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Critical Ecosystem Restoration Plan (CERP) of Kamala-Belsot-Jogiya River System



Building A Resilient Churia Region in Nepal
(BRCRN)
Project Management Unit, Babarmahal, Kathmandu

Building A Resilient Churia Region in Nepal (BRCRN)



National Project Director

मिति २०७८।०२।२७ को वन तथा वातावरण मन्त्रालयको श्रीमान् सचिवस्तरीय निर्णयबाट स्वीकृत भएको Critical Ecosystem Restoration Plan (CERP) Preparation Manual को बुँदा नं.४ को प्रावधान बमोजिम PPMU हरुको सिफारिशमा PMU को मिति २०८०।०२।२३ को निर्णयबाट प्रारंभिक स्वीकृत (Initially Approve) भएको यस नदी प्रणालीको CERP मिति २०८०।०२।२६ मा बसेको आयोजना निर्देशक समिति (Project Steering Committee) को निर्णय बमोजिम अनुमोदन (Endorse) भएको ।


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This CERP report has been prepared based on the extensive field consultations, onsite visit and applying the RS/GIS tools and technologies. This report contains data and information collected and collated from the field applying CERP steps and methodology spelled -out in MOFE approved CERP manual. The draft report was shared in three provincial and one national validation workshops organized from December 2022 to February 2023 and incorporated the suggestions obtained from the workshops.

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DECLARATION OF AUTHENTICITY

To the best of our knowledge and in accordance with the MOFE approved CERP manual, we, the service provider Nature's Conservation (P) Ltd. , Kathmandu, hereby confirm that this CERP report is our original outcomes and the data and information provided in the reports of the Madhesh and Bagmati provinces are based on advice from FAO-TA, the expertise of the service provider , community user groups, district expert consultation sessions, provincial and federal validation consultation meetings, and other secondary sources. Without citing the GoN-BRCRN project's copyright, we won't give permission for our team or any other sources to use it as copied material.

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Contents

Executive summary	vi
Chapter 1: Introduction.....	1
1.1 Background	1
1.2 Rationale of CERP	1
1.3 CERP and Theory of Change.....	1
1.4 A River System and Ecosystem Restoration.....	3
1.5 Spatial planning as base for CERP	3
1.6 Mitigation and adaptation logic in CERP.....	4
Chapter 2: Introduction to Kamala Belsot Jogiya River System.....	8
2.1 Physiography, Land Cover and Hydrology	8
2.2 Climate Variables:	11
2.3 Socio-ecological process.....	12
2.4 Problem analysis.....	12
Theme 1: Climate change mitigation	12
2.4.1 Direct and underlying drivers of Deforestation and Forest Degradation (D&FD).....	12
2.4.2 Hotspot for forest loss (Multi-criteria Analysis Result Map 1)	16
2.4.3 Enhancement area for carbon stock -MCA Result Map 2.....	18
Theme 2: Climate change adaptation	20
2.4.4 Direct drivers and underlying causes of vulnerable ecosystem and community in the river system	20
2.4.5 Hotspot for vulnerable ecosystems- MCA Result Map 3.....	24
2.4.6 Linkage of GESI and IPs specific issues to forest loss and vulnerable ecosystems	26
Solution Analysis	26
2.5.1 Climate change mitigation: solution analysis of D&FD	26
2.5.2 Climate change adaptation: solution analysis.....	30
2.5.3 Map of Planned interventions MCA Result Map 4:.....	34
2.5.4 Integration of GESI and IP's issues into solution activities	36
Chapter 3. Overall observations and findings	36
Chapter 4: Intervention Packages (IPacks)	38
IPack 1: Restoration of degraded forest (reforestation) and afforestation in river reclaimed land.....	39
IPack 2: Soil and Water Conservation.....	53
IPack 3: Agroforestry system.....	61
IPack 4: Climate resilient agriculture and land use practices	66
IPack 5: Advocacy campaign: Gender-inclusive governance.....	73
Annexes	87

List of Tables

Table 1: Variables considered as input data for Multi criteria spatial analysis (MCA)	5
Table 2: Land cover change in Kamala Belsot Jogiya river system.....	11
Table 3: Climate change scenario (MoFE, 2019).....	11
Table 4: Drivers and underlying causes of D&FD in Kamala Belsot Jogiya River System	12
Table 5: Drivers and underlying causes of vulnerable ecosystem and community in Kamala Belsot Jogiya river system.....	20
Table 6: Activities, outputs and outcomes for reducing degraded forest and enhancing forests in the Kamala Belsot Jogiya river system.....	28
Table 7: Activities, outputs and outcomes for reducing vulnerable ecosystem and communities in Kamala Belsot Jogiya river system.....	32

List of Figures

Figure 1: Establishing causal linkages with theory of change analysis	2
Figure 2: Upstream and downstream linkages in three distinct zones	3
Figure 3: Spatial Planning as a base for CERP.....	4
Figure 4: MCA process.....	5
Figure 5: Location map of Kamala Belsot Jogiya river system.....	8
Figure 6: Geology of Kamala Belsot Jogiya river system.....	10
Figure 7: Direct drivers and underlying causes of D & FD in Kamala Belsot Jogiya river system	15
Figure 8: Map of Hotspot for Forest Loss in Kamala Belsot Jogiya River System.....	17
Figure 9: Enhancement for forest carbon stock in Kamala Belsot Jogiya river system.....	19
Figure 10: Direct drivers and underlying causes of vulnerable ecosystem and associated community in Kamala Belsot Jogiya river system	23
Figure 11: Map of Hotspot for Vulnerable Ecosystem and Community in Kamala Belsot Jogiya River System	25
Figure 12: Solution tree analysis in Kamala Belsot Jogiya river system: Climate change mitigation	27
Figure 13: Solution tree analysis in Kamala Belsot Jogiya river system: Climate change adaptation	31
Figure 14: Map of Planned intervention (Mitigation and Adaptation) in Kamala Belsot Jogiya river system	35

Executive summary

The Critical Ecosystem Restoration Plan (CERP) is based on participatory and results-based planning methodology with a robust monitoring protocol, to help leverage support and facilitate budget planning from the federal to the provincial and local level for investments in ecosystem restoration. The CERP methodology covers all steps in the planning process, from the identification of stakeholders, collection of data and information, processing, analysis, discussion, and evaluation including participatory stakeholder consultations and negotiations. Multiple stakeholder workshops are instrumental in the CERP preparation process in the targeted ecosystems within river systems. In addition, the project adopted a gender-integrated approach to mainstream gender into the plan. The project has conducted additional gender study mainly focused on women, Dalits women, and indigenous women to identify the gender-specific problem and local-level solution for the intervention. The gender-specific study adopted research tools such as a seasonal calendar for gender analysis, problem, and solution community workshops, and focus group discussions among the community. Also, the process includes a consultation with women and women lead organizations.

The Kamal Belsot Jogiya River System (KBJ River System) has major tributaries that originate in the Siwalik hills, viz., Kamala, Belsot, Jogiya, Bhedwa and Selar. The Kamala, Belsot, and Jogiya rivers are the three rivers that make up the KBJ River System in the project. While Jogiya River from Ganseshman Charnath Municipality-5, Dhanusa, which originates at 350 masl, meets Kamala River in Chisapani at 122 masl, Belsot River from Udayapur District, which originated in Katari Municipality-I at 485 masl, meets Kamala River at Kalikhola Gaun, Katari Municipality-I at 149 masl. The ecosystem degraded areas termed as “hotspot” areas are identified initially by spatial analysis of 16 different variables from secondary spatial data sources. The variables were categorized into adaptation and mitigation themes and Geographical Information System (GIS) based Multi-Criteria Analysis (MCA) was used to identify preliminary hotspot areas. The maps generated from spatial analysis were taken to problem and solution workshops that took place at the local level in three locations in the River System: Belsot, Katari Municipality-I (upstream), Bandipur, Karjanaha Municipality (midstream), and Yadukuha, Shahidnagar Municipality(downstream). Participants from Community Based Organizations (CBOs) user groups-with a focus on women, indigenous people, poor and Dalit (community forest user groups, farmer groups, and climate-induced disaster management groups, soil and water conservation groups) as well as government organizations (forest sub-division offices and local government at community level) were represented in the workshops. Identification of key drivers, Problem analysis, Solution analysis and hotspot map delineation were done in two thematic groups of climate change adaptation and mitigation. The mapped hotspot locations were verified/updated in the workshops and verified in the field followed by discussions with the local communities. Additional two-day expert planning workshop in the River System discussed and validated the findings, focusing on identifying drivers and underlying causes of the two thematic problems. Additionally, the workshop also discussed and drafted the CERP with solution-activities to overcome the problems observed (drivers) and restore the ecosystem of the River System. The participants in the expert planning workshop represented the government authorities and other networks working in forests and natural resource management sector, agriculture sector and disaster risk reduction sector in the River System.

Based on the problem analysis workshops, following key problems were identified in river system:

- a. Over the past 19 years (2000-2019), forest area has decreased at the rate of 0.67 percent per year, while built-up area has increased at the rate of 7.21 percent per year in the river system (Source: ICIMOD, 2000 and ICIMOD, 2019). However, large forest loss and degradation about 1099 ha was observed during field observations in upstream regions of the river system. Field observations show large area degraded and lost in the river system which is not properly reflected in national forest

data, one of the reason being the national data does not show degraded areas. Forest fires, illegal logging, encroachment, fuelwood collection, , climate led hazards- (flash flood, landslide), are the main causes of forest loss within this river system.

- b. About 51 Community/Local Forest User Groups (CFUGs/LFUGs) are functional in the river system, which is a significant in terms of number of forest user groups. However, there is inadequate technical human resources, tools and techniques, knowledge and skills, and financial resources, and hence there is an ineffective forest management in this river system .
- c. About 24 landslides (covering about 10 ha) and a number of gullies in 19 torrents in various locations in the Ganeshman Charnath Municipality-5 Katari Municipality-1 & 2 have contributed to degraded forest ecosystems in upstream areas of this river system.
- d. A total of 3032 ha of river side land, including a flood plain and agricultural land downstream, have been deposited by the riverbed materials (like sands, boulders and pebbles), which contributes to degraded agriculture lands and reduces the fertility in the river system.
- e. Lack of access to climate-informed decision-making in agriculture practices, ineffective practices with no access to commercialization of agricultural production, intense and frequent short-duration rainfall with a risk of flash flood, inefficient irrigation facilities, infestation of pest and disease pests, and diseases, and inadequate support for improved livestock management practices are all examples of inadequate climate adaptation practices in the river system.
- f. Women and marginalized communities need access to and control over forest and community resources and information to participate in climate change and forestry-related actions at the river systems.
- g. The involvement of women in the overall planning, leadership, and decision-making process is affected by poor gender-inclusive governance. This affects the performance of CBO's women members/leader to participate in the SNRM intervention actively.

The identified solutions with intervention activities (solutions-activities) are grouped into five Intervention Packages (IPacks) based on guidance from CERP manual to address the drivers of: a) climate change mitigation—hotspot of forest loss in upstream; b) climate change adaptation—. Each IPack contains a general description of the drivers, a list of the most significant initiatives for resolving problems with outputs and outcomes to address the drivers and the underlying causes and effects of the hotspots, implementing strategies, 5-year budget plan for carrying out the initiatives, monitoring plans, analyses the feasibility of the implementation and a brief safety precaution. Additionally, there are two categories of solution activities: capacity buildings and solution-activities in spatial mappings with activities area code (GIS data layers: polygons, lines, and points). The suggested solution-activities in the plan also include beyond the Building a Resilient Churia Region in Nepal (BRCRN) priority.

Following are a brief glimpse of the Intervention Packages and key activities:

IPack I: Restoration of degraded forest and afforestation in river reclaimed land

- a. Enrichment plantation in the degraded forest: the potential native tree species,
- b. Natural regeneration management- Assisted Natural Regeneration (ANR) through:
 - Reduction of forest fire hazards through weeding, cleanings and improvements (extraction of bushes, leaf litters and forest residues) (about 49 km);
- c. Mesh-wire fencing in the riverside lands (3032 ha) plantation, including community land plantation (1296 ha), demonstration plantation (203 ha), riparian plantation (63 ha), and woodlot plantation (1470 ha).
- d. Support for alternative energy sources, priority for women and marginalized communities
- e. Capacity building for local government on monitoring for sustainable extraction of river bed materials.

IPack 2: Soil and water conservation

- a. Landslide treatments in 24 sites with bio-engineering and vegetative measures
- b. Stabilization of gully in the torrent (19 torrents)
- c. Construction of water conservation new ponds (12 ponds)
- d. Improvement of existing ponds (16 pond)
- e. Wetland Improvements (5 locations of cumulative area 9 ha)
- f. Construction of water harvesting structure (5 locations)
- g. Riverbank stabilization (20 km)
- h. Irrigation channel improvement (2 sites)
- i. Capacity building in water and soil conservation practices (Skill based trainings, orientation and demonstration visits, success stories collection and sharing)

IPack 3: Agroforestry services

- a) Adoption of Agroforestry system in the potential areas of the riverside (about 183 ha) and link with livestock promotion with establishment of agroforestry nursery-focus on the local fodder species
- b) Providing supports for irrigation facilities
- c) Formulation of groups called Agroforestry Groups (AFGs), if no any agroforestry group existed currently
- d) Capacity building trainings on Agroforestry and Institutional support

IPack 4: Climate resilient agriculture technologies and practices.

- a. Establishment of Farm Field Schools on the basis of crop problems and failures for several reasons.
- b. Support for the conservation and utilization of water source for irrigation facility using climate resilient technology
- c. Capacity building trainings on CRA (composting, manuring, mulching, water retention techniques), livestock management, protection of cultivation lands from wildlife threats and use of weather information:

IPack 5: Gender-inclusive governance

- a. Developing and implementing awareness-raising sessions targeting government, civil society, grassroots organizations, and rural communities (includes preparing a strategy with issues, objectives, actions/products)
- b. Collect local-level best practices for learning and policy influence to ensure gender responsiveness and women's participation, access, control, and leadership.
- c. Provide gender mainstreaming training/ workshops to local government and CBOs and concerned stakeholders.
- d. Conduct GESI-focused social audits and public hearings to understand the allocation of gender-responsive activities, budgeting, and implementation concerning GESI-inclusive practice at local level.

The intervention packages are targeted to improve the overall ecosystem functions of the river system and are designed as guided by CERP manual. The CERP manual guides: *“IPacks are to be composed of activities that can be operationalized at river system or site level, they should not include national level policies and measures (PAM) even though the solution trees will naturally contain these, since they respond to the policy and governance failures that are the main underlying causes of D&FD”*. Based on the CERP manual guidance, policy related interventions identified in solution analysis are reviewed against already existing REDD+ national strategy and found that most of them align with the national strategy. Hence, policy level interventions are not emphasized in CERP, rather a local level intervention focusing on restoring degraded ecosystems is prioritized.

CERP being a river system level plan, its interventions (IPacks) are designed to foster upstream-downstream linkages and address issues covering entire river system. Although the core focus of the IPacks are the upstream and mid-stream regions as guided by BRCRN project documents, the interventions to be done in upstream are expected to bring positive change in downstream ecosystem. In case of KBJ River System, majority of activities under IPack 1 (forest restoration and afforestation) as well as IPack 2 (soil and water conservation) focus on upstream and midstream regions where hill slopes are high and large degradation occurs in form of forest and soil loss. Interventions to control the forest and soil loss in upstream hilly regions will control the ecosystem degradation, thus reducing sedimentation in the downstream regions in Terai. This will subsequently reduce the flooding and damage of fertile land, river reclaimed areas and old floodplains in midstream and downstream regions. In this sense CERP IPack designs also consider the connectivity and upstream-downstream linkages for ecosystem restoration.

Chapter I: Introduction

1.1 Background

Churia landscape comprises 36 districts and extends from east to west covering 13.6% of the total landscape of the country and is regarded as home to about 60% of the total population of the country (NAST, 2012). It has significant social, ecological environmental and paleontological values as this region provides important source of biodiversity, fossils, and a basis for knowledge on evolution of Asian fauna. Bhavar ecological zone which recharges water for flat lands (Terai) via infiltration but newly emerging settlements, road network and urbanization in this area is hindering infiltration and contributing to flash floods in Terai plains of Nepal. Despite its significant importance, the fragile composition of Churia region is degrading at an alarming rate due to increased (livestock grazing, timber smuggling, illegal tree felling, etc.). Consequently, these anthropogenic factors have accelerated the loss of soil biodiversity, floods, riverbank cutting and decreased farmland productivity and which aggravated poverty and land degradation.

With accumulation of degradation on ecosystems in recent years, approaches towards ecosystem restoration have grown significantly with new ideas and opportunities (Choi, 2007; Davis and Slobodkin, 2004). Ecosystem restoration is an intentional human activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity and sustainability (SER, 2004). Ecosystems have been degraded, damaged, transformed or entirely destroyed as direct or indirect result of human activities. In some cases, these impacts to ecosystems have been caused or aggravated by phenomena such as landslide, drought, erosion, wildfire, floods, to the point at which the ecosystem cannot recover to its prior-condition or its historic developmental trajectory (SER, 2004). The ecosystems sometimes may recover remarkably well without human inputs, especially enough to incorporate the changes and recover ecological processes. But where profound physical, chemical and/or biotic changes have occurred, restoration may require substantial and viable human intervention.

1.2 Rationale of CERP

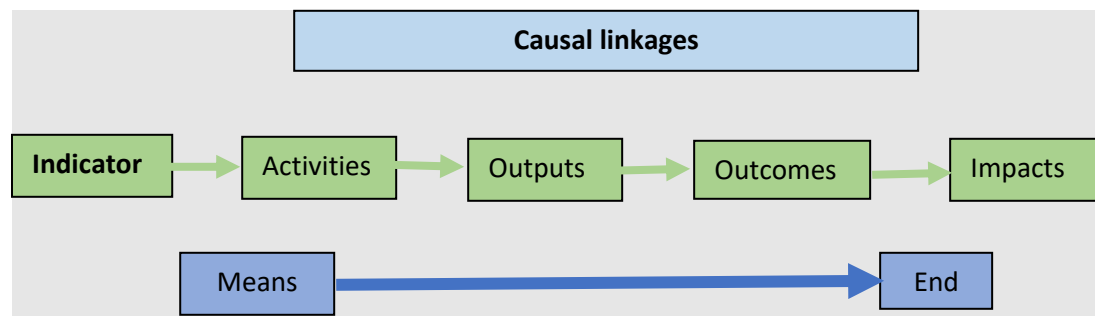
The development of CERPs will contribute to the provision of climate-informed extension and advisory services. It ensures that adaptation to Climate Change (CC) and Disaster Risk Reduction (DRR) has been integrated into provincial and local development planning. The project achieves this through promoting and integration of climate resilient land use practices in agriculture and forestry. Subsequently integrating them into local decision-making processes. This will ultimately guide the adoption of prioritized low-carbon and Climate Resilient – Sustainable Natural Resource Management (CR-SNRM).

The goal is that government and development partners together improve local and provincial service delivery through river system investments in integrated SNRM interventions. The CERP is also the basis for Monitoring and Evaluation (M&E) of ecosystem restoration actions in the landscape as well as outreach and targeted budgeting on local level. Additionally, the data generated in the annual follow-up of the CERP implementation packages, and their success will bring an array of ground level information in the areas of ecosystem restoration, SFM, sedimentation and forest gain in the river system. The reports on the cumulative impacts of the CERPs should be a part of the country's overall Nationally Determined Contribution (NDC) reporting on land use change and greenhouse gas emissions at national scale.

1.3 CERP and Theory of Change

The overall CERP development is based on the “Theory of change” approach which explains how a given intervention, or set of interventions, is expected to lead to specific development change, drawing on a causal linkage based on available evidence. A theory of change helps to identify solutions to effectively address the causes of problems that hinder progress and guide decisions on which approach should be

taken (Figure 1). A theory of change also helps to identify the underlying assumptions and risks that will be vital to understand and revisit throughout the process of M&E of CERP at river system level.



(Source: CERP Manual, 2021)

Figure 1: Establishing causal linkages with theory of change analysis

Theory of Change can be seen as an “on-going process of discussion-based analysis and learning that produces powerful insights to support programme design, planning, strategy, implementation, evaluation and impact assessment, communicated through diagrams and narratives which are updated at regular intervals” (Vogel 2012, p5). It plays a strong role in cause-and-effect analysis using problem trees and solution trees. It helps in monitoring information and in learning framework development including indicators and in scaling up. The theory of change approach therefore encourages strategic and cost-effective interventions in the long run. Theory of change is reflected in CERP monitoring plan that is presented that consists of following elements:

- Intervention Package (IPacks) and intended key result
- Risk reduction and benefit enhancement targets
- More than one indicator for each target
- Data source or data collection method
- Location of data to be collected
- Frequency of data to be collected
- Responsible person for data collection
- Relative cost of data collection: High, Medium or Low.

1.4 A River System and Ecosystem Restoration

A river system is a land mass of drainage basin where all river and its tributaries accumulate to have a common outlet. BRCRN follows the river system boundaries earlier identified and delineated by President Churia Master Plan (PTCMD 2017). It is a part of watershed system that should ideally follow hydrological boundary, however river system delineation by president Churia also considers land mass as a management unit that is delineated based on the geographical and socioecological variability. In that sense, all river system boundaries may not be true hydrological units.

A typical Churia river system can be divided into three zones based on its landform and river geomorphic behaviors as shown in figure (Figure 2). The upstream region which is the major source of sediment production acts as a sediment collection zone (Zone 1). Midstream region where meandering rivers transport sediment causing riverbank cutting and erosion (Zone 2). Downstream region where the sediment dispersal takes place forming river delta and rise of riverbed causing large flooding (Zone 3).

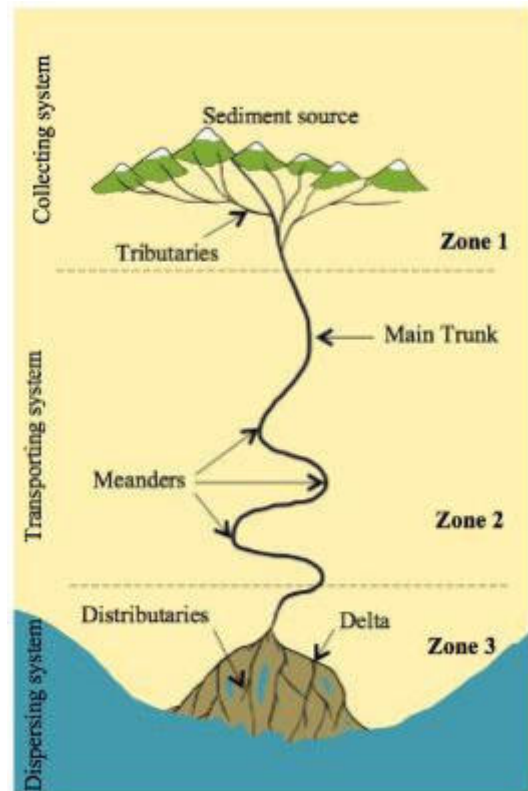


Figure 2: Upstream and downstream linkages in three distinct zones

Ecosystem restoration is the process of halting and reversing degradation, resulting in improved ecosystem services and enriched biodiversity. Ecosystem restoration encompasses a wide range of activities that contribute to protecting integral ecosystems and repairing degraded ecosystems. Such activities include, for example, enhancing organic carbon in agricultural soils, increasing fish stocks in overfished zones, remediating polluted sites, restoring ecological processes, restoring biodiversity and conserving fauna and flora that can assist in the restoration process. In landscapes where restoration is implemented, the economic benefits from restoration will need to be shared on equitable benefit-sharing mechanisms., according to rights particularly with those segments of society previously marginalized on the basis of gender, race, age, nationality or economic status. Land tenure policies and the rights of indigenous peoples will be critical importance given that many landscapes eligible for restoration are currently used by indigenous peoples without land tenure security. The three main goals are:

- Enhancing global, regional, national and local commitments and actions to prevent, halt and reverse the degradation of ecosystems;
- Increasing our understanding of the multiple benefits of successful ecosystem restoration;
- Applying this knowledge in our education systems and within all public and private sector decision-making.

CERP focuses on river system scale intervention planning to achieve ecosystem restoration at landscape level. CERP is also in-line with the United Nations decade 2021-2030 of ecosystem restoration's principles (FAO, IUCN CEM and SER. 2021).

1.5 Spatial planning as base for CERP

Mapping and spatial analysis have a vital role in the CERP development process. Maps and spatial analysis are often generated by a combination of Geospatial tools (i.e. GIS, Remote Sensing), desk-based research

and fieldwork. Large-scale maps were developed as working tools to be annotated during the workshops and these new digitized maps can be developed by the spatial planning team for further participatory analysis or inclusion in the final CERP document for implementation (Figure 3).

<p>Preparatory Mapping</p> <ul style="list-style-type: none"> - National level Secondary Data Collection - Remote Sensing Imagery Capture - Large scale base maps preparation for stakeholder consultation - 	 
<p>Spatial Analysis</p> <ul style="list-style-type: none"> - Multi-criteria Analysis - Hotspot Mapping <p>Participatory spatial planning</p> <ul style="list-style-type: none"> - Map based stakeholder planning 	

Figure 3: Spatial Planning as a base for CERP

The CERP starts with preliminary assessment of climate variables to assess the impacts of climate induced disasters over the changing land use/land cover patterns in river systems using Spatial Multi-Criteria Analysis (MCA). MCA process of CERP analyses a number of climate variables to pre-identify ‘hotspot’ sites of climate impacted locations to prepare ecosystem hotspot maps within the river systems that require interventions. These interventions are then planned and validated through a participatory process through problem and solution-tree analysis workshops. The stakeholders use the ecosystem hotspot maps as a base to demarcate the problem and solution sites, conduct site visits, identify interventions, perform suitability analysis, safeguards analysis, set monitoring protocols and identify budget for the appropriate interventions leading to an effective ecosystem restoration plan.

1.6 Mitigation and adaptation logic in CERP

Noting the role of CERP as the core process of the project in identifying the problems and solutions that lead to project interventions (activities), the CERP objectives will be to balance both mitigation and adaptation resilience building, as well as the social objective of building resilient communities. In this regard,

Mitigation and Adaptation potentials of the project are considered as primary entry points for MCA to identify hotspot sites and hence considered as major themes. Mitigation potential is addressed through identifying areas (hotspots) where BRCRN interventions have potential to reduce emissions and enhance the carbon stock. Similarly, Adaptation/Resilience potentials are addressed through identifying areas (hotspots) where BRCRN interventions have potential to address vulnerable ecosystems and vulnerable communities. The variables related to key mitigation and adaptation themes are chosen based on joint discussions with project team considering the availability of spatial data across the 26 river systems. The results of MCA process to identify maps of critical area (hotspots) for forest loss, carbon stock enhancement and vulnerable ecosystems across the 26 river systems. The participatory mapping process in field to plan the interventions during multi- local stakeholder consultative workshops.

Below graphics demonstrate adaptation and mitigation logic adopted for which careful choice of themes, variables, process and results were guided by MOFE approved CERP manual (Figure 4).

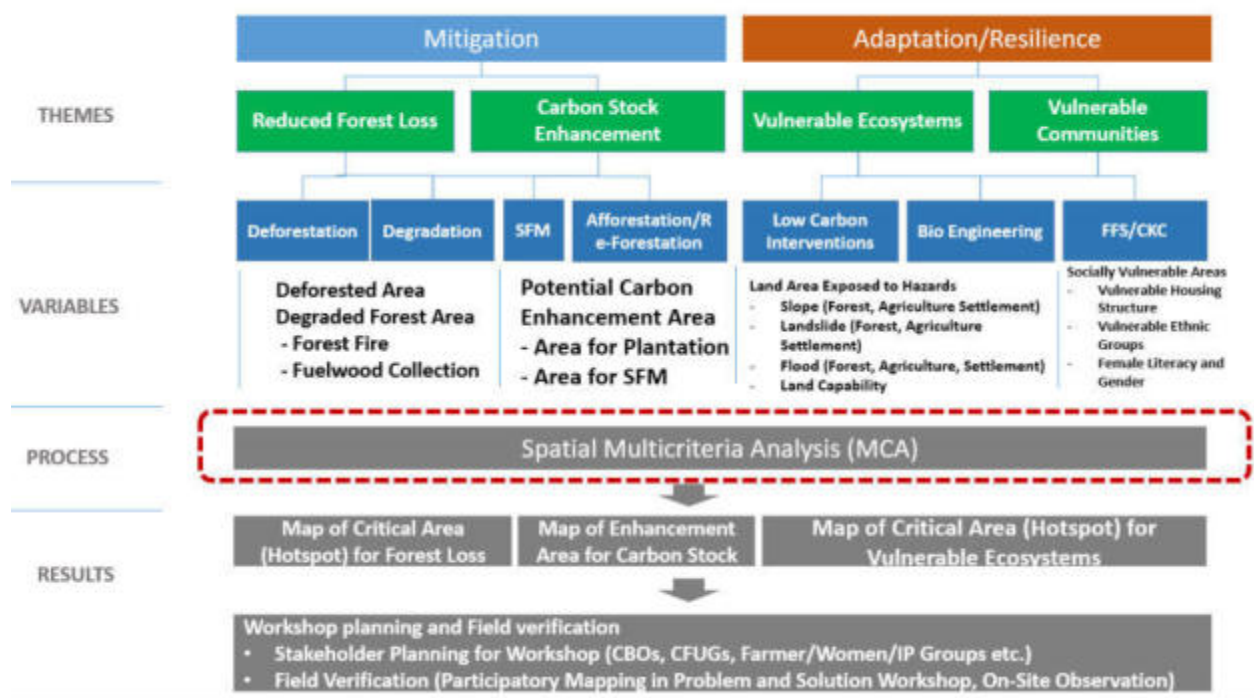


Figure 4: MCA process

The problems are especially concerned with the two thematic issues: climate change mitigation focused on deforestation and forest degradation; and climate change adaptation focused on agriculture, livestock management, and climate-induced disaster risk, vulnerable local communities, and ecosystems. A pair-wise ranking template was used to prioritize the listed problems and drivers in each working group. Discussion with interaction was done on the basis of prioritized problems to assess causes and effects. Discussion and interaction were also done with respect to GESI and IP issues related to the river system. The themes with the possible relevant indicators of the hotspot was discussed and finalized during the stakeholder's expert consultation workshop (Table I).

Table 1: Variables considered as input data for Multi criteria spatial analysis (MCA)

SN	Theme	Indicators	Data available in terms of	Data Type/features	Source
1	Climate Change Mitigation	Deforested area	Forest loss present Forest gain present	Polygon	Hansen
		Degraded Forest Area	Present Absence	Polygon	Google Earth Imageries (2021)
		Forest Fire	Present Absence	Point	MODIS
		Fuelwood Collection	Household using firewood for cooking	Polygon	CBS, 2011
		Forest exposed to landslide hazard	Landslide Inventory in terms of coverage area depending on the river system: High Medium Low	Polygon	Google Earth Imageries (2021)
		Enhancement Area	Pond areas in terms of: Pond exist No Pond Abandoned cultivated land & Riverbed	Polygon	PCTMCDMP (PCTMCDB, 2016) DoS, 1996
2	Climate Change Adaptation	Agriculture land in slope area	Slopes in 3-classes: <20° 20-30° >30°	Raster	ASTER (DEM 30m resolution)
		Agriculture exposed to landslide hazard	Landslide Inventory in terms of coverage area depending on the river system: High Medium Low	Polygon	Google Earth Imageries (2021)
		Agriculture exposed to flood hazard	Flood susceptibility in terms of: Very High (Riverbed) High Medium	Raster	PCTMCDMP (PCTMCDB, 2016)
		Land capability	Land class in 8 classes	Polygon	Soil and Terrain Database (SOTER) (FAO, 2009)
		Settlement exposed to landslide hazard	Settlement area exist Non-settlement area exist	Polygon	Maps.qed.ai

		Settlement exposed to flood hazard	Settlement area at Flood susceptibility: Very High (Riverbed) High Medium	(Raster)	Maps.qed.ai
		Landslide hazard Inventory	Landslide inventory: High Medium Low	Raster	PCTMCDMP (PCTMCDB, 2016)
		Flood hazard	Flood susceptibility in terms of: Very High (Riverbed) High Medium	Raster	PCTMCDMP (PCTMCDB, 2016)
		House structure	Indices	Polygon	CBS, 2011
		Female literacy (Gender)	Indices	Polygon	CBS, 2011

Chapter 2: Introduction to Kamala Belsot Jogiya River System

2.1 Physiography, Land Cover and Hydrology

The KBJ River System consists of major tributaries, viz., Kamala, Belsot, Jogiya, Bhedwa and Selar that originate in the Siwalik hills. . The Kamala, Belsot, and Jogiya rivers . The Kamala, Belsot, and Jogiya rivers are the three rivers that make up the KBJ River System in the project.

The KBJ River System is outlined in the project in such a way that Belsot River from Katari Municipality-1, Udayapur District, which originates at at 485masl, meets Kamala River in Kalikhola Gaun, Katari Municipality-1, while Jogiya River from Ganeshman Charnath Municipality-5, Dhanusha, which originates at 350masl, meets Kamala River in Chisapani at 122masl and the Kamala River reaches to the Nepal-India Border in South. The several thematic maps, including the River network of the River System is given in the report (Annex 2). The coverage area of the river system is about 53,113 hectare (ha). The river system covers three physiographic regions: Churia 20,803 ha (39%), Bhabar 3,298 ha (6%), and Terai 29,012 ha (55%) (DoS, 1996) (Figure 5). The total length of Kamala River within the project's KBJ River System is 98. km, whereas the areal distance from Jitpur (169 masl), Dudhauri Municipality-9 in North to the Inarwa, Siraha Municipality-17 in South at 68masl in South-Nepal-India Border is about 41 km .

The river system is dominant with tropical mixed hardwood forest-dominant species Sal (*Shorea robusta*), Asna (*Terminalia tomentosa*), Karma (*Adina cordifolia*), Harro (*Terminalia chebula*), Barro (*Terminalia bellirica*), Jamun (*Syzygium cumini*), and forest in low land Sisau (*Dalbergia sissoo*), Khayer (*Acacia catechu*), Simal (*Bombax ceiba*).

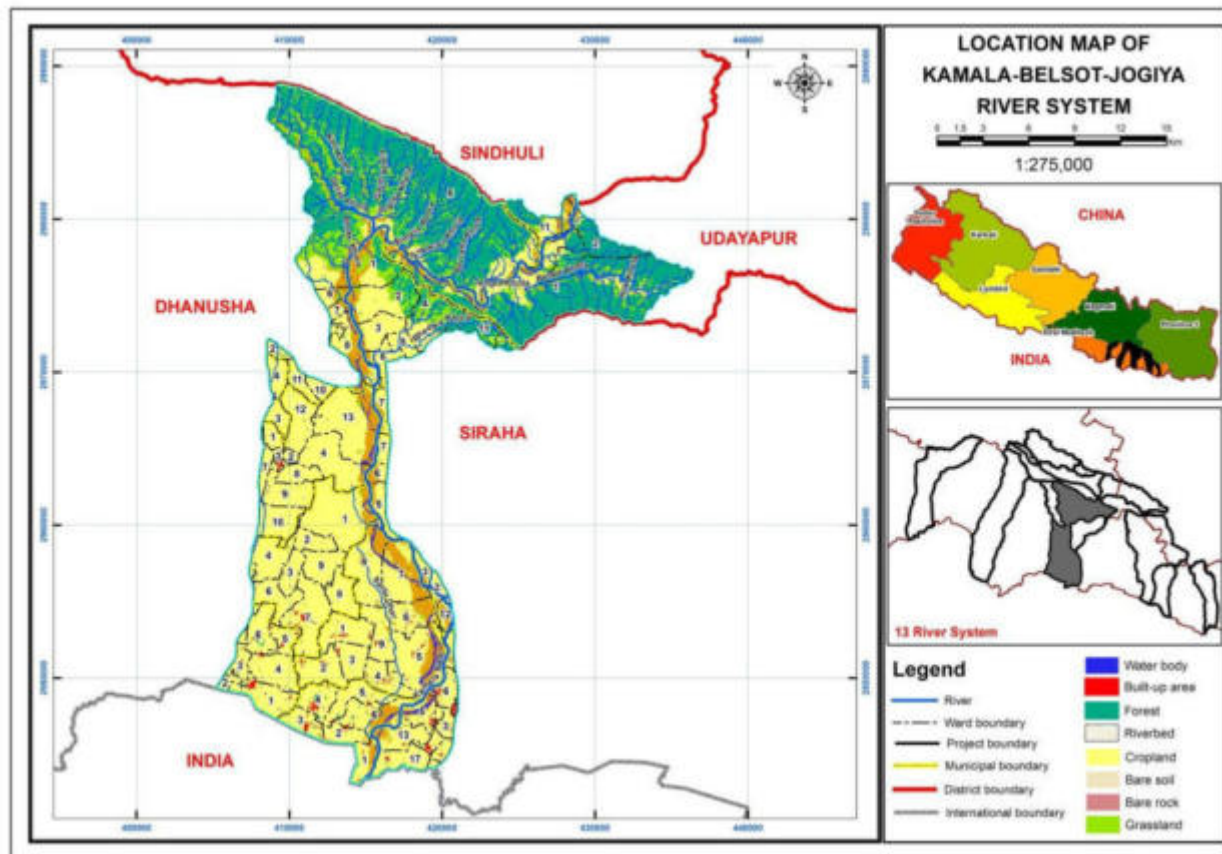


Figure 5: Location map of Kamala Belsot Jogiya river system

The hillslope is composed of Upper Siwalik (US) and Middle Siwaliks (MS) (DMG, 2007). The US of Kamala Belsot Jogiya river system (RS) consists of interbedded mudstones and fine sandstones or siltstones. Similarly, MS comprises higher proportion of sandstone in a sequence of interbedded sandstone and mudstone. Sharp topography with high relief, steep slopes and escarpments are formed on the Middle Siwaliks, which is attributed to a higher proportion of beds of thick massive hard and resistant sandstones (Figure 6).

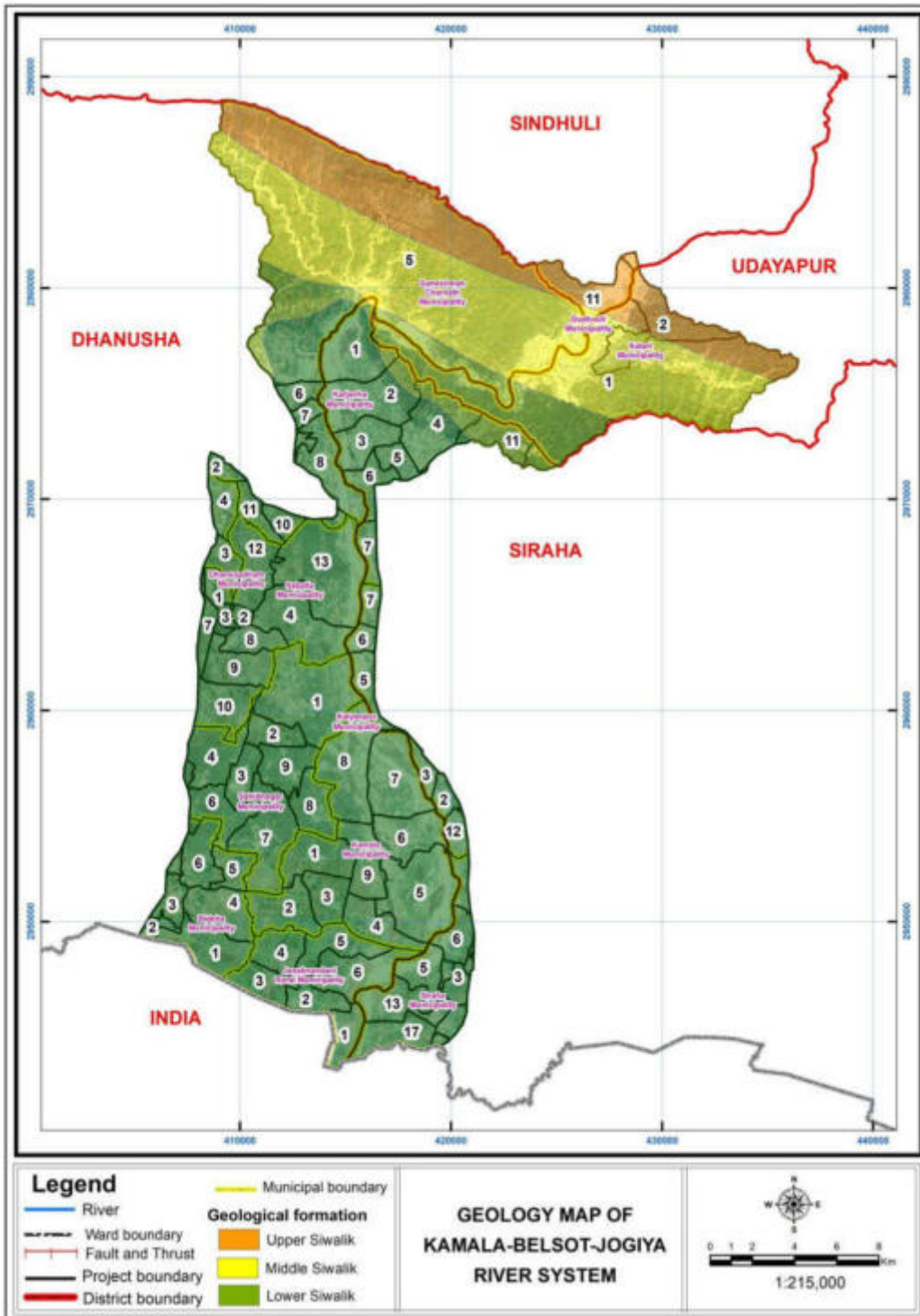


Figure 6: Geology of Kamala Belsot Jogiya river system

Predominant land use of this river system are cultivation land, covering 54.6% of total area in 2000, which has been decreased at the rate of 0.05 percent per year in 19 years (2000-2019). Forest area is also decreased at the rate of 0.67 percent per year over the period (Table 2).

Table 2: Land cover change in Kamala Belsot Jogiya river system

Land cover	2000		2019		Change area (ha) in 19 years	Rate of Change (% per yr)
	Area (ha)	Percentage (%)	Area (ha)	Percentage (%)		
Built-up area	176.0	0.3	483.9	0.9	307.9	9.21
Cultivation	29004.4	54.6	28709.2	54.1	-295.1	-0.05
Forest	15267.3	28.7	13319.2	25.1	-1948.1	-0.67
Grassland	3206.7	6.0	4395.1	8.3	1188.4	1.95
Other wooded land	95.1	0.2	949.6	1.8	854.5	47.29
Riverbed	4490.5	8.5	4375.7	8.2	-114.8	-0.13
Waterbody	873.3	1.6	880.6	1.7	7.3	0.04

Source: ICIMOD, 2021

2.2 Climate Variables:

The river system is located in the Siraha and Saptari district and has a tropical climate with significant monsoon influence (June-September), which received higher rainfall (1000-1500mm) whereas Udaypur and Dhanusa district has a sub-tropical climate with significant monsoon influence (June-September), which received higher rainfall (1500-2000mm) (DHM, 2017). A recent study by DHM Nepal on observed climate trend analysis for the period of 1975- 2014 suggested a significant positive trend in annual maximum temperature data at the rate of 0.029° C/ year in Siraha district (DHM, 2017). Moreover, Climate change scenario analysis performed for the National Adaptation Plan (NAP) process indicated that average annual mean temperature of Siraha district is likely to rise, Representative Concentration Pathway (RCP) 4.5 projected that the temperature would increase by 0.86°C and 1.23°C in the medium-term and long term respectively (Table 3). The highest rates of mean temperature increase are expected for the post-monsoon season followed by the winter season (VRA MoFE, 2019).

Table 3: Climate change scenario (MoFE, 2019)

Temperature	District	°C	Change (°C)			
		RCP 4.5	RCP 4.5		RCP 8.5	
	Reference Period (1981-2010)	Medium Term (2016-2045)	Long Term (2036-2065)	Medium Term (2016-2045)	Long Term (2036-2065)	
	Siraha	24.2	0.86	1.23	1.07	1.8
	Sindhuli	19.7	0.83	1.17	1.04	1.75
	Udaypur	19.9	0.81	1.17	1.02	1.72
	Dhanusa	24.4	0.87	1.24	1.08	1.83
Precipitation		mm	Change (%)			
		RCP 4.5	RCP 4.5		RCP 8.5	
	Reference Period (1981-2010)	Medium Term (2016-2045)	Long Term (2036-2065)	Medium Term (2016-2045)	Long Term (2036-2065)	
	Siraha	1521	4.46	5.86	4.87	9.45

	Sindhuli	19.7	0.83	1.17	1.04	1.75
	Udaypur	1653	3.37	4.58	3.55	7.93
	Dhanusa	1529	5.16	7.26	5.89	10.9

Source: MoFE 2019

Similarly, average annual precipitation is likely to change in both the medium-term and long-term periods. It is likely to increase by 5.86% and 9.45% in the long period based on RCP 4.5 and RCP 8.5 respectively in Siraha district. Likewise, average annual precipitation is likely to change in both the medium-term and long-term periods. It is likely to increase by 4.57% and 7.87% in the long period based on RCP 4.5 and RCP 8.5 respectively in Saptari district and average annual precipitation is likely to change in both the medium-term and long-term periods. It is likely to increase by 4.58% and 7.93% in the long period based on RCP 4.5 and RCP 8.5 respectively in Udaypur district. Correspondingly, average annual precipitation is likely to change in both the medium-term and long-term periods. It is likely to increase by 7.26% and 10.9% in the long period based on RCP 4.5 and RCP 8.5 respectively for Dhanusa district.

2.3 Socio-ecological process

The major rivers of this river system originated from the Siwalik Range gave rise to the KBJ River, which flows south with a high risk of flooding. The largest floods in the history of the Kamala River affected the upstream, midstream, and downstream regions of the river system, which span a river course of about 79 km. Consequently, the cultivated land in the Terai and Bhawar regions is vulnerable to flooding, which has a significant impact on the local population's ability to support themselves. The Terai region's Hilly IPs, Madheshi, and Dalit are the predominant indigenous populations and other ethnicities in the river system. Despite being a part of community forest user groups, IPs and Dalits in the upstream region lack the capacity to manage the forest effectively. The largest market.

2.4 Problem analysis

Theme I: Climate change mitigation

2.4.1 Direct and underlying drivers of Deforestation and Forest Degradation (D&FD)

Several drivers and underlying causes of D&FD were identified in the problem tree analysis in the local user's consultative workshop and verified in the expert consultative workshop held at the river system level. The drivers and underlying causes also identified through community workshop, focus group discussion and consultation meeting with women led organization gender specific concerns, issues. The identified drivers and underlying causes are listed below (Table 4). Riverbank cutting and gully erosions, forest fire, open grazing, and encroachment are the major drivers contributing to forest loss in the river system.

Table 4: Drivers and underlying causes of D&FD in Kamala Belsot Jogiya River System

Drivers	Priority	Underlying causes
Forest fire	I	<ul style="list-style-type: none"> a) Inadequate management of fire lines and trails b) Limited resources for the provision of forest watchers c) Limited forest fire control tools and equipment with users d) Lack of practices for the removal of dried leaves and branches e) Unavailability of water sources in and around forests f) Users' overconfidence in the emergence of new species and regrowth of grasses after forest fire g) Lack of forest management and service training, skills, and knowledge specially for women.

		<ul style="list-style-type: none"> h) Inadequate forest management training, skills, and knowledge among men and women. i) Carelessness and unawareness of herders/users
Encroachment and Illegal logging	2	<ul style="list-style-type: none"> a) Ineffective forest management governance of user groups b) Inadequate resources for the provisions of forest watchers c) Inactiveness of Community Based Organization (CBOs) d) Absence of concern from local governments and communities e) Lack of sensitization and awareness f) Lack of coordination among CFUGs members and the general users
Excessive fuelwood collection	3	<ul style="list-style-type: none"> a) Inadequate alternative energy sources especially among women of marginalized groups. b) Unemployed and dependent on fuelwood and timber collection for income generation (50% youth users)
Open grazing	4	<ul style="list-style-type: none"> a) Inadequate alternative energy sources especially among women of marginalized groups b) Lack of grazing land allocation c) Lack of fodder (about 20% famers have no lands for fodder plantation) d) Unemployed and dependent on fuelwood for income generation (particular by women)
Physical infrastructure development	5	<ul style="list-style-type: none"> a) Weak engagement of local governments and lack of coordination with the local government in infrastructures development b) Expansion of settlements
Multi-hazards- River bank cutting and gully erosion, drought	6	<ul style="list-style-type: none"> a) Fragile geology b) Intense and frequent rainfall c) Spatial rainfall variability d) Limited capacity of community for controlling riverbank, torrent, streams, gullies erosion

Source: Field consultation in the Problem Analysis Workshop, Kamala Belsot Jogiya River System

Problem tree analysis was done in the workshop and is presented here (Figure 7). The first 5 drivers are briefly discussed below:

Forest fire: In the river system, every year (pre-monsoon season from March to May), two to three fire events happen in the forest region. In addition, careless human activity has also contributed to the occurrence of forest fires. Other underlying causes of forest fires in the river system include people's misconceptions about: sprouting of new grass after fire, limited resources for the provision of forest watchers; limited forest fire control tools and equipment with users; lack of practices for the removal of dried leaves and branches; and unavailability of water sources in and around forests.

Encroachment: According to the local people, forest encroachment is noted in the Kamala Belsot Jogiya river system. Increased encroachment is primarily the result of poor forest management governance of user groups, inactivity of community forest user groups (CFUGs), informal political support contributing to encroachment, an inadequate role of local government in forest management with less emphasis on controlling forest encroachment, and a lack of sensitization and awareness.

Illegal logging: Illegal logging is in practice due to inadequate institutional capacity of forest user groups, lack of livelihood and income-generating options for vulnerable communities, and interference of

downstream communities in the river system. Similarly, the underlying causes are inadequate forest operation plan implementation, insufficient skilled human resources, a lack of budget, insufficient coordination among committees, users, and Sub-Division Forest Offices (SDFOs), a lack of awareness, carelessness, a lack of income generation sources, a high reliance on timber and wood, excessive fodder and fuelwood collection, Open grazing , and so on. Illegal logging of forest products is happening by the users (40 percent of CFUG users and 60 percent of external users from downstream and other community forest users), because the wood demand for their houses or residential buildings is not meeting with the quantity of wood approved or provided by the forest authority DFOs, as reported by the participants in the workshop. In general, users have increased as a result of the increasing fragmentation of family members. The demand has increased (for example: 50 cubic feet is in demand per household, but 20 cubic feet is recommended by the authorities every 5 years in the Chayan Danda Community Forest User Group in the Belsot Catchment in Katari municipality). CFUGs also have inadequate capacity to operate their forest operational plans effectively and unable to control illegal logging.

Excessive fuelwood collection: local communities have inadequate alternative energy sources for cooking and other domestic energy consumption needs. Lack of skilled training with equipment to maintain alternative energy sources and biogas, and ineffective fuelwood management among the users are the causes of the dependency of the users on fuelwood collection from the forest areas. According to the locals, about 90% of the community in the Belsot catchment is dependent on fuelwood.

Multi hazard (flash floods, landslides, and erosion): Sheet erosion was found to get transformed into small channels with runoff water—called rill erosion and then gully erosion—which swept away trees and bushes, especially in the pre-monsoon (March-May) and monsoon period (June-September), according to the locals. The gullies are increasing in number as well as in width in the river system.

Likewise, the occurrence of floods, landslides, and soil erosion has been increasing in terms of number and severity, expanding their area in the river system. The heavy rainfall has exacerbated flooding, landslides, and soil erosion. These hazardous events have degraded the forest area in the river system. In addition, landslides and erosion are observed in Ganeshman Charnath Municipality-5, and Katari Municipality-1&2 (information based on Problem Workshop and field visit, 2022).

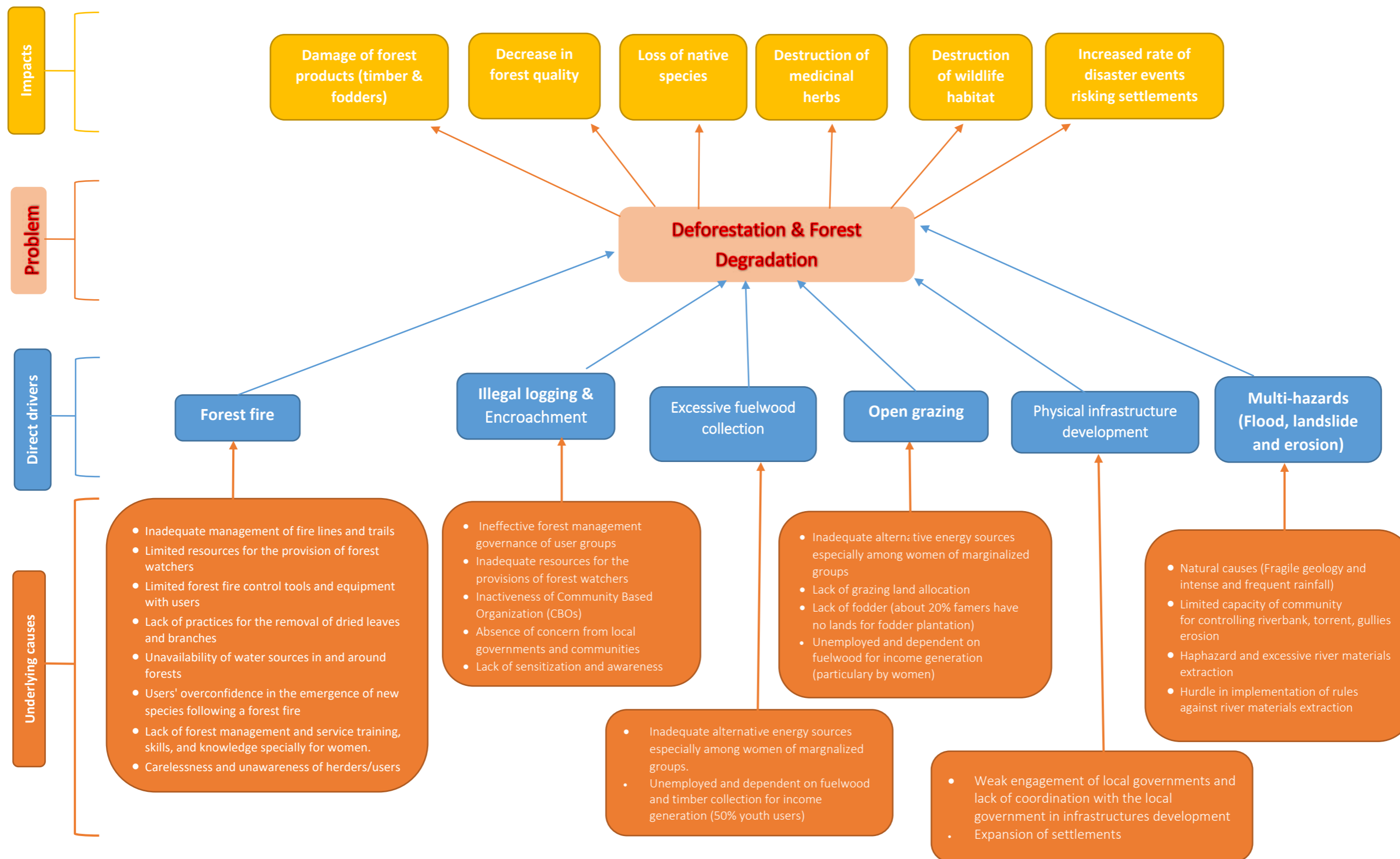


Figure 7: Direct drivers and underlying causes of D & FD in Kamala Belsot Jogiya river system

1.1.2 Hotspot for forest loss (Multi-criteria Analysis Result Map 1)

- The forest covered area has decreased at the rate of 0.67 percent per year in the last 19 years (2000–2019) and the cultivation area has also decreased at the rate of 0.05 percent per year whereas built-up area has increased at the rate of 9.21 percent per year in the river system (Source: ICIMOD, 2000 and ICIMOD, 2019). However, the primary information (grazing areas, encroachment areas, and illegal logging, the major forest loss has been concentrated in small patches in the river system. In addition, the several drivers and underlying causes might have contributed to the **degraded forest areas (cumulative area 1099 ha)**, mainly in Dudhouli Municipality-11; Ganeshman Charnath Municipality-5 & 8; Kamala Municipality-8; Karjanha Municipality-1, 2, 3 & 4; Katari Municipality-1; Sabaila Municipality-4 and Sahidnagar Municipality-3.
- Major landslides and rapid formation of gullies, mainly in: Ganeshman Charnath Municipality-5; Karjanha Municipality-4 and Katari Municipality-1 & 2 have rapidly expanded and eroded the forest lands. The degraded forest region is geologically fragile and has steep slopes.
- Midstream and downstream river bed levels rise rapidly (for example, at Ganeshman Charnath Municipality-5, 6 & 8; Janaknandani Rural Municipality-1 & 6; Kalyanpur Municipality-5, 6, 7 & 12; Kamala Municipality-5 & 6; Karjanha Municipality-1, 2 & 3; Katari Municipality-1 & 2; Sabaila Municipality-4 & 13; Sahidnagar Municipality-1 and Siraha Municipality-17 silt deposition exposes river bed agriculture lands.
- Encroachment, fuelwood collection, and illegal logging, mainly in Kamala Municipality-8; Karjanha Municipality-2 & 4; Ganeshman Charnath Municipality-5 and Katari Municipality-1 in the river system and open grazing are the major driver in the river system. Illegal logging of forest products is happening by the users (40 percent of CFUG users and 60 percent of external users from downstream and other community forest users), because the wood demand for their houses or residential buildings is not meeting with the quantity of wood approved or provided by the forest authority DFOs, as reported by the participants in the workshop. In general, users have increased as a result of the increasing fragmentation of family members. The demand has increased (for example: 50 cubic feet is in demand per household, but 20 cubic feet is recommended by the authorities every 5 years in the Chayan Danda Community Forest User Group in the Belsot Catchment in Katari Municipality-1). In addition, CFUGs also have weaknesses in operating the plan and laws of community forest, and this is also reflected in illegal logging. According to local stakeholders: about 400-500 cattle grazed daily in Shahidnagar Municipality-1.

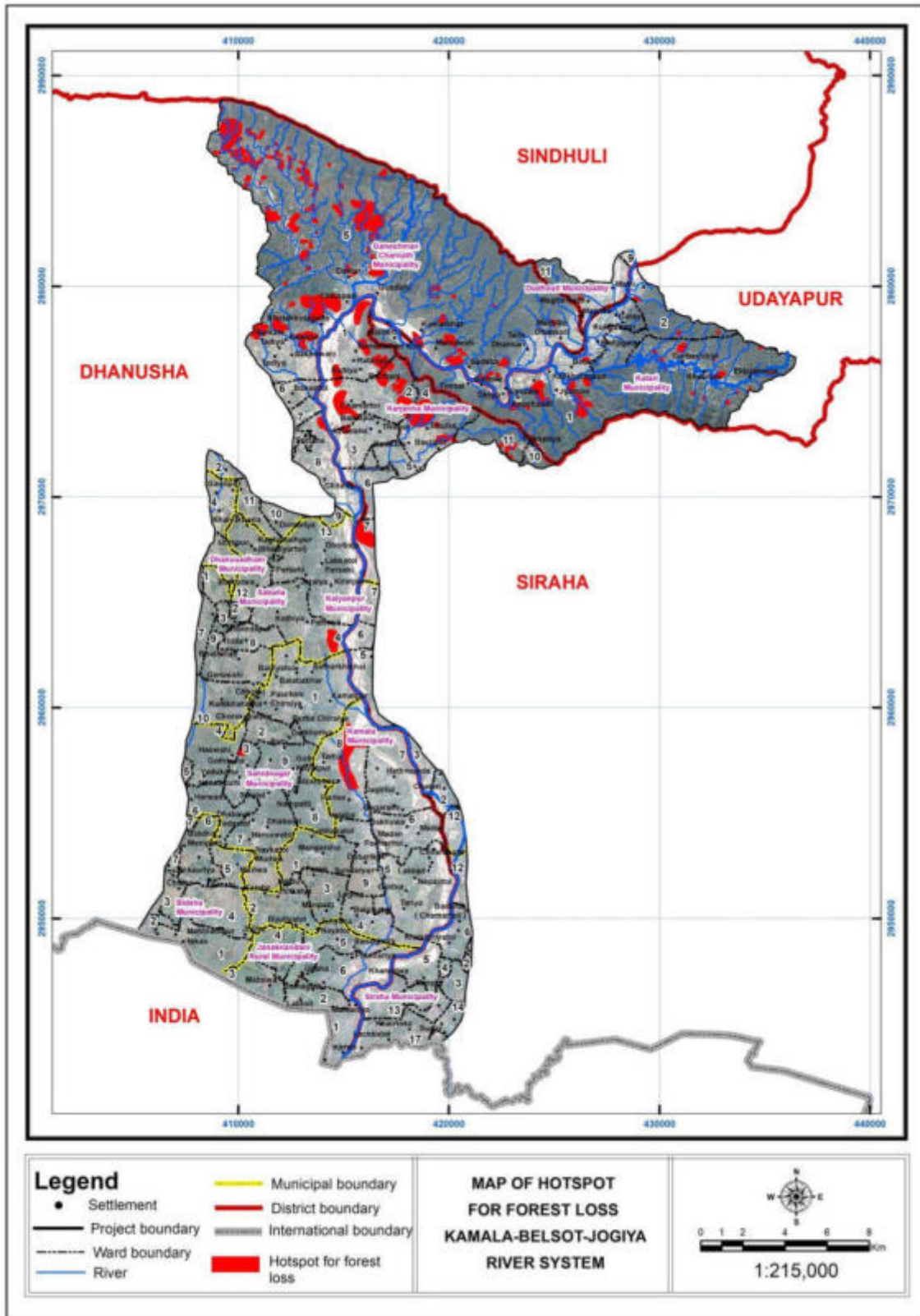


Figure 8: Map of Hotspot for Forest Loss in Kamala Belsot Jogiya River System

2.4.3 Enhancement area for carbon stock -MCA Result Map 2

- About **1099 ha** of area are degraded forests that need to be restored for carbon sequestration through forest regeneration activities in the Churia. The degraded forest is situated on different catchments, including Gauri, Jogiya, Selar and Raktabi catchments area as well as in Badahara, Joradah chure, Keshardamar and Kamalimai chisapani CFUGs in Dudhouli Municipality-11; Ganeshman Charnath Municipality-5 & 8; Kamala Municipality-8; Karjanha Municipality-1, 2, 3 & 4; Katari Municipality-1; Sabaila Municipality-4 and Sahidnagar Municipality-3..
- The river side plantation (afforestation) could be done on approximately **3032 ha**. Furthermore, afforestation needs to be carried out with different aspects of plantation, including including community land plantation (1296 ha), demonstration plantation (203 ha), riparian plantation (63 ha), and woodlot plantation (1470 ha). Here, the potential demonstration plantation area is determined on the basis of access to roads (priority along the road), nearby community, and users' priority.

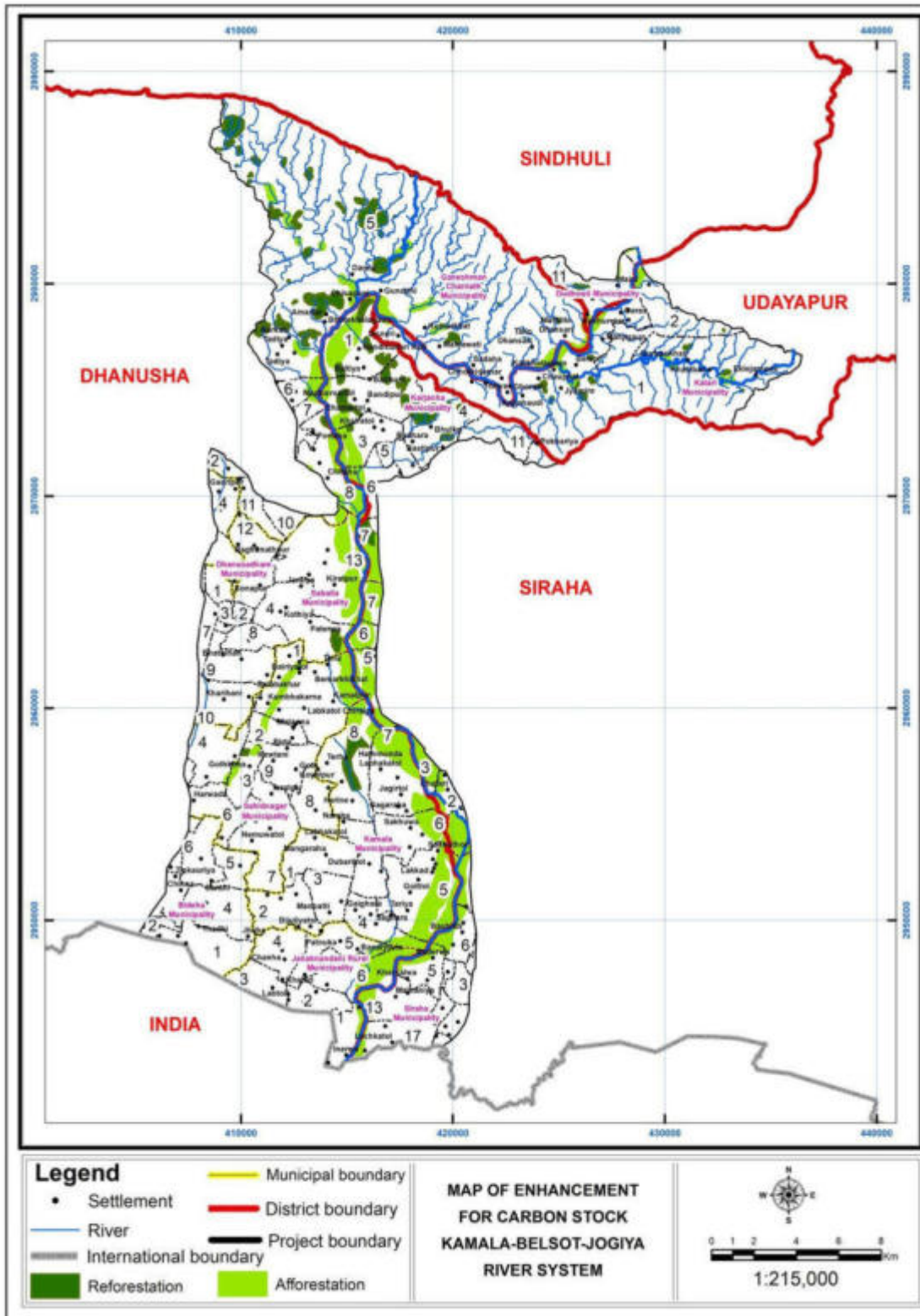


Figure 9: Enhancement for forest carbon stock in Kamala Belsot Jogiya river system

Theme 2: Climate change adaptation

2.4.4 Direct drivers and underlying causes of vulnerable ecosystem and community in the river system

Direct drivers and underlying causes of vulnerable ecosystems and communities in the river system were identified from the problem-tree analysis carried out in the user's consultation problem tree workshop and site verification. The drivers and underlying causes also identified through community workshop, Focus Group Discussion (FGD) and consultation meeting with women led organization gender specific concerns, issues. The major drivers are associated with degraded agricultural landscapes; the uncertainty of climate extremes and their impacts on water sources; agriculture production; crop insects, pests, and diseases; traditional livestock rearing practices; flooding, erosion, and landslide risks; poor irrigation facilities; anthropogenic activities in the extraction of river-induced resources; and capacity-related activities. The identified major drivers with rankings and the underlying causes are listed in the table (Table 5). Here, the drivers were ranked by the participants themselves using participatory Problem Ranking Matrix.

Table 5: Drivers and underlying causes of vulnerable ecosystem and community in Kamala Belsot Jogiya river system

Drivers	Priority	Underlying causes
Inefficient irrigation facilities	1	<ul style="list-style-type: none"> a) Water shortage at sources b) Lack of well-managed irrigation infrastructure c) Flooding occurs on a regular basis and damaging canal headworks in various tributaries of the river system. d) Women, Dalit and marginalized are not getting the access, information and support. e) Inadequate access, information and support to women, IPs, Dalit and marginalized people
Multi-hazards- Riverbank, erosion, landslide and deposition and drought and inundation	2	<ul style="list-style-type: none"> a) Frequent and intense rainfall triggers b) Fragile geology c) Excavation of river-induced mining materials in a haphazard manner d) Inadequate community capacity for flood and riverbank cutting control measures; e) Inundation due to rapidly river course changes to low lands in shreerampur, Judi bajar and Sanau khola to Bharatpur f) Lack of resources for water boring g) Inadequate practices with vegetative measures in soil erosion (low priority of plantation of bamboo, broom grass (<i>Amrisho</i>)) h) Plantation is lacking in gabion wall construction for river control measures. f) Lack of plantation in gabion wall construction for river controls measures
Infestation of crop insects, pests and diseases	3	<ul style="list-style-type: none"> 1. Lack of skills and knowledge for the selection of healthy seeds 2. Lack of understanding of pesticide applications 3. Unavailability of pesticides on time

		4. Lack of access, service, and information, specially among women, Dalits and vulnerable communities/households
Inadequate climate adaptation practices in the agriculture system, especially among women, IPs, Dalit and marginalized community	4	<ul style="list-style-type: none"> a) Inadequate technical knowledge, skills, tools, and technologies for agricultural practices on slope lands; b) Women farmers and marginalized farmer are not included in Sustainable Natural Resource Management (SNRM), technology and practices. c) Not easily accessible to the climate services to support decision making in agriculture practices. Gender roles affect to decide to adopt new practices. d) Inadequate skills and knowledge of compost manure, organic manure, and fertilizer formation e) Inadequate support and priority for crop seed production Deterioration of soil nutrition in riverside and farmlands
Decreases soil fertility	5	<ul style="list-style-type: none"> a) Inadequate resources and knowledge to restoration of soil nutrition in riverside and farmlands b) Inadequate knowledge of how to use fertilizer properly in changing environmental conditions;
Wild animal threats to agricultural production	6	<ul style="list-style-type: none"> a) Declining quality of wildlife habitats in the forests b) Inadequate crop farming practices, which are usually not damaged by wildlife, f) Lack of coping measures like fencing to protect agriculture crop from wildlife threats (<i>Neel Gai. Badel, Dumsi</i>)
Inadequate knowledge with no access to the commercialization of agricultural production	7	<ul style="list-style-type: none"> a) Lack of agricultural production collection centers and storage b) In access to the market center and information directly c) Becoming expensive to use tools/machines in agriculture mechanization d) Insufficient knowledge, agri-extension service/materials targeted to women and vulnerable groups.
Inadequate gender-inclusive governance	8	<ul style="list-style-type: none"> a) Male- supremacy and dominance in decisions b) Limited access of women to information and communication (especially climate change and irrigation, information about existing facilities, fund, notice, and subsidies) c) Less consultation with women regarding agenda and time of meetings d) Unavailability of disaggregated data e) Lack of recognition of traditional knowledge of women in SNRM f) Articulation of CRLUP/SNRM /DRR as scientifically complex subjects g) Limited knowledge on gender mainstreaming approach and value among officers/key people h) Gender power relations within households and in society and restricted mobility of women

Source: Problem tree analysis workshop,2022

The river system suffers from multi-hazards (drought, riverbank cutting, flood and landslide) due to climate impact and the impacts are magnifying due to its topographic settings and land use change. These

phenomena cause the degradation of land resulting into decreased agricultural production resulting in community vulnerability.

The agriculture ecosystem in the river system is vulnerable to river bank cutting in agriculture lands. In addition, the agricultural land is threatened by river cutting and heavy sediment deposition, resulting in the loss of soil and soil fertility. These drivers play a negative role in decreasing agricultural production in the river system. The river bank cutting is mainly reported in different locations, particularly in the Katari Municipality-1 & 2 and Ganeshman Charnath-5 & 8. The sediment deposition is on a 3032 ha area in the river system.

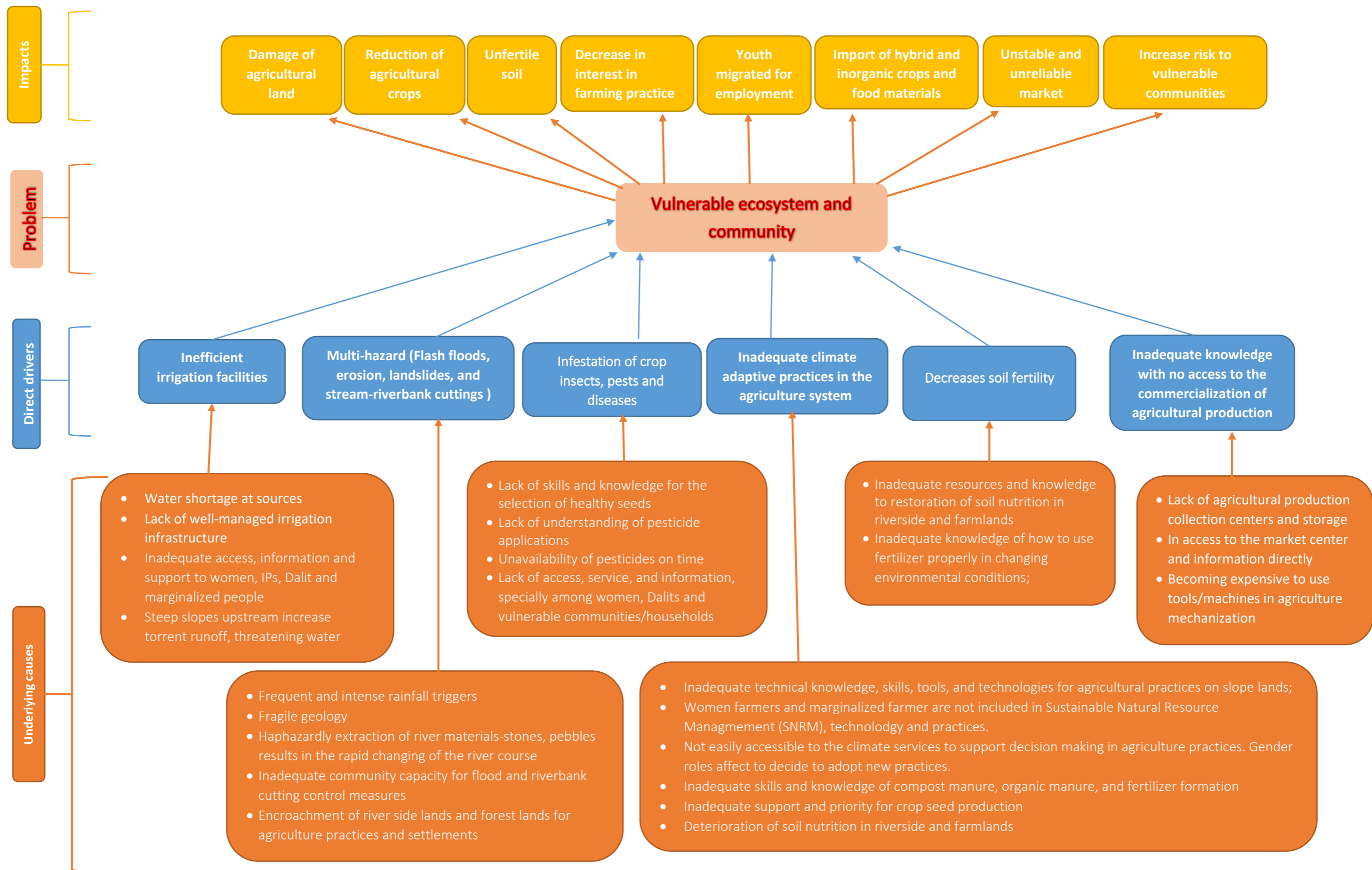


Figure 10: Direct drivers and underlying causes of vulnerable ecosystem and associated community in Kamala Belsot Jogiya river system

2.4.5 Hotspot for vulnerable ecosystems- MCA Result Map 3

- Primary data on sediment deposition area, river bank cutting zone, landslides were also integrated into the hotspot maps;
- Sediment deposition has been identified in the agricultural lands covering 3032 ha, mostly in Ganeshman Charnath Municipality-5, 6 & 8; Janaknandani Rural Municipality-1 & 6; Kalyanpur Municipality-5, 6, 7 & 12; Kamala Municipality-5 & 6; Karjanha Municipality-1, 2 & 3; Katari Municipality-1 & 2; Sabaila Municipality-4 & 13; Sahidnagar Municipality-1 and Siraha Municipality-17 of the river system;
- The spatial distribution of the hotspot map showed the distribution of hotspot areas along gullies, the river bank with the most vulnerable communities with respect to riverbank cutting and flooding in the river system. The consequences of such a phenomenon reflect on social vulnerability, including:
 - Rapidly, Kamala bank erosion is happening every year that threatens 50HHs in Katari municipality I-Belsot.
 - Likewise, Kamala River bank cutting and bank erosion in Dudhauri Municipality-II in Dhansari threaten 10 ha of agriculture land upstream of the river system.
- The vulnerable ecosystem and associated community have been classified into three classes of vulnerability, i.e., high, medium, and low. The high vulnerability refers to settlement risk and forest loss due to multi-hazards; the medium vulnerability means agricultural land risk to floods and landslides; and the low vulnerability refers to the low impact of agriculture and settlements from floods and erosion risks (Figure 11).

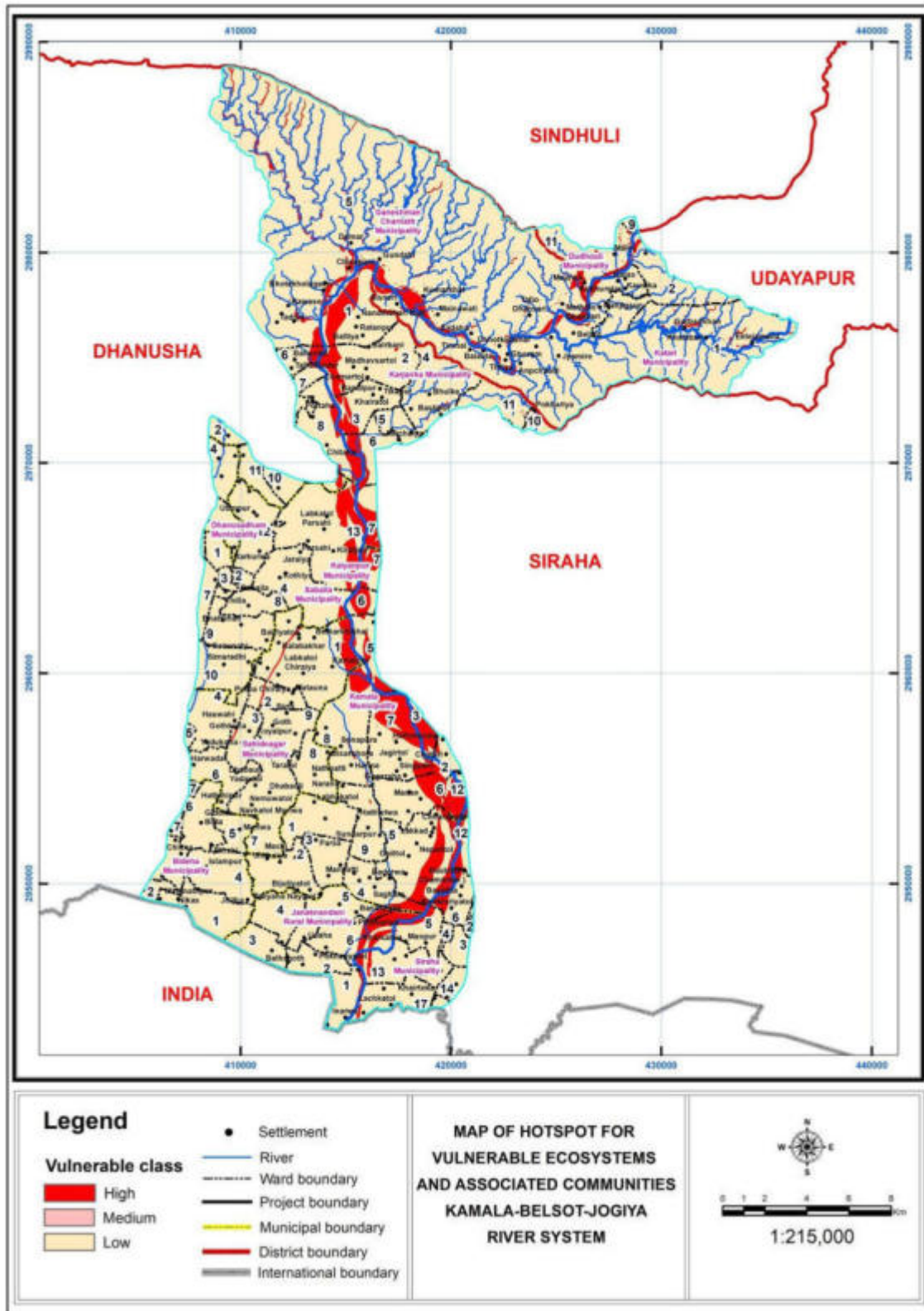


Figure 11: Map of Hotspot for Vulnerable Ecosystem and Community in Kamala Belsot Jogiya River System

2.4.6 Linkage of GESI and IPs specific issues to forest loss and vulnerable ecosystems

Mainstreaming of Gender Equality and Social Inclusion (GESI) and Indigenous Peoples (IPs) are needed in the implementation of the restoration of the ecosystem in the river system. Because of some limitations, women and men have direct and indirect roles in degraded forests and ecosystems. Women in the river system have suffered from the impact of climate change and vulnerability. Women lacked relevant information on agriculture to share their views in planning, and women suffered during the disaster. Some of factors that indirectly contributes to forest loss and vulnerable ecosystems include:

- Usually, power imbalances happen when women, the elderly, and marginalized communities are excluded from capacity-building trainings and orientations on forest management-related activities. For example, women and excluded groups are much more vulnerable in this river system in upstream and IP's women have less chance to form their own group (for example, 150 HHs of IPs-Magar ethnicity in Garas-Katari municipality-2 have inadequate knowledge on forest management and resource utilization) .
- According to the local women, their active participation is limited because: a) training materials usually do not favor them; and b) women are not given more time to express their views on forest and natural resource management.
- Women have felt difficulty continuing the use of improved cooking stoves because they do not have skill in the maintenance of cooking stoves.
- Women from marginalized communities are not interested in vegetable cultivation and agricultural practices in the river system due to a lack of knowledge about crop pest and disease management, ineffective irrigation facilities, and insufficient skills for the preparation and use of pesticides and organic fertilizers.
- Most of the vulnerable communities (about 90%) depended on fuelwood collection
- Low participation of women in fire control and management measures and training;
- Some other drivers related to vulnerable ecosystems that posed constraints for women's capacity enhancements with respect to power in decision making and access to government facilities, including:
 - Increased climate-induced disaster risks in water management and human settlement;
 - Lack of technical knowledge and skills and irrigation problems
 - The minimum role given to women in irrigation management
 - The training location and general time allocation are unsuitable for female participants.
 - lack of women's involvement in CFUGs for forest management and also for soil and water conservation;
 - Women have little or no decision-making power in agricultural practices downstream.
 - Women have less knowledge about improved seed varieties and have less access to fertilizers.
 - Women's time is spent, which is prominent in livestock rearing and feeding, but they could not take their decisions in earning money by selling cattle and goats.
 - It is hard to get alternative options for the income generation of the upstream community, especially for women. Women in upstream are dependent on fuelwood collection for selling.

Solution Analysis

2.5.1 Climate change mitigation: solution analysis of D&FD

Environmental impacts of D & FD include-damage and fragmentation of habitat, loss of biodiversity, disruption of water cycles, soil erosion, and desertification. The potential mitigation activities determined by the local users' community in the solution analysis workshop are presented in the graphics (Figure 12) in order to promote forest development for reducing D &FD in the river system. Such mitigation activities include- afforestation, Assisted Natural Regeneration (ANR) for reforestation, and capacity building for sustainable management of existing natural forest, with key supportive activities.

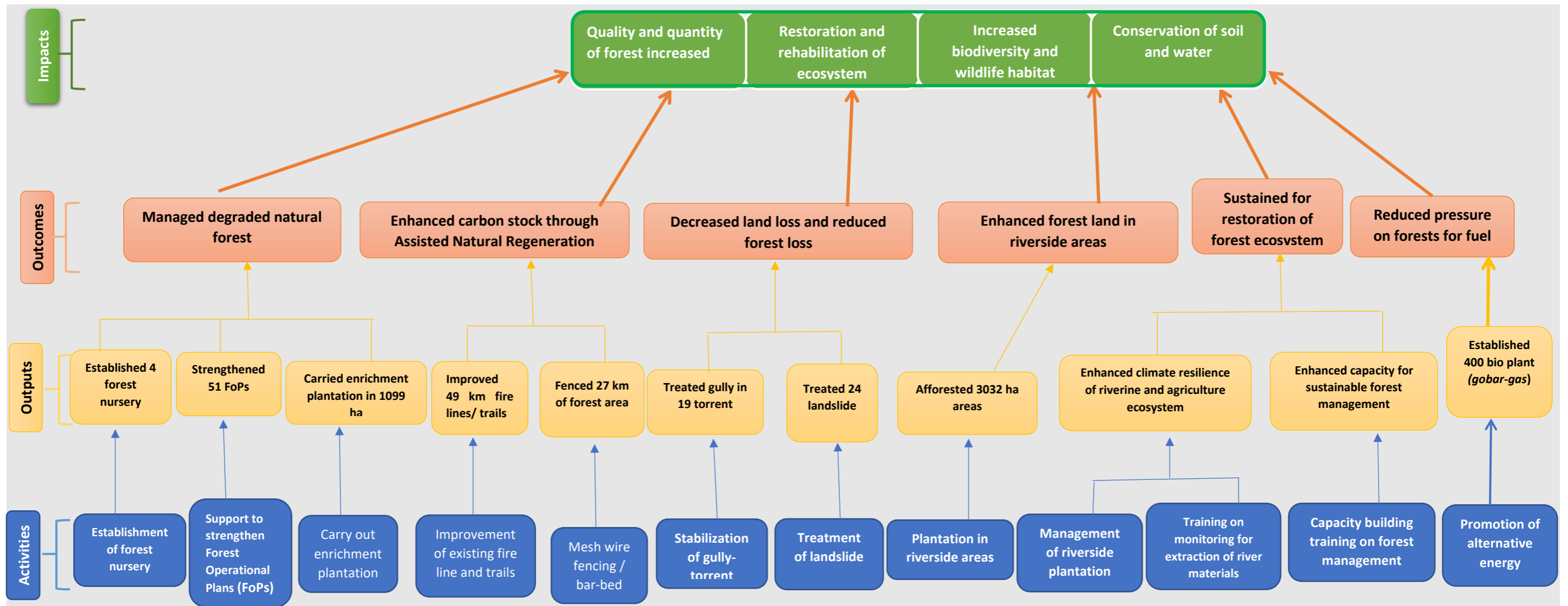


Figure 12: Solution tree analysis in Kamala Belsot Jogiya river system: Climate change mitigation

Activities, Outputs and outcomes for reducing degraded forest and enhancing forests

Several activities are proposed in the solution tree workshop to reduce degraded forest and increase carbon stock for enhancing canopy cover and forest density. The details of the activities are given in the Intervention Packages (IPacks) with their feasibility and safeguards matrix (details given in Section 5). And the details solution with the location and activity code in the map with BRCRN priority are also given in the separate data spread-sheet. The outputs and outcomes of the activities in climate change mitigation are given in the table (Table 6).

Table 6: Activities, outputs and outcomes for reducing degraded forest and enhancing forests in the Kamala Belsot Jogiya river system

Sub-activities	Activities	Outputs	Outcomes
Forest nursery establishment and enrichment plantation in degraded forest		Output 1: Natural forest ecosystems are better maintained and protected within the project area	
Natural regeneration Management-Assisted Natural Regeneration (ANR) activities <ul style="list-style-type: none"> ➤ Reduction of forest fire hazards through cleanings and improvements of existing fire line and existing trails (extraction of bushes, leaf litters and forest residues) ➤ Fencing with mesh wire ➤ Provisions for forest watcher, ➤ Minimize grazing with alternatives; ➤ Provisions for forest fire response toolkits (toolkit include gloves, boots, first aid medicine, accidental insurance) ➤ Adoption and linking of new technology (for example: Forest Watcher mobile app- the dynamic online forest monitoring and alert systems) for fire controls, ➤ Strengthening and reviewing forest operation plans to reinforce the forest management system. ➤ Empower CFUGs /LFUGs (considering women member) on forest management and forest governance; ➤ Prioritize women members of CFUG's in providing training, capacity development and other activity that affect 	Restoration of degraded natural forests		<ul style="list-style-type: none"> ➤ Degraded forest managed ➤ Enhanced climate resilient in forest ecosystem ➤ Enhanced carbon stock in natural forest region

Sub-activities	Activities	Outputs	Outcomes
sustainable natural resource management.			
Orientation sensitization on forest fire control and management for herders and forest users groups	Enhancement of capacity for sustainable forest management		Reduced barriers of sustainable forest management Sustained for restoration of forest ecosystem and services
Capacity buildings on forest management for: <ul style="list-style-type: none"> • users groups prioritizing women • government entities 			
Capacity-buildings for local government on monitoring for sustainable extraction of river induced materials and mines;			
Facilitating support for sustainable extraction of riverbed materials at river system level in collaboration with the concerns (for examples: municipal government, province government and division forest offices, river mining's industries private sectors and relevant stakeholders)			
Plantation in river site areas Post plantation management with irrigation facility and fencing	Enhancement of forest land in river side areas	Output 2: Forests and tree cover are restored and maintained in the river system landscapes.	<ul style="list-style-type: none"> ➤ Enhanced forest cover and contributed in carbon stock (in 20-30 years from the plantation period) ➤ Enhanced livelihood capacity of vulnerable community ➤ Reduced human pressure on natural forest for woods, fodders and buildings materials ➤ Enhanced soil fertility of degraded lands in river site lands
Capacity buildings trainings for users on the management of plantation in new areas-river side areas			

Sub-activities	Activities	Outputs	Outcomes
			➤ Enhanced climate resilience of riverine and agriculture ecosystem
Stabilization of gullies with torrent controls in the torrent through innovative technology and local vegetative protective measures	Conserve soil and water source and Improve water retention	Output 3: Local structures are enhancing resilience against climate change induced erosion, sedimentation and flooding risks	
Treating landslides with vegetative conservation measures(priority basis)			
Facilitation for the Promotion of alternative renewable energy sources (improved cooking stoves, biogas, electric stoves) for women and vulnerable communities' dependent on the fuelwood for energy			

2.5.2 Climate change adaptation: solution analysis

The major solutions are associated with climate resilience in agriculture and land use practices; risk reduction of climate induced hazard floods, landslides, and droughts; and capacity building of farmers and users to enhance their climate resilience.

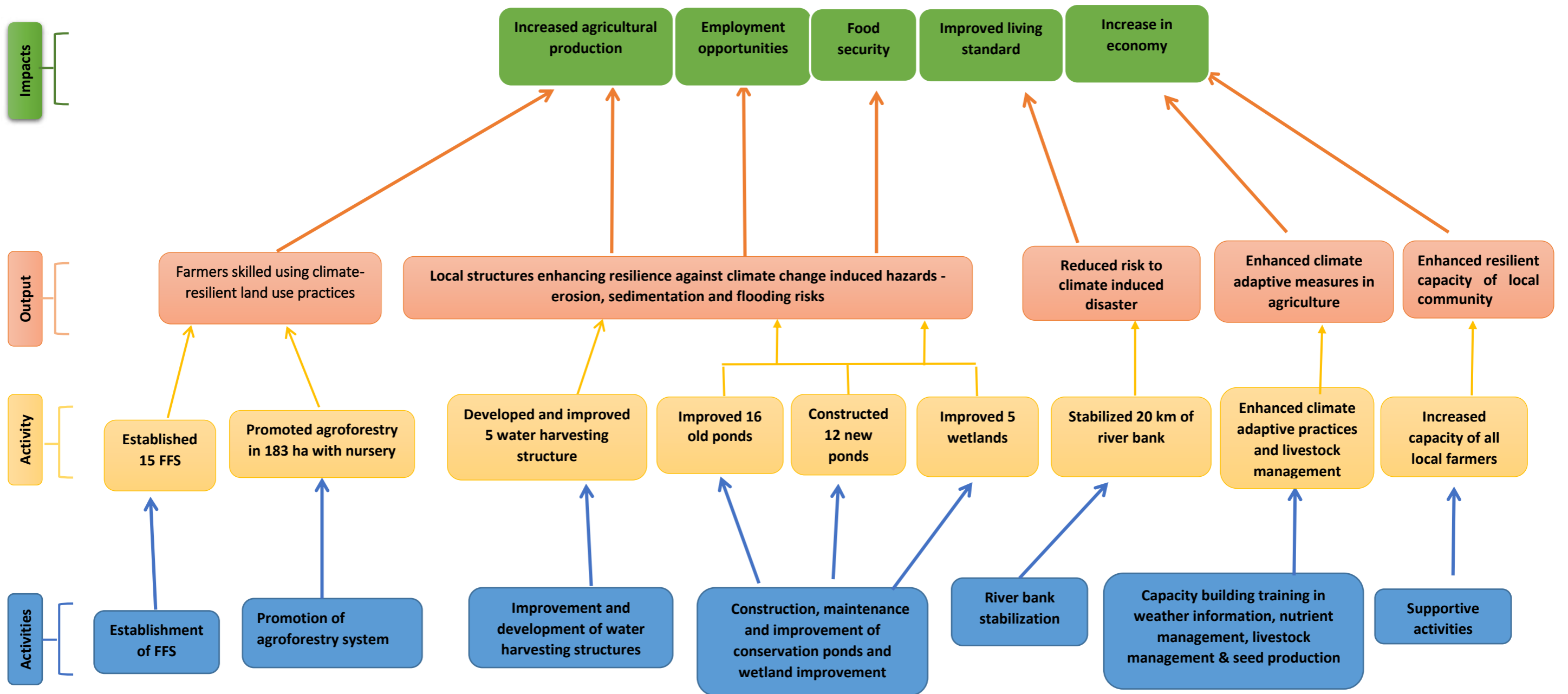


Figure 13: Solution tree analysis in Kamala Belsot Jogiya river system: Climate change adaptation

Activities, outputs and outcomes for reducing vulnerable ecosystem and communities

In order to address drivers listed (Ref section 2.4), several activities have been proposed to reduce vulnerable ecosystem and increase climate resilience of local vulnerable communities in the river system. The details activities are given in the Intervention Packages (IPacks) with their feasibility and safeguards matrix (details in Chapter-5). And the details solution with the location and Activity Code in Map with BRCRN priority are also given (provided the separate data sheet-excel in Appendix of the report). The outputs and outcomes of the activities in climate change adaptation and resilience is presented in the table (Table 7).

Table 7: Activities, outputs and outcomes for reducing vulnerable ecosystem and communities in Kamala Belsot Jogiya river system

Sub-Activities	Activities	Outputs	Outcomes
Construction of conservation ponds	Improve water retention and conserve water sources Reduce risk to water induced disasters and enhance coping capacity of vulnerable community	Output 3: Local structures are enhancing resilience against climate change induced erosion, sedimentation and flooding risks.	Enhanced coping and adaptation capacity of farmers to disaster risks Increased soil fertility Ensured water sources conservation and continuation of its services
Improvements and development of water harvesting local structures			
Riverbanks and torrent banks stabilization using local materials and bio-engineering			
Support on small irrigation facilities especially for small and medium enterprise farmers (for examples: support for surface flow management using cutoff wall chamber, irrigation canal headwork maintenance)			
Pond improvement			
Wetland protection			
Facilities of deep boring	Capacitate stakeholders in water and soil conservation		
Capacity buildings for users and government entities Promotion of rainwater harvesting in upstream regions to increase water availability and reduce flash floods, as well as connecting them to community income generation-farming system.			
Establishing agroforestry system with mixed cropping in multi-year crop; fodder and grasses with horticulture plants	Establish agroforestry activities	Output 4: Farmers are skilled in using climate-resilient land use practices.	Enhanced climate resilient capacity of farmers Enhanced the capacity of women in agriculture system and livestock management Increased income capacity of women and IPs
Institutional support for improved agroforestry groups	Capacitate farmer groups and government officers to promote agroforestry system		
Capacity buildings for Agroforestry Users Groups and government staffs			

Sub-Activities	Activities	Outputs	Outcomes
			Ensured markets of the agricultural productions
Establishment of FFS on several crops addressing several pests and diseases and facilitation for soil testing	Reduce risk to crop pests and diseases Increase agriculture production		
Support to farmers for seed production in the FFS locations			
Support for the conservation and utilization of water source by using local friendly technologies: Irrigation facilities improvement and drinking water sources improvement	Utilize water sources and improve irrigation services		
Capacity-building training in the use of weather information and its application in agricultural practices;	Enhance climate agricultural adaptive practices and increase livestock management practices		Enhanced climate adaptive measures in agriculture
Provide training nutrition management landuse practices- (Following customary laws and practices adopted by Indigenous Peoples in land use patterns) - compost manure preparation, mulching, water retention capacity, green manure)			
Livestock management through FFS with and fodder bank and shed improvements			
Support to farmers' sensitization to save agricultural practices and production from wildlife threats	Develop wildlife risk friendly agricultural practices		
Support to link farmers with the market centers and market information;	Enhance farmers capacity in commercialization of agricultural productions		Ensured income of small farmers through the agricultural production
<ul style="list-style-type: none"> • Create informal learning and sharing platforms for grassroots-level women • Conduct local level policy discourses to ensure gender responsiveness and women's participation, access, control and leadership. Produce and publish best practices and learnings in gendered governance, <ul style="list-style-type: none"> • Conduct rapid assessment on women's contribution and 	Promote gender-inclusive governance		<ul style="list-style-type: none"> • Increase women's participation • Share information about the latest news, update, notice, fund, plans and budget • Time information about training and meetings

Sub-Activities	Activities	Outputs	Outcomes
<p>involvement in NRM/ CRLUP and management.</p> <ul style="list-style-type: none"> • Provide gender mainstreaming trainings/ workshops to local government and CBOs and concerned stakeholders. • Conduct GESI focused social audits and public hearing. • Promote awareness on gender responsive information, available provisions and resources among CBOs/ women groups. • Engage male involvement to advocate gender and women’s issues and concern. 			<ul style="list-style-type: none"> • Promote and engage leadership • Male engagement

2.5.3 Map of Planned interventions MCA Result Map 4:

The enhancement activities in the river system are divided into five intervention packages in the river system: I) Restoration and rehabilitation of degraded ecosystem through sustainable forest management, ii) Soil and water conservation iii) Agroforestry systems, and iv) Climate resilient agriculture technologies and practices. The major enhancement activities include: restoration of degraded forest and forest lands, plantation in river site lands and promotion of woodlots and increasing soil fertility in river site lands through agroforestry system and enhancement of farmers’ capacity to adopt to climate change impacts on agriculture through the establishment of Farmer Field Schools (FFSs) in the river system. The “M” code in the planned intervention map referred to mitigation activities and “A” stands for adaptation activities in Kamala Belsot Jogiya river system (Figure 14).

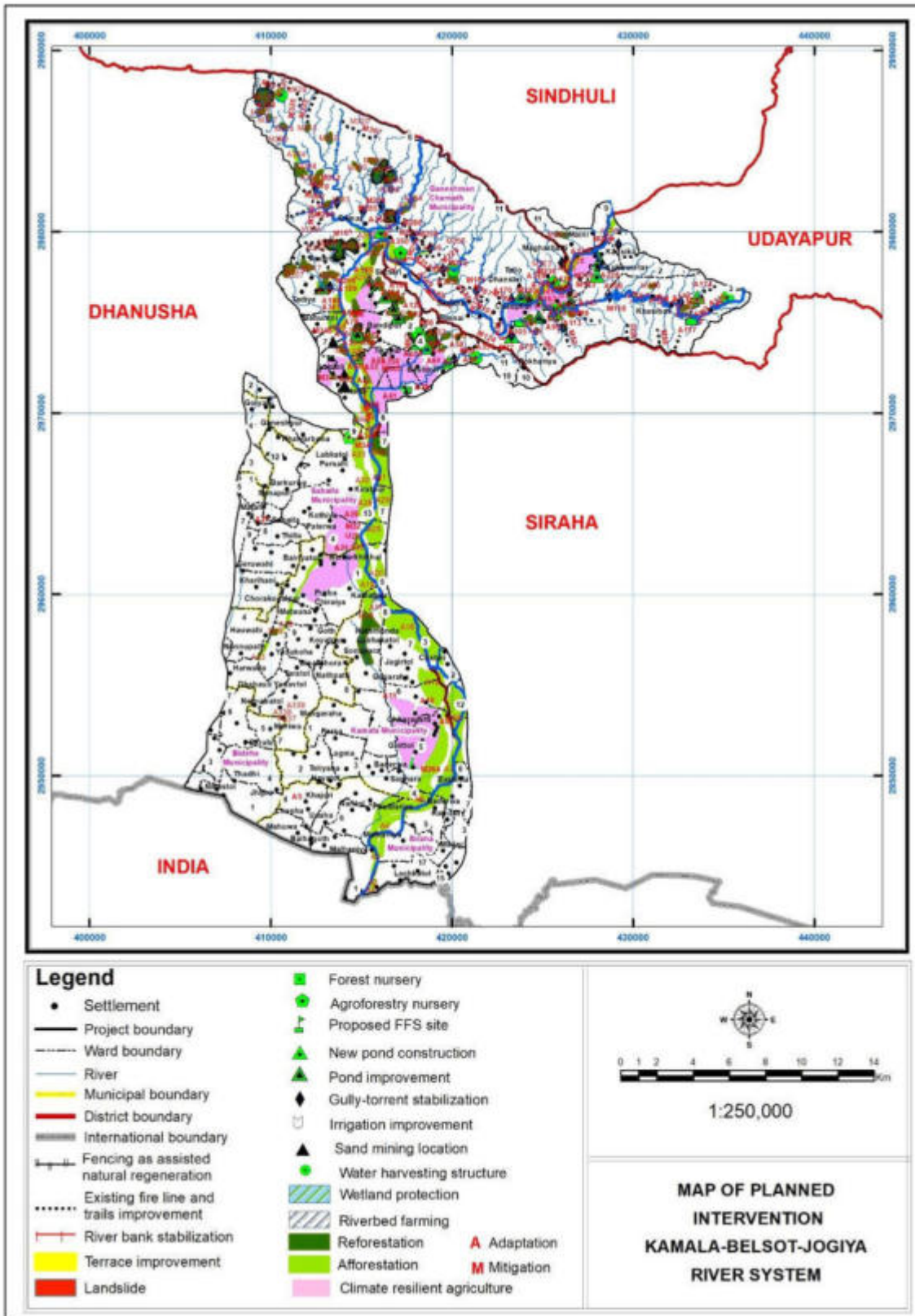


Figure 14: Map of Planned intervention (Mitigation and Adaptation) in Kamala Belsot Jogiya river system

2.5.4 Integration of GESI and IP's issues into solution activities

The following special attention is required to mainstreaming women, Dalits, indigenous people, and marginalized communities in the implementation of ecosystem restoration plans for the river system:

- a. Provide opportunities to build capacity in natural resource management for users, particularly women, indigenous peoples, the Dalits, and forest-dependent marginalized communities.
- b. Improve and synchronize CFUGs' operational plans in order to improve users' capabilities (women, Dalit, IPs, and marginalized users) and build a strong mechanism for GESI in the river system's natural resource management sector.
- c. Provide an opportunity for women with specific, major actions in the restoration of the hotspots, for example:
 - Increase financial investment in women's decision making capacity buildings, especially in forestry activities and horticulture for Churia's and Terai region women groups.
 - Provide women's capacity-building training in nursery establishment and seedling production.
 - Provide capacity-building training to CFUGs and farmers' groups on river bank and gully stabilization.
 - Minimize women's workloads in the collection of fuelwood: a) by providing cost-effective equipment and techniques, especially in alternative energy uses for cooking); b) by providing fodder seeds and access to woodlots in public and private lands
 - Minimize women's workload by engaging men in household or farm activities.
 - Reduce social barriers (gender inequality, social and economic insecurity and lowered education and understanding level) for Dalit, indigenous people, and other vulnerable ethnicity women to participate in ecosystem restoration activities such as sustainable forest management and agriculture land restoration (on both public and private lands);
- d. Special attention on Free, Prior, and Informed Consent (FPIC) process is required for the implementation of the any activities highlighted in the CERP. For this, the following 6 steps that the implementing agency (CBOs) and project manager must consider in different actions during the CERP implementation in the river system, they include:
 - **Step 1:** Identification the Indigenous Peoples' concerns and their representatives based on land and territory
 - **Step 2:** Document geographic and demographic information through participatory mapping
 - **Step 3:** Design a participatory communication plan and carry out iterative discussions through which project information will be discussed in a transparent way.
 - **Step 4:** Reach consent, document indigenous Peoples' needs that are to be included into the project, and agree on a feedback and complaints mechanism
 - **Step 5:** Conduct participatory monitoring and evaluation of the agreement
 - **Step 6:** Document lessons learned and disclose information about project achievements

Chapter 3. Overall observations and findings

- The major drivers of deforestation and forest degradation in Kamala Belsot Jogiya river system are forest fire, overgrazing, riverbank cutting and soil erosion, landslide, encroachment, illegal logging, excessive fuelwood and haphazard physical infrastructure development.
- Low involvement of forest users committees and users' groups in reducing major drivers of deforestation and forest degradation (overgrazing, encroachment, forest fire, illegal logging).

- The additional hotspot areas with respect to inundation (downstream), grazing, encroachment, flood plain areas are also identified the field visits;
- People's belief in the re-growth of new plant species once incidents of forest fire happen;
- Local users and river management civil societies in downstream also have an interest in the massive plantation along the existing embankment (called Kamala Dam). But, the structural measures are required to ensure the site is stable if massive plantation along the river site is to be done.
- To meet the requirements of soil conservation, water retention, enhancement of incomes of women and marginalized communities, woodlots and fodder in the river system, some demonstration models for restoration practices such as the construction of conservation ponds and riverbed plantations with intercropping and agroforestry systems are required.
- Assisted natural regeneration (ANR) and enrichment plantation is needed to carry out the restoration of degraded forest in the natural forest region of the river system.
- A strong collaboration with the local government unit and other concerned government agencies helps to make the implementation of the activities sustainable.
- Participants have an interest in the construction of embankments/dams on both sides along the river banks to protect agriculture lands damaged by floods, deposition, and siltation;
- Excessive cutting of bamboo plants for the consumption of *tama* (*use in vegetable*) by the users.

Chapter 4: Intervention Packages (IPacks)

The identified solutions with intervention activities (solutions-activities) are grouped into five packages known as Intervention Packages (IPacks) for Building a Resilient Churia River in Nepal (BRCRN) to address the drivers of: a) climate change mitigation—hotspot of forest loss in upstream; b) climate change adaptation—hotspot of vulnerable ecosystems and associated communities in downstream and across the river system.

Problem, Solution analysis and map demarcations done by participants are considered as a foundational step for formulating IPacks to group the activities. First, the similar activities that are identified in solution tree analysis and their map demarcations are carefully reviewed against the underlying causes obtained in problem tree analysis. In next step, the activities are grouped based on adaptation and mitigation themes making sure it addresses the underlying causes and major problems (key drivers) identified during problem tree analysis. IPacks are formulated based on this grouping such that each IPacks address the major problems (drivers) and activities relate with solution analysis process. However, all activities identified in solution analysis are not reflected in IPack activities – as in reference to guidance from CERP manual Box 14 and section C1.2 based on which policy level interventions that are already reflected in REDD+ national strategy are not included in IPacks. IPacks geographic focus and coverage areas were also closely reviewed to make sure that the upstream-midstream-downstream linkage issues are addressed.

The Kamala Belsot Jogiya river system falls in Churia region (upstream), Bhawar region (midstream) and Terai region (downstream). The river system also features a variety of terrains, including fragile geology with upstream sources of boulders, pebbles, and sand, boulder-pebble deposition terrain where the river is fan-shaped, and silt and clay deposition in the middle and lower Terai regions up to the Nepal-India border.

Five IPacks contain the activities that connect the three streams (upstream, midstream, and downstream). In this sense CERP IPack designs also consider the connectivity and upstream-downstream linkages for ecosystem restoration. The first two IPacks, IPack 1 (forest restoration and afforestation) and IPack 2 (soil and water conservation), primarily concentrate on the upstream and midstream regions of the river system, where hill slopes and forest degradation are primarily observed. Additionally, these two IPacks will definitely and primarily control upstream soil and forest loss, restoring the degraded land and forest ecosystems, and reducing sediment deposition in the midstream and downstream regions.

IPack 3 (Agroforestry system) concentrates on the midstream and downstream regions that will improve the fertility of agricultural lands in river reclaimed areas in the regions of the river system. The IPack 3 also focuses on the livestock-dependent livelihoods of marginalized farmers by prioritizing fodder species and encouraging horticulture in riverside agricultural lands. IPack 4 (Climate resilient agriculture) deals with the agricultural sector's adaptation to climate change and primarily focuses on downstream farmers. In addition, the IPack 4 will help to enhance adaptation capacity of marginalized and small farmers through climate resilient technology and knowledge and skills in agriculture and water management. Finally, a cross-cutting IPack (Gender inclusive governance) is suggested to address gender-related issues that support the restoration of the river system's degraded ecosystems.

Each IPack contains a general description of the drivers, a list of the most significant initiatives for resolving problems with outputs and outcomes to address the drivers and the underlying causes and effects of the hotspots, implementing strategies, 5-year budget plan for carrying out the initiatives, monitoring plans, analyses the feasibility of the implementation and a brief Additionally, there are two categories of solution activities: capacity buildings and solution-activities in spatial mappings with activities area code (GIS data

features: polygons, lines, and points). The suggested solution-activities in the plan also include beyond the BRCRN priority. Details about problem-solution-activities with the BRCRN priority code are given in the excel file (Referring appendix of the Plan).

IPack 1: Restoration of degraded forest (reforestation) and afforestation in river reclaimed land

Why this IPack is needed?

Drivers and general descriptions: The natural forest loss is about 1099 ha, mainly reported in Dudhouli Municipality-11; Ganeshman Charnath Municipality-5 & 8; Kamala Municipality-8; Karjanha Municipality-1, 2, 3 & 4; Katari Municipality-1; Sabaila Municipality-4 and Sahidnagar Municipality-3 in the river system (from 2015 to 2021); (Source: ICIMOD, 2015 and Google Earth Imageries, 2021). This IPack is proposed to address the following drivers and underlying causes of Deforestation and Forest Degradation and exposures of river side regions for restoration and afforestation in the river system.

- **Forest fire:** In the river system, every year (pre-monsoon season from March to May), two to three fire events happen in the forest region. In addition, careless human activity has also contributed to the occurrence of forest fires. Other underlying causes of forest fires in the river system include people's misconceptions about: sprouting of new grass after fire, limited resources for the provision of forest watchers; limited forest fire control tools and equipment with users; lack of practices for the removal of dried leaves and branches; and unavailability of water sources in and around forests.
- **Encroachment:** According to the local people, forest encroachment is noted in the Kamala Belsot Jogiya river system. Increased encroachment is primarily the result of poor forest management governance of user groups, inactivity of community forest user groups (CFUGs), informal political support contributing to encroachment, an inadequate role of local government in forest management with less emphasis on controlling forest encroachment, and a lack of sensitization and awareness.
- **Illegal logging:** Illegal logging is in practice due to inadequate institutional capacity of forest user groups, lack of livelihood and income-generating options for vulnerable communities, and interference of downstream communities in the river system. Similarly, the underlying causes are inadequate forest operation plan implementation, insufficient skilled human resources, a lack of budget, insufficient coordination among committees, users, and Sub-Division Forest Offices (SDFOs), a lack of awareness, carelessness, a lack of income generation sources, a high reliance on timber and wood, excessive fodder and fuelwood collection, Open grazing, and so on. Illegal logging of forest products is happening by the users (40 percent of CFUG users and 60 percent of external users from downstream and other community forest users), because the wood demand for their houses or residential buildings is not meeting with the quantity of wood approved or provided by the forest authority DFOs, as reported by the participants in the workshop. In general, users have increased as a result of the increasing fragmentation of family members. The demand has increased (for example: 50 cubic feet is in demand per household, but 20 cubic feet is recommended by the authorities every 5 years in the Chayan Danda Community Forest User Group in the Belsot Catchment in Katari municipality). CFUGs also have inadequate capacity to operate their forest operational plans effectively and unable to control illegal logging.
- **Excessive fuelwood collection:** local communities have inadequate alternative energy sources for cooking and other domestic energy consumption needs. Lack of skilled training with equipment to maintain alternative energy sources and biogas, and ineffective fuelwood management among

the users are the causes of the dependency of the users on fuelwood collection from the forest areas. According to the locals, about 90% of the community in the Belsot catchment is dependent on fuelwood.

- **Multi hazard (flash floods, landslides, and erosion):** Sheet erosion was found to get transformed into small channels with runoff water—called rill erosion and then gully erosion—which swept away trees and bushes, especially in the pre-monsoon (March-May) and monsoon period (June-September), according to the locals. The gullies are increasing in number as well as in width in the river system.
- Likewise, the occurrence of floods, landslides, and soil erosion has been increasing in terms of number and severity, expanding their area in the river system. The heavy rainfall has exacerbated flooding, landslides, and soil erosion. These hazardous events have degraded the forest area in the river system. In addition, landslides and erosion are observed in Ganeshman Charnath Municipality-5, and Katari Municipality-1&2 (information based on Problem Workshop and field visit, 2022).

Key activities include:

- a. Enrichment plantation in the degraded forest: the potential native tree species, includes Bamboo (*Dendrocalamus species*), Kimbu (*Morus alba*), Tanki (*Bauhinia purpurea*), Badhar (*Artocarpus lakoocha*), Nimaro (*Ficus auriculata*), Gutel (*Trewia nudiflora*), Sisau (*Dalbergia sissoo*), Satisal (*Dalbergia latifolia*), Khayer (*Acacia catechu*), Jamun (*Syzygium cumini*), Simal (*Bombax ceiba*), Sal (*Shorea robusta*), Karma (*Adina cardifolia*), Asna (*Terminalia tomentosa*), Harro (*Terminalia chebula*), Barro (*Terminalia bellirica*), Jamun (*Syzygium cumini*), Amala (*Phyllanthus emblica*)
- b. Establishment of forest nursery is recommended nearest to the potential areas of plantation (approaches: private, community and promotion in forest sub-divisions): Karjanha Municipality-2 & 7 and Katari Municipality-1 & 2
- c. Natural regeneration management-ANR (Assisted Natural Regeneration) is needed by promoting several actions such as;
 - a. Reduction of forest fire hazards through cleanings and improvements (extraction of bushes, leaf litters and forest residues) (about 49 km);
 - b. Mesh-wire fencing for protection of existing forest as priority ANR activity (27 km),
 - c. Provision of forest watcher,
 - d. Minimizing grazing with alternatives;
 - e. Provisions for forest fire response toolkits
 - f. Adoption of new technology (for example: Forest Watcher mobile app-the dynamic online forest monitoring and alert systems) for fire controls,
 - g. Strengthening and envisioning of forest management operation plans to reinforce the forest management system.
 - h. Empower CFUGs on forest management and forest governance;
- d. In addition, 3032 ha of plantation area is planned including community land plantation (1296 ha), demonstration plantation (203 ha), riparian plantation (63 ha), and woodlot plantation (1470 ha).

Objectives of the IPacks

- Improve forest cover through enrichment plantation;
- Improve forest quality through proper management;
- Build capacity of CFUGs to reduce forest fire hazard and risk;
- Reduce natural forest based fuelwood dependency;

- Increase forest cover in riverside area and link the production to the local community in income generation;

Strategies:

- Ensuing accessibility and availability of desirable forest species for plantation with priority to native species;
- Enhancing technical capacity of CFUGs/LFUGs in nursery establishment and seedlings production
- Adopting local measures for river bank stabilization to protect forest loss from flood risk in the riverside plantation
- Reducing grazing by providing alternatives (for examples: supports in fodder nursery in private lands and in community/local forest areas)
- Assisting alternative energy sources for the forest dependent communities in fuelwood collection;
- Ensuring irrigation facilities in plantation areas, especially in riverside plantation
- Enhancing capacity of government forest agencies through the support of equipments, skill based forest management training
- Developing collaboration with the concerned local governments in the river system for the intervention activities in public lands in river site;
- Assuring long-term management of plantations in riverside areas (for example: a community based three-year action plan can be developed and approved in coordination with local government and DFO).
- Visiting to successful demonstration model
- Facilitating on sustainable mining and river materials extraction to reduce environmental impacts, as well as physical infrastructure development in and through forest areas to reduce forest degradation; and for reducing illegal logging.

Incentives for participation & changing stakeholder practices:

- Fair and equitable distribution of benefit of resource to the CF users especially, marginalized forest users;
- Incentives for women and economically marginalised community for their active engagement in nursery establishment and enrichment plantation;
- Incentives for alternative bio-energy;
- Incentives for livestock sustainable management activities (promotion of profit making livestock farming, sheds improvement, fodder nursery- plantings of high quality fodder species)

Output, Activities and Sub-activities:

Output	Activity	Sub-Activities	Sub-Activity Area code	Remarks
Output I: Natural forest ecosystems are better maintained and protected within the project area	Activity I.1 : Restore degraded natural forests	Forest nursery establishment/promotion (4) in Karjanha Municipality-2 & 7 and Katari Municipality-1 & 2	M32, M72, M129, M264	
		Natural forest regeneration management and Enrichment plantation in degraded forest lands (1099 ha) in Dudhouli Municipality-11; Ganeshman Charnath Municipality-5 & 8; Kamala Municipality-8; Karjanha Municipality-1, 2, 3 & 4; Katari Municipality-1;	M14, M15, M23, M34, M47, M55, M60, M70, M71, M73, M74, M82, M85, M91, M94, M97, M108, M120, M121, M130, M146, M162, M172, M179, M196, M197, M202, M203, M207, M213, M217,	

		Sabaila Municipality-4 and Sahidnagar Municipality-3	M234, M239, M261, M274, M276, M277, M290, M292, M293, M297, M298, M300, M301, M310, M313, M314, M317, M321, M326	
		Natural regeneration management-ANR (Assisted Natural Regeneration): <ul style="list-style-type: none"> Cleaning of existing fire line and existing trails (49 km) in Ganeshman Charnath Municipality-5; Karjanha Municipality-2 & 4 and Katari Municipality-1 & 2 Fencing around the natural forest lands (27 km) in Ganeshman Charnath Municipality-5; Karjanha Municipality-2 & 4 and Katari Municipality-1 Support on forest firefighting equipment/tools sets- (26 sets) Support for fodder nursery approach-seedlings for fodder trees (500 HHs) Support on the provisions of forest watcher (at least one in each CFUGs (51 persons)) Linking with existing ICIMOD mobile apps (Forest fire App) for forest fire monitoring and forest management (I) 	M51, M62, M64, M65, M69, M83, M87, M88, M89, M92, M100, M101, M124, M128, M135, M144, M158, M167, M182, M192, M193, M204, M220, M224, M227, M229, M230, M232, M235, M237, M243, M244, M251, M253, M255, M262, M268, M269, M271, M275, M282, M289, M307, M322, M325, M327, M330, M331	Toolkit for forest fire control in accordance with government packages (Trolley with Water Tank if possible at district level) the river system has 51 CFUGs/LFUGs and forest firefighting equipment is proposed for one package for each 2 CFUGs
	Activity 1.2 Enhance capacity for sustainable forest management	a. Development of Community Based Forest Fire Fighting Groups (CB-FFFG) 51 events b. Provide skill trainings on forest fire control and management		<ul style="list-style-type: none"> The total number of CFUGs/LFUGs in the river system is about 51

		<p>(51*3)=153 person for firefighter trainings)</p> <p>c. Support for forest operational plan developments/reviews (51 plans)</p> <p>d. Coaching on forest operational plan for forest users (51 events)</p> <p>e. Provide 1-day orientation trainings for herders/livestock farmers on forest management (400 herders);</p> <p>f. Provide skill trainings on compost preparation using forest based resources-bushes and leaf litters- 5 days training (one for each CFUGs)</p> <p>g. Develop Training of Facilitators (ToF) in sustainable forest management (10 people in the river system);</p> <p>h. Capacity building trainings on forest management for government staffs (DFOs/ SDFOs) (1 event-3 days residential)</p> <p>i. Provide refresher trainings for CFUGs/LFUGs in forest management-3 days for each CFUGs/LFUGs (51 events); each event include 20 persons/users</p> <p>j. Celebration of Churia Conservation day (5 events)</p> <p>k. Capacity-buildings trainings on monitoring of sustainable extraction of riverbed materials and mines (with site demonstration)-3days residential for local governments</p> <p>l. Facilitation for School course programme on sustianable forest</p>	<ul style="list-style-type: none"> • Operational plan will be reviewed with respect to climate change, regeneration management , enrichment plantation, forest pests & diseases management , GESI integration, promotion of native species, proportional benefit sharing to marginalized users, respect to culture and social values of IPs and other ethnicity...)- • Production through media/online publications in local language/printings leaflets-pictorial contents for general forest users) • One coaching class events for each CFUGs/LFUGS
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		<p>management (I event)</p> <p>m. Production and dissemination of extension material on sustainable management of natural resources. Produce gender friendly materials.</p> <p>n. Facilitation support for alternative energy uses / biogas plants installation(400 HHs)</p>		
Output 2 Forests and tree cover are restored and maintained in the river system landscapes.	Activity 2.1 : Enhance forest land in riverside areas (afforestation)	Plantation in river site area through sustainable management (3032 ha) in Ganeshman Charnath Municipality-5, 6 & 8; Janaknandani Rural Municipality-1 & 6; Kalyanpur Municipality-5, 6, 7 & 12; Kamala Municipality-5 & 6; Karjanha Municipality-1, 2 & 3; Katari Municipality-1 & 2; Sabaila Municipality-4 & 13; Sahidnagar Municipality-1 and Siraha Municipality-17	A1, A104, A107, A112, A116, A12, A140, A149, A16, A160, A173, A188, A19, A2, A20, A200, A209, A215, A22, A226, A238, A245, A25, A257, A267, A270, A279, A28, A281, A283, A284, A286, A29, A291, A294, A3, A304, A31, A35, A36, A4, A43, A59, A6, A63, A7, A9, A98, A99	

Budget Plan (5 Years-Amount in NPR)

Note: Budget estimations are tentative and done based on consultation workshops with key stakeholders at river system level during 2022. However, during time of implementation, the rate and amount mentioned in the CERP plans are subjected to change based on the changes in market situation as well as the field condition. Respective Provincial Project Management Offices (PPMUs) can make necessary changes based on field situation following the norms and rates as per the Nepal government rules and regulations.

Output/Activities/sub-Activity	Unit	Quantity	Rate	Amount	Remarks
Output I: Natural forest ecosystems are better maintained and protected within the project area					
Activity 1.1 : Restore degraded natural forests					
1.1.1 Construction/promotion of forest Nursery	no.	4	1,000,000	4,000,000	The cost includes structure of nursery of each capacity 50,000 for Multi-year seedlings production

I.1.2 Seedling production in Nursery (Multi-years seedlings)	No.	200,000	40	8,000,000	The cost includes water supply, seedling bed preparation, nursery Naïke, forest soil collection, sand collection, poly bag purchasing, nursery shading, soil filling in poly bag, preparation of germination bed)
I.1.3 Enrichment plantation and regeneration management in degraded forest	Ha	1099	250,000	274,750,000	The cost includes survey and alignment, pitting, seedling transportation, and plantation Clearance of leaf letter, bushes, dugout waterholes (30cm*30cm) and contour bund (for regeneration management)..
I.1.4 Cleaning of existing fire line and existing trails	km	49	50,000	2,450,000	In collaboration with municipal government and DFO
I.1.5 Construction/improvements of fencings in natural forest lands	km	27	500,000	13,500,000	adopt mesh wire/ bar-bed
I.1.6 Support on forest firefighting equipment/tools (26 sets)	no.	26	500,000	13,000,000	Total CFUGs/LFUGs in the river system is only 51 groups. 1 set of firefighting equipment is for 2 groups. need to collaborate with others for firefighting water tanker-big and small size, the cost does not include bigger tanker cost.
I.1.7 Support on provisions for forest watcher	persons	51	800,000	40,800,000	for 5 years salary with incentives
I.1.8 Support on fodder-seedlings for fodder trees promotion	HHs	500	5,000	2,500,000	focus for marginalized and livestock based livelihoods dependent community
I.1.9 Linking with existing mobile app system from ICIMOD for forest fire monitoring and forest management (1 event)	lump sum	1	200,000	200,000	
I.1.10 Development of Community Based Forest Fire Fighting Groups (CB-FFFG)	no.	26	20,000	520,000	The cost includes coordination and communication and meetings for the development of CBFFFG

I.1.11 Provide skilled-based training capacity for CBFFFGs on forest fighter trainings-forest fire control and management for (51*3)=153 persons-firefighter trainings) for CFUGs/LFUGs	persons	153	30,000	4,590,000	3 persons from each CFUGs/LFUGs at community level Participants also include from local government disaster management unit Collaborate with National Disaster Risk Reduction and Management Authority (NDRRMA) and Armed Police Force
I.1.12 Support on Forest Operational Plan (FoP) renewals/reviews	no.	51	200,000	10,200,000	Review with respect to climate change, regeneration management, enrichment plantation, forest fire, pests & diseases management, GESI integration, promotion of native species, proportional benefit sharing to marginalized users, respect to culture and social values of IPs and other ethnicity...
Sub-total				374,510,000	
Activity 1.2: Enhance capacity of forest management stakeholders (government units, CFUGs, forest management CSOs, users)					
I.2.1 Coaching on forest operational plan for forest users (26 events)	events	26	30000	780,000	Half day orientation on operational plan dissemination/sensitization to the users
I.2.2 Provide 1-day orientation trainings for Herders on importance of forest services and management (400 herders/livestock owners) ;	events	20	100,000	2,000,000	Coordination with cattle's' households' owner Collaboration with municipal government and Livestock Management Centers In 20blocks events, 20 persons can adjust in each block/event
I.2.3 Provide skilled-based trainings to promote compost and green manure preparation using forest based resources-bushes and leaf-litters-3 days	events	26	300,000	7,800,000	Collaboration with municipal government 2 CFUGs can adjust in one event with one machine

training (one event for each CFUGs/LFUGs)					
1.2.4 Develop Training of Facilitator (ToF) on Forest Resource Management -7days (10 persons)	persons	10	100,000	1,000,000	Residential training for government staffs (DFO, Soil conservation Office, municipal government and forest management networks and stakeholders One event for 10 people
1.2.5 Capacity building trainings on forest management for government staffs (DFOs/ SDFOs) (1 event-3 days residential)	events	1	600,000	600,000	Participants from forest offices government and other related professional networks working in forest management in the river system Total participants 15-20 persons
1.2.6 Provide refresher trainings for CFUGs/LFUGs in forest management-3 days for each CFUGs (non-residential) at local level	event	26	200,000	5,200,000	The training facilitator-from the ToF receiver 2 event from each CFUG/LFUGs and the training should be at river system level-non-residential
1.2.7 Celebration of Churia Conservation Day (5 events) at river system level	event	5	100,000	500,000	1event for each year of the project period at river system level in collaboration with all relevant entities (Government, Non-government, private sector and School unit)
1.2.8 Capacity-buildings training on monitoring of sustainable extraction of riverbed materials and mines (with site demonstration)-3 days residential for local governments	event	1	600,000	600,000	Participants from DFOs/ SDFOs/soil conservation office/Livestock service Expert Center/local government engineers/AKCs) Site demonstration needs to be incorporated in training schedules One event for each year of the project period 15-20 participants in each event in collaboration with the concerns (for examples: municipal government, province government and division forest offices, river mining industries

					private sectors, and other relevant stakeholders
1.2.9 Facilitation on school course programme on sustainable forest management (1 event)	event	1	300,000	300,000	
1.2.10 Production dissemination of sustainable management of natural resources	Lump sum	1	500,000	500,000	Through publications in local language/printings leaflets-pictorial contents for general forest users,...
1.2.11 Facilitation support for alternative energy uses / biogas plants installation(500 HHs)	no.	400	5,000	2,000,000	In coordination with the municipal government
sub total				21,280,000	
Output 2 Forests and tree cover are restored and maintained in the river system landscapes.					
Activity 2.1 Enhance forest land in river side areas					
2.1.1 Plantation in river site area (forestry plantation)	Ha	3032	700,000	2,122,400,000	The cost includes survey and alignment, pitting, transportation of seedlings, filling of fertile soil (30cm*30 cm) or (40cm *40cm); 4-5 kg organic soil, (assumed 20% pits), plantation. The cost also includes watcher, water supply, fencing Priority for 4-categories plantation (riparian plantation, community plantation, demonstration plantation and woodlot plantation) The cost for river bank stabilization with structure measures is required to manage in collaboration (MoU) with municipal government, Janatako Tatbanda, and others , (the cost is estimated in IPack2)

					Collaboration approach with MoU/working guide notes with other government agencies/local government
2.1.2 Capacity building trainings for users on the management of plantation in river site areas	No.	5	700,000	3,500,000	One training event in every year (for 5 years); demonstration in the plantation regions-river site sites The ToF receivers should be the trainers in the river system
Sub total				2,125,900,000	
Total cost				2,521,690,000	The total estimated budget is to be varied once the detailed technical feasibility is completed and the cost can be contributed by other government agencies, especially municipal governments. Thus, a strong collaboration (with a MoU) is needed with the concerned municipal government and soil conservation offices

Note: Budget estimations are tentative and are subjected to change based on the changes in market situation as well as the field condition.

Feasibility Analysis of IPacks

Outputs/activities	Risks or obstacles	Risk reduction measures	Risk reduction targets	Indicators
Output I: Restore degraded forests				
Nursery establishment	<ul style="list-style-type: none"> Unavailability of : appropriate site, (water, slope, aspect, accessible to plantation site etc. Insecurity from wildlife-monkey 	<ul style="list-style-type: none"> Ensure water availability Require site inspection with soil test and other aspect Purchase seedling from private nursey. 	<ul style="list-style-type: none"> 200,000 seedlings purchased from private nursery 2 DFO nursery upgraded 2 Nurseries with shed 	<ul style="list-style-type: none"> No. of seedlings purchased from private nursery No. of DFO nursery upgraded No. of nurseries with shed

	<ul style="list-style-type: none"> Intense rainfall triggers nursery plant Infertility of soil resulting to unstable of plants 	<ul style="list-style-type: none"> Upgrade forest nursery under DFO Provide shed for some days. Adopt multi-year nursery plants (2-year) 		
Seedlings production (multi-year seedlings)	<ul style="list-style-type: none"> Unavailability of Multi-year seedlings for first year plantation Conflict due to the communities interest in species selection(which grows fast with high monetary value) and project priority on locally adapted species for biodiversity conservation 	<ul style="list-style-type: none"> Production of seedlings should start from the first year of the implementation period to meet the demand of seedlings Communities participation and consultation for the species selection Hire well experience nursery <i>Naike</i> 	<ul style="list-style-type: none"> 200,000 seedlings produced in planning phase Seedling species are selected as per the communities as well as project needs At least 2 nursery <i>Naike</i> are well experienced among 4 <i>Naike</i> 	<ul style="list-style-type: none"> No. of seedlings produced in planning phase Number of consultation for species selection No. of well experience nursery <i>Naike</i> devoted.
Carrying out plantation & regeneration in degraded forest	<ul style="list-style-type: none"> Drought Forest fire Open grazing Flash flood. Less interest of CFUGs 	<ul style="list-style-type: none"> Selection of drought resistant species (sal, Khayer) Construction of water hole Contour plantation Clearance of bushes and leaf-litter. Fencing Adopt rotational grazing /stall-feedings MoU with CFUG/ LFUG for the protection of the plantation area 	<ul style="list-style-type: none"> 80% enrichment plantation species are drought resistant. 80% of seedlings protected 	<ul style="list-style-type: none"> % drought resistant species in enrichment plantation Number of planted area fenced % of seedlings protected Number of MoU with the CBOs
Output 2: Enhance capacity of forest management stakeholders for sustainable forest management				
	<ul style="list-style-type: none"> Participants may not have interest to receive training 	<ul style="list-style-type: none"> Provide DSA and transportation allowances to the participant. 	<ul style="list-style-type: none"> 90% of targeted CFUG members actively involved in the training. 	<ul style="list-style-type: none"> % of targeted CFUG members actively involved in the training.

	<ul style="list-style-type: none"> • Training event may not match with leisure time of participant. • Venue may not be easy accessible to participants especially for women and other vulnerable people 	<ul style="list-style-type: none"> • Training period selected as per the demand of participants through Regular consultation with CFUG member in advance • Adopt seasonal calendar for training planning/schedule • Effective training through experimental exercise using related instruments • Selection of venue from consultation with participants • Residential training 	<ul style="list-style-type: none"> • 50% women, 13% Dalit and 31% Indigenous people are included in the training • 100% of CFUGs able to know knowledge & skills for forest management 	
	Marginalized beneficiaries may not receive the alternative energy	Require Proper analysis of marginalized beneficiaries.	• 90% of marginalized beneficiaries receive alternative energy	• % of actual beneficiaries receive alternative energy

Output 3: Enhance forest lands in river side area

Carrying out river side plantation (afforestation)	<ul style="list-style-type: none"> • Flash flood damages the plantation • Open grazing • Obstacle in Land ownership. • Social conflict between communities of two river banks • No provision of government in post plantation management • Unwillingness for controlling Open grazing due to lack of fodder • Mass production of forest product may create problem in harvesting and marketing. 	<ul style="list-style-type: none"> • Post monsoon plantation. • Prepare guideline on use of river side land. • Vigorous consultation with user member • Involvement of local government • Enhance willingness of local community around public lands through several strategies (for examples: local community managed plantation in coordination with local government; 	<ul style="list-style-type: none"> • Post monsoon plantation in 3032 ha of river side land. • 3 no. of consultation with local government to prepare guideline • 90% of users agreed to carry out plantation • 20% financial support from local government. • One thinning and one pruning/year with market assessment or distribute to local users. 	<ul style="list-style-type: none"> • Ha. of land (in post monsoon) planted. • No. of consultation with local government to prepare guideline • % of users agreed to carry out plantation • % financial support from local government.
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		sharing of products the community) <ul style="list-style-type: none"> Regular thinning and pruning with market assessment. 		
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Safeguard analysis:

Outputs and activities/ tasks	Serious risks	Risk reduction measures	Risk reduction targets	Indicators
Nursery establishment	<ul style="list-style-type: none"> Labor hired from outsider that includes women, IPs, Dalits, and marginalized people. Conflict in resources utilization (water, forest soil etc.) Expansion of invasive species 	<ul style="list-style-type: none"> Labor hired from local users. Agreement with corresponding user group for use of local seeds and other germplasms 	<ul style="list-style-type: none"> 80% of labors hired from local users Around 40% women and IPS/ dalit/marginalized groups of labors hired from local users No conflict in resource utilization 	<ul style="list-style-type: none"> No. of labor hired from local user. Agreement document No. focal desk developed in government entities
Carrying out river side plantation (afforestation)	<ul style="list-style-type: none"> Exotic species may pose risk to local biodiversity. Mass production of forest product may create problem in harvesting and marketing. The plantation area itself act as social illegal site. 	<ul style="list-style-type: none"> Promote native species for plantation. Regular thinning and pruning with market assessment. Regular patrolling mechanism should be established. 	<ul style="list-style-type: none"> 100% of the plantation species is native. One thinning and one pruning/year with market assessment or distribute to local users. No illegal event recorded in the area. 	<ul style="list-style-type: none"> % of native species planted Event of thinning and pruning/year Amount earned/year from the product No. of illegal event recorded from the area.
Carrying out plantation & regeneration in degraded forest land	<ul style="list-style-type: none"> Exotic species may pose risk to local biodiversity. 	<ul style="list-style-type: none"> Promote native species for plantation. Regular thinning and pruning 	<ul style="list-style-type: none"> 100% enrichment plantation species is native. One thinning and one pruning/year with market 	<ul style="list-style-type: none"> % of native species planted Event of thinning and pruning/year

	<ul style="list-style-type: none"> Huge biomass forest product may create problem in harvesting and marketing. Human wildlife conflict 	<ul style="list-style-type: none"> with market assessment. Compensation mechanism by CFUGs established. 	<ul style="list-style-type: none"> assessment or distribute to local users. 90% of the users received compensation on wildlife damages. 	<ul style="list-style-type: none"> Amount of forest product harvested/year % of the users received compensation on wildlife damages.
Carrying out training to CFUG members on sustainable forest management.	Right person (IPs, Dalits, marginalized groups). may be excluded in the training;	<ul style="list-style-type: none"> Assure right person in training (training is organized as per CTNA) 	<ul style="list-style-type: none"> 80% of trained CFUG members involved in forest management. 	<ul style="list-style-type: none"> % of trained CFUG members involved in forest management.
Installation of alternative energy (biogas plants).for marginalized poor communities.	<ul style="list-style-type: none"> Elite capture 	Assurance of beneficiaries highly dependent on fuelwood (IPs, Dalits, marginalized groups).	<ul style="list-style-type: none"> 400 HHs of actual beneficiaries receive alternative energy (biogas plants). 	<ul style="list-style-type: none"> No. of actual beneficiaries receive alternative energy (biogas plants).
Benefits	The focus of IPack on restoration of degraded forest and plantation in river site , capacity buildings, and promotion of alternative energy improve the ecosystem of the river			
Benefits	Benefit enhancement measures	Benefit enhancement targets	Indicators	Remarks
Clarity on sustainable forest management and increase in forest productivity	Establish strong forest management system	1099 ha natural degraded forest restored and 3032 ha river exposer lands covered with forest 50% of women and 31% IPs and 13% dalit benefited	% of degraded lands restored % of river site area covered with forest including woodlot % of vulnerable and marginalized communities benefited	

IPack 2: Soil and Water Conservation

Why this IPack is needed?

Drivers and general descriptions: This IPack is proposed to address the following key drivers and underlying causes for conserving soil and water and enhancing greenery in the river system:

➤ **Gully erosion, landslides, fragile geology, frequent and intense rainfall, droughts:**

- Landslides are natural phenomena which occur under the favorable terrain conditions and are usually triggered by heavy rainfall, human activities, including open grazing and haphazard development-road networks in fragile lands.

- About 24 landslides covering about 10 ha in Ganeshman Charnath Municipality-5 and Katari Municipality-1 & 2 are the major landslides in the river system. About 19 number of torrents is having a number of gullies that have led to degraded forest ecosystems; for example, mainly in Ganeshman Charnath Municipality-5; Karjanha Municipality-4 and Katari Municipality-1 & 2 are the major ones in the locations that need to be stabilized by using local and appropriate technologies (such as Bamboo and Amriso plantations, bio-engineering, checkdams, contour plantation, channel drainage or trenches).
 - Open and intensive grazing (for example: about 400-500 cattle grazed daily in Belsot catchment in Katari Municipality-1 has increased risk of erosion in upstream areas in forest region, riverbank corridor in upstream.
- **Inadequate community capacity for flood and riverbank-cutting control measures and conventional agricultural practices in sloppy lands**
- Inadequate rainwater harvesting techniques and water sources get impacts from road construction and drying due to several factors, including degraded forest;
 - Encroachment of river/stream side lands and forest lands for agriculture practices and income generating activities
 - Haphazardly extraction of river materials-stones, pebbles
 - Inadequate resources to combat the flash flood risk and a lack of low cost conservation measures further intensified the problem in soil and water conservation.

The key activities include:

- j. Landslide treatments-24 sites with vegetative measures and engineering structures in collaboration with local governments, soil conservation offices, forest offices and the community (of these very strongly recommended for the treatments (3 landslides), strongly recommended (3 landslides), and recommended (18 landslides))
- k. Stabilization of gully in the torrent (19 torrents) in Ganeshman Charnath Municipality-5; Karjanha Municipality-4 and Katari Municipality-1 & 2
- l. Construction of water conservation ponds (12 ponds): Ganeshman Charnath Municipality-5; Karjanha Municipality-3 & 4 and Katari Municipality-1 & 2
- m. Improvement of existing ponds (16 ponds) in Ganeshman Charnath Municipality-5; Karjanha Municipality-1, 2, 3 & 6 and Katari Municipality-1
- n. Wetland Improvements (5 locations of cumulative area 9 ha) in Karjanha Municipality-2; Katari Municipality-1 and Sahidnagar Municipality-7
- o. Construction of water harvesting structure (5 sites) in Ganeshman Charnath Municipality-5; Karjanha Municipality-2 & 11 and Katari Municipality-1
- p. Riverbank stabilization (20 km) in Ganeshman Charnath Municipality-5 & 8 and Katari Municipality-1 & 2
- q. Improvement of irrigation facilities (2 sites) in Karjanha Municipality-3
- r. Capacity buildings in water and soil conservation practices
 - Skill based training for local community CFUGs/LFUGs on landslide and gullies stabilization with locally available treatment measures **(26 events of 5 days)-2 CFUGs/LFUGs in one event**
 - Orientation training on soil and water conservation measures for government officials (from agriculture knowledge centers, extensions, soil conservation offices, forest divisions/subdivisions, local governments, and other stakeholders **(5 events, each event for 3 days)**;
 - Demonstration visits on soil and water conservation programme (5 events)
 - Production and dissemination of success stories of water and soil conservation practices for possible replication

Objectives:

- Minimize soil erosion and protect degraded lands in upstream and downstream
- Conserve water sources and increase soil moisture
- Reduce landslide, erosion and flood risks and protect vulnerable community from possible disasters
- Promote and engage women, IPs, Dalit and marginalized communities in water and soil conservation enhance capacity of community in income generation

- Increase the soil moisture and productivity

Strategy:

- Increasing the accessibility and availability of locally adapted and desirable vegetative species for soil conservation (for example, bamboo farming, Amrisha (*Thysanolaena maxima*), Amala (*Phyllanthus emblica*), Harro, Barro and linking these measures in income generation opportunities, particularly for women, dalit and IPs, Madhesi and other marginalized community .
- Stabilizing gullies and river banks through community participation, by empowering their capacity
- Coordinating with local government for gully stabilization and pond construction and improvements;

Incentives for participation & changing stakeholder practices:

- Fair and equitable distribution of benefit of resource to the Community Forest (CF) users especially, marginalized forest users;
- Incentives for women and economically marginalised community for their active engagement in nursery establishment and enrichment plantation;
- Incentives for alternative bio-energy;
- Incentives for livestock sustainable management activities (promotion of livestock farming, sheds improvement, fodder nursery- plantings of high quality fodder species,)
- Providing a subsidy for conservation measures on private land.

Output Activities and sub activities:

Activities	Sub-Activities	Sub-Activity Area code		
Output 3: Local structures are enhancing resilience against climate change induced erosion, sedimentation and flooding risks.				
Activity 3.1 Conserve soil and water source and Improve water retention	3.1.1.Landslide risk reduction (treating 24 landslides):	Very strongly recommended for treatment	M247, M249, M90	
		Strongly recommended for treatment	M242, M329, M223	
		Moderately recommended for treatment	M296, M320, M248, M266, M305, M306, M309, M308, M311, M318, M319, M332, M334, M333, M328, M241, M211, M256	
	3.1.2 Gully stabilization in torrent (19 torrents) in Ganeshman Charnath Municipality-5; Karjanha Municipality-4 and Katari Municipality-1 & 2	M118, M181, M183, M201, M206, M210, M212, M236, M240, M250, M259, M260, M278, M280, M285, M288, M312, M50, M77		
	3.1.3 Irrigation improvement (2 sites) in Karjanha Municipality-3	A356, A357		
	3.1.4 Construction of water conservation ponds (12 ponds) in Ganeshman Charnath Municipality-5; Karjanha Municipality-3 & 4 and Katari Municipality-1 & 2	A48,A49,A52,A61,A68,A75,A76,A113,A168,A174,A205, A236		
3.1.5 Improvement of existing ponds (16 pond) in Ganeshman Charnath Municipality-5; Karjanha	A38,A57,A78,A93,A95,A123,A141,A143,A147,A163,A165,A170,A189,A190,A199,A231			

	Municipality-1, 2 , 3 & 6 and Katari Municipality-1	
	3.1.6 Wetland protection (5 locations) in Karjanha Municipality-2; Katari Municipality-1 and Sahidnagar Municipality-7	A337, A338, A339, A347, A348
	3.1.7 Construction of water harvesting structure (Dam) (5 harvesting dams) in Ganeshman Charnath Municipality-5; Karjanha Municipality-2 & 11 and Katari Municipality-1	A351, A352, A353, A354, A355
	3.1.8 Riverbank stabilization (20 km) in Ganeshman Charnath Municipality-5 & 8 and Katari Municipality-1 & 2	A102, A103, A106, A114, A115, A119, A122, A125, A126, A131, A133, A134, A136, A137, A138, A139, A142, A145, A148, A150, A151, A153, A154, A155, A156, A159, A166, A169, A171, A175, A177, A184, A186, A198, A218, A219, A225, A246, A258, A40, A79 A81, A84, A96
Activity 3.2 Capacitated stakeholders in water and soil conservation	<p>3.2.1 Skill based training for local community CFUGs/LFUGs on landslide and gullies stabilization with locally available treatment measures (26 events of 5 days)-2 CFUGs/LFUGs in one event</p> <p>3.2.2 Orientation training on soil and water conservation measures for government officials (from agriculture knowledge centers, extensions, soil conservation offices, forest divisions/subdivisions, local governments, and other stakeholders (5 events, each event for 3 days);</p> <p>3.2.3 Support on demonstration visits on soil and water conservation programme</p> <p>3.2.4 Support on production and dissemination of success stories of water and soil conservation practices for possible replication</p>	Skilled based training for local community (CFUGs/LFUGs and soil and water conservation groups);

Budget Plan (5 years)-in NPR

Note: Budget estimations are tentative and done based on consultation workshops with key stakeholders at river system level during 2022. However, during time of implementation, the rate and amount mentioned in the CERP plans are subjected to change based on the changes in market situation as well as the field condition. Respective Provincial Project Management Offices (PPMUs) can make necessary changes based on field situation following the norms and rates as per the Nepal government rules and regulations.

Sub-Activity	Unit	Quantity	Unit cost	Amount	Remarks
Output 3: Local structures are enhancing resilience against climate change induced erosion, sedimentation and flooding risks.					
Activity 3.1 : Conserved soil and water source and Improved water retention					
3.1.1 Landslide treatments	No.	24	2,000,000	48,000,000	The estimated cost is for each landslide, with the bio-engineering and structures for all three types of priorities.
3.1.2 Gully stabilization in torrent	No.	19	2,000,000	38,000,000	19 (torrent streams with gullies) (Bio-engineering, palisade, brushwood check dam, bamboo plantation, contour plantation,)
3.1.3 Construction of conservation pond	No.	12	700,000	4,900,000	Size approximately: 20*20*2 m3
3.1.4 Improvement of existing pond	No.	16	500,000	500,000	Including cleaning and maintenance
3.1.5 Construction of water harvesting structures (dams)	No.	5	1,000,000	6,000,000	
3.1.6 Riverbank stabilization	km	20	30,000,000	450,000,000	cost @ Rs. 30,000,000 per 1 km Riverbank stabilization with engineering structures
3.1.7 Improvement of irrigation services	No.	2	1,000,000	2,000,000	
3.1.8 Wetland protection	Ha	9	1,000,000	9,000,000	
				558,400,000	
Activity 3.2 : Capacitate stakeholders and enhance water and soil conservations					
3.2.1 Skill based training for local community CFUGs/LFUGs	Events	26	250,000	6,500,000	<ul style="list-style-type: none"> Total 51 CFUGs/LFUGs in the river system, Each event includes 2 CFUG/LFUGs

on landslide and gullies stabilization with locally available treatment measures (26 events);					<ul style="list-style-type: none"> Each event for 5 days , including 1-day exposers visits
3.2.2 Orientation training on soil and water conservation measures for government officials	Events	5	600,000	3,000,000	<ul style="list-style-type: none"> Government officers include from agriculture knowledge centers, extensions, soil conservation offices, forest divisions/subdivisions, local governments, and other relevant stakeholders – expected participants 10-15 persons Total 5 events, each event for 3 days, including 1 day exposure visits
3.2.3 Support on demonstration visits on soil and water conservation programme	events	1	1,000,000	1,000,000	<ul style="list-style-type: none"> For government officials, other stakeholders and users National/neighboring nations good practices (need to explore, if possible)
3.2.4 Sensitize on upstream and downstream linkages for ecosystem services	events	2	500,000	1,000,000	For users (women specific), government officials of the concerned municipalities of the river system (working on soil, water and natural resources management) in collaboration with the municipal government
3.2.5 Support on production and dissemination of success stories of water and soil conservation practices for possible replication	Lump sum	1	700,000	700,000	The cost is also propose on sensitization for school children competition on drawing/debates on soil and water conservation and linkages the upstream/downstream in natural resources management
Sub-total				12,200,000	
Total				570,600,000	The total estimated budget is to be varied once the detailed technical feasibility is completed in coordination,

	especially with municipal governments. Thus, a strong collaboration (with a MoU) is needed with the concerned municipal government and soil conservation offices.
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Note: Budget estimations are tentative and are subjected to change based on the changes in market situation as well as the field condition.

Feasibility analysis:

Outputs/ activities	Risks or obstacles	Risk reduction measures	Risk reduction targets	Indicators
Activity 1: Conserved soil and water source and Improved water retention				
Landslides treatment	Costly and time-consuming procedures Low participation of local users	Cost/benefit analysis for the treatment Incentive for local labor	<ul style="list-style-type: none"> • Identification of treatable landslides • 24 landslides treated 	<ul style="list-style-type: none"> • No. of landslides treated
Gully treatment.	Requires high input Low participation of local users	Needed to convince the importance of the gully's treatments Incentive for local labor	<ul style="list-style-type: none"> • 19 torrent streams with gullies treated 	<ul style="list-style-type: none"> • No. of gullies treated
Construction of Conservation pond	Site might not be available to construct the big sized ponds Siltation in the pond	Consult with communities on the size of the pond before implementation MoU with users for the management of the ponds Conservation of catchment of the pond	<ul style="list-style-type: none"> • 12 conservation ponds constructed • 16 ponds improved • 100% MoU with the user committee on the pond management 	<ul style="list-style-type: none"> • No. of conservation ponds constructed and maintain with conserving its catchment
Output 2: Capacitate stakeholders and enhance water and soil conservations				
Carrying out training to CFUG members on soil and water conservation measures.	<ul style="list-style-type: none"> • Participants may not have interest to receive training • Training event may not match with leisure of participant. • Venue may not easy accessible to participants 	Provide DSA and transportation allowances to the participant. Training period and venue selected as per the demand of participants. Residential training	<ul style="list-style-type: none"> • 200 targeted members actively involved in the training. 	<ul style="list-style-type: none"> • No. of members actively involved in the training

Safeguard analysis

IPack outputs/ activities	Serious risks	Risk reduction measures	Risk reduction targets	Indicators
Landslide treatment.	<ul style="list-style-type: none"> • Risk of human casualty 	<ul style="list-style-type: none"> • Application of safety instrument. 	<ul style="list-style-type: none"> • No human casualty recorded in landslide treatment 	<ul style="list-style-type: none"> • No. of human casualty in landslide treatment.
Gully-torrent stabilization	<ul style="list-style-type: none"> • Vegetative species used in treatment pose to threat local biodiversity. • Labor hired from outsider 	<ul style="list-style-type: none"> • Use of locally available native species. • Labor hired from local users 	<ul style="list-style-type: none"> • 100% of the native vegetative species used in treatment. • 80% of labor hired from local user 	<ul style="list-style-type: none"> • % of the native vegetative species used in treatment. • %% of labor hired from local users
Construction and improvement of Conservation pond	<ul style="list-style-type: none"> • Children and small animal submerged in the pond. • Splash erosion occur when raindrop hit barren surface 	<ul style="list-style-type: none"> • Fencing around the pond. • Develop animal friendly ramps • Paving by grasses • Planting trees around the ponds 	<ul style="list-style-type: none"> • No casualties recorded • No erosion from the inclined inward lands and barren surface 	<ul style="list-style-type: none"> • Number of casualties recorded • Number of ponds with siltation problem
Carrying out training to CFUG members on soil and water conservation measures.	<ul style="list-style-type: none"> • Marginalized groups may be excluded in the training. 	<ul style="list-style-type: none"> • Assure right person in training by assessing the CFUGs institutions members 	<ul style="list-style-type: none"> • 80% of trained members involved in soil and water conservation measures. 	<ul style="list-style-type: none"> • % of trained members involved in soil and water conservation measures.
Benefits	Benefit measures	Benefit enhancement	Benefit enhancement targets	Indicators
Water pond for the recharging ground water	Water source for wildlife by planning recharge pond in the forest with minimum damage to the forest area Fire control and risk minimization Runoff water will be reduced, and it will reduce erosion Flash flood control		Construction of 12 ponds and 16 existing ponds improvement 24 landslide treated as per the priority and 19 torrent-gully stabilized	No.of ponds constructed and improved #ha of landslide risk reduced and no.of torrent gullies stabilized

IPack 3: Agroforestry system

Drivers and general descriptions: This IPack is proposed to address the following key drivers and underlying causes for linking the agroforestry with the fodders and support for small marginalized farmers also linking to their livelihoods depending on the livestock.

- **Unsustainable harvesting of forest resources (especially fodders, fuelwood) and river-induced resources:** In order to reduce the dependency of the community on fodder and fuelwood, planting of fodder species on public and private lands is a priority through the agroforestry system.
- **Deterioration of soil nutrition in riverside lands:** The riverside areas are expected to be enriched with soil nutrition once the agricultural crops are intercropped in woodlot areas. The riverbank and stream banks are required to be stabilized with local resources and bamboo plantations along the riverbank.
- **Increasing women's engagement in fuelwood and fodder collection in forests:** Involving women and marginalized communities in agroforestry helps enhance their income generation capacity and secure household consumption. Efficient agroforestry systems can reduce forest encroachment pressures and reduce forest degradation by increasing on-farm forest products. The Farmer Field School (FFS) approach is recommended for several potential enterprises to learn riverside management and select species and other management practices.

The key activities include:

- a. Establishment of Agroforestry nursery in the river system in different potential locations near to the agroforestry plantation areas. Some of the potential locations include: Ganeshman Charnath Municipality-5 & 9
- b. Adoption of Agroforestry system in the potential areas of the riverside of about 183 ha, mostly in the Ganeshman Charnath Municipality-5 & 8; Katari Municipality-1; Sabaila Municipality-13 and Sahidnagar Municipality-1, 2 & 3
- c. Providing supports for irrigation facilities
- d. Formulation of groups called Agroforestry Groups (AFGs), it is advised as 4 groups (25-30 members in each group)
- e. Providing Training on AF (Agroforestry) practices for 120 group members (30*4) and providing learnings and techniques through FFS approach.
- f. Capacity building training on administration and management
- g. Providing institutional support and office equipment to make work easy for the groups.
- h. Providing capacity building for government officers on the promotion of agroforestry system (technical representative includes foresters, soil conservation officers, agriculture extension officers, local government planners, etc.) -3days (residential)

Strategies:

- Establishing Farmer Field School (FFS) for convincing the community, and learnings, particularly for the marginalized community dependent on river claimed land for seasonal livelihood activities
- Establishing agroforestry activities with agroforestry nursery
- Promoting the existing groups if available; otherwise, formulating farmer groups (Agricultural Forestry Groups for efficient operation) in the hotspots by promoting gender with a clear role of women as an integral part of the agroforestry system to obtain optimal benefits ensuing at different stages of agroforestry intervention.
- Assuring women's participation by 50% from the beginning of the agroforestry system establishment
- Establishing tree woodlots for firewood, fodder, building materials
- Linking the AF system with income generation of women and marginalized community
- Increase farmers' access to market information and commercialization of AF products
- Developing a strong coordination with the local governments to promote agroforestry in public land
- Assuring water availability
- Potential trees and agriculture species for agroforestry system in the river system are: Multi-year crops-mixed cropping, fodder and grass with trees

- Enhancement of soil fertility by planting nitrogen fixing species of forest and agriculture (multi-year crops-mixed cropping, fodders and grass with forest trees)
- Clearing land demarcation between private/public (ownership of the lands-private and public lands);
- Requiring feasibility assessment for the finalization of agroforestry systems to be implemented in the hotspots once the baseline study report is ready.

The following species are potential in the river system:

- Fruit: Mango, Citrus species-Lemon, Spices species: Timbur, Ginger/turmeric, Chilly, Legume crops, Papaya, Banana, Oal, Sugarcane, Katahar (*Jackfruit*), Lichi (Lychee), Banana
- Fodder: Neem (*Azadirachta indica*), Kimbu(*Morus alba*), Bakaino (*Melia azedarach*), Moringa (*Moringa oleifera*), Koiralo (Bauhinia Variegata), **Tanki** (*Bauhinia purpurea*), **Badhar** (*Artocarpus lacucha*), **Nimaro** (*Ficus auriculata*), **Gutel** (*Trewia nudiflora*)
- Multipurpose: Amala (*Phyllanthus emblica*), Jamun (*Syzygium cumini*), Khayar (*Acacia catechu*) Satisal (*Dalbergia latifolia*), Harro (*Terminalia chebula*), Barro (*Terminalia bellirica*)

Objective:

- Diversify agricultural land production for generating livelihoods.
- Enhance soil nutrition in river-claimed lands.
- Promote timber and fuel wood production from improved agroforestry systems.
- Enhance the income-generating capacity of marginalized and vulnerable communities.

Incentives for participation & changing stakeholder practices:

- Developing a provision for the lease of lands to interested farmer groups in public lands where BRCRN work.
- Facilitating the easy access to desirable forest species for plantation.
- Making provisions for providing incentives ensuring the participation of women, IPs and marginalised people in training activities.

Outputs, Activities and sub-activities

Activities	Sub-Activities	Sub-Activity Area code
Output 4: Farmers are skilled in using climate-resilient land use practices.		
Activity 4.1 : Established agroforestry activities through group systems (4 agroforestry group) agroforestry activities	4.1.1 Establishing Agroforestry Nursery (3) in Ganeshman Charnath Municipality-5 & 9	A340, A349, A350
	4.1.2 Establishment of AF activities in the potential areas (183 ha. of river abandoned land) Ganeshman Charnath Municipality-5 & 8;Katari Municipality-1; Sabaila Municipality-13 and Sahidnagar Municipality-1, 2 & 3	A13, A18, A30, A33, A110, A111, A152, A178, A191, A195, A233
	4.1.3 4 Agro-Forestry Group committee established	
	4.1.4 4 Agro-Forestry Group received institutional support and office equipment.	
	4.1.5 Coordination meeting as a part of 30 monitoring and evaluation (5 years)	
Activity 4.2: Capacitated communities'/farmer groups and government officers	4.2.1 Training for AFG members on administration and management (120 AFG members from 4 AFG)	
	4.2.2 Training on AF practices (120 AGF members)	
	4.2.3 Providing capacity building for government officers on the promotion of agroforestry system	
	4.2.4 Audio/visual aids-dissemination of AF program	

to promote agroforestry system	
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Budget Plan (5-years) in NPR

Note: Budget estimations are tentative and done based on consultation workshops with key stakeholders at river system level during 2022. However, during time of implementation, the rate and amount mentioned in the CERP plans are subjected to change based on the changes in market situation as well as the field condition. Respective Provincial Project Management Offices (PPMUs) can make necessary changes based on field situation following the norms and rates as per the Nepal government rules and regulations.

Activity	Unit	Quantity	Unit Costs	Budget (NPr)	Remarks
Output 4: Farmers are skilled in using climate-resilient land use practices.					
Activity 4.1 : Established agroforestry activities					
4.1.1 Establishment of Agroforestry Fodder Nursery	No.	3	500,000	1,500,000	<ul style="list-style-type: none"> • Cost Include tunnel-protection measures
4.1.2 Purchasing seedlings of horticulture species for agroforestry focus on multiyear seedling production	No.	30,000	200	6,000,000	Multiyear seedling nursery on horticulture
4.1.3 Support agroforestry activities in the potential lands	ha	183	500,000	91,500,000	<ul style="list-style-type: none"> • Transportation, fertilizer, support for matching fund, • Focus on private land and link to government for government subsidy • Public lands-coordination with local government
4.1.4 Irrigation facility (small irrigation facility)	No.	4	500,000	2,000,000	<ul style="list-style-type: none"> • Shallow tubes/water harvesting dam-cutoff wall chamber /water boring/improvement of water source in collaboration with municipal government

4.1.5 Formation of AFG focusing on women farmers	No.	4	30,000	120,000	
4.1.6 Institutional support and office equipment for women group	No.	4	200,000	800,000	
4.1.7 Coordination meetings (5 years)	No.	10	25,000	250,000	Two meetings/ year/per Group
Subtotal				102,170,000	
Activity 4.2 Capacitated communities'/farmer groups and government officers to promote agroforestry system (4 AFG)					
4.2.1 Training for agroforestry groups on sustainability, principle of administration and management-3 days residential	persons	120	30,000	3,600,000	120 person
4.2.2 Training on improved AF practices (promotion for small enterprises for the production)-5 days residential	persons	120	30,000	3,600,000	
4.2.3 Providing capacity building for government officers on the promotion of agroforestry system-3days residential	events	4	500,000	2,000,000	For 5 years
4.2.4 Support on production and dissemination of success stories AF system replication	No.	1	500,000	500,000	Dissemination for 5 years
Subtotal				9,700,000	
Total				111,870,000	The total estimated budget is to be varied once the detailed technical feasibility is completed in coordination, especially with municipal governments. Thus, a strong collaboration (with a MoU) is needed with the concerned municipal government and soil conservation offices

Note: Budget estimations are tentative and are subjected to change based on the changes in market situation as well as the field condition.

Feasibility analysis:

Outputs/activities	Risks or obstacles	Risk reduction measures	Risk reduction targets	Indicators
Establish Agroforestry Groups (AFG)	<ul style="list-style-type: none"> Flood damages the AF activities. Clearing land demarcation between private/public 	<ul style="list-style-type: none"> Needed river bank and gully stabilization (spur and embankment, bamboo plantation along the bank) Approval of guideline from local unit to use river side land. 	<ul style="list-style-type: none"> 183 ha river abandoned land converted to AF activities adopting customary land practices for risk reduction approach. 	<ul style="list-style-type: none"> Hectares river side land converted to AF activities.
	Actual beneficiaries (IPS, dalit, marginalized groups) may exclude from AGF committee.	Assurance of actual beneficiaries.	<ul style="list-style-type: none"> 4 AFG committee established 	No. of AFG committee established
Train on cooperative principles, administration and management	<ul style="list-style-type: none"> Participants may not have interest to receive training Training event may not match with leisure of participant especially women with household duties (morning and evening). 	<ul style="list-style-type: none"> Provide DSA and transportation allowances to the participant. Training period selected as per the demand of participants. Selection of venue from consultation with participants Residential training 	<ul style="list-style-type: none"> 120 AFG member trained on, administration and management 	<ul style="list-style-type: none"> No. of AFG members trained
Support institutional support and office equipment.	<ul style="list-style-type: none"> Insufficient support and office equipment 	<ul style="list-style-type: none"> Assure sufficient support and quality equipment. 	<ul style="list-style-type: none"> 4 AFG received institutional support and office equipment. 	<ul style="list-style-type: none"> No. AFG received institutional support and office equipment.
Train AFG members trained on improved AF practices	Participants may not have interest to receive training	Provide DSA and transportation allowances to the participant.	<ul style="list-style-type: none"> 120 AFG members trained on improved AF practices. 	<ul style="list-style-type: none"> No. of AFG members trained on improved practices.

Safeguard Analysis:

IPack activities	outputs/Serious risks	Risk reduction measures	Risk reduction targets	Indicators
Reduction in indigenous crops that are staple food of poor	<ul style="list-style-type: none"> Implement multi-level AF practices with a focus on indigenous crops. 	<ul style="list-style-type: none"> 120 HHs consuming indigenous crop products from AF systems 	% of total AF area under hybrid/exotic species cultivation	Reduction in indigenous crops that are staple food of poor
Elite capture of grants	<ul style="list-style-type: none"> Establish a transparent grant approval with more engagement of vulnerable and marginalized communities Strong Monitoring & reporting mechanism. 	120 poor/marginalized HHs receiving grants	<ul style="list-style-type: none"> No. of poor/marginalized HHs receiving AF grants 	<ul style="list-style-type: none"> Elite capture of grants
Biodiversity risk due to hybrid/exotic species replacing indigenous species	At least 50% of trees in AF extension/credit packages are indigenous species.	% of total AF area under hybrid/exotic species cultivation	Grants & input provision with at least 50% indigenous species	Biodiversity risk due to hybrid/exotic species replacing indigenous species
Benefits		Benefit enhancement measures	Benefit enhancement targets	Indicators
Livestock based livelihood will be promoted		Fodder plantation	50 % of the fodder plants used	Proportion of the fodder plant used
Horticulture promotion		Linkages of private nursery for horticulture seedling. It will promote private forest	50 % of the linkages with private nursery	Proportion of the linkages of private nursery for horticulture seedlings

IPack 4: Climate resilient agriculture and land use practices

Drivers and general descriptions: This IPack is proposed to address the following key drivers and underlying causes for building climate resilience of small farmers by supporting climate resilient farming practices and adaptation measures in agriculture sector.

- **Climate induced multi-hazards (extreme temperature, frequent and intense rainfall, drought, floods, inundation) and Infestation of crop insects, pests, and diseases:**
- 14 FFS and 3093 ha of agricultural land are planned for Climate Resilient Agriculture (CRA), representing with the codes (A375, A376, A377, A378, A379, A380, A381, A382, A383, A384, A385, A386, A387, A388).
- Out of 14 FFS, the potential six-FFS (with respect to hotspot to climate extremes, crop varieties with different problems, farmer willingness, and access) are listed to estimate the budget.
 - Blight and blast in rice
 - Army worms and grey leaf spot in maize
 - Mango disease in mango
 - Vegetables pest and disease in vegetables
 - Rust in wheat
 - Blight and blast in rice

- **Inefficient irrigation facilities:** Farmers suffer from irregular irrigation facility due to the depletion of water source and heavily riverbed raised causes impacts of irrigation heads and lacks of surface water flow in the river system.
- **Lack of improved seeds and fertilizers:** Farmers have a lack of knowledge and information about the availability of agricultural inputs, including quality seeds, agriculture production, and market and marketing costs of different commodities. As a result, the willingness of farmers in agriculture is becoming insufficient.
- **Inadequate climate agricultural adaptive practices :** Farmers suffer from having inadequate decision-making support on how to provide agricultural inputs in changing weather systems and seasonal changes. Furthermore, the effective application of climate resilient agriculture technologies and practices on crops and the environment can improve vulnerable and marginalized farmers' coping and adaptation capacity, as well as increase crop and vegetable production and productivity through FFS approach.
- **Lack of support for livestock management practices:** Livestock management in the river system is inadequate .

The potential key activities include:

- Establishment of 6 FFS to provide skill, knowledge and improved agriculture practices to address following problems related to pest and diseases in different crops in the river system:
 - FFS on rice disease in Sahidnagar Municipality-1
 - FFS on maize disease in Katari Municipality-1
 - FFS on mango disease in Ganeshman Charnath Municipality-7
 - FFS on vegetables pest and disease in Karjanha Municipality-3
 - FFS on wheat disease in Kamala Municipality-5
 - FFS on rice disease in Karjanha Municipality-6
- Capacity-building training in the use of weather information and its application in agricultural practices;
- Capacity building on livestock management practices
- Support to farmers for seed production (improved seeds) in the location where the FFS approach is to be adopted in rice crop (for 3 years)- Sahidnagar Municipality-1
- Provide training to adopt and apply climate resilient landuse practices (for examples: compost manure preparation, mulching, water retention capacity, green manure).
- Support to farmers' sensitization to save agricultural practices and production from wildlife threats
- Support to link farmers with the local market centers and market information

Objective

- Improve farmers' coping and adaptation capacity to adopt to weather stress, manage crop pest and disease
- Increase agricultural productivity and improve livestock management practices;
- Enhance local technology in irrigation improvements
- increase farmers' access to markets and enhance incomes of marginalized farmers;

Strategies:

- Working with at least 25 farmers in each group to establish FFS;
- Increasing the capacity of FFS members, including women and IPs, in group dynamics, FFS administration, demonstration of climate-resilient technology and practices, improved tools and equipment, and marketing-related aspects
- Establishing FFS to enhance and disseminate climate resilient farming technologies and practices and build farmers' capacities to be climate resilient;
- Enhancing FFS members' capacity to give site demonstrations of relevant technologies and practices to other farmers in their community, and
- Introducing climate-resilient varieties of crops (drought and flood-tolerant varieties)

Incentive for participation & changing stakeholder practices

- Farmers benefit directly from increased crop and vegetable production and productivity as a result of the use of climate-resilient farming practices.
- Increased access to quality inputs, particularly seeds and established linkage of the production system with the market;
- Enhanced participation of IPs, women, and poor and marginalized farmers in capacity-building activities on farms and fields

Output, Activities and sub-activities

Activities	Sub-Activities	Sub-Activity Area code
Output 4: Farmers are skilled in using climate-resilient land use practices.		
Activity 4.3: Establish six FFSs and increased farmers' ability in seed production in Karjanha Municipality-3 & 6; Kamala Municipality-5; Ganeshman Charnath Municipality-7, Katari Municipality-I and Sahidnagar Municipality-I	4.3.1 Establish 6 FFSs on the crops listed above, 4.3.2 Capacity building on livestock management practices 4.3.3 Support to farmers for seed production (improved seeds) through FFS approach in rice crops (for 3-years)	A21, A117, A45, A46, A8, A37
Activity 4.4 Enhanced farmers' capacity in climate resilient farming practices,	4.4.1 Capacity building trainings on using weather information and its application skills in farming practices; 4.4.2 Provide training to adopt and apply climate resilient land use practices (for examples: compost manure preparation, mulching, water retention capacity, green manure, Sesbania manure); 4.4.3 Support to link farmers with the local market centers and market information;	
Activity 4.5 : Increased coping strategies for wildlife depredation in crops	4.5.1 Support to farmers' sensitization to save agricultural practices and production from wildlife threats 4.5.2 Sensitization programme on wildlife threats risk reduction in agriculture	

Budget Plan (5 years)

Note: Budget estimations are tentative and done based on consultation workshops with key stakeholders at river system level during 2022. However, during time of implementation, the rate and amount mentioned in the CERP plans are subjected to change based on the changes in market situation as well as the field condition. Respective Provincial Project Management Offices (PPMUs) can make necessary changes based on field situation following the norms and rates as per the Nepal government rules and regulations.

Sub-Activity	Unit	Quantity	Unit Costs	Budget (NPr)	Remarks
Activity 4.3: Established six FFSs and increased farmers' ability in seed production.					
4.3.1 Establish 6 FFSs	No.	6	350,000	2,100,000	• 6 locations (referred in the area code)

4.3.2 Capacity building on livestock management practices-sheds improvements crop depredation by wildlife	No.	6	200,000	1,200,000	<ul style="list-style-type: none"> • At 6 locations of FFS • In collaboration with municipal government and Livestock Management Center (LMC)
4.3.3 Support to farmers for seed production (rice) through FFS approach	No.	1	600,000	600,000	<ul style="list-style-type: none"> • For 3-years for crops-rice in Sahidnagar in collaboraion with AKC and municipal governeemt • In collaboration with municipal government and Agriculture Knowledge Center (AKC)
Sub-total				3,900,000	
Activity 4.4 : Enhanced farmers' capacity in climate resilient farming practices					
4.4.1 Capacity building trainings on using weather information and its application skills in farming practices;	No.	6	200,000	1,200,000	In collaboration with Nepal Agriculture Research Center (NARC), AKC
4.4.2 Provide training to adopt and apply climate resilient land use practices (for examples: compost manure preparation, mulching, water retention capacity, green manure,	Events	6	300,000	1,800,000	With demonstration for the FFS locations
4.4.3 Support to link the farmers with the local market centers and know the market information;	No.	6	200,000	1,200,000	produce market linkage—link with municipal level AKC's Unit
Sub-total				4,200,000	
Activity 4.5 Increased coping strategies for wildlife threats in crops					
4.5.1 Sensitization orientation on wildlife threats and risk reduction in agriculture	No.	6	300,000	1,800,000	At Municipality levels in upstream and downstream for vulnerable farmers
Sub-total				1,800,000	
Total				9,900,000	

Note: Budget estimations are tentative and are subjected to change based on the changes in market situation as well as the field condition.

Feasibility analysis:

IPack outp activities	Risks or obstacles	Risk measures	Risk reduction targets	Indicators
Output 1: Established six FFSs and enhanced farmers' capacity in climate resilient agriculture				
Establish 6 FFSs on the listed crops, fruit, fish and vegetable	Lack of priority about FFS in local government policy and programs ;	Continuous coordination with Palikas and promote them to incorporate FFS approach into their plans and programs	Providing knowledge through FFS approach to farmers-directly to more than 150 (25*6=150) farmers in the river system by adopting basic aims of FFS (skill development, empowerment, will power and capacity of decision making)	Number of FFS for different crops in four locations in the river system established
Develop and use FFS manuals of respective crops to address the major drivers	Lack of crop focus guidelines/manuals of local governments to address the drivers and to function and sustain the FFSs	Adoption of available manual recommended by FAO system and other institutions in the local contexts	Developing decisions making capacity of marginalized HHs (indirectly 1500 farmers=25X10X6) on how to deal with impacts of climate change and crop pests and diseases	Number of farmers capacitated
Support in irrigation system to address the impacts of water stress and increase farmers interest in FFS approach	Even though FFS is innovative approach, farmers interest is more focused on to have assured irrigation in wet and dry periods	Ensure irrigation service regularly in both seasons in collaboration with local governments and make the FFS approach effective	Supporting 50% of vulnerable farmers in FFS by providing support for small irrigation structures	Number of vulnerable farmers supported for small irrigation structures
Support farmers to link with the market centers and obtain market information	Poor access to market information and limited financial resources for the development of market centers and road networks	Disseminate market and other information during FFS conduction and link farmers with local FM radio and local government information units	Placing display boards (at 6 places where the FFS established) and ensuring the road networks to reach to the market by collaborating with local governments	Number of display boards placed
Output 2: Capacitated farmers in climate resilient agriculture practices				
Build coping capacity of marginalized farmers, including women in seed production	Poor accesses to quality and variety of vegetable seeds Often priority is given only to elite farmers not to marginalized farmers in capacity building	Promote seed production program to increase production productivity and enhance commercial vegetable production	Starting with 25 women farmers in seed FFS and building their capacity so that they can further disseminate knowledge to 250 new women farmers (25 *10) for upscaling the practices	Number of women farmers trained for quality production

IPack outp activities	Risks or obstacles	Risk measures	Risk reduction targets	Indicators
	Lack of modern tools and knowledge with equipment for seed production	Increase labor productivity, reduce cost and labor on women through the adoption of modern tools and equipment		
Provide technical weather information and its application skills in farming practices	Lack of producing weather forecasts information at farm level, resulting to obstruct in its applications in decision making process	Adopt existing weekly agromet bulletin published by NARC and customize the advisory in local context	Building capacity of 1500 FFS (25*10*6) farmers and 500 women seed producers and they are able to take decision making in agriculture practices and applications of technologies and skills and learnings to adopt to climate change and cope with insect pest and diseases problems	Number of farmers able to cope with climate change in agriculture
Provide training on improved compost manure preparation	Weak willingness of farmers to pay attention in the compost manure preparation (vermicomposting) due to lack of knowledge and skilled technical persons at local level. Lack of financial resources- for materials and equipment, complex in processes, environmental problems-odors and dust	Encourage women farmers and vulnerable farmers by providing technical and financial supports through the project in making compost in the field	Providing trainings on preparation of compost manure for 30 persons, comprising women, Indigenous People (IPs), Dalit and other vulnerable and marginalized people	Number of persons trained and become trainer of facilitators (ToF)

Safeguard analysis:

Activities	Social & Environmental risk	Risk reduction measures	Risk reduction targets	Indicators
Activity 1: Established six FFSs and increased farmers' skill in seed production				
Establish 6 FFSs on crops	<ul style="list-style-type: none"> Low participation of women, Dalits and IPs during group formation Change in agriculture practice might have negative 	<ul style="list-style-type: none"> Maximum involvement through capacity building and awareness Capacity building training to the marginalized groups and prioritizing the communities linking 	<ul style="list-style-type: none"> 50 % women, 13 % Dalit and 31 % Indigenous Peoples are included in the group 	<ul style="list-style-type: none"> % of Dalit, Indigenous Peoples and women in the group

	<ul style="list-style-type: none"> impacts on some members Inadequate options for women to participate in the programme Pesticide toxicity 	<ul style="list-style-type: none"> crop cycle and disease cycle Need to integrate daily allowances to manage opportunity cost ; Enhancement for women interest with their suitable time to participate in the programme (appropriate time is afternoon for women's involvement in the capacity building activities) Mapping out groups working/involving in the river system to enhance existing groups capacity Use of Integrated Pest Management (IPM) practices 		
Support to link farmers with the market centers and market information	<ul style="list-style-type: none"> Lack of sufficient market information and authentic data on market Variation in market pricing of agriculture products 	<ul style="list-style-type: none"> Confirmed participation of local authorities (local government) in cooperation with local communities 	<ul style="list-style-type: none"> Identified all the possible market areas of the river system Fixed pricing of the agriculture products 	<ul style="list-style-type: none"> Number of market centers
Activity 2: Capacitated farmers in climate resilient farming practices				
Capacity building trainings on using weather information and its application skills in farming practices	<ul style="list-style-type: none"> Difficulty in understanding weather technical terminologies Women, indigenous peoples, and Dalits, may face obstacles 	Ensure participation and active involvement	50 % women, 13 % Dalit and 31 % Indigenous Peoples are included in the group	% of Dalit, Indigenous Peoples and women in the group
Provide training to adopt and apply climate resilient landuse practices	<ul style="list-style-type: none"> Women, indigenous peoples, and Dalits, may face obstacles 	Ensure participation and active involvement	50 % women, 13 % Dalit and 31 % Indigenous Peoples are included in the group	% of Dalit, Indigenous Peoples and women in the group
Benefits	Benefit enhancement measures	Benefit enhancement targets	Indicators	

Promote small farmers	Promotion of organic manure, Integrated Pest Management	Climate resilient agriculture practices promoted	# no of farmers benefits with climate resilient practices
Increased productivity	Enhanced soil fertility Reduced damage due to pest and disease infestation Increased decision making in climate informed agricultural practices	Increased in production and good livestock management practices improved	# yield increased No. of farmers capacitated with skills and technologies in livestock management

Ipack 5: Advocacy campaign: Gender-inclusive governance

Drivers

- Lack of gender integration in governance (planning and implementation)
- Social norms and values
- Women lack access and resources
- Lack of resources
- Gender has to be top-priority in the governance of all structures
- Lack of transparency regarding gender and marginalized groups.
- Inadequate budget for gender related projects and activities.
- Exclusion of women and marginalized groups in governance.
- Inadequate interest and motivation of concerned institutions regarding gender.

General Description

The under representation of women in the decision-making process has resulted in the exclusion of women's specific needs and capacities in SNRM, CCA, and DRR. Increased influence of women in governance is important to identify and include gender-responsive program interventions to increase the adaptive capacity of vulnerable women.

Potential key activities include:

- Create informal learning and sharing platforms for grassroots-level women
- Conduct local level policy discourses to ensure gender responsiveness and women's participation, access, control and leadership.
- Produce and publish best practices and learnings in gendered governance,
- Conduct rapid assessment on women's contribution and involvement in NRM/ CRLUP and management.
- Provide gender mainstreaming trainings/ workshops to local government and CBOs.
- Conduct GESI focused social audits and public hearing.
- Promote awareness on gender responsive information, available provisions and resources among CBOs/ women groups.
- Engage male involvement to advocate gender and women's issues and concern.

Objectives

- Increase women's leadership in NRM, CCA, and DRR
- Building women's knowledge and skills in natural resource conservation and management Increase women's participation in decision-making forums
- Increase the commitment of local stakeholders, decision managers, and local representatives/leaders to gender equality and women's empowerment.

Strategies

Build network among women and women-led organizations for an enabling environment. And increase male engagement in the advocacy campaign.

Incentive for participation

- Consider women’s convenience while setting meeting agenda and venue.
- Provide transportation costs for attending the trainings.
- Ensure that women are aware of meetings or activities in an appropriate way.
- Provide opportunity to participate in learning events /platforms for women leaders and women champions.

I. General information of Intervention Package (Ipack)

<p>IPack 5: Advocacy campaign: Gender-inclusive governance for SNRM and Resilience</p>	<p>Lack of gender integration in SNRM, CCA, and DRR planning and implementation process</p>	<p>The underrepresentation of women in the decision-making process has resulted in the exclusion of women’s specific needs and capacities in SNRM, CCA, and DRR. Increased influence of women in governance is important to identify and include gender-responsive program interventions to increase the adaptive capacity of vulnerable women.</p>	<ul style="list-style-type: none"> • Increase awareness of gender equality and promote women’s empowerment. • Increase women’s leadership in SNRM, CCA, and DRR • Building women’s knowledge and skills in resource conservation and management • Increase women’s participation in decision-making forums 	<ul style="list-style-type: none"> • Raise awareness about gender issues and the advantages on gender equality for sustainable socio-economic development that benefits not only women, but also whole societies. • Build a network of allies and supporters of gender equality aiming to create an enabling environment when gender equality and women’s rights can flourish • Build network among women and women-led organizations for an enabling environment. 	<ul style="list-style-type: none"> • Increase women capacities, leadership and agency, • Include transformative gender activities at community level, community radio, flyers, training targeting men and women, etc • Consider women’s convenience while setting meeting agenda and venue. • Provide transportation costs for attending the trainings. • Ensure that women are aware of meeting or activities in an appropriate way. • Provide opportunity to participate in learning events /platforms for women leaders and women champions.
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2. Outputs and activities

Intervention packages	Outputs	Activities and sub activities
Advocacy Campaign: Gender-inclusive governance for SNRM and Resilience	Raise awareness campaign on gender issues for both men and women with a special focus on men to engage as allies	<ol style="list-style-type: none"> I. Developing and implementing awareness-raising sessions targeting government, civil society, grassroots organizations, and rural communities (includes preparing a strategy with issues, objectives, actions/products) <ol style="list-style-type: none"> i. Prepare and disseminate short videos on gender and governance, SNRM, and climate resilience in the river system. ii. Prepare community radio programs and short messages, PSA (public service announcement), radio jingles on gender and governance, SNRM, and resilient by utilizing local radio. iii. Prepare drama and role play by involving local school/eco club in awareness-raising campaigns on SNRM, gender inclusive governance, and youth involvement for climate resilience. iv. Engage males, especially stakeholders of the river system, and involvement in advocating gender and women’s issues and concern through awareness-raising activities by eco-club. The activity should be conducted during the day celebration: women’s day, environment day, Indigenous people’s day, Churia day, etc. v. Create informal learning and sharing platforms for grassroots-level women by utilizing local schools, eco clubs, and youth associations.
	Integrated gender equality in local planning, implementation to contribute in SNRM and climate resilience	<ol style="list-style-type: none"> 2. Collect local-level best practices for learning and policy influence to ensure gender responsiveness and women’s participation, access, control, and leadership. This should be linked with project level activity- collecting community and indigenous knowledge collection packages-compendium development.
		<ol style="list-style-type: none"> 3. Provide gender mainstreaming training/ workshops to local government and CBOs and concerned stakeholders. The activity should be linked with project level activity: building capacity of project implementer, government staffs and other stakeholders.
		<ol style="list-style-type: none"> 4. Conduct GESI-focused social audits and public hearings to understand the allocation of gender-responsive activities, budgeting, and implementation concerning GESI-inclusive practice at local level.

3. Feasibility analysis

Activities	Activities Risks and obstacles	Risk reduction measures	Indicators	
Advocacy Campaign: Gender-inclusive governance for SNRM and Resilience				
Increased access of women to NRM/ CRLUP and management knowledge and information.	5. Developing and implementing awareness-raising sessions targeting government, civil society, grassroots organizations, and rural communities (includes preparing a strategy with issues, objectives, actions/products)	Social norms and values restricting women to participate and give time for informal learning and sharing platforms.	Identification of social and structural barriers faced by women through sensitization measures	Social norms and barriers that prevent women's participation are identified.
	vi. Prepare and disseminate short videos on gender and governance, SNRM, and climate resilience in the river system.	Women and youth lack access and resources about local level policies making them vulnerable. Lack of resources	Awareness and sharing of policies. Ensure availability of resources.	3 videos developed. 3 dissemination activity in the river system. Event/ activity report At least 70% of target population participated. At least one report containing five best practices published and disseminated.
	vii. Prepare community radio programs and short messages, PSA (public service announcement) , radio jingles on gender and governance, SNRM, and resilient by utilizing local radio.		Raise awareness about long-term benefits of information dissemination.	50 radio programs in local language
	viii. Prepare drama and role play by involving local school/eco club in awareness-	Inadequate interest and motivation of concerned institutions.	Raise awareness about long-term benefits, social prestige.	Number of events between institutions and women groups/ CBOs. 3 drama and event conduct in the river system.

	<p>raising campaigns on SNRM, gender inclusive governance, and youth involvement for climate resilience.</p> <p>ix. Engage males, especially stakeholders of the river system, and involvement in advocating gender and women's issues and concern through awareness-raising activities by eco-club. The activity should be conducted during the day celebration: women's day, environment day, Indigenous people's day, Churia day, etc.</p>	Less priority		<p>4 events conduct in the river system.</p> <p>50 % of male participation engaged.</p> <p>Frequency of male involvement in gender and women's issues and concerns.</p>
Integrated gender in local planning processes in SNRM and climate resilience	<p>2. Collect local-level best practices for learning and policy influence to ensure gender responsiveness and women's participation, access, control, and leadership. This should be linked with project level activity- collecting community and indigenous knowledge collection packages- compendium development.</p>	Inadequate budget	Explore budget availability.	<p>Assessment reports. 2 Best practices collected.</p>
	<p>3. Provide gender mainstreaming training/ workshops to local government and CBOs and concerned</p>	Gender is not a priority.	Raise awareness about long-term benefits after participating in gender	1 trainings conducted.

	stakeholders. The activity should be linked with project level activity: building capacity of project implementer, government staffs and other stakeholders.		workshops/ workshops.	
	4. Conduct GESI-focused social audits and public hearings to understand the allocation of gender-responsive activities, budgeting, and implementation concerning GESI-inclusive practice at local level.	Lack of transparency. Inadequate budget. Exclusion of women and marginalized groups.	Increase practices for transparency through networking meetings, regular meetings. Policy guidance for ensuring intersectionality in social audits and public hearing. Adopt participatory tools for public hearing such as roleplays.	1 event conducted. Percentage of women including Dalits and Ips participation. Number of issues raised on intersectional issues.

5. Safeguard Analysis

Table 1: Safeguard analysis (risk)

Outputs	Activities	Social & Environmental risk	Risk reduction measures	Risk reduction targets	Indicators
Increased access of women to SNRM and increase resilience	<ul style="list-style-type: none"> i. Developing and implementing awareness-raising sessions targeting government, civil society, grassroots organizations, and rural communities (includes preparing a strategy with issues, objectives, actions/products) x. Prepare and disseminate short videos on gender and governance, SNRM, and 	<ul style="list-style-type: none"> • Social changes not acceptable by some men and women of the society and IPs not inclusive 	<ul style="list-style-type: none"> • Promotion of women, IPs, Dalit and marginalized groups • Advocating GESI and women's issues among male and inform on transformative 	<ul style="list-style-type: none"> • Informal learning and sharing platform benefited by grassroots level women, IPs, Dalits and marginalized groups • % of CBOs and women groups made aware on gender responsive information and access to 	<ul style="list-style-type: none"> • At least 30% of Grassroots level women, IPs, Dalits and marginalized empowered • Gender responsive information and availability

	<p>climate resilience in the river system.</p> <p>xi. Prepare community radio programs and short messages, PSA (public service announcement), radio jingles on gender and governance, SNRM, and resilient by utilizing local radio.</p> <p>xii. Prepare drama and role play by involving local school/eco club in awareness-raising campaigns on SNRM, gender inclusive governance, and youth involvement for climate resilience.</p> <p>xiii. Engage males, especially stakeholders of the river system, and involvement in advocating gender and women's issues and concern through awareness-raising activities by eco-club. The activity should be conducted during the day celebration: women's day, environment day, Indigenous people's day, Churia day, etc.</p>	<ul style="list-style-type: none"> Men not interested in social change and not supportive too Women participation not ensured in SNRM/CRLUP and management. Gender responsive awareness not shared or available as they are not prioritized 	<p>change and recognizing women's voice for change, reduce GBV</p> <ul style="list-style-type: none"> Awareness promotion on gender responsive information and ensure to make available to all 	<ul style="list-style-type: none"> resources increased % of male engagement in GESI and women's issues help change the social norms and values 	<ul style="list-style-type: none"> access made easy Male involvement increased in advocacy of GESI and women's issues and minimized social disparities
2.	Collect local-level best practices for	<ul style="list-style-type: none"> Change in gender roles 	<ul style="list-style-type: none"> Conduct GESI 	<ul style="list-style-type: none"> 50% men and women know 	<ul style="list-style-type: none"> Province and local

	learning and policy influence to ensure gender responsiveness and women's participation, access, control, and leadership. This should be linked with project level activity- collecting community and indigenous knowledge collection packages- compendium development	not easily accepted posing threats to social norms and values	trainings and awareness campaigns and policy reviews to strengthen the GESI initiatives	about the GESI policy and integration strategies	level policy reviewed
	3. Provide gender mainstreaming training/ workshops to local government and CBOs and concerned stakeholders. The activity should be linked with project level activity: building capacity of project implementer, government staffs and other stakeholders.	<ul style="list-style-type: none"> Gendered governance restricting women to participate. Women participation in NRM sectors can pose threat to social change 	<ul style="list-style-type: none"> Document of good and best practices in gendered governance that has minimized social discrimination and women empowered reducing GBV as well 	<ul style="list-style-type: none"> Gendered governance best practices documented, and learning shared for social change 	<ul style="list-style-type: none"> Best practices in gendered governance documented and published
Integrate d gender in local planning processes in SNRM and resilience	4. Conduct GESI-focused social audits and public hearings to understand the allocation of gender-responsive activities, budgeting, and implementation concerning GESI-inclusive practice at local level.	<p>Women not being empowered could hinder their participation.</p> <p>Leadership discrimination among women and elite captures</p> <p>GESI not prioritized. Inclusive transparency and practices limited and not prioritized</p>	<p>Rapid assessment on women's contribution and involvement in NRM/CRLUP and management to be conducted and shared for minimizing social barriers.</p> <p>Trainings to be provided to mainstream</p>	<p>% of women's contribution and involvement analyzed and further plans developed</p> <p>% of understanding level and mainstreaming of GESI well adopted</p> <p>% Of local institutions practice GESI focused social audits and public hearing for social and strong governance practice</p>	<p>Rapid assessment conducted. GESI mainstreaming training and workshops raised awareness.</p> <p>GESI focused social audit and public hearing conducted regularly</p>

			gender increasing the trend of preparing action plans as GESI priority. Regularly conduct GESI focused audits and public hearing to increase transparency and good governance		
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6. Budget:

Note: Budget estimations are tentative and done based on consultation workshops with key stakeholders at river system level during 2022. However, during time of implementation, the rate and amount mentioned in the CERP plans are subjected to change based on the changes in market situation as well as the field condition. Respective Provincial Project Management Offices (PPMUs) can make necessary changes based on field situation following the norms and rates as per the Nepal government rules and regulations.

Output 5: Advocacy Campaign: Gender-inclusive governance for SNRM and Resilience				
Activity 5.1				
5.1.1 Developing and implementing awareness-raising sessions targeting government, civil society, grassroots organizations, and rural communities (includes preparing a strategy with issues, objectives, actions/products)	Event/episode	Activity/episode/events	Amount	Total
5. Prepare and disseminate short videos on gender and governance, SNRM, and climate resilience in the river system.	Event	3	150,000	4,50,000
5.1.2 Prepare community radio programs and short messages, PSA (public service announcement), radio jingles on gender and governance, SNRM, and resilient by utilizing local radio.	Episode	50	10,000	500000
5.1.3 Prepare drama and role play by involving local school/eco club in awareness-raising campaigns on SNRM, gender inclusive governance, and youth involvement for climate resilience.	Event	3	50,000	150,000

5.1.4 Engage males, especially stakeholders of the river system, and involvement in advocating gender and women's issues and concern through awareness-raising activities by eco-club. The activity should be conducted during the day celebration: women's day, environment day, Indigenous people's day, Churia day, etc.	Event	4	100000	400000
5. Create informal learning and sharing platforms for grassroots-level women by utilizing local schools, eco clubs, and youth associations (number of event-.	Event	2	40,000	80,000
5.2 Collect local-level best practices for learning and policy influence to ensure gender responsiveness and women's participation, access, control, and leadership. This should be linked with project level activity- collecting community and indigenous knowledge collection packages-compendium development.	Event	3	20,000	60,000
5.3 Provide gender mainstreaming training/ workshops to local government and CBOs and concerned stakeholders. The activity should be linked with project level activity: building capacity of project implementer, government staffs and other stakeholders.	Event	1	150,000	150,000
5.4 Conduct GESI-focused social audits and public hearings to understand the allocation of gender-responsive activities, budgeting, and implementation concerning GESI-inclusive practice at local level.	Event	1	1,00000	1,00000
Total Budget (NRs)				18,90,000

Note: Budget estimations are tentative and are subjected to change based on the changes in market situation as well as the field condition.

Overall feasibility analysis of IPacks

Intervention Packages	Outputs	Implementation risks/obstacles L=3/M=2/H=1	Cost effectiveness of risk reduction measures H=3/M=2/L=1	Cost to implement L=3/M=2/H=1	Opportunity cost L=3/M=2/H=1	Incentive Measures H=3/M=2/L=1	Total score
IPack 1	Output 1: Natural forest ecosystems are better maintained and protected within the project area	3	2	2	3	3	13
	Output 2: Forests and tree cover are restored and maintained in the River System landscapes	2	2	3	2	2	11
IPack 2	Output 3: Local structures are enhancing resilience against climate change induced erosion, sedimentation and flooding risks	2	2	2	3	3	12
IPack 3:	Output 4: Farmers are skilled in using climate-resilient land use practices.	3	3	3	2	3	14
IPack 4:	Output 4: Farmers are skilled in using climate-resilient land use practices.	3	3	3	2	3	14
IPack 5:	Women friendly climate adaptive livelihood activities are Implemented	2	3	2	1	1	9

IPack 6	Increased access of women to NRM/ CRLUP and management knowledge and information.	2	3	1	1	3	10
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Monitoring and Reporting:

River system level monitoring and reporting will be carried out by Ministry of Forest and Environment through PMU and PPMU of BRCRN.

Following monitoring protocol will be adopted to monitor the outputs of the CERP

Expected Results	Objectively verifiable Indicator	Baseline	Target	Means of verification	Assumptions
Output 1: Natural forest ecosystems are better maintained and protected within the project area	Density of forest area in terms of biomass in the river systems.	Total biomass of forest land: 195.05 ton/ha Total biomass of other wooded land: 31.60 ton/ha	Forest density increased by 2%	Baseline survey report Endline survey report	This river system has 13361 ha forest and 950 ha other wooded land area (Baseline survey report 2022)
	Area (in ha.) of natural forest restored through ANR and enrichment plantation	0	950 ha of natural forest restored through ANR and enrichment plantation	PPMU/DFO records Maps Progress Reports	CBOs adopt climate resilient land use practices During baseline, degraded forest (other wooded forest) area is 950 ha.
	xx forestry user groups manage xx has of forest through updated forest management plan	0 forestry user groups manage 0 ha. of forest through updated forest management plan	30 forest user groups manage 7807ha. of forest through updated forest management plan	DFO/Group/PPMU records Progress report	Community based forestry groups implement renewed forest management operational plan
Output 2 Forests and tree cover are	Xx ha of new plantation outside forest	Area: 0 ha. Survival rate: NA	Area: 3032 ha. Survival rate: 80%	Municipal /DFO/PPMU record	Local government supported and

restored and maintained in the river system landscapes.	area; and their survival rate (public land forestry and private forestry)			Progress Report	owned public land and private forestry initiatives under their own jurisdiction
Output 3: Local structures are enhancing resilience against climate change induced erosion, sedimentation and flooding risks.	Volume of sedimentation	Xx cubic meter of soil volume per unit area	25% in comparison to before constructing structures	In-person assessments at lower gabions. Progress report	Other climate-resilient SNRM practices (including Activities on climate-resilient land use, sustainable management of forests and reforestation) are successfully implemented, further reducing potential for erosion and sedimentation
Output 4: Farmers are skilled in using climate-resilient land use practices.	Proportion of farmers trained by the project who begin to apply climate-resilient land use practices on their fields in the relevant season following their respective trainings.	0	At least 80% of the farmers involved in project trainings have begun to apply project-promoted climate-resilient land use practices in the season following their training	Assessment report Progress report	The final selection of practices to be promoted at each specific training site are highly relevant to targeted farmers' cropping systems and conditions, as well as the climate change challenges with which they must contend. Trainings are delivered in a form and manner that is accessible to,

					and relevant for, targeted farmers.
Output 5. Integrated gender and equity issues in governance practices in NRM/ CRLUP and management	% of women in key leadership positions of CBO's executive committee	80 out of 232 (34.5%) women are in leadership position	At least 50% women in key leadership position	DFO/Group/PPMU record	Proportional representation of all social groups ensured
	Access of women in Natural resources management, CRLUP, knowledge and information	0	At least 50% women participation in all events	Group record/PPMU record Progress report	Proportional representation of all social groups ensured
	Integrate gender in local planning processes in NRM/ CRLUP and management	0	30 no. of Gender sensitive plan	PPMU record Progress report	Gender dimensions ensured in climate resilient plan including forest management operational plan of groups

Outcome and impact level result assessment will be carried out based on result framework of CERP (annex-1) using BRCRN monitoring and evaluation framework. Output level results of this CERP fully aligned with the BRCRN outcome and impact indicators.

Activity level monitoring will be carried out based on work plan and budget. Joint monitoring mechanism will be established to monitor the activity and results.

Annexes:

Annex-I Result Framework of Kamala Belsot Jogiya Critical Ecosystem Restoration Plan

Vision: Climate resilient and sustainably managed Natural Resources and communities in Kamala Belsot Jogiya River system (by 2040)

Result framework:

Expected Results	Objectively verifiable Indicator	Baseline	Target	Means of verification	Assumptions
Impacts					
GCF core indicator (Mitigation) A4.0 Improved resilience of ecosystems and ecosystem services (proximate indicator 2 to 5)	Tonnes of carbon dioxide equivalent (tCO ₂ e) reduced or avoided Proxy indicator: (1) Deforestation rate: (2) Sustainable forest management area: (3) ANR area (4) Plantation area (5) Area of Climate Resilient Agriculture (CRA)	Proxy indicator: (1) Deforestation rate: 0.67% (2) Sustainable forest management area:0 (3) ANR area (4) Plantation area (5) Area of Climate Resilient Agriculture (CRA)	Proxy indicators: (1) Deforestation rate: 0 (2) Sustainable forest management area: 7807 ha (3) ANR area: 950 ha (4) Plantation area: 3032 ha (5) Area of Climate Resilient Agriculture (CRA): 3093 ha	PPMUs/PMU report GCF/BRCRN GHG mitigation calculation tool-based calculation sheet	Total natural forest area in this river include 13360.5 ha forest and 950 ha other wooded land (Baseline survey report 2022) CERP land use data shows changes in forest area between 2000 and 2019 is-1948.1 ha. and -0.67 % deforestation rate.
GCF core indicator (Adaptation)	Total number of direct and indirect beneficiaries (gender disaggregated)		Direct (male: 13305, female: 14368)	Progress reports PPMU record	CBOs adopt climate-resilient land use practices. 5739 HHs associated with forestry user groups with 27673 population (13305 male and 14368 female)

Outcomes					
M9.0 Improved management of land or forest areas contributing to emissions reductions	M9.1 Hectares of land or forests under improved and effective management that contributes to CO ₂ emission reductions		Atleast 7807 ha of forest ecosystems sustainably managed Atleast 950 ha of natural forests restored through assisted regeneration 3032 ha of new planted forests established Area of Climate Resilient Agriculture (CRA): 3093 ha	Project reports PPMU record	Beneficiaries adopt climate-resilient land use practices
A8.0 Strengthened awareness of climate change threats and risk reduction processes	A8.1 Number of males and females made aware of climate threats and related appropriate responses	0 men 0 women 0 total	13305 men 14368 women 27673 total	Workshop/training Attendance sheets and materials	Beneficiaries are interested in adopting climate resilient land use practices. 5739 HHs associated with forestry user groups with 27673 population (13305 male and 14368 female)
Outputs					
Output1 natural forest ecosystems are better maintained and protected within the project area	Density of forest area in the river systems.	Total biomass of forest land: <u>195.05 ton/ha</u> Total biomass of other wooded land: <u>31.60 ton/ha</u>	Forest density increased by 2%	Base line survey report Endline survey report	This river system has 13361 ha forest and 950 ha other wooded land area (Baseline survey report 2022)
	Area (in ha.) of natural forest restored through ANR	0	950 1099 ha of natural forest restored through ANR	PPMU/DFO records Maps <u>Progress Reports</u>	CBOs adopt climate resilient land use practices

	and enrichment plantation		and enrichment plantation		During baseline, degraded forest (<u>other wooded forest</u>) area is 950 ha.
	xx forestry user groups manage xx ha of forest through updated forest management plan	0 forestry user groups manage 0 ha. of forest through updated forest management plan	30 5+ forest user groups manage 7807ha. of forest through updated forest management plan	DFO/Group/PPMU records Progress report	Community based forestry groups implement renewed forest management operational plan Improved density of forest
Output 2 Forests and tree cover are restored and maintained in the river system landscapes.	Xx ha of new plantation outside forest area; and their survival rate (public land forestry and private forestry)	Area: 0 ha. Survival rate: NA	Area: 3032 ha. Survival rate: 80%	Municipal /DFO/PPMU record ProgressReport	Local government supported and owned public land and private forestry initiatives under their own jurisdiction
Output 3: Local structures are enhancing resilience against climate change induced erosion, sedimentation and flooding risks.	Volume of sedimentation	Xx cubic meter of soil volume per unit area	25% in comparison to before constructing structures	In-person assessments at lower gabions. Progress report	Other climate-resilient SNRM practices (including Activities on climate-resilient land use, sustainable management of forests and reforestation) are successfully implemented, further reducing potential for erosion and sedimentation
Output 4: Farmers are skilled in using climate-	Proportion of farmers trained by the project who begin to	0	At least 80% of the farmers involved in project	Assessment report Progress report	The final selection of practices to be promoted at

resilient land use practices.	apply climate-resilient land use practices on their fields in the relevant season following their respective trainings.		trainings by the end of PY4 report that they have begun to apply project-promoted climate-resilient land use practices in the season following their training		each specific training site are highly relevant to targeted farmers' cropping systems and conditions, as well as the climate change challenges with which they must contend. Trainings are delivered in a form and manner that is accessible to, and relevant for, targeted farmers.
Output 5. Integrated gender and equity issues in governance practices in NRM/ CRLUP and management	% of women in leadership positions of CBO's executive committee	80 out of 232 (34.5%) women are in leadership position	At least 50% women in leadership position	DFO/Group/PPMU record	Proportional representation of all social groups ensured
	Access of women in Natural resources management, CRLUP, knowledge and information	0	At least 50% women participation in all events	Group record/PPMU record Progress report	Proportional representation of all social groups ensured
	Integrate gender in local planning processes in NRM/ CRLUP and management		30 no. of Gender sensitive plan	PPMU record Progress report	Gender dimensions ensured in climate resilient plan including forest management operational plan of groups

Activities:

Activities	Description	Sub-activities	Remarks
Output I natural forest ecosystems are better maintained and protected within the project area			
Activity 1.1: Restoration of degraded natural forests		1.1.1 Construction/promotion of forest Nursery 1.1.2 Seedling production in Nursery (Multi-years' seedlings) 1.1.3 Enrichment plantation and regeneration management in degraded forest 1.1.4 Cleaning of existing fire line and existing trails 1.1.5 Construction/improvements of fencings in natural forest lands 1.1.6 Support on forest firefighting equipment/tools (26 sets) 1.1.7 support on provisions for forest watcher 1.1.8 Support on fodder-seedlings for fodder trees promotion 1.1.9 Linking with existing mobile app system from ICIMOD for forest fire monitoring and forest management (1 event) 1.1.10 Development of Community Based Forest Fire Fighting Groups (CB-FFFG) 1.1.11 Provide skilled-based training capacity for CBFFFGs on forest fighter trainings-forest fire control and management for (51*3) =153 persons-firefighter trainings) for CFUGs/LFUGs 1.1.12 Provide 1-day orientation trainings for Herders on importance of forest services and management (300 herders/livestock) 1.1.13 Provide skilled-based trainings to promote compost and green manure preparation using forest based resources-bushes and leaf-litters-3 days training (one event for each CFUGs/LFUGs)	
Activity 1.2: Enhanced capacity of forest management stakeholders (government units, CFUGs, forest management CSOs, users)		1.2.1 Support on Forest Operational Plan (FoP) /reviews 1.2.13 Coaching on forest operational plan for forest users (26 events) 1.2.2 Develop Training of Facilitator (ToF) on Forest Resource Management -7days (10 persons) 1.2.3 Capacity building trainings on forest management for government staffs (DFOs/SDFOs) (1 event-3 days residential) 1.2.4 Provide refresher trainings for CFUGs/LFUGs in forest management-3 days for each CFUGs (non-residential) at local level 1.2.5 Celebration of Churia Conservation Day (5 events) at river system level 1.2.6 Facilitation on school course programme on sustainable forest management (1 event)	

		1.2.7 Production dissemination of sustainable management of natural resources 1.2.8 Facilitation support for alternative energy uses / biogas plants installation(400 HHs)	
Output 2 Forests and tree cover are restored and maintained in the river system landscapes.			
Activity 2.1: Enhanced forest land in river site areas (afforestation)		2.1.1 Plantation in river side area (forestry plantation) 2.1.2 Capacity building trainings for users on the management of plantation in river site areas	
Output 3: Local structures are enhancing resilience against climate change induced erosion, sedimentation and flooding risks.			
Activity 3.1 Conserved soil and water source and Improved water retention		3.1.1 Landslide treatments 3.1.2 Gulley stabilization in torrent stream (19 torrents) 3.1.3 Irrigation improvement 3.1.4 Construction of conservation pond 3.1.5 Improvement of existing pond 3.1.6 Wetland improvement 3.1.7 Construction of water harvesting structures (dams) 3.1.8 Riverbank stabilization	
Activity 3.2 Capacitated stakeholders and enhanced water and soil conservations		3.2.1 Skill based training for local community CFUGs/LFUGs on landslide and gullies stabilization with locally available treatment measures (26 events); 3.2.2 Orientation training on soil and water conservation measures for government officials 3.2.3 Support on demonstration visits on soil and water conservation programme 3.2.4 Sensitize on upstream and downstream linkages for ecosystem services 3.2.5 Support on production and dissemination of success stories of water and soil conservation practices for possible replication	
Output 4: Farmers are skilled in using climate-resilient land use practices.			
Activity 4.1: Established agroforestry activities		4.1.1 Establishment of Agroforestry Fodder Nursery 4.1.2 Purchasing seedlings of horticulture species for agro-forestry focus on multiyear seedling production 4.1.3 Support agroforestry activities in the potential lands 4.1.4 Irrigation facility (small irrigation facility) 4.1.5 Formation of AFG focusing on women farmers 4.1.6 Institutional support and office equipment for women group 4.1.7 Coordination meetings (5 years)	
Activity 4.2: Capacitated communities'/farmer groups and government officers to promote agroforestry system (4 AFG)		4.2.1 Training for agroforestry groups on sustainability, principle of administration and management-3 days residential	

		<p>4.2.2 Training on improved AF practices (promotion for small enterprises for the production)-5 days residential</p> <p>4.2.3 Providing capacity building for government officers on the promotion of agroforestry system-3days residential</p> <p>4.2.4 Support on production and dissemination of success stories AF system replication</p>	
Activity 4.3 Established six FFSs and increased farmers' ability in seed production.		<p>4.3.1 Establish 6 FFSs</p> <p>4.3.2 Capacity building on livestock management practices-sheds improvements crop depredation by wildlife</p> <p>4.3.3 Support to farmers for seed production (rice & wheat) through FFS approach</p>	
Activity 4.4: Enhanced farmers' capacity in climate resilient practices		<p>4.4.1 Capacity building trainings on using weather information and its application skills in farming practices;</p> <p>4.4.2 Provide training to adopt and apply climate resilient land use practices (for examples: compost manure preparation, mulching, water retention capacity, green manure,</p> <p>4.4.3 Support to link the farmers with the local market centers and know the market information;</p>	
Activity 4.5: Increased coping strategies for wildlife threats in crops		4.5.1 Sensitization orientation on wildlife threats and risk reduction in agriculture	
5. Maximize women participation in climate adaptation actions			
5.1 Increased participation of women in climate adaptation actions		<p>5.1.1 Orient the project staff to implement GESI guidelines to ensure participation by the marginalized women</p> <p>5.1.2 Provide the Dalit women access to improved livestock and fodder management services to enable them to stop firewood selling for livelihood</p> <p>5.1.3 Assist the Majhi women on pond based fisheries</p> <p>5.1.4 Rehabilitate drinking water sources as per women's choices for location</p> <p>5.1.5 Conduct social mobilization to eliminate the structural barriers against women's active participation in climate adaptation processes.</p>	
5.2 Integrated gender in local planning processes in NRM/ CRLUP and management		<p>5.2.1 Conduct rapid assessment on women's contribution and involvement in NRM/ CRLUP and management.</p> <p>5.2.2 Provide gender mainstreaming trainings/ workshops to local government and CBOs and concerned stakeholders.</p> <p>5.2.3 Conduct GESI focused social audits and public hearing.</p> <p>5.2.4 Promote awareness on gender responsive information, available provisions and resources among CBOs/ women groups.</p>	

		5.2.5 Engage male involvement to advocate gender and women’s issues and concern.	
6.Gender inclusive governance ensured in Natural resource management			
6.1 Increased access of women to NRM/ CRLUP and management knowledge and information.		6.1.1 Create informal learning and sharing platforms for grassroots-level women 6.1.2 Conduct local level policy to ensure gender responsiveness and women’s participation, access, control and leadership. 6.1.3 Produce and publish best practices and learnings in governance	
6.2 Integrated gender in local planning processes in NRM/ CRLUP and management.		6.2.1 Conduct rapid assessment on women’s contribution and involvement in NRM/ CRLUP and management. 6.2.2 Provide gender mainstreaming trainings/ workshops to local government and CBOs and concerned stakeholders. 6.2.3 Conduct GESI focused social audits and public hearing. 6.2.4 Promote awareness on gender responsive information, available provisions and resources among CBOs/ women groups. 6.2.5 Engage male involvement to advocate gender and women’s issues and concern.	

Annex-2: Planned Activities, Location and Description

Note: The location coordinates of planned activity sites listed in table below are the result of participatory mapping exercise conducted with local stakeholders who demarcated the intervention location in the map with google image in background. Some of the locations (approximately 30% of the sites) are verified in the field for their accuracy and validity. However, due to time and resource constraint for field verification, all identified location coordinates are not verified in field. Hence, location coordinates mentioned in CERP activity sites need further field verification before the implementation. Locations are subjected to change as per the field findings and verification result. Intervention site coordinate mentioned in this CERP Annexes should be taken only as initial guidance to start the field process and, if they are found inappropriate during the field verification, the technical team from PPMU can conduct location changes with proper documentation of field condition.

SN	Activity	Location	Lat	Long	Code	Unit	Description
1	River bed farming	Kamala Municipality-8	26.754 56	86.15319	A17	41.7	Area (Ha)
2	Fencing as Assisted Natural Regeneration	Karjanha Municipality-4	26.890 55	86.18350	M56	4.9	Length (Km)
3	Fencing as Assisted Natural Regeneration	Katari Municipality-1	26.890 91	86.25772	M336	1.1	Length (Km)
4	Fencing as Assisted Natural Regeneration	Karjanha Municipality-2	26.893 96	86.14476	M67	2.0	Length (Km)
5	Fencing as Assisted Natural Regeneration	Katari Municipality-1	26.897 16	86.25421	M335	1.2	Length (Km)
6	Fencing as Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.930 90	86.13579	M161	6.0	Length (Km)
7	Fencing as Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.944 97	86.16247	M222	2.5	Length (Km)
8	Fencing as Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.966 94	86.16254	M265	2.2	Length (Km)
9	Fencing as Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.971 73	86.15714	M24	3.5	Length (Km)
10	Fencing as Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	27.002 82	86.09191	M42	3.1	Length (Km)
11	Assisted Natural Regeneration	Katari Municipality-1	26.896 11	86.23682	M91	7.3	Area (Ha)
12	Assisted Natural Regeneration	Karjanha Municipality-2	26.900 43	86.16257	M120	21.1	Area (Ha)
13	Assisted Natural Regeneration	Karjanha Municipality-4	26.887 52	86.19118	M74	5.2	Area (Ha)
14	Assisted Natural Regeneration	Kamala Municipality-8	26.738 14	86.14866	M14	121.0	Area (Ha)
15	Assisted Natural Regeneration	Sahidnagar Municipality-3	26.739 64	86.09670	M15	7.0	Area (Ha)
16	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.916 44	86.19442	M203	16.1	Area (Ha)

17	Assisted Natural Regeneration	Katari Municipality-1	26.902 36	86.32379	M130	5.5	Area (Ha)
18	Assisted Natural Regeneration	Katari Municipality-1	26.890 44	86.24138	A80	2.7	Area (Ha)
19	Assisted Natural Regeneration	Katari Municipality-1	26.897 51	86.25262	M97	8.7	Area (Ha)
20	Assisted Natural Regeneration	Katari Municipality-1	26.898 95	86.26044	M108	4.3	Area (Ha)
21	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	27.005 94	86.08910	M326	74.5	Area (Ha)
22	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.947 24	86.15985	M274	33.9	Area (Ha)
23	Assisted Natural Regeneration	Karjanha Municipality-2	26.885 87	86.17862	M71	138.7	Area (Ha)
24	Assisted Natural Regeneration	Sabaila Municipality-4	26.787 12	86.13977	M23	29.7	Area (Ha)
25	Assisted Natural Regeneration	Karjanha Municipality-2	26.891 01	86.14216	M82	23.5	Area (Ha)
26	Assisted Natural Regeneration	Karjanha Municipality-2	26.885 80	86.14546	M70	20.8	Area (Ha)
27	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.966 75	86.15961	M293	29.8	Area (Ha)
28	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.969 13	86.15360	M297	62.1	Area (Ha)
29	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.969 69	86.10924	M298	15.7	Area (Ha)
30	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.966 39	86.11969	M292	12.3	Area (Ha)
31	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.971 77	86.14060	M300	4.1	Area (Ha)
32	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.974 56	86.14983	M301	7.6	Area (Ha)
33	Assisted Natural Regeneration	Katari Municipality-1	26.892 03	86.25619	M85	8.4	Area (Ha)
34	Assisted Natural Regeneration	Katari Municipality-1	26.908 56	86.25974	M179	1.9	Area (Ha)
35	Assisted Natural Regeneration	Karjanha Municipality-1	26.928 31	86.15215	M234	24.8	Area (Ha)
36	Assisted Natural Regeneration	Karjanha Municipality-1	26.900 96	86.14099	M121	23.2	Area (Ha)
37	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.916 43	86.12587	M202	18.7	Area (Ha)
38	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.922 54	86.11327	M217	15.0	Area (Ha)
39	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.918 70	86.10118	M207	8.5	Area (Ha)
40	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.920 71	86.10453	M213	16.2	Area (Ha)
41	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.930 73	86.13279	M239	107.4	Area (Ha)
42	Assisted Natural Regeneration	Karjanha Municipality-3	26.878 07	86.14508	M55	6.9	Area (Ha)
43	Assisted Natural Regeneration	Ganeshman Charnath Municipality-8	26.880 39	86.13420	M60	11.4	Area (Ha)
44	Assisted Natural Regeneration	Ganeshman Charnath Municipality-8	26.833 51	86.15446	M34	71.9	Area (Ha)

45	Assisted Natural Regeneration	Karjanha Municipality-1	26.907 77	86.15961	M172	6.6	Area (Ha)
46	Assisted Natural Regeneration	Karjanha Municipality-1	26.906 90	86.16275	M162	8.1	Area (Ha)
47	Assisted Natural Regeneration	Karjanha Municipality-2	26.905 27	86.16616	M146	3.7	Area (Ha)
48	Assisted Natural Regeneration	Karjanha Municipality-2	26.897 05	86.17086	M94	10.3	Area (Ha)
49	Assisted Natural Regeneration	Karjanha Municipality-1	26.913 35	86.15392	M197	13.5	Area (Ha)
50	Assisted Natural Regeneration	Karjanha Municipality-4	26.887 51	86.19839	M73	3.9	Area (Ha)
51	Assisted Natural Regeneration	Katari Municipality-1	26.913 26	86.30593	M196	4.4	Area (Ha)
52	Assisted Natural Regeneration	Dudhouli Municipality-11	26.938 39	86.25533	M261	10.0	Area (Ha)
53	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.950 33	86.16762	M276	6.7	Area (Ha)
54	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.960 65	86.15971	M290	2.8	Area (Ha)
55	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.952 22	86.12479	M277	11.7	Area (Ha)
56	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.991 27	86.10015	M314	8.6	Area (Ha)
57	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.998 64	86.08727	M321	9.4	Area (Ha)
58	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.995 55	86.09219	M317	6.7	Area (Ha)
59	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.990 81	86.11318	M313	4.5	Area (Ha)
60	Assisted Natural Regeneration	Ganeshman Charnath Municipality-5	26.985 86	86.12530	M310	11.2	Area (Ha)
61	Assisted Natural Regeneration	Karjanha Municipality-4	26.874 30	86.19185	M47	10.9	Area (Ha)
62	Policy advocacy and capacity buildings on monitoring Mechanism	Ganeshman Charnath Municipality-9	26.838 72	86.14234	M341	1.0	Number
63	Policy advocacy and capacity buildings on monitoring Mechanism	Karjanha Municipality-6	26.840 53	86.15655	M342	1.0	Number
64	Policy advocacy and capacity buildings on monitoring Mechanism	Ganeshman Charnath Municipality-8	26.862 46	86.13492	M343	1.0	Number
65	Policy advocacy and capacity buildings on monitoring Mechanism	Ganeshman Charnath Municipality-8	26.868 86	86.13435	M344	1.0	Number
66	Policy advocacy and capacity buildings on monitoring Mechanism	Karjanha Municipality-3	26.875 66	86.15223	M345	1.0	Number
67	Policy advocacy and capacity buildings on monitoring Mechanism	Ganeshman Charnath Municipality-7	26.884 43	86.12821	M346	1.0	Number
68	Establishment of forest nursery	Karjanha Municipality-7	26.787 76	86.13472	M32	1.0	Number
69	Establishment of forest nursery	Karjanha Municipality-2	26.886 76	86.14187	M72	1.0	Number
70	Establishment of forest nursery	Katari Municipality-1	26.902 35	86.25589	M129	1.0	Number
71	Establishment of forest nursery	Katari Municipality-2	26.674 90	86.17502	M264	1.0	Number
72	Establishment of FFS on Paddy, Wheat	Kamala Municipality-5	26.698 20	86.18390	A8	1.0	Number

73	Establishment of FFS on Paddy	Sahidnagar Municipality-1	26.773 53	86.12598	A21	1.0	Number
74	Establishment of FFS on Paddy	Sabaila Municipality-4	26.791 98	86.13054	A26	1.0	Number
75	Establishment of FFS on Paddy	Karjanha Municipality-6	26.855 92	86.15470	A37	1.0	Number
76	Establishment of FFS on Mango	Karjanha Municipality-5	26.864 72	86.16951	A41	1.0	Number
77	Establishment of FFS on Paddy	Karjanha Municipality-3	26.870 09	86.14987	A44	1.0	Number
78	Establishment of FFS on Mango	Ganeshman Charnath Municipality-7	26.871 85	86.12687	A45	1.0	Number
79	Establishment of FFS on vegetable	Karjanha Municipality-3	26.874 00	86.15349	A46	1.0	Number
80	Establishment of FFS on Mango	Karjanha Municipality-4	26.878 28	86.18834	A58	1.0	Number
81	Establishment of FFS	Karjanha Municipality-2	26.892 33	86.15099	A86	1.0	Number
82	Establishment of FFS	Katari Municipality-1	26.898 47	86.23327	A105	1.0	Number
83	Establishment of FFS on Maze	Katari Municipality-1	26.899 90	86.32849	A117	1.0	Number
84	Establishment of FFS	Karjanha Municipality-1	26.907 11	86.14984	A164	1.0	Number
85	Establishment of FFS on Maze	Katari Municipality-1	26.908 08	86.25287	A176	1.0	Number
86	Establishment of FFS on Mango	Katari Municipality-1	26.926 21	86.27192	A228	1.0	Number
87	Establishment of agroforestry nursery	Ganeshman Charnath Municipality-9	26.837 07	86.13769	A340	1.0	Number
88	Establishment of agroforestry nursery	Ganeshman Charnath Municipality-5	26.914 88	86.25081	A349	1.0	Number
89	Establishment of agroforestry nursery	Ganeshman Charnath Municipality-5	26.929 07	86.16565	A350	1.0	Number
90	Pond Improvement	Karjanha Municipality-6	26.856 76	86.15953	A38	1.0	Number
91	Construction of conservation ponds	Karjanha Municipality-4	26.874 67	86.19545	A48	1.0	Number
92	Construction of conservation ponds	Karjanha Municipality-4	26.874 72	86.19311	A49	1.0	Number
93	Construction of conservation ponds	Karjanha Municipality-3	26.876 84	86.14428	A52	1.0	Number
94	Pond Improvement	Karjanha Municipality-3	26.878 25	86.14627	A57	1.0	Number
95	Construction of conservation ponds	Karjanha Municipality-4	26.881 80	86.18104	A61	1.0	Number
96	Construction of conservation ponds	Karjanha Municipality-4	26.884 08	86.17572	A68	1.0	Number
97	Construction of conservation ponds	Katari Municipality-1	26.887 56	86.22795	A75	1.0	Number
98	Construction of conservation ponds	Karjanha Municipality-2	26.887 65	86.14267	A76	1.0	Number
99	Pond Improvement	Karjanha Municipality-2	26.888 41	86.14203	A78	1.0	Number
100	Pond Improvement	Karjanha Municipality-2	26.896 99	86.16450	A93	1.0	Number

101	Pond Improvement	Katari Municipality-1	26.897 40	86.24285	A95	1.0	Number
102	Construction of conservation ponds	Katari Municipality-1	26.899 57	86.25240	A113	1.0	Number
103	Pond Improvement	Karjanha Municipality-2	26.901 46	86.16217	A123	1.0	Number
104	Pond Improvement	Katari Municipality-1	26.904 16	86.24909	A141	1.0	Number
105	Pond Improvement	Katari Municipality-1	26.904 47	86.24751	A143	1.0	Number
106	Pond Improvement	Katari Municipality-1	26.905 31	86.25989	A147	1.0	Number
107	Pond Improvement	Ganeshman Charnath Municipality-5	26.906 95	86.23692	A163	1.0	Number
108	Pond Improvement	Karjanha Municipality-1	26.907 18	86.15750	A165	1.0	Number
109	Construction of conservation ponds	Katari Municipality-1	26.907 37	86.24560	A168	1.0	Number
110	Pond Improvement	Ganeshman Charnath Municipality-5	26.907 52	86.23274	A170	1.0	Number
111	Construction of conservation ponds	Katari Municipality-1	26.907 94	86.33088	A174	1.0	Number
112	Pond Improvement	Karjanha Municipality-1	26.911 17	86.14679	A189	1.0	Number
113	Pond Improvement	Ganeshman Charnath Municipality-5	26.911 20	86.12212	A190	1.0	Number
114	Pond Improvement	Karjanha Municipality-1	26.914 28	86.14824	A199	1.0	Number
115	Construction of conservation ponds	Katari Municipality-2	26.918 17	86.27516	A205	1.0	Number
116	Pond Improvement	Katari Municipality-1	26.927 13	86.27556	A231	1.0	Number
117	Water harvesting structure (Dam)	Karjanha Municipality-11	26.876 81	86.20804	A351	1.0	Number
118	Water harvesting structure (Dam)	Karjanha Municipality-2	26.888 32	86.17613	A352	1.0	Number
119	Water harvesting structure (Dam)	Ganeshman Charnath Municipality-5	26.920 40	86.19514	A353	1.0	Number
120	Water harvesting structure (Dam)	Ganeshman Charnath Municipality-5	27.006 82	86.09867	A354	1.0	Number
121	Water harvesting structure (Dam)	Katari Municipality-1	26.907 62	86.34756	A355	1.0	Number
122	Construction of conservation ponds	Ganeshman Charnath Municipality-5	26.939 32	86.15497	A263	1.0	Number
123	Wetland protection	Sahidnagar Municipality-7	26.695 65	86.10400	A337	1.0	Number
124	Wetland protection	Sahidnagar Municipality-7	26.700 65	86.10150	A338	1.0	Number
125	Wetland protection	Sahidnagar Municipality-7	26.703 47	86.10879	A339	1.0	Number
126	Wetland protection	Karjanha Municipality-2	26.897 69	86.16556	A347	1.0	Number
127	Wetland protection	Katari Municipality-1	26.907 10	86.24592	A348	1.0	Number
128	Riverbank stabilization with bio- engineering structures	Ganeshman Charnath Municipality-8	26.855 58	86.14506	A40	1.8	Length (Km)

129	Riverbank stabilization with bio-engineering structures	Ganeshman Charnath Municipality-8	26.863 26	86.14555	A40	2.3	Length (Km)
130	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.888 30	86.24162	A79	0.2	Length (Km)
131	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.889 77	86.22514	A81	1.2	Length (Km)
132	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.891 49	86.25504	A84	0.1	Length (Km)
133	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.897 33	86.33056	A96	0.1	Length (Km)
134	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.898 08	86.24922	A103	0.2	Length (Km)
135	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.898 26	86.33005	A102	0.1	Length (Km)
136	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.898 58	86.32362	A106	0.1	Length (Km)
137	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.898 80	86.32428	A106	0.0	Length (Km)
138	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.899 86	86.25116	A114	0.3	Length (Km)
139	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.899 92	86.26408	A119	0.2	Length (Km)
140	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.899 99	86.33393	A115	0.2	Length (Km)
141	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.901 08	86.33860	A122	0.2	Length (Km)
142	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.901 76	86.34111	A126	0.3	Length (Km)
143	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.901 79	86.24637	A125	0.1	Length (Km)
144	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.902 71	86.25797	A131	0.4	Length (Km)
145	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.903 11	86.31440	A136	0.2	Length (Km)
146	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.903 16	86.24887	A133	0.3	Length (Km)
147	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.903 33	86.24497	A137	0.2	Length (Km)
148	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.903 33	86.31164	A139	0.3	Length (Km)
149	Riverbank stabilization with bio-engineering structures	Katari Municipality-2	26.903 45	86.26363	A134	0.4	Length (Km)
150	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.904 12	86.34316	A138	0.4	Length (Km)
151	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.904 46	86.31724	A142	0.6	Length (Km)
152	Riverbank stabilization with bio-engineering structures	Ganeshman Charnath Municipality-5	26.905 04	86.20139	A145	0.3	Length (Km)
153	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.905 28	86.29620	A148	0.3	Length (Km)

154	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.905 73	86.30699	A150	0.2	Length (Km)
155	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.905 80	86.29831	A154	0.2	Length (Km)
156	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.905 96	86.30102	A155	0.2	Length (Km)
157	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.906 04	86.31252	A153	0.2	Length (Km)
158	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.906 08	86.24512	A151	0.1	Length (Km)
159	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.906 33	86.29634	A156	0.1	Length (Km)
160	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.906 95	86.30007	A159	0.2	Length (Km)
161	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.907 40	86.30928	A166	0.2	Length (Km)
162	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.907 50	86.28927	A171	0.1	Length (Km)
163	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.908 25	86.30338	A177	0.1	Length (Km)
164	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.908 57	86.29534	A175	0.3	Length (Km)
165	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.909 31	86.25370	A184	1.3	Length (Km)
166	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.910 99	86.18094	A169	1.8	Length (Km)
167	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.911 14	86.28558	A186	0.1	Length (Km)
168	Riverbank stabilization with bio-engineering structures	Ganeshman Charnath Municipality-5	26.913 85	86.24427	A198	0.4	Length (Km)
169	Riverbank stabilization with bio-engineering structures	Ganeshman Charnath Municipality-5	26.922 62	86.18531	A219	0.1	Length (Km)
170	Riverbank stabilization with bio-engineering structures	Katari Municipality-1	26.923 52	86.15844	A225	1.1	Length (Km)
171	Riverbank stabilization with bio-engineering structures	Ganeshman Charnath Municipality-5	26.923 59	86.17456	A218	1.6	Length (Km)
172	Riverbank stabilization with bio-engineering structures	Katari Municipality-2	26.932 20	86.27884	A246	1.0	Length (Km)
173	Riverbank stabilization with bio-engineering structures	Katari Municipality-2	26.935 97	86.28320	A258	0.2	Length (Km)
174	Woodlot establishment in private land	Katari Municipality-1	26.924 76	86.26328	A226	12.1	Area (Ha)
175	Community land plantation	Ganeshman Charnath Municipality-5	26.921 85	86.25789	A215	8.2	Area (Ha)
176	Promotion of agro-forestry system with riverbank stabilization	Ganeshman Charnath Municipality-5	26.927 71	86.16255	A233	30.9	Area (Ha)
177	Riparian plantation	Karjanha Municipality-1	26.932 82	86.15464	A245	8.5	Area (Ha)
178	Community land plantation	Sabaila Municipality-13	26.808 60	86.14705	A28	83.9	Area (Ha)
179	Promotion of agro-forestry system with riverbank stabilization	Sahidnagar Municipality-1, 2	26.759 83	86.11226	A18	21.4	Area (Ha)

180	Riparian plantation	Ganeshman Charnath Municipality-5	26.930 36	86.17933	A238	4.9	Area (Ha)
181	Promotion of agro-forestry system with riverbank stabilization	Katari Municipality-1	26.913 16	86.25455	A195	23.1	Area (Ha)
182	Riparian plantation	Ganeshman Charnath Municipality-5	26.952 83	86.16911	A279	5.5	Area (Ha)
183	Riparian plantation	Ganeshman Charnath Municipality-5	26.954 45	86.17136	A281	1.2	Area (Ha)
184	Demonstration plantation	Ganeshman Charnath Municipality-5	26.955 76	86.17247	A284	5.0	Area (Ha)
185	Community land plantation	Katari Municipality-1	26.898 35	86.32238	A104	0.4	Area (Ha)
186	Promotion of agro-forestry system with riverbank stabilization	Katari Municipality-1	26.899 43	86.32049	A111	0.5	Area (Ha)
187	Woodlot establishment in private land	Katari Municipality-1	26.899 51	86.32282	A112	1.1	Area (Ha)
188	Community land plantation	Katari Municipality-1	26.898 89	86.32511	A107	0.6	Area (Ha)
189	Promotion of agro-forestry system with riverbank stabilization	Katari Municipality-1	26.899 30	86.32679	A110	0.9	Area (Ha)
190	Riparian plantation	Katari Municipality-1	26.905 75	86.24372	A149	0.8	Area (Ha)
191	Promotion of agro-forestry system with riverbank stabilization	Katari Municipality-1	26.905 95	86.29948	A152	1.1	Area (Ha)
192	Riparian plantation	Katari Municipality-2	26.943 44	86.28395	A270	11.7	Area (Ha)
193	Riparian plantation	Ganeshman Charnath Municipality-5	26.920 29	86.18753	A209	1.1	Area (Ha)
194	Woodlot establishment in private land	Ganeshman Charnath Municipality-8	26.854 39	86.14857	A36	205.0	Area (Ha)
195	Demonstration plantation	Karjanha Municipality-2	26.882 13	86.14290	A63	6.9	Area (Ha)
196	Woodlot establishment in private land	Karjanha Municipality-1	26.915 04	86.14256	A200	154.6	Area (Ha)
197	Community land plantation	Sabaila Municipality-4	26.778 42	86.14541	A22	94.5	Area (Ha)
198	Promotion of agro-forestry system with riverbank stabilization	Sahidnagar Municipality-3	26.730 44	86.09067	A13	5.0	Area (Ha)
199	Demonstration plantation	Kamala Municipality-6	26.713 03	86.18479	A12	177.4	Area (Ha)
200	Promotion of agro-forestry system with riverbank stabilization	Sabaila Municipality-13	26.814 19	86.14519	A30	5.4	Area (Ha)
201	Community land plantation	Siraha Municipality-17	26.611 63	86.15211	A1	4.5	Area (Ha)
202	Community land plantation	Siraha Municipality-17	26.615 11	86.15275	A2	2.4	Area (Ha)
203	Community land plantation	Janaknandani Rural Municipality-1	26.624 19	86.15353	A3	14.2	Area (Ha)
204	Community land plantation	Janaknandani Rural Municipality-6	26.640 27	86.16184	A4	52.6	Area (Ha)
205	Community land plantation	Kamala Municipality-5	26.661 26	86.17335	A6	563.2	Area (Ha)
206	Woodlot establishment in private land	Kamala Municipality-5	26.670 90	86.19478	A7	196.1	Area (Ha)
207	Woodlot establishment in private land	Kalyanpur Municipality-12	26.700 64	86.19752	A9	200.8	Area (Ha)

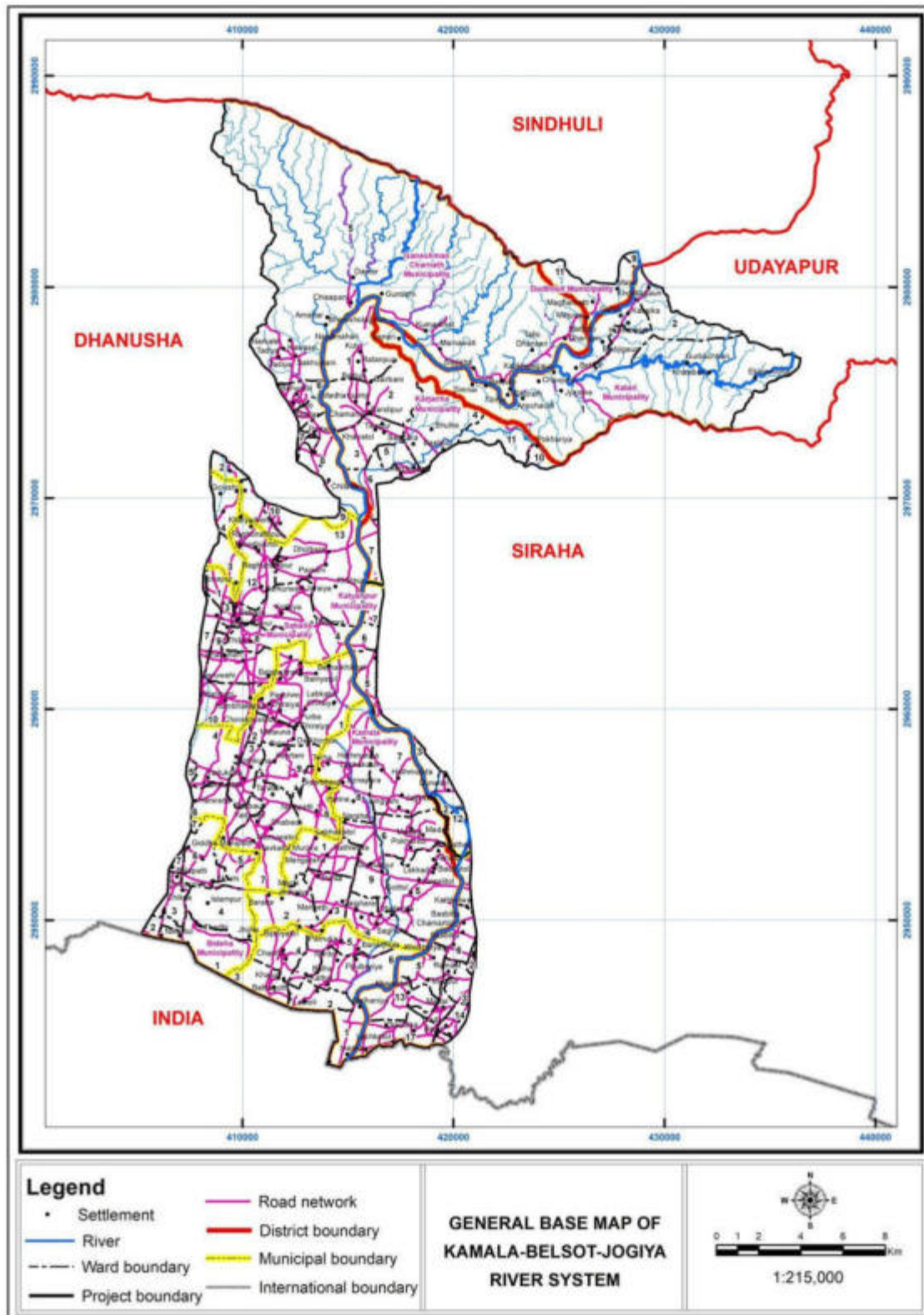
208	Woodlot establishment in private land	Kalyanpur Municipality-7	26.741 19	86.17266	A16	451.0	Area (Ha)
209	Woodlot establishment in private land	Sahidnagar Municipality-1	26.761 56	86.14727	A19	126.4	Area (Ha)
210	Woodlot establishment in private land	Kalyanpur Municipality-5	26.769 66	86.15528	A20	35.7	Area (Ha)
211	Community land plantation	Kalyanpur Municipality-6	26.791 85	86.15191	A25	129.0	Area (Ha)
212	Woodlot establishment in private land	Kalyanpur Municipality-7	26.809 32	86.15870	A29	80.2	Area (Ha)
213	Community land plantation	Sabaila Municipality-13	26.822 48	86.15545	A31	134.0	Area (Ha)
214	Community land plantation	Ganeshman Charnath Municipality-8	26.867 16	86.13982	A43	52.1	Area (Ha)
215	Community land plantation	Ganeshman Charnath Municipality-6	26.897 70	86.13055	A98	117.7	Area (Ha)
216	Promotion of agro-forestry system with riverbank stabilization	Ganeshman Charnath Municipality-8	26.833 32	86.14256	A33	84.1	Area (Ha)
217	Riparian plantation	Ganeshman Charnath Municipality-5	26.935 59	86.14640	A257	13.2	Area (Ha)
218	Demonstration plantation	Ganeshman Charnath Municipality-5	26.941 07	86.14181	A267	2.7	Area (Ha)
219	Riparian plantation	Ganeshman Charnath Municipality-5	26.957 25	86.12052	A286	0.9	Area (Ha)
220	Riparian plantation	Ganeshman Charnath Municipality-5	26.964 02	86.11649	A291	0.7	Area (Ha)
221	Riparian plantation	Ganeshman Charnath Municipality-5	26.967 10	86.11537	A294	1.8	Area (Ha)
222	Demonstration plantation	Ganeshman Charnath Municipality-5	26.977 50	86.10731	A304	9.7	Area (Ha)
223	Riparian plantation	Ganeshman Charnath Municipality-5	26.955 28	86.13187	A283	1.1	Area (Ha)
224	Promotion of agro-forestry system with riverbank stabilization	Katari Municipality-1	26.908 13	86.29585	A178	1.5	Area (Ha)
225	Riparian plantation	Katari Municipality-1	26.899 81	86.25224	A116	0.7	Area (Ha)
226	Demonstration plantation	Katari Municipality-1	26.897 85	86.25095	A99	1.0	Area (Ha)
227	Riparian plantation	Katari Municipality-1	26.904 09	86.24632	A140	2.0	Area (Ha)
228	Riparian plantation	Katari Municipality-1	26.906 88	86.24432	A160	0.8	Area (Ha)
229	Woodlot establishment in private land	Katari Municipality-1	26.911 07	86.24611	A188	7.8	Area (Ha)
230	Community land plantation	Ganeshman Charnath Municipality-5	26.907 80	86.23958	A173	13.8	Area (Ha)
231	Promotion of agro-forestry system with riverbank stabilization	Ganeshman Charnath Municipality-5	26.911 42	86.12206	A191	9.3	Area (Ha)
232	Community land plantation	Karjanha Municipality-3	26.878 44	86.14034	A59	24.8	Area (Ha)
233	Riparian plantation	Ganeshman Charnath Municipality-8	26.847 46	86.13891	A35	8.3	Area (Ha)
234	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Karjanha Municipality-4, Bhedwa Khola	26.875 94	86.19602	M50	1.0	Number

235	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Katari Municipality-1, Raksa Khola	26.887 80	86.22772	M77	1.0	Number
236	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Katari Municipality-1, Belsot Khola	26.907 61	86.28208	M118	1.0	Number
237	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Ganeshman Charnath Municipality-5, Bailaha Khola	26.910 12	86.20801	M181	1.0	Number
238	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Katari Municipality-1	26.910 46	86.26029	M183	1.0	Number
239	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Katari Municipality-1, Hile Khola	26.905 13	86.32168	M201	1.0	Number
240	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Ganeshman Charnath Municipality-5	26.911 61	86.12685	M206	1.0	Number
241	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Katari Municipality-2, Naran Khahare	26.923 04	86.27635	M210	1.0	Number
242	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Ganeshman Charnath Municipality-5, Sisuwari Khola	26.920 70	86.18929	M212	1.0	Number
243	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Ganeshman Charnath Municipality-5, Jogigairi Khahare	26.924 38	86.25549	M236	1.0	Number
244	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Ganeshman Charnath Municipality-5, Dhyangre khola	26.905 95	86.22758	M240	1.0	Number
245	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Katari Municipality-2	26.933 72	86.28700	M250	1.0	Number
246	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Ganeshman Charnath Municipality-5, Kondre Khola	26.937 12	86.17267	M259	1.0	Number
247	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Ganeshman Charnath Municipality-5, Nimain Khola	26.931 08	86.18216	M260	1.0	Number
248	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Ganeshman Charnath Municipality-5, Bapha Khola	26.949 31	86.14486	M278	1.0	Number
249	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Ganeshman Charnath Municipality-5, Kali Khola	26.953 64	86.13035	M280	1.0	Number
250	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Ganeshman Charnath Municipality-5, Gauri Khola	26.952 34	86.15506	M285	1.0	Number
251	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Ganeshman Charnath Municipality-5, Jogiya Khola	26.946 51	86.16357	M288	1.0	Number
252	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Ganeshman Charnath Municipality-5, Selar Khola	26.960 59	86.11822	M312	1.0	Number
253	Climate Resilient Agriculture		26.692 83	86.17483	A362	748.6	Area (Ha)
254	Climate Resilient Agriculture		26.768 07	86.12736	A363	470.0	Area (Ha)

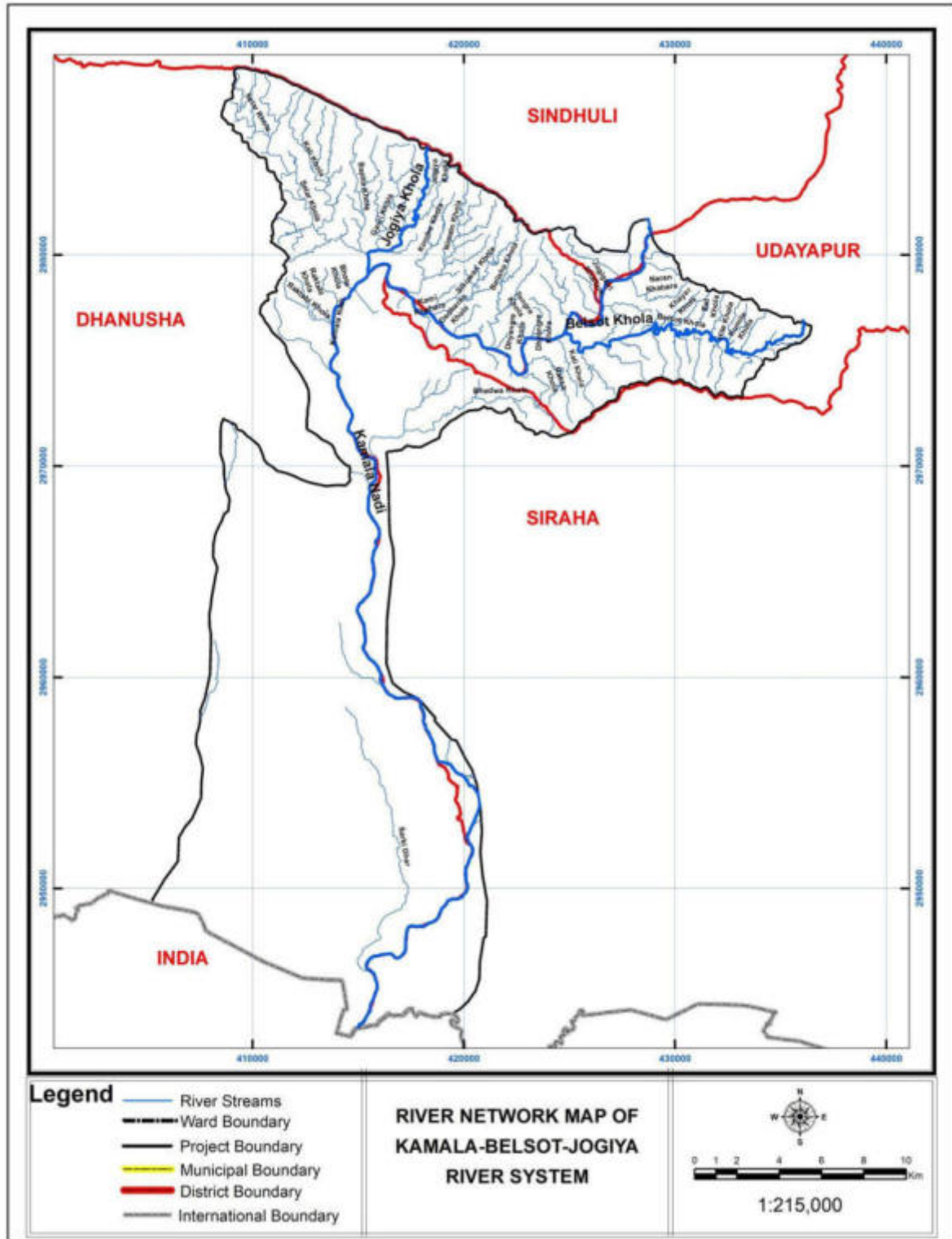
255	Climate Resilient Agriculture		26.794 93	86.13425	A364	501.0	Area (Ha)
256	Climate Resilient Agriculture		26.849 33	86.15814	A365	223.4	Area (Ha)
257	Climate Resilient Agriculture		26.872 41	86.15027	A366	142.6	Area (Ha)
258	Climate Resilient Agriculture		26.871 06	86.17372	A367	272.2	Area (Ha)
259	Climate Resilient Agriculture		26.869 91	86.12799	A368	137.2	Area (Ha)
260	Climate Resilient Agriculture		26.869 97	86.16012	A369	202.7	Area (Ha)
261	Climate Resilient Agriculture		26.876 50	86.18649	A370	52.8	Area (Ha)
262	Climate Resilient Agriculture		26.894 48	86.14818	A371	117.7	Area (Ha)
263	Climate Resilient Agriculture		26.906 42	86.14635	A372	95.0	Area (Ha)
264	Climate Resilient Agriculture		26.898 56	86.23351	A373	111.1	Area (Ha)
265	Climate Resilient Agriculture		26.907 40	86.25144	A374	81.7	Area (Ha)
266	Climate Resilient Agriculture		26.923 55	86.26834	A375	103.3	Area (Ha)

Note: Activity location and coordinates are subjected to change based on field condition before the implementation. BRCRN PPMU offices can make the necessary changes with proper documentation of field condition

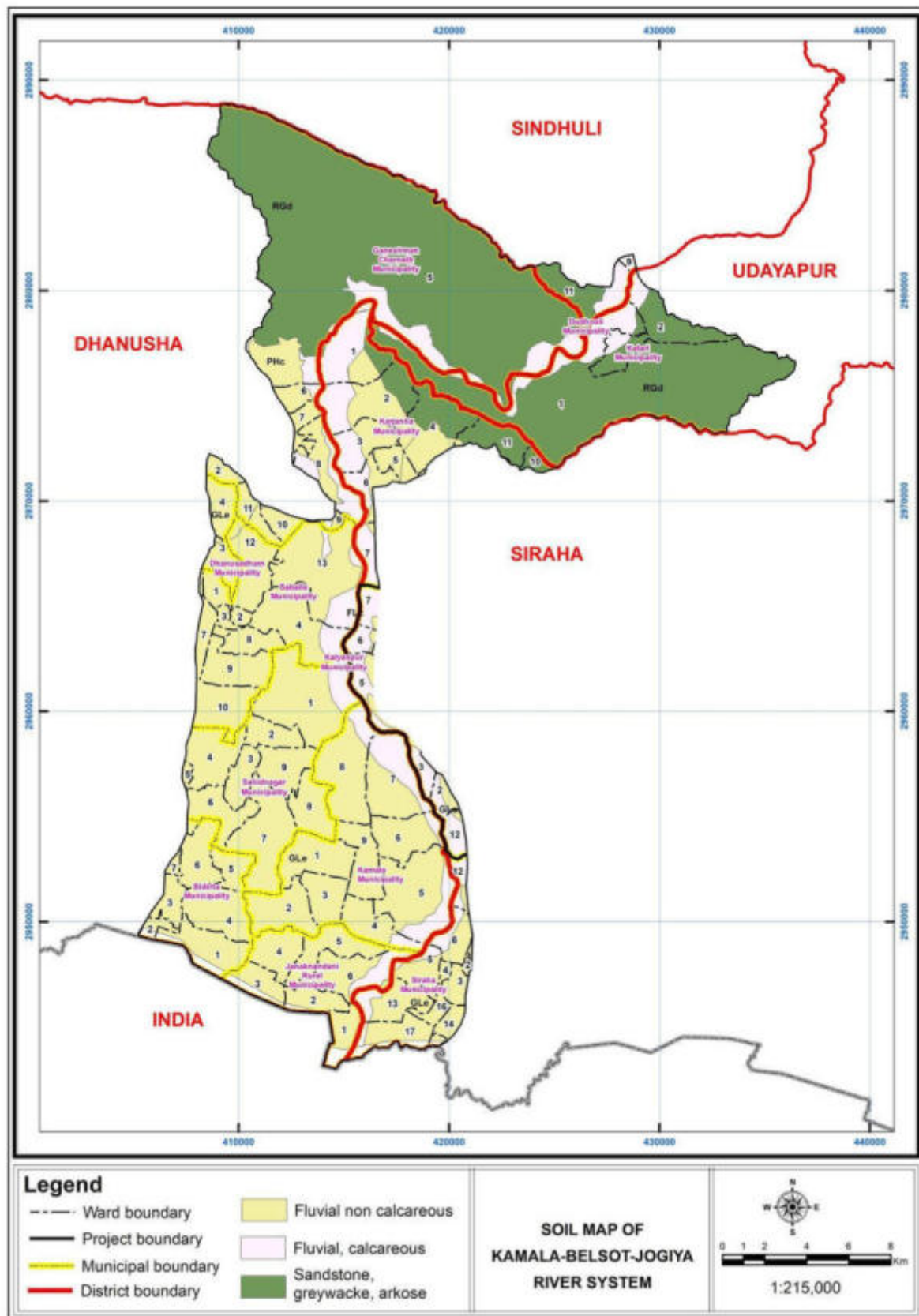
Annex 2: Thematic Maps of the Kamala Belsot Jogiya river system



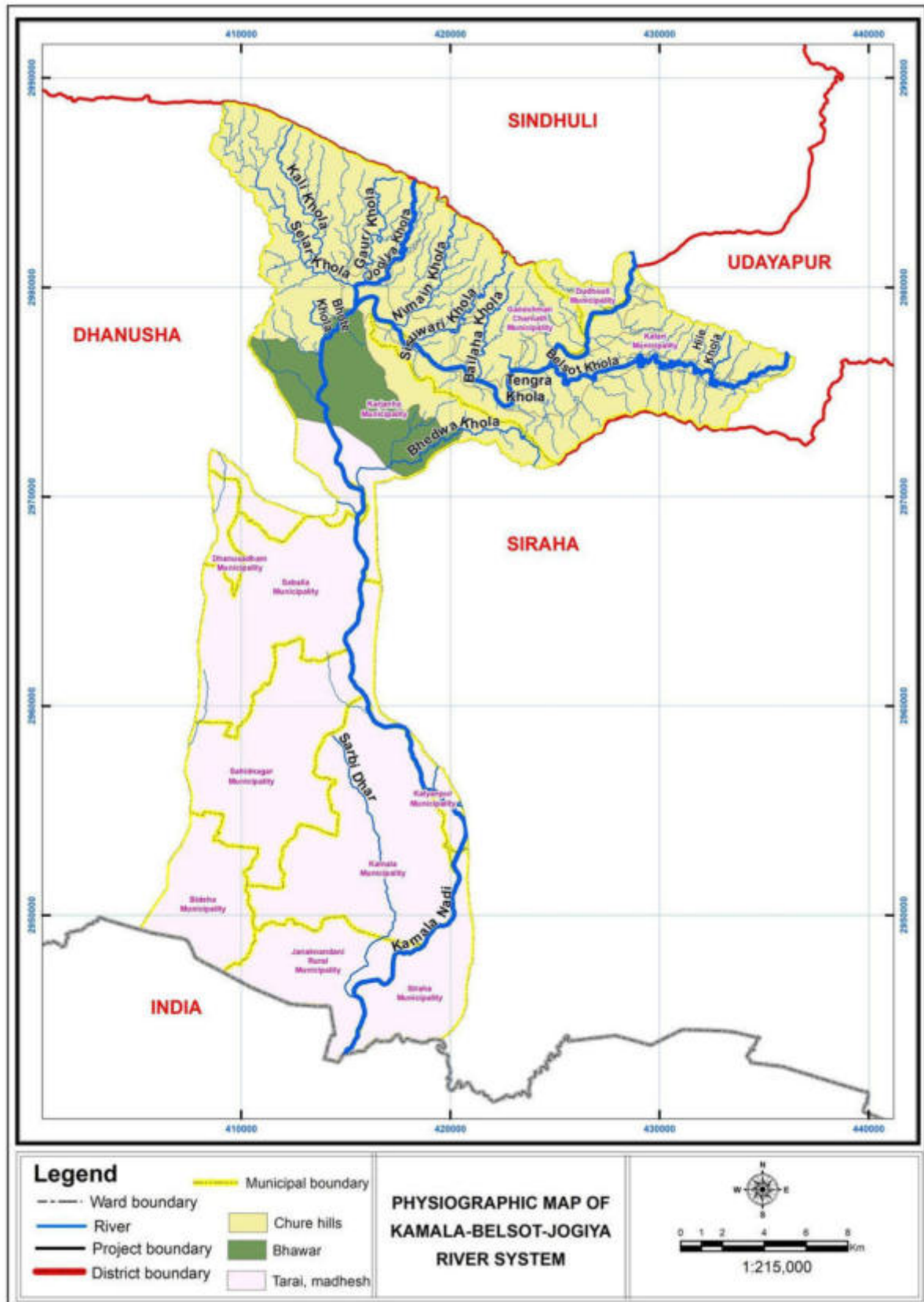
Base map of Kamala Belsot Jogiya river system



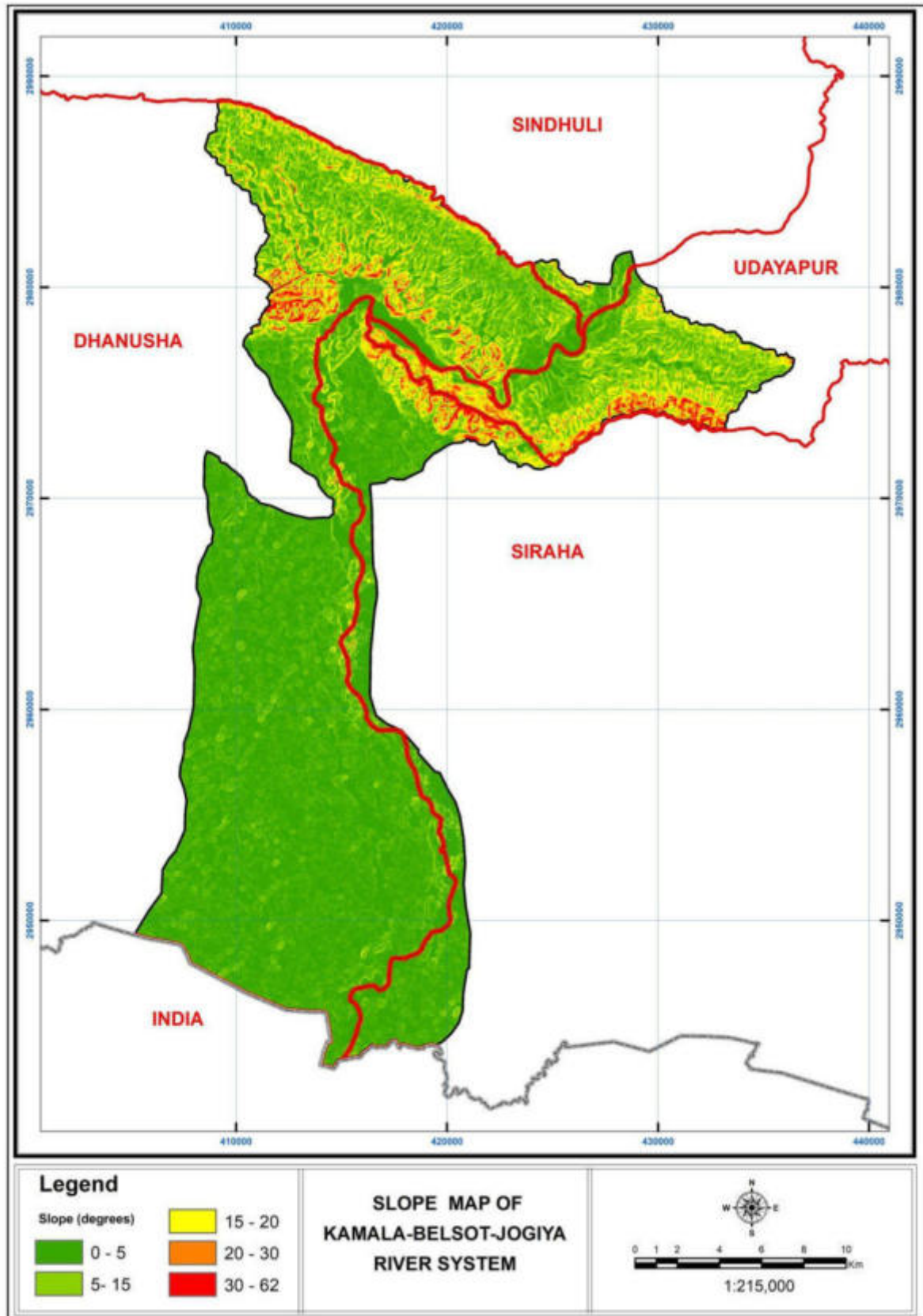
River network of Kamala Belsot Jogiya river system



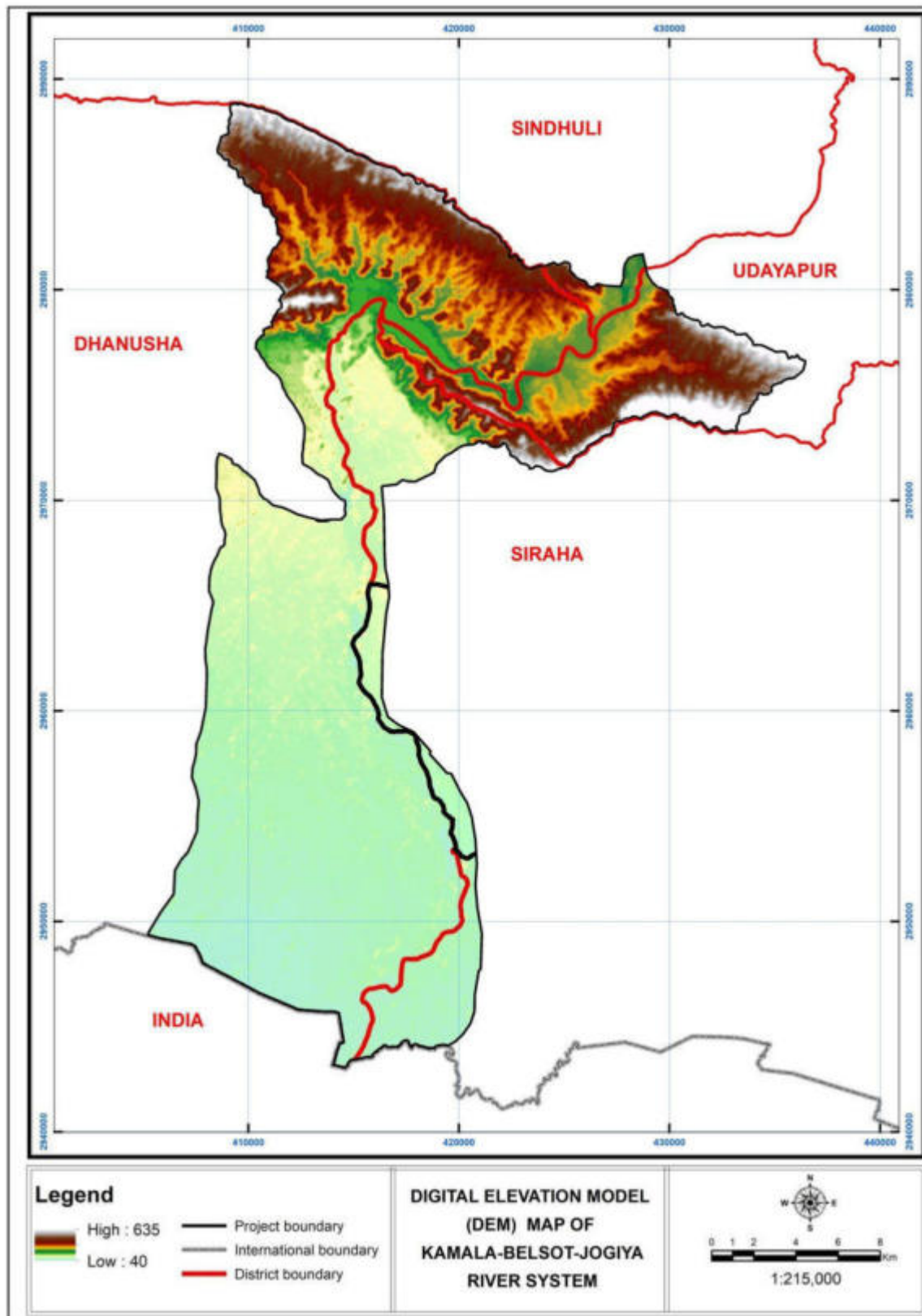
Soil Map of the Kamala Belsot Jogiya river system



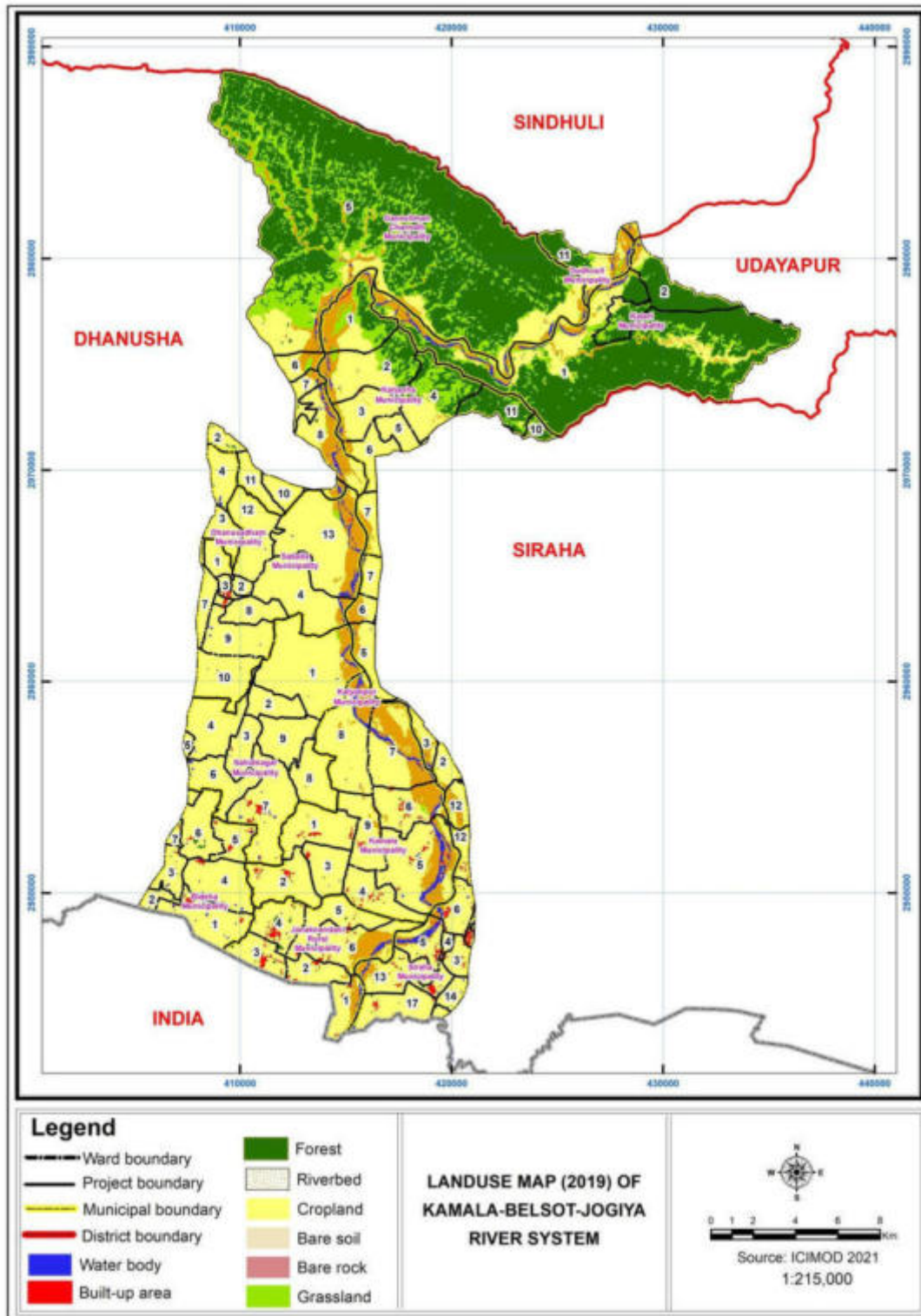
Physiographic Map of the Kamala Belsot Jogiya river system



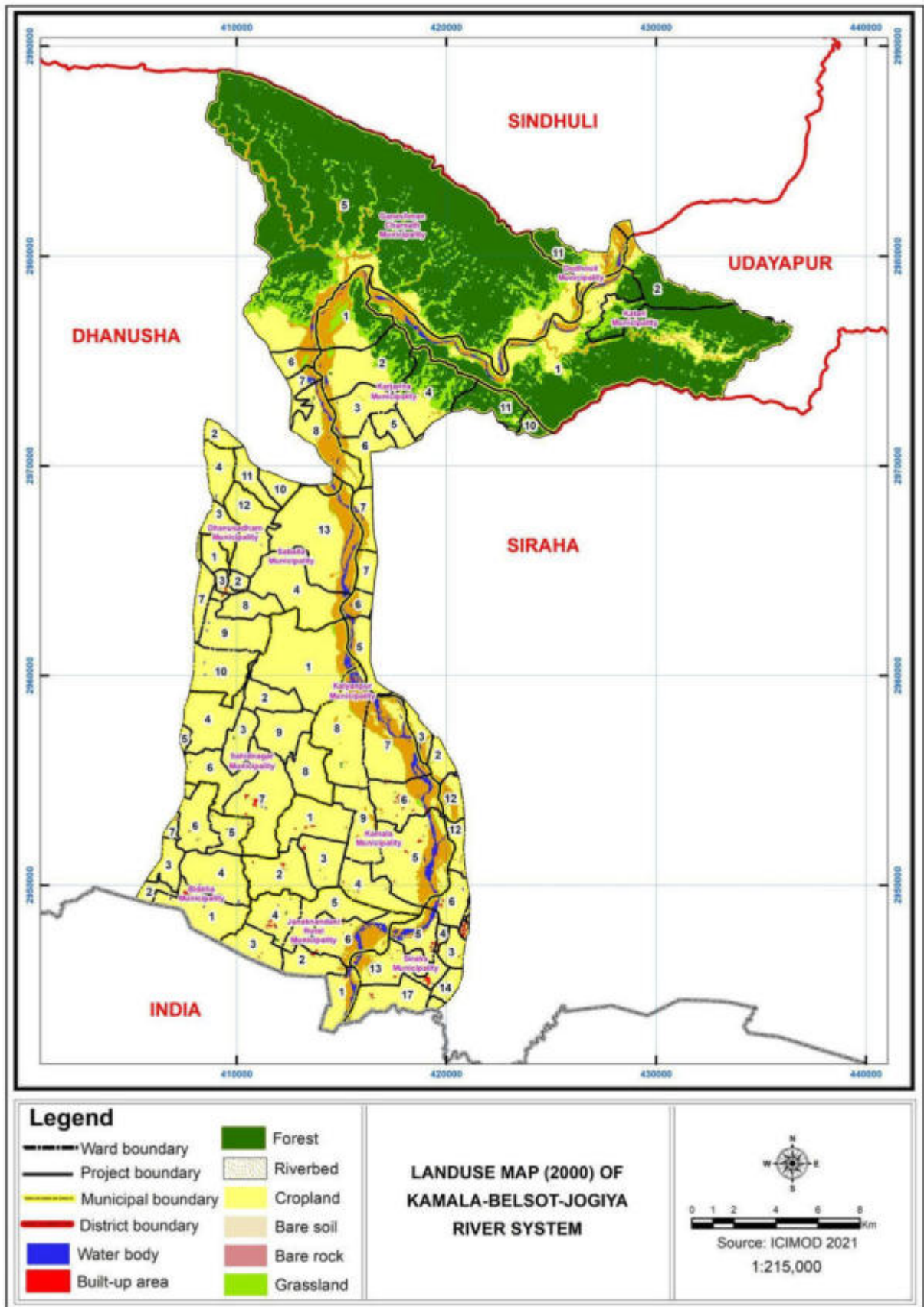
Slope Map of the Kamala Belsot Jogiya river system



Digital Elevation Map of the Kamala Belsot Jogiya river system



Landuse map of Kamala Belsot Jogiya river system (ICIMOD, 2019)



Landuse map of Kamala Belsot Jogiya river system (ICIMOD, 2000)

Glimpses of the events and site visits in Kamala Belsot Jogiya River System



Local stakeholders and facilitators actively engaged in problem tree and solution tree workshops held in Belsot, Katari Municipality-I, Udaypur, KBJ River System





Local stakeholders and facilitators actively engaged in problem tree and solution tree workshops held in Bandhipur, Karjaniya Municipality-3, Siraha, (midstream), KBJ River System



Mr. Bholendra Prasad Pokharel, Mayor, Karjanaha Municipality, Siraha highlighted the issues and potential related to Kamal river system during the Problem and Solution Tree Workshops in Bandhipur, Kamala River System



Local stakeholders and facilitators actively engaged in problem tree and solution tree workshops held in Yadukuwa, Sahid Nagar Municipality, Dhanusa, (downstream), KBJ River System



Site verification of hotspot and discussion with ward chairpersons in Karjanaha Municipality 2 &3 in KBJ River System



Riverbank cutting and debris falls (86.253699/86.253699) Katari Municipality-I



Potential for establishment of FFS (Maize), (26.908079/86.252865) Katari Municipality-I



Potential for Beldit wetland Protection and tourism Program, Pond Improvement (26.907365/86.245601) Katari Municipality-
|



River bank cutting and degradation of land and forest and potential for stabilization with plantation (26.913845/86.244273) Ganeshman
Charnath Municipality-5



Requirement of stabilization of the River bank, and potential for planting bamboo (26.906076/86.24512) Katari Municipality-I



Necessity of gullies and torrent stream stabilization (26.901788/86.24637) Katari Municipality-I



Gully stabilization (Check dam) and potential for construction of conservation ponds (26.899566/86.252397) Katari Municipality-I



Potential for afforestation area (26.915035/86.142561) Karjanha Municipality-I



Potential for wetland protection and restoration (26.897448/86.165095) Karjanha Municipality-2



Potential for reforestation of forest lands with plantation (26.891007/86.142163) Karjanha Municipality-2



Potential area for construction of conservation ponds (26.887645/86.14267) Karjanha Municipality-2



Potential for improvements of conservation ponds (26.878245/ 86.146272) Karjanha Municipality-2



Potential for establishment of FFS on vegetable (26.873995/ 86.153492) Karjanha Municipality-3



Potential for agroforestry Area and afforestation (26.833323/ 86.142563) Ganeshman Charnath Municipality-8



Potential river sites for Plantation area 26.741186/ 26.741186, Kalyanpur Municipality-7



Community practices riverbed farming and potential for strengthening through intercropping and riverine plantation (26.763896/86.155953) Kalyanpur Municipality- 5



Site inspection and interaction with the locals on hotspots Ganeshman Charnath Municipality-5



Expert Planning Workshop in Dhanusha interaction on Kamal Belsot Jogiya (Dhanusa part)



Expert Planning Workshop in Siraha district interaction on Kamal Belsot Jogiya (Siraha part)

