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Food and Agriculture Organization of the United Nations

Critical Ecosystem Restoration Plan (CERP)

of

Khando 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 ।

2020/2/24

National Project Director

Disclaimer:

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.

 As the CERP is public property, therefore, any plans or activities prepared under this report can be implemented by any organizations and institutions. The report attempts for higher precision, however, there may be areas for improvement. Intervention site locations and budget estimations mentioned in report are based on field consultation and observations. During the time of implementation, they are subjected to change based on the changes in field condition at the time of implementation. Considered as the lively planning instrument, the CERP has the window open for the revision along with its implementation at the river system.

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Date: 26 March, 2021

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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Acronyms and Abbreviation

A	Adaptation
AF	Agro-Forestry
AFG	Agroforestry Group
AKC	Agriculture Knowledge Center
ANR	Assisted Natural Regeneration
BRCRN	Building a Resilient Churia Region in Nepal
CB-FFFG	Community Based Forest Fire Fighting Group
CBO	Community Based Organization
CERP	Critical Ecosystem Restoration Plan
CF	Community Forest
CFUGs	Community Forest Users Groups
CRLU	Climate Resilient Land Use
D & FD	Deforestation and Forest Degradation
DFO	District Forest Office
DRR	Disaster Risk Reduction
DoS	Department of Survey
FFS	Farmer Field Schools
FoP	Forest Operational Plan
FPIC	Free, Prior, and Informed Consent
GESI	Gender Equality and Social Inclusion
GIS	Geographic Information System
HHs	Households
ICIMOD	International Centre for Integrated Mountain Development
ICS	Improved Cooking Stove
IPs	Indigenous Peoples
IPPF	Indigenous Peoples Planning Framework of BRCRN Project
IPacks	Intervention Packages
IPM	Integrated Pest Management
LFUGs	Local Forest Users Groups
LMC	Livestock Management Center

LPG	Liquefied petroleum gas
LRP	Local Resource Person
M	Mitigation
MCA	Multi-Criteria Analysis
MoU	Memorandum of Understanding
NARC	Nepal Agriculture Research Center
NDC	Nationally Determinant Contributions (NDC)
NDRRMA	National Disaster Risk Reduction and Management Authority
PPMU	Provincial Project Management Unit
RM	Rural Municipality
SCWs	Seepage Cutoff Walls
SDFOs	Sub-Division Forest Offices
SNRM	Sustainable Natural Resource Management
ToF	Training of Facilitators
WFG	Women Farmer Group

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 Khado River system has major tributaries that originate in the Siwalik hills, viz., Banwari, Jurpaniya, Bhaluwahi, Damara, Dudhaila, Khado, Dumarjor and Amsot. 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 two locations in the River system: Rupani Rural Municipality-1, Rupani and Rajbiraj Municipality-15, Musaharniyan. 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), forests has decreased at the rate of 0.48 percent per year, while built-up area has increased at the rate of 14.92 percent per year in the River system (Source: ICIMOD, 2000 and ICIMOD, 2019). However, total forest loss has been detected in upstream, which is about 485ha. Field observations show large area degradaded 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 21 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 15 landslides (covering about 7 ha) and a number of gullies in 17 torrents in various locations in the Agnisair Krishna Savaran Rural Municipality-1 & 2; Rupani Rural Municipality-6 and Shambhunath Municipality-2 & 7 have contributed to degraded forest ecosystems in upstream areas of this River system.
d. A total of 588 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 in Nepal (BRCRN) priority.

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

IPack 1: 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 7 km);
c. Mesh-wire fencing in the riverside lands (588 ha) plantation, including community land plantation (275 ha), demonstration plantation (11 ha), riparian plantation (14 ha), and woodlot plantation (288 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 15 sites with bio-engineering and vegetative measures

b. Stabilization of gully in the torrent (17 torrents)
c. Construction of water conservation new ponds (7 ponds)
d. Improvement of existing ponds (4 pond)
e. Wetland Improvements (1 locations of cumulative area 1.4ha)
f. Construction of water harvesting structure (2 locations)
g. Riverbank stabilization(13 km)
h. Irrigation channel improvement (9 locations)
i. Capacity buildings in water and soil conservation practices (Skill based trainings, orientation and demonstration visits, success stories collection and sharing)

IPack 3: Agroforestry services

- Adoption of Agroforestry system in the potential areas of the riverside (about 183 ha) and link with livestock promotion with establsihment of agroforestry nursery-focus on the local fodder species
- Providing supports for irrigation facilities
- Formulation of groups called Agroforestry Groups (AFGs), if no any agroforestry group existed currently
- Capacity builing 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 area. Although the core focus of the IPacks are the upstream and mid-stream regions as guided by Building a Resilient Churia Region in Nepal (BRCRN) project documents, the interventions to be done in upstream area are expected to bring positive change in downstream ecosystem. In case of Khado River system, majority of activities under IPack 1 (forest restoration and afforestation) as well as IPack 2 (soil and water conservation) focus on upper and midstream regions where hill slopes are high and large degradation occurs in the 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 floodplains in midstream and downstream regions. In this sense CERP IPack designs also consider the connectivity and upstream-downstream linkages for ecosystem restoration.

Chapter 1: 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 allow 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 Teraiplains 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.

1.2Rationale of CERP

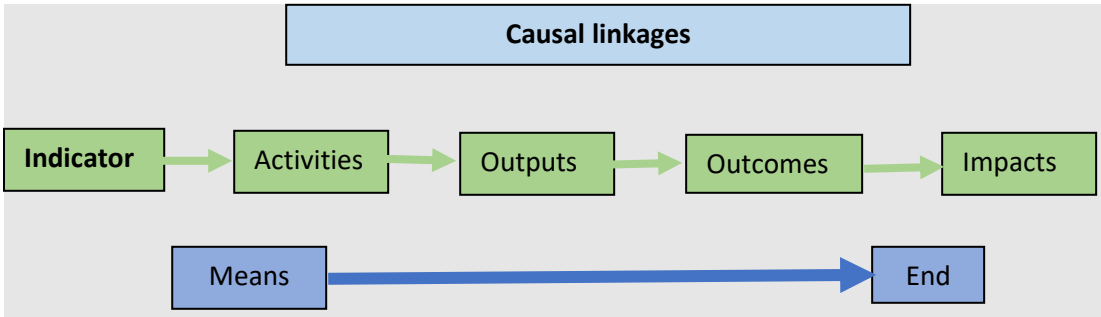
The development of CERPs will contribute to the provision of climate-informed extension and advisory services. It ensures that adaptation to Climate Change (CC) and Disaster Risk Reduction (DRR) has been integrated into provincial and local development planning. The project achieves this through promoting 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.

1.3CERP 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 (PTCMDB 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).

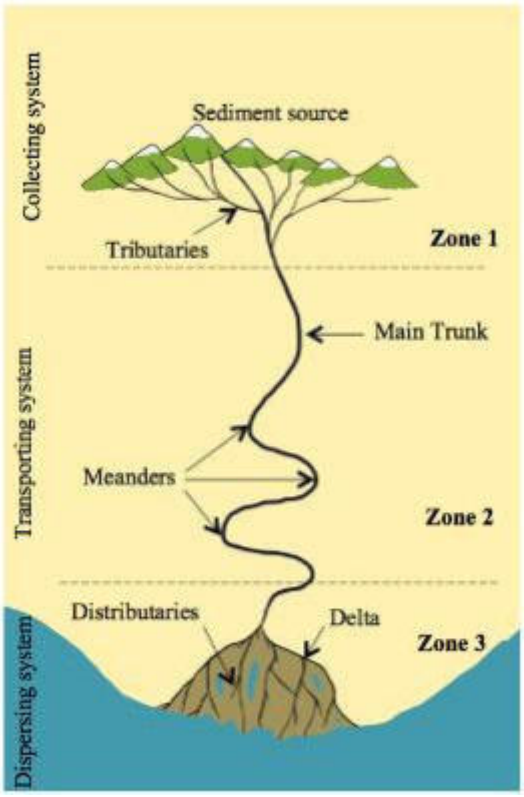


Figure 2: Upstream and downstream linkages in three distinct zones

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).

Preparatory Mapping
- National level Secondary Data Collection
- Remote Sensing Imagery Capture
- Large scale base maps preparation for stakeholder consultation
-

Spatial Analysis
- Multi-criteria Analysis
- Hotspot Mapping

Participatory spatial planning
- Map based stakeholder planning

Figure 3: Spatial Planning as a base for CERP

The CERP starts with preliminary assessment of climate variables to access 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.

1.6Mitigation 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).

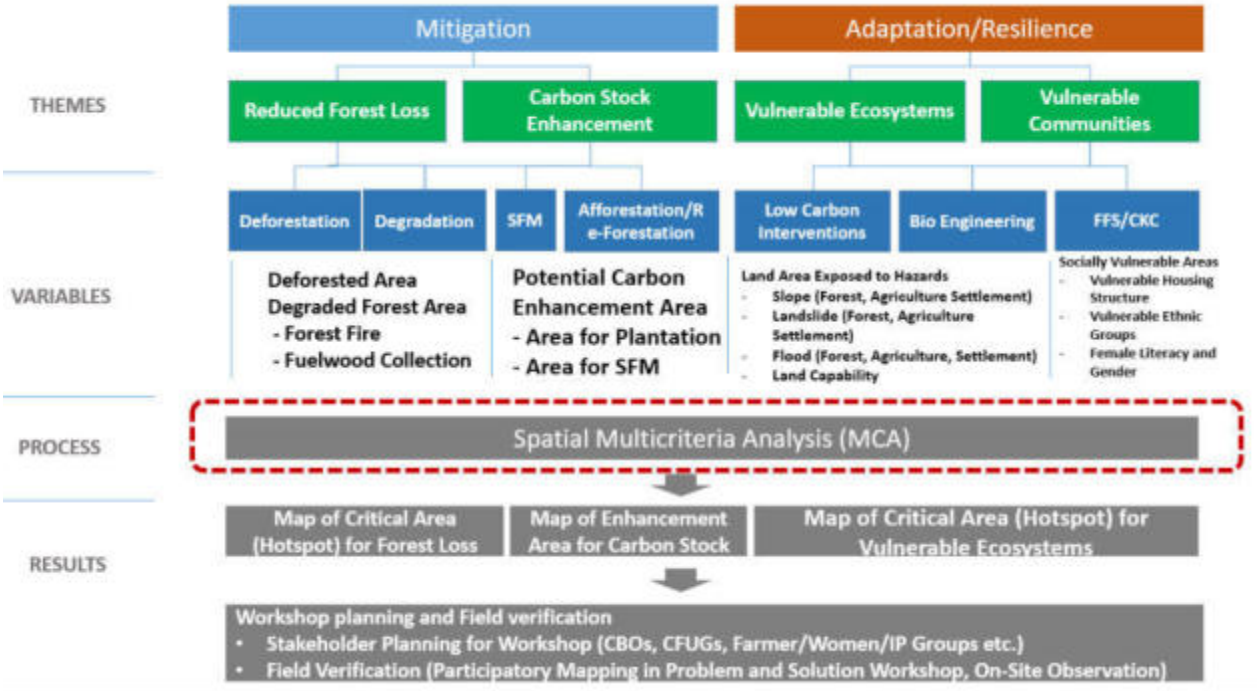


Figure 4: MCA process

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 1).

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	Polygon	PCTMCDMP (PCTMCDB, 2016)
			Abandoned cultivated land & Riverbed		DoS, 1996
2	Climate Change Adaptation	Agriculture land in slope area	Slopes in 3-classes: <20^0 $20\text{-}30^0$ >30^0	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 Khado River System

2.1 Physiography, Land Cover and Hydrology

The Khado River originates in the north at a height of 419 meters above mean sea level (masl) in Rupani Rural Municipality-6, flows south, and then crosses the Nepal-India border at a height of 62 masl (Figure 5). The River travels a total distance of about 48.79 meters, while the aerial distance is 31.40 meters. The total area of Khado River system is about 17,319 hectare (ha). The Khado River System consists of major tributaries, viz., Banwari, Jurpaniya, Bhaluwahi, Damara, Dudhaila, Khado, Dumarjor and Amsot. The River System (RS) covers three physiographic regions Churia 4,503 ha (26%), Bhabar 6,335 ha (36.6%), and Terai6,481 ha (37.4%) (DoS, 1996). The several thematic maps, including the River network of the River system is given in the report (Annex 1). The River system is dominant with tropical mixed hardwood forest-dominant species Sal *(Shorea robusta*), Asna (*Terminalia tomentosa*), Karma (*Adina cordifolia*) Jamun (*Syzygium cumini*), Harro (*Terminalia chebula*), Barro (*Terminalia bellirica*), and forest in low land Sisau (*Dalbergiaa sissoo*), Khayer (*Acacia catechu*), Simal (*Bombax ceiba*).

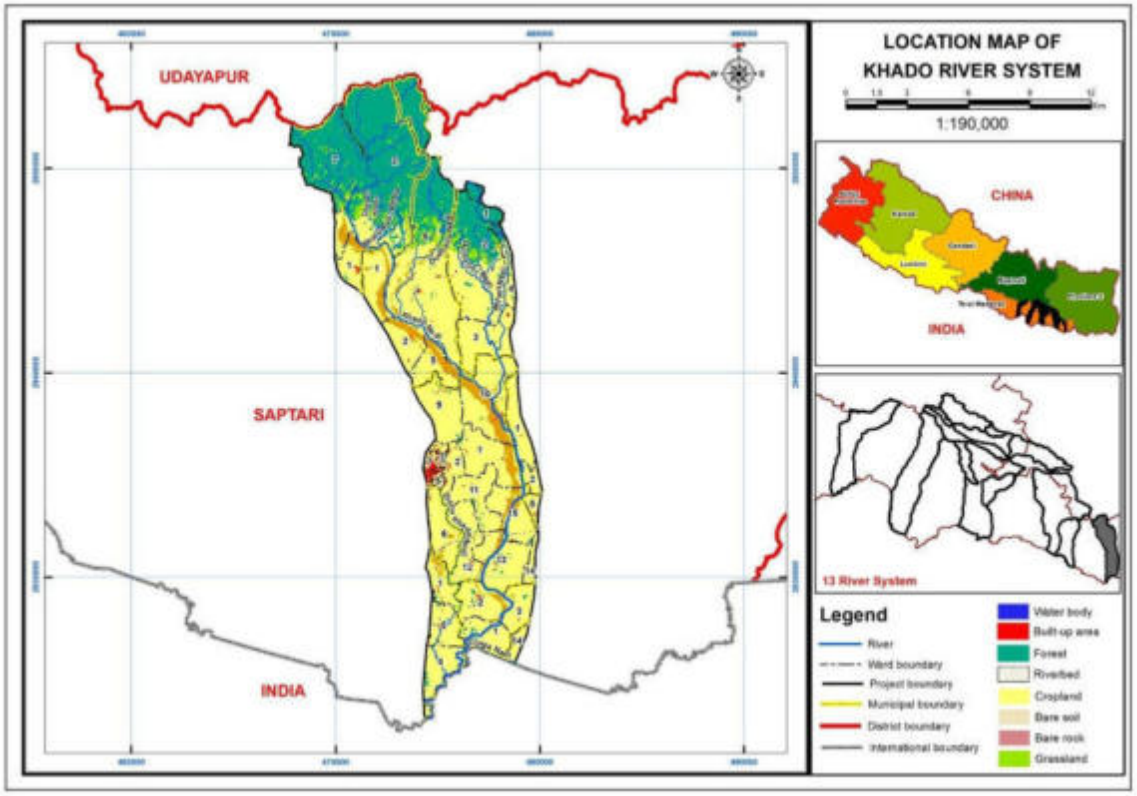


Figure 5: Location map of Khado River system

The hillslope is composed of Lower Siwalik (LS) and Middle Siwaliks (MS) (DMG, 2007). The US of Khado 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).

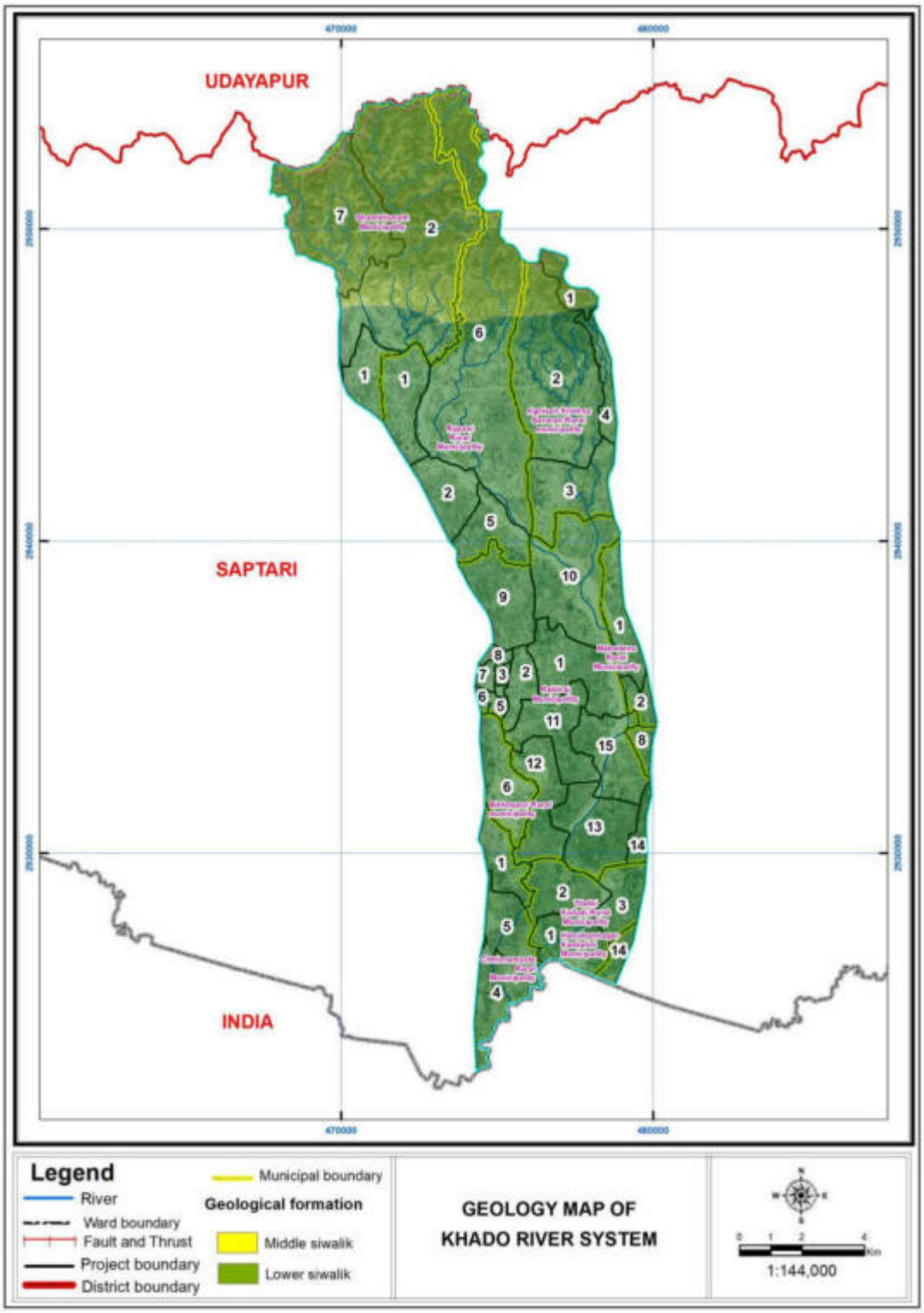


Figure 6: Geology of Khado River system

Predominant land use of this River system are cultivation land, covering 65.2% of total area in 2000, which has been decreased at the rate of 0.14 percent per year in 19 years (2000-2019). Forest area has also decreased at the rate of 0.48 percent per year over the period (Table 2).

Table 2: Land cover change in Khado 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	43.7	0.3	167.5	1.0	283.5	14.92
Cropland	11298.8	65.2	11000.7	63.5	-2.6	-0.14
Forest	4562.1	26.3	4143.2	23.9	-9.2	-0.48
Grassland	362.1	2.1	575.2	3.3	58.9	3.10
Other wooded land	81.0	0.5	457.1	2.6	464.5	24.45
Riverbed	966.1	5.6	944.2	5.5	-2.3	-0.12
Waterbody	4.9	0.0	30.7	0.2	531.5	27.97

Source: ICIMOD, 2021

2.2 Climate Variables:

The River system is located in Saptari district and has a tropical climate with significant monsoon influence (June-September), which received higher rainfall (1000-1500mm) (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 0.030◦ C/ year in Saptari district (DHM, 2017). Moreover, Climate change scenario analysis performed for the National Adaptation Plan (NAP) process indicated that average annual mean temperature of Saptari district is likely to rise, Representative Concentration Pathway (RCP) 4.5 projected that the temperature would increase by 0.85^{0}C and 1.22^{0}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)

		^{0}C	Change (^{0}C)			
Temperature	District	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)
	Saptari	24	0.85	1.22	1.06	1.79
Precipitation		mm	Change (%)			
		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)
	Saptari	1567	3.26	4.57	3.76	7.87

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 4.57% and 7.87% in the long period based on RCP 4.5 and RCP 8.5 respectively in Saptari district.

2.3 Socio-ecological process

Originating from and covering a significant area in the Siwalik range, Khado River is one of the most flood-prone rivers. The Bhabar and plain region of the River system, where the meandering River (about 49.5 km) was suffered from the biggest floods in the past. The cultivated land in Bhawar and Terairegions are at risk to flooding and is a considerable impact on the livelihood of the local people. The main indigenous populations and other ethnicity in the River system are IPs (Hilly and Terain), Madheshi, and Dalit (Hill and Terain. Even though IPs and Dalit in upstream are in community forest users' groups, they have inadequate capacity for effective forest management. The major market centers along the River system are Rupani, Rajbiraj, Jagmohan, , Raghunathpur Bajar, Belhi are the major market centers of the River system.

2.4Problem analysis

Theme 1: 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 Khado River System

Drivers	Priority	Underlying causes
Multi-hazards-River bank cutting and gully erosion, drought	I	a) Fragile geology b) Intense and frequent rainfall c) Spatial rainfall variability d) Limited capacity of community for controlling riverbank, torrent, streams, gullies erosion
Forest fire	2	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. h) Inadequate forest management training, skills, and knowledge among men and women. i) Carelessness and unawareness of herders/users
Open grazing	3	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 (particulary by women)
Encroachment and Illegal logging	4	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	5	a) Inadequate alternative energy sources especially among women of margnalized groups. b) Unemployed and dependent on fuelwood and timber collection for income generation (50% youth users)

Source: Field consultation in the Problem Analysis Workshop, Khado River System

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

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 gulley 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.

Similarly, the number of floods, landslides, and soil erosion events has increased in recent years, their impacts having expanded in the River system. Flooding, landslides, and soil erosion have been exacerbated by extreme and torrential rainfall. These hazardous events have degraded the forest area in the River system. In addition, landslides and erosion are reported in Shambhunath Municipality-2 & 7, Agnisair Krishna Savran Rural Municipality- 1 & 2, and Rupani Rural Municipality-6.

Forest fire: In the River system, every year (pre-monsoon season from March to May), three to four forest fire events happen in the River system. In addition, careless human activity has also increased 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.

Open grazing: Open grazingis also a major dRiver in the River system. According to local stakeholders: about 80-90 cattle and 80-90 goats graze daily in Agnisair Krishna Savaran Rural Municipality-2. Similarly, in the Jankalyan Namuna community forest in Rupani Rural Municipality-6, around 200 goats are grazed daily in the forest. Open grazing directly affects seedling, saplings and vegetation regrowth within forest through trampling effect resulting in soil compaction. Open grazing of livestock mainly goats cause damage of saplings through browsing effects. Due to soil compaction, there is less infiltration on the upstream that increases runoff and results in flash flood downstream.

Encroachment: According to the local people, forest encroachment is noted in the Khado 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.

Excessive fuelwood collection: Local communities have a lack of alternative energy sources for cooking and other domestic energy consumption uses, lack of skilled training with equipment to maintain alternative energy sources and biogas, ineffective fuelwood management among the users are the causes of the dependency of the users on fuelwood collection from the forest areas. 90% forest users of the Bandevi community in Agnisair Krishna Savaran Rural Municipality-2 rely on fuelwood and a daily collection of 300-450 kg.

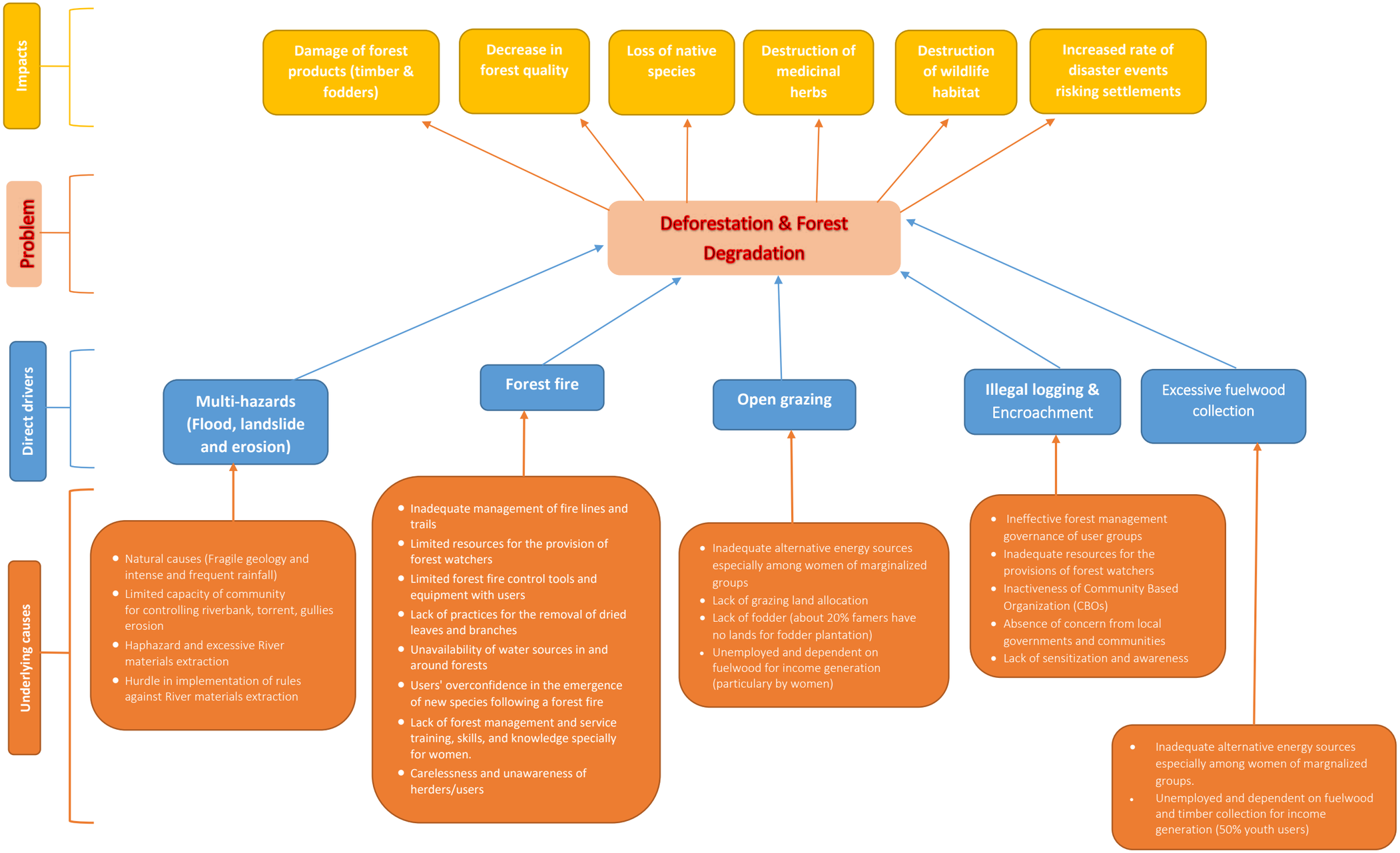


Figure 7: Direct drivers and underlying causes of D & FD in Khado River system

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

- The forest covered area has decreased at the rate of 0.48 percent per year in the last 19 years (2000–2019) and the cultivation area has also decreased at the rate of 0.14 percent per year whereas built-up area has increased at the rate of 14.92 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 485 ha),** mainly in Shambhunath Municipality-2 & 7; Rupani Rural Municipality-6; and Agnisair krishna Savaran Rural Municipality-2.
- Major landslides and rapid formation of gullies, mainly in: Agnisair Krishna Savaran Rural Municipality-1 & 2; Rupani Rural Municipality-6 and Shambhunath Municipality-2 & 7 have rapidly expanded and eroded the forest lands. The degraded forest region is geologically fragile and has steep slopes (Figure 8).
- Midstream and downstream River bed levels rise rapidly (for example, at Agnisair Krishna Savaran Rural Municipality-2, 3 & 4; Mahadeva Rural Municipality-1 & 2; Rajbiraj Municipality-1, 10, 13 & 15; Rupani Rural Municipality-1, 5 & 6; Shambhunath Municipality-2 & 7 and Tilathi Koiladi Rural Municipality-1 & 2 silt deposition exposes River bed agriculture lands.
- Marginalized communities within and outside of the community forest collect excessive fuelwood (for example: users from upstream and downstream collect fuelwood of 4500 kg daily in the post monsoon season from Bandevi community forest in Agnisar Rural Municipality-2)

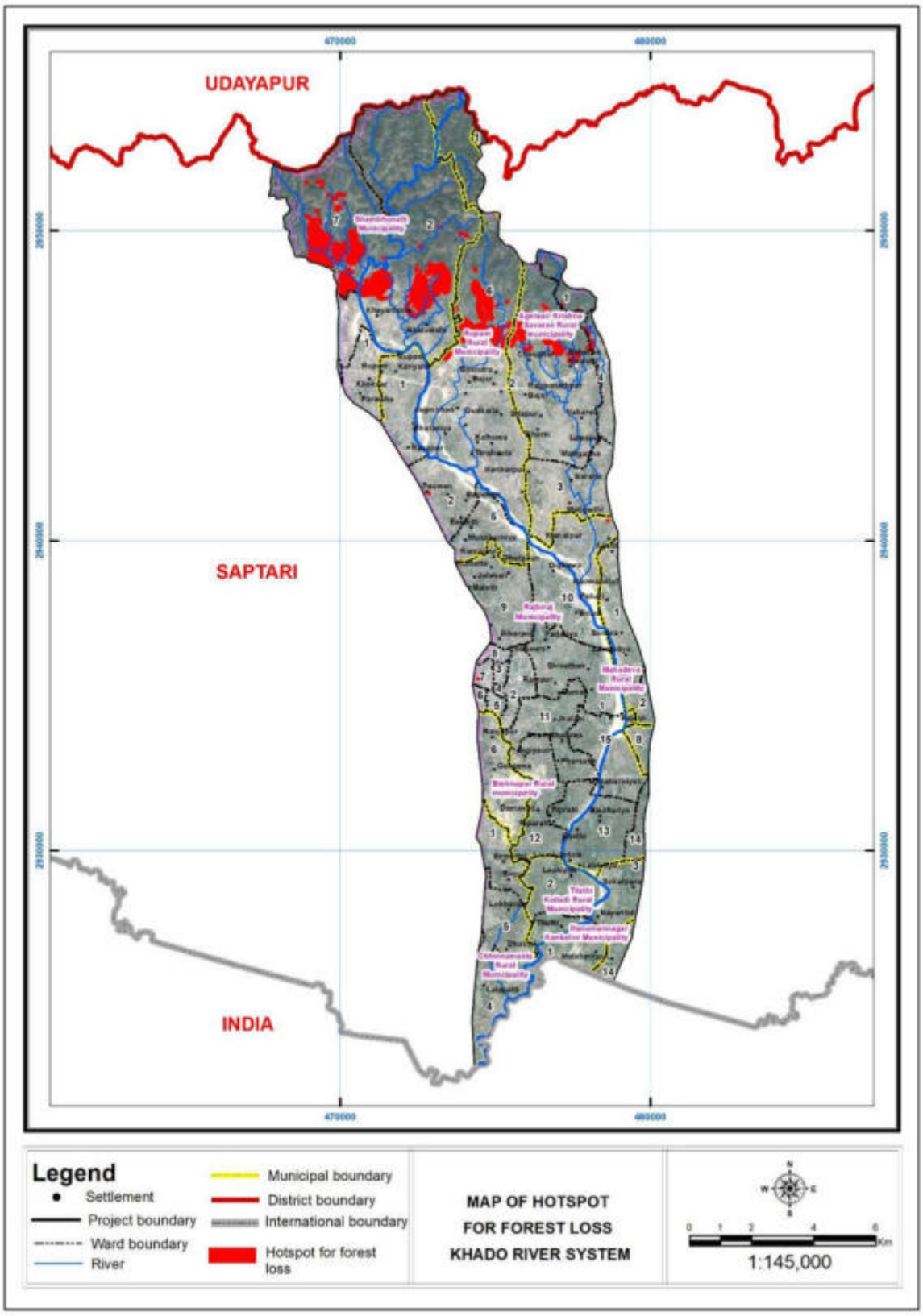


Figure 8: Map of Hotspot for Forest Loss in Khado River System

2.4.3 Enhancement area for carbon stock -MCA Result Map 2

- About **485 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 Shambhunath Municipality-2,6&7 and Agnishar Krishna Savan Rural Municipality-2 and Rupani Rural Municipality-6 in Churiya and Bhabar regions, with more focus on different catchments, including Banwari , Jurpaniya, Bhaluwahi, and Damara catchments.
- The River side plantation (afforestation) could be done on approximately **588 ha.** Furthermore, afforestation needs to be carried out with different aspects of plantation, including including community land plantation (275 **ha**), demonstration plantation (11 **ha**), riparian plantation (**14 ha),** and woodlot establishment (**288 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**.**

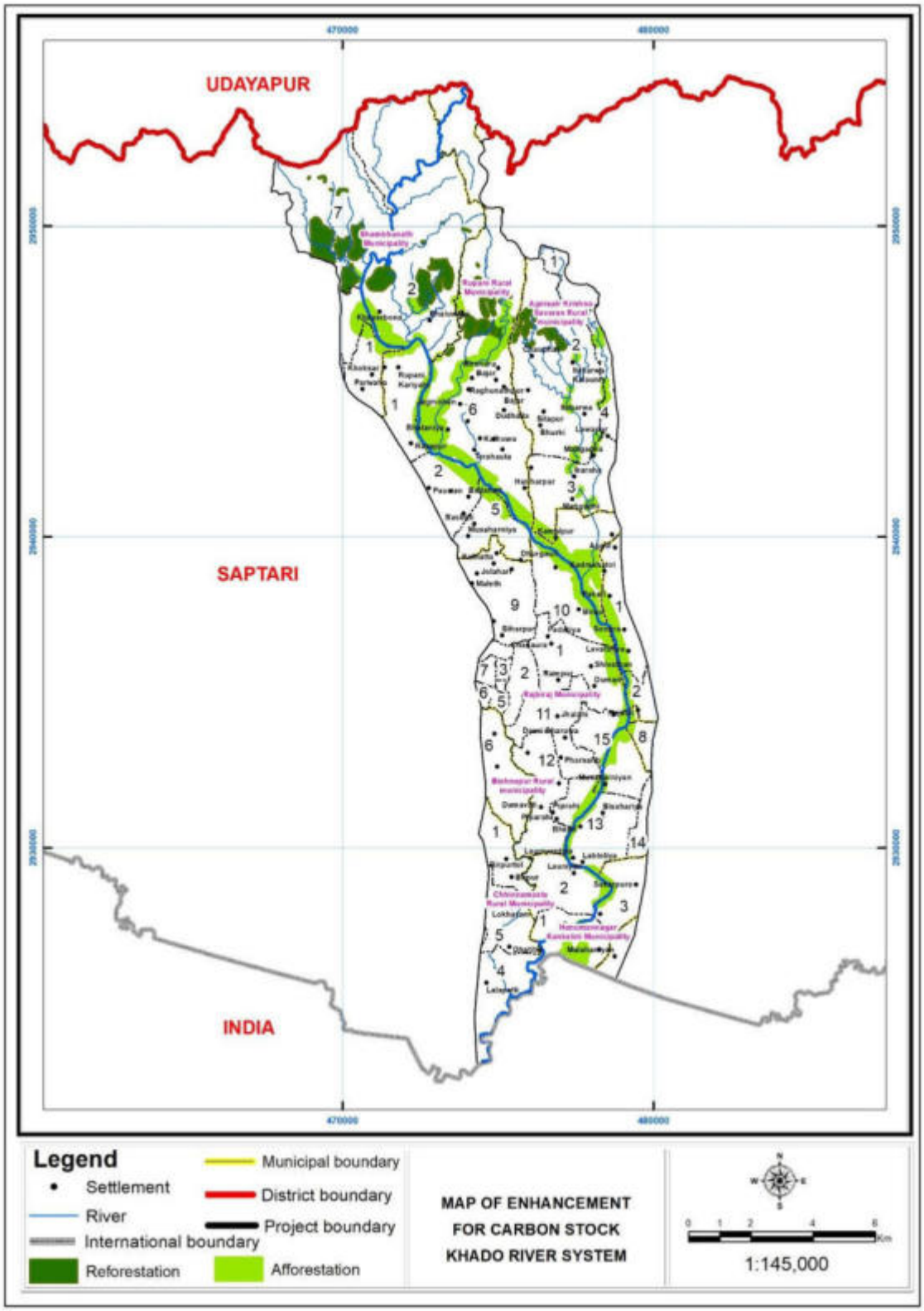


Figure 9: Enhancement for forest carbon stock in Khado River system

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 Khado River system

Drivers	Priority	Underlying causes
Multi-hazards-Riverbank, erosion, landslide and deposition and drought and inundation	I	a) Frequent and intense rainfall triggers b) Fragile geology c) Excavation of river-induced mining materials in a haphazard manner d) Inundation due to rapidly River course changes to lowlands-Tilathi e) Inadequate community capacity for flood and riverbank cutting control measures; f) Inndation due to rapidly River course changes to low lands in shreerampur, Judi bajar and Sanau khola to Bharatpur g) Lack of resources for water boring h) Inadequate practices with vegetative measures in soil erosion (low priority of plntation of bamboo, broom grass (*Amrisho*)) i) Plantation is lacking in gabion wall construction for River control measures. j) Lack of plantation in gabion wall construction for River controls measures
Infestation of crop insects, pests and diseases	2	a) Lack of skills and knowledge for the selection of healthy seeds b) Lack of understanding of pesticide applications c) Unavailability of pesticides on time d) Lack of access, service, and information, specially among women, Dalits and vulnerable communities/households
Inefficient irrigation facilities	3	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
Wild animal threats to agricultural production	4	a) Declining quality of wildlife habitats in the forests b) Inadequate crop farming practices, which are usually not damaged by wildlife, c) Lack of coping measures like fencings to protect agriculture crop from wildlife threats (*Neel Gai. Badel, Dumsi*)
Inappropriate livestock management practices	5	a) Lack of availability of improved breed of livestock (goat, cow and buffalo) b) Conventional practices for rearing c) Inadequate access to clinical services d) insufficient fodder availability e) Lack of women's capacity in livestock management and rearing f) Hard to get waged laborers and increases input costs for agriculture practices g) Inadequate support for livestock management
Inadequate knowledge with no access to the commercialization of agricultural production	6	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	7	a) Male- supremacy and dominance in decisions b) Limited access of women to information and communication (especially climate change and irrigation, information about exisiting facilicites, fund, notice, and subsidies) c) Less consultation with women regarding agenda and time of meetings d) Unavilability 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. The River bank cutting is mainly noted in different locations, particularly in the near Rajbiraj Municipality-13, 15; Rupani Rural Municipality-1, 6; and

Shambhunath Municipality-1, 2 & 7 regions. The sediment deposition is on a 588 ha area in the River system, mostly in agriculture lands. The high flood event of 1993 in Khado impacted around 6.77 ha of agricultural lands in Rajbiraj Municipality- 10. Likewise, around 13.55 ha of land in Rajbiraj Municipality-15 and 2.71 ha of agriculture land in khadak Municipality -5 are deposited with sediments with has decreased the soil fertility.

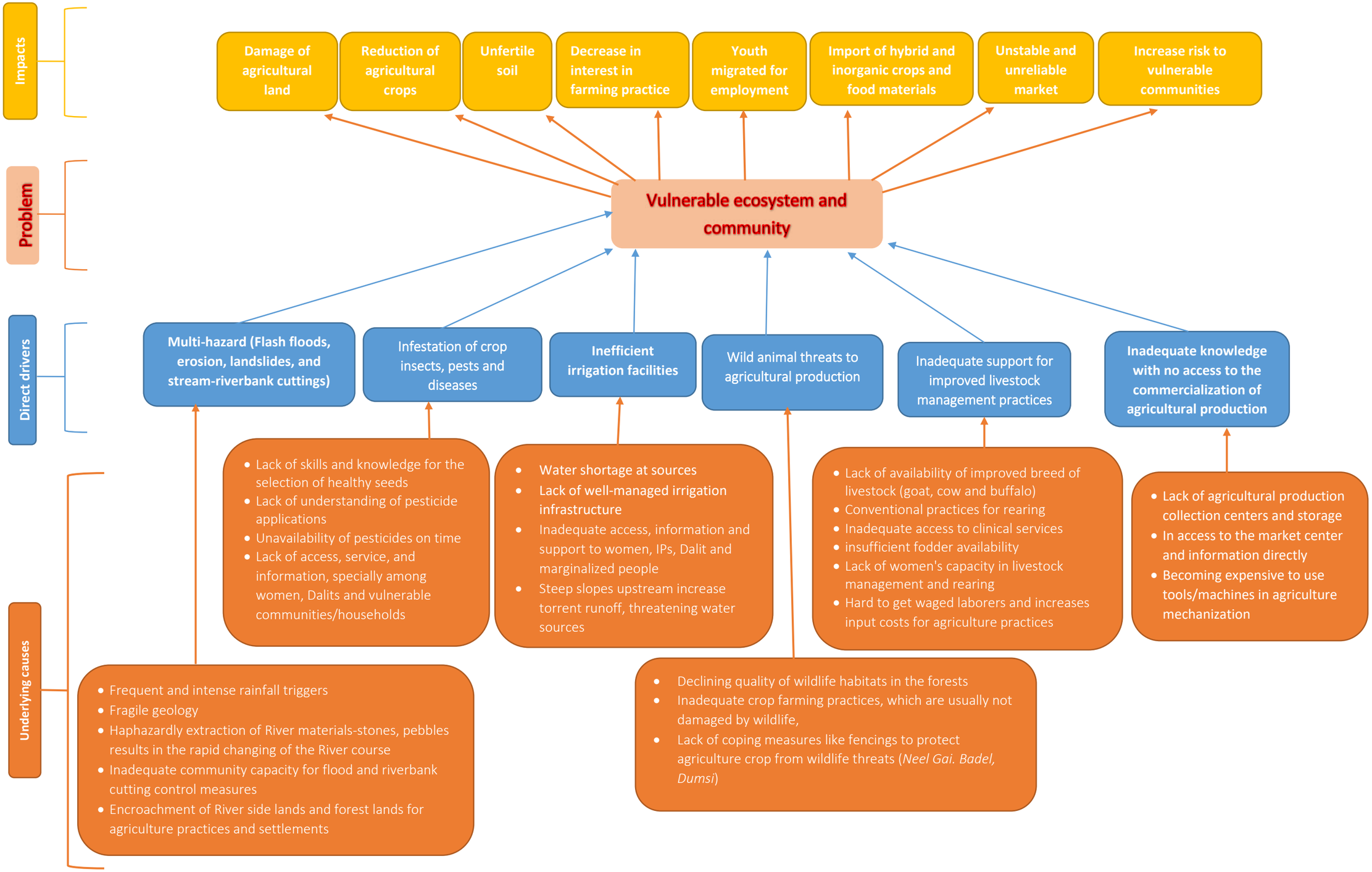


Figure 10: Direct drivers and underlying causes of vulnerable ecosystem and associated community in Khado River system

2.4.5 Hotspot for vulnerable ecosystems- MCA Result Map 3

- Primary information 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 588 ha, mostly in Agnisair Krishna Savaran Rural Municipality-2, 3 & 4; Mahadeva Rural Municipality-1 & 2; Rajbiraj Municipality-1, 10, 13 & 15; Rupani Rural Municipality-1, 5 & 6; Shambhunath Municipality-2 & 7 and Tilathi Koiladi Rural Municipality-1 & 2 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:
    - In the upstream, Shmbhunath Municipality-2 (Bhaluwai and Kharboniya communities), Rupani Rural Municipality-6 (Bhataniya community), and Agnishar Krishna Rural Municipality-3 (Ikraha community);
    - In the downstream, Rajbiraj Municipality-10 (Biraul community affected by the 1993 flood), Rajbiraj Municipality-1 (Shivathan community), Mahadeva Municipality-2 (Kajauli community), and Tilathi rural municipalities-1 (Belhi community), 2 (Laxminiya community), and 3 (Nayatol community).

- 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).

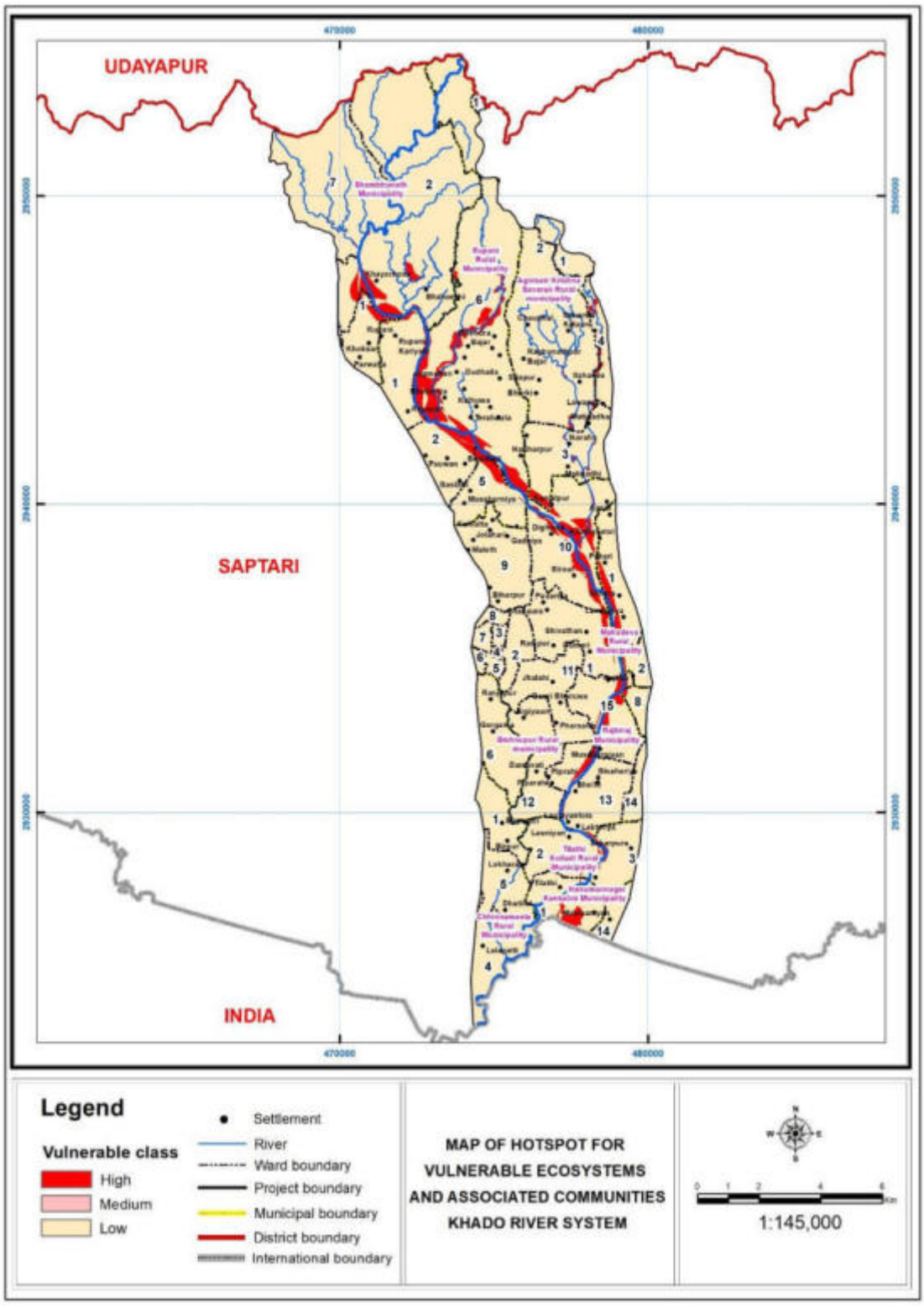


Figure 11: Map of Hotspot for Vulnerable Ecosystem and Community in Khado River System

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.
- 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.
- In general, IPs women in the upstream of the River system depend on goat-farming for their income, where goat-rearing practice is free grazing. Considering one example as: a total of 400 goats (about 10 goats per household and a total of 40 households) from the Chopal community , mostly IPs-Tamang, Rai, and Magar in Agnishar Rural Municipality-2 , and 100 cattles and 100 goats from the donwstream community are grazed daily in the Bandevi Community Forest region.
- 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.

2.5 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.

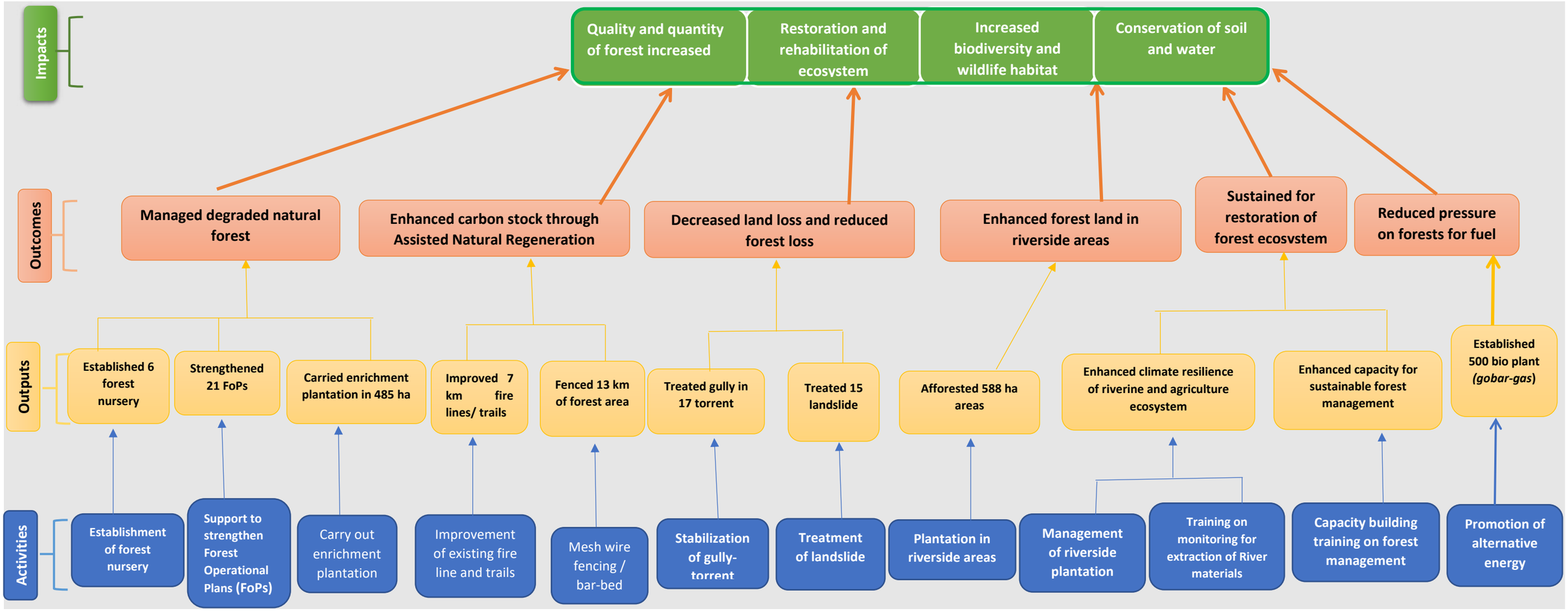


Figure 12: Solution tree analysis in Khado River system: Climate change mitigation

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 Khado River system

Sub-activities	Activities	Outputs	Outcomes
Forest nursery establishment and enrichment plantation in degraded forest	Restoration of degraded natural forests	Output 1: Natural forest ecosystems are better maintained and protected within the project area	
Natural regeneration Management-Assisted Natural Regeneration (ANR) activities ➢ 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 medicne, accidential 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,			➢ Degraded forest managed ➢ Enhanced climate resilient in forest ecosystem ➢ Enhanced carbon stock in natural forest region

Sub-activities	Activities	Outputs	Outcomes
capacity development and other activity that affect sustainable natural resource management.			
Orientation sensitization on forest fire control and management for herders and forest users groups Capacity buildings on forest management for: • 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)	Enhancement of capacity for sustainable forest management		Reduced barriers of sustainable forest management Sustained for restoration of forest ecosystem and services
Plantation in River site areas Post plantation management with irrigation facility and fencing Capacity buildings trainings for users on the management of plantation in new areas-River side areas	Enhancement of forest land in River side areas	Output 2: Forests and tree cover are restored and maintained in the River system landscapes.	➢ 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

Sub-activities	Activities	Outputs	Outcomes
			in River site lands ➢ 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.

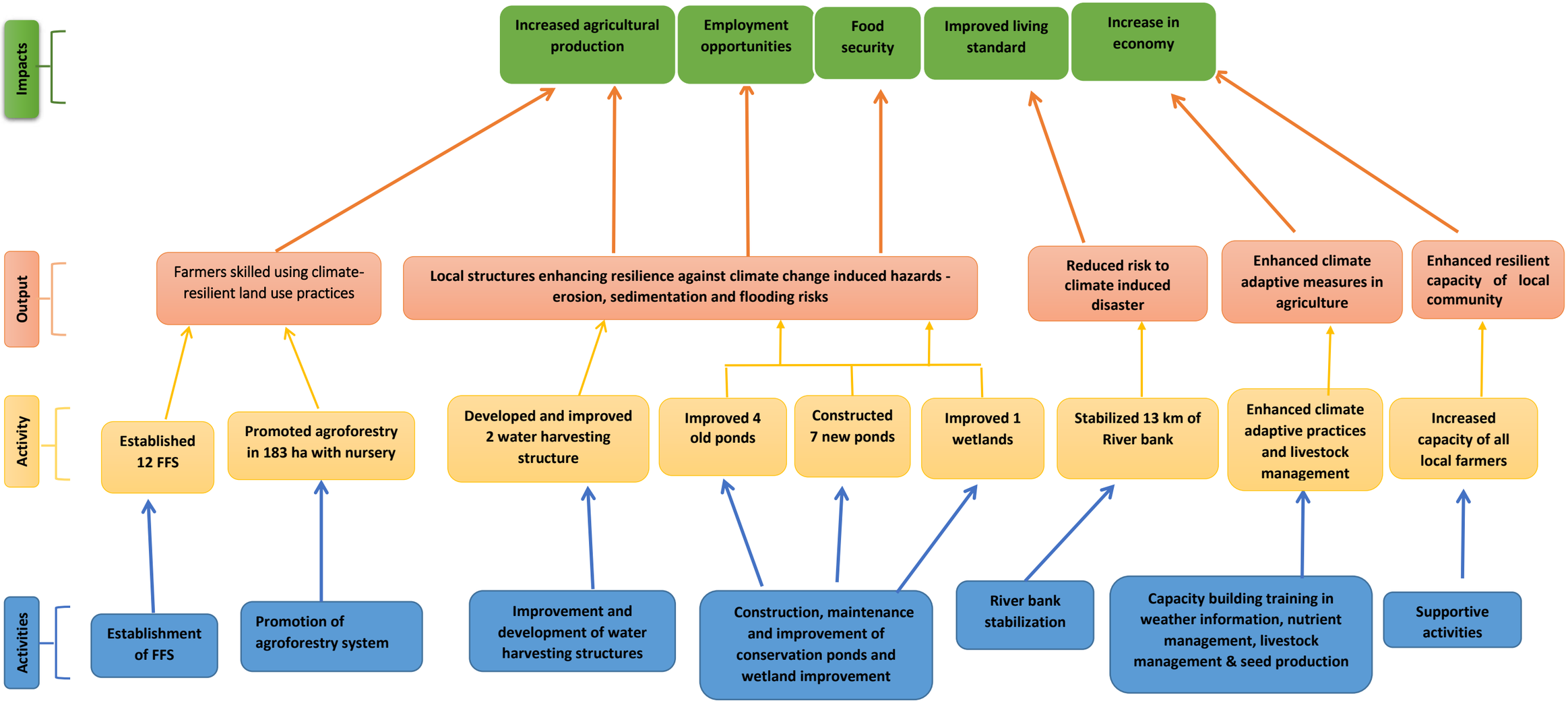


Figure 13: Solution tree analysis in Khado River system: Climate change adaptation

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 Khado 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 and Irrigation improvement			
Wetland improvement			
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.	Capacitate stakeholders in water and soil conservation		
Establishing agroforestry system with mixed cropping in multi-year crop; fodder and grasses with horticulture plants	Establish agroforestry activities Capacitate farmer groups and government officers to promote agroforestry system	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			
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		Enhanced climate adaptive measures in agriculture
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		
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
• 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	Promote gender-inclusive governance		• · 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
involvement in NRM/ CRLUP and management. • 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.			• · 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
Khado River system (Figure 14).

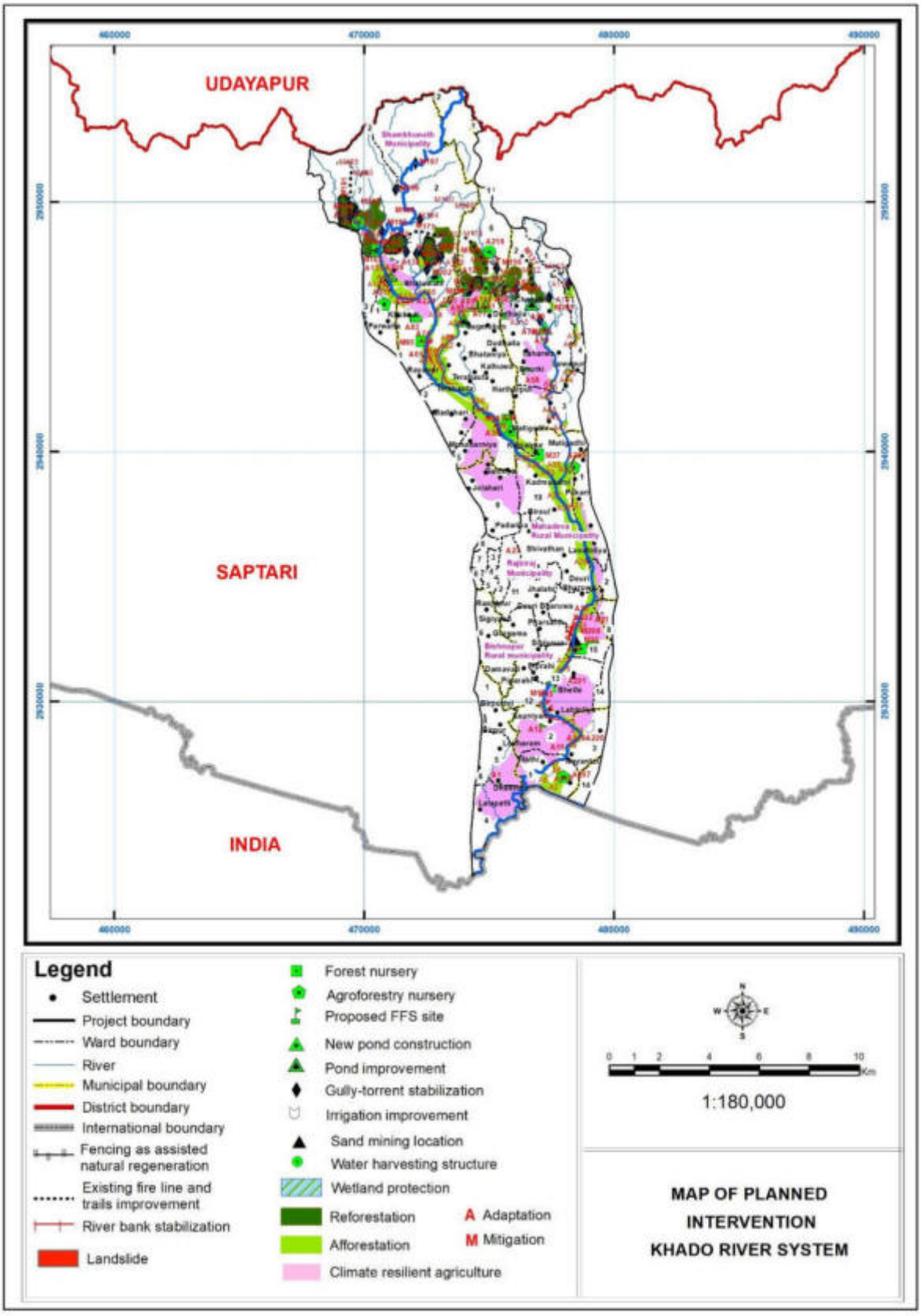


Figure 14: Map of Planned intervention (Mitigation and Adaptation) in Khado River system

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 Chure's region women –Shambhunath Municipality and Agnishar Rural Municipality and cereal crops farming practices for Terai's region women in Rupani Rural Municipality, Rajbiraj Municipality and Tilathi rural municipalirty;
- 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 the Khado River system are open grazing, River bank cutting and gully erosion, forest fire, encroachment, illegal logging, high

dependency on fuelwood and cow dung cakes, free grazing, and a weak forest management committee.

- Low involvement of forest users' committees, especially women and users' groups, in reducing major drivers of deforestation and forest degradation (open grazing, encroachment, forest fire, illegal logging)
- Women from IPs and marginalized communities are mostly engaged in alcohol production for their income generation upstream in Agnishar Krishna Sharavan Rural Municipality-2, resulting in pressure on the nearest forest. Marginalized women (having no land of their own) in these upstream municipalities take an interest in vegetable farming and mixed-cropping farming, such as mango with ginger and turmeric. For this purpose, facilitation is required for them to acquire land on lease, and they also need technical and financial support in collaboration with the municipal government. In addition, if a detailed assessment is to be done, it is possible to take potential private and public lands on lease in the Municipality.
- Unawareness and weak forest management of CFUGs have enhanced deforestation and forest degradation in the River system.
- Construction of conservation ponds and River site woodlots and fodder plantations, intercropping and agroforestry systems are of high priority in the River system. Few demonstration models for restoration practices as well as soil conservation, water conservation, and increasing women's and marginalized communities' incomes are required in the River system.
- Assisted natural regeneration (ANR) and enrichment plantation are needed to carry out the restoration of degraded forest in the natural forest region of the River system;
- Participants have an interest in the construction of embankments/dams on both sides along the River banks of the Khado River and its torrent streams to protect agriculture lands damaged by floods, deposition, and siltation;
- Policy advocacy is required in collaboration with the concerned municipalities and provincial governments for: a) the sustainable extraction and management of riverbed materials deposited in the Khado River system; b) upstream-downstream linkages through the proposed activities for the restoration of degraded forest and vulnerable ecosystems;
- A strong collaboration with the concerned municipal governments (Shambhunath Municipality, Agnishar Krishna Shravan Rural Municipality, Rupani Rural Municipality, Rajbiraj Municipality) and other concerned government agencies is required to make the implementation of the activities sustainable and for financial collaboration with the BRCRN project.

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 Khado River system falls in Churia region (upstream), Bhawar region (midstream) and Terairegion (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 in Bhawar, and silt and clay deposition in the middle and lower Terairegions 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 -5 (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?
The natural forest loss is about 485 ha, mainly reported in Shambhunath Municipality-2, 6 & 7 and Agnishar Krishna Savan Rural Municipality-2 and Rupani Rural Municipality-6 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 site regions for restoration and afforestation in the River system.

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 gulley 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.

Similarly, the number of floods, landslides, and soil erosion events has increased in recent years, their impacts having expanded in the River system. Flooding, landslides, and soil erosion have been exacerbated by extreme and torrential rainfall. These hazardous events have degraded the forest area in the River system. In addition, landslides and erosion are reported in Shambhunath Municipality-2 & 7, Agnisair Krishna Savran Rural Municipality- 1 & 2, and Rupani Rural Municipality-6.

Forest fire: In the River system, every year (pre-monsoon season from March to May), three to four forest fire events happen in the River system. In addition, careless human activity has also increased 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.

Open grazing: Open grazingis also a major dRiver in the River system. According to local stakeholders: about 80-90 cattle and 80-90 goats graze daily in Agnisair Krishna Savaran Rural Municipality-2. Similarly, in the Jankalyan Namuna community forest in Rupani Rural Municipality-6, around 200 goats are grazed daily in the forest.

Encroachment: According to the local people, forest encroachment is noted in the Khado 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.

Excessive fuelwood collection: local communities have a lack of alternative energy sources for cooking and other domestic energy consumption uses, lack of skilled training with equipment to maintain alternative energy sources and biogas, ineffective fuelwood management among the users are the causes of the dependency of the users on fuelwood collection from the forest areas. 90% of the Bandevi community forest in Agnisair Krishna Savaran Rural Municipality-2 users rely on fuelwood and a daily collection of 300-450 kg.

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)*

b. Establishment of forest nursery is recommended nearest to the potential areas of plantation (approaches: private, community and promotion in forest sub-divisions): Rajbiraj Municipality-10, 13 & 15; Rupani Rural Municipality-1 & 6 and Shambhunath Municipality-7
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 7 km);
    b. Mesh-wire fencing for protection of existing forest as priority ANR activity (13 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, 588 ha of plantation is planned including community land plantation (275 **ha**), demonstration plantation (11 **ha**), riparian plantation (**14 ha),** and woodlot establishment (**288 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 riversite 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 riversite 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 riversite 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 riversite 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 disribution 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
Output1 natural forest ecosystems are better maintained and protected within the project area	**Activity 1.1 : Restore degraded natural forests**	Forest nursery establishment/promotion (6) in Rajbiraj Municipality-10, 13 & 15; Rupani Rural Municipality-1 & 6 and Shambhunath Municipality-7	M163, M17, M20, M37, M44, M65	
		Natural forest regeneration management and Enrichment plantation in degraded forest lands (485 ha) in Shambhunath muncipality-2&7; Agnisair Krishna Savaran Rural Municipality-2; and Rupani rural muncipality-6	M185,M175,M92, M118,M120,M108,M122,M114,M181,M183,M168,, M161,M170,M154,M99,M127,M117,M166	
		Natural regeneration management-ANR (Assisted Natural Regeneration): • Cleaning of existing fire line and existing trails **(7 km)** in Agnisair Krishna Savaran Rural Municipality-2; Rupani Rural Municipality-6; Shambhunath Municipality-2 & 7 • Fencing around the natural forest lands **(13 km) in** Agnisar Krishna Savaran Rural Municipality-2; Rupani Rural Municipality-6 and Shambhunath Municipality-2 & 7 • Support on forest firefighting equipment/tools sets- **(21 sets)**	M191,M177,M160,M317 M130,M212,M213,M214,M215	Toolkit for forest fire control in accordance with government packages (Trolly with Water Tank if possible at district level) the River system has 21 CFUGs/LFUGs and forest firefighting equipment is proposed for one package for each 1 CFUGs

		• Support for fodder nursery approach-seedlings for fodder trees **(500 HHs)** • Support on the provisions of forest watcher (at least one in each CFUGs **(21 persons)** • Linking with existing ICIMOD mobile apps (Forest fire App) for forest fire monitoring and forest management (1**)**		
	Activity 1.2 Enhance capacity for sustainable forest management	a. Development of Community Based Forest Fire Fighting Groups (CB-FFFG) 21 events b. Provide skill trainings on forest fire control and management **(21*3)=63 person for firefighter trainings**) c. Support for forest operational plan developments/reviews **(21 plans)** d. **Coaching on forest operational plan for forest users (21 events)** e. Provide 1-day orientation trainings for herders/livestock farmers on forest management (**500 herders);** f. Provide skill trainings on compost preparation using forest based resources-bushes and leaf litters**- 5 days training** (one for each CFUGs) g. Develop Training of Facilitators (ToF) in sustainable forest management (10 people in the River system); h. Capacity building trainings on forest management for government staffs (DFOs/ SDFOs) **(1 event-**3 days residential) i. Provide refresher trainings for CFUGs/LFUGs in forest management-3 days for each CFUGs/LFUGs **(21 events); each event include 20 persons/users**		• The total number of CFUGs/LFUGs in the River system is about 78 • 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

		j. Celebration of Churia Conservation day (**5 events)** k. Capacity-buildings trainings on monitoring of sustainable extraction of riverbed materials and mines (with site demonstration)-3days residential for local governments l. **Facilitation for School course programme on sustianable forest management (1 event)** m. Production and dissemination of extension material on sustainable management of natural resources. Produce gender friendly materials. n. Facilitation support for alternative energy uses / biogas plants installation(500 HHs)		
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 **(588 ha) in** Agnisair Krishna Savaran Rural Municipality-2, 3 & 4; Mahadeva Rural Municipality-1 & 2; Rajbiraj Municipality-1, 10, 13 & 15; Rupani Rural Municipality-1, 5 & 6; Shambhunath Municipality-2 & 7 and Tilathi Koiladi Rural Municipality-1 & 2	A50,A56,A16,A39,A36,A34,A132,A68,A79,A91,A126,A125,A136,A140,A145,A6,A9,A13,A80,A84,A82,A95,A69,A106,A7,A3,A45,A46,A48,A49,A51,A52,A53,A63,A66,A72,A104,A89,A101,A110,A70,A64,A55,A54,A43,A42,A41,A8,A115	

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
Output1: 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.	6	1,000,000	6,000,000	The cost includes structure of nursery of each capacity 50,000 for Multi-year seedlings production
1.1.2 Seedling production in Nursery (Multi-years seedlings)	No.	300,000	40	12,000,000	The cost includes water supply, seedling bed preparation, nursery *Naike*, forest soil collection, sand collection, poly bag purchasing, nursery shading, soil filling in poly bag, preparation of germination bed)
1.1.3 Enrichment plantation and regeneration management in degraded forest	Ha	485	250,000	121,250,000	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)..
1.1.4 Cleaning of existing fire line and existing trails	km	7	50,000	350,000	In collaboration with municipal government and DFO
1.1.5 Construction/improveme	km	13	500,000	6,500,000	adopt mesh wire/ bar-bed

nts of fencings in natural forest lands					
1.1.6 Support on forest firefighting equipment/tools (21 sets)	no.	21	500,000	10,500,000	Total CFUGs/LFUGs in the River system is only 21 groups. 1 set of firefighting equipment is for 1 groups. need to collaborate with others for firefighting water tanker-big and small size, the cost does not include bigger tanker cost.
1.1.7 support on provisions for forest watcher	person s	21	800,000	16,800,000	for 5 years salary with incentives
1.1.8 Support on fodder-seedlings for fodder trees promotion	HHs	500	5,000	2,500,000	focus for marginalized and livestock based livelihoods dependent community
1.1.9 Linking with existing mobile app system from ICIMOD for forest fire monitoring and forest management (1 event)	lump sum	1	200,000	200,000	
1.1.10 Development of Community Based Forest Fire Fighting Groups (CB-FFFG)	no.	21	20,000	420,000	The cost includes coordination and communication and meetings for the development of CBFFFG
1.1.11Provide skilled-based training capacity for CBFFFGs on forest fighter trainings-forest fire control and management for (21*3)=63 persons-firefighter trainings) for CFUGs/LFUGs	person s	63	30,000	1,890,000	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
1.1.12Support on Forest Operational Plan (FoP) renewals/reviews	no.	21	200,000	4,200,000	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				**182,610,000**	
Activity 1.2: Enhance capacity of forest management stakeholders (government units, CFUGs, forest management CSOs, users)					
1.2.1Coaching on forest operational plan for forest users (21 events)	events	21	30000	630,000	Half day orientation on operational plan dissemination/sensitization to the users
1.2.2 Provide 1-day orientation trainings for Herders on importance of forest services and management (500 herders/livestock owners) ;	events	25	100,000	2,500,000	Coordination with cattle's' households' owner Collaboration with municipal government and Livestock Management Centers In 25 blocks events, 20 persons can adjust in each block/event
1.2.3Provide 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)	events	21	300,000	6,300,000	Collaboration with municipal government 1 CFUGs can adjust in one event with one machine
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	21	200,000	4,200,000	The training facilitator-from the ToF receiver One 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.	500	5,000	2,500,000	In coordination with the municipal government
sub total				**19,630,000**	
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					
2.1.1Plantation in River site area (forestry plantation)	Ha	588	700,000	411,600,000	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				**415,100,000**	
Total cost				**617,340,000**	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:

Outputs/ activities	Risks or obstacles	Risk reduction measures	Risk reduction targets	Indicators
Output 1: Restore degraded forests				
Nursery establishment	• Unavailability of : appropriate site, (water, slope, aspect, accessible to plantation site etc. • Insecurity from wildlife-monkey • Intense rainfall triggers nursery plant • Infertility of soil resulting to unstable of plants	• Ensure water availability • Require site inspection with soil test and other aspect • Purchase seedling from private nursey. • Upgrade forest nursery under DFO • Provide shed for some days. • Adopt multi-year nursery plants (2-year)	• 300,000 seedlings purchased from private nursery • 2 DFO nursery upgraded • 2 Nurseries with shed	• No. of seedlings purchased from private nursery • No. of DFO nursery upgraded • No. of nurseries with shed
Seedlings production (multi-year seedlings)	• 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	• 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 *Naike*	• 300,000 seedlings produced in planning phase • Seedling species are selected as per the communities as well as project needs • At least 2 nursery *Naike* are well experienced among 6 *Naike*	• No. of seedlings produced in planning phase • Number of consultation for species selection • No. of well experience nursery Naike devoted.
Carrying out plantation & regeneration in degraded forest	• Drought • Forest fire • Free grazing • Flash flood. • Less interest of CFUGs	• 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	• 80% enrichment plantation species are drought resistant. • 80% of seedlings protected •	• % drought resistant species in enrichment plantation • Number of planted area fenced • % of seedlings protected • Number of MoU with the CBOs

		• MoU with CFUG/ LFUG for the protection of the plantation area		
Output 2: Enhance capacity of forest management stakeholders for sustainable forest management				
	• Participants may not have interest to receive training • Training event may not match with leisure time of participant. • Venue may not easy accessible to participants especially for women and other vulnerable people	• Provide DSA and transportation allowances to the participant. • 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	• 90% of targeted CFUG members actively involved in the training. • 50% women, 13% Dalit and 31% Indigenous people are included in the training • 100% of CFUGs able to know knowledge & skills for forest management	• % of targeted CFUG members actively involved in the training.
	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)	• Flash flood damages the plantation • Free grazing • Obstacle in Land ownership. • Social conflict between communities of two River banks • No provision of government in post plantation management	• 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:	• Post monsoon plantation in 588 ha of River site land. • 3 no. of consultation with local government to prepare guideline • 90% of users agreed to carry out plantation	• 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.

	• Unwillingness for controlling open grazingdue to lack of fodder • Mass production of forest product may create problem in harvesting and marketing.	local community managed plantation in coordination with local government; sharing of products the community) • Regular thinning and pruning with market assessment.	• 20% financial support from local government. • One thinning and one pruning/year with market assessment or distribute to local users.	

Safeguard analysis:

Outputs and activities/ tasks	**Serious risks**	**Risk reduction measures**	**Risk reduction targets**	**Indicators**
Nursery establishment	• Labor hired from outsider that includes women, IPs, Dalits, and marginalized people. • Conflict in resources utilization (water, forest soil etc.) • Expansion of invasive species	• Labor hired from local users. • Agreement with corresponding user group for use of local seeds and other germplasms	• 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	• No. of labor hired from local user. • Agreement document • No. focal desk developed in government entities
Carrying out River side plantation (afforestation)	• 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.	• Promote native species for plantation. • Regular thinning and pruning with market assessment. • Regular patrolling mechanism should be established.	• 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.	• % 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	• Exotic species may pose risk to local biodiversity. • Huge biomass forest product may create problem in harvesting and marketing. • Human wildlife conflict	• Promote native species for plantation. • Regular thinning and pruning with market assessment. • Compensation mechanism by CFUGs established.	• 100% enrichment plantation species is native. • One thinning and one pruning/year with market assessment or distribute to local users. • 90% of the users received compensation on wildlife damages.	• % of native species planted • Event of thinning and pruning/year • Amount of forest product harvested/year % of the users received compensation on wildlife damages.
Carrying out training to CFUG members on sustainable forest managemennt.	Right person (IPs, Dalits, marginalized groups). may be excluded in the training;	• Assure right person in training (training is organized as per CTNA)	• 80% of trained CFUG members involved in forest management.	• % of trained CFUG members involved in forest management.
Installation of alternative energy (biogas plants).for marginalized poor communities.	• Elite capture	Assurance of beneficiaries highly dependent on fuelwood (IPs, Dalits, marginalized groups).	• 500 HHs of actual beneficiaries receive alternative energy (biogas plants).	• 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	• 485 ha natural degraded forest restored and 771 ha (588 ha from afforestation and 183 ha for Agroforestry) 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 15 landslides covering about 7 ha in Agnisair Krishna Savaran Rural Municipality-1 & 2, Rupani Rural Municipality-6,and Shambhunath Municipality-2 & 7 are the major landslids in the River system. About 17 number of torrents is having a number of gullies that have led to degraded forest ecosystems; for example, mainly in Agnisair Krishna Savaran Rural Municipality-1 & 2; Rupani Rural Municipality-6 and Shambhunath Municipality-2 & 7 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 drainge or trenches).
  - Free and intensive grazing (for example about 500 goats are grazed daily in Agnisair Krishna Savaran Rural Municipality-2) 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 agricultrue 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-15 sites with vegetative measures and engineering strucutres in collaboration with local governments, soil conservation offices, forest offices and the community (of these very strongly recommended for the treatmens (2 landslide), strongly recommended (2 landslide), and recommended (11 landslide)
k. Stabilization of gully in the torrent (17 torrents) in Agnisair Krishna Savaran Rural Municipality-1 & 2; Rupani Rural Municipality-6 and Shambhunath Municipality-2 & 7
l. Construction of water conservation ponds (7 ponds): Agnisar Krishna Savaran Rural Municipality-2; Rupani Rural Municipality-6 and Shambhunath Municipality-2 & 7
m. Improvement of existing ponds (4 pond) in Agnisair Krishna Savaran Rural Municipality-2 and Rupani Rural Municipality-6
n. Wetland Improvements (1 locations of cumulative area 1.4 ha) in Agnisair Krishna Savaran Rural Municipality-2
o. Irrigation facilities improvement (9 sites) in Shambhunath Municipality-1 & 2; Rupani Rural Municipality-1 & 6; Rajbiraj Municipality-13 & 15 and Tilathi Koiladi Rural Municipality-1, 2 & 3
p. Construction of water harvesting structure (2 sites) in Rupani Rural Municipality-6 and Shambhunath Municipality-7
q. Riverbank stabilization (13 km) in Rajbiraj Municipality-13 & 15; Rupani Rural Municipality-1 & 6 and Shambhunath Municipality-1, 2 & 7
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 **(21 events of 5 days)-1 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 cosnervation (for example, bamboo farming, Amrisho (*Thysanolaena maxima*), Amala (*Phyllanthus emblica*), Harro, Barro and linking these measures in income generation opportunities, particularly for women, dalit and IPs, Madhesi and othe margninalied 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 disribution of benefit of resource to the Community Forest (CF) users especially, marginalized forest users;
- Incentives for women and economically marginalised community for their active enagement in nursery establishment and enrichment plantation;
- Incentives for alternative bio-energy;
- Incentives for livestock sustianable 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 15 landslides):	Very strongly recommended for treatment	M128, M107
		Strongly recommended for treatment	M148, M143
		Moderately recommended for treatment	M193, M186, M196, M195, M194, M184, M190, M188, M178, M155, M150
	3.1.2 Gully stabilization in torrent (17 torrents) in Agnisair Krishna Savaran Rural Municipality-1 & 2; Rupani Rural Municipality-6 and Shambhunath Municipality-2 & 7	M182, M189, M198, M199, M196, M197, M200, M201, M202, M203, M119, M156, M204, M205, M116, M206	

	3.1.3 Construction of water conservation ponds (7 ponds) in Agnisar Krishna Savaran Rural Municipality-2; Rupani Rural Municipality-6 and Shambhunath Municipality-2 & 7	A40,A75,A88,A93,A112,A131,A162
	3.1.4 Improvement of existing ponds (4 pond) in Agnisair Krishna Savaran Rural Municipality-2 and Rupani Rural Municipality-6	A77,A90,A105,A121
	3.1.5 Wetland protection (1 locations) in Agnisair Krishna Savaran Rural Municipality-2	A210
	3.1.6 Construction of water harvesting structure (Dam) (2 harvesting dams) in Rupani Rural Municipality-6 and Shambhunath Municipality-7	A216, A217
	3.1.8 Riverbank stabilization (13 km) in Rajbiraj Municipality-13 & 15; Rupani Rural Municipality-1 & 6 and Shambhunath Municipality-1, 2 & 7	A100, A109, A111, A113, A123, A133, A139, A14, A144, A147, A157, A158, A159, A22, A23, A57, A60, A67, A85, A94, M129, M134, M141, M151, M165, M169, M171, M174, M176
	3.1.9 Irrigation facilities improvement (9 sites) in Shambhunath Municipality-1 & 2; Rupani Rural Municipality-1 & 6; Rajbiraj Municipality-13 & 15 and Tilathi Koiladi Rural Municipality-1, 2 & 3	A224, A226, A225, A221, A223, A222, A219, A218, A220
Activity 3.2 Capacitated stakeholders in water and soil conservation	3.2.1 Skill based training for local community CFUGs/LFUGs on landslide and gullies stabilization with locally available treatment measures **(**39 events of 5 days)-2 CFUGs/LFUGs in one event 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);** 3.2.3 Support on demonstration visits on soil and water conservation programme 3.2.4 Support on production and dissemination of success stories of water and soil conservation practices for possible replication	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.	15	2,000,000	30,000,000	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 (17 torrents)	No.	17	2,000,000	34,000,000	17 (torrent streams with gullies) (Bio-engineering, palisade, brushwood check dam, bamboo plantation, contour plantation,)
3.1.3 Construction of conservation pond	No.	7	700,000	4,900,000	Size approximately: 20*20*2 m3
3.1.4 Improvement of existing pond	No.	4	500,000	500,000	Including cleaning and maintenance
3.1.5 Construction of water harvesting structures (dams)	No.	2	1,000,000	6,000,000	
3.1.6 Riverbank stabilization	km	13	30,000,000	450,000,000	cost @ Rs. 30,000,000 per 1 km Riverbank stabilization with engineering structures
3.1.7Wetland protection	Ha	1.4	1,000,000	1,400,000	
3.1.8 Improvement of irrigation services	No.	9	1,000,000	9,000,000	
Sub-total				**535,800,000**	

Activity 3.2 : Capacitate stakeholders and enhance 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 **(21 events);**	Events	21	250,000	5,250,000	• Total 21 CFUGs/LFUGs in the River system, Each event includes 1 CFUG/LFUGs • Each event for 5 days , including 1-day exposer visits
3.2.2 Orientation training on soil and water conservation measures for government officials	Events	5	600,000	3,000,000	• Government officers inlcude from agriculture knowledge centers, extensions, soil conservation offices, forest divisions/subdivisions, local governments, and other relavent 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	• For government officials, other stakeholders and users • National/neighberiong 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				**10,950,000**	
Total				**546,750,000**	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
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	• Identification of treatable landslides • 15 landslides treated	• 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	• 17 torrent streams with gullies treated	• 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	• 7 conservation ponds constructed • 4 ponds improved • 100% MoU with the user committee on the pond management	• 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.	• 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	• 200 targeted members actively involved in the training.	• No. of members actively involved in the training

Safeguard analysis

IPack outputs/ activities	Serious risks	Risk reduction measures	Risk reduction targets	Indicators
Landslide treatment.	• Risk of human casualty	• Application of safety instrument.	• No human casualty recorded in landslide treatment	• No. of human casualty in landslide treatment.

Gully-torrent stabilization	• Vegetative species used in treatment pose to threat local biodiversity. • Labor hired from outsider	• Use of locally available native species. • Labor hired from local users	• 100% of the native vegetative species used in treatment. • 80% of labor hired from local user	• % of the native vegetative species used in treatment. • %% of labor hired from local users
Construction and improvement of Conservation pond	• Children and small animal submerged in the pond. • Splash erosion occur when raindrop hit barren surface	• Fencing around the pond. • Develop animal friendly ramps • Paving by grasses • Planting trees around the ponds	• No casualties recorded • No erosion from the inclined inward lands and barren surface	• Number of casualties recorded • Number of ponds with siltation problem
Carrying out training to CFUG members on soil and water conservation measures.	• Marginalized groups may be excluded in the training.	• Assure right person in training by assessing the CFUGs institutions members	• 80% of trained members involved in soil and water conservation measures.	• % of trained members involved in soil and water conservation measures.

Benefits	**Benefit enhancement measures**	**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 7 ponds and 4 existing ponds improvement 15 landslide treated as per the priority and 17 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: Mahadeva Rural Municipality-1; Shambhunath Municipality-1 and Tilathi Koiladi Rural Municipality-1
b. Adoption of Agroforestry system in the potential areas of the riverside of about 183 ha, mostly in the Rajbiraj Municipality-10 & 15; Shambhunath Municipality-1 & 2;Agnisair Krishna Savran Rural Municipality-2; Rupani rural muncipality-1&6 and Tilathi Koiladi Rural Municipality-1& 3
c. Providing supports for irrigation facilities
d. Formulation of groups called Agroforestry Groups (AFGs), it is advised as 3 groups (25-30 members in each group)
e. Providing Training on AF (Agroforestry) practices for 90 group members (30*3) 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: Bamboo *(Bambusa vulgaris*), 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 (3 agroforestry group) agroforestry activities	4.1.1 Establishing Agroforestry Nursery (3) in Mahadeva Rural Municipality-1; Shambhunath Municipality-1 and Tilathi Koiladi Rural Municipality-1	A207,A209,A211
	4.1.2 Establishment of AF activities in the potential areas (183 ha. of River abandoned land) Rajbiraj Municipality-10&15; Shambhunath Municipality-1 & 2;Agnisair Krishna Savran Rural Municipality-2; Rupani rural Muncipality-1 & 6 and Tilathi Koiladi Rural Municipality-1 & 3	A11, A124, A2, A24, A30, A31, A32, A35, A5, A7, A76, A96
	4.1.3 3 Agro-Forestry Group committee established	
	4.1.4 3 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 to promote agroforestry system	4.2.1 Training for AFG members on administration and management (90 AFG members from 3 AFG)	
	4.2.2 Training on AF practices (90 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	

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	• Cost Include tunnel-protection measures
4.1.2 Purchasing seedlings of horticulture species for agro-forestry 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	• 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.	3	500,000	1,500,000	• 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.	3	30,000	90,000	
4.1.6 Institutional support and office equipment for women group	No.	3	200,000	600,000	

4.1.7 Coordination meetings (5 years)	No.	10	25,000	250,000	Two meetings/ year/per Group
Subtotal				**101,440,000**	
Activity 4.2 Capacitated communities'/farmer groups and government officers to promote agroforestry system (3 AFG)					
4.2.1 Training for agroforestry groups on sustainability, principle of administration and management-3 days residential	persons	90	30,000	2,700,000	90 person
4.2.2 Training on improved AF practices (promotion for small enterprises for the production)-5 days residential	persons	90	30,000	2,700,000	
4.2.3 Providing capacity building for government officers on the promotion of agroforestry system-3days residential	events	3	500,000	1,500,000	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				**7,400,000**	
Total				**108,840,000**	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)	• Flood damages the AF activities. • Clearing land demarcation between private/public	• 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.	• 183 ha River abandoned land converted to AF activities adopting customary land practices for risk reduction approach.	• Hectares River side land converted to AF activities.
	Actual beneficiaries (IPS, dalit, marginalized groups) may exclude from AGF committee.	Assurance of actual beneficiaries.	• 3 AFG committee established	No. of AFG committee established
Train on cooperative principles, administration and management	• 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).	• 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	• 90 AFG member trained on, administration and management	• No. of AFG members trained
Support institutional support and office equipment.	• Insufficient support and office equipment	• Assure sufficient support and quality equipment.	• 3 AFG received institutional support and office equipment.	• 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.	• 90 AFG members trained on improved AF practices.	• No. of AFG members trained on improved practices.

Safeguard Analysis:

IPack outputs/ activities	Serious risks	Risk reduction measures	Risk reduction targets	Indicators

Reduction in indigenous crops that are staple food of poor	• Implement multi-level AF practices with a focus on indigenous crops.	• 90 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	• Establish a transparent grant approval with more engagement of vulnerable and marginalized communities • Strong Monitoring & reporting mechanism.	90 poor/marginalized HHs receiving grants	• No. of poor/marginalized HHs receiving AF grants	• 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**:
- 12 FFS and 1934 ha of agricultural land are planned for Climate Resilient Agriculture (CRA),representing with the codes (A235, A236, A237, A238, A239, A240, A241, A242, A243, A244, A245, A246)
- Out of 12 FFS, the potential five-FFS (with respect to hotspot to climate extremes, crop varieties with different problems, farmer willingness, and access) are listed to estimate the budget.
    - *Phed daduwa,* yellowing, low growth and bacterial disease called sheath blight on rice crop
    - Vegetables (Blight disease in potato and fruit flies, epilachna beetle and downy mildew in pointed gourd)
    - Rust in wheat
    - Powdery mildew and anthracnose in watermelon
    - Vgetables diseases on *Parwar*

- **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:

a) Establishment of 5 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 *Phed daduwa,* yellowing, low growth and bacterial disease called sheath blight on rice crop in Rajbiraj Municipality-15
   - FFS on vegetables (Blight disease in potato and fruit flies, epilachna beetle and downy mildew in pointed gourd) in Rupani Rural Municipality-1
   - FFS on rust in wheat in Shambhunath Municipality-2
   - FFS on Powdery mildew and anthracnose in watermelon in Tilathi Koiladi Rural Municipality-8
   - FFS on vegetables diseases on *Parwar* in Agnisair Krishna Savaran Rural Municipality-2

b) Capacity-building training in the use of weather information and its application in agricultural practices;
c) Capacity building on livestock management practices
d) Support for the conservation and utilization of water source by using local friendly techniques, for example: building of Seepage Cutoff Walls (SCWs) for tapping sub-surface water in irrigation sustainability in Agnisair Krishna Savaran Rural Municipality and Shambhunath Municipality
e) 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)- Rajbiraj Municipality
f) Provide training to adopt and apply climate resilient landuse practices (for examples: compost manure preparation, mulching, water retention capacity, green manure).
g) Support to farmers' sensitization to save agricultural practices and production from wildlife threats
h) 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,
- 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 five FFSs and increased farmers' ability in seed production in Rajbiraj Municipality-15; Rupani Rural Municipality-1; Shambhunath Municipality-2; Tilathi Koiladi Rural Municipality-8 and Agnisair Krishna Savaran Rural Municipality-2	4.3.1 Establish 5 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) 4.3.4 Support for the conservation of water source and improvement of irrigation facilities using the technology of sub-surface water harvesting (SCWs) chambers	A21,A83,A138,A25,A97
Activity 4.4 Enhanced farmers' capacity in climate resilient farming practices,	4.4.1Capacity 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.

Activity/Sub-Activity	Unit	Quantity	Unit Costs	Budget (NPr)	Remarks
Activity 4.3: Establish five FFSs and increase farmers' ability in seed production.					
4.3.1 Establish 5 FFSs	No.	5	350,000	1,750,000	• 5 locations (referred in the area code)
4.3.2 Capacity building on livestock management practices-sheds improvements crop depredation by wildlife	No.	5	200,000	1,000,000	• At 5 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	• For 3-years for crops-rice in Barathahwa in collaboraion with AKC and municipal governemnt • In collaboration with municipal government and Agriculture Knowledge Center (AKC)
4.3.4 Support for the conservation of water source and improvement of irrigation facilities using the technology of sub-surface water harvesting (SCWs) chambers	No.	5	2,000,000	10,000,000	• In collaboration with municipal governments
Sub-total				**13,350,000**	
Activity 4.4 : Enhance 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.	5	200,000	1,000,000	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	5	300,000	1,500,000	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.	5	200,000	1,000,000	produce market linkage—link with municipal level AKC's Unit
Sub-total				**3,500,000**	
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.	5	300,000	1,500,000	At Municipality levels in upstream and downstream for vulnerable farmers
Sub-total				**1,500,000**	
Total				**1,500,000**	

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 outputs/ activities	**Risks or obstacles**	**Risk reduction measures**	**Risk reduction targets**	**Indicators**
Output 1: Establish five FFSs and increase farmers' ability in seed production.				
Establish 5 FFSs on the listed crops and on fruits	• 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 125 (25*5=125) 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 five 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 1250 farmers=25X10X5) on how to deal with impacts of climate change and crop pests and diseases with weather conditions in crop growth and development	Number of farmers capacitated

IPack outputs/ activities	Risks or obstacles	Risk reduction measures	Risk reduction targets	Indicators
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 5 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: Capacitate farmers in climate resilient agriculture practices				
Build coping capacity of marginalized farmers, including women in seed production	• Poor accesses to quality and variety of seeds • Often priority is given only to elite farmers not to marginalized farmers in capacity building • Lack of modern tools and knowledge with equipment for seed production	• Promote seed production program to increase production • productivity and • enhance production • Increase labor productivity, reduce cost and labor on women through the adoption of modern tools and equipment	• Starting with 25 women farmers in seed FFS and building their capacity so that they can further disseminate technology to 250 new women farmers (25 *10) for upscaling the seed production technology in rice crop in 1 site;	Number of women farmers trained for quality production
Provide technical	• Lack of producing weather forecasts	• Adopt existing weekly agromet	• Building capacity of 1250 FFS farmers and 625	Number of farmers

IPack outputs/ activities	Risks or obstacles	Risk reduction measures	Risk reduction targets	Indicators
weather information and its application skills in farming practices	information at farm level, resulting to obstruct in its applications in decision making process	bulletin published by NARC and customize the advisory in local context	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	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 125 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 five FFSs and increased farmers' skill in seed production					
	Establish 5 FFSs on crops	• Low participation of women, Dalits and IPs during group formation • Change in agriculture practice might have negative impacts on some members • Inadequate options for women to participate in the programme • Pesticide toxicity	• Maximum involvement through capacity building and awareness • Capacity building training to the marginalized groups and prioritizing the communities linking crop cycle and disease cycle • Need to integrate daily allowances to manage opportunity cost ; • Enhancement for women interest with their suitable time to	• 50 % women, 13 % Dalit and 31 % Indigenous Peoples are included in the group	• % of Dalit, Indigenous Peoples and women in the group

			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	• Lack of sufficient market information and authentic data on market • Variation in market pricing of agriculture products	• Confirmed participation of local authorities (local government) in cooperation with local communities	• Identified all the possible market areas of the River system • Fixed pricing of the agriculture products	• 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	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	•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

IPack 5: Implement women friendly climate adaptive livelihood activities
Drivers:

- Loss of women's access to forest resources due to flood disaster
- The women of the Khadu Khola basin used to rely , among others, on selling fuel wood, livestock raising and homemade wine production by harvesting fuelwood and fodder from the nearby forest,

which is fully affected by flood, River changing direction whereby they lost easy access to forest resources.

- Due to lack of alternative employment opportunities, most of the males migrate for wage earning.
- Women's facing increased workload, increased burden of high interest-private loans, causing stress mental stress, occasionally leading to suicide.
- Due to lack of rural roads, pregnant women deprived of health services due to distant location of the village health posts.
- Social barriers limit the women participation in decision making process.

General descriptions:

Particularly the dalit and the IPs are the mostly dependent on forest resources for livelihood. The increasing impact of climate change reducing production of crops and loss of the corps during floods, has threatened the livelihoods and wellbeing of the smallholder women;

The proposed IP ack emphasizes on gender responsive climate actions, building climate awareness and skill development in climate adaptation practices, alternative employment/income generation, removing the structural barriers faced by the women and girls in participating in decision making processes regarding local level climate adaptation planning.

Objectives:

- Increase involvement of marginalized women in climate resilient actions (+climate adaptation plans)
- Provide women's access to improved livestock and fodder management services
- Increase involvement of marginalized women in climate resilient actions (+climate adaptation plans)
- Rehabilitate drinking water sources as per women's choices

Strategies:

- Building women's capacity in assessment of gender impacts of climate change and participate/influence the climate resilient planning processes on their choices
- Providing improved livestock raising services at homestead along with climate resilient agriculture and sustainable forestry management services
- Strengthening women's saving credit cooperatives to manage their group finances in a productive purpose
- Reducing work burden : Providing support to install homestead drinking wtaer and alternative energy systems

Incentives for participation and changing stakeholders' practices:

- Support subsidized loans scheme through "revolving fund" provisions for the target women for productive purpose
- Provide a "fodder & Livestock" package programme for livestock raising for the dalit women
- Encourage homestead training (FFS) for women considering their time poverty and limited mobility
- Compensate the opportunity cost of women working in daily wages, while involving them in project activities

Outputs and activities

Outputs	Activities
Women friendly climate adaptive livelihood activities are Implemented	• Provide gender mainstreaming trainings/ workshops to local government and CBOs and concerned stakeholders on the need to include women in CCAs
	• Train the target women on improved livetsock raiisng techniques ; • Assist them in fodder plantation and management

	• Support installation of tubewells for alternative sources of driking water collection
	• Assist the target women to install solar energy panels

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.

IPack 5: Women friendly climate adaptive livelihood activities are Implemented				
Gender mainstreaming trainings/workshops to local government, CBOs, stakeholders	**event**	**1**	**1,50,000**	**1,50,000**
Train women on improved livestock raising and fodder management	event	3	30,000	90,000
Provide goats/pigs to women	number	25	3,000	75,000
Support installation of tube wells	number	5	20,000	1,00,000
Assist women to install solar panels	number	25	20,000	5,00,000
Total				**7,65,000**

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 5: : **Implement women friendly climate adaptive livelihood activities**					
Women friendly climate adaptive livelihood activities are Implemented	Gender mainstreaming trainings to local government, CBOs, stakeholders	Participants may not be interested to learn	Integrate GESI knowledge in job descriptions of the personnel Enable the participants to articulate the long term benefits of acquiring gender integration skills	20 persons are trained % of women as participants	Number of persons trained; % of women as participants
	Train women on improved livestock raising techniques;	Risk in elite capture;	Implement clear selection criteria for participants	25 women received training and services	Number of women received training

	Assist them in fodder plantation and management				
	Support installation of tube wells	Risk in elite capture	Implement clear selection criteria for participants	5 tube wells installed	Number of HHs benefit
	Assist the target women to install solar energy panels	Risk in elite capture	Implement clear selection criteria for participants	25 women received solar panel services	Number of households benefitted % of dalits HHs benefitted

IPack 6: Promotion of gender - responsive climate adaptation plans at the local level
Drivers:

- Lack of disaggregated data on access to and control over resources (household and forest resources) and socio-economic decisions by gender resulting on marginalization of women's (particularly that of the dalit women, single women and IP s women) in participation in climate adaptation planning processes.
- Socio-cultural barriers limiting women's participation in public events, e.g., training and development discourse;
- Unequal status of women to men on land and economically valued productive assets making them vulnerable to socio-economic insecurity, dependency on men and facing domestic violence.

General descriptions

- The underrepresentation of women in the decision-making process has resulted in the exclusion of women's specific needs and capacities in climate adaptation plans and programmes.
- Increased influence of women in governance is important to identify and include gender-responsive program interventions to increase the adaptive capacity of vulnerable women.
- The IPack emphasizes on activities to empower women as change agents for themselves to get stronger to raise voice and claim services in climate adaptation through their participation in local planning processes.

Objectives:

To reduce the structural barriers faced by the women in participating in decision making processes regarding local level climate adaptation planning.

Strategies

- Increase women's leadership and participation in decision-making processes and forums to voice on their specific needs and interests;
- Capacity building of local government for gender- integrated policies, planning, and budgeting
- Capacity building of the women and locally based women-led organizations in working towards gender integration in the climate adaptation plans and programmes including budget distribution, acting as watch point for elimination of gender discrimination and domestic violence against women.
- Assist collective actions and organized claims of the target women to claim rights on land ,(public and fallow land), leased agreements , special allocation of public assets for livelihood purposes.

Incentives for participation and changing stakeholders' practices

- Consider the women's concern and convenience while setting meeting agenda and venue, and also for including them @50% in the FFS within CERP processes.

- Develop a code of conduct for meeting facilitators on gender friendly approaches, language and facilitation mode that will encourage the women as well as the government authorities, service providers to communicate in women friendly manner, encouraging fearless participation.
- Provide guidelines to all project activities for ensuring equal participation of women in capacity building activities
- Provide "child care " facilities during all training/events for the lactating mothers with children
- Provide "Social mobilization" and encourage home health checkup services by the existing Female Community Health Volunteers for the pregnant women;
- Employ female psycho social counsellors to facilitate mental health support services for those women who are under depression , even with motive for suicide.

Outputs and activities:

Outputs	Activities
IPack 6: **Gender responsive Climate Adaptation plans implemented at the local level**	• Capacity building of local government for gender-integrated cliamte resilient policies, planning, and budgeting
	• Capacity building of the women and the women-led organizations for acting on gender integration in climate adaptation plans and programmes, and • for elimination of social barriers, all gender discriminations and domestic violence against women.
	• Assist collective actions of the target women to claim rights on land ,(public and fallow land), leased agreements , special allocation of public assets for livelihood purposes.

Budget Plan:

Ipack 6: Gender responsive Climate Adaptation plans implemented at the local level				
Train the local government for gender- integrated climate resilient policies, planning, and budgeting	Event	1	1,00,000	1,00,000
Training /workshop for the women and the women-led organizations on gender integration in CCA plans and elimination of social barriers, discriminations and domestic violence against women	Event	3	1,00,000	3,00,000
Assist dialogues (collective actions) of the target women to claim rights on land ,(public and fallow land), leased agreements , special allocation of public assets	event	4	25,000	1,00,000
Total				**5,00,000**

Feasibility analysis

Gender responsive Climate Adaptation plans implemented at the local level	Capacity building of local government for gender-integrated climate resilient policies, planning, and budgeting	Willingness of participants to participate in training events	Communicate with the potential participants prior to the training to explain the learning benefits	20 participants attended the training	Number of targeted participants % of women
	Capacity building of the women, women-led organizations on gender integration in climate adaptation plans; Elimination of social barriers, all gender discriminations and VAW	More than the expected number of participants request for participation The deprived women might be excluded from the event	Well-designed participant's selection criteria to ensure the right participants Take special care to inform the deprived groups of women about the events on time	50 women have reached by the event; At least the key gender discriminatory social barriers (e.g., dowry, early marriage, domestic violence etc.) identified to eliminate	Number of women reporting on participation Number of social barriers prioritized by the women to eliminate
	Assist women to claim rights on land ,(public and fallow land), leased agreements , special allocation of public assets	Some of the women might be hesitant to join this advocacy Lack of suitable land for leasing	Inform the women about the existing affirmative policies of GoN for deprived women to access resources through special arrangements; Collaboration with local government for allocating suitable land on lease to women for productive purpose. Make MoU to build trust between the women and Rural Municipality	2 events held to establish dialogues between the women and the Rural Municipality	Number of dialogues Undertaken by the women Number of women with access to leased land % of Dalit women Number of MoUs done between the women and the Municipality

Ipack 7: 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.

1. General information of Intervention Package (Ipack)

IPack 5: Advocacy campaign: Gender-inclusive governance for SNRM and Resilience	Lack of gender integration in SNRM, CCA, and DRR planning and implementation process	The underrepresentation of women in the decision-making process has resulted in the exclusion of women's	• Increase awareness of gender equality and promote women's empowerment.	• Raise awareness about gender issues and the advantages on gender equality for sustainable socio-economic development	• Increase women capacities, leadership and agency, • Include transformative gender activities at community level,

		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.	• 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	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.	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.

2. Outputs and activities

Intervention packages	Outputs	Activities and sub activities
IPack3: 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**	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) i. Prepare and disseminate short videos on gender and governance, SNRM, and climate resilience in the river system. i. Prepare community radio programs and short messages, PSA (public service announcement), radio jingles on gender and governance, SNRM, and resilient by utilizing local radio. i. 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. *v*. 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	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.
		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.
		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) i. Prepare and disseminate short videos on gender and governance, SNRM, and climate resilience in the river system. i. Prepare community radio programs and short messages, PSA (public service announcement), radio jingles on gender and governance, SNRM, and resilient by utilizing local radio. i. 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. k. Engage males, especially stakeholders of the river system, and involvement in advocating gender	Social norms and values restricting women to participate and give time for informal learning and sharing platforms. Women and youth lack access and resources about local level policies making them vulnerable. Lack of resources Inadequate interest and motivation of concerned institutions.	Identification of social and structural barriers faced by women through sensitization measures Awareness and sharing of policies. Ensure availability of resources. Raise awareness about long-term benefits of information dissemination. Raise awareness about long-term benefits, social prestige.	Social norms and barriers that prevent women's participation are identified. 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. 50 radio programs in local language Number of events between institutions and women groups/ CBOs. 3 drama and event conduct in the river system.

	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.	Less priority		4 events conduct in the river system. 50 % of male participation engaged. Frequency of male involvement in gender and women's issues and concerns.
Integrated gender in local planning processes in SNRM and climate resilience	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.	Inadequate budget	Explore budget availability.	Assessment reports. 2 Best practices collected.
	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.	Gender is not a priority.	Raise awareness about long-term benefits after participating in gender workshops/ workshops.	1 trainings conducted.

	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.	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) k. Prepare and disseminate short videos on gender and governance, SNRM, and climate resilience in the river system. i. Prepare community radio programs and short messages, PSA (public service announcement), radio jingles on gender and governance, SNRM,	• Social changes not acceptable by some men and women of the society and IPs not inclusive	• Promotion of women, IPs, Dalit and marginalized groups • Advocating GESI and women's issues among male and inform on transformative change and recognizing women's voice for change, reduce GBV • Awareness promotion on gender responsive information and ensure to make	• 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 resources increased • % of male engagement in GESI and women's issues help change the social norms and values	• At least 30% of Grassroots level women, IPs, Dalits and marginalized empowered • Gender responsive information and availability access made easy • Male involvement increased in advocacy of GESI and women's

	and resilient by utilizing local radio. i. 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. i. 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.	• 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	available to all		issues and minimized social disparities
	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	• Change in gender roles not easily accepted posing threats to social norms and values	• Conduct GESI trainings and awareness campaigns and policy reviews to strengthen the GESI initiatives	• 50% men and women know about the GESI policy and integration strategies	• Province and local level policy reviewed

	community and indigenous knowledge collection packages- compendium development				
	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.	• Gendered governance restricting women to participate. • Women participation in NRM sectors can pose threat to social change	• Document of good and best practices in gendered governance that has minimized social discriminati on and women empowered reducing GBV as well	• Gendered governance best practices documented, and learning shared for social change	• Best practices in gendered governanc e document ed 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.	Women not being empowered could hinder their participation. Leadership discrimination among women and elite captures GESI not prioritized. Inclusive transparency and practices limited and not prioritized	Rapid assessment on women's contribution and involvement in NRM/CRLUP and management to be conducted and shared for minimizing social barriers. Trainings to be provided to mainstream 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	% of women's contribution and involvement analyzed and further plans developed % of understanding level and mainstreaming of GESI well adopted % Of local institutions practice GESI focused social audits and public hearing for social and strong governance practice	Rapid assessment conducted. GESI mainstreaming training and workshops raised awareness. GESI focused social audit and public hearing conducted regularly

6. Budget:

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**

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	3	3	3	2	3	14

	climate-resilient land use practices.						
Ipack 5 **Advocacy campaign: Gender-inclusive governance**	Output 5: Integrated Gender inclusive governance ensured in Natural resource management and increased access of women to NRM/ CRLUP and management knowledge and information.	2	3	1	1	3	10

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 forest biomass:171.62 ton/ha Total other wooded land biomass: 17.45 ton/ha	Forest density increased by 2%	baseline survey report Endline survey report	This River system has 4157 ha of forest area and 457 ha other wooded land (Baseline survey report 2022)
	Area (in ha.) of natural forest restored through ANR and enrichment plantation	0	Atleast 457 ha of natural forest restored through ANR and enrichment plantation	PPMU/DFO records Maps Reports	CBOs adopt climate resilient land use practices During baseline, degraded forest (other wooded land) area is 457 ha.
	xx forestry user groups manage xx has of forest through updated forest management plan	0 forestry user groups manage 0 ha. of forest	Atleast 10 forest user groups manage 1363 ha. of forest through updated	DFO/Group/PPMU records Progress report	Community based forestry groups implement renewed forest management

			forest management plan		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: 588 ha. Survival rate: 80%	Municipal /DFO/PPMU records Progress Report	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	cubic meter of soil volume per unit area (NA)	25% in comparison to before constructing structures	In-person assessments at lower gabions.	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 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	Assessment report Progress report PMU/PPMU records	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. Advocacy campaign: Gender-inclusive governance	% of women in leadership positions of CBO's executive committee	46 out of 97 (47.4%) women are in leadership positions	At least 50% women in leadership position	DFO/Group/PPMU records	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	Proportional representation of all social groups ensured
	Integrate gender in local planning processes in NRM/ CRLUP and management		No. of Gender sensitive plan (to be decided)	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-1 Result Framework of Khado Critical Ecosystem Restoration Plan

Vision: Climate resilient and sustainably managed Natural Resources and communities in Khado 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 (proxi indicator 2 to 5)*	Tonnes of carbon dioxide equivalent (tCO_2eq) reduced or avoided. **Proxy indicator**: Area of (1) Deforestation rate: (2) Sustainable forest management area: (3) ANR area (4) Plantation area (5) Area of Climate Resilient Agriculture (CRA)	**Proxy indicators:** Deforestation rate: -0.48% Sustainable forest management area: 0 ha ANR: 0 ha Plantation area: 0 ha Climate Resilient Agriculture: 0 ha	**Proxy indicator**: Deforestation rate: 0 Sustainable forest management area: 1363 ha Plantation area: 588 ha ANR: 457ha Climate Resilient Agriculture: 1934 ha	PPMUs/PMU report GCF/BRCRN GHG mitigation calculation tool-based calculation sheet	Total natural forest area in this river system include 4157.4 ha forest and 456.7 ha other wooded land (Baseline survey report 2022) CERP land use data shows changes in forest area between 2000 and 2019 shows 0.48% deforestation rate.
GCF core indicator (Adaptation)	Total number of direct and indirect beneficiaries (gender disaggregated)	0	Direct (male: 4890, female: 4953)	Periodic reports PPMU records	CBOs adopt climate-resilient land use practices. 1872 HHs associated with 10 CFUGs with 9843 population (4890 male and 4953 female) 1363 ha of forest managed by 10 CFUGs

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		1363 ha of forest ecosystems sustainably managed Atleast 457 ha natural forests restored through assisted regeneration 588 ha of new planted forests established	Maps/remote sensing Project reports PPMU records	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	4890 men 4953 women 9843 total	PMU/PPMU record Progress report	Beneficiaries are interested in adopting climate resilient land use practices. 1872 HHs associated with 10 CFUGs with 9843 population (4890 male and 4953 female)
Outputs					
Output1 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 forest biomass:171.62 ton/ha Total other wooded land biomass: 17.45 ton/ha	Forest density increased by 2%	~~Periodic assessment report (~~baseline survey report ~~,~~ eEndline survey report ~~)~~	This River system has ~~about~~ 415743 ha of forest area and 457 ha other wooded land (Baseline survey report 2022)
	Area (in ha.) of natural forest restored through ANR and enrichment plantation	0	Atleast 457 ha of natural forest restored through ANR and enrichment plantation	PPMU/DFO records Maps Reports	CBOs adopt climate resilient land use practices During baseline, degraded forest (other

					wooded land) area is 457 ha.
	xx forestry user groups manage xx has of forest through updated forest management plan	0 forestry user groups manage 0 ha. of forest	Atleast 1021 forest user groups manage 1363 ha. 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: 588 ha. Survival rate: 80%	Municipal /DFO/PPMU record	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.	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	0	At least 80% of the farmers involved in project trainings report that they have begun to apply project-promoted climate-	Assessment report Progress report PMU/PPMU records	The final selection of practices to be promoted at each specific training site are highly relevant to targeted farmers' cropping

	respective trainings.		resilient land use practices in the season following their training		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. **Advocacy campaign: Gender-inclusive governance**	% of women in leadership positions of CBO's executive committee	46 out of 97 (47.4%) women are in leadership positions	At least 50% women in ~~key~~ leadership position	DFO/Group/PPMU records	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	Proportional representation of all social groups ensured
	Integrate gender in local planning processes in NRM/ CRLUP and management		Atleast 10 no. of Gender sensitive plan (to be decided)	PPMU record Progress report ~~plan~~	Gender dimensions ensured in climate resilient plan including forest management operational plan of groups

Activities:

Activities	Description	Sub-activities	Remarks
Output1 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 (21 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) 1.10 Development of Community Based Forest Fire Fighting Groups (CB-FFFG) 1.11 Provide skilled-based training capacity for CBFFFGs on forest fighter trainings-forest fire control and management for (21*3) =63 persons-firefighter trainings) for CFUGs/LFUGs 1.12 Provide 1-day orientation trainings for Herders on importance of forest services and management (500 herders/livestock) 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 1.13 Coaching on forest operational plan for forest users (21 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(500 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 side 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		3.1.1Landslide treatments 3.1.2Gully stabilization in torrent stream (17 torrents) 3.1.3Construction of conservation pond 3.1.4Improvement of existing pond 3.1.5 Wetland improvement 3.1.6 Construction of water harvesting structures (dams) 3.1.7 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 (21events); 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 (6 AFG)		4.2.1Training for agroforestry groups on sustainability, principle of administration and management-3 days residential 4.2.2 Training on improved AF practices (promotion for small enterprises for the production)-5 days residential 4.2.3 Providing capacity building for government officers on the promotion of agroforestry system-3days residential 4.2.4 Support on production and dissemination of success stories AF system replication	
Activity 4.3 Established five FFSs and increased farmers' ability in seed production.		4.3.1 Establish 5 FFSs 4.3.2 Capacity building on livestock management practices-sheds improvements crop depredation by wildlife 4.3.3 Support to farmers for seed production (rice & wheat) through FFS approach 4.3.4 Support for the conservation of water source and improvement of irrigation facilities using the technology of sub-surface water harvesting (SCWs) chambers	
Activity 4.4: Enhanced farmers' capacity in climate resilient 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, 4.4.3 Support to link the farmers with the local market centers and know the market information;	
Activity 4.5: Increased coping strategies for wildlife threats in crops		4.5.1 Sensitization orientation on wildlife threats and risk reduction in agriculture	
1. Maximize women participation in climate adaptation actions			
5.1 Increased participation of women in climate adaptation actions		5.1.1 Orient the project staff to implement GESI guidelines to ensure participation by the marginalized women 5.1.2 Provide the Dalit women access to improved livestock and fodder management services to enable them to stop firewood selling for livelihood 5.1.3 Assist the Majhi women on pond based fisheries 5.1.4 Rehabilitate drinking water sources as per women's choices for location	

		5.1.5 Conduct social mobilization to eliminate the structural barriers against women's active participation in climate adaptation processes.	
5.2 Integrated gender in local planning processes in NRM/ CRLUP and management		5.2.1 Conduct rapid assessment on women's contribution and involvement in NRM/ CRLUP and management. 5.2.2 Provide gender mainstreaming trainings/ workshops to local government and CBOs and concerned stakeholders. 5.2.3 Conduct GESI focused social audits and public hearing. 5.2.4 Promote awareness on gender responsive information, available provisions and resources among CBOs/ women groups. 5.2.5 Engage male involvement to advocate gender and women's issues and concern.	
2.5 **Advocacy campaign: Gender-inclusive governance**			
6.1 Increased access of women to NRM/ CRLUP and management knowledge and information.		6.1.1Create 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

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	Fencing as Assisted Natual Regeneration	Agnisar Krishna Savaran Rural Municipality-2	26.63896	86.75530	M215	1.5	Length (Km)
2	Fencing as Assisted Natual Regeneration	Rupani Rural Municipality-6	26.64062	86.74581	M214	1.6	Length (Km)
3	Fencing as Assisted Natual Regeneration	Shambhunath Municipality-2	26.65209	86.72820	M213	3.0	Length (Km)
4	Fencing as Assisted Natual Regeneration	Shambhunath Municipality-2	26.65483	86.71513	M212	2.8	Length (Km)
5	Fencing as Assisted Natual Regeneration	Shambhunath Municipality-7	26.66691	86.69502	M130	4.0	Length (Km)
6	Assisted Natural Regeneration	Shambhunath Municipality-7	26.66653	86.69212	M185	76.2	Area (Ha)
7	Assisted Natural Regeneration	Shambhunath Municipality-7	26.65908	86.70146	M175	1.0	Area (Ha)
8	Assisted Natural Regeneration	Rupani Rural Municipality-6	26.63477	86.73310	M92	5.5	Area (Ha)
9	Assisted Natural Regeneration	Rupani Rural Municipality-6	26.64121	86.74741	M118	8.4	Area (Ha)
10	Assisted Natural Regeneration	Rupani Rural Municipality-6	26.64136	86.74387	M120	16.7	Area (Ha)
11	Assisted Natural Regeneration	Rupani Rural Municipality-6	26.63884	86.75321	M108	13.9	Area (Ha)
12	Assisted Natural Regeneration	Shambhunath Municipality-2	26.64169	86.73969	M122	20.8	Area (Ha)
13	Assisted Natural Regeneration	Rupani Rural Municipality-6	26.64042	86.74976	M114	11.9	Area (Ha)
14	Assisted Natural Regeneration	Shambhunath Municipality-7	26.66466	86.69859	M181	21.1	Area (Ha)
15	Assisted Natural Regeneration	Shambhunath Municipality-7	26.66597	86.70366	M183	38.0	Area (Ha)
16	Assisted Natural Regeneration	Shambhunath Municipality-7	26.65571	86.71108	M168	47.4	Area (Ha)
17	Assisted Natural Regeneration	Shambhunath Municipality-2	26.65266	86.72488	M161	53.6	Area (Ha)
18	Assisted Natural Regeneration	Shambhunath Municipality-2	26.65681	86.73068	M170	42.9	Area (Ha)
19	Assisted Natural Regeneration	Rupani Rural Municipality-6	26.65020	86.74473	M154	37.5	Area (Ha)
20	Assisted Natural Regeneration	Agnisair Krishna Savaran Rural Municipality-2	26.63662	86.75938	M99	1.8	Area (Ha)
21	Assisted Natural Regeneration	Agnisair Krishna Savaran Rural Municipality-2	26.64329	86.75778	M127	29.7	Area (Ha)
22	Assisted Natural Regeneration	Agnisair Krishna Savaran Rural Municipality-2	26.64090	86.76649	M117	31.0	Area (Ha)

23	Assisted Natural Regeneration	Shambhunath Municipality-7	26.65509	86.70078	M166	27.8	Area (Ha)
24	Policy advocacy and capacity buildings on monitoring Mechanism	Rajbiraj Municipality-15	26.51257	86.78381	M208	1.0	Number
25	Establishment of forest nursery	Rajbiraj Municipality-13	26.49547	86.77447	M17	1.0	Number
26	Establishment of forest nursery	Rajbiraj Municipality-15	26.50924	86.78629	M20	1.0	Number
27	Establishment of forest nursery	Rajbiraj Municipality-10	26.57945	86.76890	M37	1.0	Number
28	Establishment of forest nursery	Rupani Rural Municipality-6	26.59202	86.75629	M44	1.0	Number
29	Establishment of forest nursery	Rupani Rural Municipality-1	26.62037	86.72179	M65	1.0	Number
30	Establishment of forest nursery	Shambhunath Municipality-7	26.65366	86.70370	M163	1.0	Number
31	Establishment of FFS on Paddy, Wheat	Chhinnamasta Rural Municipality-4	26.45769	86.75180	A1	1.0	Number
32	Establishment of FFS on Wheat, Paddy	Tilathi Koiladi Rural Municipality-2	26.47813	86.77021	A10	1.0	Number
33	Establishment of FFS on Vegetable	Rajbiraj Municipality-13	26.49345	86.77882	A15	1.0	Number
34	Establishment of FFS on Paddy	Rajbiraj Municipality-15	26.51387	86.79120	A21	1.0	Number
35	Establishment of FFS on Watermelon	Tilathi Koiladi Rural Municipality-8	26.52443	86.79311	A25	1.0	Number
36	Establishment of FFS on Paddy	Rupani Rural Municipality-5	26.58239	86.74378	A38	1.0	Number
37	Establishment of FFS on Potato	Agnisair Krishna Savaran Rural Municipality-2	26.61256	86.76544	A58	1.0	Number
38	Establishment of FFS on Vegetable	Rupani Rural Municipality-1	26.63155	86.71998	A83	1.0	Number
39	Establishment of FFS on Mango	Agnisair Krishna Savaran Rural Municipality-2	26.63281	86.75628	A86	1.0	Number
40	Establishment of FFS on Parwar	Agnisair Krishna Savaran Rural Municipality-2	26.63626	86.75596	A97	1.0	Number
41	Establishment of FFS on Wheat	Rupani Rural Municipality-6	26.63638	86.74286	A98	1.0	Number
42	Establishment of FFS on Wheat	Shambhunath Municipality-2	26.64626	86.70983	A138	1.0	Number
43	Establishment of agroforestry nursery	Tilathi Koiladi Rural Municipality-1	26.46292	86.77917	A207	1.0	Number
44	Establishment of agroforestry nursery	Mahadeva Rural Municipality-1	26.57501	86.78287	A209	1.0	Number
45	Establishment of agroforestry nursery	Shambhunath Municipality-1	26.63392	86.70676	A211	1.0	Number
46	Construction of conservation ponds	Rupani Rural Municipality-6	26.58831	86.75761	A40	1.0	Number
47	Construction of conservation ponds	Agnisair Krishna Savaran Rural Municipality-2	26.62533	86.77138	A75	1.0	Number
48	Pond Improvement	Rupani Rural Municipality-6	26.62789	86.73882	A77	1.0	Number
49	Construction of conservation ponds	Rupani Rural Municipality-6	26.63314	86.74745	A88	1.0	Number
50	Pond Improvement	Agnisair Krishna Savaran Rural Municipality-2	26.63394	86.76612	A90	1.0	Number
51	Construction of conservation ponds	Rupani Rural Municipality-6	26.63491	86.73348	A93	1.0	Number
52	Pond Improvement	Rupani Rural Municipality-6	26.63804	86.74031	A105	1.0	Number

53	Construction of conservation ponds	Rupani Rural Municipality-6	26.64017	86.74764	A112	1.0	Number
54	Pond Improvement	Rupani Rural Municipality-6	26.64168	86.73809	A121	1.0	Number
55	Construction of conservation ponds	Shambhunath Municipality-2	26.64408	86.72777	A131	1.0	Number
56	Construction of conservation ponds	Shambhunath Municipality-7	26.65311	86.70294	A162	1.0	Number
57	Water harvesting structure (Dam)	Rupani Rural Municipality-6	26.65250	86.74907	A216	1.0	Number
58	Water harvesting structure (Dam)	Shambhunath Municipality-7	26.66301	86.69619	A217	1.0	Number
59	Wetland protection	Agnisair Krishna Savaran Rural Municipality-2	26.62779	86.76053	A210	1.4	
60	Riverbank stabilization with bio-engineering structures	Rajbiraj Municipality-13	26.48547	86.77258	A14	1.2	Length (Km)
61	Riverbank stabilization with bio-engineering structures	Rajbiraj Municipality-15	26.51674	86.78294	A22	1.0	Length (Km)
62	Riverbank stabilization with bio-engineering structures	Rajbiraj Municipality-15	26.51726	86.78401	A23	1.4	Length (Km)
63	Riverbank stabilization with bio-engineering structures	Rupani Rural Municipality-6	26.61194	86.73042	A57	1.9	Length (Km)
64	Riverbank stabilization with bio-engineering structures	Rupani Rural Municipality-1	26.61335	86.72662	A60	1.7	Length (Km)
65	Riverbank stabilization with bio-engineering structures	Rupani Rural Municipality-6	26.62134	86.73355	A67	0.2	Length (Km)
66	Riverbank stabilization with bio-engineering structures	Shambhunath Municipality-2	26.63304	86.72955	A85	0.6	Length (Km)
67	Riverbank stabilization with bio-engineering structures	Shambhunath Municipality-2	26.63538	86.73280	A94	0.2	Length (Km)
68	Riverbank stabilization with bio-engineering structures	Rupani Rural Municipality-6	26.63655	86.73446	A100	0.4	Length (Km)
69	Riverbank stabilization with bio-engineering structures	Shambhunath Municipality-2	26.63912	86.73654	A109	0.2	Length (Km)
70	Riverbank stabilization with bio-engineering structures	Shambhunath Municipality-1	26.63927	86.70730	A111	0.7	Length (Km)
71	Riverbank stabilization with bio-engineering structures	Rupani Rural Municipality-6	26.64009	86.73734	A113	0.3	Length (Km)
72	Riverbank stabilization with bio-engineering structures	Shambhunath Municipality-2	26.64167	86.73613	A123	0.3	Length (Km)
73	Riverbank stabilization with bio-engineering structures	Rupani Rural Municipality-6	26.64369	86.75312	M129	0.2	Length (Km)
74	Riverbank stabilization with bio-engineering structures	Shambhunath Municipality-2	26.64431	86.73797	A133	0.3	Length (Km)
75	Riverbank stabilization with bio-engineering structures	Rupani Rural Municipality-6	26.64451	86.75227	M134	0.2	Length (Km)
76	Riverbank stabilization with bio-engineering structures	Rupani Rural Municipality-6	26.64635	86.73535	A139	0.2	Length (Km)
77	Riverbank stabilization with bio-engineering structures	Rupani Rural Municipality-6	26.64722	86.75243	M141	0.2	Length (Km)
78	Riverbank stabilization with bio-engineering structures	Shambhunath Municipality-2	26.64796	86.73523	A144	0.1	Length (Km)
79	Riverbank stabilization with bio-engineering structures	Rupani Rural Municipality-6	26.64897	86.73618	A147	0.1	Length (Km)
80	Riverbank stabilization with bio-engineering structures	Rupani Rural Municipality-6	26.64951	86.75144	M151	0.3	Length (Km)

81	Riverbank stabilization with bio-engineering structures	Shambhunath Municipality-2	26.65035	86.73610	A157	0.2	Length (Km)
82	Riverbank stabilization with bio-engineering structures	Shambhunath Municipality-2	26.65100	86.73581	A158	0.1	Length (Km)
83	Riverbank stabilization with bio-engineering structures	Shambhunath Municipality-2	26.65156	86.73643	A159	0.1	Length (Km)
84	Riverbank stabilization with bio-engineering structures	Shambhunath Municipality-2	26.65436	86.70533	M165	0.5	Length (Km)
85	Riverbank stabilization with bio-engineering structures	Shambhunath Municipality-7	26.65602	86.70454	M169	0.1	Length (Km)
86	Riverbank stabilization with bio-engineering structures	Shambhunath Municipality-7	26.65680	86.70259	M171	0.3	Length (Km)
87	Riverbank stabilization with bio-engineering structures	Shambhunath Municipality-7	26.65836	86.70215	M174	0.1	Length (Km)
88	Riverbank stabilization with bio-engineering structures	Shambhunath Municipality-7	26.65900	86.69989	M176	0.2	Length (Km)
89	Promotion of agro-forestry system with riverbank stabilization	Rajbiraj Municipality-10	26.57475	86.77708	A35	9.7	Area (Ha)
90	Promotion of agro-forestry system with riverbank stabilization	Rajbiraj Municipality-10	26.57161	86.78008	A32	16.6	Area (Ha)
91	Riparian plantation	Shambhunath Municipality-7	26.65705	86.70318	A172	0.8	Area (Ha)
92	Demonstration plantation	Shambhunath Municipality-2	26.64973	86.73574	A152	0.3	Area (Ha)
93	Demonstration plantation	Shambhunath Municipality-2	26.64908	86.73517	A149	1.1	Area (Ha)
94	Community land plantation	Shambhunath Municipality-2	26.64738	86.73638	A142	3.2	Area (Ha)
95	Woodlot establishment in private land	Rupani Rural Municipality-5	26.59475	86.74293	A47	56.9	Area (Ha)
96	Woodlot establishment in private land	Shambhunath Municipality-2	26.63759	86.71449	A103	19.0	Area (Ha)
97	Promotion of agro-forestry system with riverbank stabilization	Shambhunath Municipality-1	26.63593	86.71475	A96	35.2	Area (Ha)
98	Riparian plantation	Shambhunath Municipality-7	26.65558	86.70441	A167	0.3	Area (Ha)
99	Demonstration plantation	Shambhunath Municipality-2	26.63285	86.72960	A87	0.6	Area (Ha)
100	Demonstration plantation	Rupani Rural Municipality-1	26.62848	86.72770	A78	3.2	Area (Ha)
101	Community land plantation	Shambhunath Municipality-2	26.64837	86.72248	A146	12.9	Area (Ha)
102	Community land plantation	Rupani Rural Municipality-1	26.61305	86.72392	A59	20.4	Area (Ha)
103	Community land plantation	Rajbiraj Municipality-13	26.50503	86.77886	A18	16.6	Area (Ha)
104	Community land plantation	Rajbiraj Municipality-15	26.50910	86.78336	A19	2.2	Area (Ha)
105	Community land plantation	Mahadeva Rural Municipality-2	26.53408	86.79010	A26	64.1	Area (Ha)
106	Woodlot establishment in private land	Rajbiraj Municipality-1	26.54453	86.78563	A28	20.9	Area (Ha)
107	Woodlot establishment in private land	Mahadeva Rural Municipality-1	26.55633	86.78579	A29	31.7	Area (Ha)
108	Community land plantation	Rajbiraj Municipality-10	26.57182	86.77369	A33	31.8	Area (Ha)
109	Community land plantation	Rupani Rural Municipality-6	26.60173	86.74068	A50	22.8	Area (Ha)

110	Woodlot establishment in private land	Rupani Rural Municipality-6	26.61081	86.72913	A56	55.1	Area (Ha)
111	Promotion of agro-forestry system with riverbank stabilization	Rajbiraj Municipality-10	26.55692	86.78127	A30	23.6	Area (Ha)
112	Community land plantation	Rajbiraj Municipality-13	26.49515	86.77471	A16	8.2	Area (Ha)
113	Woodlot establishment in private land	Rupani Rural Municipality-6	26.58475	86.76054	A39	58.8	Area (Ha)
114	Community land plantation	Rajbiraj Municipality-10	26.57824	86.76356	A36	6.6	Area (Ha)
115	Community land plantation	Rajbiraj Municipality-10	26.57396	86.76794	A34	4.2	Area (Ha)
116	Community land plantation	Shambhunath Municipality-2	26.64430	86.70892	A132	37.5	Area (Ha)
117	Woodlot establishment in private land	Rupani Rural Municipality-6	26.61551	86.73093	A62	9.1	Area (Ha)
118	Riparian plantation	Rupani Rural Municipality-6	26.62130	86.73303	A68	6.4	Area (Ha)
119	Woodlot establishment in private land	Rupani Rural Municipality-6	26.62866	86.73724	A79	10.1	Area (Ha)
120	Community land plantation	Rupani Rural Municipality-6	26.63477	86.74784	A91	12.8	Area (Ha)
121	Community land plantation	Rupani Rural Municipality-6	26.64329	86.75221	A126	0.7	Area (Ha)
122	Community land plantation	Rupani Rural Municipality-6	26.64328	86.74962	A125	1.3	Area (Ha)
123	Community land plantation	Rupani Rural Municipality-6	26.64493	86.75159	A136	0.5	Area (Ha)
124	Community land plantation	Rupani Rural Municipality-6	26.64687	86.75164	A140	1.3	Area (Ha)
125	Community land plantation	Rupani Rural Municipality-6	26.64819	86.75163	A145	0.8	Area (Ha)
126	Promotion of agro-forestry system with riverbank stabilization	Tilathi Koiladi Rural Municipality-1	26.45951	86.77494	A2	23.5	Area (Ha)
127	Community land plantation	Tilathi Koiladi Rural Municipality-1	26.46545	86.77654	A6	1.4	Area (Ha)
128	Promotion of agro-forestry system with riverbank stabilization	Tilathi Koiladi Rural Municipality-1	26.46756	86.77567	A7	1.7	Area (Ha)
129	Community land plantation	Tilathi Koiladi Rural Municipality-2	26.47610	86.78250	A9	5.3	Area (Ha)
130	Promotion of agro-forestry system with riverbank stabilization	Tilathi Koiladi Rural Municipality-3	26.47890	86.78509	A11	7.6	Area (Ha)
131	Community land plantation	Rajbiraj Municipality-13	26.48284	86.78063	A13	7.1	Area (Ha)
132	Promotion of agro-forestry system with riverbank stabilization	Rupani Rural Municipality-6	26.62669	86.73538	A76	3.5	Area (Ha)
133	Woodlot establishment in private land	Rupani Rural Municipality-6	26.63006	86.73941	A80	2.1	Area (Ha)
134	Woodlot establishment in private land	Rupani Rural Municipality-6	26.63194	86.74204	A84	2.2	Area (Ha)
135	Demonstration plantation	Rupani Rural Municipality-6	26.63155	86.73947	A82	1.3	Area (Ha)
136	Woodlot establishment in private land	Rupani Rural Municipality-6	26.63566	86.74579	A95	12.2	Area (Ha)
137	Community land plantation	Rupani Rural Municipality-1	26.62264	86.72494	A69	6.6	Area (Ha)
138	Demonstration plantation	Shambhunath Municipality-2	26.63826	86.72358	A106	1.5	Area (Ha)
139	Woodlot establishment in private land	Tilathi Koiladi Rural Municipality-1	26.46092	86.77200	A4	0.8	Area (Ha)

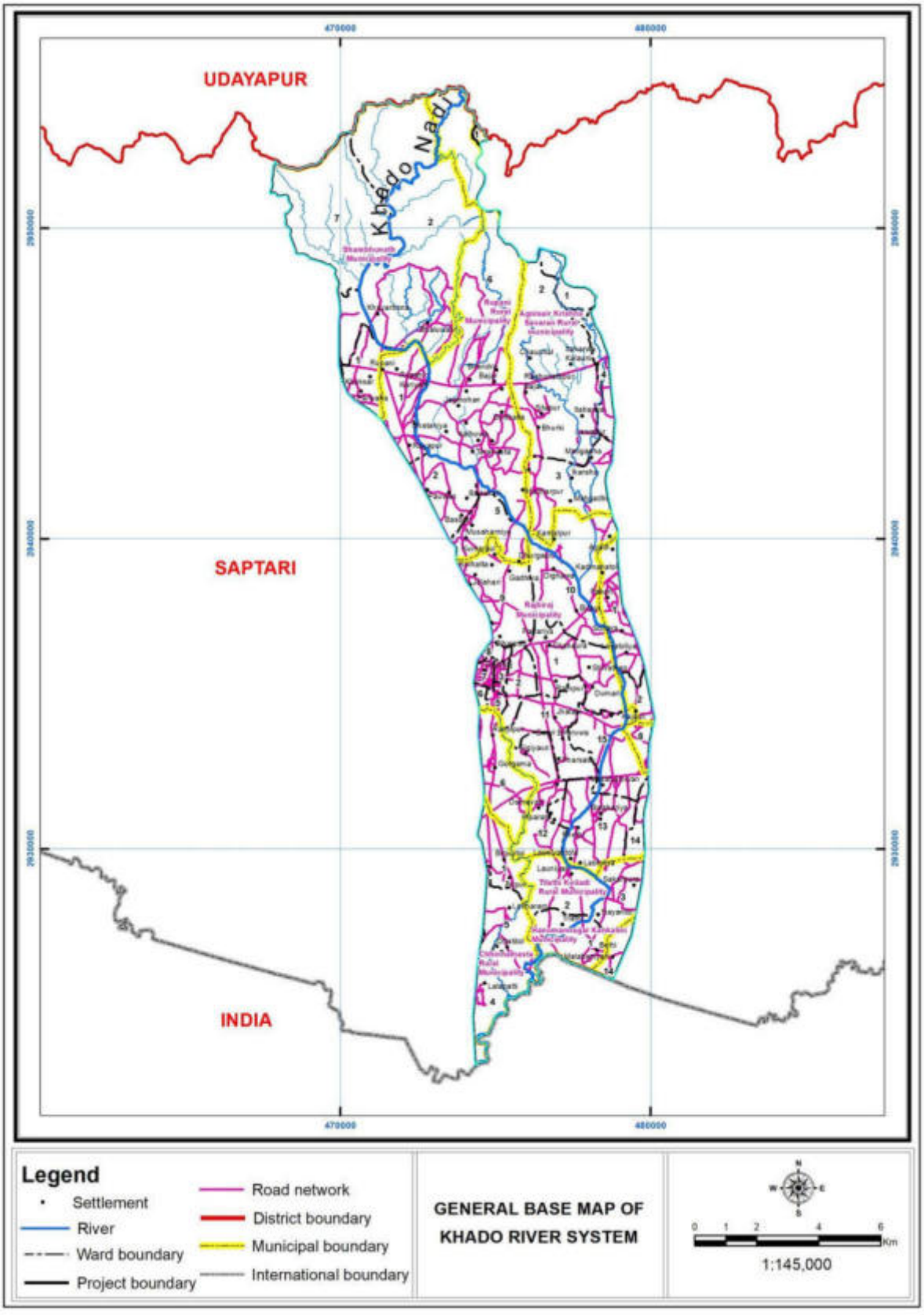
140	Woodlot establishment in private land	Tilathi Koiladi Rural Municipality-1	26.45970	86.77008	A3	0.4	Area (Ha)
141	Promotion of agro-forestry system with riverbank stabilization	Tilathi Koiladi Rural Municipality-1	26.46266	86.77154	A5	1.9	Area (Ha)
142	Woodlot establishment in private land	Agnisair Krishna Savaran Rural Municipality-3	26.59385	86.77456	A45	1.6	Area (Ha)
143	Demonstration plantation	Agnisair Krishna Savaran Rural Municipality-3	26.59409	86.77551	A46	0.6	Area (Ha)
144	Woodlot establishment in private land	Agnisair Krishna Savaran Rural Municipality-3	26.59555	86.77319	A48	0.5	Area (Ha)
145	Woodlot establishment in private land	Agnisair Krishna Savaran Rural Municipality-3	26.60041	86.77189	A49	0.5	Area (Ha)
146	Woodlot establishment in private land	Agnisair Krishna Savaran Rural Municipality-2	26.60304	86.77395	A51	1.8	Area (Ha)
147	Demonstration plantation	Agnisair Krishna Savaran Rural Municipality-2	26.60484	86.77385	A52	1.1	Area (Ha)
148	Woodlot establishment in private land	Agnisair Krishna Savaran Rural Municipality-2	26.60604	86.77395	A53	0.7	Area (Ha)
149	Woodlot establishment in private land	Agnisair Krishna Savaran Rural Municipality-2	26.61878	86.77179	A63	1.8	Area (Ha)
150	Demonstration plantation	Agnisair Krishna Savaran Rural Municipality-2	26.62072	86.77134	A66	0.4	Area (Ha)
151	Woodlot establishment in private land	Agnisair Krishna Savaran Rural Municipality-2	26.62361	86.77240	A72	0.4	Area (Ha)
152	Community land plantation	Agnisair Krishna Savaran Rural Municipality-4	26.63786	86.78040	A104	1.6	Area (Ha)
153	Community land plantation	Agnisair Krishna Savaran Rural Municipality-2	26.63350	86.77417	A89	1.4	Area (Ha)
154	Community land plantation	Agnisair Krishna Savaran Rural Municipality-4	26.63712	86.78177	A101	1.6	Area (Ha)
155	Community land plantation	Agnisair Krishna Savaran Rural Municipality-4	26.63963	86.78196	A110	1.6	Area (Ha)
156	Riparian plantation	Agnisair Krishna Savaran Rural Municipality-2	26.62315	86.78369	A70	3.0	Area (Ha)
157	Riparian plantation	Agnisair Krishna Savaran Rural Municipality-2	26.61917	86.78219	A64	0.7	Area (Ha)
158	Riparian plantation	Agnisair Krishna Savaran Rural Municipality-2	26.60963	86.78120	A55	0.9	Area (Ha)
159	Riparian plantation	Agnisair Krishna Savaran Rural Municipality-3	26.60639	86.78016	A54	1.1	Area (Ha)
160	Woodlot establishment in private land	Agnisair Krishna Savaran Rural Municipality-3	26.59131	86.77966	A43	0.3	Area (Ha)
161	Woodlot establishment in private land	Agnisair Krishna Savaran Rural Municipality-3	26.59065	86.77967	A42	0.3	Area (Ha)
162	Woodlot establishment in private land	Agnisair Krishna Savaran Rural Municipality-3	26.58979	86.77792	A41	0.6	Area (Ha)
163	Community land plantation	Tilathi Koiladi Rural Municipality-1	26.46823	86.77634	A8	0.7	Area (Ha)
164	Promotion of agro-forestry system with riverbank stabilization	Rajbiraj Municipality-15	26.51817	86.78527	A24	11.7	Area (Ha)
165	Promotion of agro-forestry system with riverbank stabilization	Rajbiraj Municipality-10	26.56467	86.77670	A31	28.8	Area (Ha)
166	Demonstration plantation	Rupani Rural Municipality-6	26.64060	86.75174	A115	1.1	Area (Ha)
167	Promotion of agro-forestry system with riverbank stabilization	Shambhunath Municipality-2	26.64314	86.70424	A124	19.6	Area (Ha)

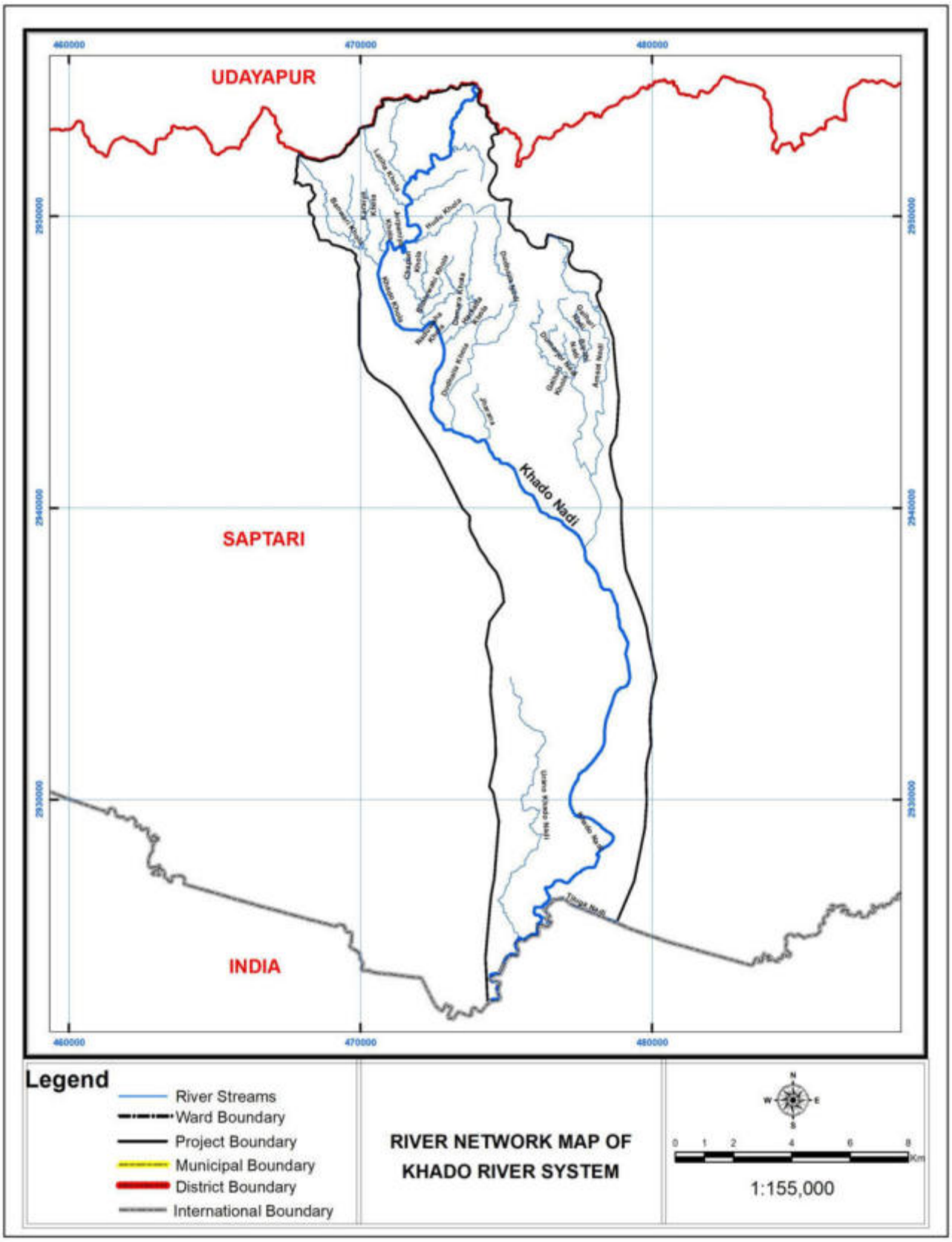
168	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Shambhunath Municipality-7, Manwari Khola	26.66505	86.69297	M182	1.0	Number
169	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Shambhunath Municipality-7, Karaiya khola	26.66698	86.69530	M189	1.0	Number
170	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Rupani Rural Municipality-6, Harkatta khola	26.63890	86.74174	M198	1.0	Number
171	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Shambhunath Municipality-7, Jurpaniya khola	26.65993	86.70581	M199	1.0	Number
172	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Shambhunath Municipality-7, Latiha khola	26.67504	86.71136	M196	1.0	Number
173	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Shambhunath Municipality-2, Khado U/S	26.68459	86.71934	M197	1.0	Number
174	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Shambhunath Municipality-2, Hudu Khola	26.66435	86.72121	M180	1.0	Number
175	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Shambhunath Municipality-2, Musaharniya khola	26.65268	86.71568	M200	1.0	Number
176	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Shambhunath Municipality-2, Chapan khola	26.65200	86.71985	M201	1.0	Number
177	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Shambhunath Municipality-2, Chituwahi khola	26.64607	86.72398	M202	1.0	Number
178	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Shambhunath Municipality-2, Bhaluwahi khola	26.65066	86.72958	M203	1.0	Number
179	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Rupani Rural Municipality-6, Damara khola	26.64948	86.73566	M119	1.0	Number
180	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Rupani Rural Municipality-6, Dudhaila Nadi	26.64667	86.75201	M156	1.0	Number
181	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Agnisair Krishna Savaran Rural Municipality-2, Dumarjor nadi	26.63893	86.75993	M204	1.0	Number
182	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Agnisair Krishna Savaran Rural Municipality-2, Gaihari Nadi	26.63625	86.77315	M205	1.0	Number
183	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Agnisair Krishna Savaran Rural Municipality-1, Amsot Nadi	26.64097	86.78078	M116	1.0	Number
184	Torrent-Gully stabilization through check dams, contour planting, stone walls etc.	Agnisair Krishna Savaran Rural Municipality-2, Biyahi Nadi	26.62802	86.76944	M206	1.0	Number
185	Climate Resilient Agriculture		26.45924	86.75560	A227	345.6	
186	Climate Resilient Agriculture		26.47609	86.77085	A228	287.5	
187	Climate Resilient Agriculture		26.49071	86.78231	A229	289.2	
188	Climate Resilient Agriculture		26.51753	86.79209	A230	103.1	
189	Climate Resilient Agriculture		26.54139	86.79101	A231	70.2	

190	Climate Resilient Agriculture		26.57530	86.74990	A232	457.1	
191	Climate Resilient Agriculture		26.61082	86.76857	A233	173.1	
192	Climate Resilient Agriculture		26.63162	86.75694	A234	22.3	
193	Climate Resilient Agriculture		26.63583	86.75590	A235	5.1	
194	Climate Resilient Agriculture		26.63424	86.73868	A236	61.9	
195	Climate Resilient Agriculture		26.63285	86.71947	A237	57.1	
196	Climate Resilient Agriculture		26.64462	86.71303	A238	61.5	

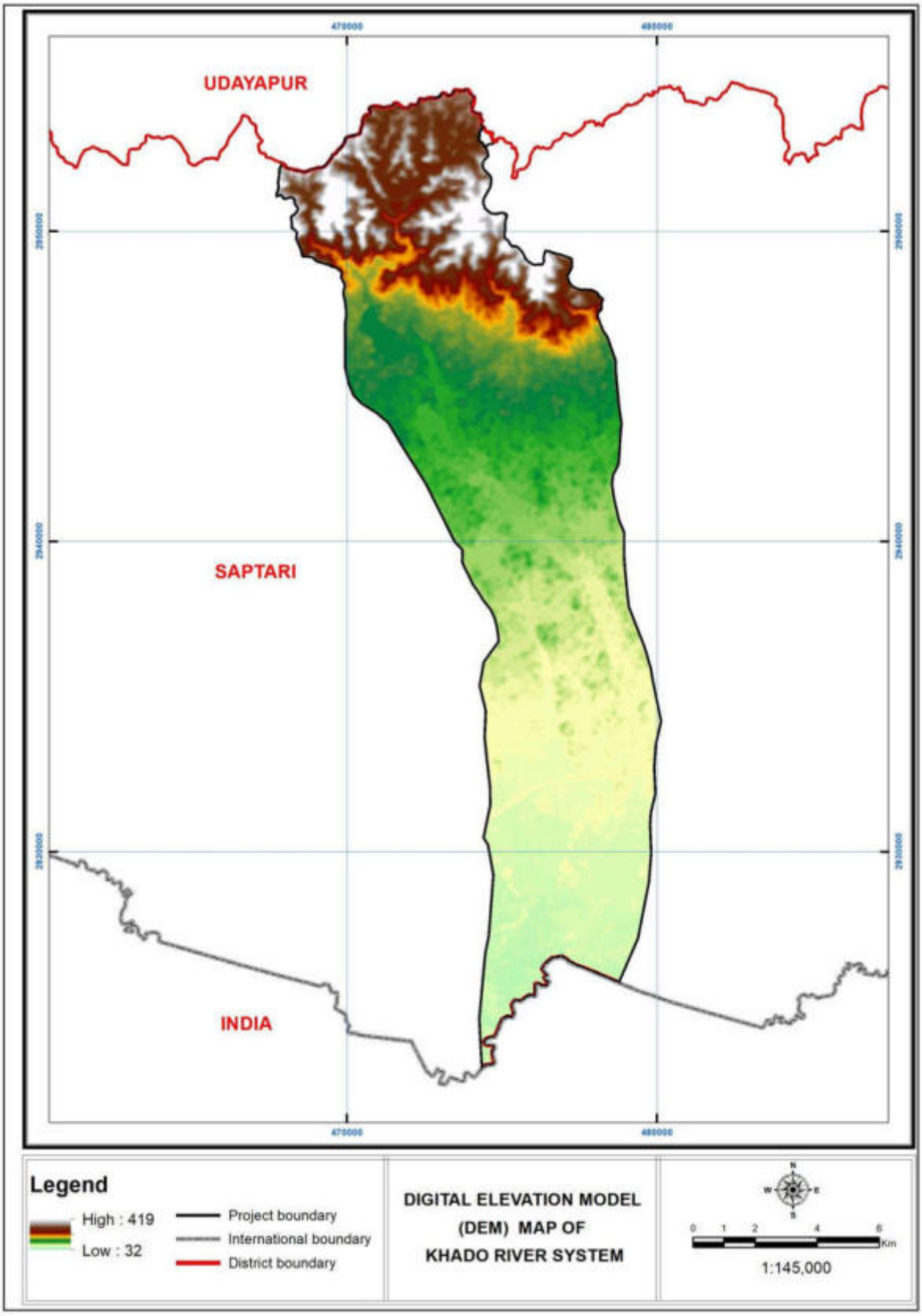
Note: Activity location and coordinates are subjected to change based on field condition before the implementation. BRCRN PPMU offices can make the necessary changes with proper documentation of field condition

Annex 3: Thematic Maps of the Khado River system

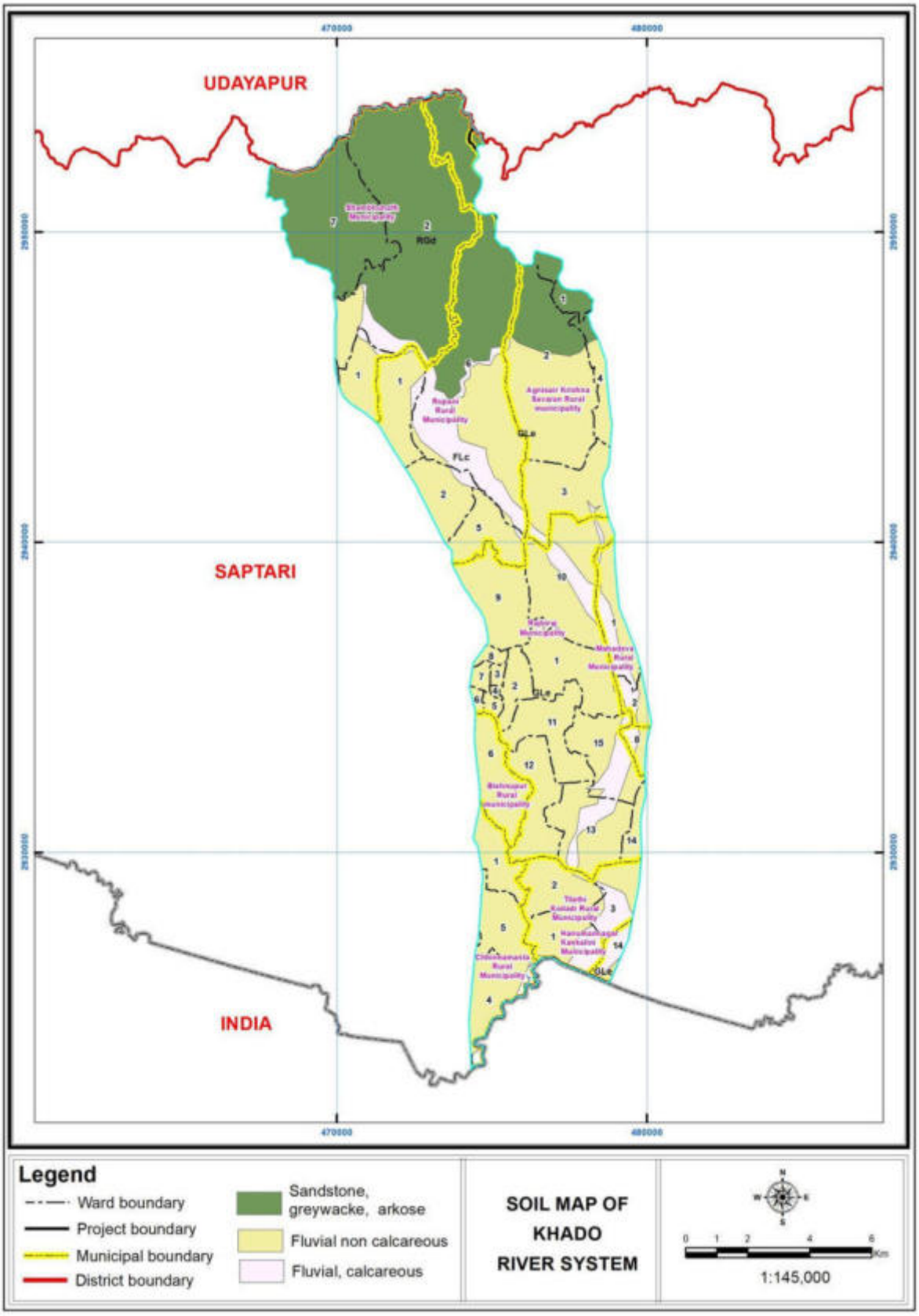




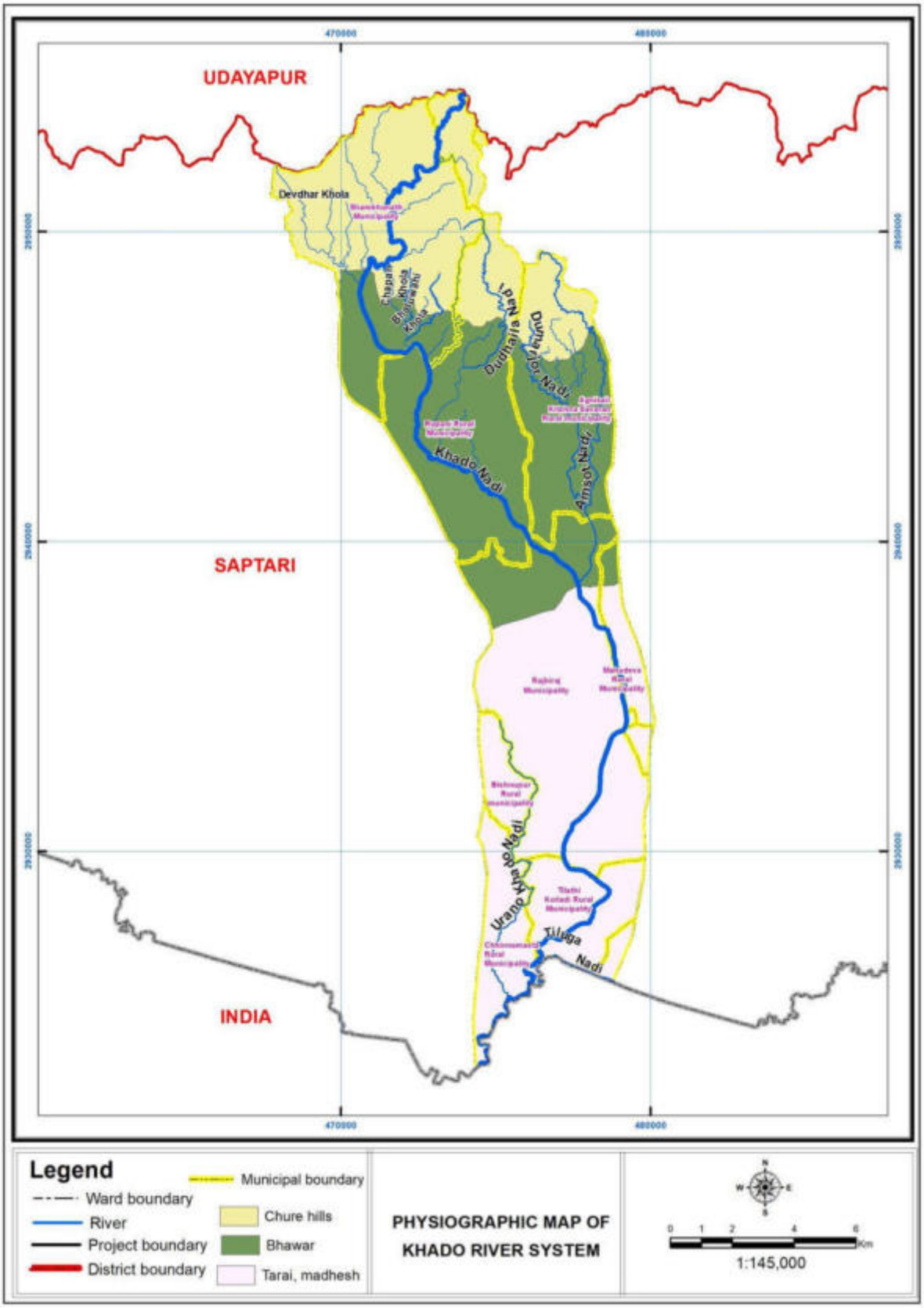
River network of Khado River system



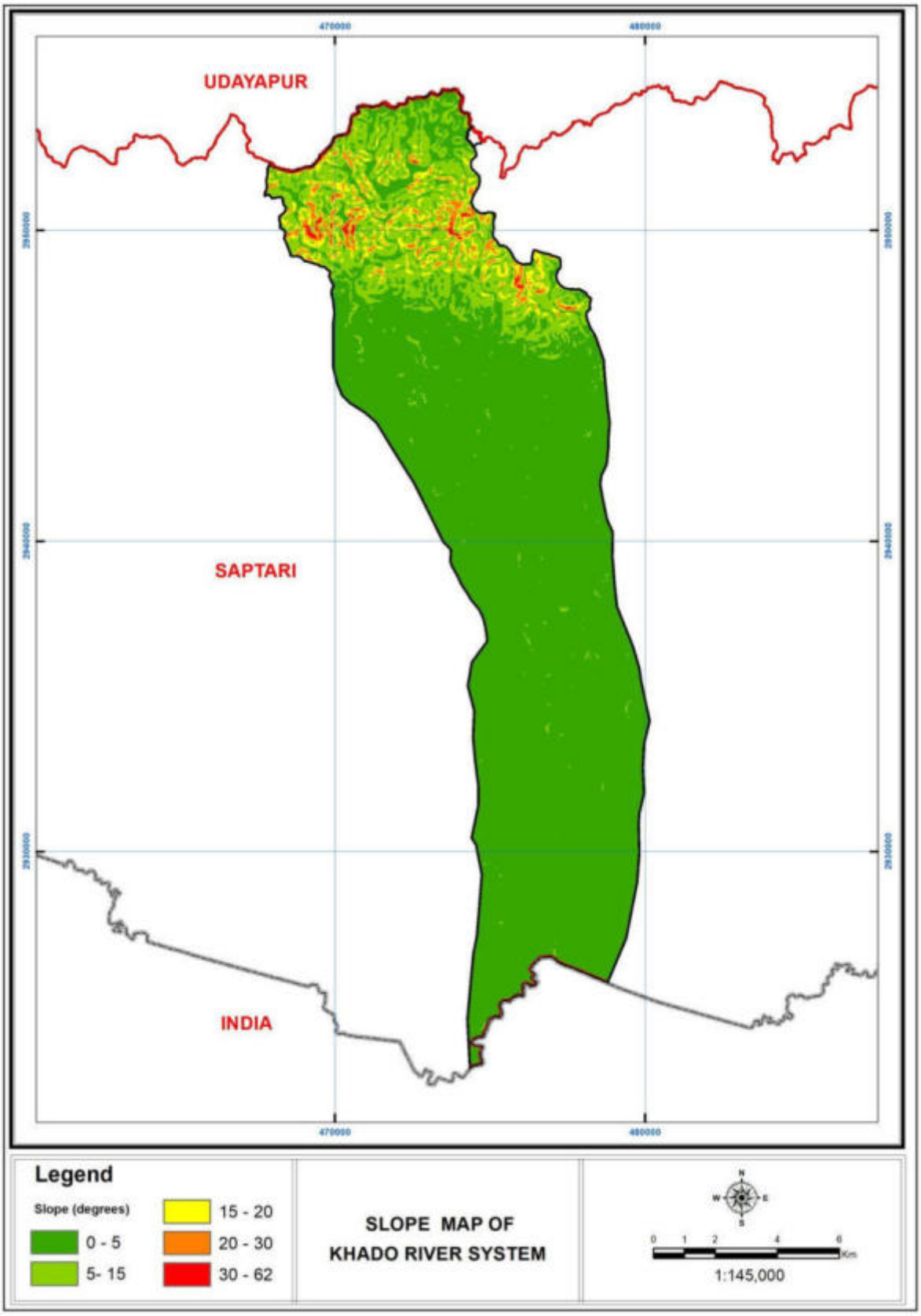
Digital Elevation Map of the Khado River system



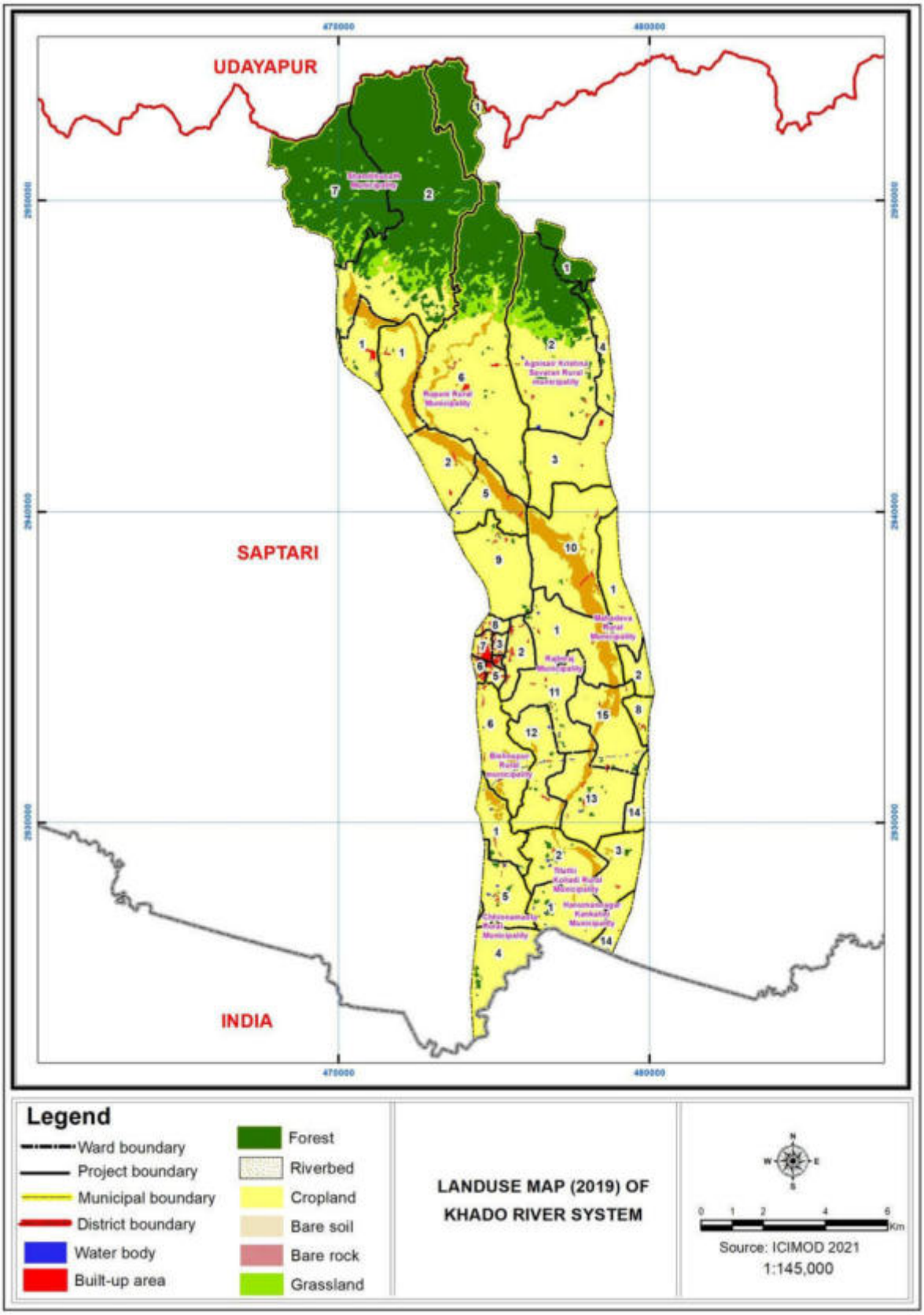
Soil Map of the Khado River system



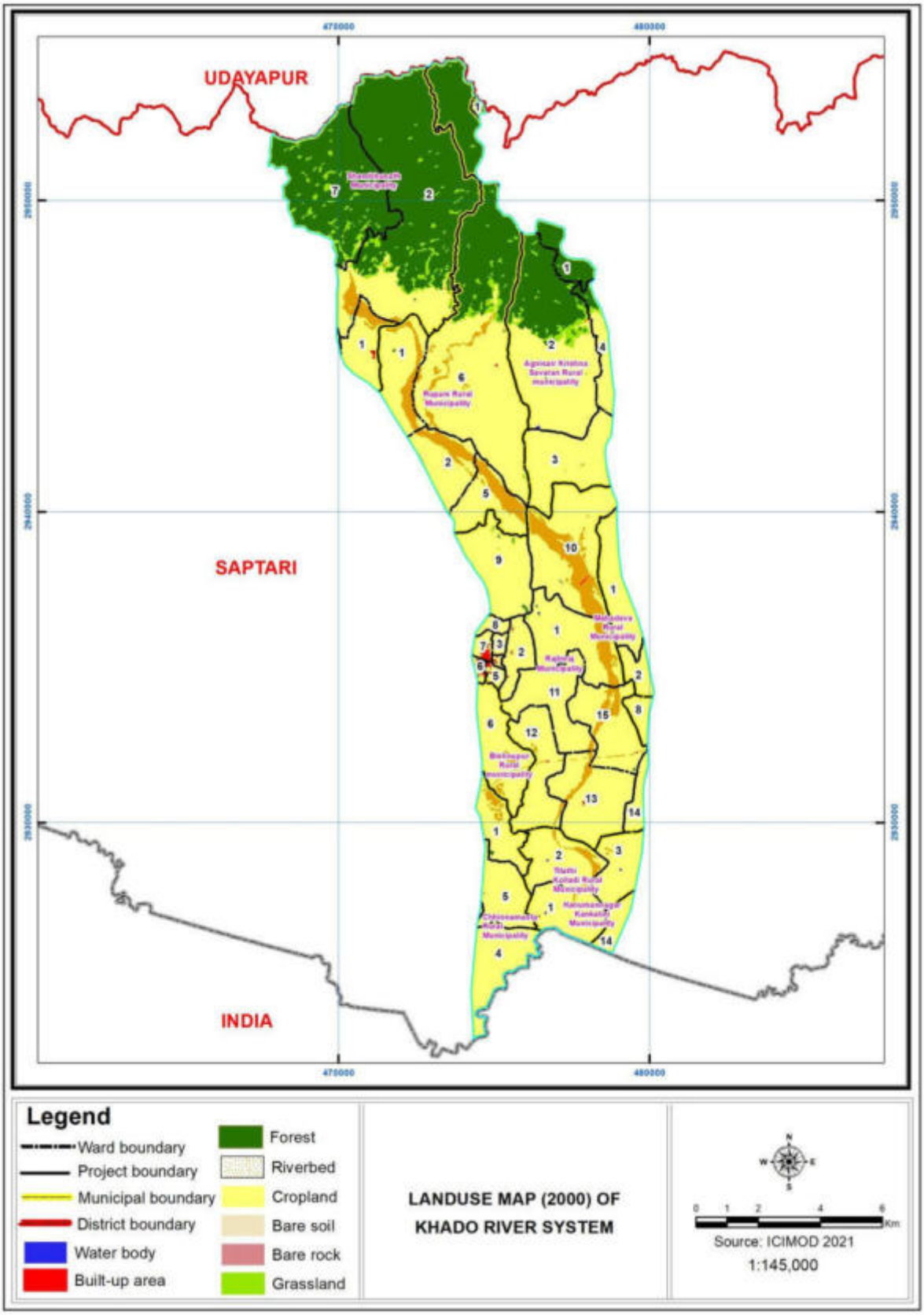
Physiographic Map of the Khado River system



Slope Map of the Khado River system



Landuse map of Khado River system (ICIMOD, 2019)



Landuse map of Khado River system (ICIMOD, 2000)

Glimpses of the field works

Local stakeholders and facilitators actively engaged in problem tree and solution tree workshops held in Rupani (upstream-downstream), Ruapani Rural Municipality-1

Local stakeholders and facilitators actively engaged in problem tree and solution tree workshops held in Musaharniyan-Rajbiraj Municipality-15 (downstream) in Khado River System

Potential for agroforestry with River bank stabilization (26.518171/86.785266) Rajbiraj Municipality-15

Potential for riversite plantation and linking with the local community-public private lands 26.544525/ 86.785633 Rajbiraj Municipality-1

Potential for River site plantation 26.556918/86.781268 Rajbiraj Municipality-10

Potential for enrichment of natural forest and plantation in River site (26.63662/86.759378) Agnisair Krishna Savaran Rural Municipality-2

Landslide with forest loss in upstream (26.643293/86.757781) and (26.638384/86.75767) Agnisair Krishna Savaran Rural Municipality-2

Hotspot of forest loss and land degradation (26.638838/86.75321) Rupani Rural Municipality-6

Potential for River bank deposition 26.640595/ 86.751742 Rupani Rural Municipality-6

Forest Loss (26.641364/86.743866) Rupani Rural Municipality-6

Potential for plantation with River bank stabilization (plantation) 26.637588/86.714485 Shambhunath Municipality-2

Potential for River site plantation 26.644301/86.708917 Shambhunath Municipality-2

Interaction with the locals in Rupani Rural Municipality-6

Users engaged in fodder collection from the nearest forest area in Rupani Rural Municipality-6

Site verification and interaction with the locals in Rupani Rural Municipality-6

Interaction with the locals in Agnisair Krishna Savaran Rural Municipality-2

Site verification and interaction with the locals Agnisair Krishna Savaran Rural Municipality-2

Site verification and the local interaction in Agnisair Krishna Savaran Rural Municipality-2

Expert Planning Interaction Workshop-interaction on Khado Rivers system-CERP-draft in Saptari

Validation workshop in Madhesh Province