer collecting fuel and less cleaning, and 15% reported reduced drudgery and better health (WWF Nepal 2016i). Hariyo Ban's biogas support in the Terai contributed to establishing a second Gold Standard biogas project in Nepal, whereby carbon credits are sold commercially to a company in Switzerland, generating revenue and bringing yet another benefit from biogas.

The perception mapping exercise found that while a significant number of biogas units and ICSs have been installed, a small group of poor people living near to forests are unable to afford ICS or biogas, and they continue to rely on forests for firewood. The study recommended that they should receive ICS training and small-scale support to link them with GoN alternative energy promotional activities (WWF Nepal 2016f).

Biogas Has More Than One Benefit

Using biogas in Nepal's First Model Biogas Village Development Committee
© WWF Nepal, Hariyo Ban Program/Nabin Baral

Malati Devi Chaudhary of Amauri, Pathariya-3, Kailali used to face hardships in collecting firewood from community forests 15 to 35 km away; she also had to purchase firewood. However, since installing a biogas plant in her home through the revolving fund support provided by the Hariyo Ban Program, she states:

"*I don't have to buy fuelwood or spend a lot of time collecting it, as biogas has reduced my home's fuelwood needs to less than half a cartload for an entire year. That is nearly an 80-90% reduction. Food cooks faster and it is smoke free. Also, I am cultivating vegetables using the slurry as fertilizer."* Phul Mati Chaudhary, another local resident of this Tharu community, said that she had not visited the forest to collect firewood for the past two years after installing biogas.

Like Malati Devi and Phul Mati, 67 of the 82 households in Amauri have installed biogas plants. Most of these biogas units have toilets attached, which has helped to improve sanitation and health in the community. As a result, almost all households have toilets, and Amauri has been declared an open defecation free area.

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Improved Cook Stoves Make Life Easier for Rural Women

Prem Kumari Ghale, 40, using her improved cook stove in Manaslu CFUG, Ghermu, Lamjung
© WWF Nepal, Hariyo Ban Program/Nabin Baral

"*In the past, we had traditional stoves and we women had to get up early, at dawn, and spend a long time preparing meals. The stove used a lot of firewood and spouted smoke, leaving our walls and lungs blackened*," said Kamala Poudel of Bhakarjung CFUG in Dhikurpokhari VDC in Kaski.

"*Now with improved cook stoves that we received with support from the Hariyo Ban Program, we can have meals ready in no time and all the smoke goes outside, keeping walls inside the house clean. In the past, my eyes often used to water as I sat by the traditional stove to prepare meals, but now when I use the improved cook stove, they no longer itch or sting. The stove also uses so much less firewood that I don't have to go to the forest to collect it as often, and I carry smaller bundles of firewood so my back does not ache. It has made life so much easier, and now we even have plenty of time for other activities – to meet, to discuss our problems, to talk of conserving our forests.*"

Reducing the Impacts of Overgrazing

Open access and the tradition of keeping large numbers of unproductive livestock are recognized as major underlying causes of overgrazing in forests. While the number of livestock is declining nationally due to reduced labor availability, forest grazing is still a major problem in some forests where Hariyo Ban is working, especially in the western Terai. Browsing and trampling by livestock damage tree seedlings and saplings, adversely affecting regeneration of forests. The Program reduced overgrazing in many areas through promotion of fodder tree and grass planting on farm land to reduce the need for forest grazing (which also reduces loss of livestock to wild animals); and promotion of stall feeding including provision of feeding troughs. It sensitized CFUGs and herders on adverse impacts of overgrazing on natural ecosystems, and promoted improved breeds, often coupled with biogas support to increase incentives. Alternative livelihoods were provided for forest dependent communities in coordination with district livestock development offices and service centers. The Program also supported communities to build fences and dig trenches to prevent livestock from entering forests.

A zero-grazing program was launched through community forests in the Brahmadev and Karnali corridors. The Program worked closely with the District Livestock Office, Kanchanpur, to promote artificial insemination to improve the local breed, and to promote mass livestock vaccinations in order to reduce the risk of disease transmission to wildlife in SWR. Grazing control enabled regeneration of native grass species. Conflict between protected area and people reduced significantly, as community members no longer had to collect fodder illegally. Perception mapping conducted by Hariyo Ban revealed that 78% of the participants either agree or strongly agree that overgrazing in their forest land is reduced, with regular patrolling to control grazing in forests, stall-feeding for livestock, and future plans to control overgrazing from outside. In several places the condition of forest land is improving with greater forest regeneration and/or increased richness in regenerated species because of reduced grazing pressure (WWF Nepal 2016f).

Reducing the Impacts of Poorly Planned Road Development

While improved access for remote communities is an important part of development in Nepal, unplanned or poorly planned local road development is causing many problems and in recent years has become recognized as a serious driver of deforestation and forest degradation (e.g. WWF Nepal 2013b and 2014; MoFSC 2014b). As part of the PES work in Marshyangdi, Hariyo Ban Program worked with local VDCs to stop the practice of opening up new roads with bulldozers without adequate planning of road alignment and appropriate road design. Some of the royalties from the Middle Marshyangdi Hydropower are now being used to restore badly degraded areas. After the earthquake, bioengineering work supported rehabilitation of several landslides associated with roads in four districts, developing demonstration sites for best restoration practices. Building on these results, work to promote better road planning, design and restoration will be scaled up with local authorities in phase 2.

Renewing Community Forest Operational Plans

Sustainable management of community forest areas was promoted by supporting CFUGs to renew their community forest operational plans (CFOPs), and working with them to incorporate measures for sustainable use and management of natural resources, along with equitable benefit sharing. Renewal of CFOPs is usually required every five years and is the responsibility of the CFUGs; without up-to-date plans the CFUGs cannot legally derive benefits from their forests. The 481 CFOPs that were renewed have benefitted 72,404 households. 42% of these CFOPs were supported to

incorporate climate change adaptation and mitigation, while 50% of the CFOPs have provisions to aid disaster affected members of the community. Figure 2 shows distribution of Hariyo Ban-supported renewals by district.

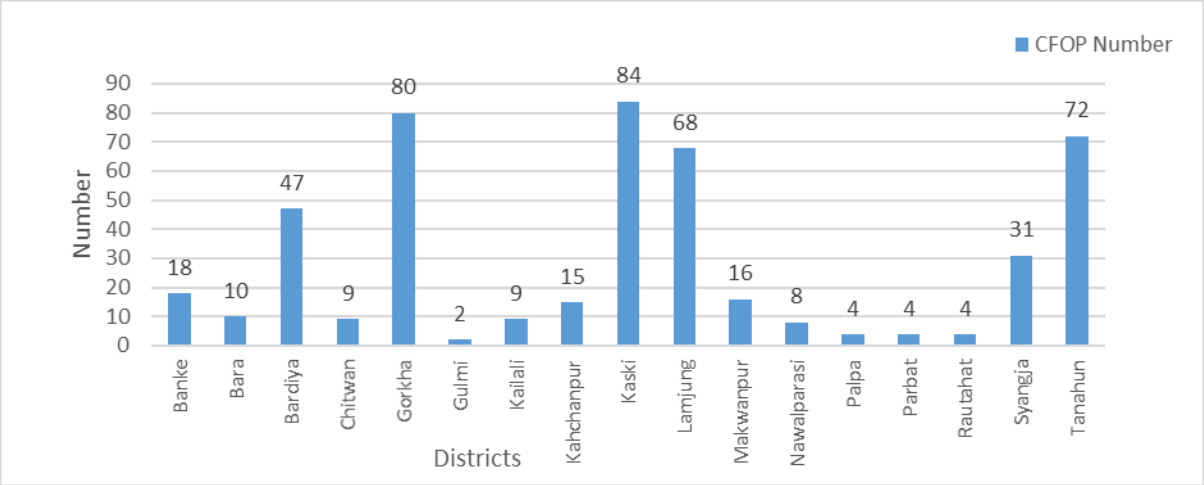


Figure 2. Number of CFOPs renewed by district

Promoting Sustainable Forest Management

Sustainable forest management (SFM) refers to environmentally appropriate, socially beneficial, and economically viable management of forests for present and future generations. SFM was tested in collaboration with the DFO Kaski following approval of the Scientific Forest Management Working Procedure 2071, to increase sustainable harvest of timber and income generation for communities. Labor for the inventory and management of the forest were locally sourced, trained and engaged in SFM practicing silvicultural activities such as thinning, pruning, bush cutting, pollarding, climber cutting, and removing diseased, dying, deformed and decayed trees. After measuring, tagging and numbering the recorded trees, data was maintained at the tree and plot levels separately. SFM enabled a greater timber harvest than was previously planned, while soil erosion and sediment loss from the forest area were more effectively controlled through the building of brushwood check dams and covering gullies with branches after timber extraction. SFM has been expanded to 534.78 ha, including establishment of 14 demonstration plots.

Sustainable Forest Management in Kaski

- Started in 191 ha of Takanja CF in Siddha VDC, Kaski
- Eight ethnic, marginalized locals trained from within the CFUG
- 3,500 ft^3 timber sustainably harvested under SFM instead of 1,500 ft^3 originally planned (which would have been underharvested)
- SFM expanded to 497.22 ha in 14 demonstration sites

Tree planting in Bhakarjung
© WWF Nepal, Hariyo Ban Program

Seedling production and plantation support

Hariyo Ban supported the production of seedlings of various tree species in private nurseries in CFUGs and in nurseries at DFOs and District Soil Conservation Offices (DSCOs), and distribution of seedlings to communities for planting in private forests and on barren public lands, and for restoration of degraded forests and watershed areas. Planting was promoted to conserve floral species, habitats, ecosystems, corridors and watersheds; to restore degraded areas and improve forest connectivity; to improve sustainable production and management of natural resources to support livelihoods; and to increase resilience to climate change and minimize disaster risk.

Plantations

- 923,910 seedlings of different tree species produced in nurseries and distributed for planting
- 3,184 hectares brought under new plantation
- 559 cement troughs distributed for stall feeding of cattle to control grazing in plantation area
- 335 km of fencing erected to protect 6213 ha of existing forests areas and new plantation areas.

Biophysical condition in many plantation areas has improved through increase in vegetation cover, improvement in slope stability, and reduction in soil erosion and sediment loss. More wildlife sightings in the plantation areas have also been reported, indicating improvement in habitats and ecosystem conditions. However, it must be noted that the success of plantation varies with species planted, management regime, and location of plantation site.

Key elements that influenced the success of plantations and restoration included: selection of tree species in line with local site conditions and community demand; timing of planting and use of

specific silvicultural methods for different species; control of open grazing; community ownership; and regular monitoring. Plantation sites on private land were more successful, while plantations in CFs were successful when there was effective community mobilization that ensured equitable benefit sharing and active participation of women, poor and marginalized groups in leadership roles (WWF Nepal 2016e).

Payments for Ecosystem Services Piloted

PES schemes based on payment for sediment retention were successfully piloted by the Hariyo Ban Program in Mid Marshyangdi watershed in Lamjung district and the Phewa watershed in Kaski. These schemes involved a lengthy process that included feasibility studies, preparation of PES implementation and monitoring plans, endorsement of the plans by DDCs and VDCs, and Memorandums of Understanding (MoU) signed between the ecosystem buyers and producers.

Mid-Marshyangdi hydropower

In the Marshyangdi watershed siltation and sedimentation due to unmanaged infrastructure development, land degradation, and unsustainable practices in agriculture and natural resource utilization upstream have major impacts on hydropower production. The Mid-Marshyangdi hydropower project alone spends more than US $80,000 annually for maintenance of equipment damaged by sediments. The PES scheme for sediment retention was piloted to include hydropower companies as ecosystem service buyers and residents of 17 VDCs and one municipality in the upstream region as ecosystem service providers. The major institutions established to implement the PES are shown in Figure 3.

Khahare Khola in Bensishahar Municipality 5 (previously Gaunshahar VDC), Lamjung was identified as a demonstration plot for the Mid-Marshyangdi PES scheme, and Khahare Khola Sub-Watershed Conservation and Management User Committee was formed to raise awareness and to conserve 239 hectares in the area. Planting of tree seedlings and construction of check dams helped to trap and retain sediment at 14 different points in the sub-watershed, and training was provided on multi-cropping to reduce sediment loss and maintain soil fertility of agricultural land. Sediment measuring scales were placed in seven sections of the demonstration site to collect information on sediment loss, and the effectiveness of the sediment traps and sediment retention activities. Results showed that the measures reduced the sediment reaching the river by 2,532 cubic meters annually, while the growth of vegetation planted as part of the soil bioengineering is expected to help control additional sediment loss in the future (CARE Nepal, unpublished data). The sediment retention activities cost US $27,842, of which 39% was funded by the DSCO, 7% from the DDC/Municipality, 33% from the Hariyo Ban Program, and 21% from the community. Further details are contained in CARE Nepal (2016a).

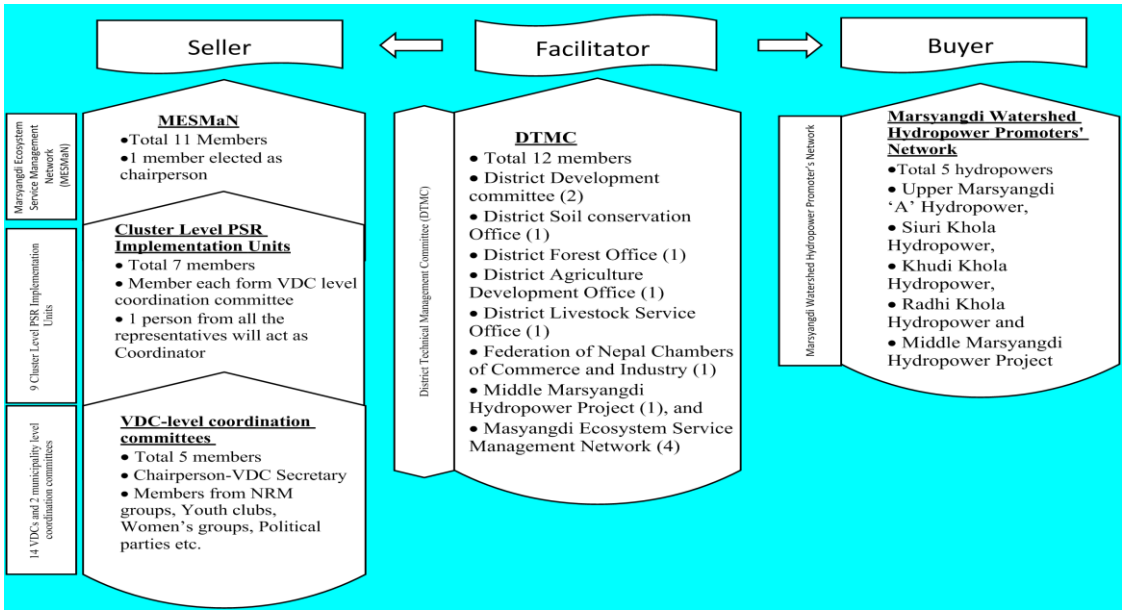


Figure 3. Major institutions established for PES pilot initiatives in the Mid-Marsyangdi Watershed

Before and after photographs of payments for ecosystem services demonstration site in Lamjung district
© CARE Nepal, Hariyo Ban Program

Phewa lake

The Phewa watershed is a very popular tourist destination in Nepal but is under tremendous threat because Phewa Lake is filling up and shrinking in area because of sedimentation from upstream areas. Unsustainable agricultural practices, loss of forest cover and unplanned village roads in the upstream areas have induced large landslides, extensive soil erosion and a large amount of sediment flow to the lake (Map 5). A scheme for payment for sediment retention was piloted following an MoU between the upstream communities as ecosystem service providers, tourism entrepreneurs as ecosystem service buyers, and a 25-member Phewa Watershed Ecosystem Management Board as the main governing body and intermediary.

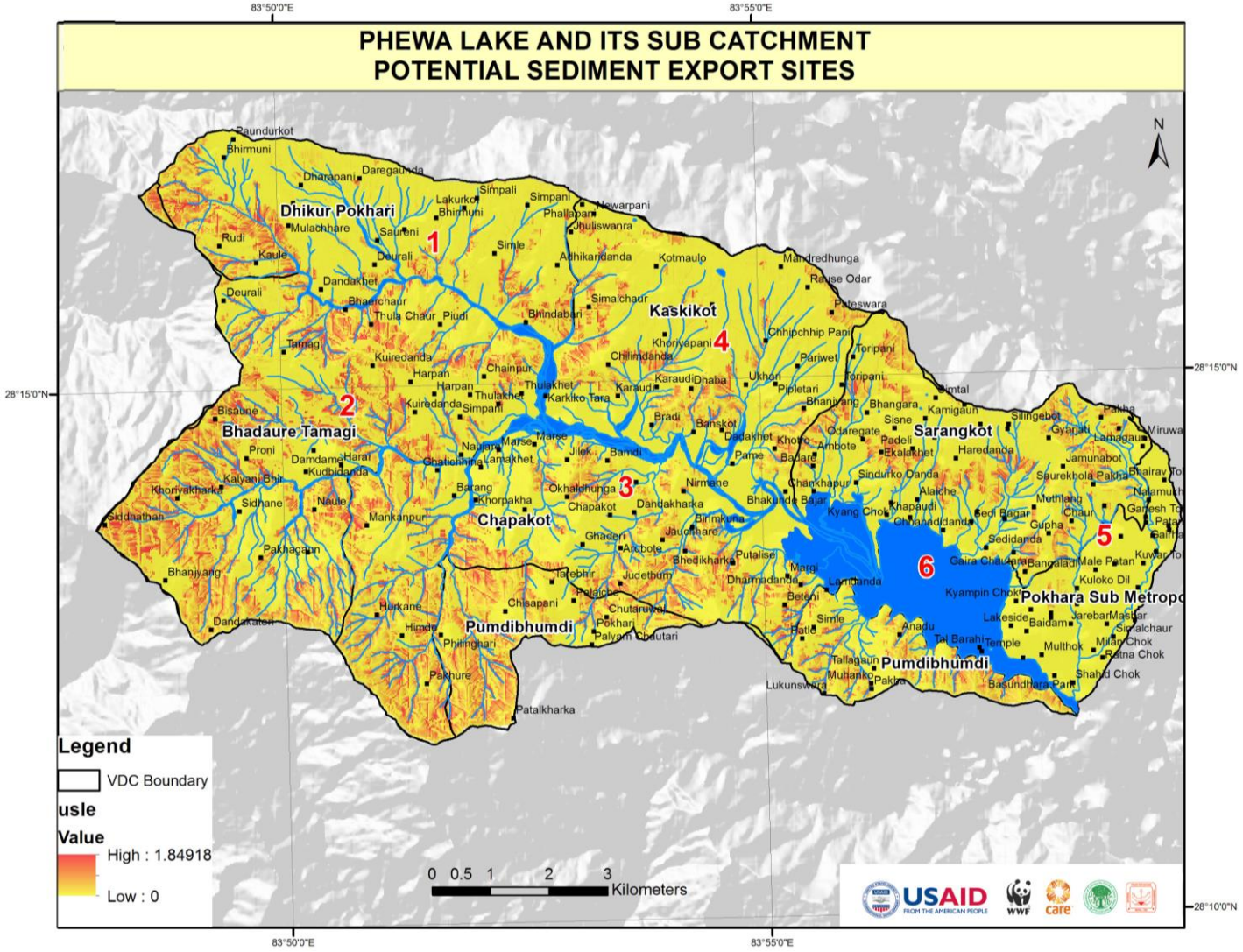
Andheri khola sub-watershed was selected as the pilot site in the Phewa PES program, and implementation of PES activities was undertaken using NRs. 100,000 from Paschimanchal Hotel Association of Pokhara with technical support from DSCO. Activities included installation of seven river embankment structures in Khahare Khola, construction of gabion check dams in three sites in

Paudur to control landslides, and maintenance of one km of roadside drainage in Adhikari Dada. Planting along the gabion check dams, cultivation of perennial corps, and fodder/forage promotion in the upper catchments of the watershed were also conducted. Sediment traps were placed to measure the sediment flows, and analysis of the data from these traps revealed that the annual sediment load flowing into Phewa Lake was effectively reduced by about 794 cubic meters. In addition, tea planting was promoted by Hariyo Ban as part of the PES program to reduce surface runoff velocity and soil erosion, as well as provide alternative income opportunities for residents of upper catchment areas of the watershed. A sustainable fundraising mechanism for the PES scheme was initiated with a green sticker campaign through which any tourism operator is eligible for the green sticker after paying NRs. 6,000 per year to support the PES scheme.

Both these PES schemes are still at a relatively early stage and are not yet fully operational. Further information is provided in Annex 8. Arising from this work, the Hariyo Ban Program supported the development of a national PES policy with stakeholder consultations, to create an enabling environment for PES in Nepal. The draft policy was prepared and shared with stakeholders and experts for feedback, and a revised version has been submitted to MoFSC for endorsement and implementation.

Other PES schemes were also supported by Windows of Opportunity grants: for irrigation water in the Banganga watershed of Kapilvastu district through Eco Envoy Private Limited, and in Khageri khola watershed in Barandabhar forest corridor, Chitwan district through CO-ACT Nepal.

Fewa Lake
© WWF Nepal, Hariyo Ban Program/Nabin Baral



Map 5. Potential for sediment export from soil erosion and landslides in the Phewa catchment using the Integrated Valuation of Ecosystem Services and Tradeoffs (InVEST) tool; this and other information helped prioritize VDCs for the Phewa catchment payments for activities in the PES scheme.

Climate Change Adaptation

Strategic Approach

The Hariyo Ban Program's approach to climate change adaptation integrates community and ecosystem adaptation. This approach acknowledges both human rights and ecosystem principles, using improved management of ecosystems to help vulnerable people increase resilience and adapt to climate change, while at the same time recognizing that many ecosystems and the services they provide are themselves vulnerable to climate change, and their resilience is built accordingly. The approach both focuses directly on adaptation, and mainstreams it into the other Program components to make them climate-smart. It involves working at multiple scales to accommodate natural processes and different administrative levels.

At community and VDC level, Hariyo Ban used bottom up-planning working with communities, GoN and other partners in line with the National Adaptation Program of Action to Climate Change (NAPA) (Ministry of Environment 2010) to assess local vulnerability and design and implement adaptation plans. The process included resilience building of ecosystem services where relevant, and took into account differential vulnerability of women, poor people, and marginalized groups. At this level the focus was on community forests and sub-watersheds, and interventions often covered several sectors to reduce vulnerability. At larger scales, vulnerability assessment, resilience building and adaptation was undertaken for specific focal species, critical habitats, protected areas, corridors for species migration, and climate-smart forest management practices. The two new landscape strategies for TAL and CHAL mainstreamed climate resilience building and adaptation. In practice, a feedback system developed, using existing local-level vulnerability assessments to inform higher level ones, and vice versa, so that knowledge about vulnerability at different levels was built up over the course of the Program.

Since DRR is a large component of adaptation in Nepal, integration of DRR and adaptation plans was piloted at VDC level, and plans mainstreamed into local planning processes to ensure sustainability and leverage funding. As climate adaptation is a relatively new discipline for Nepal, a cascading training of trainers approach was taken to build capacity from national to local level, and a large amount of outreach was done.

Understanding on Climate Change Impacts, Vulnerabilities and Options for Adaptation and Resilience Building Enhanced

The people and ecosystems of Nepal are increasingly facing adverse impacts of climate change. Impacts on human communities are already apparent as climate induced hazards have forced communities to change livelihood practices, including the ways they use the environment and the services it provides. The impacts on the ecological communities are slower to manifest, or may not be detected yet because they are not closely enough monitored, but this could suddenly change as tipping points are reached. Hariyo Ban worked to increase understanding of the current and potential future impacts of climate change on both human and ecological communities from site to landscape level; determined options for adaptation and resilience building; and built capacity of people and institutions to assess vulnerabilities and to plan and implement adaptation activities.

Assessments of Climate Impacts and Vulnerabilities, and Adaptation and Resilience Options

Several studies and vulnerability assessments were conducted to better understand climate change impacts, vulnerabilities, and measures for adaptation and building resilience. Landscape level vulnerability assessments were conducted in TAL and CHAL (WWF Nepal 2016a and c), and the results are outlined in the landscapes section. The findings were used in targeting, designing and implementing Hariyo Ban interventions to address climate vulnerabilities.

Vulnerability assessments at the community level were conducted to prepare CAPAs and LAPAs. The most common hazards at the community level included: floods, droughts, landslides, hail, disease and pests, forest fire, drying of natural springs, and invasive species (WWF Nepal 2016b). The hazards varied significantly across landscapes and districts, as would be expected in such topographically diverse terrain.

A study on long-term projected climate change impacts on biodiversity (Thapa et al. 2016) looked at broad impacts using climate modeling, and opportunities afforded by smaller scale topographical climate refugia (north facing slopes, steep river valleys, etc.). The study identified the most vulnerable forest types and animal species, and the likely role of refugia in harboring forests and wildlife as climate change advances (Map 6). It recommended conservation of patches of resilient forest in temperate broadleaf and subalpine conifer forests as climate refugia; interventions to increase adaptive capacity of subtropical broadleaf forests; and interventions to maintain north-south connectivity, ensuring ecosystem functions and wildlife movement. Hariyo Ban worked to incorporate many of the results and recommendations in training, outreach, policy work, vulnerability assessments at other scales, and field implementation.

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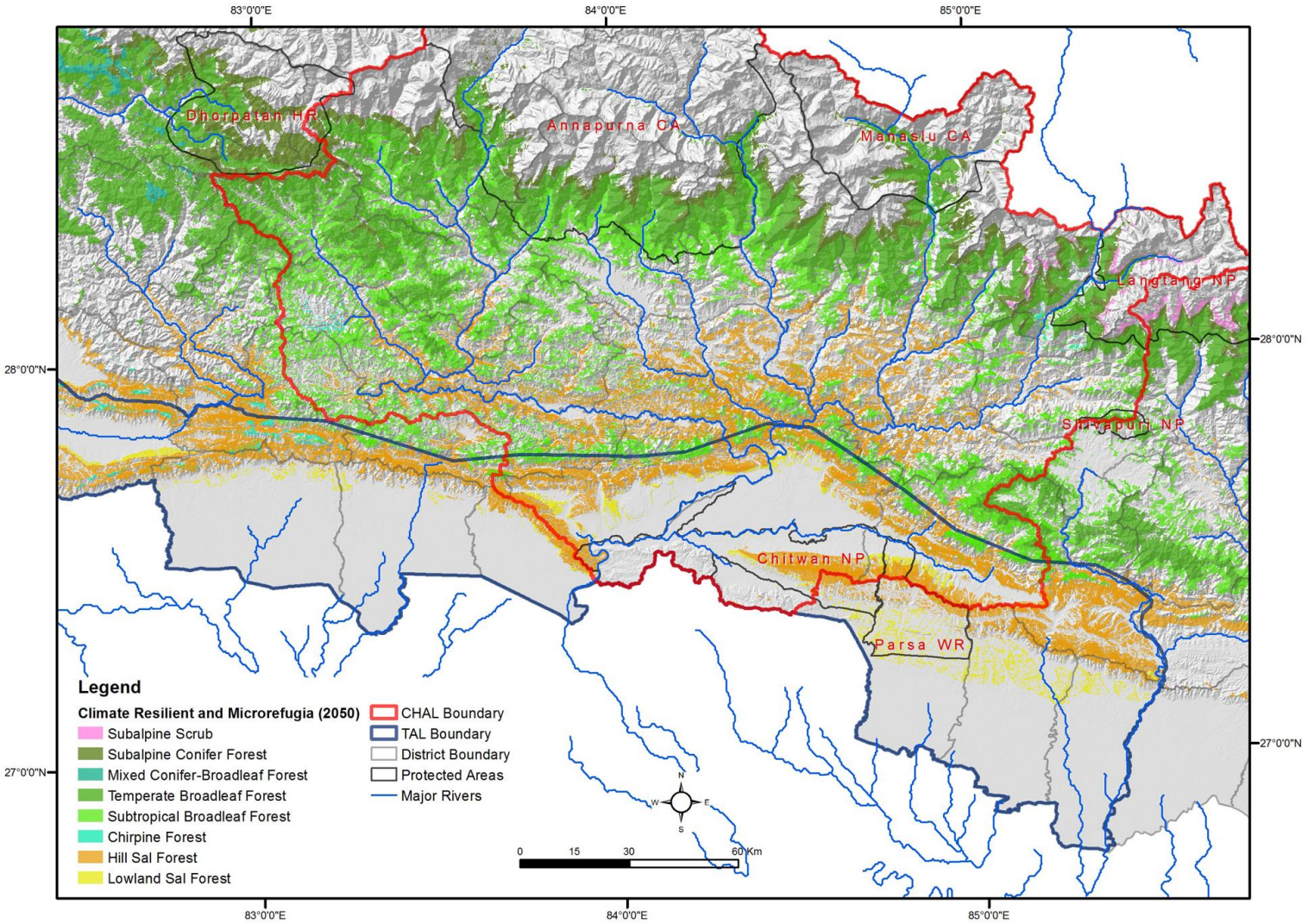
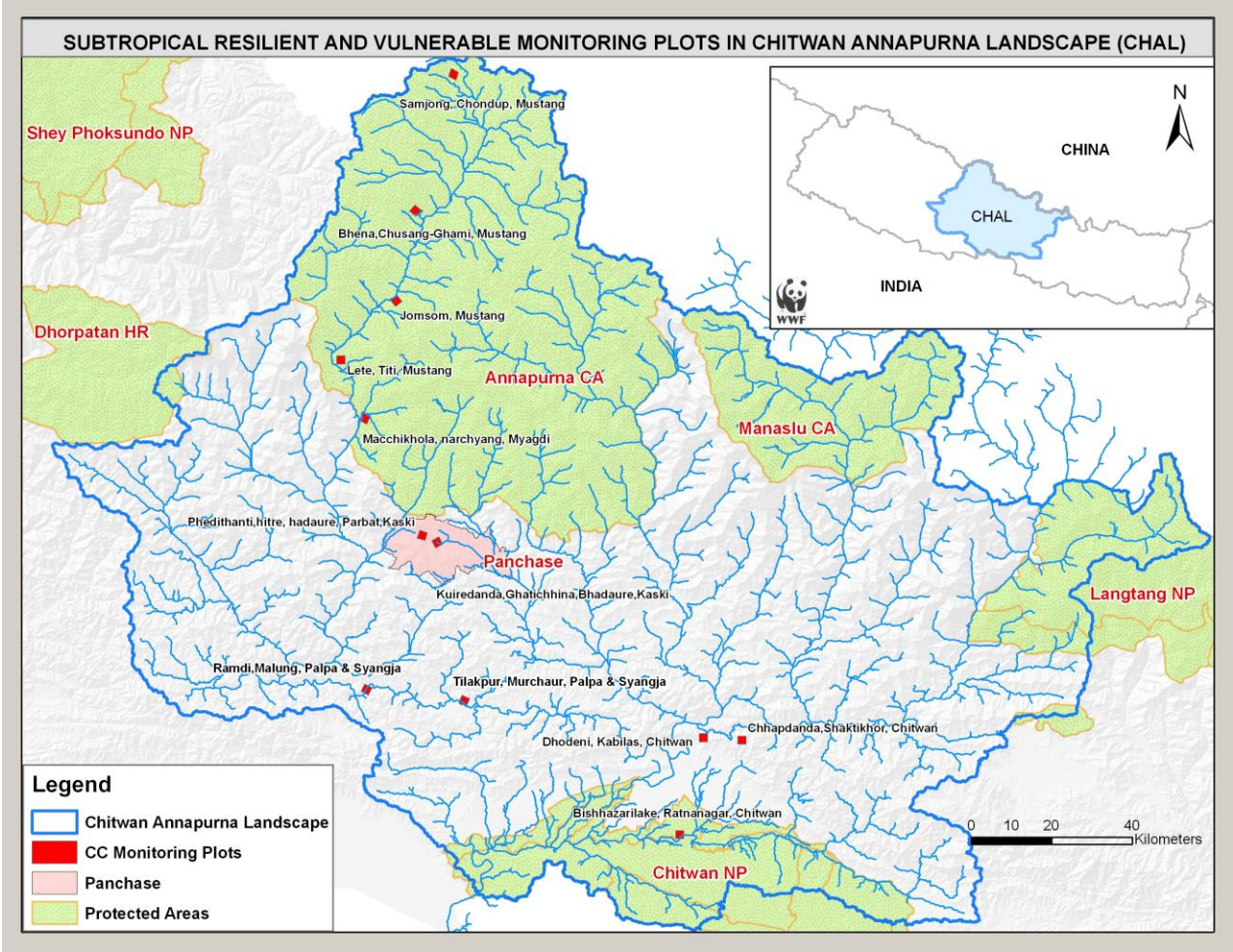


Map 6. Projected distribution of climate change-resilient forest vegetation in 2050 in CHAL and part of TAL, using the IPCC's A2A scenario (a high GHG emissions scenario), and overlain with likely topographical micro-refugia (steep valleys and north facing slopes). Current forest cover is indicated in the background. Note that areas shown without forest cover in 2050 do not indicate forest loss, but that the current forest vegetation type and composition could change due to climate change impacts (Thapa et al. 2016). This map is based on climate modeling with a fair degree of uncertainty, but the trend it indicates provides useful insights for broad-level climate-smart planning. These results should be used in conjunction with other work, e.g. the germination and establishment trials undertaken through the Windows of Opportunity fund1

To monitor the impacts of long-term climate change on forests, freshwater systems and local communities, the Program collaborated with several academic institutions and consultants to establish a set of forest and freshwater monitoring plots along an altitudinal gradient from the lowlying Terai to Mustang. The freshwater plots lie in the Kali Gandaki-Narayani river. The baseline for the forest plots is complete; the baseline for the freshwater plots will be finalized in the early stages of Hariyo Ban II. Map 7 shows the locations of the forest plots.

Two further studies looked at likely impacts of climate change on tree species important to people. The first used Global Climate Model (GCM)-based climate envelope models to project the future distribution of the selected tree species under the Intergovernmental Panel on Climate Change (IPCC) A2A GHG scenario. The second study assessed seed germination and seedling survival success under projected climatic conditions of the IPCC A1B GHG scenario using the TACA-GEM mechanistic model which evaluates a species' response to climate change during the most sensitive stage of the life cycle: germination and establishment. While many species are likely to be affected by climate change, results indicated that response to climate change and resilience is likely to vary significantly among species. Results will be used to provide broad guidance on tree planting in light of climate change. See WWF Nepal 2016j for more discussion on the methodologies.



Map 7. Locations of forest climate monitoring plots in the Gandaki basin. Plots were strategically located in different forest types and at different altitudes to monitor the long-term impacts of climate change. In some places paired plots were established to compare sites that were thought to be vulnerable to climate with nearby sites thought to be climate refugia. A separate set of freshwater monitoring plots is being established along the Kali Gandaki/Narayani river at different altitudes.

Capacity Building on Climate Change Vulnerability Assessment and Adaptation

The Program started with a major effort to build capacity in climate change and adaptation, since this was a new area of work for many partners. A national training workshop was held to train trainers, and refine training materials. Several of those trainers then rolled out training at lower levels, including to LRPs and partner organization staff who would facilitate LAPAs and CAPAs at local level. The training program took into account the results of the training needs assessment (WWF Nepal 2013d), and a training manual was developed for trainers (CARE Nepal 2014). Additional specialized climate change training was incorporated later on as needed, including for government officials (e.g. for protected area managers, and for district forest officials on how to mainstream climate adaptation into their work).

Other capacity building and awareness raising activities took place to disseminate knowledge about climate change, its impacts on different sectors, and options and best practices for adapting and building resilience to adverse impacts of climate change. Activities were also organized to build understanding on the links between CCA and DRR, and to help with integration and mainstreaming for improved networking and advocacy. Activities included workshops, exposure visits, summer school programs, academic curriculum revisions, community led advocacy campaigns, celebration events on specific days, mobilization of mass media on thematic issues, and sharing of publications and information, education and communication (IEC) materials, for key stakeholders including government staff, NGOs, CBOs, NRM groups, communities, academics and LRPs.

A total of 18,831 people, including LRPs, citizen scientists, women leaders, government staff, NGOs, CBOs and NRM groups were trained by the Program on climate change and its impacts; vulnerability assessment; and adaptation planning. In some cases training included integration and mainstreaming of CCA and DRR activities into local development planning processes, and implementation of these activities. Trainees at different levels have assisted in implementation and monitoring of the Program interventions in the field, as well as building an enabling environment.

Members of Chetana Women's Community Forest Users Group planning to reduce the risk of flooding in their village during the monsoon
© WWF Nepal, Hariyo Ban Program/Nabin Baral

Strategies to Enhance Adaptive Capacities of Human Communities and Ecosystems Piloted

Development and Implementation of Adaptation Plans

Hariyo Ban successfully piloted and scaled up integrated community and ecosystem vulnerability assessment, adaptation planning and implementation of the adaptation plans. These adaptation plans have been endorsed by CFUGs (for CAPAs), and by local government (VDCs/Municipalities for LAPAs) with support for mainstreaming of these plans into the local development planning process.

Adaptation Plans

- 421 adaptation plans prepared (331 CAPAs and 90 LAPAs)
- 398 adaptation plans implemented at least partially (328 CAPAs and 70 LAPAs)
- 288,499 vulnerable people benefitted from implementation of adaptation plans
- 391 drinking water supply systems and 81 waterholes for wildlife constructed
- 162 irrigation canals/systems, 187 km of foot trails, and 26 wooden bridges maintained
- 414 check dams/dykes/embankments constructed using both civil engineering and soil bioengineering measures
- NRs. 109,866,703 invested in implementation of adaptation plans

The CAPA and LAPA adaptation activities that were implemented fall under all six categories of the NAPA: agriculture and food security; forests and biodiversity; water and energy; climate induced disasters; human health; and infrastructure. The budget for adaptation activities under each category is shown in Figure 4. Key activities under the adaptation plans include construction/maintenance of drinking water supply systems and irrigation systems; small ponds for rainwater harvesting; waterholes or reservoirs for wildlife; foot trails; wooden bridges; check dams/dykes/embankments; early warning systems for floods; land restoration through plantation and fencing/grazing control; forest fire control; invasive species removal; off-season farming; organic farming; integrated pest management; alternative energy promotion; establishment of emergency relief funds; and sanitation campaigns.

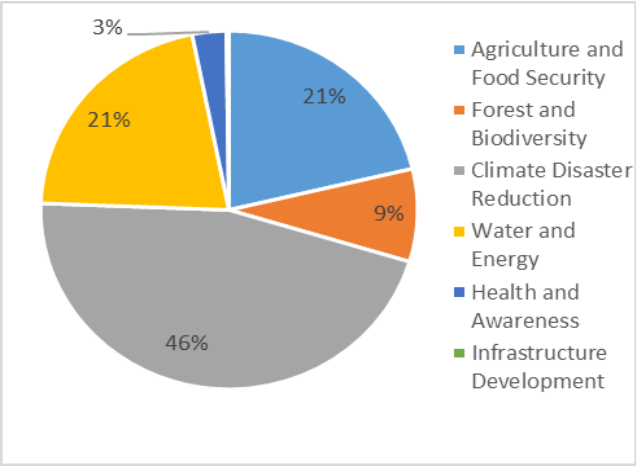


Figure 4. Allocation of resources for adaptation across different sectors

A review of 27 sample CAPA communities supported by the Program found that despite having implemented only a small fraction of the activities listed in the plans, the Program had been effective in reducing vulnerability in 20.7% of the households surveyed (CARE Nepal 2016b). Adaptation plans in Banke district had been effective in reducing vulnerabilities in 50.5% of sampled households, followed by Chitwan (29.8%), and Bardia (20.9%), while adaptation activities at the corridor level were most effective in Kamdi and Karnali corridors (31.14% of sampled households in each corridor).

Intact ecosystems are more likely to withstand the effects of climate change than degraded ones (Hansen et al. 2003). Another study assessed the status of biophysical condition in 33 vulnerable sites where adaptation and watershed management activities had been implemented (often in combination with efforts of others). It found good evidence of improved biophysical condition, and improved ecosystem services through activities such as water source conservation, habitat management, removal of invasive alien species, degraded land stabilization, conservation plantation, fodder/grass and fruit tree plantation, soil bioengineering practices, and torrent and gully control. Soil erosion and river bank cutting had been reduced in some TAL sites, and incidence of landslides reduced in CHAL sites. In some sites there were reports of increased wildlife sightings of species such as rhinoceros, tiger, elephant, leopard and deer. (CARE Nepal 2016c).

An adaptation health check-up assessment covering 195 implemented adaptation plans (190 CAPAs and 5 LAPAs) found that 50.77% of the adaptation plans were highly or very highly responsive in addressing climate change induced vulnerabilities, while 45.64% were moderately responsive (CARE Nepal 2016d). Among these, CHAL had 70% of the adaptation plans as high or very highly responsive and 28.33% as moderately responsive, compared to only 20% highly or very highly responsive and 73.33% moderately responsive in TAL. However, much still needs to be done to ensure resilience under dynamic climatic conditions and social contexts, as most of the adaptation plans prepared and implemented were found to be reacting to current hazards only. It is important to also assess potential hazards that may intensify in the future, and 'no-regrets' measures to address them should be incorporated into the adaptation plans, along with scaling up of the best practices to build resilience. To ensure long term effectiveness, all prioritized adaptation activities should be implemented in a package and in sequential order.

Improving Lives, Transforming the Community

Drinking water project in Tanahu
© WWF Nepal, Hariyo Ban Program/ Nabin Baral

Residents of Huslangkot, Dharampani in Tanahun district were reeling from acute water scarcity. Years ago, water had been readily available locally, but the source had been shrinking at a rapid rate in recent years. This community is located high in the hills, and women and children of the 31 households were having to walk over 3 hours a day for only a jar of water. Now, however, the Kotle Khola Rural Solar Drinking Water Project is providing them with water from taps close to their homes. The project was designed by the Rural Energy Fund and supported by the Hariyo Ban Program, Alternative Energy Promotion Centre, District Water Supply Office, the VDC, and Siddhathani CFUG. The project uses a solar powered pump to lift water to a reservoir, and then to the taps in the community. This water is used not only for domestic use but also to irrigate kitchen gardens, and has increased the adaptive capacity of the people by providing improved access to clean water while promoting efficient water use. Women now spend much less time carrying water. Green vegetables in their diet from the kitchen gardens, rare in the past, will help improve health and wellbeing. Community members have also formed a farmers group, and started to coordinate for commercial vegetable farming.

Hariyo Ban and the CFUG have also supported livelihood improvement activities for poor people. The community has started tackling other climate vulnerabilities and conserving biodiversity by improving sanitation, controlling forest fires, and planting and stabilizing degraded land. The community, along with Siddathani CFUG, received first prize from the Western Region Forest Directorate on International Mountain Day in 2013 for their outstanding contribution to conservation, and the development of mountain ecosystems and local livelihoods.

Integrating Climate Adaptation and Disaster Risk Reduction Plans

Integration of CCA and DRR was piloted in three VDCs with inclusion of differential vulnerabilities, through the merging of three LAPAs and the corresponding local disaster risk management plans (LDRMPs) of the VDCs following steps as shown in Figure 5 (CARE 2016e). Hariyo Ban provided seed funding for many plans, and these were often supplemented with resources from other sources, such as government line agencies and VDCs/municipalities as shown in Figure 6.

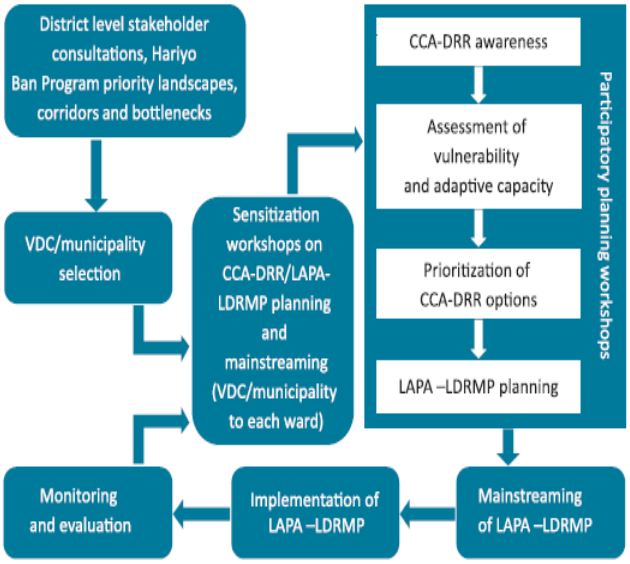


Figure 5. Steps for integration of CCA-DRR piloted by Hariyo Ban

District, cluster and national level workshops for LAPA and CAPA communities were particularly effective in advocacy for integration of CCA-DRR, mainstreaming into local development planning processes, and implementation of integrated adaptation plans. Hariyo Ban worked with the National Network of Community Disaster Management Committee (NCDMC), engaging with district and VDC level chapters of NCDMC and strengthening CCA-DRR networks. The Program followed the process outlined in Figure 7 to promote advocacy for mainstreaming adaptation activities into local sectoral plans, and sharing best practices for replication and scaling up with greater leveraging of resources (CARE 2016f).

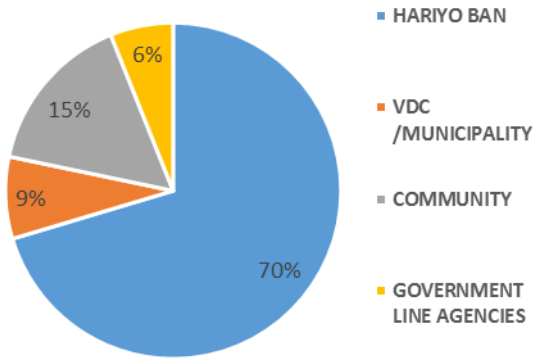


Figure 6: Resources leveraged for adaptation plan implementation

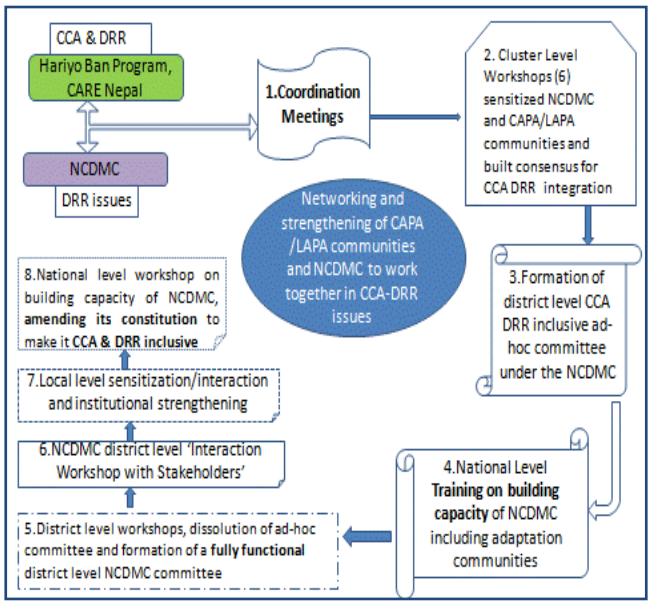


Figure 7: Process for strengthening CCA-DRR network

Voices for the Voiceless

Irrigation water from wells supported by Hariyo Ban Program (Prakash Luhar on the right)
© CARE Nepal, Hariyo Ban Program

Prakash Luhar, 45, lives in Baitada Parki tole, Daiji VDC in Kanchanpur District. In the past, people in his community spent many nights during the monsoon fearing for their lives, homes, livestock and fields with the threat of river bank cutting and floods in the Chaudhar River. The floods during the monsoon forced them to shift homes, while summer droughts brought acute water shortages, both of which had become more severe in the last few years. These were the major hazards in their climate vulnerability assessment, from which they developed a CAPA with support from Hariyo Ban. Most of the community are poor and illiterate, and had previously been unaware of the availability of government funds to help communities like theirs. Now the situation is improving. The community installed gabions to control river cutting and redirect the flow of floods away from settlements and farmlands. They also planted bamboo and fast growing shrubs and trees to help stabilize river banks. Three wells have been constructed in the village which supplying water for drinking and irrigation, a great improvement during droughts. These activities have increased the community's capacity to cope with and adapt to natural disasters such as flood and droughts. The community has also constructed a gravel road connecting their village to town, and is using bioengineering to control floods with NRs 100,000 from Daiji VDC and NRs. 250,000 from Kanchanpur District Agriculture Development Office (DADO).

Prakash Luhar states, "*There is nothing more rewarding than sleeping without fear of being washed away by floods. We have a lot more to do and a long way to go, but I have a dream to build a safe house for the whole community in case we have to take shelter during the monsoon again.*"

Hariyo Ban partners allocated seed funds for implementation of adaptation plans. However, for many plans the available funds were not adequate. Resource limitations often restricted implementation of the activities in the package and the order they were done in, posing questions about the long-term effectiveness and the ability to increase coverage through scaling up of adaptation activities. This is particularly critical for scaling up construction and maintenance of civil engineering works and soil bioengineering to reduce climate induced disaster risk, as well as livelihood improvement and alternative energy promotion.

Hariyo Ban adapted CARE's existing Climate Vulnerability and Capacity Analysis tool for community level adaptation planning, including incorporation of ecosystem vulnerability. Undertaking CAPAs at community level enabled the program to identify and tackle differential vulnerability of different groups within a community, and local ecosystem vulnerability. It also ensured that the specific vulnerabilities of each community were tackled: since vulnerabilities often vary between neighboring villages in Nepal, e.g. on valley floors, slopes and ridge tops, working at this level was found to be very appropriate. However, in some places, for example the sparsely populated VDCs in Manaslu Conservation Area, working directly at VDC level was also successful. In some places Hariyo Ban subsequently scaled up CAPAs to LAPA level, ensuring that local vulnerabilities were taken into account. Since VDC level is the smallest administrative unit, it was important to work at VDC level at some point to help mainstream climate adaptation into local development planning.

CAPAs and LAPAs supported by Hariyo Ban are listed in Annexes 9 and 10 respectively.

Participatory Systems for Vulnerability Monitoring Piloted and Established

CARE's Participatory Monitoring, Evaluation And Reflective Learning tool (PMERL) was tested as part of the CAPA process to encourage communities to regularly monitor the vulnerabilities in their localities and progress in implementation of adaptation activities. However, the tool was found to be too complex. As a simpler substitute, the Adaptation Plan Health Check Up tool was introduced using participatory focus group discussion to track and record information on the process, achievements and way forward (CARE 2016d). This tool was widely accepted by the communities, with facilitation support by LRPs, in light of its simplicity and user-friendly format. In addition, community review and reflection, and community change monitoring have also been applied successfully, both for adaptation plans and for tracking progress and impacts of other Hariyo Ban Program community interventions. It is important to note that continuous support to communities is needed to regularize and institutionalize the monitoring and documentation practices.

Members of CLAC from Janahit Mahakali CFUG, Krishnapur, Bani, Kanchanpur, engaged in Health Check-up
© WWF Nepal, Hariyo Ban Program/ Nabin Baral

Enabling Policy Environment for Climate Change Adaptation Strengthened

Hariyo Ban supported the implementation of national climate change policies, including the Climate Change Policy 2011, the NAPA, and the LAPA Framework in the field. Since at the beginning of Hariyo Ban these policy instruments were very new, the Ministry of Environment did not need further policy assistance at national level but was very keen to see the policies implemented, and to learn from the experience. More recently, when the National Adaptation Plan (NAP) formulation process started, Hariyo Ban provided support to MoPE including mainstreaming of GESI; this support was still ongoing at the end of Phase I of the Program.

At local level, Hariyo Ban has been working on mainstreaming adaptation plans into the local development planning process, including differential impacts/vulnerabilities and GESI sensitivity. It has supported MoPE and MoFALD to integrate and harmonize CCA plans with DRR plans; and promoted policy discourse through sharing of best practices in preparation and implementation of integrated adaptation plans.

Disaster Relief, Recovery and Reconstruction

Strategic Approach

The 2014 Terai floods caused fatalities and loss of property in many communities in western Terai. The Hariyo Ban Program aligned some funds for livelihood recovery support, and provided training in environmentally sound practices in post-disaster reconstruction. Then the April 2015 earthquake occurred, killing more than 8,790 people, injuring over 22,300, damaging or destroying 700,000 houses, displacing over 8 million people, and damaging essential infrastructure and government offices (National Planning Commission 2015). The earthquake also severely disrupted Hariyo Ban's work, especially in eastern CHAL near the epicenter of the first earthquake.

Post-earthquake Disaster Relief, Recovery and Reconstruction Support

- 106,699 people benefitted including 55,026 women and adolescent girls; 9,080 Dalits; 74,730 Janajatis; 10,068 youths; 5,767 women headed households; and 1,723 single women
- 140 pregnant women received nutritious food, hygiene kits and relief materials
- 28 schools received support for safe drinking water and sanitation (toilets); 20 schools supported to develop climate adaptation and disaster risk management plans
- Six micro-hydro plants reconstructed; 329 solar panels, 2,968 ICSs, 1,756 MICs and 1010 electrical appliances supported
- 16,651 people employed through cash for work program with 101,380 person days of employment
- 70 drinking water systems, 55 irrigation system, 19 wooden bridges, and 186.28 km of trail maintained/repaired
- 38 check dams installed for landslide control along with debris removal in 67 sites
- Recovery of 11 ecotourism sites supported along with 12 homestays, 13 Gumba/Kani/Mani, and 3 campsites

The Program immediately conducted short-term relief work, and subsequently realigned existing funds for earthquake recovery. The Program also received additional funding from USAID for earthquake recovery and reconstruction, with the goal of enhancing the resilience of earthquake recovery and reconstruction efforts in Nepal by identifying and integrating sound environmental practices. The Program took a strategic two-pronged approach, providing support for recovery in four seriously affected districts in CHAL (Nuwakot, Dhading, Rasuwa, and Gorkha), and working to promote environmentally sound practices in recovery and reconstruction across other sectors. In its response, Hariyo Ban could draw on the experience of its consortium partners, particularly CARE's experience of post-disaster situations and WWF's work on green recovery and reconstruction with humanitarian partners in other parts of the world.

Disaster Relief, Recovery and Reconstruction supported in CHAL

Immediately after the earthquake the Hariyo Ban consortium partners undertook relief work, taking food, tarpaulins, blankets, dignity kits and other supplies to many affected partner communities in the four districts. While many supplies were delivered by road, NTNC faced huge logistical challenges in

Manaslu Conservation Area because the trails were blocked in many places by landslides, and mule trains could not get through until they had been cleared.

In the recovery phase, Hariyo Ban provided support for livelihoods and food security, safety, and DRR. To help restart household economies and repair local infrastructure such as trails and bridges, a cash-for-work program was implemented by consortium partners with a focus on poor households including women and disabled. Support was provided to reestablish tourism infrastructure and homestays, assisting in recovery of ecotourism businesses and promoting conservation. Agriculture support included restocking of livestock lost in the earthquake, provision of tools and labor-saving tillers, and repair of irrigation schemes. Damaged community water supplies were also repaired, sometimes seeking water from other sources since many springs dried up after the earthquake.

The earthquake resulted in many landslides. Hariyo Ban supported soil bioengineering to stabilize shallow landslides that were threatening roads and settlements, creating demonstration sites in four districts (WWF Nepal 2016k).

Alternative energy equipment was provided to meet the immediate energy needs of people, reduce pressure on forests for firewood, and replace equipment damaged or destroyed by the earthquake. Hariyo Ban's metallic improved cook stove distribution at high altitudes contributed to the humanitarian sector's winterization efforts. In some places, such as Barpak VDC in Gorkha, people could retrieve MICSs distributed by Hariyo Ban before the earthquake from the rubble and reuse them from temporary shelters. These, along with additional MICSs distributed by Hariyo Ban, led to declaration of the VDC as a kitchen smoke free VDC in March 2016. Deurali VDC in the same district was also declared smoke-free.

In all this work there was an emphasis on sound environmental practices, drawing from Green Recovery and Reconstruction Toolkit developed by WWF US and the American Red Cross after the East Indian Ocean tsunami in 2004 (WWF and American Red Cross 2010).

Single women, women at greatest risk of GBV, and the poorest in the disaster affected area were given priority in the interventions, particularly for livelihood support. In addition, as disaster affected adolescent girls and women are particularly vulnerable to GBV, including trafficking and other sexual violence, support was provided to protect them and raise their awareness about sexual and reproductive health, GBV and measures to reduce or avoid them. Hariyo Ban helped build their capacity for recovery, encouraging them to participate in decision-making processes, engage in advocacy on local issues, and contribute to recovery in their community.

Nyakphedi trail in Manaslu
© NTNC, Hariyo Ban Program

Construction of Sardi Bhir trail in Manaslu
© NTNC, Hariyo Ban Program

Trails in Langtang and Manaslu Reopened for Local Communities and Tourists

The Langtang trail is a major tourist trail and is used by the residents of Langtang VDC to transport supplies every day. It is the only gateway to Langtang valley, connecting major landmarks including Rimiche, Lama Hotel, Riverside, Woodland, Ghodatabela, Thangsyarp, Langtang valley, Mundu, Sindhum, and Kenjing Gompa. The 17-km long trail that starts from the Langtang suspension bridge bordering Langtang and Syafru VDCs was severely damaged by landslides in numerous places after the earthquake. The Hariyo Ban Program supported repair of the trail with removal of landslide debris and overgrown vegetation, widening of narrow sections, and opening of new sections where it was not possible renovate the old route. The reopening of the trail provided employment, enabled transport of reconstruction materials to this remote area, reestablished social and economic connections, and enabled the tourism industry to restart in the valley. All this greatly helped recovery greatly helped recovery for the people of Langtang.

In Manaslu Conservation Area the trail to upper Gorkha was severely damaged in several places by landslides and flood washouts after the earthquake. This disrupted a vital lifeline connecting remote mountain communities with family, friends and markets. It also hit a burgeoning tourism trekking industry. To restore local livelihoods and tourism, NTNC, Hariyo Ban Program supported local communities to rebuild 13.5 km of trail including 12 wooden bridges. This provided an opportunity for the communities to improve the quality of the trails, making them safer, wider and more attractive for trekkers. By carefully extracting local materials like stone and mud, and reusing timber, the trail building minimized adverse environmental impacts and was cost effective.

Wooden bridges installed at Yarubagar and Sardi near Lokpa in Chumchet VDC have served over 6,900 local people in Tsum and Nubri Valley, in addition to more than 2,000 trekkers by the end of 2016. Mule trains, vital for livelihoods and for transporting recovery and reconstruction materials, used the bridge at Yarubagar until an alternative route was built. At Sardi Bhir two wooden bridges continue to serve more than 1900 local people in Tsum valley. This enabled people in Tsum to migrate to lower areas during the winters of 2015 and 2016—a time when heavy snowfall covers the area for about three months each year. The traditional seasonal migration enables people to make ends meet and avoid the harsh winter in Tsum.

Early Recovery Through Cash-for-Work Schemes

Sapana Pariyar, from Budhathum VDC, recounted her story, "The earthquake of April 2015 badly damaged my house. We were compelled to live in a tent. There was no source of income. At this critical time, we got an opportunity to be involved in the cash-for-work program. We received cash payments in return for labor, allowing us to purchase supplies and clothes, build a temporary shelter, and pay school fees for our children. This was valuable support to my family."

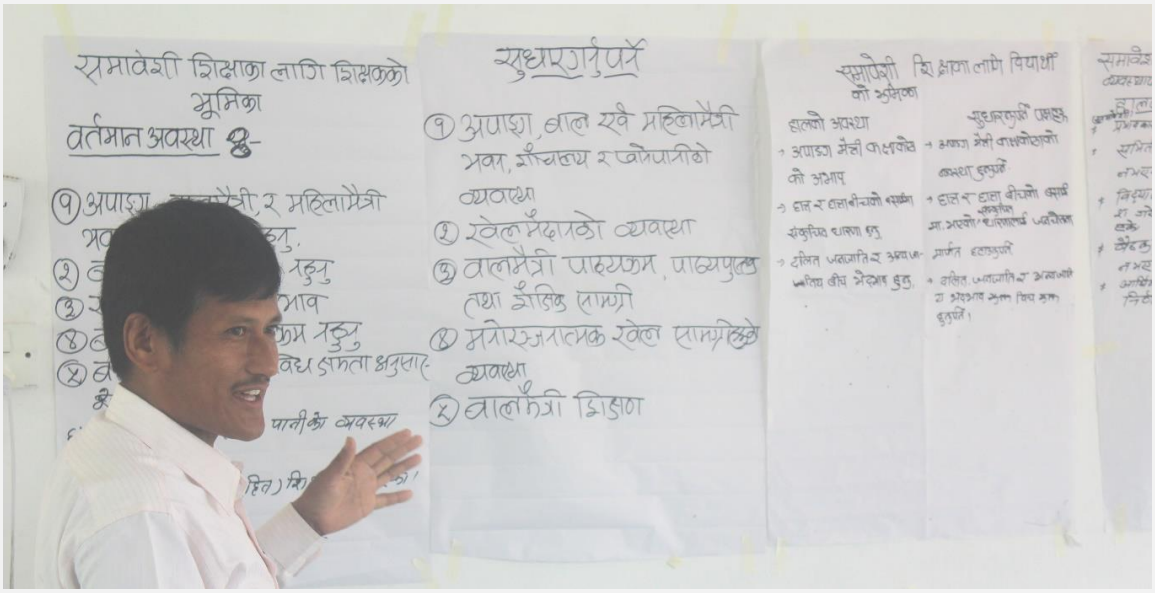
Engaging people in community infrastructure projects through cash-for-work schemes helped rebuild communities, encouraging neighbors to work together, while also giving people an opportunity to make decisions and invest their household earnings in the way that was best for them.

Sapana Pariyar (right) receiving cash-for-work payment
© CARE Nepal, Hariyo Ban Program

Disaster Risk Management Planning in Shree Mahendrodaya Secondary School, Mulpani-5, Dhading district

The Shree Mahendrodaya Secondary School had no disaster plan in place when the earthquake struck, and according to its Principal, Kamal Bahadur Thapa, it was the only affected schools in its VDC. Hariyo Ban helped the school to build back safer and greener, and prepare for future disasters. Support included education in emergency training, a 'school-in-a-box' kit, and support to for drinking water and toilet repair. A workshop was held on climate change adaptation and disaster risk reduction, with participation by community members, teachers, students, members of the school management committee, the Ward Citizen Forum, and the local health post representative. Participants learned about environmentally sound practices in recovery and reconstruction, and undertook a participatory vulnerability and capacity assessment of the school. Major hazards identified included wind storms, earthquakes, insufficient drinking water, and landslides. From this the school prepared a climate and disaster risk management plan for disaster management and preparedness, in line with the Comprehensive School Safety Framework and Flagship 4 of the Nepal Risk Reduction Consortium on Community Based Disaster Management.

Before starting to implement the plan they made an inclusive decision to ensure that reconstruction activities would not negatively impact the environment. They also decided to give priority for local labor, and ensure participatory monitoring. To stabilize a bank in front of the school they needed to build a gabion wall, so they collectively did a local survey to decide on the least damaging place to extract stones. They plan to plant grass to stabilize the soil and prevent erosion. To improve the quality of their new water supply they aerated the water. Their disaster risk management plan is now annexed to the school improvement plan.



Shree Mahendrodaya Secondary School preparing its disaster risk management plan
© CARE Nepal, Hariyo Ban Program/Nabin Dhungana

GoN operations were also seriously affected, and there were big concerns that illegal activities in forests and protected areas might escalate after the earthquake. Institutional support for office furniture and electronics was provided to DFOs to help with recovery after the disaster so that they could resume their work including services to local communities. Capacity of communities in DRR was enhanced through trainings on DRR, GRR guidelines, school and community based disaster risk management (DRM) planning, techniques to reduce disaster risk, and implementing DRM plans. Support was also provided to CFUGs, CAMCs, women's groups and CLACs with DRR, WASH and rescue/relief equipment. 11,387 people were capacitated and DRR kits were provided to 42 women's groups, 5 CLAC groups, and 7 CAMCs.

Capacity for Green Recovery and Reconstruction Enhanced and Environmentally Sound Practices Promoted

Hariyo Ban and WWF staff took part in the Post-Disaster Needs Assessment shortly after the earthquake, helping develop ten principles for environmentally sound recovery and reconstruction. They supported the Ministry of Science, Technology and Environment (MoSTE) to undertake a Rapid Environmental Assessment (REA) which identified in more detail the environmental impacts caused by the earthquake, and examined likely impacts during relief, recovery and reconstruction (MoSTE 2015). This formed the basis for Hariyo Ban's subsequent GRR work. A major threat to biodiversity was in the reconstruction of buildings (houses, schools, health facilities and government buildings), including sourcing of building materials, and impacts when people sought new settlement areas and alternative livelihoods. Inputs were provided to the Post Disaster Recovery Framework, and efforts were made to mainstream environmental aspects into other sectors, especially those most likely to adversely impact the environment. Emphasis was placed on both minimizing impacts of recovery and reconstruction, and building back better, safer and greener to reduce the risk of future disasters.

Hariyo Ban provided input to guidelines produced by the Department of Education on school reconstruction and to the Department of Urban Development and Building Construction's new mason training curriculum and manual. The Program trained over 1,000 people in green recovery and reconstruction, including government engineers from the education, housing and water sectors; government forestry officers; members of District Disaster Relief Committees (DDRCs); mason trainers; NGO staff; members of parliament; and media. The Program developed briefing and reference materials for several sectors. Efforts to reach beyond the district level to local communities and households included collaboration with BBC Media Action, providing environmental messages for local level and training local radio station staff to produce environmental public service announcements. Posters were produced on environmentally sound practices for households, farmers and schools at the request of the MoFALD.

Scaling-up Green Recovery and Reconstruction Efforts

The World Bank requested Hariyo Ban for its green recovery and reconstruction materials and soil bioengineering approach, as it set up environmental and social safeguards in the multi-donor supported Rural Housing Reconstruction Program. The Program was to operate in 14 districts of Nepal, with a great ability to reach to householder level. This was an important way to get green practices promoted in rural housing reconstruction on a large scale.

GRR training on flood recovery
© WWF Nepal, Hariyo Ban Program

In addition to the formal training and capacity building, Hariyo Ban reached out to many stakeholders including the National Reconstruction Authority, United Nations Office of Coordination for Humanitarian Affairs, humanitarian clusters, GoN Departments, NGOs and university departments. It presented on GRR at conferences and meetings at national and international level to raise general awareness and to reach key decision-makers, senior government officials, donors, NGO leaders, parliamentarians, media reporters, and other key audiences. Forums included the Society of Nepalese Architects/South Asian Association for Regional Cooperation of Architects, the Nepal Engineers Association, national workshops on landslides, and a workshop with MoUD/ Department of Urban Development and Building Construction (DUDBC) and the International Union for the Conservation of Nature (IUCN)'s Eco-DRR Project at the World Conservation Congress. It produced a manual for environmentalists, humanitarian workers, engineers, development specialists and donors on green recovery and reconstruction for Nepal (WWF Nepal 2016k).

The Program commissioned a rapid evaluation of its recovery and reconstruction work (see WWF Nepal 2016l; the text box has a summary of findings).

Landslide Stabilization with Soil Bioengineering in Dhodre, Gorkha District

Soil bioengineering in Dhodre, Gorkha: construction of a brush layer, one of the techniques used to stabilize the slope.
© WWF Nepal, Hariyo Ban Program/Madhuban Maskay

In Dhodre, Gorkha district, a landslide developed on a steep slope where torrential rainfall, coupled with poor water management, caused gully formation and massive erosion. The earthquake made the landslide worse, blocking a road below. Local people were very concerned. Immediate action was needed to stabilize the site and prevent further gullying. This site was surveyed by the Hariyo Ban Program's soil bioengineering consultant, Dr Madhuban Maskay, and selected as a pilot demonstration site.

The problem was discussed with Dhodre Community Forest Users Group, and community members were briefed on the best techniques to stabilize the site. These included small-scale civil engineering measures (gabion wall) in combination with soil bioengineering methods: hedge brush layering/brush layering; grass slip planting; palisades; fascines; vegetative propagation of bamboo; and bamboo crib walls. The fascines and palisades slowed drainage. Community members worked with the consultant to select plant species, and the work was undertaken with local labor. Within six months the site was showing good results (see photos). After the monsoon, the community took responsibility for watering the plants during the dry season until they became well established. However, one challenge was control of livestock on the site due to open grazing; at this early stage the plants were still vulnerable to browsing and trampling. The community forest users group worked to raise awareness among the livestock owners about the importance of controlling livestock to protect the site and avoid further landslides.

Rapid Evaluation of Hariyo Ban's Earthquake Recovery Work

A consultant evaluation of Hariyo Ban's recovery work (WWF Nepal 2016l) found that with a few exceptions, activities promoting GRR practices at district level were effective in improving the wellbeing of affected people including women and other vulnerable groups, while helping to reduce environmental pressure. The cash for work, training components, and the organizational efficiency of the consortium and local implementing partners contributed to effective implementation. The central level interventions such as GRR trainings were largely successful in reaching out to multiple audiences. The local technology based bio-engineering demonstration sites were successful and are now being replicated in small numbers by the community members in program districts.

There were also several challenges and gaps. There was a high demand for shelter construction but Hariyo Ban could not support it because of donor regulations. Despite cash for work being immensely successful for starting household economies, implementation met several challenges. The bioengineering demonstrations were mainly in forest areas; this successful model should have been integrated in other interventions such as foot trails and around settlements. Many recovery works did not incorporate the cost of future rehabilitation/repair and maintenance since no Hariyo Ban GRR funds could be committed beyond the end of the first phase. Many disaster management plans prepared for VDCs and schools had limited integration of GRR practices. Planning of GRR interventions could have been more strategic in identifying the priority needs of public agencies and affected people, and availability of labor and other capacity. Building strategic partnerships with other donors working primarily in shelter and livelihood sectors could have increased effectiveness of the GRR program. While GRR training was largely successful in sensitizing and imparting GRR knowledge to government line agencies and others at center and district level, outreach to community level was not enough before the work ended.

First layer of stretcher and header of the bamboo crib wall completed

Live cuttings inserted between first and second layer stretchers

Five layers of crib wall construction completed to stabilize the base of the slope

Results: bamboo sprouting and starting to put down roots

Construction of Bamboo crib wall and results after 7 weeks (Dhodre, Gorkha)
© WWF Nepal, Hariyo Ban Program/Madhuban Maskay

Livelihoods

Strategic Approach

Since many local people are dependent on natural resources, promoting more sustainable use of resources often involves helping people to adapt and improve their livelihoods to reduce pressure. Livelihood support is also sometimes undertaken to change attitudes to conservation, and to provide motivation to volunteers. The Program recognized that different approaches were needed for different groups of people. Very poor and landless people were helped to develop livelihood improvement plans, where they were supported with no-interest loans to implement on-farm and/or off-farm income generation and livelihood development activities. Some were provided with vocational skill-based training including support to get Council for Technical Education and Vocational Training (CTEVT) accreditation and initiate self-employment; this was also made available to youths and CBAPU members to help motivate them to support conservation efforts. Microcredit programs provided community members with low interest loans from revolving funds facilitated by local cooperatives, so they could to start or scale up income generating activities (IGAs). For groups with natural resources or agricultural produce for which there is a good market, green enterprise development provided support to establish, operate, market and scale up forest and agriculture based green enterprises to increase income of entrepreneurs, their employees and CFUGs. In locations with good tourism potential, entrepreneurs were trained and supported to register and operate ecotourism ventures to increase their income, providing incentives to support conservation.

Income of Forest Dependent Communities Increased

The Hariyo Ban Program adopted five broad sustainable livelihood improvement approaches to increase the incomes of the forest-dependent people, in line with the approaches of the consortium partners: i) Livelihood Improvement Plan preparation and support for ultra-poor forest-dependent households for income generation; ii) vocational skill-based training; iii) Global Conservation Program (GCP) approach for Income Generation Activities through the promotion of alternative energy and microcredit programs; iv) green enterprise development; and v) ecotourism. The market potential of selected products and demand for skilled labor were assessed before the livelihood activities were designed and implemented. The livelihood activities benefitted 79,830 poor and marginalized forest dependent households, including those supported with funds for earthquake recovery and reconstruction.

Livelihood Improvement Plans and Income Generation Activities

An assessment of the impacts of the livelihood interventions revealed that while income has increased, there has not been a substantial change in living standards (84% of households) (WWF Nepal 2016m). The same study found that those who received LIP and IGA support had a much greater rise in income compared to others. Households have mostly used the earned income to scale up the IGAs, purchase subsistence materials for the household, and pay for children's education.

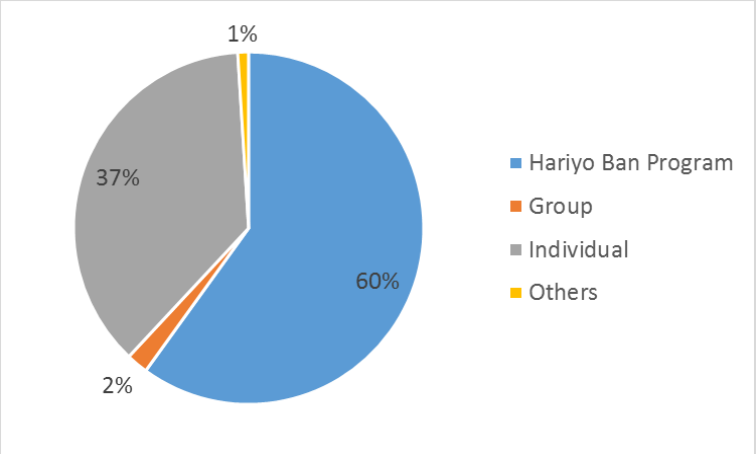


Figure 8. Sources of NRM group matching funds

LIPs and IGAs benefitted poor, marginalized people. Most the LIP/IGA support was for on-farm support for livestock or agriculture (95%) while off-farm support was for small businesses such as grocery shops, tailoring, and furniture making. The NRM groups or the individuals themselves invested 40% of the resources for the LIPs/IGAs as match funds, as shown in Figure 8. In addition to providing the matching support to Hariyo Ban supported households, CFUGs themselves have also been funding LIPs, following the CFDG 2009, through allocation of 35% of their annual income to support livelihoods of poor members identified using the Participatory Wellbeing Ranking tool (PWBR) (CARE Nepal 2013a). Also, the Program promoted IGAs through loans mobilizing revolving funds, which were established in the NRM groups and facilitated by cooperatives, and improved access of poor rural communities to adequate capital to operate and scale up IGAs. The revolving funds provided a sustainable financing mechanism for alternative livelihood development that can continue after Hariyo Ban ends.

Breaking Stereotypes

Ishwori Kadal has been running a small shop on her own land close to her home and making a good income. "*I received 20,000 rupees from the Hariyo Ban Program as a loan to support my livelihood improvement plan, which had to be paid back in two installments. At that time, my husband had been unemployed for some time and the meager income of about 300 to 400 rupees a day from the small grocery shop I used to operate was barely enough to make ends meet. Our home is located close to a school by the highway where there were no other stores selling quality snacks. So, with the loan support, my husband and I decided to scale up our shop into a tea-snack and grocery store, purchasing some furniture, utensils and other materials for the shop. My husband and brother-in-law then visited my father's place at Kohalpur where he runs a tea-snack shop and got training to make pakaura (fritters), samosas, chowmein and other dishes. They prepare the food and serve the customers while I am the cashier at our shop. We have paid back the loan and make a daily profit of 1,000 to 1,200 rupees a day*," Ishwori shared.

A variety of livelihood activities supported by Hariyo Ban
© WWF Nepal, Hariyo Ban Program

Skill based training and employment

Skill based training and support to find employment were provided for vocations such as mobile phone repair, plumbing, cooking, electrical repair, off-season vegetable farming, livestock technician, carpentry, bicycle repair and metal welding to improve and diversify livelihood options of poor forest dependent people, and reduce their forest dependency. Intensive training for CTEVT certification and employment was also provided, which prioritized ysouths, particularly CBAPUs members; citizen scientists; and youths from poor, forest-dependent households who were also engaged in conservation activities in their communities. Most of the trainees are employed locally, although some have used their skills to find employment abroad as well. See the box for results (from an unpublished WWF Nepal survey).

Skill Based Training Results

- 1,127 people received skill training
- 482 people received intensive training for CTEVT certification, of which 95.5% were accredited
- 45% of the people who received skill based training (64% for those CTEVT certified) obtained local employment
- A higher proportion of trainees in house wiring (91%), mobile repairing (64%) and plumbing (53%) were employed than other vocations
- Average monthly income of employed trainees was NRs. 6,450 with a range from NRs. 1,000 to NRs. 28,000 per month

Self-Employment Making Handicrafts

Bir Bahadur Dhami of Jhalari-2, Kanchanpur used to make a meager income as a woodcutter collecting wood from the Chure hills to sell in the market. After receiving a month-long training in making rattan handicrafts and furniture with Hariyo Ban support, he has given up his old profession and instead makes a living out of preparing and selling rattan chairs, tables, hangers, racks, stools and other furniture. He stated: "I make around NRs. 8,000 to NRs. 9,000 a month. My new furniture making work is much better, as I don't need to fear punishment by villagers for illegally cutting firewood. I had borrowed Rs. 50,000 from the local cooperative to start my business, out of which I have already paid back NRs. 21,000."

Youth, the Spirit of Awakening

Raju B.K. in his shop
© WWF Nepal, Hariyo Ban Program

"I was extremely happy and I could already visualize my career when I was selected as a participant for the training," beamed Raju B.K. from Sukla Gandaki VDC, Dhorfirdi, Tanahun, during the 35-day skill-based training on house wiring supported by the Hariyo Ban Program. He has since completed the training and started a house wiring shop in his village with his own investment of 150,000 rupees.

"He could not earn much from foreign employment. There was no ray of hope until he was selected for the training. Now, he makes nearly NRs. 30,000 a month from the house wiring shop," informed his spouse.

"If youths get an opportunity in the village, they won't have to go abroad. The Hariyo Ban Program has helped me become self-reliant," said Raju.

Green Enterprises and Ecotourism

The Hariyo Ban Program helped establish 26 green enterprises and 12 ecotourism ventures, following feasibility studies and value chain analysis. These have benefitted 21,444 people, including 333 female employees, by improving incomes while helping restore 1,188 ha of degraded forest and abandoned agriculture land.

The green enterprises supported include broom grass and bel juice in Tanahun; duna tapari (sal leaf plate) in Tanahun, Banke and Bardia; jam-jelly-pickle in Tanahun and Gorkha; nettle powder in Gorkha; lapsi in Kaski and Parbat; cardamom and chiraito in Gorkha, Tanahun, Lamjung and Kaski; coffee, tea and bamboo in Kaski; essential oil in Banke; bananas in Kanchanpur; citrus in Palpa; and cow farming, onion cultivation and honey production in multiple districts. Data in the descriptions below are from local communities and Hariyo Ban partner internal reports.

Broom Grass: Broom grass cultivation has been described in the Sustainable Landscapes section. It was first initiated in former shifting cultivation sites with the planting of 2,097,650 rhizomes in 201 ha of land in 49 leasehold forest user groups (LHFUGs) in Devghat and Abukhaireni in Tanahun. This benefitted 338 households, who have made over 3 million rupees in four years from selling brooms made from the broom grass. The income has been critical in supporting livelihoods during the farming off-season. However, despite the promising market demand for brooms, the producers have not yet been able to effectively cash in on the demand, due to limited production and challenges in transporting the product to market. Support was provided to form and register a cooperative to address the gaps, which is helping. Broom grass cultivation has also been promoted in other areas of Tanahun, as well as in Syangja and Palpa districts, with cultivation of 328.4 ha of degraded land.

Broom grass and broom production
© WWF Nepal, Hariyo Ban Program/Nabin Baral

Bel juice: The bel juice enterprise "Mountain Tanahun Samudaik Bel Tatha Falful Prasodhan Udhyog" was established in Jumdanda in Tanahun following an inventory of the bel fruit resource in the CFs in the area, and feasibility study for the enterprise. Six CFUGs in Tanahun were initially engaged to operate the bel juice enterprise with technical support and a seed grant from the Hariyo Ban Program to purchase machinery, produce and market the bel juice. The enterprise now involves seven CFUGs and has already sold about 6,000 bottles of bel juice in two and half years of operation with an income of NRs. 1,143,000, indicating good market potential. However, a steady supply of electricity to operate the machinery, transportation to more distant but lucrative markets, and availability of bel fruits (raw material) until planted trees mature could become limiting factors.

Bel juice entrepreneurs
© WWF Nepal, Hariyo Ban Program

Sal leaf plate or duna tapari udhyog: The sal leaf plate enterprise was first established in Jumdanda Jhapri CF in Tanahun, employing women to prepare the leaf plates. There is good demand for leaf plates in the local markets, and the enterprise has made an income of NRs. 55,000 over a period of three years. The establishment of leaf plate enterprises has also been supported in Banke and Bardia districts to tap into local markets there. However, there have been challenges with smooth operation of these enterprises due to unreliable power supply, difficulties with transport to markets, and time management for women entrepreneurs, while competition from larger foreign companies entering the local market could become a threat in the future due to their economies of scale.

Sal leaf plate enterprise
© WWF Nepal, Hariyo Ban Program/Jyoti Shrestha

Jam-jelly-pickle: Women entrepreneurs were trained and supported to start jam-jelly-pickle enterprises from their own homes in Jumdanda Jhapri CF in Tanahun and Dhodre CFUG in Gorkha using mulberry, pear, mango, lapsi, carrot, and radish. The entrepreneurs report that they have made a steady income from the sale of their products, but face challenges in conserving the products before they reach consumers; spoilage has reduced profits. Time management for the business has also been an issue for the women, as they must balance the business with household responsibilities, which has limited production.

Jam-jelly-pickle and honey enterprise, Jum Danda Jhapri, Tanahun
© WWF Nepal, Hariyo Ban Program

Non-timber forest product cultivation and processing: The Program promoted non-timber forest product (NTFP) enterprises, including preparation of sour date (lapsi) candy and dried pulp, and cultivation of chiraito and cardamom. Lapsi cultivation and processing into candy or dried pulp (both local snacks) have been supported in Kaski and Parbat with purchase of equipment and training for entrepreneurs. There is demand for lapsi products in the market, but availability of fruits could limit expansion. Cardamom cultivation has been promoted in degraded forest lands and agricultural fields in Gorkha, Tanahun, Lamjung and Kaski. Cardamom farmers from Gorkha have already made over NRs. 170,000 in the first year of harvesting. In addition, scaling up chiraito cultivation was supported with planting on 3.74 ha in Ragar CF in Barpak, Gorkha, which has generated NRs. 386,250 in income in the first year of production. The CFUG continued the chiraito cultivation even after the devastating earthquake in 2015, indicating its potential to support recovery of livelihoods in the region, and there is potential for an increase in production in the future. However, fluctuating market prices of NTFPs could pose risks to the farmers, particularly in the absence of storage facilities.

Nettle Powder Enterprise for Local Livelihood Improvement

Nettle enterprise in Barpak
© WWF Nepal, Hariyo Ban Program/Nabin Baral

A nettle powder enterprise was established in Barpak, Gorkha in 2012 with support from the Hariyo Ban Program to improve local livelihoods. The enterprise employs people from 11 poor households to collect and process nettles that grow wild in the region. Nettle has numerous health benefits.

"*Nettle is extremely nutritious and people have been using it for hundreds of years to treat painful muscles and joints, eczema, arthritis, gout, anemia and urinary problems in Nepal. Regular consumption of boiled nettle is also said to reduce chances of night blindness and to strengthen the immune system*," informed Tara Gnyawali, Senior Livelihoods Expert with WWF Nepal.

The enterprise received certifications from the Department of Food Technology and Quality Control, and started marketing with strong brand recognition for good quality. However, the earthquake destroyed the building housing the nettle powder machinery. Luckily the workers were able to retrieve the machinery from the rubble and reconstruct the building. By the end of Hariyo Ban Phase I they were planning to recommence production very soon and were enthusiastic about the role that the nettle enterprise would play in helping them, their families and the community to recover and improve their livelihoods.

Tea and Coffee: Tea and coffee cultivation was promoted as part of both PES implementation and enterprise development support in the Phewa watershed in Kaski district. Both these perennial crops require minimal tillage, help to stabilize slopes, reduce runoff and soil erosion, and hence when planted in degraded areas can reduce sedimentation of streams and Phewa lake. There is a good market for these cash crops which will not only help increase farmers' incomes, but also help in diversifying livelihoods and building resilience. Tea cultivation was piloted in Bhadaure Tamagi, Chapakot and Dhikurpokhari VDCs with the planting of 130,700 tea seedlings on 42 ha of degraded land following a feasibility study. Thirty-six farmers were trained in tea cultivation and preparation, and the Harpan Bari Tea Cooperative was established to promote tea cultivation, processing and marketing in the area. Farmers reported that about half the tea saplings have survived, and they had an income of NRs. 160,000 from the first year of production. Coffee cultivation was promoted in Andherikhola sub watershed with planting of 13,530 coffee seedlings on 8.5 ha of degraded land. A coffee cooperative was established with 41 member farmers (women), and support was provided to establish a pulping house to add value to the coffee. The coffee cooperative has already sold about 625 kg of coffee, making an income of about NRs. 2,180,000 over the course of three years.

Young tea plantation (left) and coffee seedlings (right)
© WWF Nepal, Hariyo Ban Program

Ecotourism

Homestays have been supported in 12 sites in Bhadaure Tamagi VDC in Kaski; Mipra and Chapa villages in Taghring VDC in Lamjung; Barpak VDC in Gorkha; and in Chitwan, Nawalparasi, Parsa, Banke, Bardia, Kailali and Kanchanpur districts. These ecotourism ventures were promoted by linking them to the Nepal Tourism Board, and through activities such as hospitality training for entrepreneurs, nature guide training, furniture and furnishing support for homestays, entrepreneur group formation, trail improvement, chautara construction, renovation of conservation ponds, promotion of alternative energy, orchid demonstration plots, honey hunting tour design, establishment of a visitor information center and website, sign posting, and IEC material publication. A total of 3,766 visitors have visited 6 homestays supported by Hariyo Ban in the past two years, helping the communities make NRs. 3,129,150. Visitor records show that Ayodhyapuri Madhyawarti Samudaik Home Stay in Madi, CNP, Pokhari Homestay in Nawalparasi, and Ghodaghodi Lake in Kailali have earned NRs. 578,000 in just one year, and the homestays in Kaski and Lamjung made NRs. 918,000 over the same period. The homestay business has also motivated the entrepreneurs to take part in initiatives to help conserve biodiversity.

Ecotourism

- 84 home stay (entrepreneurs) with 256 bed capacity
- Pokhari homestay owners are supporting Goral conservation
- Maghi homestay owners are supporting bird conservation
- Ayodhyapuri and Amaltari homestay owners are supporting rhino conservation

While the livelihoods crosscutting component undoubtedly benefited people, including poor, marginalized and women, the link with improving the trends in forest and biodiversity condition is less clear. The underlying assumption that providing improved/alternative livelihoods for people would either directly reduce pressure by reducing forest dependence, or result in improvements indirectly by changing attitudes to conservation and hence behaviors through entry, barter or bridging, was not always well translated from theory to practice. This was indicated by a review of livelihood outcomes (WWF Nepal 2016m), which found some sites had greater use of forests (e.g. from fodder collection for Program supported stall-fed goats), while others had the same or less following the livelihood interventions. However, sustainability in the cases of increased use was not assessed. While Hariyo Ban staff do have strong anecdotal evidence of positive correlations in some places, for example improved livelihoods as an incentive for CBAPU members to continue patrolling their forests, and the livelihoods work associated with biogas which reduces forest pressure, the baseline for monitoring the effects of livelihoods on forests was inadequate for detecting the livelihoods/forest linkage. Also, it takes time to see improvements in biophysical condition after pressure is reduced, and often a project lifespan is not long enough to see this. At the start of Hariyo Ban I there was no livelihoods coordinator on the core team and the partners supported livelihoods in the ways they had been working previously. While efforts were made from the third year to rectify the problem with threats-based work-planning to focus livelihood efforts on reducing high priority threats and drivers in specific places, and recruitment of a Livelihoods Specialist to coordinate the component, at the end of Phase I the linkages are still unclear. A further consultancy (USAID in press) is helping Hariyo Ban II to establish a more refined monitoring system to monitor and evaluate this linkage better. This issue is a major challenge for many projects around the world (Roe et al. 2015); hopefully Hariyo Ban II can contribute to better practices and global learning in this area.

Governance

Strategic Approach

Hariyo Ban's landscape approach is dependent on partnering with local communities and empowering them to steward their forests effectively. The Program therefore worked to strengthen internal governance of NRM groups to promote sound management of forests and natural resources, following national policies. Strengthening governance ensures representative leadership and participation of women, poor, vulnerable and marginalized groups; promotes equitable benefit sharing; increases accountability of leaders; and builds capacity for sustainable management of natural resources. This in turn should lead to improved conservation of critical forests, ecosystems, corridors, watersheds, and landscapes, reducing threats and drivers, and providing a platform for climate change adaptation. Beyond this, the governance programmatic framework aims to ensure: a) empowerment of marginalized citizens, b) accountability of public authorities and other power holders to marginalized citizens, and c) inclusive spaces for negotiation between public authorities/other power-holders and marginalized citizens (Figure 9).

Key strategies applied were: mainstreaming of GESI and good governance provisions in policies/guidelines of NRM groups and their implementation; capacity building of stakeholders to assess and improve governance; supporting NRM groups to practice and apply good governance; increasing equitable benefit sharing (EBS) with support to improve livelihoods of poor and marginalized users in NRM groups; enhancing capacities of government agencies and FECOFUN to monitor NRM groups and their practices in line with national policies and guidelines; and increasing engagement of communities, including poor, vulnerable and socially excluded (PVSE) people, in conservation.

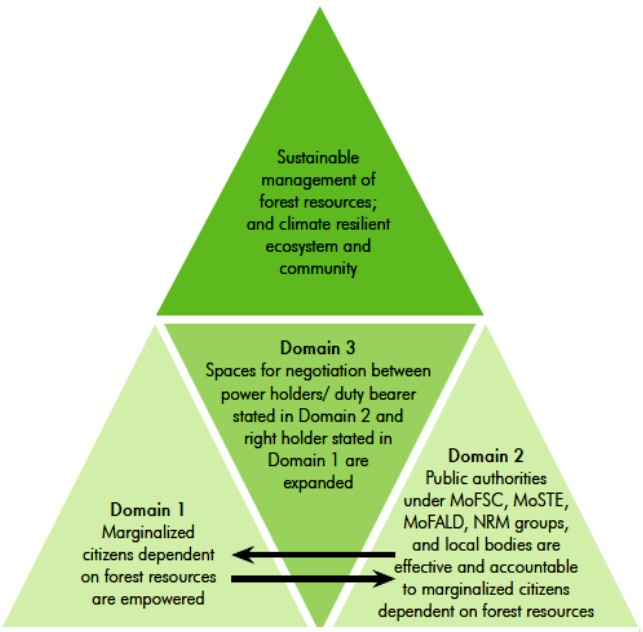


Figure 9. Governance framework

Capacity for Good Governance Enhanced

To build capacity for good governance implementation, Hariyo Ban raised awareness and provided training for key stakeholders on the Program's approaches and on relevant government policies, strategies and guidelines. The Program also built capabilities and skills to undertake leadership roles, organize advocacy campaigns and support good governance practices. Stakeholder executive committee and general members of NRM groups included members from marginalized groups (women, poor, *Dalit*, *Janajati*); LRPs; and representatives of government agencies, CBO/NGOs and the private sector. More intensive capacity building opportunities were provided to PVSEs through

CLACs, mentorship/coaching, cross learning visits/meetings and learning and sharing events to build their capabilities to take on leadership roles in executive committees of NRM groups, as well as other organizations in the community. Altogether, 6,752 people including 3,117 women, 573 Dalits, 2,857 Janajatis, and 443 youths received capacity building opportunities to improve NRM governance.

Institutional support to build NRM group capacity for better governance practices was also provided, including hardware support for group offices, capacity building opportunities for executive committee members, and support to conduct governance strengthening with tools such as Participatory Governance Assessment (PGA) (CARE Nepal 2013b), Participatory Hearing and Public Audit (PHPA) (CARE Nepal 2013c), and Participatory Well-Being Ranking (PWBR) (CARE Nepal 2013a), and EBS with the allocation of 35% of groups' annual income to support IGAs for poor users. 89 CFUGs received hardware support for offices (furniture and electronics) for them to operate better. Over the course of Phase I, internal governance of 328 NRM groups was improved.

Governance in NRM Groups Strengthened

NRM groups are considered to have improved governance when they use all three governance tools (PHPA, PGA and PWBR) and apply EBS in a single year. PHPA helps NRM groups build capability to establish a system of sharing all development activities, decisions, implementation processes and financial transactions carried out by the executive committee members to make them more accountable and transparent. PGA uses a spider's web diagram to assess governance status, and help prepare an action plan with strategies to improve governance in areas where this is needed. The PWBR helps assess relative wellbeing of member households in the NRM group, identifying poor and ultra-poor households who can then be supported with livelihood improvement assistance. These have largely been institutionalized in the CFUGs with inclusion in their renewed CFOPs and constitutions, ensuring sustainability of governance practices.

Major Governance Results

- Internal governance of 328 NRM groups strengthened.
- These CFUGs committed to annual PHPA to maintain transparency in fund mobilization; over 700,000 rupees in misappropriated funds have been recovered.
- Executive committees of CFUGs reformed to make them representative and inclusive, with women and marginalized groups in key positions as per CFDG 2009.
- CFUGs committed to allocating at least 35% of their total budget for livelihood improvement of the poor and ultra-poor; CFUGs disbursed over NRs. 8 million
- CFUGs providing timber, firewood and other forest products to ultra-poor people at a lower price than for others.

Achievements from using these governance tools include reformation of executive committees to be more inclusive, with women and PVSE people in key positions (see GESI section for details). A greater percentage of groups' annual income is being allocated to promote IGAs for poor users, as per the CFDG 2009: an internal assessment by Hariyo Ban revealed an increase from 7.92% to 27.25% as shown in Figure 10, coming close to the guideline figure of 35%. CFUGs provided over NRs. 8 million to support livelihood development activities for poor and marginalized members; these activities have benefitted 1,191 PVSE households. Management decisions have become more transparent and inclusive (results from an internal CARE Nepal unpublished review of governance tools outcomes).

In support of this work fund mobilization guidelines were developed on IGAs for pro-poor livelihoods, and are being implemented with the active participation of district FECOFUN chapters. However, many CFUGs still struggle with poor documentation and information management, while accountability, particularly in terms of equitable benefit sharing to PVSE groups and transparency in fund allocation and mobilization, are still major challenges. A total of NRs. 731,376[5] in misappropriated funds was recovered in 23 CFUGs.

A list of NRM groups with improved governance is given in Annex 11.

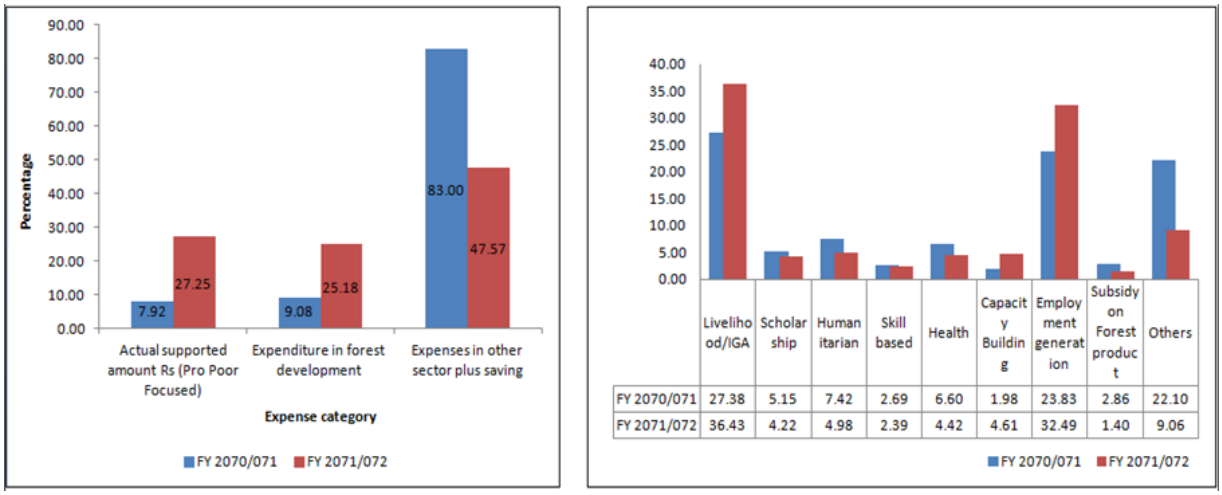


Figure 10. Allocation of pro-poor funds (left) and activity breakdown (right)

[5] Hariyo Ban M&E database

The Path to Good Governance

Sadabahar CFUG in Fattepur, Banke district was not implementing its operation plan effectively, and most of the members were unaware of national provisions and guidelines for management of community forests. The Hariyo Ban Program supported the CFUG to use the governance tools of PGA, PHPA and PWBR in 2014, with orientation on CFDG 2009. As a result, the governance status of the CFUG improved, with reformation of the executive committee to be more inclusive. The committee now includes 50% female members in key positions, leading to inclusion of women and marginalized people in decision-making processes, and providing a way to address their issues and concerns. Manamaiti Tharu, a CFUG member, stated,

"We are happy with the change in leadership in our community. It has reduced misunderstandings and conflict among CFUG committee members, as the process is participatory. This has been reflected in better protection and management of forests and grasslands. In addition, we have received benefits equitably."

The CFUG supported livelihood improvement activities for 20 poor member households. A system of scaled costs for grass and firewood was based on PWBR, and poor and ultra-poor households get their allocated forest products for free. The CFUG also conducted numerous activities to support climate change adaptation and sustainable management of the forest to conserve biodiversity. These efforts led the CFUG to be recognized as the best CFUG in Banke district in 2015 by MoFSC.

People Engaged in PHPA
© WWF Nepal, Hariyo Ban Program

Gender Equality and Social Inclusion

Strategic Approach

Conservation of biodiversity, sustainable management of natural resources, and building of resilience to climate change with community stewardship and effective mobilization hinges upon ensuring gender equality and social inclusion. In local communities, women are responsible for managing many forest resources, and poor and marginalized people are often the most dependent on natural resources for their livelihoods and wellbeing. If they are not empowered to participate, benefit equitably, and eventually play leadership roles in management of their resources, forests and people both suffer. Early in Phase I the Program developed a GESI strategy with the aim of building a GESI sensitive organizational culture; building capacity to address GESI issues; and implementing direct Program interventions for:

Major GESI Results

- 34,830 people benefitted from GESI focused interventions, including 29,104 women, 6,510 Dalits, and 16,012 Janajatis
- Percentage of 913 sampled CFUGs with women in key positions in executive committees increased from 47% in 2013 to 70% in 2016
- Representation of Janajatis and Dalits in at least two decision-making positions in the sampled CFUGs increased from 52% to 64% over the same period
- incorporation of anti-GBV measures in local NRM policies increased as a result of CLAC work

1) Increasing access of women, Dalits, indigenous people, poor and marginalized groups to participate in decision making processes and take on leadership roles in NRM; and
2) Ensuring access of target communities to equitable benefit sharing

Hence Hariyo Ban made GESI an integral part of all interventions, prioritizing participation from PVSE groups and supporting the mainstreaming of GESI into policies, plans and practices of NRM groups, NGOs and government agencies from local to national level. Since GBV is prevalent in local communities and often acts as a barrier to women's participation, the Program had a special focus on reducing GBV. To increase support for GESI from consortium partners, the Program worked with the partners to enhance GESI awareness and promote sound GESI practices internally.

Sensitivity and Accountability of Stakeholders to GESI Issues Increased

Capacity for women and PVSE people for leadership and advocacy was built by increasing their understanding of relevant concepts and approaches in natural resource management and climate adaptation, and the GESI linkages, as well as raising their awareness about GESI provisions in relevant national policies. The capacity building had a major focus on equitable benefit sharing, transparency, accountability and inclusion at all levels and steps of decision making. Leadership training was provided, and the Program built capability for GESI institutionalization in CLACs, and provided orientation on Gender Responsive Budgeting and Auditing, and Community Scoreboard tools.

Application of the Gender Responsive Budgeting and Auditing tool was very effective; it analyzes the proportion of a development budget and spending that is (a) directly gender responsive, (b) indirectly gender responsive, and (c) gender neutral. This analysis is done mainly for public financing. Hariyo

Ban slightly modified the basic indicators used by the Ministry of Finance to apply it in the NRM sector and promoted the approach; it was also used for the Hariyo Ban budget. The Community Scoreboard is a performance assessment tool where service receivers/seekers rate the performance of service providers across a range of indicators with scores. This is a participatory exercise where both parties take part. Hariyo Ban used the Community Scoreboard to assess the quality of services provided by local authorities and groups including VDCs, municipalities and CFUGs; in many cases joint commitments were made to enhance the quality of services where needed.

The Program recognized that promoting better GESI depends not only on empowering women and marginalized people, but also on engaging men and decision makers as champions for the cause. It successfully piloted a comprehensive framework for men and decision maker engagement to support the leadership of women and marginalized groups, as well as anti-GBV initiatives. The framework was piloted at the CFUG level with the formation of anti-GBV committees to address GBV issues in forest management. The program recognized the contributions from change agents, female leaders, men and decision-makers, and provided encouragement for next steps. It supported campaigns on GESI issues.

A total of 5,985 people, including 3,981 women, received training on GESI and governance advocacy, planning, implementation, and mainstreaming into plans and policies at different levels. Overall, 34,830 people benefitted from GESI focused interventions, including 29,104 women, 6,510 Dalits, and 16,012 Janajatis.

Representation and Leadership of Women and Marginalized Groups in Executive Committees of NRM Groups Increased

The Hariyo Ban Program was successful in increasing the number of women and marginalized people in executive committees of CFUGs, as well as in leadership positions of various community and civil society organizations and institutions. In 2013, a rapid assessment of 913 CFUGs conducted by Hariyo Ban on representation of women and marginalized groups in leadership positions revealed that 47% of CFUGs had women as either chairperson or secretary. By 2016 this had increased to 70%. Representation of Janajatis and Dalits in at least two decision-making positions in the sampled CFUGs also increased, from 52% to 64% over the same period. Both results exceeded the Program's targets and show very good progress, but are still short of 100% as mandated by the CFDG 2009. Results are shown in figure 11.

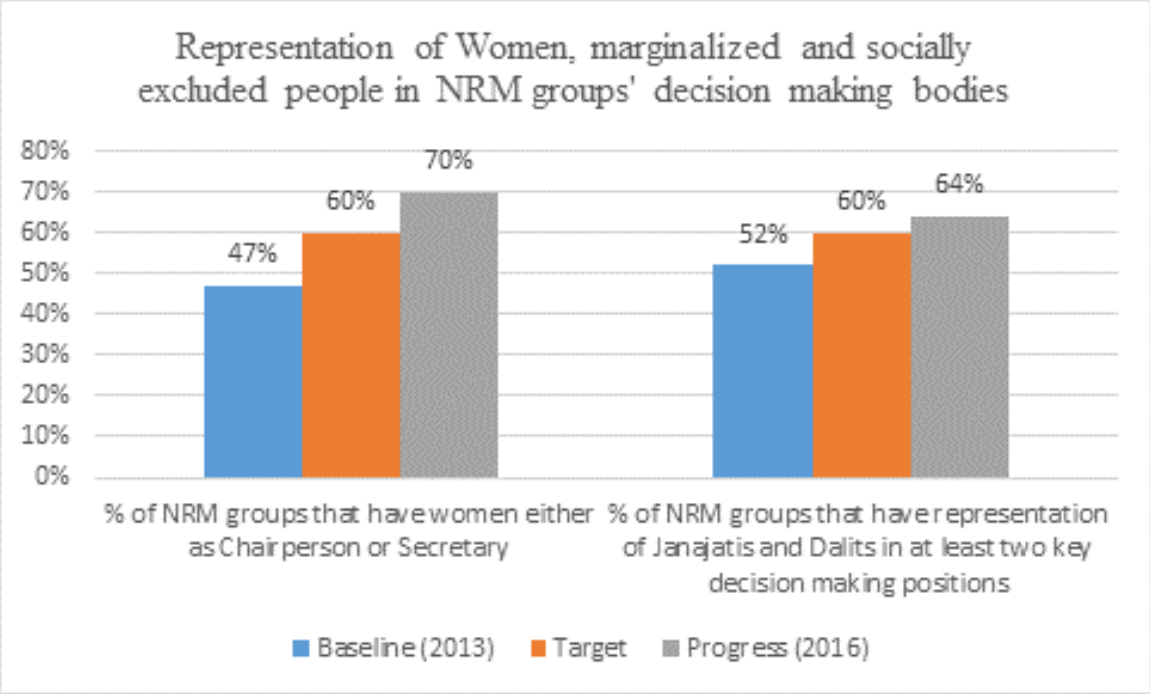


Figure 11. Representation in NRM groups' decision-making bodies

CLACs have been a major vehicle to empower women, poor and marginalized groups for leadership, and drive this reformation in CFUGs. More broadly they have been a very useful platform for social transformation, bringing people together to discuss and plan actions to address various local issues. The 485 CLACs that the Program supported capacitated 12,436 women and 334 men to undertake social advocacy. This resulted in several positive outcomes, such as helping women and marginalized groups achieve leadership roles not just in NRM groups but also in other community institutions, as shown in Figure 12 (results from a WWF Nepal unpublished assessment). CLAC members have also been active in pushing for strengthened internal governance of NRM groups, with results described in the Governance section of this report, and for building community stewardship through effective mobilization for conservation of biodiversity, sustainable management of resources, livelihood improvement with equitable benefit sharing, and reducing climate vulnerabilities by addressing differential impacts and resilience building. CLAC members were engaged in advocacy against GBV, and an internal assessment of impacts of the Program's work with CLACs on GBV in the NRM sector revealed that with increased awareness among stakeholders, incorporation of anti-GBV measures in local NRM policies was increasing.

A list of the CLACs that Hariyo Ban supported is given in Annex 12.

GESI Mainstreamed into National Policies and Local Planning Processes

GESI mainstreaming was supported in the local development planning process, and in all the national biodiversity, REDD+, PES and climate change adaptation policies, strategies and plans that the Program supported for formulation, revision, and/or implementation.

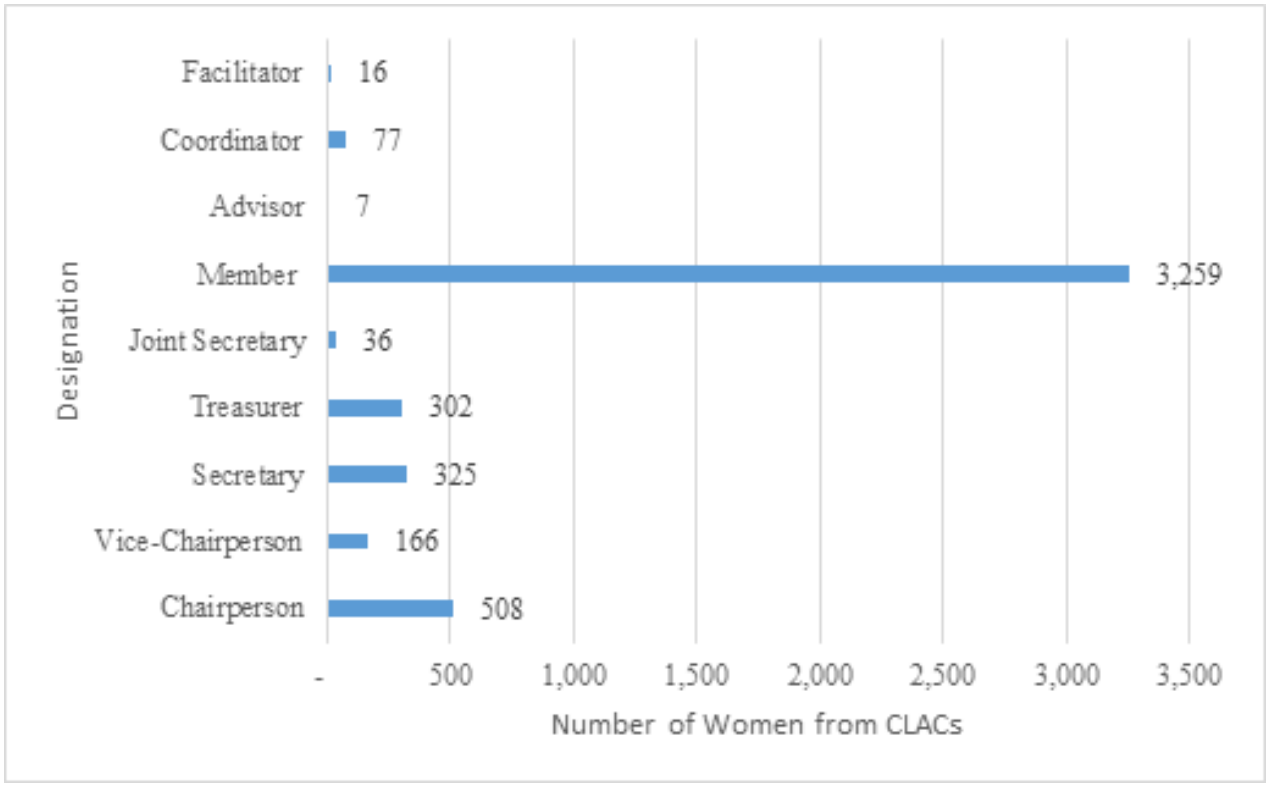


Figure 12. CLAC women representation in executive committees of various community level organizations

Members of the community learning and action center in Bhakarjung Community Forest User Group
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Community Learning and Action Center Supports Bikan Mahato to Tackle Gender-Based Violence

Bikan Mahato from Kawasoti in Nawalparasi is a former victim of domestic violence, which she attributes to her lack of formal education and agency to avert the abuse. However, after participating in a CLAC supported by the Hariyo Ban Program in Krishnasar CFUG, she became more aware of her rights, and has not just ameliorated her own situation but has also been actively advocating against GBV in her community. Respecting her endeavors, WWF Nepal awarded her NRs. 100,000 as a community change agent, which she has invested in construction of a pond for fish farming, sewing training for 35 women, and awareness programs for both sexes to reduce GBV. She has also been helping other women who are victims of domestic violence with NRs. 1,500 per month to gain economic independence. Bikan is motivated to work for social change, and is planning to form a CLAC network across seven CLACs in Nawalparasi. She believes that for big changes to occur, it is essential to work together because a group is stronger than an individual.

Hariyo Ban Support Empowers Pabita Kafle to Play a More Active Role in the Management of her Community Forest

"When I held the position of Treasurer in the Shiva Shaktiswori Community Forest Users Group, I was responsible for handling the user group's finances. Despite knowing I would be responsible for any discrepancies the men forced to sign checks with the amount already filled in, without being able to ask questions about the sums. Hariyo Ban then supported a CLAC in our CFUG, where women members discussed the issue of our representation in the executive committee, and empowerment to fulfill those roles properly. Re-elections were held and I was elected as Secretary of the executive committee. I have since received training in the Community Forestry Development Guidelines, and on how to effectively execute my responsibilities as Secretary. Now, the men members do not direct as they did before, and we are keen to ensure the Community Forestry Development Guidelines and the operational plan of our community forest are properly followed," said Ms. Pabita Kafle, Secretary, Shiva Shaktiswori Community Forest.

Challenges for Women Leaders

Santali Chepang in the Srijana CLAC in Chandisthan CFUG in Lamjung district shared these thoughts:

"*It is not easy trying to lead as a woman. Initially, many people in the village criticized us and said we were acting too smartly for our own good. They were not used to seeing women, least of all from a highly marginalized Janajati group, going out and campaigning for various causes. We had to work hard, go from door to door, and convince women and their family members to participate in the public sphere. It was difficult to convince the men and elite groups, and sometimes we faced unwarranted accusations. But we are not going to stop, and hope that through our initiatives we can bring some change.*"

Windows of Opportunity Grants Fund

The WOO grant fund aimed to help achieve Hariyo Ban goals and objectives by promoting flexibility and responsiveness to the dynamic policy environment and political and socio-economic transition, through providing grants to GoN and civil society organizations including resource partners. The WOO fund supported activities outside the regular work plan of Hariyo Ban, including those that arose at short notice. It covered applied research; testing and promoting innovative approaches; capacity building; and policy opportunities. WOO awards ranged from $1,000 to $50,000. A total of 111 awards were made during the first phase of the Program (58 to GoN agencies and 53 to civil society organizations (CSOs)), with Government grants mainly supporting capacity building, policy development and implementation, while CSO grants mainly focused on research and piloting of innovative approaches.

WOO funds allocated for GoN enabled greater GoN participation in and ownership of Hariyo Ban because government agencies could use these funds to directly address their Hariyo Ban-related priorities (policies, plans and capacity building needs). This would have been more complicated under the regular funding allocated to consortium partners. The WOO fund promoted networking with a wider range of stakeholders, in addition to those Hariyo Ban was working with through the regular program. Some research by WOO grantees was incorporated into the program work, such as research that raised the profile of disabled people and enabled them to share forest benefits more equitably; a study on research and innovative approaches in two biodiversity corridors in CHAL; and trials of tree species germination and establishment under different climate conditions.

The WOO grants helped to significantly strengthen capacity at various levels. For example, some CSOs built capacity of Members of Parliament and district level political leaders, sensitizing them in biodiversity conservation and climate change adaptation. GoN officials and others took part in exposure visits and some also participated in conferences, sharing the approaches and learning of Hariyo Ban in the international arena and obtaining new knowledge from around the world on approaches that can be applied in Nepal. The WOO fund also helped respond to changing political conditions and building an enabling environment to achieve Hariyo Ban objectives. For example, a study was supported to assess the functionality and institutional requirements of the forestry sector under new federalism structures following the adoption of the Constitution of Nepal in 2015. This provided helpful inputs to MoFSC to plan new provincial arrangements for conservation and management of natural resources.

The WOO fund supported innovative activities under all the program components. Notable contributions under the biodiversity theme included assisting in climate smarting the Blackbuck Conservation Area following a devastating flood in 2014, which caused high mortality of blackbuck. Other examples include support for community based goral conservation, and support for vulture conservation by reducing the threat of poisoning. Policy development was supported including preparation of monitoring protocols for red panda and pangolin; drafting guidelines for sand and gravel extraction to reduce impacts of infrastructure; and supporting the preparation of a management plan for the Pokhara Lake Cluster following its declaration as a Ramsar site.

Under the sustainable landscapes theme, WOO grants supported broom grass planting in the mid-hills of Chitwan-Panchase-Annapurna corridor, which helped address shifting cultivation, one of the main drivers of deforestation at the corridor level while improving livelihoods, stabilizing steep slopes, and re-establishing forest cover. Under the climate adaptation theme, WOO supported the piloting of CCA and DRR plan harmonization by developing an integrated plan that could be more easily mainstreamed into the local level planning process. Under governance, working through the National

Act on Rights to Information in the forestry sector proved highly successful in enabling women, poor and marginalized groups to understand their rights to information on community forest financial management, promoting greater transparency and more equitable benefit sharing. Under the livelihoods theme, WOO expanded the already tested micro-finance model through cooperatives for livelihood improvement; this support was recognized by the WOO evaluation as being a sound and sustainable approach. Under the GESI theme, the Institute of Forestry was provided with support to develop a GESI curriculum and to encourage female students by improving conditions in the women's dormitories. Support was also provided to scale up successful approaches, such as promotion of alternative energy technologies, including ICSs, and declaring wards of two VDCs in Gorkha district (Barpak and Deurali) as Indoor Smoke Free VDCs.

The WOO enabled a quick response by Hariyo Ban to help some affected beneficiaries and stakeholders immediately following the earthquake. For example, GoN was provided with support to continue management operations despite damage to infrastructure. Support was provided for early recovery through replacing damaged equipment in offices, and providing construction materials for reconstruction. Some civil society WOO grantees realigned existing funds to help with earthquake recovery, but a quick response through new grants to civil society was not possible because of a recent change in the system introducing a competitive process for civil society, which takes longer. This situation has been rectified in the small grants program in Phase II of Hariyo Ban, with a rapid disbursing fund after disasters.

WOO was evaluated by a consultant (WWF Nepal 2016n); the evaluation raised important issues and recommendations. These were considered in the planning and implementation of the Small Grants Program in Hariyo Ban II.

A list of the WOO activities supported by Hariyo Ban is given in Annex 13.

Hariyo Ban also had a separate student grants and internships fund. 65 students, nearly 60% of them women, received support for academic research projects in Hariyo Ban thematic and cross-cutting areas, and 52 students and recent graduates undertook internships with the Program team. Many of these dedicated and inspiring people have great potential as future leaders, and the Hariyo Ban support which helped them at a critical time in their careers should pay dividends for conservation and development in Nepal in the coming decades.

When the 2014 floods drowned 40 blackbucks in the Blackbuck Conservation Area in Khairapur, Windows of Opportunity funds supported DNPWC to create earth mounds as a refuge in future floods; Hariyo Ban also intensified support to establish a second population in Suklaphanta, through the regular Program.
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MAJOR LESSONS

The Hariyo Ban Program implemented many proven as well as new strategies and approaches in biodiversity conservation, sustainable landscapes, climate change adaptation, livelihoods, governance, and gender equality and social inclusion. The Program developed a learning agenda with a set of learning questions to test the effectiveness of several key approaches and the validity of some of the main assumptions underlying the conceptual model and results chains. Additional approaches were also tested as the Program progressed. Where needed, approaches were adapted or modified during the Program as part of a collaborative learning and adaptive management process to improve the effectiveness of the Program.

Some of the major lessons from the Program are outlined below.

Biodiversity Conservation

Threats based approach: The threats based approach was effective when it was well operationalized and each consortium partner brought its specialized expertise and experience. Hariyo Ban was able to mobilize existing expertise and experience in conservation in Nepal through the two conservation consortium partners, WWF and NTNC. There was some resistance initially to adopting a prioritized threat based approach using maps, and to work at the most appropriate scales, as people were not always willing to move out of their comfort zones and take on non-traditional approaches.

Control of invasive alien plant species: Despite 3 years of work, the introduction of biological agents to control water hyacinth did not yield good results. This may need further study on a smaller scale. Control of invasive species locally by uprooting, cutting etc. is effective if other vegetation cover is established that prevents regeneration (e.g. broom grass controlling *Lantana camara*). However, this solution is only at site level, and only works for some species.

Effectiveness of power fences to reduce HWC: The effectiveness of power fences depends on the level of community effort in regular maintenance. Power fences were very successful in stopping wildlife from entering agricultural land and settlements in areas where maintenance was regularly performed.

Mobilizing youth for conservation: CBAPUs, citizen scientists, ecoclubs and the LRP program were particularly effective in mobilizing youths and preparing a generation of conservationists who can challenge rigid social norms and values to control wildlife crimes and unsustainable harvesting, undertake wildlife research and rescue, and conserve biodiversity through sustainable management of natural resources. Continued encouragement and motivation of youths is important; Hariyo Ban motivated them and their families through regular opportunities for capacity building, support to improve livelihoods, seed funds to support conservation initiatives, and recognition of their efforts.

Outlook for focal species: Conservation of current populations of several species may not be adequate if they are only restricted to their existing ranges. Re-establishing new populations in parts of their historical ranges where they have disappeared, with increased connectivity using corridors, can contribute to increasing populations and building resilience of the species, especially considering climate change and other emerging threats. Suitable ranges may extend beyond historic limits as climate change advances. To guide conservation efforts an enhanced understanding of the ecology of several species, their habitats and threats is needed through further scientific research and long-term

monitoring; and partnerships between relevant stakeholders from GoN to local communities, NRM groups, CBOs, NGOs and academia.

Managing at subwatershed and river basin scales: ISWMPs provide a good platform to integrate sustainable natural resource management with better governance. This incorporates GESI, CCA, DRR, biodiversity conservation and livelihood improvement, while restoring degraded lands and addressing different threats/drivers/vulnerabilities to ecological and human communities within watersheds as well as sub-river basins. Some threats need to be tackled at a larger scale, such as impacts of poorly designed hydropower in a whole river basin, so Phase II should work at larger scales where necessary, e.g. to maintain environmental flows for people and nature. Taking a river basin approach was a recommendation of the mid-term evaluation.

Climate refugia and corridors: As climate change advances, climate refugia (e.g. on north facing slopes and in steep valleys) will become ever more important for biodiversity conservation in Nepal, as well as for people. These areas should be prioritized within the landscapes, and non-climate stresses should be minimized to maintain resilience of species, people and ecosystems. The biodiversity corridors linking TAL and CHAL along north-south temperature gradients on slopes and along river valleys should be restored and maintained to facilitate regular migrations and other movements of species including birds, fish, mammals and plant species; their importance is likely to increase as species move to cooler, damper places in refugia and higher altitudes because of climate change. These concepts have been well received by protected area managers, and climate change has been successfully mainstreamed into Manaslu Conservation Area's management plan.

Buy-in for conservation: Engagement of government, politicians and other relevant stakeholders and partners through enhanced capacity has helped to build ownership and commitment. The production of tangible benefits, and ensuring of financial aid management without creating dependency, is critical in sustaining participatory biodiversity conservation.

Sustainable Landscapes

REDD+ readiness: The Hariyo Ban contribution to REDD+ readiness was not as effective as was planned, as it relied to a great extent on the global and national policy formulation processes and agreements, which were outside the control of the Program. The delays in these processes significantly affected how much Hariyo Ban could advance its own work on REDD+. However, the Program did support preparations for the Terai subnational REDD+ project. It also made initial steps for a CHAL subnational project; the carbon inventory indicated that CHAL is a promising potential landscape for a subnational level REDD+ project, as most of the forests in CHAL are community managed and well conserved, and there is a strong opportunity for forest carbon enhancement. The capacity that was developed could be used in forest carbon assessment and periodic monitoring of the carbon stock change.

Community Forest Development Guideline 2009: Implementation of CFDG 2009 is an effective strategy for building REDD+ readiness, and ensuring equitable benefit sharing. Widespread dissemination of information on provisions under the guideline to support their enforcement, particularly at the community level, can be a challenge that needs to be overcome through more awareness and capacity building support.

Tools for valuing ecosystem services in PES: Application of simple tools for valuation of ecosystem services and goods, such as the Integrated Valuation of Ecosystem Services and Tradeoffs (InVEST),

was effective in educating stakeholders and initiating the two payments for ecosystem services schemes in CHAL watersheds.

Tackling drivers of deforestation and forest degradation: Having a good understanding of key threats and drivers, along with effective ways to tackle them, can bring focused and effective results. However, when sites are scattered and not tied into a central threats/drivers rationale, the collective impact can be more diffuse and difficult to measure. Threats/drivers should be tackled at the most appropriate level(s) to leverage results, and this varies between drivers. The Program had greatest success in tackling drivers like over-extraction of fuel wood and shifting cultivation, where there were relatively easy solutions at community level and good motivation to change behaviors. Control of fire is more challenging, for reasons outlined elsewhere in the report; behavior change probably holds more promise than fire-fighting, especially in CHAL. The Program did not make as much progress on infrastructure as some of the other drivers except in the Marshyangdi valley (through the PES project interventions); this driver should be a major priority in Phase II, with a more focused approach learning from Phase I.

Reduction of firewood consumption and carbon emissions: Biogas, MICSs, and ICSs are established measures to reduce emissions and fuel wood demands, thereby conserving forests and biodiversity. They also provide social benefits such as decreased indoor air pollution and savings in women's time spent collecting fuel wood, and PES opportunities for payments for cleaner energy on a large scale (e.g. Gold Standard biogas). There continues to be scope in to scale these approaches up in many rural areas where access to electricity and LPG are limited, and particularly for poor forest dependent households. In the longer term, as people transition from open fires through improved cook stoves, biogas and LPG to electricity, demand for firewood will decline; programs like Hariyo Ban can accelerate this trend and make sure that poor people also benefit.

Payments for ecosystem services: PES can be a valuable strategy to integrate and sustainably finance biodiversity conservation with restoration of degraded ecosystems, DRR, CCA and livelihood development activities. There is good PES potential for water supplies, sediment retention, flood reduction, ecotourism, and Gold Standard biogas in the landscapes. Hariyo Ban's PES piloting was successful to a large extent but it is still too early to definitively state achievements. Initiating PES takes time, particularly when there are many stakeholders, as much effort is needed to raise awareness about PES principles and build trust among stakeholders. High transaction costs exist in bringing the 'buyer' and 'seller' stakeholders together. The readiness of the ecosystem service 'buyers' to pay additional revenues to fund PES programs is challenge to overcome for scaling up and continuing PES programs, while 'sellers' often find it difficult to understand that payment is not automatic and will only be made when measurable services are delivered. Seed funds are often needed to support establishment of PES arrangements and initial environmental work, while ability to pay is often limited among 'buyers' in Nepal. Simpler schemes covering a small geographic area would be easier and quicker to implement, if the services and the threats to them are contained in an area and do not extend beyond the area's boundaries. Approval of the national PES Policy is essential if PES approaches are to be replicated, and to move forward with the existing pilot schemes.

Links between Program components: Sustainable landscapes issues cannot be dealt with in isolation from the other two thematic components. In particular, forests are likely to be extensively affected by climate change in the coming decades (Thapa et al. 2016). No-regrets measures need to be taken now to adapt forest management practices: for example, tree planting programs should consider what tree species are likely to grow in an area in the future (WWF Nepal 2016j). Sustainable forest management needs to take biodiversity and social impacts into account, and find solutions for multiple forest use while streamlining management for production. There is a large overlap between drivers of

deforestation and forest degradation, and biodiversity threats; the Program ensured good coordination across the two components to tackle them.

Climate Change Adaptation

Capacity building: Capacity building at different scales from local communities to the national level was very successful in helping to increase awareness on the impacts of climate change and measures to adapt. This also enhanced ability to prepare and implement adaptation and resilience building activities. The capacity of stakeholders was critical in achieving Program objectives and ensuring sustainability of the achievements. The role of LRPs as facilitators and the communication link between local communities, stakeholders, and project staff and experts was particularly effective in raising awareness, building capacity and mobilizing communities for climate change adaptation.

Tackling differential vulnerability: PVSE groups are often the most vulnerable to climate. Identifying and targeting the most vulnerable sites, poverty pockets and vulnerable PVSE populations using Underlying Causes of Poverty and Vulnerability Analysis tools, coupled with participatory and bottom up processes to prepare and implement adaptation plans, helped ensure that the Program reached the most vulnerable, building their adaptive capacity and resilience.

Community learning and action centers: CLACs were a very effective vehicle to generate awareness and empower PVSE groups in the community, and more broadly to drive social mobilization for overall development and social transformation. They combined confidence-building and leadership training for PVSE people with activities to tackle local issues, all the while preparing these people to participate effectively in climate adaptation and forest management, take on greater roles in their communities, and improve their lives.

Improving local level adaptation planning: CAPAs and LAPAs were effective in addressing current hazards faced by communities, but were not so effective in considering likely future hazards to people and ecosystems, and adopting 'no-regrets' activities now to help reduce these impacts. The Program could have made better use of climate science and adaptation technologies such as early warning systems in the local level adaptation work. Greater integration of climate science, application of results from ecosystem and species climate resilience work, research to fill gaps, and use of tools to plan for no-regrets scenarios in adaptation and resilience building for both people and ecosystems is needed in the future.

CAPAs or LAPAs? CAPAs are effective in capturing local vulnerabilities, including differential vulnerability and site specific conditions, as well as for targeting and prioritization of adaptation activities for PVSE people, other vulnerable populations and ecosystems. CAPAs also have strong community ownership, but face challenges due to lack of institutional recognition within the national adaptation framework, and limited resources in communities to implement them. The incorporation of the CAPA into a community's CFOP, or rolling several CAPAs up into a LAPA at VDC level, provide pathways to legitimize them. Eventually, once planning is done through a climate change lens, separate climate adaptation planning should become redundant but we are not at that stage yet.

Leveraging resources for adaptation: CAPA preparation in communities has increased expectations but in many cases there are not enough funds to fully implement the CAPAs. A major focus is needed on leveraging resources to implement adaptation activities. This is often most successful when there is good coordination between communities, NRM groups, implementing partners and government line agencies, and when adaptation is mainstreamed in local level planning. Hariyo Ban found that in

general it is not a good idea to allocate a standard amount of seed funding for implementing each CAPA and LAPA; needs vary tremendously between sites/VDCs, especially if infrastructure is needed. It is better to allocate funds based on need. Since it is often not possible to fund the whole adaptation plan at once, one approach is to fund some initial activities and gauge how well the community uses them; communities or VDCs that are committed and do a good job can then be prioritized for further funding.

Integrating adaptation with DRR and mainstreaming in local level planning: Extensive engagement with GoN to support the regular local planning process was effective in building an enabling environment for scaling up and increasing the likelihood of ongoing support for Hariyo Ban's local adaptation work. Integrating CCA and DRR plans and activities and then mainstreaming them into the government planning process, aligned with government priorities, was effective not just for enhancing resource leverage, but also in avoiding duplication of effort, making efficient use of resources, and institutionalizing adaptation practices. There is ample scope for integration of LDRMPs and LAPAs since they use many common methodologies and tools for assessment and planning, and both are primarily implemented at VDC level. There is strong interest from MoPE and MoFALD in pursuing this further with a focus on resilience building. The experiences, achievements and lessons so far provide a strong base for this policy harmonization in the future, and should be a priority for Phase II.

Adaptation at multiple scales: Adaptation at the local level is often not enough to address broader ecosystem processes. An inclusive network of adaptation and disaster communities can help create an enabling environment for integration of CCA-DRR at different levels, and build collaboration for effective implementation of CCA-DRR integrated activities. ISWMPs and PES based on ecosystem scales can be an effective means to support implementation and scaling up of identified integrated CCA-DRR activities, including improving upstream-downstream linkages and communication in order to reduce the risk of maladaptation. This is particularly true where upstream adaptation activities may inadvertently adversely affect downstream people or ecosystems.

Monitoring and evaluation of local level adaptation: Review and reflection with communities and other key stakeholders such as CBOs, NGOs and government agencies has been an effective tool to collect feedback, create a platform for dialogue, and establish partnerships for implementation of adaptation plans. Initial monitoring and evaluation of adaptation activities using the PMERL tool proved too complicated and cumbersome in communities. The Program consequently turned to the Adaptation Health Check-up tool which was simpler and easier to use. There is still a need to further simplify the process and integrate it with existing community practices.

Green Recovery and Reconstruction

Flexibility and adaptability: It is very important to be needs based, adaptive and flexible for effective program delivery. After the 2015 earthquake, major changes were made in the Program to support recovery and reconstruction. While some original activities had to be sacrificed, the program was able to adapt and respond to a major need (and opportunity) that arose, supporting recovery of Hariyo Ban's partner communities, and helping reduce adverse environmental impacts from earthquake recovery and reconstruction.

Coordination, communication and sharing in Hariyo Ban's field recovery work: Hariyo Ban used the specializations of each consortium partner to make its recovery and reconstruction work in the field more effective, sharing knowledge and approaches across the consortium. Coordination with the District Disaster Relief Committees and humanitarian partners was essential, as was readiness to

change plans in the rapidly evolving situation. In hindsight, Hariyo Ban should have had a full-time senior field coordinator for its recovery work in the four districts.

Post-earthquake rapid environmental assessment: The REA was a valuable tool as a foundation for the rest of the GRR work, along with the post disaster needs assessment. In hindsight, while the REA could have been produced much more quickly and simply without such a large team of experts or government-chaired committees, they brought it credibility and buy-in from high level GoN officials (Secretary level), and this helped in the subsequent GRR work.

Positive response to green recovery and reconstruction concepts: There was a very strong positive response to the green recovery work from other sectors, and a willingness to put the principles into practice as long as activities were practical, cost-effective, and not too time-consuming. There was direct uptake of GRR principles by several other sectors (e.g. housing, education, forestry, water) which will hopefully result in scaling up environmentally sound approaches. However, it takes time to move from theory to practice, and this work needs to be continued to maintain momentum. Unfortunately, it is not within the scope of Hariyo Ban II.

Time for promoting green recovery and reconstruction: Additional funding for just over a year was not long enough to follow through on green recovery and reconstruction with other sectors after a major disaster, including rolling out of a multi-sectoral training program and materials, post-training mentoring and support at different levels, supporting recovery work in the field, making use of newly established pilot demonstration sites, and monitoring and evaluating the effectiveness of the approach used. It was also not long enough for Hariyo Ban's direct support to affected communities in the field. Ideally GRR programs should last for the duration of the recovery and reconstruction, continuing to provide technical support and mentoring after capacity has been built; monitoring effectiveness of efforts; adjusting as needed; and documenting best practices and lessons for the future.

Soil bioengineering: Low-cost soil bioengineering schemes based on indigenous knowledge can be an effective and cheap tool for stabilizing slopes and reducing flood risk, with pilot demonstration sites as a useful way to try out approaches and communicate results. In the short time that the Program had for this work after the earthquake, direct community-to-community transfer of knowledge and skills was already starting to happen, suggesting opportunities for scaling up.

Green recovery and reconstruction guide: Further lessons from the GRR work are documented in the GRR guide (WWF Nepal 2016k).

Livelihoods

Good for people but what about biodiversity? Livelihood support activities helped to diversify income sources of the ultra-poor and others, building their resilience and economic wellbeing, but the livelihood support did not generally result in a tangible reduction of biodiversity threats or drivers of deforestation and forest degradation in the time period of the Program. Paying greater attention to livelihood-biodiversity linkages when designing livelihood activities, and improving monitoring, are important lessons for Phase II. Further lessons are contained in WWF Nepal (2016m) and USAID (in press.)

Taking a block approach rather than scattering too widely: It is important to continue efforts to ensure that poor and forest dependent people benefit from income generation and livelihood promotion activities under the block approach to reduce dependency on forest resources and promote conservation.

Improving the green enterprise approach: Green enterprises faced challenges due to small-scale and scattered livelihood activities in NRM groups. In the future, concentrating in a smaller geographic area, taking a block approach for high value crops and NTFPs, promoting raw material enhancement, scaling up as a cooperative enterprise, and linking to markets would be a better approach to promote green enterprises.

Youth livelihood support: Youth interest is in service sectors rather than agriculture or forest production. Consequently efforts need to be made to connect forest dependent youths with skill based training programs, and link them with job markets and enterprise establishment support, in order to reduce forest dependency and promote youth involvement in forest management and biodiversity conservation. This approach worked particularly well for CBAPU members.

Governance

Sustainability of local governance efforts: PHPA and PGA are useful tools for improving governance and communication, monitoring and evaluating CFUG activities, and improving decision making for efficient management and allocation of resources. However, while good coverage has been achieved sustainability is still questionable, particularly in areas where the level of awareness and capacity for advocacy among users is still low. Further mentoring and support is needed in these cases.

Role of youth: Youth can play important leadership roles to challenge rigid social norms and values and bring about change; they should be an integral part of governance strategies in Phase II.

Support for the poor: The PWBR tool is useful in categorizing forest users and identifying the poor and ultra-poor; this has helped leverage funding support for their livelihoods not only from within CFUG resources, but also from other agencies. However, benefit sharing and leveraging additional funds is not enough: these people require additional skills, technical support and linkages with markets help to make the opportunities sustainable.

Increasing women, poor and marginalized people's participation: The governance work, including use of the governance tools, helped to increase participation of women, poor and marginalized people in the management of their forests, and in other community activities, enabling many of them to build skills to take on leadership roles.

Gender Equality and Social Inclusion

Men and leaders as GESI champions: It is not enough to work only with women and marginalized groups to promote gender equality and social inclusion. Engagement of men and elites is needed to change attitudes and bring transformative change for empowerment of women and marginalized groups. The Program found that when it built their capacity in GESI, some men were very receptive to the concept of supporting GESI among their peers and the groups they were leading, and became strong champions. This approach needs to be continued and scaled up.

Reducing gender based violence in natural resource management: Gender based violence in the NRM sector can occur in forests as women collect resources or take part in forest management activities; in the community as women assume leadership roles or advocate more strongly in NRM groups; and in the home, as a result of their new forest management roles or improved livelihoods.

GBV can be a serious barrier for women to become more involved in NRM. Awareness raising, mainstreaming GBV in local policies, encouraging women to work together on the issue, linking them with specialist organizations tackling GBV, and engagement of men and decision makers in the issue is important in reducing GBV in NRM.

The value of CLACs: CLACs have been crucial in facilitating the inclusion of women in CF management, and providing a platform to discuss the issues of marginalized people. However, 16 weeks of meetings is not enough; it is essential to continue to provide feedback and guidance to keep the momentum going. Formation and implementation of men and youth CLACs helps to change their attitudes for transformative change. CLACs provide a common platform for joint discussion on the issues that require joint efforts from both men and women.

NRM group GESI policies, standards and practices: Internal GESI policies, standards and practices of NRM groups and institutions are extremely helpful to create an enabling environment for promoting leadership, participation and benefit sharing for women and marginalized groups.

GESI thematic groups: GESI thematic groups at different levels are valuable for sharing knowledge and approaches and leveraging resources for the advancement GESI. This is particularly important for GESI focal points in organizations where GESI is not part of the organizational culture; the moral support and advice that such groups can provide is very valuable.

Maya Tapa pulls up her fishing net to see if she has caught any fish. While the fisheries in the two landscapes are depleted, many marginalized households still depend on them, and taking a river basin approach will help restore and maintain many ecosystem services such as this.
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FACTORS CONTRIBUTING TO THE SUCCESS OF THE PROGRAM

The following factors significantly contributed to the Program's success:

Consortium: The Hariyo Ban Program brought together four consortium partners with diverse expertise and extensive experience in Nepal: two development organizations and two conservation organizations; with two national NGOs who could reach down to grassroots level using their extensive networks, and two international organizations who could build capacity, convene diverse stakeholders, work at larger scales, and tap cutting edge approaches globally. Partners had a range of policy approaches, ranging from provision of technical inputs to GoN, to advocacy from grassroots to national level. These complementary approaches and competencies provided a wide and strong technical base for the consortium (see WWF Nepal 2016o for further information on consortium effectiveness). The consortium partners also had community trust and goodwill gained through implementation of earlier USAID funded programs (GCP, Strengthening the Role of Civil Society and Women in Democracy and Governance (SAMARPAN) and SAGUN), which helped in reaching communities and stakeholders. The core team had a wide range of competencies and a dedicated staff; four of the five key personnel positions worked on the Program for all five years of Phase I, which provided continuity. All these strengths were a major factor in the ability of the consortium to deliver results.

Partnerships and coordination: The Hariyo Ban consortium could not have produced the Program's results on its own. It partnered with many different organizations from local to national levels, who made major contributions to the Program's achievements. The Program partnered with several government agencies at national, regional and district levels. A high-level coordination mechanism was developed at central level through the Program Steering Committee (PSC) chaired by the MoFSC Secretary; the PSC endorsed the Program's work plan each year, and the PSC's Working Group met frequently to ensure coordination. National level partnerships were forged with the departments of MoFSC as well as other relevant ministries and departments; the scope of these partnerships was broadened during earthquake recovery and reconstruction. Partnerships at regional level were made with Regional Directorates of MoFSC, coordination with Western Regional Directorate being the strongest. At district level, some partnerships with DFOs and DSCOs were stronger than others; partnerships were also forged with other relevant district line agencies and bodies such as the District Disaster Relief Committees.

In addition to government, the Hariyo Ban Program collaborated and partnered with many CBOs, CSOs, NGOs, media, academic/research institutions, private sector organizations and consultants through regular contracts and grants, Windows of Opportunity fund awards, and technical partnerships. The Program partnered with several resource partners, most of whom made important contributions to the Program. Partnerships also enabled leveraging of additional resources for activities the Program could not fund, and for scaling up activities. A large amount of partner capacity building was needed, particularly in communities, CBOs/NRM groups and GoN. A concrete strategy was essential to capitalize on the partnerships, and constant communication and coordination was essential to productively utilize them. Joint monitoring visits with partners were very productive.

Collaborative donor relationship: A collaborative relationship with USAID Nepal with good two-way communication helped with smooth operation of the Program, and with local networking.

Flexibility: The Program was able to work with a good degree of flexibility and adaptive management, which strongly contributed to its success. Testing many innovative as well as traditional

approaches, it adopted the most effective ones, and stop activities that were not yielding strong results. The Program's funding, through the US Presidential Initiative for Global Climate Change's earmarked funds for sustainable landscapes and adaptation, and the US Government Congressional Earmark for Biodiversity Conservation, enabled the Program to work across many different disciplines while reducing vulnerability to climate change and threats to biodiversity. For example, in the climate adaptation work at community and VDC level, the Program worked in all six thematic areas of the National Adaptation Programme for Action (Ministry of Environment 2010). The Program also had to adapt to changes in the operating environment, which provided opportunities as well as challenges. The biggest change was after the 2015 earthquake, when USAID Nepal encouraged the Program to realign funds for earthquake relief and recovery, and then provided additional funds for green recovery and reconstruction, a totally new approach for the Program and many of its staff.

Landscape approach: Taking a landscape approach, the Program was able to work at multiple scales from local to national, and to work across different sectors in order to more comprehensively tackle threats, drivers and vulnerabilities at the most appropriate levels. There is growing realization among forestry sector stakeholders, independent professionals, and research institutions that working only within administrative boundaries (VDCs and districts) and current units of forest management regimes (single CFUGs and BZCFs) is not adequate to tackle the new challenges brought about by climate change and other emerging threats. Commercialization of forest products, rapid development in other sectors and the growing need for land and water resources highlighted the need for working across different sectors (e.g. land use, water resources, agriculture, energy and transport). Hariyo Ban's coverage of these issues necessitated working at multiple scales, which the landscape approach facilitates. GoN created a favorable policy environment for this, prioritizing the landscape conservation approach, recognizing CHAL as a landscape, formulating a Strategy for it, and revising the TAL Strategy. The river basin approach was incorporated into the Forest Policy 2015.

Synergies across components: While the three thematic components started out relatively independently, the Program quickly realized the importance of fostering synergies across components to make the most of expertise and opportunities, and avoid duplication. The synergies enabled more robust and resilient results. For example, the biodiversity component mainstreamed climate adaptation into many aspects of species and landscape conservation to promote climate-smart approaches. The climate adaptation component combined community and ecosystem adaptation in an integrated approach (more information in the Hariyo Ban case study in USAID 2015). The sustainable landscapes component looked at the likely impacts of climate change on drivers (e.g. future occurrence of fire) as well as likely future impacts of climate change on forest types and forest management. This involved working closely with the biodiversity component to tackle drivers of deforestation and forest degradation, which were also threats to biodiversity. The three cross-cutting components were mainstreamed into the thematic components. There were strong synergies between livelihood improvement and reducing several threats and drivers. Governance and GESI (themselves closely linked) played an important role in ensuring that climate adaptation took into account differential vulnerabilities, and that forest management was equitable and participatory.

Success in contributing to enabling policy environment: The Program was able to contribute to several GoN policies, strategies, directives and guidelines (Annex 3). This helped to create a stronger policy environment for the Program to operate in, giving legitimacy to replicate and scale up some of the approaches it had piloted. Hariyo Ban supported in-depth consultation with and engagement of stakeholders and policy makers during the formation of several policy instruments, contributing to inclusive and democratic policies, and ownership of those policies.

Windows of Opportunity fund: The WOO fund enabled work outside the regular work plan, responding to opportunities that arose at short notice, testing innovative approaches, filling in gaps in regular programs of Hariyo Ban, building an enabling environment and enhancing capacity of stakeholders. A large volume of work was undertaken through WOO by GoN and civil society organizations, with many important contributions to achieving Hariyo Ban's goal. In several cases, WOO grants produced work that was later mainstreamed into the Program (e.g. Small Mammal Conservation and Research Foundation (SMCRF)'s work on biodiversity corridors in CHAL, Deepa Rawal's work on seedling germination and establishment under different temperature regimes for tree species planting guidance in light of climate change (WWF Nepal 2016j), and work on several policy documents). WOO also brought a wide range of partners to Hariyo Ban across many disciplines, helped develop relationships and fostered GoN buy-in and ownership.

Duration of Program: A duration of five years for the first phase meant that the Program had time to undertake assessments at the beginning (particularly in CHAL and for climate change where there were many unknowns initially), and to develop mature partnerships to achieve results. This would not have been possible had the Program only run for two or three years. Even five years is a short time to develop trust and partnerships with local communities, change attitudes about inclusion and governance in local groups, pilot and scale up cutting edge approaches (e.g. for climate change), see impacts from forest and biodiversity management, and roll out a landscape approach in a new landscape as big and complex as CHAL. The fact that the Program is continuing for another five years will enable it to scale up successful approaches and work towards greater sustainability.

Application of different media: Pictorial and visual tools, such as photos and illustrations, and radio messages were effective communication vehicles to reach poor, vulnerable and socially excluded groups and rural communities. The Program used these extensively to share messages and information with the target communities. Media visits to take journalists to the field were effective in encouraging them to write about the major themes of the Hariyo Ban Program, particularly initiatives benefitting or undertaken by people in the field. Constant feedback to assure the quality of reporting, continuance of reporting on the sector and reaching the target audience is important.

Daraundi river valley
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SUSTAINABILITY

'Sustainability' in the traditional sense of the word is perhaps not the best term to use in face of climate change. A major challenge for all the categories of sustainability outlined below is that there will be profound changes as climate change advances and Nepal experiences more extreme weather events. Managing proactively to promote resilience of natural, social and economic systems and institutions in light of change is essential. For example, rather than trying to recreate past conditions in biodiversity and forests, we need to proactively manage for future change, considering uncertainty and developing 'no-regrets' approaches in the face of different possible scenarios.

With that caveat, this section outlines the measures that Hariyo Ban has taken to make its interventions and results sustainable. The Program worked to mainstream successful approaches into regular government, community and civil society processes, and build capacity for the future, so that they could continue after the Program closed. An Exit Strategy and Legacy Plan was developed in the fourth year covering ecological, social, policy and institutional, economic/financial, and political sustainability. The Program also worked on the Mid-term Evaluation recommendations to address sustainability issues. In addition, the Program developed and implemented a Learning Strategy that provided critical inputs on aspects of sustainability that were taken into account.

When the same consortium was awarded Hariyo Ban II, the Program made some adjustments, focusing on ensuring sustainability and documentation of components and activities that were not continuing in Hariyo Ban II (including Sustainable Landscapes and Post-Earthquake Green Recovery and Reconstruction), and carrying forward critical capacity and learning to Phase II. Closing meetings to communicate Hariyo Ban achievements and learnings, and to receive feedback for the second phase, were held at three levels: (i) community level involving representatives of all NRM groups that Hariyo Ban worked with, (ii) landscape level where representatives from field level government and civil society organizations participated, and (iii) national level that brought representatives from national and international stakeholders: government ministries and departments, USAID and other relevant donors, INGOs, CSOs and academic institutions.

A quick review of the updated sustainability plan (Annex 14) showed that Hariyo Ban has been successful in attaining ecological, social and institutional sustainability (at least in the short term) for many of its interventions, but more effort is required with respect to financial and political aspects. A brief overview of different categories of sustainability with select examples is provided below.

Ecological sustainability: The revision of the TAL Strategy, incorporating climate change considerations, and the endorsement of CHAL as an important north-south, river basin landscape by GoN through development of the CHAL Strategy, provide a framework and direction for all conservation activities in these two landscapes. The translocation/dispersal of key species (rhino, swamp deer, blackbuck and water buffalo) not only helps recreate the original large mammal assemblage in CNP, but also ensures that the populations of these important species are less likely to be wiped out due to disease outbreaks and/or climate-induced or other disasters. Similarly, CBAPUs have been widely accepted by government and other stakeholders as being instrumental in attaining zero poaching of rhino, along with GoN. Development and implementation of integrated sub-watershed management plans in collaboration with relevant government agencies will ensure that the ecological aspects of these interventions will be continued by relevant stakeholders, with upstream-downstream collaboration. GRR work focused on capacity building of stakeholders with supporting guidelines and technical briefs is another possible example of ecological sustainability, but will require more time to see the results.

Social sustainability: Most of the Hariyo Ban interventions were widely accepted by the communities because of tangible and potential benefits that they brought to the people. For example, the CBAPUs' role, structure and function have been widely accepted by community people because of the forest benefits to the local communities, and in many cases opportunities for skilled based employment and tourism. There is increasing demand for adaptation related interventions because they help communities to address multi-faceted vulnerabilities. The multi-year (usually five year) adaptation plans provide a solid foundation for social developments that not only provide tangible benefits in the short-term but help to build resilience in the longer term.

Policy and institutional sustainability: Hariyo Ban primarily works with NRM groups (CFUGs, CAMCs, LHFUGs and BZCFs) that are constituted/formed based on government policy framework, and sub-groups of these formal groups (e.g. CLACs and CBAPUs). Work includes capacity building of these NRM groups and sub-groups to ensure effective functioning and long-term sustainability. Plans developed by these groups, such as CFOPs and LAPAs, are embedded in policy guidelines that are supported by government line agencies. Some of the new institutional set up, such as basin or sub-basin level institutions, have not been fully established in the absence of a policy framework to support formation of such institutions. This work needs more time and is to be continued in Phase II.

Financial sustainability: There were mixed results in this area. The two PES pilots could be a sustainable financial mechanism for watershed management, and initial results are promising. The revolving funds managed by cooperatives for livelihood interventions are a successful sustainable approach (WWF Nepal 2016n); they will continue to make loans to support livelihoods and biogas after the end of Hariyo Ban. The second Gold Standard biogas project the Program supported will bring in performance-linked income over a long period. At the same time, fund leveraging for adaptation is going to be a challenge due to huge demand and resource gaps. Scaling up GRR is promising, but requires sustained effort to influence the huge amount of donor and GoN funding. The overall landscape approach, though widely accepted by government and experts, is still facing funding gaps due to the current practice of fund flow through administrative units with fixed political boundaries.

Political sustainability: The first phase of Hariyo Ban coincided with the political transition in the country: formulation of a New Constitution and coming up with a new political structure, and revising existing Acts and Regulations to back it up. The absence of elected representatives in local bodies (DDCs and VDCs) for over 15 years was a political vacuum with huge implications for development efforts. These conditions sometimes made it challenging to come up with a policy framework, and there has been little political will to incorporate successful replicable models and practices promoted by Hariyo Ban. For example, the REDD+ Strategy took almost four years to finalize and the PES policy is yet to be endorsed. The integration of CCA and DRR is a successful model that could be adopted and scaled up by local elected bodies. Most of the Hariyo Ban interventions were widely accepted by political powers because they were jointly implemented with government agencies and formally recognized NRM groups within the government policy framework. The 10-year project period with Phases I and II is critically important to give time for lasting results in the rapidly changing political situation. The changing political context, with a national election at three levels (local, province and federal) may create a better enabling environment in Phase II.

Hariyo Ban Legacy

The first phase of Hariyo Ban had many results and achievements that formed significant milestones for conservation or climate change work in Nepal; were innovative; had local, regional, national and/or global significance; provided value addition; and presented opportunities to scale up in the

future. Hariyo Ban expects that this legacy will play a significant role in sustaining and upscaling the Program results and impacts. The major legacy activities are documented through policy documents, reports, publications, and/or on video. Several legacy activities were analyzed for their innovation/value addition, lessons learned, and the contribution they make to biodiversity conservation, landscape management, and/or climate change mitigation and adaptation in Nepal. A list of the main legacy activities is provided in Annex 15, and include: support to GoN for the CHAL Strategy; support to the national HWC compensation and relief fund; PES pilots in Phewa and Marsyangdi; and integration of LAPAs and LDRMPs. The Program's publications and other outreach materials are archived on the Hariyo Ban web pages on WWF Nepal's website (www.wwfnepal.org) as well as USAID's Development Experience Clearinghouse (https://dec.usaid.gov/). Sets of the major phase I publications are being distributed to relevant government ministries, departments and offices; academic and research institutions and libraries; NGOs and donors.

Mid-Term Evaluation Recommendations

The mid-term evaluation of Hariyo Ban performance was conducted in March 2015. The evaluation team gave the following recommendations:

- Learn lessons from integrated sites that are showing synergies to ensure their sustainability after Hariyo Ban (e.g., policy for climate change adaptation and CFUG networking).
- Either phase out "patchy" sites – those that are less integrated and successful – or work to bring them the full package of activities (e.g., re-do or support governance activities, strengthen or re-run CLACs, ensure appropriate technical backstopping).
- Develop a clear strategy for strengthening and/or reframing the water basin approach by focusing resources and activities at sites that have potential to show how water basin approach can work (e.g., focus on strong and workable PES sites).
- Use CAPAs as a bottom-up planning tool to prepare LAPAs, and mainstream both into Village Development Committee (VDC) plans using the Ministry of Federal Affairs and Local Development (MoFALD) framework of environment friendly local governance planning (EFLGP).

The Hariyo Ban team unpacked these recommendations and formulated specific activities that were implemented in the final year of the Program. (While the evaluation was not done earlier due to circumstances at the time, it would have been helpful if it could have been held towards the end of the third year so that recommendations could have been implemented sooner.) A quick stocktaking at the end of the fifth year (Annex 16) showed that a good degree of progress was made across all four recommendations. The recommendations continue to be applied in Hariyo Ban II.

Coniferous forest with Machhapuchhre and the Annapurna range in the background, from Deurali in the Annapurna Conservation Area
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CONCLUSIONS

In over five years of interventions the Hariyo Ban Program made great strides towards reducing threats to biodiversity and climate change vulnerability of both human and ecological communities. The Program did so by improving understanding, building capacity, piloting and testing innovative strategies and approaches, replicating and scaling up of proven technologies and tactics, and expanding impacts with adaptive management to address challenges faced, and using opportunities when they arose.

Challenges and Obstacles

Natural disasters: the earthquake of 2015 and Terai floods of 2014 disrupted Program implementation. After the earthquake, Hariyo Ban cancelled several planned activities and realigned funding for earthquake recovery. Capacity of many partner communities and institutions was affected, and government priorities changed. The vulnerability of Nepal to natural and climate-induced hazards remains a challenge to the Program, despite work to build resilience and reduce disaster risk.

Political instability: the border blockades, fuel crisis, and repetitive strikes, bandhs and agitations were a major challenge for timely, effective and efficient program delivery.

Absence of locally elected representatives: the lack of locally elected representatives in VDCs and municipalities made it difficult to institutionalize program interventions such as CAPAs, and may affect the scaling up and sustainability of some program achievements.

Federalism: the division of the country into states with devolved authority will bring challenges for the sustainability of Program achievements and the momentum for biodiversity conservation and climate change resilience building, with costs to the environment as each state pushes for development.

Delays in policy formulation and implementation: policy delays remain a challenge. In particular, the REDD+ Strategy, which Hariyo Ban supported in its early years, still had not been approved by the government at the end of 2016, delaying many activities in the Sustainable Landscapes component. GESI integration, especially in protected areas and buffer zones, and implementation of GESI and governance provisions at community level, have been slow.

Delays in CFOP renewal: it was a major hold-up in the community forest work, and Hariyo Ban had to reduce the original target. The Program arranged with the Multi-Stakeholder Forestry Project (MSFP) to take up CFOP renewal work after facing challenges in getting them renewed. Now that MSFP is closed, the burden will fall back on Hariyo Ban again.

Staff turnover: staff turnover among the consortium partners, and frequent transfers in partner government agencies resulted in loss of institutional memory, gaps in coordination, and delays and additional costs, including recruitment and training for staff and LRPs, as well as partnership re-establishment and capacity building with government officials.

Limited capacity at local level: limited human resources and organizational capacity at local level hindered effectiveness of program implementation and were a strain on building stronger partnerships. The Program built capacity in priority thematic areas, provided institutional support, and included

LRPs and partner organizations in participatory planning, implementation, monitoring and evaluation to alleviate this gap.

Underutilization of LRPs: underutilization of trained LRPs outside the CFUGs and Program activities, particularly due to lack of recognition by government agencies, limited their effectiveness. This included use of LRPs in CFOP renewal. Hariyo Ban tried to address this problem by arranging for accreditation of LRPs by CTEVT to increase the likelihood of piloted interventions, strategies and approaches being sustainable.

Human-wildlife conflict: HWC has been increasing, particularly in community and collaborative forests as wildlife populations grow through conservation efforts. Conflict is also likely to intensify as climate change advances, and infrastructure and other development disturbs habitats and animal movements. HWC strongly affects community attitudes to conservation. The scale of HWC in the two landscapes was beyond the scope of the Program to address comprehensively in the field, though the new national HWC management fund should help.

Reluctance in some quarters to plan ahead for climate change: while existing climate impacts affecting local communities are readily recognized and people are willing to tackle vulnerability to current hazards, it is more difficult to encourage some groups of people to plan for future changes, even with 'no-regrets' strategies that can take into account different climate scenarios. Given the major changes that are inevitable we should no longer be managing forests and biodiversity for how they used to be, but for how they are likely to change in the future. We also need to consider changes in ways that people will use ecosystems because of climate change. The climate-smarting of the MCA management plan is a great start for this; much more is needed.

Balance between top-down and bottom-up when working in large landscapes: many partners expressed concern that the first-year work plan was not participatory, so the Program made efforts to ensure the second one was. However, this resulted in field-level interventions being geographically scattered and individually small, which limited effectiveness. This was a key finding of the mid-term evaluation (ECODIT 2015), which the Program tried to address strategically with more intensive, packaged support to a smaller number of areas, and scaling up mechanisms (Annex 16).

High expectations: expectations of both communities and government were way beyond the scope and capacities of the Program both within and outside the two landscapes. Many demands for livelihood development and small-scale infrastructure could not be met due to limited resources. Now that the Multi-Stakeholder Forestry Project has closed and Hariyo Ban is the only remaining large donor-funded forestry project in Nepal, this pressure is growing again.

Starting field activities before assessments were done: pressure for early results, and the need to engage field staff, meant that field level activities had to be started before the Program had a good overview of CHAL. While the Program tried to select no-regrets locations and activities, it meant that they were grandfathered in for several years. Ideally assessments should have been completed beforehand to ensure the Program's resources were directed to the most effective levels and priority geographical areas.

Working as a consortium: four NGO partners came together to form the Hariyo Ban consortium, some of whom had not worked together previously. Each had different missions and approaches, and it took a while to build mutual trust and understanding, and identify how to work together productively. Five years later, all have benefited from the relationship though there have been transaction costs (WWF Nepal 2016o).

Challenge to complete Hariyo Ban I on time: the blockades, the fact that Hariyo Ban received both additional biodiversity funds and new earthquake recovery funds towards the end of the first phase, the earlier than expected start of Hariyo Ban II, and turning down of a requested three-month no-cost extension, meant that some final activities of Hariyo Ban I were rushed or had to be dropped, and there was slight under-spending. Programmatically this particularly affected the earthquake recovery work and final learning analysis and documentation.

Construction of buildings: donor restrictions meant that community buildings such as emergency shelters could not be constructed; this affected the program's work in disaster response after the Terai floods and Gorkha earthquake.

Donor approval processes: In some cases, time-consuming donor approval processes delayed work, such as the small-scale infrastructure work, and non-consortium partner subawards in the first year.

While there are many challenges and uncertainties ahead, Nepal has strong capacity to adapt to change.
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Gaps

The following activities were not accomplished as planned; some of them will be taken up in Hariyo Ban II:

REDD+ related interventions: not as much progress as planned due to delays in endorsement of the National REDD+ Strategy.

Annapurna Conservation Area: ACA was not handed over to local communities because a government decision was made to delay the process; Hariyo Ban supported community capacity building towards it.

Infrastructure: we did not make as much progress in promoting environmentally sound infrastructure development as we had hoped, because the earthquake diverted attention and resources from it. Hopefully this will be achieved in Phase II.

Generation Green: Hariyo Ban did not support the Generation Green movement; WWF used its own funds for this, and Hariyo Ban supported youth involvement in other ways (e.g. ecoclubs, CBAPUs).

Early warning systems: Hariyo Ban could not complete the work around establishing early warning systems that focused on landslide induced flash-floods (considering post-earthquake scenario in hill districts) due to limited expertise available in the country as well as time constraints.

Seed and agriculture tool distribution: this distribution to earthquake affected families was dropped on the advice of DDRCs, because it was already covered by others.

Timber treatment: demonstration and orientation on seasoning and preservation of timber for construction of new houses in earthquake affected areas with Hariyo Ban funding was dropped due to time and capacity limitations, but Hariyo Ban supported WWF to do this with other funds.

Land use planning: Hariyo Ban had intended to provide support for the implementation of land use plans, but this did not move beyond endorsement of the land use policy, due to the absence of a policy framework. Many adverse impacts on forests, environment, agriculture land, and water resources are due to a lack of proper land use planning.

Wildlife disease surveillance: Hariyo Ban could not complete follow up work on wildlife disease surveillance and capacity building after the conference due to other priorities.

Mechanism for long-term climate monitoring: The work to develop a sustainable mechanism for monitoring forest biodiversity and capacity building for freshwater monitoring did not go as far as planned; it will be continued in Phase II.

Green corridor support: establishment of a demonstration site for solid waste management between Shivapuri and Langtang could not be established in Trishuli sub-basin due to changing priorities with the earthquake.

Sarus crane habitat restoration: this work in Lumbini could not be accomplished.

Work with elected local body representatives: Engagement with newly elected local body representatives (DDC/VDC) was dropped because the election was delayed beyond the Hariyo Ban I timeframe.

Opportunities and Proposed Next Steps

Continuing support for green recovery and reconstruction: GRR needs to be taken to the next phase now that a large amount of capacity and awareness have been built in many different sectors for environmentally sound earthquake reconstruction; since this is not included in Hariyo Ban II there is a big opportunity for WWF Nepal or another organization to carry this forward (WWF Nepal 2016k).

Integration and mainstreaming of climate adaptation and disaster risk reduction: This could help remove conflicting policy provisions, duplication of interventions and ensure sustainability of achievements with promotion of a more holistic approach and provisioning of opportunities for partnerships with a wider range of stakeholders and organizations for synergetic effect.

Increased application of climate science and technology: Phase II should increase the application of climate science and disaster risk reduction technology in adaptation and climate-induced disaster reduction/management work.

Climate-smarting silvicultural practices: This presents a large opportunity, given the vulnerability of Nepal's forests to climate change. No-regrets strategies could include, for example, shorter rotations, increased diversification, and careful selection of species for planting in specific locations, taking advantage of Nepal's varied topography and altitude, with monitoring for climate impacts (Thapa et al. 2016; WWF Nepal 2016j).

Continuing and replicating PES work: The PES work can be further expanded in the two basins, and replicated in similar contexts. Pursuing simpler projects in the future would likely give quicker results.

Continuing development of REDD+ subnational level projects: Preparation of the REDD+ subnational project in Terai is continuing with the preparation of the ERPD, with funding from the World Bank. Another REDD+ subnational project should be pursued in CHAL, building on the forest carbon baseline and the awareness that has been built in communities and other stakeholders about REDD+. This is not supported under Phase II of Hariyo Ban, and is an opportunity for others.

River basin approach: The river basin approach promotes a holistic and long-term strategy for conservation and resilience building that has been institutionalized through the CHAL Strategy as well as ISWMPs. It should be promoted at different scales in Hariyo Ban II and beyond, and considered as the new federal structure is introduced, promoting collaboration on management of shared resources and ecosystem services across provincial and local jurisdictional boundaries. It should be employed as Hariyo Ban II works to promote environmentally sound practices in infrastructure development, including basin-wide hydropower development that ensures environmental flows.

Working across the range of different forest management regimes: There are good opportunities to sharing best practices from each type of community forest management regime with the others (community forests, buffer zones, conservation areas, leasehold forests and collaborative forests), and learn from each other about successful approaches, as well challenges and lessons. Where adjacent forest regime types are affected by the same issues across neighboring boundaries, there are opportunities to work together to tackle them (e.g. climate hazards, invasive plant species, HWC, encroachment, forest fires, illegal poaching and extraction, environmentally insensitive infrastructure development, and upstream-downstream impacts). Currently, they tackle these hazards, threats and drivers on an individual basis based on their plans, but there is much scope for joint action. Ideally

policy changes should be made that facilitate formal collaboration (e.g. resource pooling, joint planning, and joint patrolling and joint advocacy).

Collaboration with stakeholders: Collaboration between CSOs, NGOs, government line agencies and other development projects needs to be further strengthened through engagement in participatory planning and review-reflections, involvement in joint monitoring mechanisms, building capacities in governance and GESI issues, and resource leveraging.

Institutionalization of governance interventions: Governance interventions in NRM groups need to be further supported and continued to strengthen CFUG abilities to govern themselves and advocate for stronger policies to help protect forests and protected areas. Likewise, institutionalization strategies, approaches and practices piloted by the Program are necessary to assure their sustainability as well as the achievements with increased ownership and stewardship.

Expertise of consortium partners: The consortium has tremendous expertise in the thematic components and approaches, and these can be further leveraged with promotion of cross learning. The experiences from the Hariyo Ban Program provides a platform for further interventions to build upon on the achievements of the Program, the lessons learned and the partnerships established. This should focus on greater integration of the different themes, with bundling of strategies and activities for more effective impacts. In addition, the trained manpower and groups established by the Program, including LRPs, CBAPUs, women change agents, citizen scientists, and CLACs exists as valuable resources in the local communities that can be capitalized upon.

Alignment with GoN priorities and processes: Alignment of further interventions with GoN priorities and processes, and strengthening mechanisms for transmission of decisions and information to and from central, regional, and district level, would facilitate better coordination and build government ownership and incentivize actions supportive of program interests.

A local woman walks through the community forest to collect forest products. Hariyo Ban is proud to have collaborated with very many stakeholders at different levels in the quest to ensure natural resources and ecosystem services for local livelihoods and security, as well as promoting green post-disaster recovery and sound economic development in the face of climate change.
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REFERENCES

CARE Nepal. 2013a. Internal Governance Tool 2: Participatory Well-Being Ranking. CARE Nepal, Hariyo Ban Program, Lalitpur, Nepal.

CARE Nepal. 2013b. Internal Governance Tool 3: Participatory Governance Assessment. CARE Nepal, Hariyo Ban Program, Lalitpur, Nepal.

CARE Nepal. 2013c. Internal Governance Tool 1: Public Hearing and Public Auditing. CARE Nepal, Hariyo Ban Program, Lalitpur, Nepal.

CARE Nepal, 2014. Vulnerability Assessment and Adaptation Planning: Training of Trainers Manual. CARE Nepal, Hariyo Ban Program, Kathmandu, Nepal.

CARE Nepal, 2016a. Documentation of Payment for Ecosystem Services Initiatives in Lamjung District, Hariyo Ban Program, Nepal. CARE Nepal, Hariyo Ban Program, Kathmandu, Nepal.

CARE Nepal. 2016b. Assessing Indicators and Status of Vulnerability Reduction through Climate Change Adaptation Interventions in the Hariyo Ban Program. CARE Nepal, Hariyo Ban Program, Kathmandu, Nepal.

CARE Nepal 2016c. Assessment and Documentation of Sites towards the Improvement of Biophysical Conditions through Climate Change Adaptation Interventions under Hariyo Ban Program. CARE Nepal, Hariyo Ban Program, Kathmandu, Nepal.

CARE Nepal 2016d. Climate Adaptation Plan Health Check-up Tool. CARE Nepal, Hariyo Ban Program, Kathmandu, Nepal.

CARE Nepal 2016e. Integrating Disaster Risk Reduction and Climate Change Adaptation: Lessons from the Hariyo Ban Program, Nepal. CARE Nepal, Hariyo Ban Program, Kathmandu, Nepal.

CARE Nepal 2016f. Mainstreaming Climate Adaptation in Local Development Planning: A Reflection from the Hariyo Ban Program, Nepal. CARE Nepal, Hariyo Ban Program, Kathmandu, Nepal.

Central Bureau of Statistics. 2011. National Population and Housing Census (National Report). National Planning Commission Secretariat, Government of Nepal, Kathmandu, Nepal.

Department of Forest Research and Survey. 2015. State of Nepal's Forests. Forest Resource Assessment (FRA) Nepal, Department of Forest Research and Survey (DFRS). Kathmandu, Nepal.

Dhakal M., Karki (Thapa) M., Jnawali S.R., Subedi N., Pradhan N.M.B., Malla S., Lamichhane B.R., Pokheral, C.P., Thapa G.J., Oglethorpe J., Subba S.A., Bajracharya P.R. and Yadav H. 2014. Status of Tigers and Prey in Nepal. Department of National Parks and Wildlife Conservation, Kathmandu, Nepal.

ECODIT. 2015. Evaluation: Mid-term Performance Evaluation of the Hariyo Ban Project. ECODIT, Arlington, Virginia, USA.

Gaydos J.K., Bunn D., Mazet J. and Dhakal I.P. 2014. Assessing Wildlife Health Capacity Needs in Nepal. Unpublished report, Wildlife Health Center, School of Veterinary Medicine, Davis, CA, USA, and Faculty of Animal Science, Veterinary Science and Fisheries, Agricultural and Forestry University, Chitwan, Nepal.

Hansen L.J., Biringer J.L. and Hoffman J.R. 2003. Buying Time: A User's Manual for Building Resistance and Resilience to Climate Change in Natural Systems. WWF, Berlin, Germany.

Ministry of Environment. 2010. National Adaptation Programme of Action to Climate Change. Kathmandu, Nepal.

Ministry of Forests and Soil Conservation. 2004. Terai Arc Landscape Nepal: Strategic Plan 2004-2014 – Broad Strategy Document. Ministry of Forests and Soil Conservation, Kathmandu, Nepal.

Ministry of Forests and Soil Conservation. 2014a. Nepal Biodiversity Strategy and Action Plan 2014-2020. Ministry of Forests and Soil Conservation, Kathmandu, Nepal.

Ministry of Forests and Soil Conservation. 2014b. Emission Reductions Program Idea Note (ER-PIN): People and Forests – an SMF-Based Emission Reduction Program in Nepal's Terai Arc Landscape. Ministry of Forests and Soil Conservation, Kathmandu, Nepal.

Ministry of Forests and Soil Conservation. 2015a. Strategy and Action Plan 2016-2025, Chitwan-Annapurna Landscape, Nepal. Ministry of Forests and Soil Conservation, Kathmandu, Nepal.

Ministry of Forests and Soil Conservation 2015b. Strategy and Action Plan 2015-2025, Terai Arc Landscape, Nepal. Ministry of Forests and Soil Conservation, Kathmandu, Nepal.

Ministry of Science, Technology and Environment. 2015. Nepal Earthquake: Rapid Environmental Assessment. Ministry of Science, Technology and Environment, Kathmandu, Nepal.

National Planning Commission. 2015. Nepal Earthquake 2015: Post Disaster Needs Assessment. National Planning Commission. Kathmandu, Nepal.

NTNC. 2014. Profiles of the Greater One-horned Rhinoceros of Bardia National Park and Shuklaphanta Wildlife Reserve. NTNC, Hariyo Ban Program. NTNC, Lalitpur, Nepal.

NTNC. 2015. Technical Report on National Rhino Count 2015. NTNC, Lalitpur, Nepal.

Roe, D., Booker, F., Day, M., Zhou, W., Allebone-Webb, S., Hill, N., Kumpel, N., Petrofsky, G., Redford, K., Russell, D., Shepherd, G., Wright, J., Sunderland, T. 2015. Are alternative livelihood projects effective at reducing local threats to specified elements of biodiversity and/or improving or maintaining the conservation status of those elements? **Environmental Evidence** 4:22.

Thapa G.J., Wikramanayake E., Jnawali S.R., Oglethorpe J. and Adhikari R. (2016). Assessing climate change impacts on forest ecosystems for landscape-scale spatial planning in Nepal. **Current Science** 110 (3): 345-352.

United Nations Development Program. 2016. Human Development Report 2016: Human Development for Everyone. United Nations Development Program, New York, USA.

USAID. 2015. Integrating Biodiversity and Climate Change Adaptation in Activity Design. USAID, Washington, DC, USA.

USAID. In press. Planning for Long Term Impact in the Hariyo Ban Programme. USAID Nepal, Kathmandu, Nepal.

WWF and American Red Cross. (2010). Green Recovery and Reconstruction Toolkit for Humanitarian Aid. WWF US and American Red Cross, Washington DC, USA.

WWF Nepal. 2000. Biodiversity Assessment and Conservation Planning: Chitwan-Annapurna Linkage. WWF Nepal, Kathmandu, Nepal.

WWF Nepal. 2013a. Chitwan-Annapurna Landscape: A Rapid Assessment. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal 2013b. Chitwan-Annapurna Landscape: Biodiversity Important Areas and Linkages. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2013c. Chitwan-Annapurna Landscape: Drivers of Deforestation and Forest Degradation. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2013d. Training Needs Assessment and Training Strategy. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

2014. Beyond Investment: Developing sustainable green infrastructure in Nepal. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2015a. The value of a river basin approach in climate adaptation. Paper presented at International Conference on Climate Change Innovation and Resilience for Sustainable Livelihoods, Kathmandu, Nepal, January 2015.WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2015b. Broom Grass: Rehabilitation of Forests Degraded by Shifting Cultivation/Slash and Burn Agriculture. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2016a. Chitwan-Annapurna Landscape: Climate Vulnerability Assessment and Recommendations for Adaptation Interventions. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2016b. Knowledge Documentation of Climate Change Adaptation Interventions. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2016c. Realigning Priorities: Climate Vulnerability Assessment, Terai Arc Landscape. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2016d. Swamp Deer: Switching Grounds. (video). WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2016e. Champ Plantation Assessment in the Chitwan-Annapurna Landscape Area. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal 2016f. Effectiveness of Hariyo Ban Program in Addressing Threats to Biodiversity and Drivers of Deforestation and Forest Degradation. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2016g. Effectiveness of Power Fencing in Reducing Human Wildlife Conflict. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal 2016h. Forest Carbon Assessment in Chitwan-Annapurna Landscape. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2016i. Knowledge Documentation on Impacts of Biogas on Forests and Socio-Economic Development of Local Communities in the Terai Arc and Chitwan Annapurna Landscapes. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2016j. Selecting Tree Species for Climate Change-Integrated Forest Restoration and Management. WWF Nepal/Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2016k. Building Back Safer and Greener: A Guide to Sound Environmental Practices for Disaster Recovery in Nepal. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2016l. Rapid Evaluation of Hariyo Ban Program's Earthquake Recovery Work. WWF Nepal/Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2016m. Livelihood and Governance Outcome Monitoring. WWF Nepal, Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2016n. Evaluation of Windows of Opportunity Project, Hariyo Ban Program. WWF Nepal/Hariyo Ban Program, Kathmandu, Nepal.

WWF Nepal. 2016o. Assessing the Effectiveness of the Hariyo Ban Program Consortium. WWF Nepal, Kathmandu, Nepal.

Xu J., Eriksson M., Vaidya R., Shrestha A., and Hewitt K. 2007. The Melting Himalayas: Regional Challenges and Local Impacts of Climate Change on Mountain Ecosystems and Livelihoods. International Centre for Integrated Mountain Development, Kathmandu, Nepal.

ANNEX 1: BENEFICIARIES AND STAKEHOLDERS

Local communities:

- Poor, vulnerable and socially excluded (PVSE) men and women associated with the community learning and action centers (CLACs)
- Poor community forest users identified through the Participatory Well-Being Ranking (PWBR)
- Members of community based anti-poaching units (CBAPUs), women's groups, farmer's groups, eco clubs, youth clubs
- Executive committee members and general members of natural resource management groups: community forest user groups (CFUGs), buffer zone community forest user groups (BZCFUGs), buffer zone user committees (BZUCs), conservation area management committees (CAMCs), community forest coordination committees (CFCCs), leasehold forest user groups (LHFUGs), collaborative forest user groups, etc.
- Executives and members of various cooperatives
- Local resource persons (LRPs), citizen scientists
- Earthquake affected communities

Civil society organizations:

- FECOFUN district chapters
- Local non-government organizations including implementing partners
- Resource Partners:
  - Alternative Energy Promotion Center
  - Asia Network for Sustainable Agriculture and Bioresources
  - Bird Conservation Nepal
  - Biogas Sector Partnership-Nepal
  - Clean Energy Nepal
  - Centre for Molecular Dynamics – Nepal
  - Community-based Forestry Supporters' Network, Nepal
  - Centre For Rural Technology, Nepal
  - Dalit Alliance For Natural Resources (DANAR)
  - Himalayan Grassroots Women's Natural Resource Management Association Nepal
  - International Development Enterprises
  - International Institute for Environment and Development
  - Institute of Forestry, Pokhara (IOF)
  - Mercy Corps
  - Nepal Forum of Environmental Journalists
  - Nepal Federation of Indigenous Nationalities
  - Nepal Foresters Association
  - Resource Identification and Management Society Nepal
  - Rupantaran Nepal
  - School Environment Conservation Education Network-Nepal

Universities and colleges:

- Tribhuvan University (TU)
- Kathmandu University
- Mid-Western University
- Institute of Forestry
- Himalayan College of Agricultural Sciences and Technology

- International School for Advanced Studies
- Agriculture and Forestry University
- Various foreign universities and schools

Research Institutions:

- Nepal Agricultural Research Council
- Nepal Academy of Science and Technology

Private sector organizations and media:

- Hotel Association Nepal
- Paschimanchal Hotel Association, Pokhara
- Various media institutions from radio, television, print to electronic

Government of Nepal:

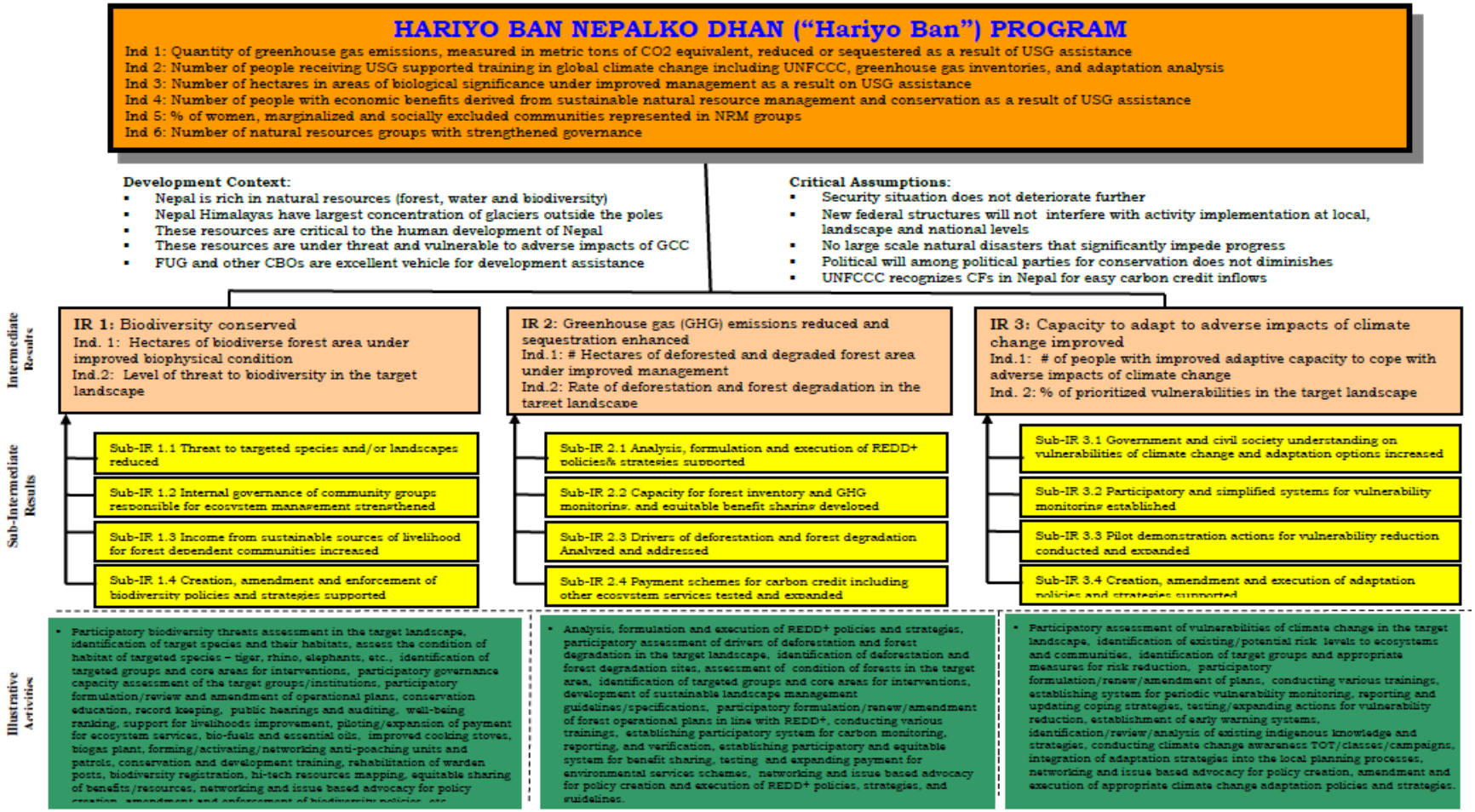
- Ministry of Forests and Soil Conservation
- Ministry of Population and Environment
- Ministry of Federal Affairs and Local Development
- Ministry of Land Reform and Management
- Ministry of Urban Development
- Ministry of Agricultural Development
- Department of Forests
- Department of National Parks and Wildlife Conservation
- Department of Soil Conservation and Watershed Management
- Department of Forest Research and Survey
- Department of Plant Resources
- Department of Urban Development and Building Construction
- Regional Forestry Directorates: Central, Western, Mid-Western and Far-Western
- Regional Training Centers: Central, Western, Mid-Western and Far-Western
- District Forest Offices
- District Soil Conservation Offices
- Protected Areas: Annapurna Conservation Area, Manaslu Conservation Area, Chitwan National Park, Bardia National Park, Banke National Park, Langtang National Park (LNP), Parsa Wildlife Reserve, Suklaphanta Wildlife Reserve, Blackbuck Conservation Area
- District Agriculture Development Offices
- District Livestock Service Offices (DLSO)
- District Disaster Relief Committees in Gorkha, Dhading, Rasuwa and Nuwakot
- District Development Committees
- Village Development Committees

National and regional programs and projects:

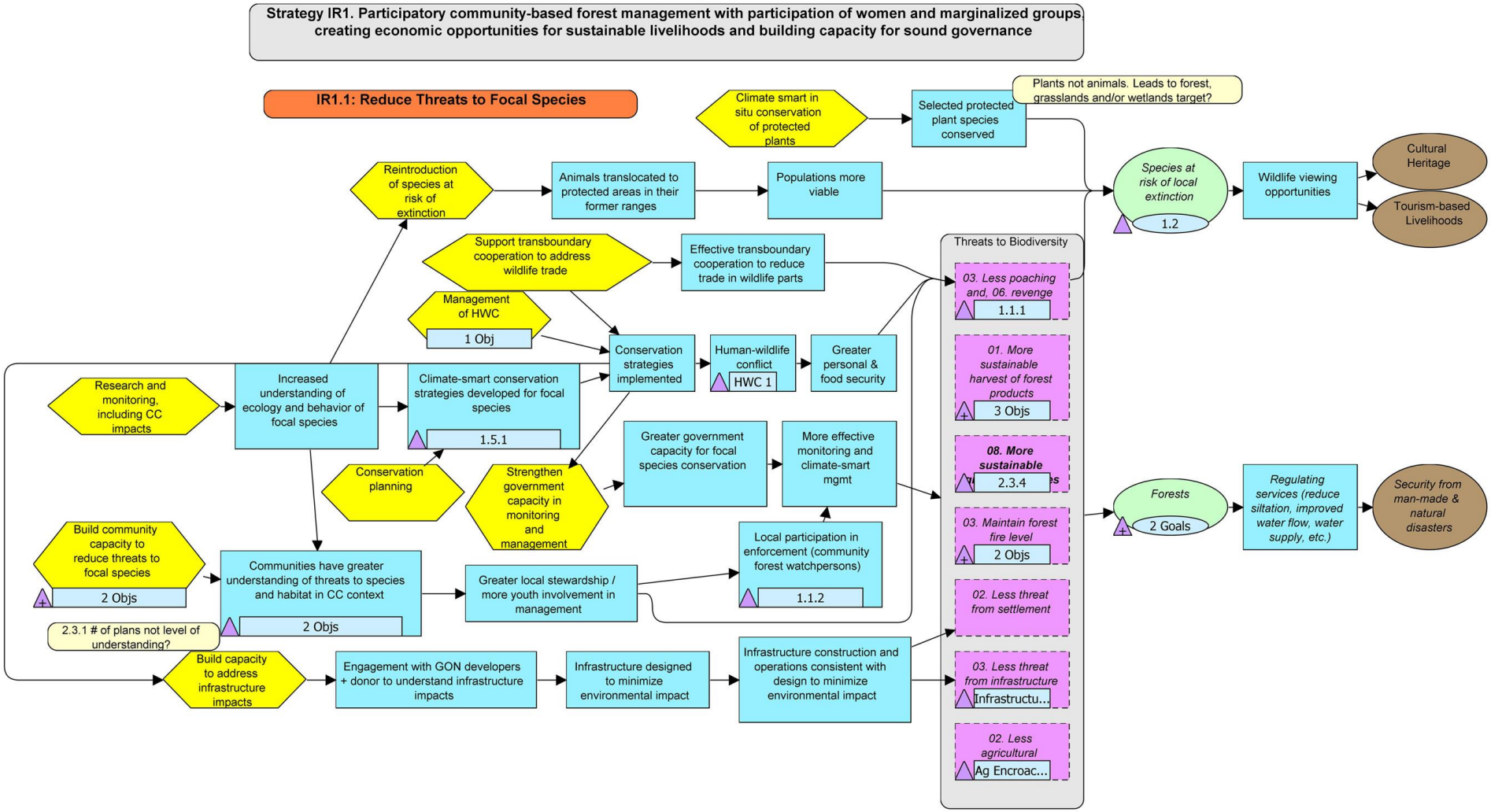
- Multi Stakeholder Forestry Project (MSFP)
- Forest Carbon Partnership Facility
- Forest Resource Assessment (FRA)
- Nepal Climate Change Support Project
- Initiative for Climate Change Adaptation

Annex 2: RESULTS FRAMEWORK AND RESULTS CHAINS

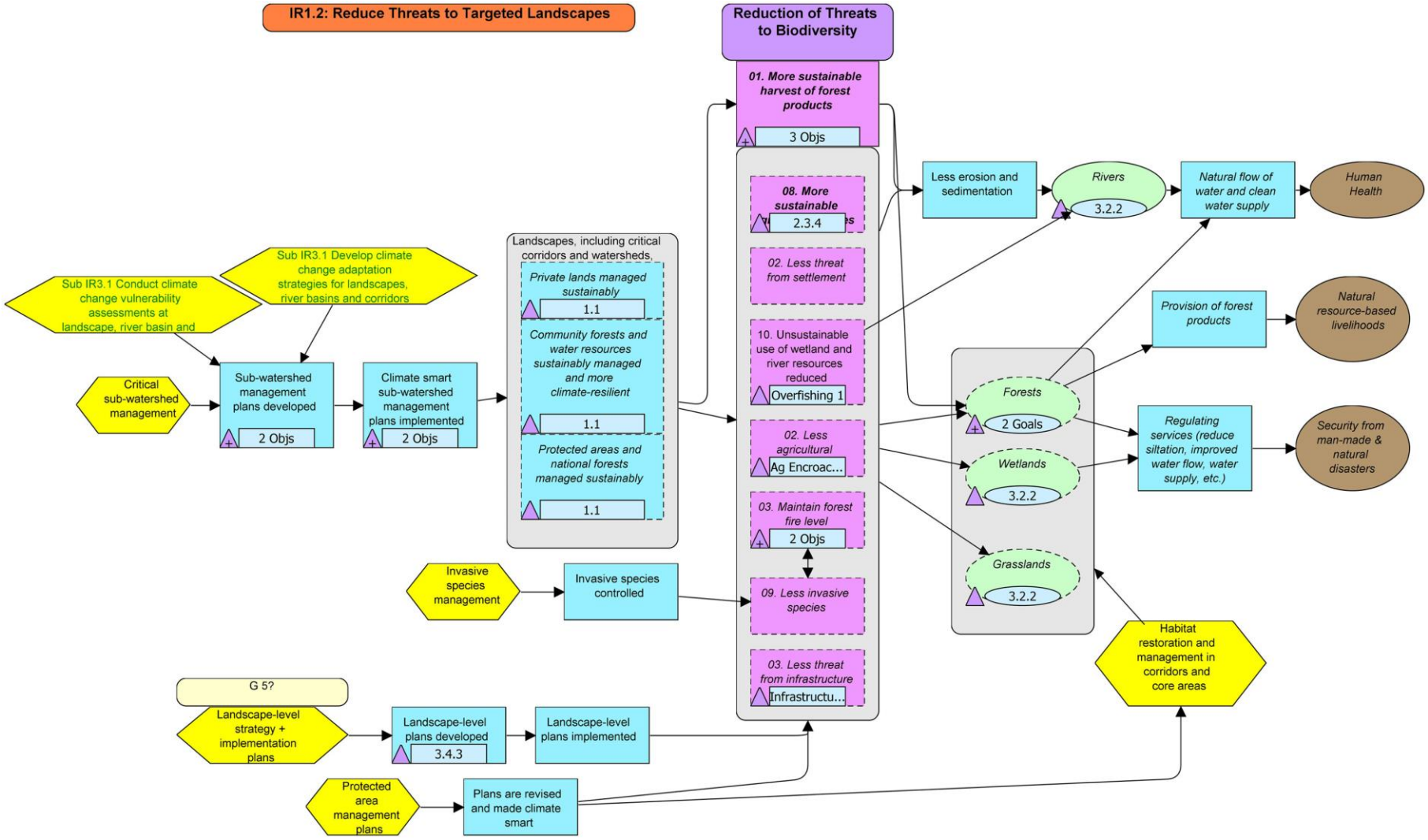
Annex 2.1: Results Framework



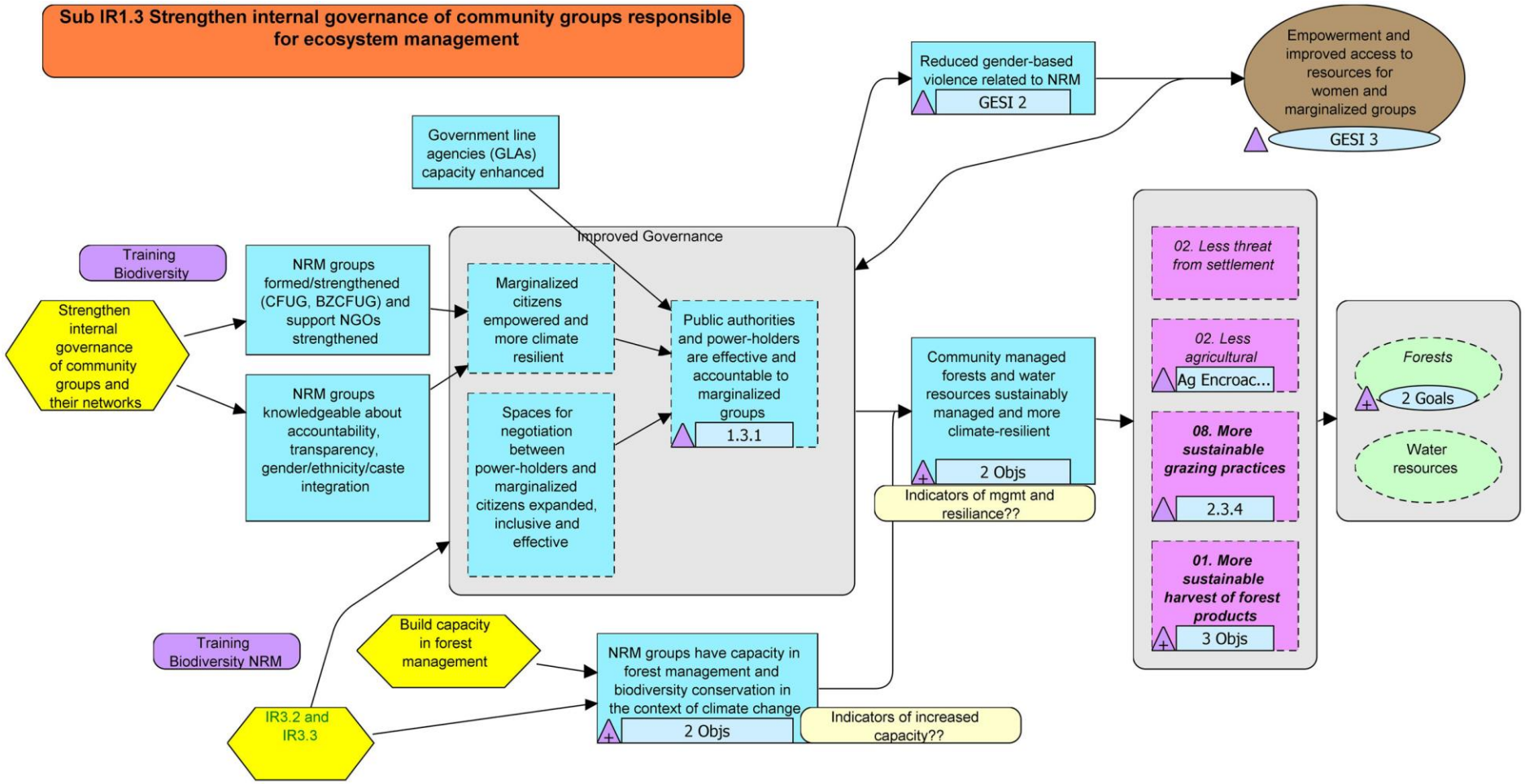
Annex 2.2: Results Chain for Biodiversity Conservation Sub-IR 1.1



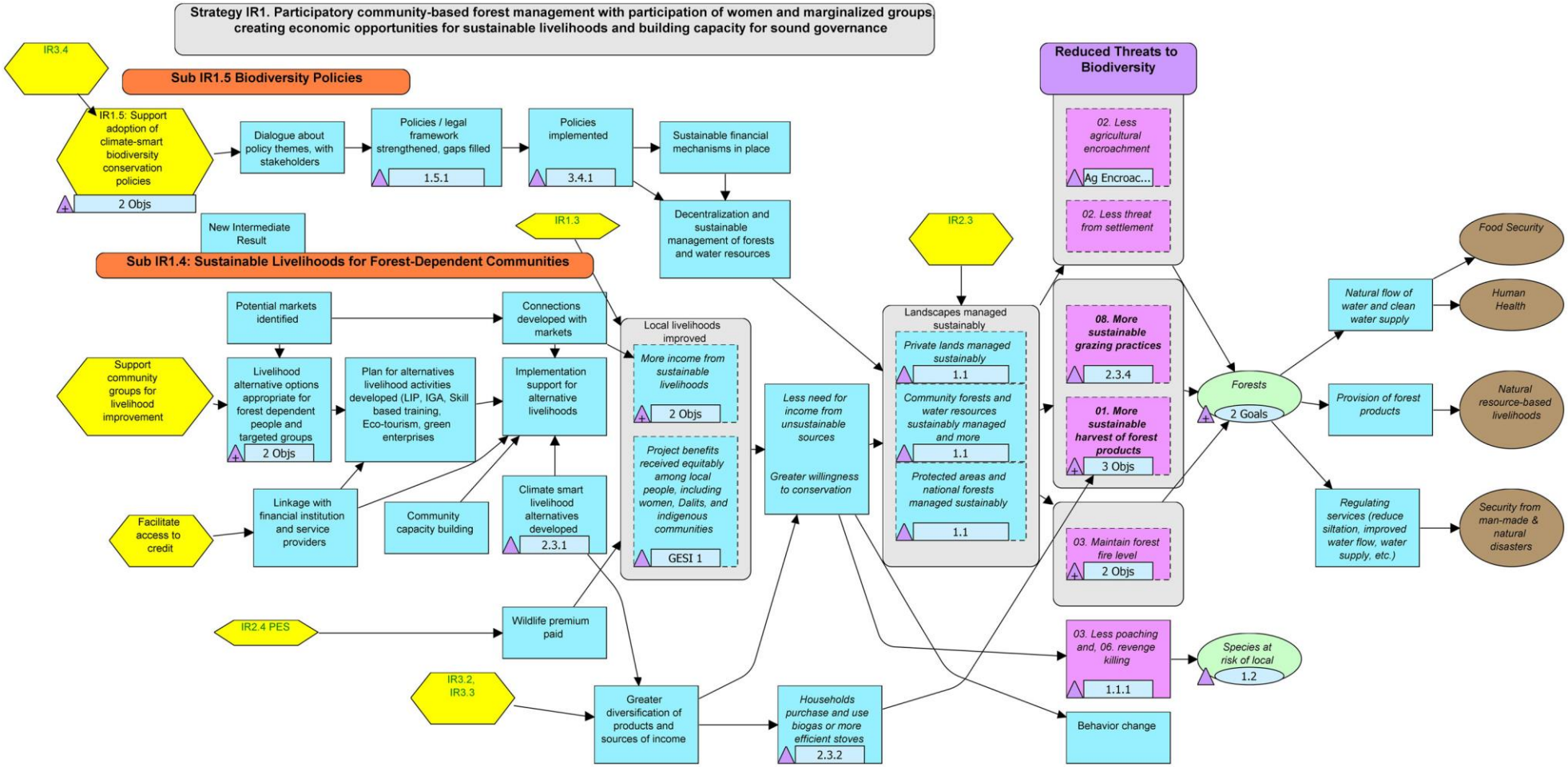
Annex 2.2: Results Chain for Biodiversity Conservation Sub-IR 1.2



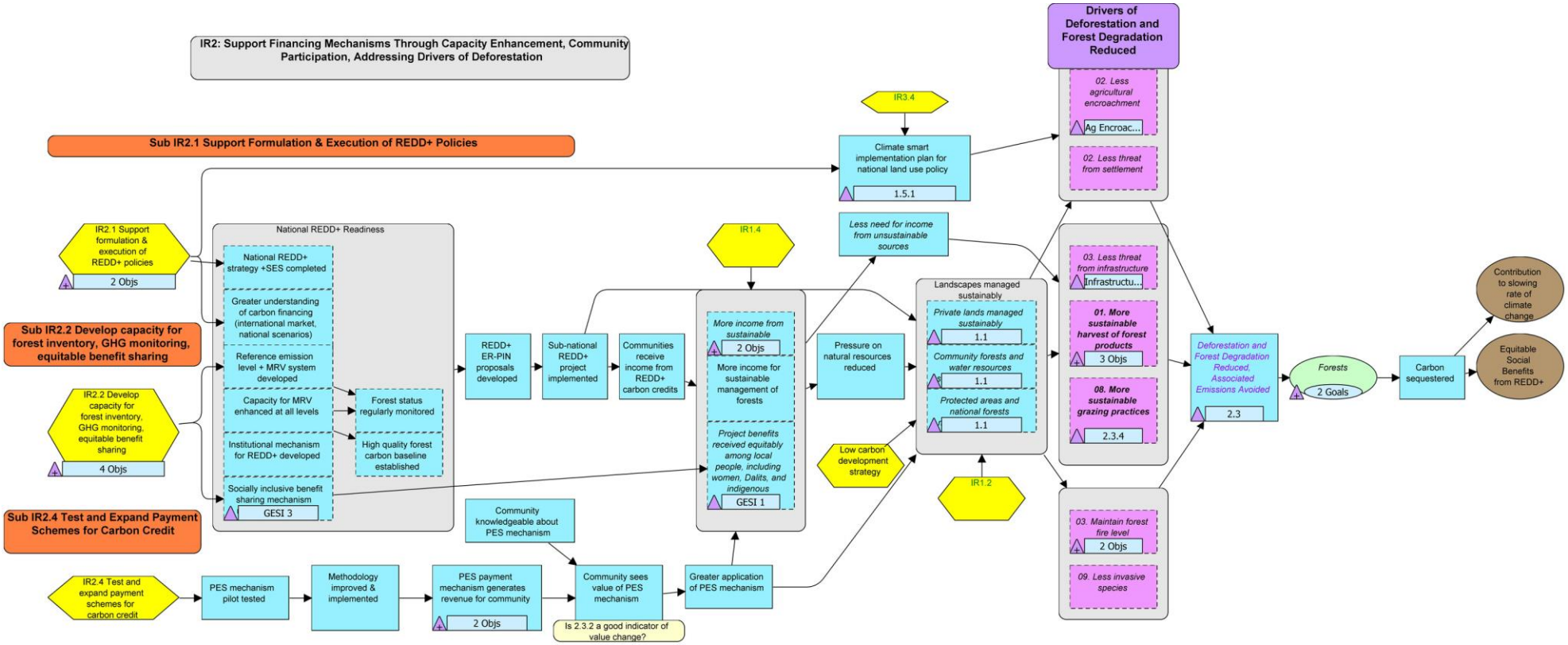
Annex 2.3: Results Chain for Biodiversity Conservation Sub-IR 1.3



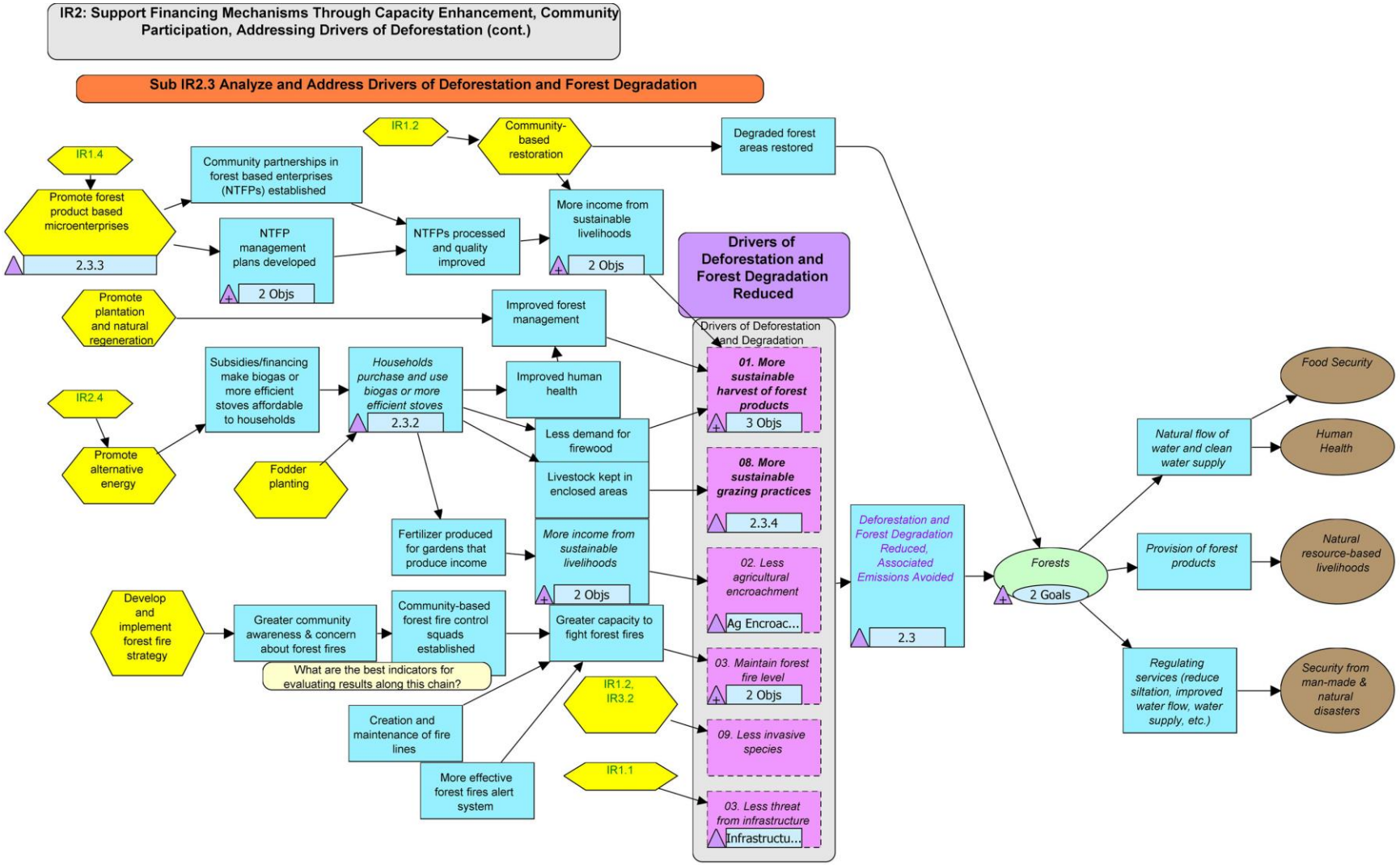
Annex 2.4: Results Chains for Biodiversity Conservation Sub-IRs 1.4 and 1.5



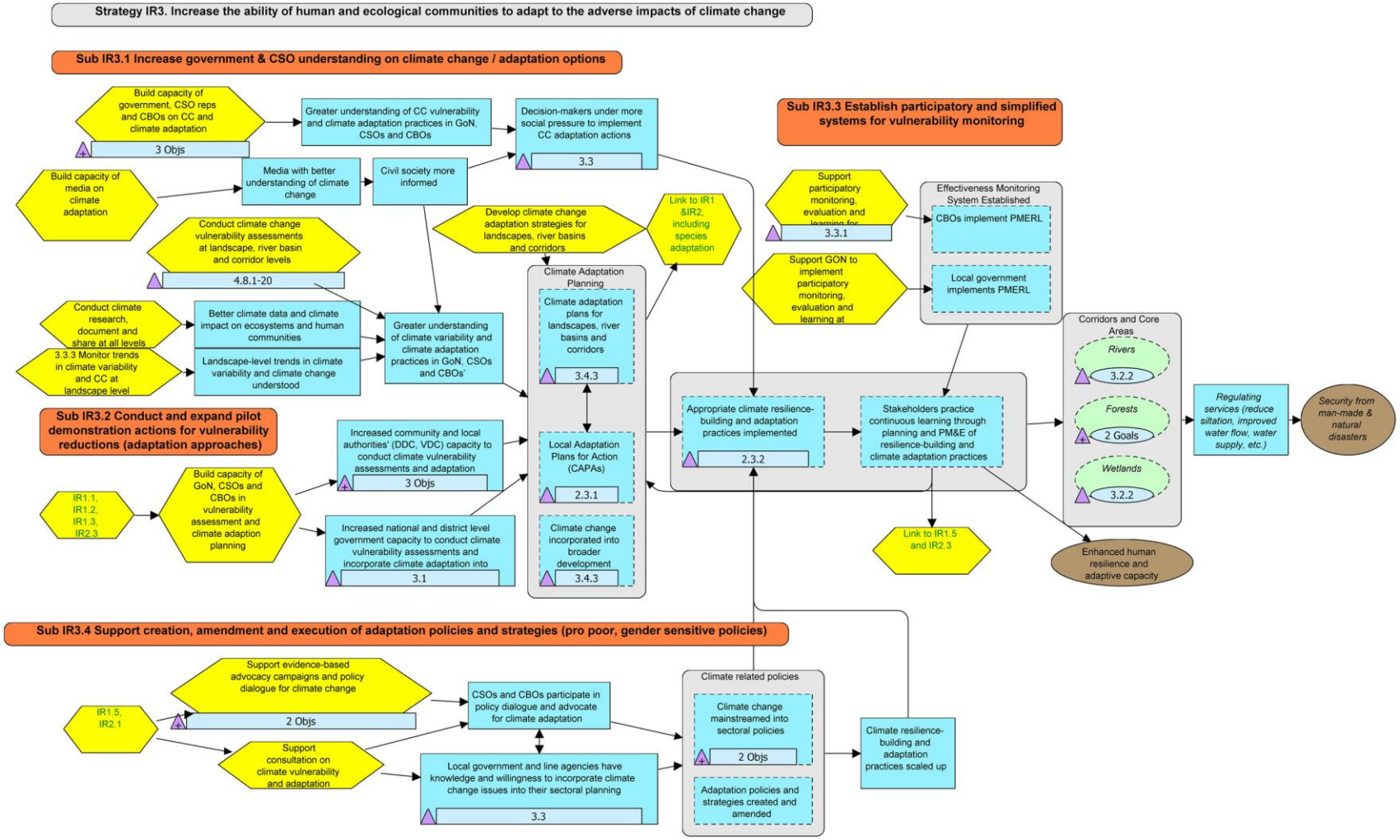
Annex 2.5: Results Chain for Sustainable Landscape Sub-IRs 2.1, 2.2 and 2.4



Annex 2.6: Results Chain for Sustainable Landscape Sub-IR 2.3



Annex 2.6: Results Chains for Climate Change Adaptation



ANNEX 3: POLICIES, STRATEGIES, DIRECTIVES AND GUIDELINES SUPPORTED

The following policy documents were supported by Hariyo Ban I[6]:

Endorsed by Government:

- Amendment of Forest 1993 Act and Forest Regulation, 1995
- Emission Reductions Program Idea Note: People and Forests – an SMF-Based Emission Reduction Program in Nepal's Terai Arc Landscape, 2014
- Forest Policy, 2014
- Forestry Sector Strategy, 2016
- Guidelines for Developing Type Designs for School Buildings in Nepal, 2016
- National Biodiversity Strategy and Action Plan (NBSAP), 2014
- Nepal Earthquake 2015: Post Disaster Recovery Framework 2016-2020, 2016
- Nepal Strategy and Action Plan 2016-2025, Chitwan-Annapurna Landscape, 2015
- Operational Guideline for National Relief Fund to Mitigate Human Wildlife Conflict, 2013
- Ramsar Information Sheet (RIS) for Bishazari Lake, 2013
- Ramsar Information Sheet for Jagdishpur Reservoir Ramsar, 2013
- Red Panda Field Survey and Protocol for Community Based Monitoring, 2016
- Site-specific Species Conservation Action Plan for Blackbuck in Shuklaphanta, 2016
- Strategy and Action Plan 2015-2025, Terai Arc Landscape, 2015
- Timber Production, Supply and Management Directive for Earthquake Affected People, 2016
- Vulture Conservation Action Plan (VCAP) 2015-2019, 2015

Not yet endorsed by Government:

- Community Forest Products Sale and Distribution Guideline, 2016
- Community Forestry Financial Directive
- Emission Reductions Project Document (in preparation) REDD Safeguards Information System
- Land Use Policy Implementation Plan
- National REDD+ Strategy
- National Invasive Species Management Strategy
- National Monitoring System for REDD+ Social and Environmental Standards
- National Payments for Ecosystem Services Policy
- Nepal Wildlife Health Management Strategy (in preparation)
- Pangolin Monitoring Protocol
- Pokhara Lake Cluster Management Plan
- REDD+ Benefit Sharing Mechanism Document
- Species Conservation Action Plans for Bijaya Sal
- Species Conservation Action Plans for Pangolin
- Tissue Culture Protocol for *Dendrobium* Species

[6] The titles of these policy documents have in many cases been translated from Nepali by Hariyo Ban staff and may not reflect official translations

ANNEX 4: PUBLICATIONS AND COMMUNICATION MATERIALS SUPPORTED BY HARIYO BAN

Type	Publication	Organization	Language	Printed	Year	Theme
Action Plans	Site Specific Action Plan for Blackbuck Reintroduction: Hirapurphanta, SWR	NTNC	Nepali	Yes	2016	Biodiversity Conservation
Assessments/ Studies	Chitwan-Annapurna Landscape: A Rapid Assessment	WWF	English	Yes	2013	General
	Chitwan-Annapurna Landscape: Biodiversity Important Areas and Linkages	WWF	English	Yes	2013	Biodiversity Conservation
	Chitwan-Annapurna Landscape: Drivers of Deforestation and Forest Degradation	WWF	English	Yes	2013	Sustainable Landscapes
	Preparing for Change: Climate Vulnerability Assessment of the Chitwan-Annapurna Landscape	WWF	English	No	2016	Biodiversity Conservation, Climate Change Adaptation
	Blue Sheep Monitoring in the Upper Kali Gandaki Valley	WWF	English	Yes	2013	Biodiversity Conservation
	Climate Change Impacts on the Biodiversity of the Terai Arc Landscape and the Chitwan-Annapurna Landscape	WWF	English	Yes	2015	Biodiversity Conservation, Climate Change Adaptation
	Champ Plantation Assessment in the Chitwan-Annapurna Landscape Area	WWF	English	No	2016	Biodiversity Conservation and Sustainable Landscapes
	A Study on Promoting Community Managed Ecosystem in TAL and CHAL	WWF	English	Yes	2013	Biodiversity Conservation
	First Record of Steppe Polecat *Mustela eversmanii* in Nepal	NTNC	English	Yes	2014	Biodiversity Conservation
	Status Survey of Biodiversity Conservation in Community Forests	WWF	English	No	2013	Biodiversity Conservation
	Ancient Himalayan Wolf (*Canis lupus chanco*) Lineage in Upper Mustang of the Annapurna Conservation Area, Nepal.	NTNC	English	Yes	2016	Biodiversity Conservation
	Forest Carbon Assessment in Chitwan-Annapurna Landscape	WWF	English	Yes	2016	Sustainable Landscapes
	A Baseline Study of the Hariyo Ban Program	WWF	English	Yes	2012	General
	Hariyo Ban Program: Training Needs Assessment and Training Strategy	WWF	English	Yes	2013	General
	Community-based Natural Resource Management Institutions in Nepal: Why the Future Needs Women	CARE	English	Yes	2016	GESI
	Identifying Barriers to Dalit and Janajati Women´s Successful Leadership in Community Based Forest Management in Nepal	CARE	English	Yes	2016	GESI
	Gender Assessment of Natural Resource Management Dynamics of Power Relations and Indigenous Knowledge	CARE	English	Yes	2016	GESI

Type	Publication	Organization	Language	Printed	Year	Theme
	Profiles of the Greater One-horned Rhinoceros of Bardia National Park and Shuklaphanta Wildlife Reserve, Nepal	NTNC	English	Yes	2015	Biodiversity Conservation
	Status of Tiger and Prey in Nepal	DNPWC	English	Yes	2014	Biodiversity Conservation, WOO
	Preliminary Assessment: Piloting Payments for Ecosystem Services in Lamjung	CARE	English	Yes	2015	Sustainable Landscapes
	Beyond Investment: Developing Sustainable Green Infrastructure in Nepal	WWF	English	Yes	2014	Infrastructure
	Analysis of Available Models of Improved Cook Stove (ICS) and Their Suitability in Different Ecological Zones in Nepal	WWF	English	No	2015	Sustainable Landscapes
	Realigning Priorities: Climate Vulnerability Assessment, Terai Arc Landscape	WWF	English	Yes	2016	Climate Change Adaptation
Books	Soil Conservation and Watershed Management Program Activities (Definition, objective, scope and working strategy)	MoFSC – DSCWM	English	Yes	2015	Climate Change Adaptation
	Biodiversity Training Resource Book	FECOFUN	Nepali	Yes	2016	Biodiversity Conservation
	Ferns and Fern Allies of Nepal (by Fraser-Jenkins C. R., D.R. Kandel & S. Pariyar)	MoFSC – DPR	English	Yes	2015	Biodiversity Conservation, WOO
Booklets and Briefing Sheets	15 booklets on focal species supported by Hariyo Ban	WWF	English & Nepali	Yes	2016	Biodiversity Conservation
	Natural Resources and Local People in the Nepal Constitution	FECOFUN	Nepali	Yes	2016	Biodiversity Conservation
	Livelihood Improvement Through Skill Based Training सिपमुलक तालिमद्धारा जिविकोपार्जनमा सहयोग	Kantipur Bahuprabidhik Sikshyalaya	Nepali	Yes	2016	Biodiversity Conservation, WOO
	Handbook for Homestay Operation होमस्टे सञ्चालकहरुका लागी सहयोगी पुस्तिका	KOSIS Nepal	Nepali	Yes	2016	Biodiversity Conservation, WOO
	Promoting Climate Change Adaptation in Nepal नेपालमा जलवायु परिवर्तन अनुकूलन प्रवर्धन	WWF/CARE	English and Nepali	Yes	2013	Climate Change Adaptation
	Public Hearing and Public Auditing सार्वजनिक सुनुवाई तथा सार्वजनिक लेखा परिक्षण	WWF/CARE	English and Nepali	Yes	2013	Governance
	Participatory Well-Being Ranking सहभागितामूलक सम्पन्नता स्तरीकरण	WWF/CARE	English and Nepali	Yes	2013	Governance
	Participatory Governance Assessment सहभागितामूलक सुशासन आँकलन	WWF/CARE	English and Nepali	Yes	2013	Governance
	Climate Adaptation Plan Health Check-up Tool	CARE	English	Yes	2016	Climate Change Adaptation
	The Benefits and Challenges of Integrating an Ecosystem Approach in Community Climate Adaptation in Two Landscapes in Nepal	WWF	English	Yes	2016	Climate Change Adaptation
	Mainstreaming Adaptation in Local Development	CARE	English	Yes	2016	Climate

Type	Publication	Organization	Language	Printed	Year	Theme
	Planning: A Reflection from the Hariyo Ban Program, Nepal					Change Adaptation
	Integrating Disaster Risk Reduction and Climate Change Adaptation: Lessons from Hariyo Ban Program, Nepal	CARE	English	Yes	2016	Climate Change Adaptation
	Nepal Earthquake 2015: Environmental Considerations for Food Security	WWF	English	Yes	2015	Green Recovery & Reconstruction
	Environment in the Emergency Education Response	Shelter Cluster	English	Yes	2015	Green Recovery & Reconstruction
	Post-Disaster Shelter and Housing: Sound Environmental Practices for Long-term Safety and Wellbeing	WWF	English	Yes	2016	Green Recovery & Reconstruction
	Water, Sanitation and Hygiene (WASH) Environmental Considerations	WWF	English	Yes	2016	Green Recovery & Reconstruction
	Building Back Better, Safer and Greener for a More Resilient Nepal	WWF	English	Yes	2016	Green Recovery & Reconstruction
	Key Provisions of Community Forest Development Program Guideline, 2nd amendment, 2065 (reproduced based on Community Forest Development Program Guideline, 2nd amendment, 2065, MoFSC – DoF) सामुदायिक वन विकास कार्यक्रमको मार्गदर्शन, दोस्रो परिमार्जन, २०६५ का प्रमुख प्रावधानहरु	CARE	Nepali	Yes	2014	Biodiversity Conservation
	Community Learning and Action Center Brief Introduction सामुदायिक सिकाई तथा कार्य केन्द्र संक्षिप्त परिचय	CARE	Nepali	Yes	2012	Climate Change Adaptation
	Hariyo Ban Program Framework for Strengthening Governance in Natural Resource Management	CARE	English	Yes	2016	Governance
	Perceptions and Engagement of the Private Sector in Urban Climate Resilience: A case study from western Terai, Nepal: Synthesis Paper	CARE	English	Yes	2016	Climate Change Adaptation
	Hariyo Ban Program Phase I: Achievements and Learning	WWF	English	Yes	2016, revised 2017	General
Bulletins/ Brochures/ Leaflets/ Flyers	Kumroj: Model Biogas VDC	NTNC-BCC & Budhi Rapti Users' Committee	Nepali & English	Yes	2013	Biodiversity Conservation, Climate Change Adaptation
	Collaborative Effort for Implementing Community Adaptation Plans in CFUGs	FECOFUN	English	Yes	2014	Climate Change Adaptation
	Participatory Assessment of Implementation of Community Adaptation Plans of Action by Hariyo Ban Program in Nepal	FECOFUN	English	Yes	2015	Climate Change Adaptation
	Community Based Adaptation to Climate Change: Best Practices and Learning from Hariyo Ban Program	FECOFUN	English	Yes	2015	Climate Change Adaptation
	Forest Fire Management	FECOFUN	Nepali	Yes	2016	Biodiversity Conservation

Type	Publication	Organization	Language	Printed	Year	Theme
	Impact Study of HWC Focusing on Economic Losses Due to Crop Damage and Property Damage in TAL	NTNC	English	Online	2016	Biodiversity Conservation
	Clouded Leopard Co-exist with Five Other Felids in Chitwan National Park	NTNC	English	Yes	2014	Biodiversity Conservation
	Rights to Information and Governance in Forestry सुचनाको हकमा र वनमा सुसासन	Farwest Media Development Centre	Nepali	Yes	2015	Biodiversity Conservation, WOO
	Integrating Vulture Safe Zones with Wider Landscape Level Conservation to Save Critically Endangered Vultures in Nepal	BCN/IUCN	English	No	2016	Biodiversity Conservation, WOO
Case Studies/ Stories	Broom Grass: Rehabilitation of Forests Degraded by Shifting Cultivation/Slash-and-Burn Agriculture	WWF	English and Nepali	Yes	2015	Livelihoods
	Success Stories Volumes I and II	WWF	Nepali	Yes	2014 and 2016	General/All themes
Curricula	Gender and Social Inclusion in Natural Resource Management: A Teaching Course Curriculum	IOF	English	No	2015	Biodiversity Conservation, GESI, WOO
	Gender Mainstreaming and Development: A Teaching Manual for BSc. Forestry	IOF	English	No	2015	Biodiversity Conservation, GESI, WOO
Flipcharts	Causes, Mitigation Measures and Adaptation to Climate Change	CARE	Nepali	Yes	2014	Climate Change Adaptation
	Causes, Mitigation Measures and Adaptation to Climate Change	CARE	English	Yes	2014	Climate Change Adaptation
	Principles of REDD+ Social and Environmental Standards	WWF	Nepali	Yes	2014	Sustainable Landscapes
	Principles of REDD+ Social and Environmental Standards	CARE	English	Yes	2013	Sustainable Landscapes
Manuals/ Guidelines/ Handbooks/ Guides/ Protocols	Preparing for Climate Change: Integrating Climate Adaptation into Protected Area Management Planning in Nepal	WWF	English	Yes	2016	Biodiversity Conservation
	Vulnerability Assessment and Adaptation Planning, Training of Trainers Manual	CARE	English	Yes	2014	Climate Change Adaptation
	GESI Awareness in Conservation	NTNC	Nepali	Yes	2014	GESI
	Climate Change Community Adaptation Plans for Action Preparation Guideline समुदाय स्तरिय जलवायु परिवर्तन एकीकृत अनुकूलन योजना सहयोगी पुस्तिका	CARE	Nepali	Yes	2013	Climate Change Adaptation
	Biodiversity and GESI Training Manual	NTNC	English	Yes	2015	Biodiversity Conservation, GESI
	Bio-engineering for River Training and Slope Protection Works: Training Course for Field Technicians Working in Disaster Reduction Project Areas. Training Manual	Mercy Corps	English	Yes	2014	Climate Change Adaptation
	Guideline for Champ Plantation	MoFSC – DoF	Nepali	Yes	2016	Biodiversity Conservation

Type	Publication	Organization	Language	Printed	Year	Theme
	Bio-engineering for River Training and Slope Protection Works: Training Course for Field Technicians Working in Disaster Reduction Project Areas. Facilitators' Guide	Mercy Corps	English	Yes	2014	Climate Change Adaptation
	Technical Resources Materials Collection for Local Resource Persons स्थानीय सहजकर्ताहरुको लागी प्राविधिक स्रोत सामाग्रीहरुको संगाला	CARE	Nepali	Yes	2013	General
	GESI in Natural Resource Management in relation to climate change जलवायु परिवर्तनको सन्दर्भमा प्राकृतिक स्रोत व्यवस्थापनमा लैङ्गिक समानता तथा सामाजिक समावेशीकरण तालिम निर्देशिका	CARE	Nepali	Yes	2013	GESI
	Sustainable Management of Forests Training Resource Book	FECOFUN	Nepali	Yes	2016	Biodiversity Conservation
	GESI Mainstreaming in REDD+: Training Manual रेड प्लसमा लैङ्गिक समानता र सामाजिक समावेशीकरण मूलप्रवाहीकरण तालिम निर्देशिका	CARE	Nepali	Yes	2015	GESI
	Jaibik Bibidhata Samrakshyanma Laingik tatha Samajik Samabeshikaran – Talim Srot Pustika (Training Manual on Gender and Social Inclusion in Biodiversity Conservation)	NTNC	Nepali	Yes	2015	GESI
	Directive on Timber Production, Supply and Management for Earthquake Affected Families	MoFSC	Nepali	Yes	2016	Green Recovery & Reconstruction
	Building Back Safer and Greener: A Guide to Sound Environmental Practices for Disaster Recovery in Nepal	WWF	English	Yes	2016	Green Recovery & Reconstruction
	Building Material Selection and Use: An Environmental Guide	WWF	English	Yes	2016	Green Recovery & Reconstruction
	Field Monitoring Guidelines	WWF	English	Yes	2016	M&E
	Gender Responsive Budgeting Guideline	CARE	Nepali	Yes	2016	GESI
	Guide Book for Local Resource Person स्थानीय सहजकर्ताहरुको लागी सहयोगी पुस्तिका	CARE	Nepali	Yes	2013	General
	Participatory Governance Assessment Handbook	CARE	English	Yes	2016	Governance
	ToT Manual for Participatory Disaster Management and Climate Change Adaptation सहभागिमुलक बिपद व्यवस्थापन तथा जलवायू परिवर्तन अनुकुलन प्रशिक्षक प्रशिक्षण पुस्तिका	National NCDMC	Nepali	Yes	2016	Climate Change Adaptation, WOO
Photo Story Book	Photo Story Book of Earthquake Recovery and Reconstruction	CARE	Nepali and English	Yes	2016	Climate Change Adaptation
Policy Brief	Gender and Social Inclusion in Community Forest Management – An Analysis of Community Forests of Makawanpur, Kaski, Dang and Bardia	HIMAWANTI	English	Yes	2014	GESI, WOO
Posters/ Pamphlets	Reducing Vulnerability through Implementation of Adaptation Plans of Action: FECOFUN Experience through Hariyo Ban Program in Nepal	FECOFUN	English	Yes	2016	Climate Change Adaptation
	Green Recovery and Reconstruction Posters: WASH, Education, Shelter and Bioengineering	WWF	English	Yes	2016	Green Recovery & Reconstruction
	Payment for Ecosystem Services	CARE	Nepali	Yes	2013	Sustainable landscapes

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	Local Adaptation Plan of Action Cycle	CARE	Nepali	Yes	2014	Climate Change Adaptation
	Community Adaptation Plan of Action Cycle	CARE	Nepali	Yes	2014	Climate Change Adaptation
	Integrated Climate Adaptation Planning	CARE	Nepali	Yes	2014	Climate Change Adaptation
	Building Resilience through the Integration and Mainstreaming of Climate Change Adaptation and Disaster Risk Reduction: Lessons from the Hariyo Ban Program in Nepal	CARE	English	Yes	2016	Climate Change Adaptation
	Perceptions and Engagement of the Private Sector in Urban Climate Resilience: A case study from western Terai, Nepal Synthesis Paper	CARE	English	Yes	2016	Climate Change Adaptation
	Measuring effectiveness of adaptation plans by using a 'Health Checkup Tool': Practices and lessons from the Hariyo Ban Program in Nepal	CARE	English	Yes	2016	Governance
	Community Adaptation to Climate Change-Best Practice and Learning from Hariyo Ban Program	FECOFUN	English	Yes	2014	Climate Change Adaptation
	Forest Fire Control Awareness Poster	FECOFUN	Nepali	Yes	2015	Biodiversity Conservation
	GESI Awareness in Conservation	NTNC	Nepali	Yes	2015	GESI
Proceedings	Proceedings of the International Conference on Invasive Alien Species Management	NTNC	English	Yes	2014	Biodiversity Conservation
	Reflecting the Past - Designing the Future: The Proceeding of Reflective Learning on Social Mobilization	CARE	English	Yes	2015	General/All themes
	Report on Strategic Planning Workshop for Improving Wildlife Health Capacity in Nepal	Agriculture and Forestry University	English	No	2016	Biodiversity Conservation
Process Document	Initiative for a Resilient Human Community and Ecosystem: A Case of Dharampani, Tanahun	CARE	Nepali	Yes	2014	Climate Change Adaptation
Hariyo Ban Internal Strategies and Plans	Framework Environmental Mitigation and Monitoring Plan	WWF	English	Yes	2013	M&E
	GESI Mainstreaming Strategy of Hariyo Ban Program	WWF	Nepali & English	Yes	2013	GESI
	Hariyo Ban Program Learning Strategy	WWF	English	Online	2013	General/All themes
	Performance Monitoring Plan	WWF	English	No	2016	General/All themes
	Environmental Monitoring and Management Plan	WWF	English	No	2016	General/All themes
Reports and Papers	Integration of gender into forestry research – translated from publication by Center for International Forestry Research वन सम्बन्धि अनुसन्धानमा लङ्गिक समायोजन	CARE	Nepali	Yes	2015	GESI
	Principles of REDD+ Social and Environmental Standards	CARE	Nepali	Yes	2016	Sustainable Landscapes

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	District Disaster Preparedness Response Plan: Kaski	CARE	Nepali	Yes	2016	Climate Change Adaptation
	Community Based Climate Change Adaptation Best Practices and Learning Documentation	WWF	English	No	2014	Climate Change Adaptation
	Key Learning Document of Hariyo Ban Program (Strategic Achievements, Limitations and Way Forward)	FECOFUN	Nepali	Yes	2016	Biodiversity Conservation
	Report on Documentation of the Lessons Learnt from FECOFUN in REDD+ Piloting Project	FECOFUN	English	Yes	2016	Sustainable Landscapes
	Impact of Biogas on Reducing Pressure on Forests and Workload of Women in Terai Arc Landscape, Nepal	NTNC	English	Yes	2015	Biodiversity Conservation, Climate Change Adaptation
	The value of a river basin approach in climate adaptation. Paper presented at International Conference on Climate Change Innovation and Resilience for Sustainable Livelihoods	WWF	English	No	2015	Climate Adaptation
	Sensitization of District Level Political Leaders on Policy Discourse of Biodiversity Conservation	National Federation of Youth NGOs	English	No	2016	Biodiversity Conservation, WOO
	Documentation of Payment for Ecosystem Services Initiatives in Lamjung District, Hariyo Ban Program, Nepal.	CARE	English	No	2016	Sustainable Landscapes
	Assessing Indicators and Status of Vulnerability Reduction through Climate Change Adaptation Interventions in the Hariyo Ban Program	CARE	English	No	2016	Climate Change Adaptation
	Assessment and Documentation of Sites towards the Improvement of Biophysical Conditions through Climate Change Adaptation Interventions under Hariyo Ban Program	CARE	English	No	2016	Climate Change Adaptation
	Assessing climate change impacts on forest ecosystems for landscape-scale spatial planning in Nepal (Thapa et al.)	WWF	English	Published in Current Science 110(3)	2016	Biodiversity Conservation and Climate Change Adaptation
	Effectiveness of Hariyo Ban Program in Addressing Threats to Biodiversity and Drivers of Deforestation and Forest Degradation	WWF	English	No	2016	Sustainable Landscapes
	Effectiveness of Power Fencing in Reducing Human Wildlife Conflict	WWF	English	No	2016	Biodiversity Conservation
	Knowledge Documentation on Impacts of Biogas on Forests and Socio-Economic Development of Local Communities in the Terai Arc and Chitwan Annapurna Landscapes	WWF	English	No	2016	Sustainable Landscapes
	People and Forests: Livelihoods and Governance Results from the Hariyo Ban Program Phase I	WWF	English	No	2016	Livelihoods and Governance
	Evaluation of Windows of Opportunity Project, Hariyo Ban Program	WWF	English	No	2016	WOO
	Working Together for Forests and People: Assessment of the Effectiveness of the Hariyo Ban Program Consortium	WWF	English	No	2016	General
	Biodiversity, People and Climate Change: Final Technical	WWF	English	No	2017	General

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	Report of the Hariyo Ban Program, First Phase					
Government Policies and Strategies	Strategy and Action Plan 2015-2025, Terai Arc Landscape, Nepal	MoFSC	English	Yes	2015	Biodiversity Conservation
	Strategy and Action Plan 2016-2025, Chitwan-Annapurna Landscape, Nepal	MoFSC	English	Yes	2016	Biodiversity Conservation
	Guideline on Landslide Treatment and Mitigation	DSCWM	English	Yes	2016	Climate Change Adaptation
	Conservation Landscapes of Nepal	MoFSC	English	Yes	2016	Sustainable Landscapes
	Community Forest Development Directive	MoFSC	English	Yes	2016	Sustainable Landscapes
	Red Panda Field Survey and Protocol for Community Based Monitoring	MoFSC	English	Yes	2016	Biodiversity Conservation
Video Documentaries	She is the Change	WWF	English & Nepali	Yes	2014	Livelihoods
	Green Hopes	WWF	English	Yes	2014	Livelihoods
	The Last Yak Herder of Dhe	Clikman Productions	English	Yes	2014	Climate Change Adaptation
	Forest Carbon Inventory Process	WWF	Nepali	Yes	2014	Sustainable Landscapes
	Local Adaptation Plans for Action Framework	WWF	English	Yes	2014	Climate Change Adaptation
	The Seti River Flood	WWF	English	Yes	2013	Climate Change Adaptation
	Local Adaptation Plans for Action Framework	WWF	Nepali	Yes	2016	Climate Change Adaptation
	Agents of Change	WWF	English	Yes	2016	GESI
	Rhinos on the Move	WWF	English	Yes	2016	Biodiversity Conservation
	The Change Factor	WWF	Nepali	Yes	2016	Climate Change Adaptation
	Swamp Deer: Switching Grounds	WWF	English	Yes	2016	Biodiversity Conservation
	Green Recovery and Reconstruction for Resilient Nepal	WWF	English	Yes	2016	Green Recovery & Reconstruction
	Mahila Paila (Footprints of Change)	CARE	Nepali & English	Yes	2015	GESI
	Pariwartan Ka Samwahak (Carriers of Social Change)	CARE	Nepali	Yes	2015	GESI
	National Sharing workshop on mainstreaming adaptation initiatives and learning	CARE	Nepali	Yes	2015	Climate Change Adaptation
	Gare sakinchha	CARE	Nepali	Yes	2016	Climate Change

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	गरे सकिन्छ					Adaptation
	Initiation of Community Forest in CCA	FECOFUN	Nepali	Yes	2015	Climate Change Adaptation
	NTFP Value Chain Analysis of ACA and MCA	NTNC	Nepali	Yes	2013	Biodiversity Conservation
	Community based Goral Conservation in Nawalparasi and Palpa	NTNC	Nepali	Yes	2016	Biodiversity Conservation
	Livelihood Enhancement of Forest Dependent Ultra-Poor Households though Skill Based Training for Biodiversity Conservation -Video Documentation	Kantipur Bahuprabidhik Sikshyalaya		Yes		Livelihood, Biodiversity Conservation, WOO
	Use of Rights to Information in Community Forestry सामुदायिक वनमा सुचनाको हकको प्रयोग	Farwest Media Development Centre	Nepali	No	2015	Biodiversity Conservation, WOO

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