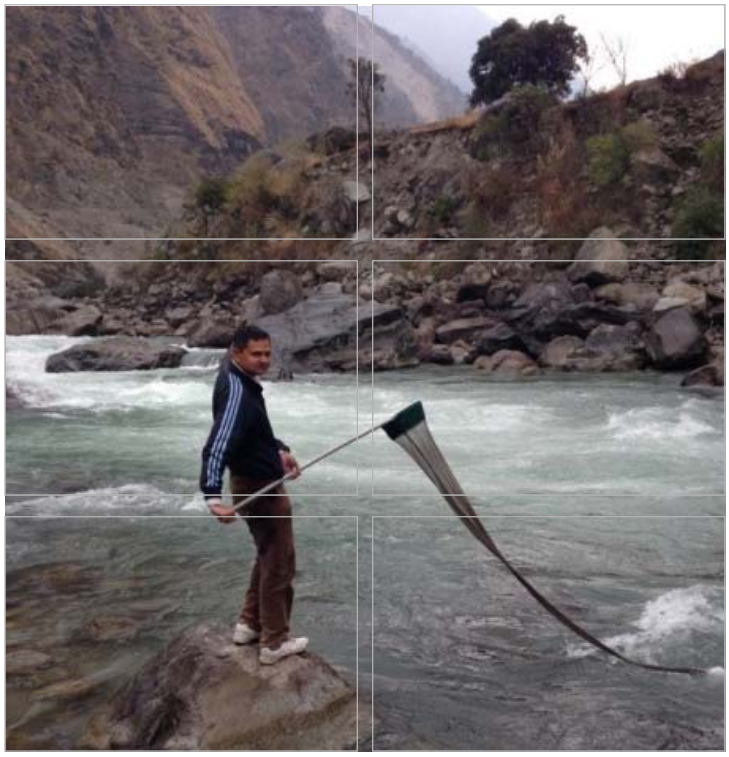

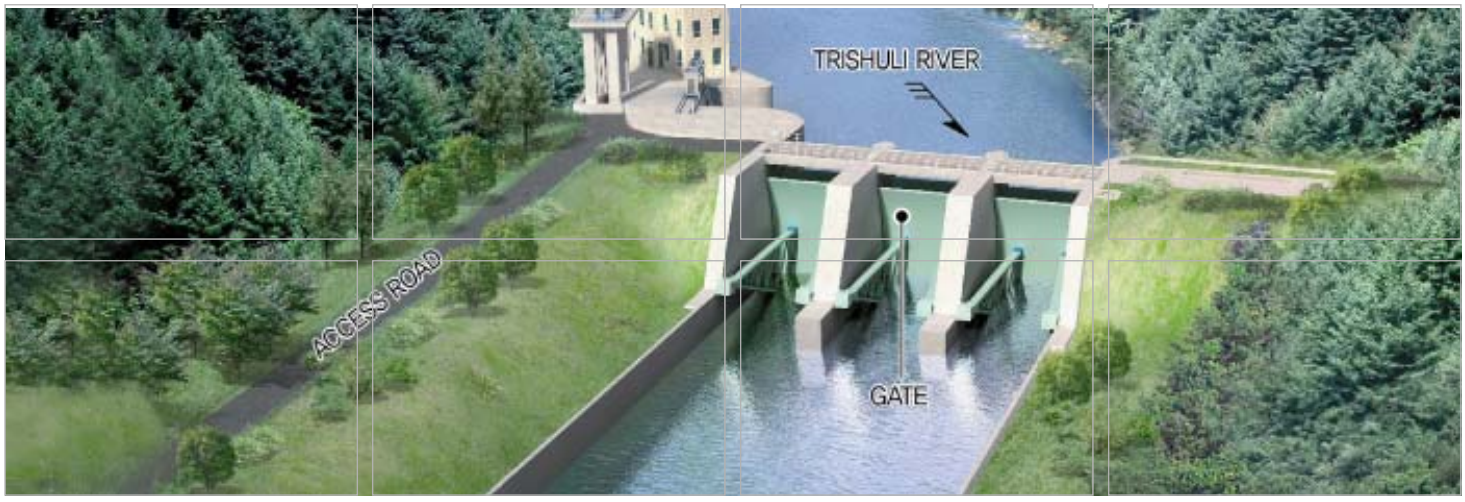

Upper Trishuli-1 Hydropower Project Updated Non-Technical ESIA Addenda

Final

Prepared for:
Nepal Water and Energy Development Company (NWEDC) and International Finance Corporation

NEPAL

March 2019

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FINAL REPORT

UPPER TRISHULI – 1 HYDROPOWER PROJECT

UPDATED NON-TECHNICAL ESIA ADDENDA

FINAL VERSION

NEPAL

March 2019

For and on behalf of:

Environmental Resources Management

Approved by: David Blaha, Partner

Signed: 

Date: 12 March 2019

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ATTACHMENTS

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ACRONYMS AND ABBREVIATIONS

ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
AJAC	Adibasi Janajati Advisory Council
BOOT	Build, Own, Operate and Transfer
CCCS	Cross-Cultural Consulting Services, PLLC
CFUG	Community Forestry User Group
CHP	Cultural Heritage Program
CIA	Cumulative Impact Assessment CTVET
CLO	Community Liaison Officers
CPA	Consent Process Agreement
CR	Critically endangered
DEG	German Investment Corporation
DFO	District Forest Office
DHI	Drawdown Hazard Index
DoED	Department of Electricity Development
DT	Distance from Tunnel
DMU	Discrete Management Units
EC	Executive Committee
EDP	Economic Development Program
EFlows	Environmental Flow
EMP	Environment Management Plans
EN	Endangered
EPC	Engineering, procurement, and construction
ESAP	Environmental and Social Action Plan
ESIA	Environmental and Social Impact Assessment
ESMC	Environmental and Social Management Cell
ESMMP	Environmental and Social Management and Monitoring Plans
ESRS	Environmental and Social Review Summary
FDI	Foreign Direct Investment
FF	Fracture Frequency
FMO	Netherlands Development Finance Company
FPIC	Free, Prior, and Informed Consent
GB	Governing Board
GIIP	Good International Industry Practice
GoN	Government of Nepal
GRM	Grievance Redress Mechanism
GWh	Giga Watt hour
HPP	Hydro-Power Project
IF	Intersection of Main Faults
IFC	International Finance Corporation
IMT	Internal Monitoring team
IPO	Indigenous Peoples Organisation
IPP	Indigenous Peoples Plan
IUCN	International Union for Conservation of Nature
Km	kilometer
m^3/s	cubic meters/second
SPS	Safeguard Policy Statement
OBOR	One Belt One Road
O&M	Operation and Maintenance
LALRP	Land Acquisition and Livelihood Restoration Plan
LNP	Langtang National Park
MC	Management Committees
MK	Rock Mass Permeability

MOE	Ministry of Energy
MW	Mega Watts
NEFIN	Nepal Federation of Indigenous Nationalities
NWEDC	Nepal Water & Energy Development Company Pvt. Ltd.
NEA	Nepal Electricity Authority
OV	Overburden
PAF	Project-Affected Families
PAP	Project-Affected Persons
PC	Program Committees
PDA	Project Development Agreement
PI	Potential of Inflow Index
PPA	power purchase agreement
PSM	Participatory Social Mapping
PZ	Plastic Zone Radius
SDP	Social Development Program
ST	Spring Type
THDP	Trishuli Hydropower Developer's Forum
TRB	Trishuli River Basin
TRBMP	Trishuli River Basin Management Plan
VEC	Valued Environmental and Social Components
WBG	The World Bank Group
WG	Working Group

1. INTRODUCTION

1.1. PROJECT STATUS

Upper Trishuli 1 ("UT-1" or the "Project") is a proposed 216 MW greenfield run-of-river hydropower project located on the Trishuli River in Nepal. The Project is being developed by a Nepalese special purpose vehicle, the Nepal Water & Energy Development Company Pvt. Ltd. ("NWEDC" or the "Company").

The project will sell power to Nepal Electricity Authority ("NEA"), the national utility, for domestic supply under a 30-year power purchase agreement ("PPA"). The project will be developed on a Build, Own, Operate and Transfer ("BOOT") basis under a 35-year concession agreement (Project Development Agreement or "PDA") with the Government of Nepal's ("GoN") Ministry of Energy ("MOE"). If constructed, UT-1 will be the largest Foreign Direct Investment ("FDI") in Nepal to date, increasing the country's domestic power supply by approximately one-third compared to today's levels and providing about 40% of its expected 1,456 GWh of annual output during the dry season, which includes the peak winter-demand months. The Project's expected commissioning date is October 2023.

The International Finance Corporation [IFC] and Multilateral Investment Guarantee Agency (MIGA) from the WBG, are supporting development of the Project. Other financial institutions considering participating in a lender's consortium include the Asian Development Bank, the Asian Infrastructure Investment Bank, and several European Development Banks, which may include DEG, FMO, and CDC Group. These various banks are collectively referred to herein as the "Lenders' Group."

The IFC conducted early disclosure of a draft updated Environmental and Social Impact Assessment (ESIA) on 23 March 2018; and after review and comments by multiple stakeholders, including the Lenders' Group, the Updated ESIA was disclosed in its final form together with the IFC's Environmental and Social Review Summary (ESRS) and Environmental and Social Action Plan (ESAP) on 30 July 2018.

1.2. PURPOSE OF THIS ADDENDA

The purpose of this Addenda is to summarize and disclose supplemental studies and activities that have been conducted on behalf of the UT-1 Project since the disclosure of the Final Updated ESIA in July 2018. It is important to note that this update identified no material deficiencies in the previously disclosed information; however it provides greater clarity and more detailed mitigation measures to address the previously identified key issues. In addition, and in accordance with the recommendations of the Final Updated ESIA and the Project's Environmental and Social Action Plan (ESAP), the IFC has provided Advisory Services interventions to supplement the Final Updated ESIA and/or to address actions that were pending at the time of the Final Updated ESIA to ensure the project could be brought to Board. Further, some of the members of the Lenders' Group have requested additional information, clarification,

or analyses to help them in documenting compliance with their own institution's environmental and social policies.

This Addenda is divided into six sections as follows:

- Section 2.0 Supplemental Administrative Framework;
- Section 3.0 Supplemental Biodiversity Information;
- Section 4.0 Indigenous Peoples Plan and Consultation;
- Section 5.0 Supplemental Groundwater Analysis;
- Section 6.0 Supplemental Cumulative Impact Assessment; and
- Section 7.0 Additional Project Requirements

2. SUPPLEMENTAL ADMINISTRATIVE FRAMEWORK

2.1. AIIB ENVIRONMENTAL AND SOCIAL FRAMEWORK

The Environmental and Social Framework (ESF) of the Asian Infrastructure Investment Bank (AIIB), approved by the AIIB's Board in February 2016, sets forth mandatory environmental and social requirements through Environmental and Social Policies (ESP) for Projects funded by the Bank. The Bank's ESF aims to achieve environmentally and socially sustainable project outcomes by integrating good international practice in to all phases of a project, from the decision making to the preparation and implementation.

As part of its vision provided in the ESF, AIIB has established the following:

- The Bank requires the integration of environmental and social sustainability in the identification, preparation and implementation of the Project, which in turns become part of its decision-making process.
- The Bank requires meaningful consultation of Stakeholders by its Clients throughout the Project life-cycle.
- The Bank supports its Clients to identify potential gender-specific opportunities as well as gender-specific adverse risks and impacts under their Projects and to develop mitigation measures to avoid or reduce such impacts and risks.
- The Bank recognizes the important role played by workers and their representatives in the development process and their contribution to sustainable economic growth, thus requires protection to be afforded to workers on their rights and working conditions, and avoidance of forced, harmful or exploitative forms of labor.
- The Bank recognizes that protecting and conserving biodiversity, sustainably managing terrestrial and aquatic natural resources and maintaining core ecological functions and services are fundamental to sustainable development.

The Bank conducts an Environmental and Social Due Diligence on all its prospective Projects to inform its decision-making process, and requires its Client to prepare instruments in compliance with its ESP, comprising an assessment of key activities and project components (including associated facilities) and the development of management plans and/or planning frameworks.

Based on the Bank's Project screening and categorization process, the Project has been categorized as a Category A: likely to have significant adverse environmental and social impacts that are irreversible, cumulative, diverse or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works and may be temporary or permanent in nature.

AIIB further requires compliance, where relevant to the Project, with three Environmental and Social Standards (ESS), for identification and management of environmental and social risks and impacts:

- AIIB ESS 1: Environmental and Social Assessment and Management;

- AIIB ESS 2: Involuntary Resettlement;
- AIIB ESS 3: Indigenous Peoples.

The following section provides an overview of the key requirements of AIIB's ESS:

AIIB ESS 1: Environmental and Social Assessment and Management

- Introduces concept of proportionality: ES assessment and management measures are to be proportional to Project risks and impacts;
- Mentions effective mitigation and monitoring measures for quality assessment and management of ES risks and impacts;
- Applies during the course of Project implementation;
- Requires the tracking of risks and impacts and the management of related procedures to be reflected in an Environmental and Social Management Plan;
- Focus: general requirements for the assessment and management structure and process, and specific environmental, social, working conditions and community; health and safety considerations;
- Requires the examination of alternatives to proposed project and related risks and impacts;
- Whatever the risks and impacts involved, AIIB will not finance projects involving the activities included in its Environmental and Social Exclusion List (e.g. forced labour, production of, or trade in illegal or dangerous products such as PCBs, weapons, tobacco, alcoholic beverages);
- Requires the preparation of an Environmental and Social Management Planning Framework (ESMPF) when details are missing at time of project's approval by the AIIB or when the AIIB determines that the ES assessment should be conducted in phases;
- Monitoring results should be documented and communicated in accordance with Information Disclosure requirements;
- Project changes requiring approval from the AIIB;
- Grievance mechanism: Necessary 'to receive and facilitate resolution of the concerns of people who believe they have been adversely affected';
- Information Disclosure addresses the sharing of documents, including of the draft ES assessment documents, in a timely manner and in locations and languages accessible to stakeholders.

AIIB ESS 2: Involuntary Resettlement

- Focuses on involuntary: 'as a result of: (a) involuntary acquisition of land; or (b) involuntary restrictions on land use or on access to legally designated parks and protected areas';

- Defines 'physical' (relocation, loss of residential land or loss of shelter) and 'economic' (loss of land or access to land and natural resources; loss of assets or access to assets, income sources or means of livelihood) displacements;
- Introduces notions of time, of proportion, and of direct correlation with project: "involuntary resettlement of the recent past or foreseeable future that is directly linked to the Project"; "whether such losses and involuntary restrictions are full or partial, permanent or temporary";
- Includes notions of obligation and of quality of restoration: 'If these impacts are found to be adverse at any stage of the Project, the Client is required to develop and implement a management plan to restore the livelihoods of affected persons to at least pre-Project level or better;"

Requirements proportionate to risks and impacts of the involuntary resettlement:

- Resettlement Plan or Framework proportional to degree of impacts in accordance to scope of physical/economic displacement and vulnerability of the displaced;
- Abbreviated Resettlement Plan allowed where less than 200 people displaced or where entire displaced population not physically displaced and lose less than 10% of productive assets;
- Where impacts significant, consider transforming Involuntary Resettlement as a stand-alone project;
- Where risks and impacts highly complex and sensitive, encourages a social preparation phase before compensation and resettlement decision- making (involving consultation with affected people and host population): to build capacity of the vulnerable and address resettlement issues (include social preparation cost in resettlement budget);
- Can use existing formal or informal grievance mechanisms if well designed and implemented and seen suitable by the Bank. Grievance mechanisms process to be transparent and understandable, gender- sensitive, culturally appropriate and readily accessible to affected people;
- Information disclosure to include grievance redress and outcomes reports, draft and final resettlement plans/frameworks, updates, and monitoring reports to all stakeholders in the same manner;
- Specified client should improve the standards of living of the displaced poor and vulnerable to at least national minimum standards, including access to social protection systems, legal and affordable access to land and resources/housing in rural/urban areas, and appropriate income sources in urban areas;
- Specifies that should not include compensation for people on illegally settled land;
- Requires developing procedures for displaced people who are under administrative or legal review;
- Reminds to closely supervise implementation;

- Wait for compensation and other resettlement entitlements provision before any displacement.

AIIB ESS 3: Indigenous Peoples

- Invites clients to take into account national legislation, customary law and any international conventions to which the country is a party in assessing the above characteristics;
- Includes vulnerability in its generic definition of 'Indigenous Peoples': term refers 'to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees;
- Asks for an Indigenous Peoples Framework to be prepared when project details undefined;
- Specifies that a social assessment should be conducted to define project impacts on Indigenous Peoples
- Assessment should be culturally appropriate and gender-sensitive
- Both positive and adverse impacts should be assessed;
- Participation of Indigenous Peoples should also be in monitoring and evaluation of arrangements;
- Where FPICon is especially required, engage suitably qualified and experienced independent experts for identifying risks and impacts on Indigenous Peoples;
- Documentation of FPICon evidence of agreement should also demonstrate broad community support (otherwise AIIB will exclude doubtfully supported activities from project);
- Impacts on protected areas and natural resources (access restriction, displacement) should particularly be avoided or otherwise benefits shared equitably;
- Requires grievance mechanism, with same conditions than for Involuntary Resettlement grievance mechanism (see above).
- Have provisions for complainants to remain anonymous and be protected from retaliation if requested.

The AIIB requires the establishment of a project-level Grievance Redress Mechanism to receive and facilitate resolution of the concerns or complaints of people who believe they have been adversely affected by the Project's environmental or social impacts, and to inform Project-affected people of its availability. The grievance mechanism includes provisions to protect complainants from retaliation and to remain anonymous, if requested.

The AIIB's Independent Accountability Mechanism, the Project-Affected People's Mechanism (PPM) has been established by the Bank to provide an opportunity for an independent and impartial review of submissions from Project-affected people who believe they have been or are likely to be adversely affected by AIIB's failure to implement its ESP in situations when their

concerns cannot be addressed satisfactorily through the Project-level GRM or the processes of Bank Management. For information on how to make submissions to the PPM, please visit https://www.aiib.org/en/policies-strategies/operational-policies/policy-on-the-project-affected-mechanism.html.

For the purpose of this Project and the preparation of its environmental and social instruments, the IFC Performance Standards have been deemed to be materially consistent with the relevant provisions of the AIIB's ESP and relevant Environmental and Social Standards.

3. SUPPLEMENTAL BIODIVERSITY INFORMATION

This section discloses updated information to:

- Address actions that were pending at the time of the Final Updated ESIA and/or were included in the Project's ESAP (i.e., complete an upgraded Environmental Flow [EFlows] and Connectivity Study – see Section 3.1);
- Supplement the Final Updated ESIA (i.e., eDNA Study – see Section 3.2);
- Provide clarifications to the Final Updated ESIA as requested by members of the Lenders' Group (see Section 3.3); and
- Document conformance with the Asian Development Bank's (ADB) Safeguard Policies (see Section 3.4).

This section also provides a draft Biodiversity Management Plan (BMP) as an updated table of required Project biodiversity mitigation measures (see Section 3.5) and a list of completed ESAP items from the disclosed July 2018 ESAP.

3.1. UPDATED ENVIRONMENTAL FLOW AND CONNECTIVITY STUDY

This section provides a summary of the updated Connectivity and EFlows Study.

3.1.1. Updated EFlows and Connectivity Assessment Methods and Results

An updated EFlows and connectivity assessment was undertaken to confirm that the proposed EFlows in the approximately 11 km diversion reach below the dam will provide sufficient water depths to allow the Common snowtrout to migrate upstream to spawn during the beginning of the spawning season in March and April. The 2018 EFlows Assessment was limited in that no hydraulic data/relationships were available for the diversion reach and therefore the Final Updated ESIA recommended further data collection and detailed connectivity assessment in the dewatered reach during low flow months. Figure 3-1 shows the location of EFlows sites for the UT-1 project.

The updated study involved the following additional field studies and analyses:

- Development of field surveyed cross-sections at EFlows site 2 (EF2), divided into 2A and 2B, in the diversion reach which are critical hydraulic locations (i.e., high gradient, wide rapid habitat where shallowest flow depths would occur during reduced flow conditions) along the diversion reach;
- Development of stage-discharge rating curves for the diversion reach;
- Development of a relationship between discharge and ecologically relevant hydraulic parameters using the rating curves and cross-sectional geometry data from above;
- Characterization of the Mailung Khola low-flow hydraulics as a proxy for geomorphology and EFlows dynamics of a lean-season Trishuli River diversion reach; and
- Supplemental fish surveys.

Figure 3-1: Locations of the EFlows study sites for UT-1.

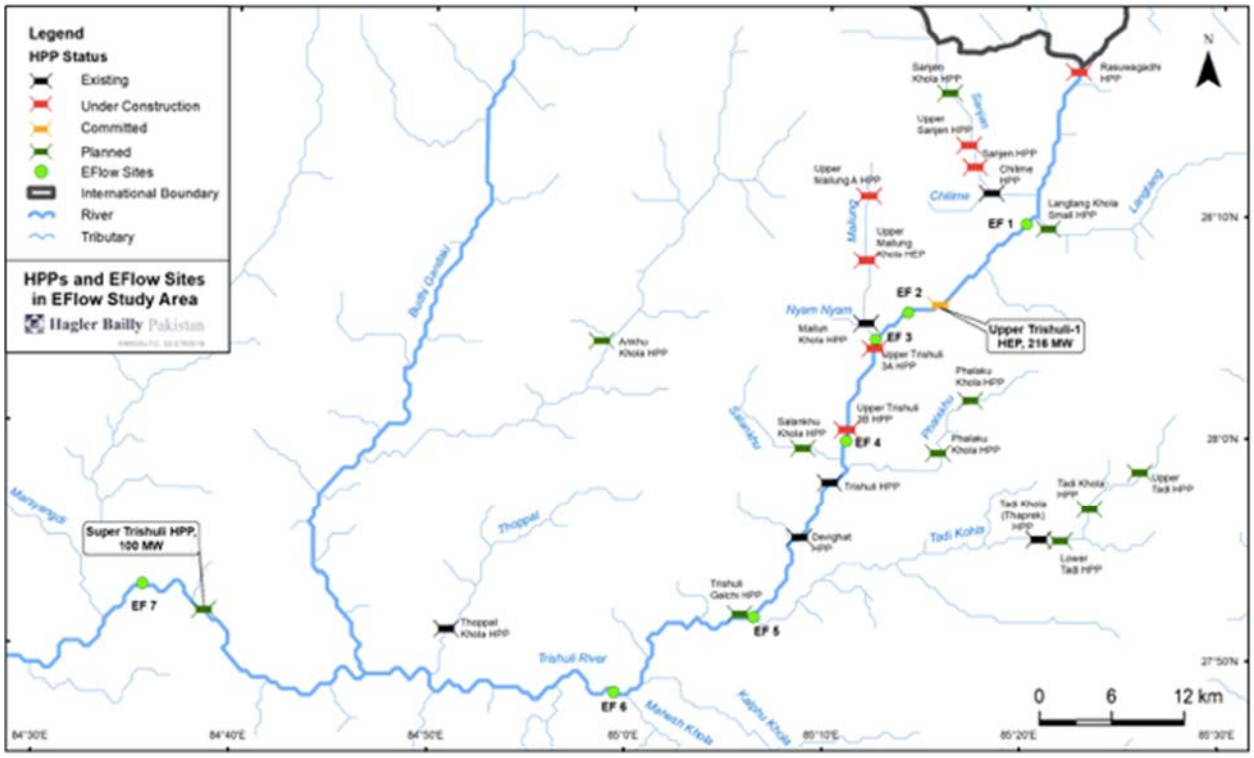


Figure Source: Southern Waters, 2018[1]

3.1.1.1. Supplemental Fish Survey Results

Additional fish sampling was conducted by Nepalese and Pakistani fish biologists in March and April 2018 at five locations, one in the diversion reach (EF2), one near the Project tailrace at the confluence with the Mailung Khola (EF3), two further downstream below Trishuli-3A hydropower project (EF4 and EF5, see Figure 3-1) and an additional site on the Mailung Khoha below the Mailung Khola Hydropower Project. Overall fish abundance was low and only six species were captured during these sampling events. Fish breeding and feeding areas at the Trishuli River locations appeared limited, whereas Mailung Khola was found to have good fish breeding habitat. The Common snowtrout was the only species captured in the UT-1 Project area (Table 3-1).

[1] *Draft Connectivity Assessment and Upgrade of EFlows Assessment for Upper Trishuli 1 HPP.* Prepared by Southern Waters, in association with Streamflow Solutions, South Africa, Hagler Bailly Pakistan, and HydroLab, Nepal. July 2018.

Table 3-1: Fish Species Recorded from the Trishuli River, April 2018

Scientific Name	Common Name	IUCN Status	April 2018	Sampling Location/ Site
Schizothorax richardsonii	Common snowtrout	Vulnerable	✓	EFlows Site 2, 3, 4, 5 and Mailung
Schizothorax progastus	Dinnawah snowtrout	Least Concern	✓	EFlows Site 5
Glyptothorax indicus/garhwali	Glyptothorax Catfish	Least Concern	✓	EFlows Site 5
Crossocheilus latius	Gangatic Latia	Least Concern	✓	EFlows Site 5
Barilius bendelisis /tileo	Hamilton's/ Tileo Barb	Least Concern	✓	EFlows Site 5
Pseudecheneis sulcatus	Sucker Throat Catfish	Not assessed		EFlows Site 3
Schistura corica	Stone Loach	Least Concern	✓	EFlows Site 5

Overall fish population in the UT-1 area was small relative to the tributaries, and species diversity and abundance increased in a downstream direction along the Trishuli River. This is consistent with previous studies that have found population densities of Common snowtrout to be relatively low in the mainstem Trishuli River, and higher in the tributaries, particularly the 'cool to warm water' kholas (Sharma 1989; SWECO 2016).

The study researchers suggest that the UT-3 Hydropower Project (HPP), located approximately 1.5 km downstream of the UT-1 powerhouse, is already blocking fish migrations. They noted that Dinnawah snowtrout (*Schizothorax progastus*) was again not found above the UT-3 HPP. It has not been recorded there since 2012. Based on consultation with Nepalese fish specialists and local fishermen, they concluded that Dinnawah snowtrout "no longer occur (upstream of UT-3) because summer migration between the upper and middle Trishuli River is cut off by UT-3 and the Dinnawah cannot tolerate the cold winter temperatures in the upper Trishuli River" (Southern Waters 2018).

The study researchers also noted heavy fishing pressures in the study area and believe that pre-development baseline population of Common snowtrout in the Upper Trishuli River has almost certainly been reduced by activities in the catchment (Rai et al. 2008; Sehgal 1999; SWECO 2016). There are few, if any, long-term data that can be used to quantify this, but based on discussion with local fishermen and the professional experience of fish biologists from both Nepal and Pakistan, this significant reduction is a result of fishing, downstream migration barriers (e.g., Trishuli 3A hydropower project), and loss or degradation of important tributary spawning areas due to pressures such as sand and gravel mining and sediments from road construction. It is not only the number of fish that has reduced, but also the size of the individual fish. Historically fish of up to 2.5 kilograms (kg) have been recorded in the Trishuli River (Sharma 1989), but the largest fish recorded in 2018 was approximately 350 grams (g).

These observations and conclusions regarding fish diversity, abundance, distribution, and habitat preferences are all consistent with the conclusions in the Final Updated ESIA.

3.1.2. Connectivity Assessment

Common snowtrout have two spawning periods: March-April and October-November (Jan et al. 2017). In the Trishuli Basin, they migrate upstream from lakes and rivers in the downstream valley upstream to find suitable places for breeding, mainly in tributaries or side channels along the main river bed (Jhingran 1991; Welcomme 1985; Sunder 1997). The Common snowtrout primarily use the Trishuli River as a corridor to reach these tributaries. Thus, upstream and downstream passage past hydropower infrastructure is a major issue with respect to their long-term survival in the river basin, as is the continued access to their breeding areas in the tributaries.

The Connectivity Assessment was undertaken to evaluate the ability of Common snowtrout to pass through the diversion reach with the EFlows release during their migration. The assessment takes account of the predicted hydrologic and hydraulic conditions of the diversion reach and the biological capacity of Common snowtrout to pass them (e.g., swimming/jumping abilities, life history).

3.1.2.1. Hydrologic and Hydraulic Conditions

Taking into consideration the proposed released EFlows of 3.86 m^3/s during the winter months (February and March), Table 3-2 below summarizes the predicted water depths, velocities, and cascade heights at the cross-section at EFlows site EF2A within the UT-1 diversion reach.

Table 3-2: Depths and Velocities Predicted for the Cross-section at EFlows Site EF2A

Parameter	Predicted Design
Discharge	3.86 m^3/s
Reach length	2.5 km, representing the ~11-km diversion reach
Maximum depth	0.50 m
Average depth	0.24 m
Average velocity	0.47 m/s
98th percentile velocity	1.43 m/s
Cascade height	1-1.5 m

The calculations show that the maximum and average depths are 0.50 m and 0.24 m, respectively, which the study considered adequate for fish passage through the rapids, based largely on an analysis of the hydrology, hydraulics, and observed fish migration experience at Mailung Khola. It is likely that vertical cascades will develop in places in the rapids as discharge falls. The slope, size of bed substrates, and low-flow channel width of the Trishuli River relative to those of the Mailung Khola, however, indicate that most of the cascades that will develop in the dewatered reach of UT-1 at 3.86 m^3/s will be surmountable to Common snowtrout.

In the event that an impassable cascade does indeed form at 3.86 m^3/s, it is unlikely that small increases in minimum flow (e.g., to ~5 m^3/s) would make a significant difference in passability. If necessary, it should be possible to realign the bed substrates to facilitate passage of Common snowtrout (e.g. river training). Since the river channel is geomorphologically-dynamic, and the size and position of large-scale sediments change over time in response to landslides,

earthquakes, floods, and/or upstream hydropower construction activities, such rearrangement of the bed would need to be done on a regular basis.

3.1.2.2. Common Snowtrout Biological Characteristics Related to Connectivity

The Connectivity Assessment evaluated the biological characteristics of the Common snowtrout that will affect their ability to migrate through the low water levels in the diversion reach.

Common snowtrout spawn when they reach about two years of age, depending on food supply (Jhingran 1991; Welcomme 1985; Sunder 1997). Common snowtrout spawn in spring when the eggs in the female reach maturity, provided the aquatic system provides sufficient food required for proper development of eggs. Migration and subsequent spawning occurs in response to a combination of triggers such as increased flows resulting from snowmelt and/or monsoon rains, rise in water temperature, comparatively higher turbidity level, and the appearance of side channels (Negi 1994; Rafique and Qureshi 1997; Talwar and Jhingran 1991).

Once migration is triggered, water depth, velocity, and temperature, along with light conditions may affect migration. The UT-1 diversion reach will have a dry season flow of ~3.86 m^3/s; a related depth of water of ~0.25 m; and a maximum velocity of ~1.5 m/s. These physical characteristics would allow passage of Common snowtrout of approximately 200 to 250 g and <25 cm (Bhat *et al*. 2013), which would be at the lower end of breeding stock size (Kausar *et al*. 2017; Jan *et al*. 2014).

Larger Common snowtrout individuals (>250 kg) are not likely to be common in the UT-1 diversion reach because of the high fishing pressure and the inability of the fish to access the lower reaches of Trishuli River, which provide the feeding and resting habitat in winter season that enable to the fish to grow to larger sizes, as a result of the blockage by UT-3 hydropower dam.

3.1.2.3. Summary

The Connectivity Assessment concludes that Common snowtrout of the size currently found in the UT-1 Project area should be able to successfully navigate the diversion reach with NWEDC's proposed EFlows during the spring migration period (March 3.86 m^3/s) and April (5.0 m^3/s) and reach the UT-1 fish ladder. The assessment also notes that once the UT-1 Project is operating and the diversion reach has lower flows and velocities, the river there will more closely resemble the characteristics of the tributary streams, and thus may become more suitable for Common snowtrout spawning than under natural flows, provided suitable gravel beds are present.

The Assessment also warns, however, that fishing pressure in the Upper Trishuli River is significant, and pools in the diversion reach, where upstream migrating Common snowtrout may take refuge or rest, will attract fishermen. The assessment notes that over-fishing in the diversion reach during spring migration could be a major concern and will need to be addressed. Further, it notes that it is critical that spawning grounds in the Trishuli River tributaries upstream of the UT-1 headworks need to be protected or the value of the UT-1 fish ladder will be limited as any upstream migrating Common snowtrout would not find suitable spawning habitat.

3.1.3. Update to UT-1 EFlows Assessment

Based on the new hydraulic, geomorphic, probability of cascades, and availability of pools data described above, a series of updates were made to the links and response curves in the DRIFT DSS that was used for the UT-1 EFlows assessment (SANS Solutions 2016) specifically to evaluate fish movement through the UT-1 diversion reach (EFlows Site 2). The most significant of these updates were:

- Geomorphology:
  - revision of links and response curves to include site-specific hydraulics outlined in sections and insights from field visit understanding;
  - linking geomorphology and sediments for the Trishuli River in the UT-1 dewatered reach;
  - developing two new geomorphology indicators:
    - probability of cascade;
    - availability of pools.
- Snowtrout
  - revising links and response curves to include site-specific hydraulics outlined in sections and insights from field visit;
  - changing links from ones based on hydrology (minimum 5-day discharge) to ones based on hydraulics (minimum depth and maximum velocity); and
  - adding links to "availability of pools".

The updated EFlows Assessment concluded that many of the expected impacts on the Common snowtrout populations within the Upper Trishuli River Basin have already occurred, mainly as a result of the construction of other mainstem hydropower projects without fish passage facilities and the loss of important tributary spawning habitat (e.g., Chilime Khola and Mailung Khola). As indicated in Section 2.1.1 above, the EFlows study researchers believe that there has already been a significant reduction in common snowtrout population in the Upper Trishuli River. The EFlows Assessment estimates that the incremental impact of the UT-1 Project on fish populations in the study area is expected to be small (i.e., approximately 5%), and could be mitigated to achieve No Net Loss (NNL) by applying standard practices such as river training, appropriately design fish-passage, and heavy monitoring with well-defined adaptive management triggers that could result in re-stocking, hauling, among others. The impacts on the Common snowtrout populations will be further alleviated if the Trishuli 3A HPP below UT-1 has a functional fish ladder.

3.1.4. EFlows and Connectivity Assessment Conclusions and Recommendations

The Connectivity Assessment and Upgrade of EFlows Assessment for the Upper Trishuli-1 Hydropower Project, which focused on Project operations, reaches these basic conclusions:

- Fish Community – the supplemental fish sampling results and interpretation were consistent with the description of the Upper Trishuli fish diversity, abundance, distribution, and habitat preferences presented in the Final Updated ESIA;
- Connectivity Assessment – the proposed minimum March EFlows of 3.86 m^3/s during the start of the Common snowtrout upstream migration period should be adequate for Common snowtrout of the size commonly found in the UT-1 Project area to successfully navigate the diversion reach to the UT-1 fish ladder. It is possible that some small cascades may appear at lower flows that could function as a barrier to fish movement, but these could be physically modified to remove the barrier effect (e.g. river training).
- EFlows Assessment –The EFlows Assessment concludes that the incremental impact of the UT-1 Project on fish populations in the study area is expected to be small (i.e., approximately 5%) and can be mitigated to achieve NNL by applying mitigation actions already planned in the project's BMP (see Section 3.5).

As discussed in the Final Updated ESIA, the Project will divert flows through a diversion tunnel, during Project construction, which would not result in any significant modification of flows in the Trishuli River. NWEDC has committed to maintaining the required monthly EFlows during Project commissioning and reservoir filling, so required EFlows will be provided throughout Project construction.

3.2. eDNA Study

In March and April 2018, researchers from the Center for Molecular Dynamics Nepal (CMDN) joined the fish sampling team to apply and test environmental DNA sampling, also known as eDNA, along the Trishuli River (CMDN 2018). eDNA is a new sampling and monitoring method for aquatic diversity that is a promising non-invasive method for improving aquatic biodiversity monitoring. eDNA sampling involves collecting water samples, filtering out the detritus, and then analyzing the water for genetic material (i.e., DNA) from aquatic organisms. The eDNA may come from entire organisms, such as small planktonic organisms, or from cells, scales, and other parts of larger organisms. eDNA is still in experimental stages and thus the analysis conducted for the UT-1 Project are considered preliminary and need to be confirmed and tested with further studies.

For the UT-1 study, water samples were collected at six sample locations, which corresponded with the updated EFlows Assessment sampling sites, including site EF2 in the diversion reach, EF3 near the confluence with Mailung Khola, and EF4-7 downstream. The eDNA was extracted from these water samples. The COI gene segment from the eDNA was then amplified (copied many times) and compared to a global DNA database (NCBI GenBank). This process tentatively identified 25 different species of fish across the six sampling locations, although some were only identified to the genus level (i.e. *Barilius* sp. and *Schizothorax* sp.). Most of the species were documented further downstream from the UT-1 area. Nine fish species total were identified using the eDNA analysis from the water samples collected at sites EF2 and EF3. However, the reference DNA database (NCBI GenBank) has limited data available on Himalayan fish species, which creates uncertainties in the species identifications from the eDNA study. These

uncertainties need to be addressed before a final fish list can be confirmed and comparisons can be made with the fish sampling results. Additional studies are currently underway to verify the eDNA results and to evaluate the use of eDNA for future fish monitoring of the UT-1 project.

3.3. FINAL UPDATED ESIA CLARIFICATIONS

Members of the Lenders' Group requested clarifications as various aspects of the Final Updated ESIA, which are addressed below.

3.3.1. Alternative Energy Sources Evaluation

The UT-1 Project is intended to provide baseload power for domestic use taking advantage of the Project's proximity to Kathmandu, Nepal's power demand center. The evaluation of alternatives must take into consideration this project purpose. Table 3-3 compares alternative energy sources.

Table 3-3: Comparison of Alternative Energy Sources

Energy Source	Technical Feasibility	Environmental and Social Implications	Conclusion
Coal and Oil	There are no significant domestic supplies of coal or oil in Nepal and no ports or railroads to transport these fuels to Nepal	Would increase greenhouse gas emissions and worsen air quality.	Not viable alternative
Nuclear	No experience or expertise available in Nepal	Waste management would pose a significant issue	Not viable alternative
Biomass	Reliable fuel supply to meet baseload power needs for 216 MW facility highly uncertain		Not viable alternative
Solar	Unable to meet baseload power needs for 216 MW facility	Provides clean renewable energy source, but facility of this size would like result in increased forest clearance or increased economic displacement	Not viable baseload alternative, although could complement hydropower by providing supplemental generation during the dry season
Wind	Unable to meet baseload power needs for 216 MW facility	Provides clean renewable energy source but poses risks to many migratory birds	Not viable baseload alternative, although could complement hydropower by providing supplemental generation during the dry season
Hydropower	Renewable power source that takes advantage of Nepal's water resources and elevation assets	Provides clean renewable baseload energy source	Technically viable and environmentally and socially acceptable alternative

3.3.2. EFlows Requirements

The Lenders' Group has requested clarification of the Project's Environmental Flow (EFlows) requirement, as it has been presented slightly differently in various Project documents.

NWEDC has committed to providing at least 10% of the average monthly flow for each month of the year, so the Project's EFlows requirements vary each month (Table 3-4). The minimum EFlow required by the Nepal Government and established in the Government's EIA approval is 3.84 m^3/s (approximately 10% of the minimum monthly flow in February and March), which is an uniform requirement for each month of the year (Table 3-4). NWEDC, however, has committed to releasing significantly more than this by providing 10% of the average monthly flow for each month. See Table 3-4 for NWEDC's proposed monthly EFlows releases. Although sometimes rounded to 3.9 m^3/s in the ESIA, 3.86 m^3/s is the required minimum Project EFlows, which will be required in the months of February and March; for all other months NWEDC will provide higher Project EFlows equivalent to the 10% of average monthly flow).

Table 3-4: Flows into the Diversion Reach Based on Mean Monthly Flows under Regulated and Unregulated Conditions

Flow Management Scenarios	Mean Monthly Flow (m^3/s) at the Intake Site											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Existing average river flow regime[1]	43.7	38.6	38.6	49.5	87.5	230.4	487	557.8	370.8	160.4	79.9	54.6
Required (Nepal law) minimum diversion reach EFlows regime	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84
NWEDC Proposed minimum diversion reach EFlows regime	4.4	3.86	3.86	5.0	8.8	23.0	48.7	55.8	37.1	16.0	8.0	5.5

[1] These data show average monthly flows for the period from 1967 – 2010 upon which the EFlows requirements were based. Updated flow data from 1967 – 2015 are now available, which are being used in the latest LTA model, but these updated data do not change the required EFlows.

3.3.3. Updated EFlows Assessment for Other Native Species

The original EFlows Assessment (SANS Solutions 2017) and the updated Connectivity and EFlows Assessment (Southern Waters 2018) both focused on the Common snowtrout as a key indicator species because of its dominance in the Project area (represents approximately 98% of the fish caught in the Project area during multi-year sampling), year-round presence, migratory life history, anatomical factors, sensitivity to habitat fragmentation.

The Lenders' Group noted that the proposed EFlows should meet the objective of maintaining viable populations of all native species present in the diversion reach. Section 2.1 describes the connectivity assessment and upgraded EFlows assessment, which concludes that the proposed EFlows is adequate for the Common snowtrout. We evaluate below the adequacy of the proposed EFlows for the other four native fish species found in the diversion reach.

Dinnawah snowtrout (*Schizothorax progastus)*

The Dinnawah snowtrout have not been found in the Project area since 2011, which is attributed to construction of the downstream Trishuli 3A HPP. The approved Trishuli 3A HPP design does include a fish ladder, which was partially constructed before being damaged during the earthquake. If the Trishuli 3A fish ladder is repaired, it is anticipated that the Dinnawah snowtrout may again migrate upstream through the Project area, although the Project area is at

the upstream limit in terms of where the species is typically found relative to elevation and water temperatures. The Dinnawah snowtrout is similar in size (maximum size of 50 cm vs 60 cm for Common snowtrout)[2] and swimming ability. Therefore, an EFlows suitable for Common snowtrout should be adequate for the Dinnawah snowtrout. Planned fish monitoring during UT-1 construction and operations should determine the presence of Dinnawah snowtrout and the adequacy of the proposed EFlows in enabling it to reach the UT-1 fish ladder.

Ministry of Energy's Department of Electricity Development has stated that the fish ladder design is appropriate and there is no need to make any exception to the permit or amend the relevant clause of regulatory ESIA (Clause 2.1.1 page 336). The international expert who designed the fish ladder (Dr. Halvard Kaasa) confirmed in writing that the ladder as designed could function for both snow-trout species, *Schizothorax richardsonii* (Buchchhe Asala) and *Schizotoraichthys progustus* (Chuchche Asala).

Suckerthroat catfish (*Pseudecheneis sulcata)*, Torrent catfish (*Euchiloglanis hodgarti)*, and Pharping catfish (*Glyptosternum [Myersglanis] blythi)*

There are three catfish species found in the Project area, all of which are believed to be present upstream of dam, in the diversion reach, and downstream of the powerhouse. None of these species are migratory, although they may move short distances within the river. Based on the fish baseline surveys, none of these species are abundant within the Project area, although they are relatively common and widespread throughout the Himalayan region. These species are relatively small (i.e., a maximum length of only 6 to 7 cm for the Pharping and Torrent catfish, respectively, and about 19 cm for the Suckerthroat catfish), demersal, do not migrate, and tend to use a small area, therefore the proposed EFlows should be sufficient to maintain viable populations within the diversion reach.

Banded loach (*Schistura savona) and* Mottled loach (*Neamcheilus botia)*

There are two loach species found in the Project area, both of which were only found downstream of the powerhouse in the warmer waters at the mouth of the Mailung Khola, but may also be found in the diversion reach. Neither of these species are migratory. Based on the fish baseline surveys, neither of these species are abundant within the Project area, although they are relatively common and widespread throughout the Himalayan region. The loach species are not used as a protein source. The proposed EFlows should be adequate to maintain viable populations of these two species as they are both relatively small (maximum length of 4 to 11 cm), demersal, do not migrate, and tend to use a small area.

3.3.4. Fish Ladder Design and Operations

The UT-1 Project will include a fish ladder specifically designed to allow the upstream passage of migratory Common snowtrout and Dinnawah snowtrout (if present). The consulting firm SWECO developed a conceptual design for the fish ladder, which was incorporated into preliminary design drawings by NWEDC's design engineers (DKJV). SWECO reviewed these design drawings and provided additional comments. As indicated in the Final Updated ESIA,

[2] , www.fishbase.org

the fish ladder design was reviewed and found acceptable by fish passage experts from the IFC. The Biodiversity Management Plan also includes an adaptive management approach to ensure successful fish passage.

Recognizing that the fish ladder design was still being finalized, the Final Updated ESIA recommended, and NWEDC committed to contracting an international fish scientist (Fish Monitoring Advisor) with expertise in Nepal fish to, among other responsibilities, monitor construction of the fish ladder and dam to ensure it is consistent with the SWECO design, oversee commissioning of the fish ladder, and monitor the effectiveness of the fish ladder.

Further, the Engineering, Procurement, and Construction (EPC) Contract requires that "the Contractor shall submit to the Lenders, for their review and approval, the proposed design of the headworks with a description of the way the structure is proposed to be built, maintained and operated to ensure downstream and upstream fish passage."

Some members of the Lenders' Group asked for clarification as to whether the fish ladder will be effective for downstream fish passage. Although downstream migrating fish could use the fish ladder, the flow through the fish ladder is unlikely to attract many fish to the ladder. As indicated in the Final Updated ESIA, in order to avoid fish being entrained into the powerhouse turbines, which would result in high levels of injury or mortality, NWEDC proposes to:

- Monitor fish movement to detect the beginning of the downstream migration period and ensure fish are guided away from the powerhouse intake.
- Provide a guidance mechanism to help direct adult and juvenile fish away from the powerhouse intake;
- Ensure a smooth spillway and a deep pool at the base of the dam to minimize injury to fish migrating through the flap gates with spillage water; and
- Preferably spill water via the spillway at the left side of the weir.

The Biodiversity Management Plan requires NWEDC to implement these measures.

Some members of the Lenders' Group requested additional information regarding the details of the Project's proposed fish ladder design and operations, specifically confirmation that the fish ladder is designed to withstand seasonal flooding and/or flows when the flap gates are open. NWEDC will be required to submit to the Lenders prior to the initiation of construction of the headworks, for their review and approval, the proposed design of the headworks with a detailed description of the way the fish ladder is proposed to be built, maintained, and operated, and demonstrating that the fish ladder will be operational for, and able to withstand, the expected range of Trishuli River flows. See Section 7.2 for Additional ESAP Items.

3.3.5. Number of Mammal Species Present

A total 25 species of mammals were reported from the Project site and surrounding areas based on field studies in support of the Project. The Final Updated ESIA incorrectly stated that only 24 species were reported in the Area of influence, although 25 species were listed in the table provided in the ESIA.

3.3.6. Sediment Management

Some members of the Lenders' Group requested additional information regarding under what conditions would the Project flush sediment from the reservoir and the desander.

The Project operation and maintenance (O&M) Contractor will be required to develop a detailed Sediment Management Plan. This plan will limit the flushing of sediment from the reservoir and the desander to periods when spillage is occurring to supplement the sediment transport capacity of the EFlows, to avoid both flushes during low flow and silting of riverbed in the dewatered reach. Based on the particle size of the sediment in the desander, the O&M Contractor will calculate the flow in the diversion reach and time required to transport the sediment through the diversion reach down to the powerhouse outlet, and desander flushing will only be allowed with a flow and during a duration that are above this threshold values.

The requirement for development of a Sediment Management Plan was included in the July 2018 ESAP and has not yet been completed.

3.4. CONFORMANCE WITH ADB SAFEGUARD POLICIES

The ADB requested assessment of the Project's conformance with its Safeguard Policy Statement (SPS, 2009) for critical and natural habitat and the potential presence of critically endangered or endangered chiropters (bats).

3.4.1. Upper Trishuli 1 Project Classification as per ADB SPS

Categorization for the proposed Project was undertaken by using ADB's Rapid Environmental Assessment (REA), Involuntary Resettlement (IR), and Indigenous People (IP) Assessment checklists during the screening and scoping exercise of the ESIA. Although the Involuntary resettlement category was originally categorized as Category B, further assessment has led to a new categorization of A (see Table 3-5 for updated Categorization results).

Table 3-5: Project Categorization as per ADB Safeguards

Criteria	Remark	Categorization
Environmental Categorization	The Project is a Run of River hydropower project and could potentially have significant adverse social and/or environmental impacts that are diverse, irreversible, and unprecedented. The Project is also located in close vicinity of the LNP, which is a biodiversity-protected area. The Project will result in regulated/ reduced downstream flow and will have associated impact on aquatic biodiversity. There is also loss of 76.62 ha community forest, 2.6 ha from LNP.	A
Indigenous Peoples Category	The PAF of the Project are comprised primarily of Tamang. The Tamang group are categorized as Indigenous Peoples, in keeping with ADB's definition.	A
Involuntary Resettlement Category	The Project has resulted in land acquisition, physical resettlement, and economic displacement.	A

3.4.2. Critical Habitat Assessment

The SPS defines Critical Habitat as follows:

> "A subset of both natural and modified habitat that deserves particular attention. Critical habitat includes areas with high biodiversity value, including habitat required for the survival of critically endangered or endangered species; areas having special significance for endemic or restricted-range species; sites that are critical for the survival of migratory species; areas supporting globally significant concentrations or numbers of individuals of congregatory species; areas with unique assemblages of species or that are associated with key evolutionary processes or provide key ecosystem services; and areas having biodiversity of significant social, economic, or cultural importance to local communities. Critical habitats include those areas either legally protected or officially proposed for protection, such as areas that meet the criteria of the World Conservation Union classification, the Ramsar List of Wetlands of International Importance, and the United Nations Educational, Scientific, and Cultural Organization's world natural heritage sites."

The SPS also establishes the following criteria for projects in critical habitat:

> No project activity will be implemented in areas of critical habitat unless the following requirements are met:
>
> i. There are no measurable adverse impacts, or likelihood of such, on the critical habitat which could impair its high biodiversity value or the ability to function.
>
> ii. The project is not anticipated to lead to a reduction in the population of any recognized endangered or critically endangered species or a loss in area of the habitat concerned such that the persistence of a viable and representative host ecosystem be compromised.
>
> iii. Any lesser impacts are mitigated in accordance with the following paragraph:
>
> Mitigation measures will be designed to achieve at least No Net Loss of biodiversity in accordance with the SPS. They may include a combination of actions, such as post project restoration of habitats, offset of losses through the creation or effective conservation of ecologically comparable areas that are managed for biodiversity while respecting the ongoing use of such biodiversity by Indigenous Peoples or traditional communities, and compensation to direct users of biodiversity.

As per the ADB SPS definition, the UT-1 Project does affect 6.77 ha of critical habitat (i.e., Langtang National Park (LNP), including the buffer zone, which is a protected area). This includes 2.61 ha of natural habitat that would be permanently converted for the headworks infrastructure; and 4.16 ha of modified habitat (a former cluster of houses and agricultural fields) that would be impacted for the new worker camp.

The LNP Management Plan specifically encourages development of hydropower projects within the LNP buffer zone. Nevertheless, the ADB SPS requires No Net Loss of critical habitat. The UT-1 Biodiversity Management Plan (see Section 2.5) includes mitigation actions to compensate

for the impacts on LNP buffer zone and to address impacts on terrestrial and aquatic biodiversity, with the ultimate aim of demonstrating No Net Loss. These include compensating for the loss of trees on a 2:1 basis as per the PDA agreement and on a 25:1 basis for any additional trees that may be affected during the course of project implementation. Furthermore, NWEDC will also acquire, reforest, and donate at least 2.61 ha of similar land to be annexed into the LNP to offset the Project's use of government-owned National Park buffer zone land. The remaining 4.16 ha of land within the LNP buffer zone was privately owned and included a cluster of houses and agricultural fields, with only a few trees. This property was also isolated from the rest of LNP by the recently constructed "Chinese Road."

Therefore, the Project, when considering the proposed mitigation measures, will not lead to any impairment of high biodiversity values in the LNP or its function and will not cause a reduction in the population of any recognized endangered or critically endangered species or a loss in area of the habitat concerned, such that the persistence of a viable and representative host ecosystem be compromised. The mitigation actions along with the compensation proposed, as an offset aligned with the ADB SPS, will result in No Net Loss of Biodiversity.

3.4.3. Chiropteran Critical Habitat Assessment

The proximity report (April 2018) generated by the Integrated Biodiversity Assessment Tool for the Project site lists Csorba's Mouse-eared Myotis (*Myotis csorbai*; IUCN-Red-List v2018-1, DD; Nepal Red-List[3] CR) as potentially being present. The bat species is endemic to Nepal and known from only a single location; Kailash caves in Syngja District, approximately 250 km from the Project. The species is therefore unlikely to be found in the project area and is presently not a critical habitat candidate species. There are no other critically endangered (CR) or endangered (EN) chiropteran species found in the Project area. Furthermore, there are no chiropteran species in the area affirmatively satisfying the Extent of Occurrence of < 50,000 km^2 for restricted range species.

3.5. DRAFT BMP: UPDATED LIST OF REQUIRED PROJECT BIODIVERSITY MITIGATION MEASURES

The following three tables (Table 3.6 – 3.8) summarize the mitigation actions committed by NWEDC to address impacts on biodiversity and to achieve No Net Loss of Biodiversity as required by IFC's PS6 and ADB's SPS. The tables can be considered as a Draft BMP, which as always, is a living document that should be reviewed and updated throughout the project lifecycle. These tables will be reviewed and revised as needed by the Fish Monitoring Advisor.

Mitigation actions for construction related impacts must be included in EPC contracts and any relevant sub-contracts to ensure that EPC and sub-contractors are aware of the required actions and carry them out. Similarly, mitigation actions during Operation must be included in any

[3] Jnawali, S.R., Baral, H.S., Lee, S., Acharya, K.P., Upadhyay, G.P., Pandey, M., Shrestha, R., Joshi, D., Laminchhane, B.R., Griffiths, J., Khatiwada, A. P., Subedi, N., and Amin, R. (compilers) (2011) The Status of Nepal Mammals: The National Red List Series, Department of National Parks and Wildlife Conservation, Kathmandu, Nepal.

contracts with operators and sub-contractors. The following tables show proposed terrestrial and aquatic mitigation actions during all phases of the Project.

Table 3-6: Terrestrial Biodiversity Mitigation Measures for UT-1 Project

Impact Summary	Mitigation	Responsible	Timeline
Construction Phase			
All	Ensure that all relevant biodiversity management actions from BMP and ESIA are included in the EPC contracts.	NWEDC	Prior to the commencement of construction activities
All	Ensure that all relevant biodiversity management actions from BMP and ESIA (as listed here) are included in sub-contracts. The following management plans are necessary to implement the relevant biodiversity actions provided below and their development should be a part of the sub-contracts i. Spill Prevention and Response Management Plan ii. Waste Management Plan ii. Water Quality Management Plan v. Wastewater Management Plan v. Spoil Management and Disposal Plan vi. Excavation, Slope Stability, Sediment and Erosion Control Management Plan, ii. Stockpiles, Quarries and Borrow Pits Management Plan ii. Habitat restoration and Rehabilitation Plan.	EPC	Prior to the commencement of construction activities
Workers' Camps and Work Sites			
Water supply affecting ecology	The intake of water from streams for water supplies should leave residual flows in the watercourses.	EPC	During construction
Wastewater discharges affecting water quality	• Sewage disposal methods shall be designed to the standards outlined by the Nepalese government. • Use of oil/water separators • Provision of settling ponds to manage runoff from work areas	EPC	During construction
Solid waste polluting the environment and causing health hazards	All solid waste shall be removed from site and disposed of at a municipal landfill or at an approved disposal site.	EPC	During construction
Construction Issues			
Unauthorized access to LNP	• Install fencing around the dam site to prevent unauthorized worker access to LNP forest. • Monitor attempts to enter LNP and add additional fencing or patrols as needed • Engage with stakeholders/partners and LNP management to ensure clear understanding of biodiversity issues and the appropriate implementation of the BMP.	EPC	During construction
Construction of access roads can affect cultivated areas, sensitive areas and cause noise and dust pollution	• Design and location of access roads shall be approved by a road engineer and Environmental and Social Management Cell (ESMC); • Follow erosion and sedimentation procedures and noise and dust procedures as explained below; • Avoid constructing access roads in sensitive areas and agricultural land; • Build an appropriate drainage system;	EPC	Before and during construction

Impact Summary	Mitigation	Responsible	Timeline
	• Protect all areas susceptible to erosion by installing necessary temporary and permanent erosion and sediment control structures; • Conserve as much vegetation as much as possible; • Initiate revegetation after completion of construction works.		
Erosion and sedimentation caused by the construction activities	• Protect all areas susceptible to erosion by installing necessary temporary and permanent erosion and sediment control structures. • Conserve as much vegetation as much as possible • Collect and store topsoil for use in restoration; • Initiate revegetation after completion of construction works; • Construct spoil sites that are stable and not susceptible to erosion; • Avoid spoil disposal in areas that could can cause future landslides, or cause soil from the dump to be washed into any watercourse; • Avoid spoil disposal near residential areas or in unstable lands or in areas that could affect drainage and irrigation ditches; • Use spoils for construction purposes as appropriate; and • Rehabilitate spoil sites as soon as the disposal operations are complete.	EPC	During construction
Noise and vibration associated with construction activities, excavation and blasting.	• Machinery operation to occur only during designated hours (to be confirmed by Contractor in agreement with ecologists); • Work to be carried out in daylight; • Concrete batching plants and other noisy equipment to be located as far as practical from sensitive areas for biodiversity.	EPC	During construction
Increased utilization of roads by traffic associated with construction activities.	• Signage and speed humps to be used in areas where wildlife crossing is likely; • Wetting of roads to reduce dust during the dry season, and as necessary; • Training of vehicle drivers regarding the driving risks through biodiversity sensitive areas and along remote roads.	EPC	During construction
Pollution risk activities occurring on site	• Develop and implement appropriate storage, transport, and use practices to recognized standards; • Solid waste disposal shall be taken off site.	EPC	During construction
Clearing, revegetation and restoration of construction sites			
Disturbance of Natural Habitat	Demarcate in the field the approved limits of clearing to ensure no additional Natural Habitat or Community Forest is disturbed.	EPC	During construction
Disturbance of soil profile, loss of biodiversity habitats and introduction of invasive species.	• Clearing shall take place in a phased matter to retain vegetative cover as much as possible; • Areas not approved for clearing shall be kept undisturbed and demarcated by construction fencing; • Collect and store topsoil for use in restoration; • Appropriate local native species of vegetation shall be selected for the compensatory planting and restoration of the natural landforms; • All affected areas shall be landscaped and any necessary remedial works shall be undertaken without delay, including revegetation and reforestation. Use saved topsoil;	EPC	During construction

Impact Summary	Mitigation	Responsible	Timeline
	• Stabilize and rehabilitate/reforest temporarily disturbed areas, especially community forest.		
Earthworks, Fill Slopes, Cuts, Borrow Pits, Quarries, Disposal Sites, Stockpiles			
Generation of suspended solids from bare ground and runoff into watercourses	No direct discharge of sediment laden water without treatment; • Earthworks and land clearance shall be minimized and phased; • Storm water shall be diverted around exposed areas; • Any discharges to watercourses shall occur during high flow and/or discharged as close to the outfall as possible to maximize mixing; • Stockpiles, borrow pits, and quarries disposal sites shall be located at least 50 meters from a watercourse and avoid sensitive areas; • Timing of works around the drier seasons where possible • Provision of storm water cut off drains wherever possible.	EPC	During construction
Introduction of invasive species	An invasive species management plan shall be developed to control invasive species brought in through imported top soil, fill, machinery, and vehicles through surveillance and standard operating procedures. The plan should also include measures for the control of invasive species if proliferation were to occur.	EPC	During construction
Disturbance of natural habitats for spoil/alluvial material	• Limit extraction of material to approved and demarcated quarries and borrow pits; • Stockpile and reuse soils before excavating new soils / alluvium; • Stockpiles shall be compacted as much as practical and not be exposed for extended periods; • Stockpiles shall be reused as soon as practicable; • Storm water shall be diverted around stockpiles.	EPC	During construction
Work in watercourses			
Sediment discharges arising from working in and near the river	• Stabilize works at the end of each working day and prior to storm events; • Do the work during low flow periods; • Works shall be minimized; • Divert the river around the work area where possible; • Culverts shall be placed in access tracks where they cross streams more than 3 meters wide and 0.5 meter deep; • Install sediment control measures to prevent siltation of watercourses.	EPC	During construction
Tunnels			
Contaminants in water discharged from tunnels during construction	• Settlement ponds and /or sediment infiltration devices; • Monitoring immediately upstream and 50 meters downstream of the discharge with a clarity tube to estimate any effects on clarity; for nutrients to detect explosives residue and for pH; • Any discharges to watercourses shall occur during high flow and/or discharged as close to the outfall as possible to maximize mixing; • Spill kits and emergency procedures shall be used for spills of chemicals, fuels and oils and staff trained.	EPC	During construction
Concrete, Cement			
Contaminants in water discharged from concrete	• Settlement ponds and / or sediment infiltration gallery;	EPC	During construction

Impact Summary	Mitigation	Responsible	Timeline
manufacturing, including a rise in pH	• Monitoring immediately upstream and 50 meters downstream of the discharge with a clarity tube to estimate any effects on clarity; for pH to detect alkali discharges; • Any storm water discharges to watercourses shall occur during high flow and/or discharged as close to the outfall as possible to maximize mixing; • Water to be reused where possible in the process; • Procedures for handling of unhydrated cement material and wet cement to avoid spills.		
Maintenance of Construction Equipment and Working Areas			
Reduction of air quality due to emission from poorly maintained equipment and vehicles. Risk of pollution of vegetation and watercourses due to improper disposal of used lubricants and fuels.	• Maintain all equipment in good working conditions • Establish spill prevention procedures; • Ensure that maintenance activities are carried out in approved areas; • Establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for debris; • Onsite burning of debris and wastes shall be prohibited.	EPC	During construction
Flora and Fauna			
Unauthorized access to LNP	• Install fencing around the dam site to prevent unauthorized worker access to LNP forest; • Provide staff to monitor/patrol activities in the LNP buffer zone at the dam site and powerhouse worker camp to ensure no illegal activity by construction workers and to report to LNP; • Engage with stakeholders/partners and LNP management to ensure clear understanding of biodiversity issues and the appropriate implementation of the BMP. • Display of hording boards showing illegal acts (poaching, hunting, etc.) in consultation with LNP. The conservation significance of black bear will be also displayed in the hoarding board.	EPC	During construction
Faunal populations may be adversely affected by direct losses of individuals (e.g. mortality, injury) or modification of habitat.	• Awareness raising among construction workers and site management staff about LNP and threatened species. • Awareness raising among workers about prohibition of extracting or exploiting floral and faunal resources within construction areas or LNP. • Access shall not be permitted in the LNP and this shall be communicated to workers and staff. • Use signage and speed humps in areas where wildlife crossing is likely. • Train vehicle drivers regarding the driving risks through biodiversity sensitive areas and along remote roads.	EPC	Before and during construction
Compensation planting for trees cut in project area	In accordance with the Ministry of Forests and Environment requirements, NWEDC will compensate for the loss of trees on a 2:1 basis in accordance with its PDA agreement and on a 25:1 basis for any additional trees that may be affected during the course of project implementation.	NWEDC	Before and during construction

Impact Summary	Mitigation	Responsible	Timeline
Compensation planting for trees cut in LNP buffer zone	In accordance with Nepal Ministry of Forest and Environment requirements, NWEDC will acquire, reforest, and donate at least 2.6 ha of similar land to be annexed into the LNP to offset the Project's use of parklands.	NWEDC	Before and during construction
Compensation and training for Community Forest User Groups	• Support to the community forest management initiatives as agreed to with the Ministry of Forests and Environment. • Provide training and capacity building for the Community Forest User Groups. • Provide staff to monitor activities in community forests to ensure no illegal activity by construction workers, to identify and discourage any encroachment by camp workers.	NWEDC and EPC contractor	Before and during construction
Destruction of native vegetation and land outside proposed working areas	• Include terms in contracts with EPC contractors indicating that exploitation of biodiversity resources shall result in penal action. • Adopt a Worker Code of Conduct that prohibits unauthorized entrance to LNP or Community Forests.	EPC	Before and during construction
Impacts to fauna and flora by project workers	• Prohibit use of wildlife meat at the worker camps. • Prohibit hunting, fishing, and poaching and the collection/trade of natural or wildlife products by workers. Clearly indicate that these activities could result in the termination of their employment. • Prohibit use of firewood and the burning of vegetation • Provide workers with adequate quantity of cooking fuels such as kerosene and LPG to discourage firewood use	EPC	Before and during construction
Operation Phase			
Impacts to flora and fauna from induced access	• Restrict access to project site for non-project related people by posting guards at access points and implementing patrols; • Engage with stakeholders/partners and LNP management to ensure clear understanding of biodiversity issues and the appropriate implementation of the BMP. • Restrict access to LNP from project site with fencing and patrols. • Monitor attempts to access LNP and adjust fencing and patrols as needed.	NWEDC, O&M contractor	Ongoing
Compensation for tree cutting (see above)	5 years of maintenance of the trees planted as compensation.	NWEDC, O&M contractor	Ongoing for 5 years
Impacts to land and soil	• Routes for movement of operations and maintenance (O&M) vehicle shall be designated to avoid the soil compaction in other areas; • Ensure hazardous waste (used oil, transformer oil, oil soaked cottons) is properly labelled and stored onsite at a location provided with impervious surface, shed and secondary containment system; • Lubricants, oils, grease, and chemicals shall be stored on designated area with impervious surface and containment system; • Solid waste generated from Power House (PH), Dam, and accommodations area shall be collected through proper collection system and stored in designated locations; • Maintenance of vehicles, machineries, and equipment shall be carried out in only designated area; • Random disposal of waste shall not be allowed;	NWEDC and O&M contractor	Before and during operations.

Impact Summary	Mitigation	Responsible	Timeline
	• Appropriate training shall be conducted for all workers responsible for handling hazardous waste; • Sludge generated from STP should be used in garden and landscape.		
Impacts to water resources and quality	• Regular inspections for water leakages and preventing wastage of water from water supply tankers; • Recycling/reusing of water to the extent possible; • No treated/raw sewage shall be discharged to rivers, tributaries etc.; • Water for O&M phase shall be sourced from river; • Spill/leakage clearance plan to be adopted for immediate cleaning of spills and leakages. • Manpower engaged during O&M phase onsite shall be sensitized about water conservation and encouraged for optimal use of water; • Employees shall be given training towards proactive use of designated areas/bins for waste disposal and encouraged for use of toilets. Open defecation and random disposal of sewage will be strictly restricted; • Provision of appropriate drainage shall be implemented along all access roads, quarry site, soil stockpiles and other construction sites; • Packaged sewage treatment plant should be provided for treatment and disposal of wastewater generated from accommodations and office and PH area; • Efficient operation of STP shall be ensured; • Regular monitoring of treated water quality; • Provision of oil and grease trap at vehicle, machinery, and equipment maintenance area and regular upkeep and removal; • Pasture development and afforestation activities in the catchment area.	NWEDC and O&M contractor	During operations.
Impacts to air quality on wildlife and flora	• Vehicles used in O&M Phase shall be regularly maintained and idling time reduced to minimize emissions; • Vehicle exhausts observed emitting significant black smoke in their exhausts will be serviced/ replaced • Regular maintenance of vehicles shall be undertaken.	NWEDC and O&M contractor	During operations.
Impacts from noise on wildlife	Restriction on unnecessary honking.	NWEDC and O&M contractor	During operations.
Increased utilization of roads by traffic associated with operation activities	• Signage and speed humps shall be used in areas where wildlife crossing is likely; • Training shall be provided to vehicle drivers regarding the driving risks through biodiversity sensitive areas and along remote roads.	NWEDC and O&M contractor	During operations.

Table 3-7: Terrestrial Biodiversity Mitigation Measures for UT-1 Transmission Line

Impact summary	Mitigation	Responsible	Timeline
Ecological Impacts-Vegetation Clearing	• Vegetation disturbance and clearance shall be restricted to the Project footprint area; • Unnecessary disturbance of neighboring vegetation shall be strictly prohibited; • Simultaneous revegetation on outskirts of Project activity shall be practiced for areas that are determined to have loose or unstable soil; • Local grass species shall be seeded in disturbed areas during monsoon; • Any disruption to flora to be kept to a minimum and restricted to only the essential area required for construction; • Wherever possible, mature trees to be avoided and use of existing gaps in vegetation maximized; • Education of the workers to respect the local flora and fauna; • Other measures to be taken to reduce dust, noise, control of surface run-off, waste management, etc.	NWEDC/EPC Contractor	During construction
Disturbance to Flora and Fauna	• Construction and transportation activities shall be avoided at night and in peak areas during dawn and dusk; • Areas with pre-existing burrows and ground roosting sites for birds shall be avoided when possible; • Avoidance of construction activities during the breeding season and other sensitive seasons or times of day; • Hazardous materials shall not be stored near natural drainage channels; • Efforts shall be made to minimize construction noise and the use of noise barriers shall be considered for high noise levels; • Waste materials shall be cleared in a timely manner and the use of artificial lights shall be minimized so as to not attract wildlife; • Vehicle movement shall be restricted to only when necessary in areas where wildlife is active; • Anti-poaching and hunting policy shall be strictly enforced; • General awareness regarding fauna shall be enhanced through trainings, posters, etc. among the staff and laborers.	NWEDC/EPC Contractor	During construction
Substation construction	Substation construction sites shall be fenced in order to prevent accidents involving wildlife or local inhabitants.	NWEDC/EPC Contractor	Prior to the commencement of construction activities
Impacts to Birds	• Raise the transmission poles with suspended insulators in order to reduce the electrocution of bird species or fixing insulated caps made of plastic; • Require bird-safe strain poles with insulating chains of at least 60 cm length.	NWEDC/EPC Contractor	During construction

Impact summary	Mitigation	Responsible	Timeline
Bird monitoring	Check for vacuums or holes in the towers to avoid nesting by any of the birds;	NWEDC/ O&M contractor	Regularly
Bird monitoring	Monitor bird carcasses electrocuted on a monthly basis and record any threatened or migratory species observed. Any spurt in mortality will need consideration of design modifications to reduce mortality.	NWEDC/ O&M contractor	Regularly

Table 3-8: Aquatic Biodiversity Mitigation Measures for UT-1 Project

Impact Summary	Mitigation	Responsible	Timeline
Project Design			
Hydrological changes			
Change to flow regimes (water and sediments)	• Design dam to release a minimum environmental flow (EFlows) of at least 3.86 m^3/sec to diversion reach between dam and powerhouse • Dam operation run-of-river (no peaking) • Develop an EFlows Management Plan to explain flow plans	NWEDC, Project Engineer and O&M Contractor	Prior to the commencement of construction activities
Blockage of aquatic fauna (esp. fish) migration up and downstream	• Design fish ladder for snow trout (*Schizothorax richardsonii*) for upstream passage, 1 m^3/sec in fish ladder and 1 m^3/sec attraction flow • Design spillway for downstream fish passage per fish passage design • Design adequate sediment flushing mechanism for minimum environmental damage downstream • Apply fish exclusion device to entrance to headrace tunnel in reservoir to prevent fish from entering intake	NWEDC, Professional fish passage designer, Project Engineer	Prior to the commencement of construction activities
Impacts on fish migration during construction	• Design diversion tunnel to meet the Trishuli River water level during Spring fish migration period to allow fish to pass up and downstream	NWEDC, Project engineers	Prior to the commencement of construction activities
Pre-Construction			
Changes to flow regimes (water and sediments)	• Installation of flow measuring gauges (meter with recording provisions) both electronic and manual measurement basis to measure EFlows	EPC, NWEDC	Prior to the commencement of construction activities
Changes to aquatic habitat and fish migration	• Hire expert fish monitoring advisor to guide mitigation and long-term monitoring program to show NNL • Create a fish research and monitoring team of NWEDC staff, consultants, and university/government researchers	NWEDC, Fish Monitoring advisor, Fish consultants, University researchers, Government researchers	Prior to the commencement of construction activities
Impacts on fish migration	• Develop a fish monitoring plan, which would begin to be implemented prior to the initiation of construction to provide a solid baseline against which to measure Project effects on fish populations • Monitor and study fish migration patterns to guide mitigation	NWEDC, Fish monitoring advisor, Fish consultants?	Prior to the commencement of construction activities
Construction Phase			
Construction impacts on river ecosystem and water quality	• No spoil dumped in river or tributaries • No quarry within 500 m of river and tributaries	NWEDC, EPC contractor	During construction

Impact Summary	Mitigation	Responsible	Timeline
	See Terrestrial mitigation table (Table 3-5) for additional construction measures		
Impacts of workers on aquatic biodiversity	• Prohibit fishing and hunting • Prohibit dumping of waste into river See additional action in Terrestrial Mitigation Table (Table 3-5)	NWEDC, EPC contractor	During construction
Impacts on fish migration	• Monitor fish stranding at base of diversion tunnel in Spring • Trap and truck fish upstream of the dam as needed during migration period • Survey and monitor diversion reach in dry season (twice weekly) to identify barriers to fish movement • Monitor construction of the fish ladder and dam to ensure it is consistent with the SWECO design; and • Develop a more detailed design for the fish guidance mechanism.	NWEDC, EPC contractor, Fish Monitoring advisor, Fish consultants	Regularly during construction.
Operation Phase			
Impacts to fish migration from dam blockage	• Operate fish ladder to ensure effective fish passage • Ensure fish guidance system to direct fish to fish ladder, both upstream and downstream • Ensure the channel in the diversion segment just below the dam leads the fish to the fish ladder entrance; • Establish a flow and temperature monitoring program to optimize fish ladder performance; • Establish a program and train NWEDC staff to monitor and report on the effectiveness of the fish ladder for upstream fish passage and the effectiveness of downstream fish passage measures; • Establish a program and train NWEDC staff to monitor and report on the populations of Common snowtrout upstream of the dam, in the diversion reach, and downstream of the powerhouse relative to baseline conditions; and • Evaluate the effectiveness of the current EFlows program and determine whether further actions are warranted	NWEDC, O&M contractor, Fish Monitoring advisor, Fish contractors?	Before and during operations.
Impacts to fish migration from low flow in diversion reach	• Enhance river channel connectivity as needed to ensure that fish can pass through diversion reach • Survey and monitor diversion reach in dry season (annually and after extreme events) to identify barriers to fish movement • Survey and monitor diversion reach in dry season to identify barriers to fish movement • Modify habitat in diversion reach as needed if barriers are identified • Monitor and prohibit fishing in the diversion reach	NWEDC, O&M contractor, Fish Monitoring advisor, Fish contractors?	Before and during operations.
Impacts on reservoir water quality	• Removal of dead vegetation or debris on regular basis • Regular monitoring of reservoir water quality	NWEDC O&M contractor	Regularly during operations.
Impacts on river fishes by creation of reservoir	• Prohibit introduction of non-native fishes in reservoir • Prohibit fishing in reservoir- or develop reservoir fishing regulations • Prohibit entry to reservoir	NWEDC, O&M contractor	Before and during operations.

Impact Summary	Mitigation	Responsible	Timeline
	• Monitor native fish populations in reservoir		
Impacts to aquatic habitat from low flow in diversion reach	• Manage riparian vegetation and areas where tributaries join the Trishuli river to maintain fish habitat • Monitor water quality, aquatic habitat and fauna	NWEDC, O&M contractor, Fish Monitoring advisor, Fish contractors?	Before and during operations.
Impacts on aquatic and riparian flora and fauna	• Maintain riparian vegetation • Monitor birds using the reservoir • Manage fishing pressures through collaborations with local fishermen and local government	NWEDC, O&M contractor	Before and during operations.
Changes to flow regimes (water and sediments)	• Committed EFlows should be released and records maintained • Monitor to ensure that water is present and flowing in diversion reach at all times • Controlled flushing of sediment from reservoir and desanders	NWEDC	During operations.
Emergencies due to flow regime	• Implementation of emergency response plan in case of flash flood, cloud burst, etc. • Warning system on water level fluctuation must be installed at major locations/communities downstream of the proposed dam site	NWEDC, O&M contractor	During operations.
All impacts	Share the knowledge gained about the interaction between the HPP and S. richardsonii in English and Nepalese on the project website on an annual basis, so that interested stakeholders can learn from the Project's experience with: • Fish ladder attractivity and efficiency • Use of the diverted reach for spawning • Downstream migration mortality • Desander operation influence • Adaptive management measures • Impacts of neighbouring HPPs	NWEDC, O&M contractor, Fish Monitoring Advisor, NWEDC Fish Monitoring Team	During operations.
Adaptive Management			
Impacts on river connectivity by low flows in diversion reach	• Monitor aquatic habitat, river connectivity (barriers) and fish migration through diversion reach and fish passage (See also Table 3.9) • Modify habitat in diversion reach as needed if barriers are identified	NWEDC, O&M contractor	During operations.
Biodiversity Offset			
Impacts on fish migration	Monitor and study snow trout migration patterns at another site to provide information on migration timing, cues, river conditions, etc.	NWEDC Fish monitoring advisor Fisheries department	Before and during operations.

Table 3.9 presents a list of the preliminary monitoring indicators and metrics to demonstrate No Net Loss of Biodiversity for the UT-1 Project as required by IFC's PS6. The monitoring plan and metrics will be finalized and guided by the Fish Monitoring Advisor and adjusted as needed throughout the life of the project.

Table 3-9: Draft Biodiversity Evaluation and Monitoring Plan (BEMP) for UT-1

Project Impact	Measure of No Net Loss	Possible Adaptive Management	Responsibilities/ Institutional Arrangements
Terrestrial			
Terrestrial offset: Afforestation of degraded forest land in LNP	• Monitor survival of planted tree species and maintenance of floral diversity within 2.61 ha offset site in LNP as compared to control site in LNP.	• If survival rates of planted trees are low then replanting procedures need to be reviewed and further replanting needs to be carried out	NWEDC/O&M contractor, LNP, Forest Department
Terrestrial offset: Afforestation of degraded forest land in Forest Department land	• Monitor survival of planted tree species and 5 years of maintenance of floral diversity in 81 ha planted as compensation	• If survival rates of planted trees are low then replanting procedures need to be reviewed and further replanting needs to be carried out	NWEDC, O&M contractor, Forest Department
Induced access to LNP from project related roads and reduced river flow	• Monitor attempts to access LNP in and around the project site	• If people are documented accessing LNP from the project site, additional security and protection measures will be needed such as increased fencing or patrols	NWEDC/O&M contractor, LNP, Forest Department
Impacts to birds from Transmission Line	• Check for vacuums or holes in the towers to avoid nesting by birds • Monitor bird mortality from electrocution or collision with power lines on a monthly basis and record any threatened or migratory species observed.	• Any spurt in mortality will need consideration of mitigation actions such as bird diverters and insulators	NWEDC/ O&M contractor
Aquatic			
Loss of aquatic habitats, fish diversity and abundance from altered EFlows and anthropogenic pressures	• Monitoring of Common snowtrout abundances as compared to baseline values in project area, particularly within diversion reach • Monitoring of other aquatic biodiversity indicators of ecological integrity such as habitat condition and health of indicator ecological community, macroinvertebrates, mammals • Methods, metrics and thresholds to be determined by Fish Monitoring Advisor	If either Common snowtrout abundance or proxy indicators for ecological integrity decline past set thresholds, actions will be taken to determine and address the cause, such as enhancement of aquatic habitat, addressing external threats (e.g. fishing, pollution), and modifying river bed.	NWEDC. Fish Monitoring Advisor, NWEDC Fish Monitoring Team (may include Fisheries Department/DNPWLS LNP/Tribhuvan University), O&M contractor

Project Impact	Measure of No Net Loss	Possible Adaptive Management	Responsibilities/ Institutional Arrangements
Impacts on snow trout spawning sites	• Monitoring of snow trout through fry and fingerling abundance at spawning sites • Subsequent to the spring migration targeted spawning sites shall be monitored annually for Common snowtrout fry and fingerling abundance. • Methods, metrics and thresholds to be determined by Fish Monitoring Advisor	If metrics decline beyond thresholds then causes (e.g. impaired migration, pollution, sand mining) for the declines will be evaluated and actions taken to minimise the causes	NWEDC. Fish Monitoring Advisor, NWEDC Fish Monitoring Team, O&M contractor
Deviation of EFlows from established EFlows regimes	• Aligning to established EFlows regimes with ecological requirements through intensive monitoring • Installation of flow measuring gauges (meter with recording provisions) both electronic and manual measurement of EFlows • Snow trout tagging and sampling in the diversion reach for first 5 years of operation to determine whether upstream migrating Common snowtrout are able to reach the UT-1 fish ladder at the dam. • Surveys to evaluate diversion reach to ensure no barriers or obstacles exist to upstream migration under minimum EFlows conditions • Methods, metrics and thresholds to be determined by Fish Monitoring Advisor	If EFlows are not adequate for movement of snow trout and other fish through the diversion reach, mitigation actions may be needed to improve connectivity such as improvement of river bed channels and removal of blockages. If EFlows are not consistently be released by dam according to EFMP, adjustments or penalties will be required.	NWEDC. Fish Monitoring Advisor, NWEDC Fish Monitoring Team, O&M contractor
Blockage to fish migration upstream	• Quantification of Common snowtrout passing through fish pass (downstream and upstream) to determine it is effective, methodology to be developed by Fish Monitoring Advisor and may include fish counters or camera and fish tagging	Based on the monitoring data, if fish passage is deemed inadequate to maintain viable populations along the impacted river stretch, design modifications to the fish ladder may be needed (where possible) or inlet flow modifications	NWEDC. Fish Monitoring Advisor, NWEDC Fish Monitoring Team, O&M contractor
Increased external pressures on aquatic biodiversity due to improved access to the river and low water flow	• Monitor measures of external pressures including fishing pressure (number of fishermen, nets, lines, etc.), sand/gravel mining, and pollution. • Methods, metrics and thresholds to be determined by Fish Monitoring Advisor	If thresholds are exceeded, additional mitigation may be needed to restrict and regulate fishing, mining and other uses of the river.	NWEDC. Fish Monitoring Advisor, NWEDC Fish Monitoring Team, O&M contractor

Project Impact	Measure of No Net Loss	Possible Adaptive Management	Responsibilities/ Institutional Arrangements
Changes to physico-chemical parameters in the Trishuli River and consequent changes to biodiversity	• Regular monitoring of reservoir water quality, metrics thresholds to be set by NWEDC and Fish Monitoring Advisor • Aligning to the ESMMP to reduce erosion, sedimentation, contaminant concentration	If any of the parameters exceed permissible thresholds, as established from regular and routine monitoring, operational procedures will need to be reviewed and modified	NWEDC, O&M contractor
Reservoir creation and water quality	• Regular monitoring of reservoir water quality, metrics thresholds to be set by NWEDC and Fish Monitoring Advisor	If reservoir water quality drops below set thresholds, actions to clean reservoir or adjust water flow in reservoir may be needed.	NWEDC, O&M contractor
Reservoir creation impacts on flora and fauna	• Monitor birds and other fauna using the reservoir • Monitor riparian vegetation • Monitor native fish populations in reservoir. • Methods, metrics and thresholds to be determined by Fish Monitoring Advisor	If metrics drop below set thresholds, actions to clean reservoir or adjust water flow in reservoir may be needed.	NWEDC. Fish Monitoring Advisor, NWEDC Fish Monitoring Team

4. INDIGENOUS PEOPLES PLAN AND CONSULTATION

As indicated in the Final Updated ESIA, the UT-1 Project will affect Indigenous Peoples and triggers the need for obtaining Free, Prior, and Informed Consent (FPIC), pursuant to IFC Performance Standard 7 (Indigenous Peoples) and the ADB Social Safeguard for Indigenous Peoples. As a result, the UT-1 Project ESAP included the following requirement:

> "NWEDC shall seek consent from affected IP communities for a draft package of project mitigation measures and benefits (an Indigenous Peoples Plan [IPP]) prior to commencement of the main phase of project construction. Once consent has been achieved, the Company will provide for full implementation of the agreement(s), including a suitable monitoring and evaluation mechanism that will be agreed to between NWEDC, affected IP community representatives and GoN representatives during the FPIC deliberations."

4.1. FPIC PROCESS

NWEDC has undertaken a six-month supplemental consultation process, which builds on the past five years of ongoing engagement with the Project-affected Indigenous Peoples (IP) communities, to obtain their consent for the UT-1 Project. The FPIC process was guided and facilitated by an international social expert from the social development consulting firm Cross-Cultural Consulting Services (CCCS) and by NEFIN, Nepal's leading Indigenous Peoples Organization, and incorporated a shared tripartite (NWEDC, community, local government) decision-making approach for Indigenous Peoples Plan (IPP) creation and aimed at development of a mechanism for joint management of IPP implementation and its embedded Grievance Redress Mechanism (GRM). The process was carried out via the following steps:

Table 4-1: FPIC Process Steps

Step No.	Timeframe	Process Description
Step 1 Project Disclosure	June 2018	ESIA and related plans disclosed to members of the original 9 project-affected villages (including those in IDP camps).
Step 2: Village Mobilization and Representatives Selection	June 2018	IPO (NEFIN mobilized villages to inform them about the FPIC process and the IPP and to facilitate their selecting representatives from various social strata to ensure community social inclusion on a UT-1 Adibasi Janajati Advisory Council (AJAC).
Step 3: Local Government and NWEDC WG representatives selected	June 2018	IPP partners selected representatives to join in a collaborative UT-1 Adibasi Janajati FPIC & IPP Working Group (WG) to manage the IPP/FPIC process. Local governments chose 3 members to serve on the WG (one from each of the three Wards in which the villages are located) and 2 ex-officio members were appointed from NWEDC.
Step 4: UT-1 Adibasi Janajati Advisory	June 2018	Village representatives were educated about the project, the IPP preparation process and the FPIC process. They selected 2 members from each village (one woman, one man) to

Step No.	Timeframe	Process Description
Council Meeting #1		serve on a Working Group while FPIC and IPP capacity building was conducted by NEFIN.
Step 5: UT-1 Adibasi Janajati FPIC & IPP Working Group Meeting #1	June 2018	(i) clarification of the roles of the AJAC vs. the WG, (ii) determination of the consent process, approval of a Consent Process Agreement (CPA), (iii) direct discussion with NWEDC of outstanding project issues.
Step 6: Participatory Social Mapping	July 2018	To confirm the social impact assessment and related studies conducted for the ESIA and other project planning documents, a Participatory Social Mapping was carried out by NEFIN with the support of members of the AJAC. This Social Mapping combined a Village Profile with a needs assessment, which helped inform the contents of this IPP.
Step 7: Consultations Round 1	July 2018	Community Priorities: presentation by NEFIN of results of Participatory Social Mapping and discussion of possible mitigation, benefits and management structure in an IPP; collection of concerns and requests for draft IPP.
Step 8: Nesing Added as a Tenth FPIC Village	August 2018	Mobilization of Nesing Villagers, Participatory Social Mapping (PSM) activities, and selection of representatives to AJAC and WG, raising their total number of members to 85 and 20 (villagers), respectively.
Step 9: UT-1 AJAC Meeting #2	Sept. 2018	Consolidation of IPP priorities based on Consultation Round 1 and Participatory Social Mapping.
Step 10: UT-1 Adibasi Janajati FPIC & IPP Working Group Meeting #2	Sept. 2018	Confirmation of selection of IPP Programs; local government (Ward Chairs) join the process; instructions for IPP writing relayed to CCCS; confirmation of CPA.
Step 11	Sept. 2018	Drafting/revising of IPP based on Consultation Round 1 input
Step 12: Consultations Round 2	Oct. 2018	IPP Confirmation: submission of detailed Plan with proposed components, management structure and total budget to 10 villages by NEFIN.
Step 13: Revision of Draft IPP	Oct. 2018	Revision of Draft IPP by CCCS based on community inputs as gathered by NEFIN. Disclosure of revised IPP #2 to communities.
Step 14: UT-1 Adibasi Janajati FPIC & IPP WG Meeting #3: Process Decision Point	Oct. 2018	Reviewed latest revisions to IPP and made adjustments; determined another consultation round was not needed; conducted mediation with NWEDC on a demands framework agreement to resolve outstanding issues.
Step 15: UT-1 Adibasi Janajati Advisory Council Meeting #3:	Oct. 2018	The consent process was carried out seeking approval for i) the revised IPP (FPIC Draft #3), ii) the Demands Framework Agreement, and iii) a document spelling out three-sided implementation arrangements by AJAC community representatives, the three local Ward governments, and the Company. A Consent Statement was approved by acclamation and signed by all

Step No.	Timeframe	Process Description
Consent Decision		71 AJAC members present and voting.
Step 16: Consent Statement Consecration and Turnover to NWEDC	Nov. 2018	Formal Consent was granted by the community for both the Project and the IPP by means of a puja carried out by lamas and bonpo (shamans) wherein the Company received the signed Consent Statement.
Step 17: IPP Implementation	Pending Financial Closure	When Project Financial Closure is obtained, NWEDC will initiate IPP implementation under tripartite supervision to ensure that each party fulfils their commitments.

4.1.1. FPIC Process Consultations

During the FPIC process outlined above, the following separate and dedicated consultation rounds were held with the project-affected Villages:

- June 2018: NEFIN mobilizers visited the original nine FPIC villages (either at the original site or in the displaced persons camps) to inform villagers about the project, the FPIC process, and the IPP. At these meetings, village representatives were selected to join the AJAC. As described in the IPP, NEFIN (both central and local), local villagers, and consultants held a meeting in May, prior to the June selection meetings, to determine the makeup of the village AJAC representatives (e.g., number of women representatives, number of poor representatives), who were then formally selected in June.
- July 2018: NEFIN mobilizers, working closely with the village representatives on the AJAC carried out the Participatory Social Mapping and gathered PAP recommendations for the IPP in the then nine FPIC villages.
- July/August 2018: NEFIN carried out the First Round of Consultations with those from the nine villages, gathering specific recommendations from each village for the IPP as to Project benefits and mitigation measures. These recommendations were incorporated into the IPP PAP/FPIC Draft #1. At the end of August, special consultations were held with Nesing village to bring them into the FPIC process. A summary of additional information collected for Nesing Village is provided in Attachment 3.
- September/October 2018: NEFIN carried out the Second Round of Consultations with those from the now ten FPIC villages to gather their feedback on the disclosed IPP PAP Draft #1.
- October/November: This feedback produced IPP FPIC Draft #2 which was disclosed to the communities and the WG prior to the Third AJAC's consent decision.

4.1.2. Participatory IPP Development Process

A community-led participatory approach was adopted for the development of the IPP to ensure a planning and decision-making process which provided an opportunity for often disenfranchised groups to be heard. The Participatory Social Mapping (PSM) was conducted for all affected villages led by AJAC members in their respective villages with the aim to collect the data on

community layout, infrastructure, demography, health and other socioeconomic patterns which would further serve as a village profile to guide the AJAC and community members for listing the community priorities to be included in the IPP.

After the PSM, the village profile and situation report were discussed with community members prior to the development of a village-level IPP which provided the basis for a needs analysis and the setting of priorities for the IPP. As a result of the series of consultations with community people, AJAC and Working Group, the Tamang villagers' priorities were documented in three batches: a) village-level demands, b) village-level IPP preferences, and c) village-level infrastructure priorities. The participatory approach facilitated community ownership and thus helped to build a strong basis for ongoing involvement and felt accountability towards the IPP. NEFIN facilitated the entire process of community-level planning and development of the IPP.

4.1.3. Achieving Consent and Its Supporting Documents

During the Third WG and AJAC Meetings held 30 October till 1 November, the 71 community representatives approved three documents:

- *Statement of Consent for the UT-1 Project and the UT-1 IPP*. This is the key document granting the ten FPIC villages' consent (via their AJAC representatives) to both the UT-1 Project construction and to the UT-1 IPP. Note that although the FPIC process had been aiming all along for consent for the IPP only, the AJAC delegates decided that they also consented to the project itself. Signed by 71 of the 85 AJAC members (all of those who were present for the AJAC meeting).
- *UT-1 Tripartite Agreement for IPP Implementation.* In this innovative document, the Company, the AJAC and the three Ward Chairs all agreed on their joint responsibilities to implement the IPP. All three partners signed the Agreement.
- *A Framework Agreement for Consensus Agreement Relating to Community Demands Presented by the UT-1 FPIC & IPP Working Group*. This document contained NWEDC's pledge to engage in a process of dialog to respond to the multiple demands brought during the FPIC consultations.

4.1.4. Partner Input Requirements

The three partnering entities for the UT-1 IPP are NWEDC, local governments (the three most affected Ward Chairs), and the local communities. Each will contribute in its own way to Plan implementation according to agreements discussed during the consultation process under way between June and October 2018 and summarized in the UT-1 IPP Tripartite Implementation Agreement (Attachment 1: Indigenous Peoples Plan). At a minimum, inputs from the partners would include the following:

- NWEDC: The Company will finance the IPP according to a fixed budget over the five-year duration of the first IPP. The Environmental and Social Management Cell (ESMC) of NWEDC to be established for this Project will work with the IPP governing bodies established in the IPP to coordinate activities for both mitigation efforts and benefits

sharing. At present, there are two Community Liaison Officers (CLOs) engaged at the project site, one of whom is from a project-affected Tamang family. In addition to this, NWEDC will recruit a female Tamang communication officer at the time of IPP implementation after Financial Close. This internal institutional structure will be further strengthened as necessary through engagement of experts/scholars working with the Tamang community or NGOs working in the area.

- Local Government: The three Ward governments in which the 10 IPP villages are located will participate in the governance bodies of the IPP and help coordinate IPP activities with local government plans and programs.
- Indigenous Peoples of the Affected Communities: Members of the 10 IPP villages shall serve on the IPP governance bodies (AJAC, the Governing Board [GB], and the Program Committees [PC]) and shall both receive and contribute information on how the Plan is operating and provide feedback on the Project's progress. These villagers will directly participate in Plan co-management and supervision.

The IPP includes a provision for an ex-officio representatives of NEFIN on the Governing Board, including one representative each from the NEFIN Central and NEFIN District Committees.

4.2. IPP GOVERNANCE STRUCTURE

IPP implementation will be carried out with the active participation of affected IP communities and will be overseen by a GB and an Executive Committee whose work will be supplemented by project committees and an NWEDC IPP support unit. The GB (composed of representatives from the three Plan partners discussed above, and NEFIN - one representative each from the NEFIN Central and NEFIN District Committees) will serve as the chief management oversight body for the implementation of the IPP. The makeup and replacement procedures for members of the IPP Governing Board are clearly defined; however, although there is an understanding that the Council will continue to represent the interests of the villagers in their interaction with the NWEDC, this should be formalized into an agreement.

The first round of IPP implementation is planned over the five-year project construction period. The members of the AJAC, Local Government representatives, and NWEDC have agreed to enter into this mutually beneficial partnership arrangement to co-supervise and co-oversee IPP implementation.

The AJAC represents the broadest representation of Project-Affected Persons, households, communities, and thus serves as the highest body in the UT-1 IPP governance process. Broadly representative of the ten FPIC villages, the AJAC will conduct an annual meeting to review the year's governance body reports and to advise on the future year's budget and Plan implementation. It will issue guidance to the Governing Board (including recommendations as to measures to implement evaluation report suggestions), which will in turn ensure that the general instructions received from the AJAC are indeed implemented by IPP governance bodies. AJAC representatives will be selected during village meetings similar to those held in June of 2018 for

the FPIC process. They will serve a term of 2.5 years with those members elected in June 2018 carrying over their service for the first half of the First IPP's implementation period.

Progress reports will be issued by UT-1 on a quarterly basis prior to meetings of the Governing Board and monitoring reports (internal and external) will be issued at regular intervals. The IPP partners will establish an internal monitoring team to conduct monitoring activities.

In addition, project affected persons will be provided with access to a grievance mechanism formulated specifically for the UT-1 IPP. This mechanism is aimed at allowing all IPP stakeholders to communicate any concern or grievance in a format which is convenient to them.

5. SUPPLEMENTAL GROUNDWATER ANALYSIS

The UT-1 Project will install an underground tunnel beneath the northwest slope of the Trishuli River valley that roughly parallels the course of the river. There are 46 unique springs (or seeps, referred herein as 'water-points') in the region of the proposed Project, some which are used for drinking purposes, irrigation, and animal feeding.

The construction of the UT-1 Project has the potential to cause groundwater drawdown, which could affect some of the springs in the area that are used by local communities. In order to determine the drawdown risk, a screening-level assessment with the objective of ranking springs and risks was performed. The Drawdown Hazard Index (DHI, Dematteis et al. 2001) was used to calculate the potential risks of drawdown of any of the water-points that might be affected by Project construction. This assessment identifies drawdown risk ratings for the individual springs.

5.1. DRAWDOWN HAZARD INDEX (DHI)

The DHI identifies possible vulnerable water-points using a mathematical formulation. The variables in the formulation are the geologic and hydrologic conditions that a specific water-point experiences and the final DHI Risk score is the probability that that water-source will or will not experience drawdown.

System variables include:

- Fracture Frequency (FF) – the volumetric joint count (Jv) that is derived from the number of fractures per linear meter (λ) for the discontinuity sets;
- Rock Mass Permeability (MK) – describes the overall permeability of lithological units including discontinuities;
- Overburden (OV) – depth of overlying material; and
- Plastic Zone Radius (PZ) – the width of the effected zone of the excavation of the tunnel on the surrounding material as to degrade that material by creating new fractures and discontinuities.

These variables interact and influence each other in a natural setting, for this reason a normalized global interaction matrix was used to determine and assign weights to the system variables (Dematteis et al. 2001).

The Potential of Inflow Index (PI) is the sum of the weighted system variables by the parameters assigned to those variables through a study of the system. The PI is calculated for a given tunnel section.

$$PI = \frac{(41 \times FF) + (22 \times MK) + (17 \times OV) + (20 \times PZ)}{100}$$

The DHI is then calculated for a specific water-point on the surface using the PI of the tunnel section and adjusting for additional variables.

The adjustment factors are:

1. Intersection of Main Faults (IF) – defines if water-points are affected by elements of elevated permeability.
2. Spring Type (ST) – source or water: surface, deep, or mixed.
3. Distance from Tunnel (DT) – in meters.

$$DHI = \frac{(41 \times FF) + (22 \times MK) + (17 \times OV) + (20 \times PZ)}{100} \times (IF + 1) \times (ST + 1) \times (DT + 1)$$

5.2. RESULTS AND CONCLUSIONS

DHI values associated with each water-point indicate that all forty-six of the springs are rated at having low or medium risk of partial drawdown, with no water-points receiving a negligible or high risk warning (See Figure 5-1 below). The data used is shown in Table 5-1 below, as are the results of the risk assessment at each location.

- Negligible: DHI <0.2 null to minimal drawdown (high probability)
- Low: 0.2< DHI <0.6 Partial drawdown
- Medium: 0.6 < DHI < 0.7 Partial to complete drawdown
- High: DHI > 0.7 Complete Drawdown (high probability)

Figure 5-1: DHI Risk Assessment Overall Results

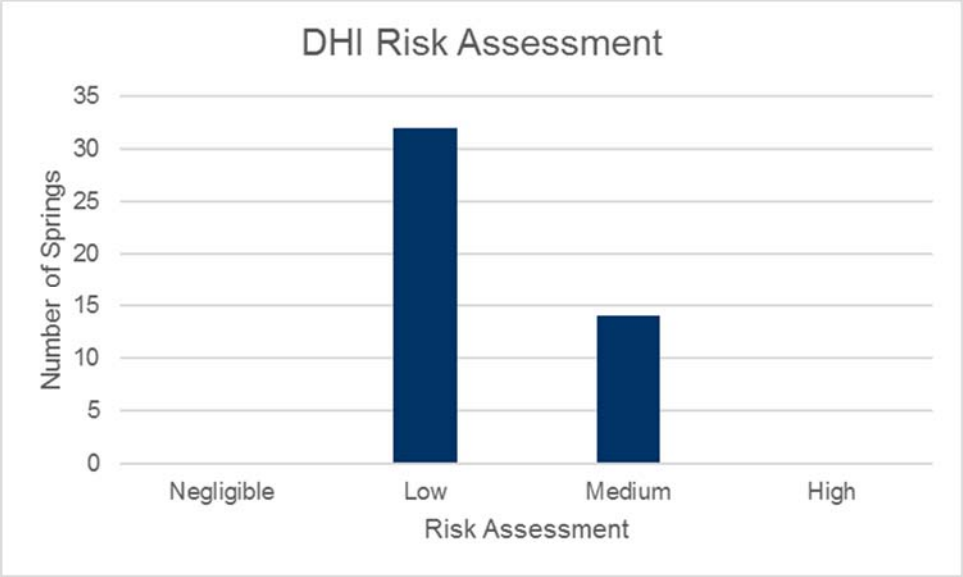


Table 5-1: DHI Values and Risk Assessment Results at each Location

Water-point	DT (Distance from the tunnel)		IF (Intersection with major faults)		ST (Spring type - deep or shallow)		FF (Frequency of Fracturation)		MK (Degree of Permeability)		OV (Overburden)		PZ (Amplitude of the Pastic Zone)		DHI Vaule	Risk Assessment
	Measurement (m)	DHI Value	Measurement	DHI Value	Measurement	DHI Value	Measurement (λ)	DHI Value	Measurement	DHI Value	Measurement (m)	DHI Value	Measurement	DHI Value		
Budget form Mul	569.536	0.2	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	393	0.1	~10	0.30	0.395775	Low
Bhatermul	562.423	0.2	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	338	0.1	~10	0.30	0.395775	Low
#3 Bhatermul	212.272	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	137	0.25	~10	0.30	0.515288	Low
Nagh Dhungamul	325.656	0.4	No	0	Superficial	0	1.67 to 5	0.1875	Low	0.30	317	0.1	~10	0.30	0.307825	Low
Gumboatingmul	323.501	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	192	0.25	~10	0.30	0.515288	Low
Kulumul	194.385	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	151	0.25	~10	0.30	0.662513	Medium
Thankukola mul	174.252	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	154	0.25	~10	0.30	0.662513	Medium
Wamrang mul	254.768	0.4	No	0	Superficial	0	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.343525	Low
Besimul	288.205	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.515288	Low
Unidentifed mul #1	214.717	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	172	0.25	~10	0.30	0.515288	Low
Unidentifed mul #2	214.717	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	172	0.25	~10	0.30	0.515288	Low
Fulbarimul	125.843	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	137	0.25	~10	0.30	0.662513	Medium
Peepal botmul	173.182	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	152	0.25	~10	0.30	0.662513	Medium
Prajomul	137.946	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	188	0.25	~10	0.30	0.662513	Medium
Majhowamul	162.035	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	137	0.25	~10	0.30	0.662513	Medium
Gansingmul	123.023	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	137	0.25	~10	0.30	0.662513	Medium
Chitaumul	185.991	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	200	0.25	~10	0.30	0.662513	Medium
ThuloDhungamul	424.749	0.2	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.441675	Low
Manchumul	1559.627	0	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.368063	Low
Mnchu mul-2	551.562	0.2	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	154	0.25	~10	0.30	0.441675	Low
Mnchu mul-3	648.761	0.1	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	154	0.25	~10	0.30	0.404869	Low
Ghattekholamul	658.186	0.1	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	151	0.25	~10	0.30	0.404869	Low
Panglingkholamul	1890.013	0	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	192	0.25	~10	0.30	0.368063	Low
Sano hakumul	996.211	0	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.368063	Low
Chanchane mul-1	710.201	0.1	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	465	0.1	~10	0.30	0.362794	Low
Chanchane mul-2	712.992	0.1	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	465	0.1	~10	0.30	0.362794	Low
Amchuroamul	10373.373	0	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	75	0.5	~10	0.30	0.431813	Low
Thangachuebamul	505.208	0.2	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	71	0.5	~10	0.30	0.518175	Low
Kulmowamul	342.376	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	137	0.25	~10	0.30	0.515288	Low
Bhumedhanmul	353.330	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	215	0.1	~10	0.30	0.461738	Low
Milisongmul	277.353	0.4	No	0	Superficial	0	1.67 to 5	0.1875	Low	0.30	287	0.1	~10	0.30	0.307825	Low
Kakasongmul	249.075	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	170	0.25	~10	0.30	0.515288	Low
Gulunglungmul	159.202	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.662513	Medium
Gulunglung mul-2	162.005	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.662513	Medium
Gulunglung mul-3	162.800	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.662513	Medium
Chirwatikhola mul	153.479	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	170	0.25	~10	0.30	0.662513	Medium
chirwati mul	145.851	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	170	0.25	~10	0.30	0.662513	Medium
Thungbar mul	538.623	0.2	No	0	Superficial	0	1.67 to 5	0.1875	Low	0.30	229	0.1	~10	0.30	0.26385	Low
Garuwa mul	458.106	0.2	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	137	0.25	~10	0.30	0.441675	Low
ThuloDhunga mul	311.910	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	131	0.25	~10	0.30	0.515288	Low
Thangachanwameri m	239.857	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	137	0.25	~10	0.30	0.515288	Low
Ghattekholamul	159.320	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	123	0.25	~10	0.30	0.662513	Medium
Ghattekhola mul-2	209.182	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	123	0.25	~10	0.30	0.515288	Low
Khuleamul	475.661	0.2	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	56	0.5	~10	0.30	0.518175	Low
Chiuribotmul	331.783	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	141	0.25	~10	0.30	0.515288	Low
Bhakchung Khola	1587.745	0	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	297	0.1	~10	0.30	0.329813	Low

This risk assessment is driven by geological and hydrogeological factors, and does not take into consideration potential risks to communities (e.g., springs providing water to villages) into the risk rating. Figure 5-2 shows the location and risk rating of each spring relative to local communities.

These data indicate that several of the Medium Risk rated springs are used for agricultural use and serve as a source of domestic water for some villages:

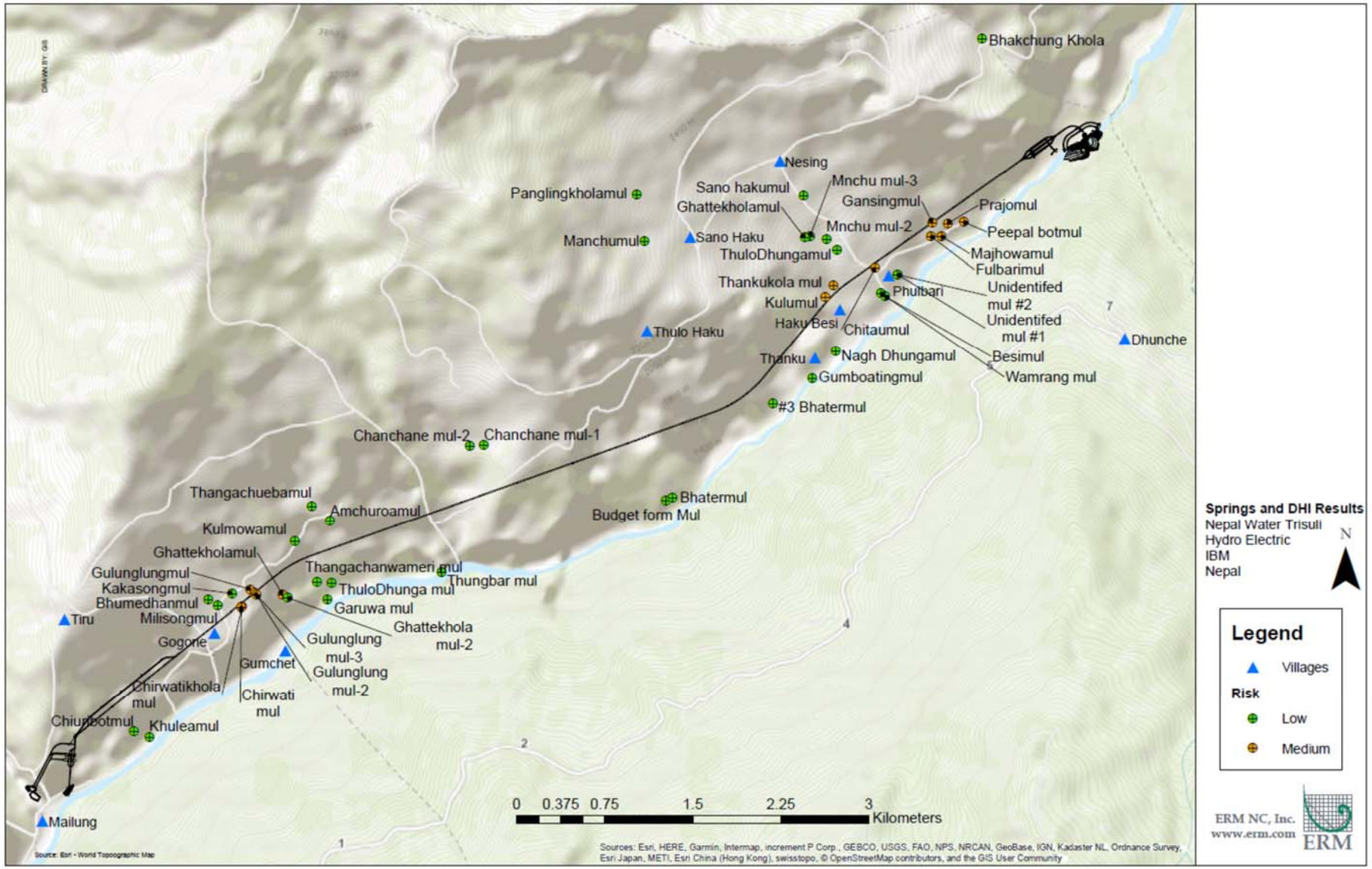
- Thanku – Springs #6 and 7
- Phulbari – Springs #12, 13,14,15, and 16
- Haku Besi – Spring #17
- Gogone – Springs #33, 34, 35, 36, 37, and 42

NWEDC indicates that it will grout the tunnel when construction encounters any significant groundwater seepage, which should reduce the potential for the UT-1 Project affecting any springs relied on by local villages.

5.3. RECOMMENDATIONS/ NEXT STEPS

NWEDC will monitor flow on a monthly basis in the medium risk rated springs during tunnel construction to detect if the project tunneling is affecting the flow in springs. If a change in flow is detected during construction that cannot be attributed to changes in precipitation, then NWEDC will inspect the tunnel and provide supplemental grouting. If supplemental grouting does not mitigate the impact, NWEDC will provide alternative water supply for the affected households.

Figure 5-2: Location and Risk Rating of Each Spring Relative to Local Communities



6. SUPPLEMENTAL CUMULATIVE IMPACT ASSESSMENT

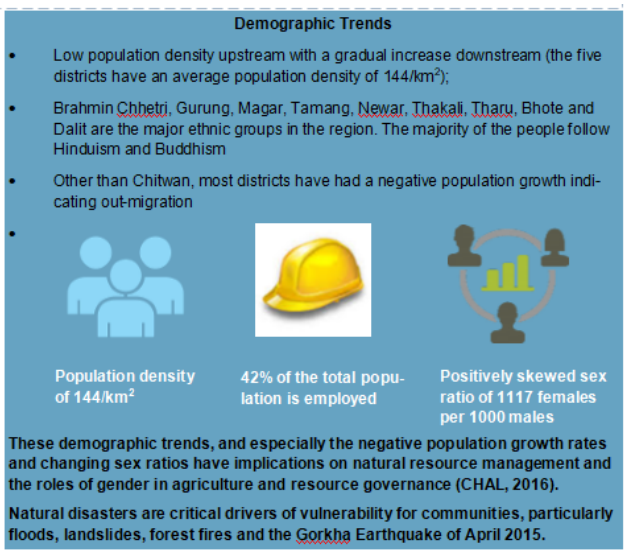
The following is a summary of the Trishuli River Basin Cumulative Impact Assessment. The IFC funded the development of this Cumulative Impact Assessment (CIA) in part to evaluate the contribution of the UT-1 Project to cumulative impacts in the basin, but also to promote cooperative management of important basin resources. Once the CIA is reviewed and cleared by the CIA stakeholders, the IFC will disclose the full CIA under the Sustainable Hydropower Advisory website.[4]

6.1. INTRODUCTION

The Trishuli River Basin (the "basin") covers an area of 32,000 km² across the Central Development Region of Nepal and comprises approximately 13% of the Gandaki River Basin. The Trishuli River originates in the Trans-Himalayan Zone within the Tibet Autonomous Region of the People's Republic of China. The Trishuli River cascades downwards from an altitude of 2600 m into Nepal at the Rasuwa Pass (Rasuwa district). It continues its descent for 130 km through high-altitude mountains (Nuwakot, Dhading and Gorkha districts) before joining the Kali Gandaki River at Devighat (Chitwan district).

Figure 6-1: Overview of the Trishuli River basin

Features	Description
Catchment Area	6624.7 km² up to the confluence with Budhi Gandaki River
Physiography	• Varied spatial distribution across mountains of Trans Himalaya and Higher Himalaya to the Middle Hills and the Siwalik range; • Steep and fragile geomorphology makes the area vulnerable to natural disasters
Hydrology	Spatial distribution varies across physiographic zones creating micro climates that affect annual water availability. Springs are a major source of water
Key Biodiversity Areas	• Langtang National Park and buffer area of Shivpuri National Park; • Migratory route for aquatic fauna and flyways for migratory birds; • Link protected areas in the north with Shivpuri National Park towards the east and Chitwan National Park towards the South
Livelihood Patterns	Main economic activities include forestry, agriculture and participation in tourism-related activities from rafting and religious sites



Source: Adapted from information obtained in the CHAL Strategy (2016) and Dandekhya, S., England, M., Ghate, R., Goodrich, C. G., Nepal, S., Prakash, A., Shrestha, A., Singh, S., Shrestha, M.S., Udas, P. B. (2017) The Gandaki Basin – Maintaining livelihoods in the face of landslides, floods, and drought. HI-AWARE Working Paper 9.

There are six (6) operational hydropower projects along the Trishuli River and its major tributaries that total 72 megawatts (MW). In addition, seven (7) hydropower projects (total of 286 MW) are under construction and at least 23 hydropower projects are in the planning stage

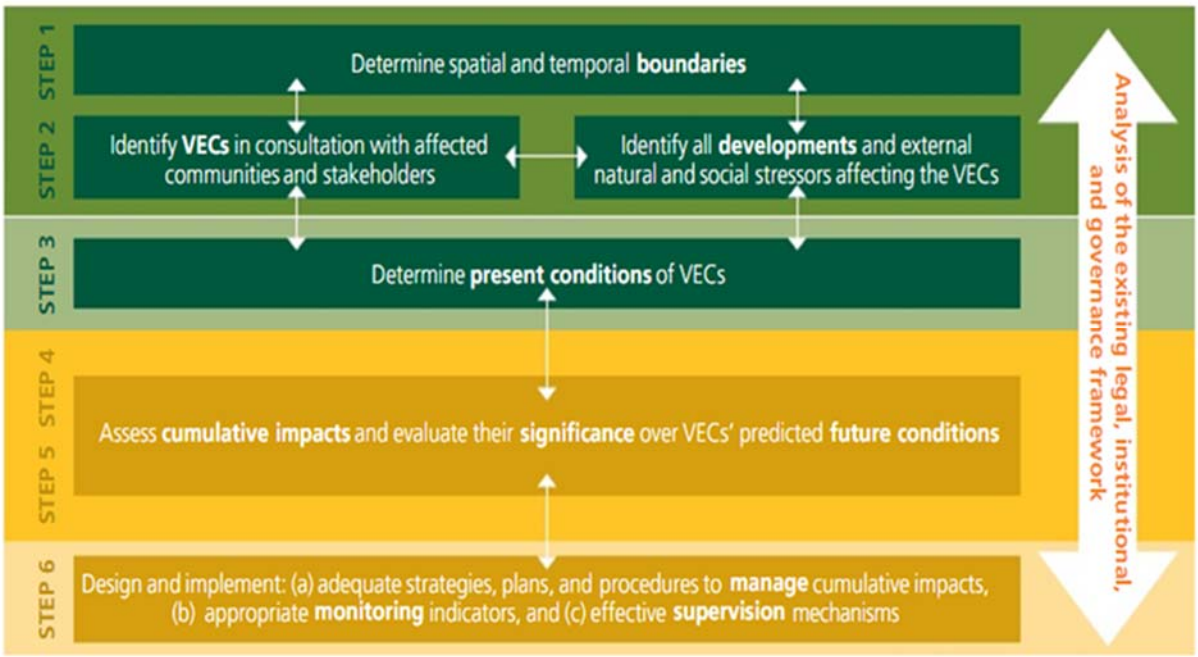
[4] https://www.ifc.org/wps/wcm/connect/Industry_EXT_Content/IFC_External_Corporate_Site/Hydro+Advisory

with survey licenses being issued by the Department of Electricity Development (DoED, June 2018).

Cumulative impacts of operational hydropower projects; such as aquatic habitat fragmentation, degradation of the catchment area, reduced water availability, and an increased risk of landslides; are already evident in the basin (ESSA, 2014)[5]. In April 2015, Nepal suffered a major earthquake which further altered environmental and social conditions (SESIA, UT1 2018). While hydropower developers have prepared environmental impact assessments (EIAs) for specific projects within the basin, there have been limited efforts to provide a basin-level understanding of cumulative impacts to Valued Environmental and Social Components[6] (VECs) in the context of multiple hydropower projects acting in concert with the altered baseline conditions and other stressors.

The CIA follows the 6 step process provided in Figure 6-2 as per the IFC Good Practice Handbook for Cumulative Impact Assessments.[7]

Figure 6-2: Six Step Process for CIAs as per IFC Good Practice Handbook



5 http://essa.com/wp-content/uploads/2014/01/Essa_Project_Sheet-Nepal.pdf

[6] Valued Environmental and Social Components (VECs) are defined as fundamental elements of the physical, biological or socio-economic environment, (including the air, water, soil, terrain, vegetation, wildlife, fish, birds and land use) that are likely to be the most sensitive receptors to the impacts of a proposed project or the cumulative impacts of several projects.

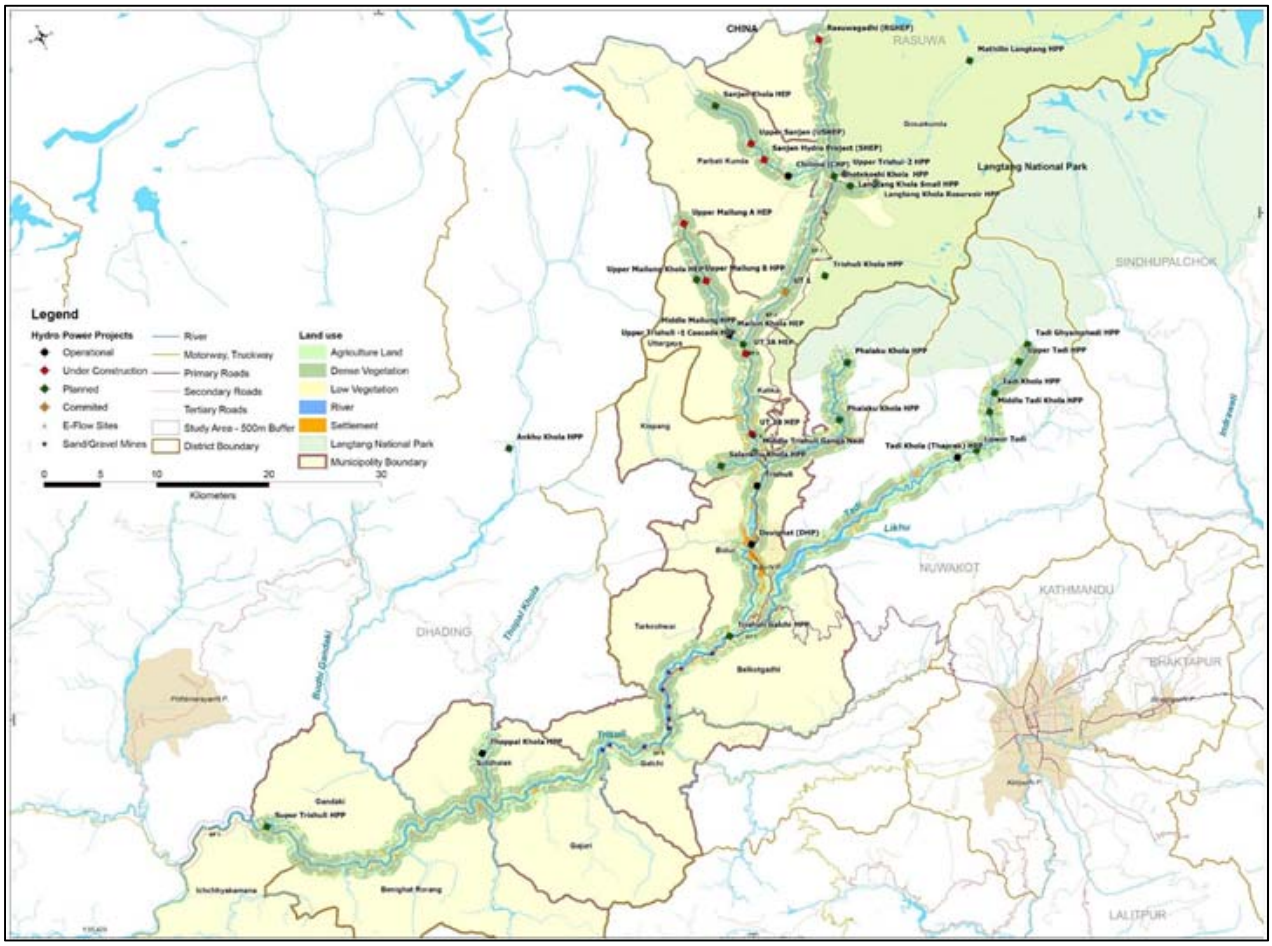
[7] IFC (2016) Good Practice Handbook on Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets

6.2. STEP 1: DETERMINING SPATIAL AND TEMPORAL BOUNDARIES

6.2.1. Spatial Extent of the Study Area

The spatial extent of the study area includes the entire catchment of the Trishuli River from the Tibetan border to the point immediately downstream of Super Trishuli Hydropower Project. (HPP) For ascertaining the baseline conditions with respect to the VECs, the study area was divided into the upstream, midstream and downstream reaches on the basis of topographic elevation, water temperature, and agro-climatic zones.

Figure 6-3: Spatial Extent of the Study Area



6.2.2. Temporal Boundaries

Temporal boundaries under consideration for the CIA will include projects in two scenarios likely to be developed within the next 10 years ("Committed Scenario," including Operating, Under Construction, and Committed projects) and within 50 years ("Full Development Scenario" which includes all Committed Scenario projects plus future Planned projects).

6.3. STEP 2: IDENTIFY VECS, DEVELOPMENTS, AND STRESSORS

6.3.1. Identification of VECs

Table 6-1 summarizes the VECs included in the CIA, which were identified based on a robust stakeholder engagement program, consultation with a governmental and NGO key informants, field reconnaissance, and literature reviews, the VECs were for the cumulative impact assessment. The assessment approach is also referenced. The Downstream Response to Imposed Flow Transformations (DRIFT) model, a holistic physical and ecological model, was used to evaluate cumulative impacts of hydropower projects on aquatic habitats.

Table 6-1: VECs considered under the CIA

Identified VEC	Available Information	Key Basin-level Impacts to Consider	Assessment Approach
Langtang National Park (LNP) 	• Location of HPPs and associated facilities around LNP; • Biodiversity values and data on the LNP	• Impact on biodiversity values from LNP linked to footprint of project components and illegal and unregulated resource extraction due to stressors	• Qualitative assessment of impacts from hydropower, transmission lines, and stressors working in concert
Aquatic Habitat 	• Hydrological time series data; • Select parameters on operational hydropower projects; • Results from e-DNA and connectivity assessments around UT-1	• Reduction in flows that may lead to degradation of ecosystem integrity and fish habitat; • Fragmentation of habitats	• Set up of the DRIFT Model and its interpretation for project development scenarios.
Cultural and Religious Sites 	• Mapping of specific cultural and religious sites along with their significance; • Information on local dependence	• Insufficient quantity and quality of flows to carry out religious and culturally significant activities due to a cascade of projects; • Livelihood implications on the local economy	• Qualitative assessment of low flow areas using the results from DRIFT in order to ascertain feasibility of controlled releases
Livelihoods 	• River-based Livelihoods; • Ecosystem services-based livelihoods; • Information on land and natural resource based impacts	• Change in flows may affect river-use based livelihoods; • Poor mitigation and compensation policies of land-based impacts may exacerbate economic vulnerabilities.	• Extrapolation of DRIFT results for river-based livelihoods and ecosystem services; • Cumulative land and livelihood loss in specific sections of the study area.
Water Resources 	• Water quality information from IEE and EIA Reports and secondary sources; • Dependence of local communities on surface water and springs.	• Deterioration of water quality linked to muck disposal and other stressors such as waste management from urban areas	• Qualitative assessment of implications on water resources on springs. • Mapping of specific sites where high TDS/fecal coliform has been detected to under-construction projects and urban areas

6.3.2. Identification of All Development and External Environmental and Social Stressors

Hydropower development has been the main development activity in recent years in the Trishuli River System in view of the basin's hydropower potential and the area's existing power deficit. In addition to the six (6) operational projects and the seven (7) under-construction projects, another 23 projects are in different stages of planning (from financial closure to being allotted a survey license) as per DoED data (June 2018).

Table 6-2: Trishuli River Hydropower Projects

Status	Main Stem Projects	Capacity (MW)	Tributary Projects	Capacity (MW)
Operational	**2 Total Projects**	**38**	**4 Total Projects**	**43**
	Trishuli HPP	24	Chilime	22
	Devighat	14	Mailung Khola	5
			Tadi Khola	14
			Thoppal Khola	2
Under Construction	**3 Total Projects**	**208**	**4 Total Projects**	**78**
	Rasuwagadhi	111	Upper Sanjen	14.8
	Trishuli 3A	60	Sanjen Hydro	42.5
	Trishuli 3B	37	Upper Mailung A	6.42
			Upper Mailung Khola	14.3
Planned	**6 Total Projects**	**582.6**	**17 Total Projects**	**581**
	**Upper Trishuli 1***	**216**	Sanjen Khola	78
	Trishuli Galchi	75	Langtang Khola Small	10
	Super Trishuli	100	Salankhu Khola	2.5
	Upper Trishuli 2	102	Phalaku Khola	14.7
	Upper Trishuli 1 Cascade	24.6	Phalaku Khola	5
	Middle Trishuli Ganga Nadi	65	Upper Tadi	11
			Middle Tadi Khola	5
			Lower Tadi	4.993
			Ankhu Khola	49.5
			Bhotekoshi Khola	33.5
			Mathillo Langtang	24.35
			Langtang Khola	310
			Trishuli Khola	4.409
			Upper Mailung B	7.5
			Middle Mailung	10
			Tadi Ghyamphedi	4.7
			Tadi Khola	5.5

*Note: UT1 is considered as a "Committed" Project among the other Planned projects.

Several project development scenarios were developed to help understand the incremental:

- **Existing Projects Scenario (Baseline):** This development scenario represents the present conditions in which six (6) of the existing projects are operational, and is referred to as Existing/Operational Scenario;

- **Committed Scenario (Existing + Under-Construction + Committed Projects):** This scenario represents the expected conditions in which six (6) of the existing projects, seven (7) of under-construction project, and the UT-1 project (which is the only Project with a PPA that was not yet under construction). This scenario is referred to as Committed Scenario in this section;
- **Full Development Scenario (all projects foreseen):** This scenario represents conditions in which all of the above and 22 other planned projects are operational.

The CIA has also considered major associated project facilities, such as transmission lines and access roads.

In addition to hydropower projects, key stressors and anticipated regional developments have also been considered based on their potential to attenuate the baseline conditions of the VECs screened into the assessment. Key stressors are illustrated subsequently.

Figure 6-4: Overview of Key Stressors

It should be noted that based on observations and consultations with local stakeholders, while fishing is carried out across the basin, the patterns and dependence vary. While overfishing has occurred in the past, presently, fishing is carried out mostly for subsistence and to complement

existing income sources. Certain communities that were traditionally known to predominantly fish have moved towards regular income from sand mining and other livelihoods.

6.4. STEP 3: DETERMINING PRESENT CONDITIONS OF VECS

The next step in the CIA process was determining the present conditions of the individual VECs identified for the Trishuli River Basin. The purpose of defining the existing conditions is to understand the VECs potential response to the stress caused by cumulative impacts, their resilience, and their recovery time. The present condition of each of the five VECs identified above is described below.

6.4.1. Langtang National Park (LNP)

Established In 1976, the LNP is the nearest Himalayan park to the capital city of Kathmandu with an area of 1,710 km2 that extends over the southern mountainous terrain of the Nepal-China (Tibet) border. The park lies in the pinnacle, the meeting point between Indo-Malayan and Palearctic realms, and has important ecosystems of both realms thereby harbouring significant biodiversity and a wide range of vegetation types along the altitudinal range between 1,000 m and 7,245 m. LNP is the third most popular trekking destination among the protected areas of Nepal.

The LNP was perceived to be an important VEC for terrestrial habitat due to the forest land requirement and proposed transmission lines of at least four (4) planned hydropower projects within the national park. Construction of infrastructure and access roads may cumulatively impact biodiversity habitats within the LNP.

6.4.2. Aquatic Habitat

The aquatic baseline of the Trishuli Basin, which is categorized according to the cold, cool, and cool to warm bioclimatic zones, was compiled from 3 sources:

- Review of secondary literature and earlier EIAs;
- A 2016 fish survey carried out by SWECO (2016);[8] and
- A 2018 eDNA survey carried out by the Centre for Molecular Dynamics (CMDN) and fish surveys by Hagler Bailly, Pakistan (HBP) (Southern Waters 2018).[9]

Review of secondary literature and EIAs (Rajvanshi (1996)[10] and NESS (2016)[11]) revealed the presence of 71 species. Of these 71 species, five species are listed as threatened species: *Tor putitora* (EN), *Schizothorax richardsonii* (VU), *Neolissocheilus hexagonolepis* (NT), *Tor tor* (NT), which are migratory, and *Balitora brucei* (NT) are present in the Trishuli River (IUCN

[8] SWECO. 2016. Upper Trisuli-1 Field visit report: Fishery migration research. 29th of February – 105 04th of March 2016
[9] Southern Waters (2018) Connectivity assessment and upgrade of EFlows assessment for Upper Trishuli 1 HPP. Contract PO# 7187038
[10] Rajbanshi, K. G., 1996. Conservation Status of the Inland Fish Fauna of Nepal. Royal Nepal Academy of Science and Technology, Kathmandu, Nepal
[11] NESS. 2016. Baseline Monitoring and Aquatic Ecology and Water Quality Analysis of Upper Trishuli Hydropower Project (216 MW), Field Visit and Consolidated Final Report. Prepared by Nepal Environmental and Scientific Services Ltd. For the Nepal Water & Energy Development Company (NWEDC).

Red-List Version 2018-1). Two species, *Danio aequipinnulus and Psilorhynchoides pseudecheneis* are endemic to Nepal. The 2018 surveys sampled aquatic water quality, macro-invertebrates, periphyton and fish species at seven Environmental Flows (EFlows) sites (see Figure 6-5 below). Table 6-3 lists the fish species found at EFlows sites 2 to 5, which are closest to the UT-1 Project.

Figure 6-5: Environmental Flow Sites to Measure Water Quality and Aquatic Biodiversity

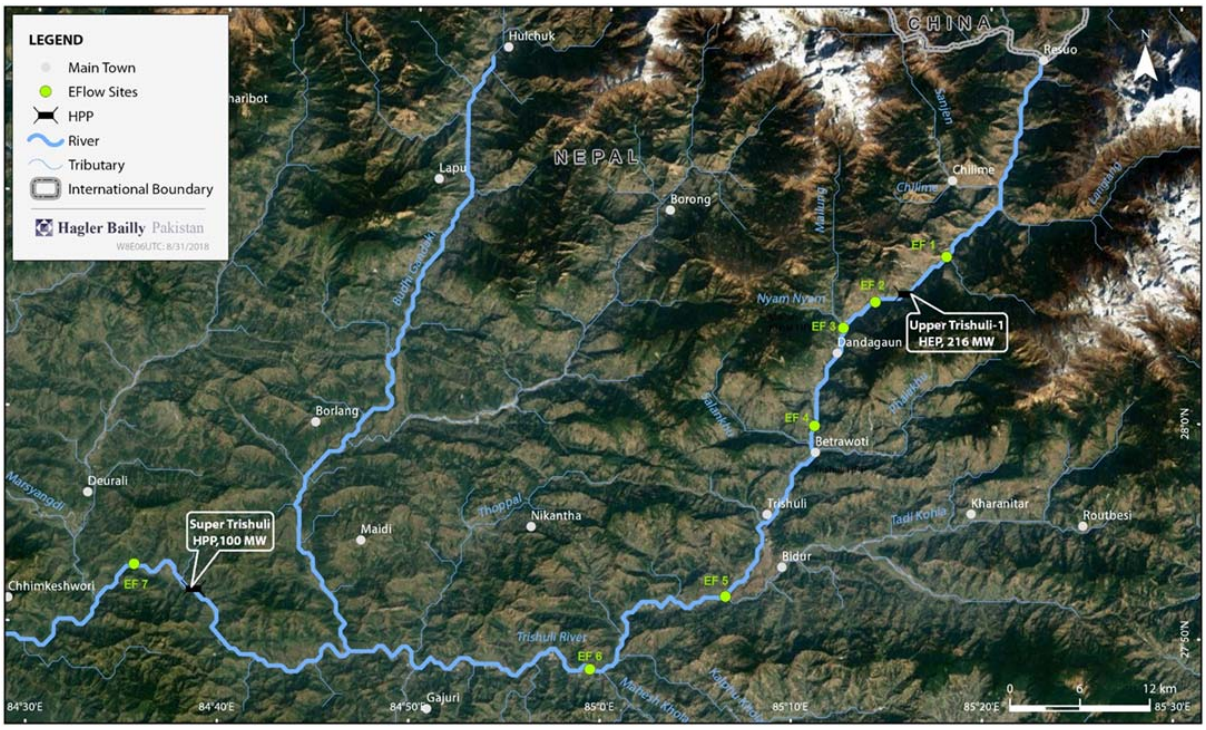


Table 6-3: Fish Species in the Trishuli River, March and April 2018

Scientific Name	Common Name	IUCN Status	March 2018	April 2018	Sampling Location/ Site
Schizothorax richardsonii	Common Snowtrout	Vulnerable	✓	✓	E-flows Site 2, 3, 4, 5, Mailung Khola
Schizothorax progastus	Dinnwah Snowtrout	Least Concern		✓	E-flows Site 5
Glyptothorax indicus/garhwali	Glyptothorax Catfish	Least Concern		✓	E-flows Site 5
Crossocheilus latius	Gangatic Latia	Least Concern		✓	E-flows Site 5
Barilius bendelisis /tileo	Hamilton's/Tileo Barb	Least Concern		✓	E-flows Site 5
Pseudecheneis sulcatus	Sucker Throat Catfish	Not assessed	✓		E-flows Site 3
Schistura corica	Stone Loach	Least Concern		✓	E-flows Site 5

Source: Southern Waters (2018)

In addition, the 2018 surveys also included an e-DNA analysis (CMDN,2018)[12] which identified additional fish species; however, eDNA is still in experimental stages and results are being

[12] CMDN (2018) Aquatic Ecology Field Survey of UT-1 dewatered reach and Trishuli River Basin, Nepal.

confirmed and tested with further studies. The application of eDNA is being further investigated for use in long-term monitoring of fish in the basin.

From the 2016 SWECO surveys, which focused on the UT-1 area of influence, breeding Common snowtrout (*Schizothorax richardsonii*) individuals were recorded from Chilime Khola (Upstream of UT-1) and Andheri Khola (downstream of Trishuli 3B), although no data were presented on fish size distribution. The densities of common snowtrout fry and fingerlings in the main river were considerably less than in the tributaries, and the overall fish population in the UT-1 area was relatively small relative to those in tributaries. The tributaries seemed to be of vital importance to the fish population. Species diversity increased downstream of the UT-1 area, and fish abundance and diversity in the Trishuli 3B area was higher than in the UT-1 area, although Common snowtrout was the most abundant throughout the study area. The authors also observed that the Trishuli 3A infrastructure could already be acting as a barrier to upstream migration of fish.

Due to its threatened and migratory status and that it is fished extensively for commercial and sustenance purposes, the Common snowtrout was determined to be an important VEC.

6.4.3. Cultural Sites

The Trishuli River Basin has religious and mythological value to local communities due to the myths concerning the origins of the river.[13] As such, the river flow supports cultural practices and rituals linked to religious ceremonies and cremation rites of Hindus. The population upstream of the basin is predominantly Buddhist and does not practice cremation rites along the banks of the river. Cremation/burial practices of communities such as the Tamang, Gurung and Chepang communities across the basin are linked to groves/forest areas in the uplands and not to the river. However, other communities undertake cremation rites along the main stem of the river basin. Two specific locations, i.e. Uttargaya (between upstream and midstream); and Devighat (midstream) have emerged as regionally significant for pilgrims and national tourists due to the inflow of multiple tributaries that support cremation-related rites and temples of local significance

6.4.4. Livelihoods

Basin-wide stakeholder consultations prioritised the consideration of livelihoods that are dependent upon the Trishuli River and related ecosystem services as a VEC. River-based and ecosystem services-based livelihoods were discussed along with the potential significance of land acquisition impacts on land and natural resources of local communities. While physical and economic displacement is a localised impact of hydropower projects, the CIA has considered whether multiple projects (and their associated facilities) within the same municipality and/or tributary along with potential loss of livelihood activities (linked to imposed flow restrictions in dewatered reaches) have led to an increase in economic vulnerability within the basin.

13 A review of tourism brochures that provide information on rafting and recreation activities in the Trishuli basin suggests that the river is named after the trident wielded by Lord Shiva of the Hindu Pantheon. Legend proclaims that Lord Shiva drove his trident into the ground at Gosaikunda to create three springs – the source of the river.

The assessment has also tried to establish if there are certain vulnerable social groups that may not be directly benefited from land acquisition but whose livelihoods may be impacted due to reduced flows and implications on ecosystems/fish integrity.

6.4.4.1. Fishing Livelihoods

Artisanal fishing livelihoods (capture fishing, subsistence fishing and recreation fishing) have seen a decline in the Trishuli River Basin (Gurung et al, 2011)[14]. Consultations indicate that this decline is due to the reduction in fish resources; degradation of water quality and habitat; and availability of wage labour as an income generating activity (especially linked to sand mining). However, consultations with local communities indicated subsistence-level dependence on fishing as follows:

- Limited fishing activities, even for subsistence or recreation, were reported upstream, other than for specific locations, such as Mailung Khola. Review of EIA reports suggested that other than occasional recreational fishing and as a supplementary nutrition source, there is negligible dependence upon fishing;
- In the midstream section, even though this area has seen degradation due to intense sand mining activities and urbanisation; fishing as a livelihood activity is carried out by Dalit, Magar, Rai and certain Tamang households;
- Downstream of the river basin; Rai, Magar, Majhi and Chepang communities undertake fishing activities in Icchyakayamana and Gandaki municipalities above the confluence between Trishuli and Budhi Gandaki to supply to restaurants along Prithvi Highway and linked to seasonal demands from activities such as tourism, rafting, pilgrimage etc.

There is limited processing and/or value addition of fish that are caught since they are either sold to restaurants or consumed. Fishery Research Stations in Nuwakot and Dhunche (funded by the Nepal Agricultural Research Council (NARC)) has been focusing on intensification of aquaculture and capture fisheries to support livelihood activities that are less dependent on flows.

Overall, cumulative impacts on fishing livelihoods is not considered significant as few people depend on this livelihood and shifts to aquaculture and capture fisheries. Impacts to subsistence-level fishing are best managed through the CIA's biodiversity-related recommendations.

6.4.4.2. Other Ecosystem Services Based Livelihoods

Some communities and families in the midstream and downstream sections of the study area rely on the river for some ecosystem services-based livelihoods, such as for irrigation, river based sand mining, and whitewater rafting.

The gradual urbanization, upgrade of local infrastructure and the development of hydropower projects in the Trishuli Basin has spurred local enterprise and trade opportunities linked to sand and gravel mining; crusher units and quarries; construction contractors and service providers for

[14] Gurung, T.B., A. Rayamajhi, G. Lamsal, R.P. Dhakal & S.R. Basnet. 2011. Mid hill river fish and fisheries: resilience to food and nutritional security among hill communities in upper Trishuli, Nepal, p 10-20, Proceedings of the 8th national workshop on Livestock & Fisheries Research, Nepal Agricultural Research Council

hydropower developers; general plying of private vehicles and dumper trucks; restaurants and grocery stores along urban areas and tourist towns.

Primary consultations with local communities and the Nepal Association of Rafting Agencies (NARA) indicated that white water rafting as a tourism and recreation activity occurs only in the downstream area of the Trishuli Basin. The peak season for rafting is from October to February where approximately 15,000-20,000 tourists visit annually to undertake river rafting. June to August each year (during the monsoon season) is the low season for this activity, due to the velocity of the river.

6.4.5. Water Resources

Water availability in the Trishuli River Basin depends upon annual rainfall and glacier melt (upstream in the Tibet Autonomous Region) and is affected by extreme events and interventions such as river diversion schemes[15].

In the upstream study area, it has been reported that during the earthquake, water infrastructure like pipes in Rasuwa district were badly damaged, leaving villages with no access to clean and safe drinking water[16]. There is no use of river water for irrigation or for drinking in view of the altitude and general riparian topography, which makes access to the riverbank difficult. The midstream area in Nuwakot faces scarcity of safe drinking water, which is exacerbated by landslides which engulf available drinking water pipelines[17].

In Kispang, Bidur and Benighat the major drinking water source is piped water supply and not linked to the river or to springs. The exception is in some villages, like Belkotgadi, where the communities have installed wells on the banks of the Trishuli. In the downstream area, it is estimated that each settlement in this district has 1-2 streams. Local communities use piped water for drinking (and not the Trishuli River). However, the source of water for agriculture varies from river water being channeled directly to the fields into some small scale storage systems, in the form of ponds and tanks.

Analysis of water quality based on turbidity and coliform levels (from untreated domestic sewage) at various sections along the river indicates that turbidity levels are high as the river flows through the mid-stream and downstream sections, and it is likely that sand/gravel mining are significant contributors to high turbidity levels. E-coli concentrations, while exceeding the National Drinking Water Quality Standards (NDWQS) at all sampling locations, is highest in the mid-stream and downstream sections.

[15] Dandekhya, S., England, M., Ghate, R., Goodrich, C. G., Nepal, S., Prakash, A., Shrestha, A., Singh, S., Shrestha, M.S., Udas, P. B. (2017) The Gandaki Basin – Maintaining livelihoods in the face of landslides, floods, and drought. HI-AWARE Working Paper

[16] https://cafod.org.uk/content/download/28639/308240/version/1/file/Proposal%20for%20Nepal%20PiF%20PDF.pdf

[17] http://www.icimod.org/?q=17345

6.5. STEPS 4 AND 5: EVALUATION OF CUMULATIVE IMPACTS ON VECS AND THEIR SIGNIFICANCE

The analysis of cumulative impacts on VECs involves estimating the future state of the VECs that may result from the impacts they experience from various past, present, and predictable future developments. Cumulative impacts as described in the report are based on current and planned conditions of the basin, without any responsive actions to prevent or reduce the impacts. Table 6-4 summarizes key cumulative impacts on each identified VEC in the Trishuli River Basin.

Table 6-4: Summary of Cumulative Impacts

Identified VEC	Key Non- HPP Stressors	Cumulative Impacts from HPPs	Cumulative Impact Significance
Terrestrial Biodiversity – Langtang National Park	• Infrastructure development associated with the OBOR initiative	• Declining populations of species of conservation significance through illegal extraction, exploitation and export; • No significant impacts envisaged on wildlife dispersal and migratory bird corridors	• Access roads and transmission lines will provide improved access and potentially increase illegal entry into the LNP - resulting in the loss and degradation of habitat from logging and wildlife through poaching • Lower capacity transmission lines within the park have a minimal footprint and thereby do not impact habitat for threatened or endemic species • Transmission line network is unlikely to endanger any major flyway for migratory bird species
Aquatic Biodiversity – Habitat quality	• Sand/Gravel Mining and Processing; • Soil from landslides and dumping of spoil from road construction degrade aquatic habitat	• Alteration of aquatic habitats and deterioration of water quality as indicated by ecosystem integrity results across project development scenarios	• Significance was evaluated on the basis of ecosystem integrity as predicted by the DRIFT model at different EFlows sites. Ecosystem integrity is expected to progressively deteriorate based on the four scenarios modelled from existing Ecosystem Integrity Categories B/C/D (slightly/moderately/largely modified) to Ecosystem Integrity Categories D/E (largely/seriously modified) for the full development scenario.
Aquatic Biodiversity - Snowtrout and mahseer populations in Discrete Management Units (DMUs) due to cumulative impact of hydropower projects and altered ecological flows in diversion reaches	• Sand and sediment mining; • Access roads that may render stretches of the river upstream accessible with potential increase in unregulated fishing; • Climate change resulting in long term temporal changes in flow in diversion reaches in diversion reach already compromised by low flows caused by dams	• Impediments to upstream and downstream migration in both main stem and tributaries as a result of multiple HPP dams leading to declines of snowtrout and mahseer populations; • Degradation of aquatic habitats and lowered water depths from modification on natural	• Significance evaluated based on DRIFT modeling. Fish integrity is expected to progressively deteriorate based on the four scenarios modelled. Existing integrity ranges from Ecosystem Integrity Category B (slightly modified) to Ecosystem Integrity Category C/D (moderately/largely modified). These are predicted to deteriorate to Ecosystem Integrity categories

Identified VEC	Key Non- HPP Stressors	Cumulative Impacts from HPPs	Cumulative Impact Significance
		flow regimes leading to impediments to upstream migration	E (seriously modified) and F (Critically/ Extremely modified) for the full development scenario.
Cultural and Religious Sites – Uttargaya and Devighat These sites have regional importance as sites for Hindu rituals, ceremonies and pilgrimages during the year	• Sand and gravel mining activities result in degradation of river banks with river subsidence altering water quality. • Quality of water linked to increased fecal coliform and pollution load untreated sewage from nearby towns will further contribute towards loss of heritage resources and intangible cultural services relative to the baseline condition	• Reduction in flow in specific river segments (e.g., diversion reaches)	• Significance evaluated based on water quality and flow. Flow impacts are expected to be more Project-specific, rather than cumulative and best managed as part of individual project EIA review process.
Livelihoods While unregulated fishing has been declining, this activity contributes towards subsistence and a supplementary income from sale of fish to restaurants/hotels along the Prithvi Highway.	• Sand and sediment mining leading to degradation of aquatic habitat and with implications on fish resources	• In the full development scenario, fish integrity is likely to be significantly impacted in the upstream reach indicating a general decline in any possibility of fishing-based livelihoods. • Livelihood impacts on certain vulnerable social groups (Rai, Magar and Dalit) that may depend upon fishing more than other communities may increase	• Significance evaluated based on DRIFT modelled changes to overall fish integrity. Assessment indicates that fish abundance will be impacted, although relatively few families rely exclusively on fishing as a livelihood. • Overall significance of impacts upstream are linked to economic displacement and will be significant in view of multiple projects • Overall significance of impacts midstream is minor; however, specific communities such as Rai, Magar and Dalit may be impacted due to loss of livelihoods linked to fishing. • Overall significance of impacts downstream is minor; other than for local communities that support rafting and tourism activities – localized impact linked to Super Trishuli HPP
Water Resources – Surface Water Quality: Basin water quality is poor, turbidity and coliform levels increase in downstream direction. Trishuli River is not used directly for drinking.	• Sand and sediment mining; • Spoil disposal from construction activities; • Solid waste and untreated sewage from major/urban settlements along the banks of Trishuli River	• While additional projects in concert with increased intensity of existing stressors are likely to further degrade habitats, these may tend to be spatially restricted (other than in the midstream reach). The impacts of stressors such as sand and gravel mining and disposal of soil seem more significant.	• Significance analysis of water quality based on turbidity and coliform levels at various sections along the river.

6.5.1. Aquatic Biodiversity

The DRIFT model evaluates multiple stressors on aquatic habitat and classifies the resulting habitat condition using ecosystem integrity categories ranging from Unmodified ("A") to Critically/Extremely Modified ("F"), which are described in Table 6-5.

Table 6-5: Ecosystem Integrity Categories

Ecosystem Category	Description of Ecosystem Integrity Categories
A	Unmodified. Still in a natural condition.
B	Slightly modified. A small change in natural habitats and biota has taken place but the ecosystem functions are essentially unchanged.
C	Moderately modified. Loss and change of natural habitat and biota has occurred, but the basic ecosystem functions are still predominantly unchanged.
D	Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred.
E	Seriously modified. The loss of natural habitat, biota and basic ecosystem functions is extensive.
F	Critically / Extremely modified. The system has been critically modified with an almost complete loss of natural habitat and biota. In the worst instances, basic ecosystem functions have been changed and the changes are irreversible.

Table 6-6 shows the predicted changes in ecosystem integrity at each of the seven EFlow sites (see Figure 6-5 above) for Existing/Baseline Conditions and then incrementally for each of the different Scenarios under a "Business As Usual" approach (i.e., construction and operation in compliance with local requirements). As indicated in Table 6-6, ecosystem integrity along the Trishuli River, in the absence of significant management actions, such as those that would be required is IFC PS were to be applied, is predicted to decline from primarily ecosystem integrity categories B/C to primarily categories D/E.

Table 6-6: Ecosystem Integrity by Project Development Scenario

E-flow Site/ Reach	Existing	Under-Construction	Committed	Full Development
E-flow Site 1	B	B/C	C/D	D
E-flow Site 2	B	B/C	E	E
E-flow Site 3	C	C/D	D	E
E-flow Site 4	C	C	C	D
E-flow Site 5	C	C	C	D
E-flow Site 6	C/D	C/D	C/D	D
E-flow Site 7	B	B	B	C

6.6. STEP 6: MANAGING CUMULATIVE IMPACTS

This Step describes proposed mitigation measures for each of the identified VECs, but also proposes a High Management Approach for enhanced management and protection of VECs and

suggests an organizational structure for effective cooperative management of these important river basin resources.

6.6.1. VEC Specific Mitigation Measures

The CIA study identifies VEC-specific potential cumulative impacts in the Trishuli River Basin, and proposed mitigation and monitoring measures at three different stakeholder levels: Individual hydropower developers, government authorities, and local communities. The following table provides a short description of the proposed mitigations measures per stakeholder type for each identified VEC.

Table 6-7: Proposed Mitigation Measures per Stakeholder Type

Identified VEC	Proposed Mitigation Measures		
	Hydropower Developers	Government Authorities	Local Communities
Terrestrial Biodiversity – LNP	• Contractor Management Plans to raise awareness of contractors engaged in coordination with local access road contractors	• Increased funding and resources to LNP forest guards	• Shared access road development plan by adjoining municipalities to reduce access and disturbance in park
Aquatic Biodiversity – Habitat quality	• Release of adequate EFlows for aquatic biodiversity	• Fish surveys carried out by the Fisheries Research Stations; • Habitat Restoration Plans to be prepared	• Regulating sand mining through municipality level governance • Community-based protection/ stewardship of river reaches within there are of influence / use. • Implement actions for controlling erosion and run off into the river, with emphasis on those pertaining to access roads
Aquatic Biodiversity	• Provision of fish passage with design validation by a fisheries expert; • Enhance connectivity between main stem and tributaries, including river training, to be maintained; • Provision of appropriate EFlows based on holistic assessments of affected river segments; • Monitoring of fish passage and abundance during migratory season	• Monitoring and enforcement of functioning fish ladder and EFlows releases. • Enforcement of fishing and mining regulations. • Enhancement of fish breeding areas in tributaries.	• Community-based regulation of capture fisheries for snowtrout and golden mahseer • Community-based protection of fish breeding areas in tributaries.
Cultural and Religious Sites – Uttargaya and Devighat	• Undertake an assessment of the actual requirements for water flow in dewater reaches for normal rituals as well as during specific times through the year, especially during the dry season period	• Regional policy directives to temporarily stop mining activities at least during key festivals/pilgrimages and regionally significant rituals • Implement domestic wastewater treatment for towns currently discharging	• Raising awareness among local communities and sand and gravel mining entities for management of waste along with specific zones being declared for muck/spoil disposal • Education to stop disposing solid waste in river bed and

Identified VEC	Proposed Mitigation Measures		
	Hydropower Developers	Government Authorities	Local Communities
		untreated sewage into the river	tributaries. Construction of septic systems
Livelihoods	• Granting reservoir area fishing rights/licenses based on district allocations • Developing focused livelihood support plans for specific communities of cold-water aquaculture schemes • Agree on principles of avoidance measures, compensation and livelihood restoration • Good grievance redress mechanism	• Develop Sustainable Fishing Plans for specific sections of the basin • Coordinate with individual hydropower developers to ensure livelihoods are restored	• Implement sustainable fishing plans • Communities based of cold-water aquaculture /fish farm schemes • Community monitoring and supervision.
Water Resources – Surface Water Quality	• Implementation of the Environment Management Plan on muck disposal during construction.	• Implementation of regulations on sand/ gravel mining; • Exploring sewage treatment options	• Awareness on household waste disposal through municipal authorities and community-based organisations.

6.6.2. Proposed High Management Approach

Steps 4 and 5 above show that, under a Business As Usual approach, future planned developments would result in significant degradation of aquatic biodiversity and several other VECs. Although the mitigation actions proposed in Table 6-7 are a start to mitigating cumulative impacts, based on the level of development proposed for the Trishuli River Basin, additional management actions at a higher level, such as a High Management Approach, are also suggested to address the significant cumulative impacts that are predicted to affect the Trishuli River Basin.

The High Management Approach comprises a combination of quasi-regulatory, incentive-based, and technical measures to manage fish populations, regulate sediment mining, and apply general watershed management measures, which will contribute to the improvement of habitats and consequently reduce cumulative impacts to the identified VECs. This High Management Approach suggests measures to be cooperatively implemented by hydropower developers, governmental authorities, and local communities.

6.6.2.1. The High Management Approach

The High Management Approach is envisioned as a collaborative approach potentially involving IFC and other DFI/International Cooperation Agencies and hydropower developers/operators, government agencies, civil society, universities, and local communities to finance and cooperatively manage and monitor cumulative impacts within the Trishuli River Basin, which could include the following institutional arrangement (see Figure 6-6):

- Hydropower developers/operators within the Trishuli River Basin are encouraged to implement additional management measures and agree to a Cumulative Impacts Management Charter that would go beyond simple regulatory compliance. This Charter

would form the basis of a Trishuli Hydropower Developer's Forum (THDP), as a developer-driven institution to help manage cumulative impacts;

- Municipalities could be empowered under proposed revisions to the Environment Friendly Local Governance Framework (2013) to form Local Management Committees, which would include participation from hydropower developers and local NGOs/community-based organizations;
- A Technical Resource Group, including the participation of government ministries, conservation groups and universities, could provide technical guidance to the THDP and the Local Management Committees.

Figure 6-6: Proposed Institutional Structure for a High Management Approach

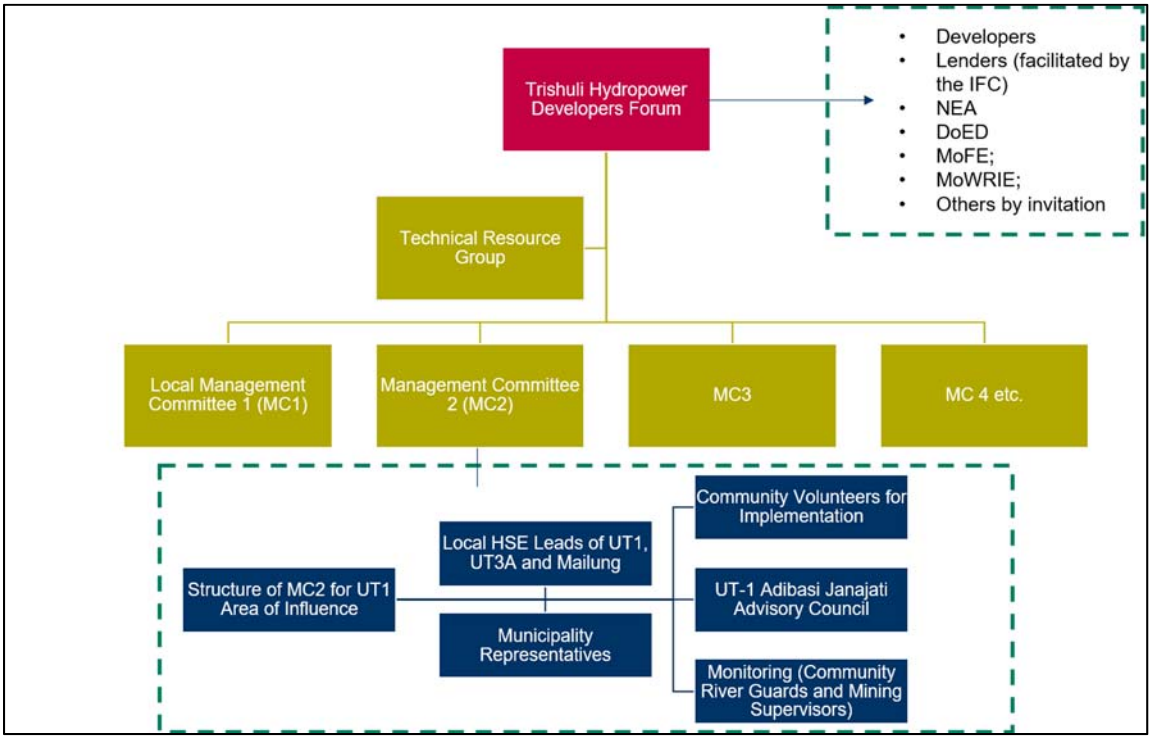


Table 6-8 summarizes suggested elements of a High Management Approach.

Table 6-8: Suggested Elements of a High Management Approach

Theme	Description	Responsibility
Developer's Charter on Sustainable Hydropower in Trishuli River Basin	This would be a Vision and Commitments-driven document which could include the following: • Applying a uniform set of standards for including fish passages in the design of projects based on a review of contemporary and innovative designs for fish in conjunction with leading experts in this discipline; • Developing guidelines to prepare and implement an environmental flow management framework for each hydropower project based on available secondary guidance on adaptive management. This should be project/reach specific keeping in mind ecological, cultural and social sensitivities inherent for the river reach; • Assessing land-based and livelihood impacts from projects in order to develop and fund livelihood restoration measures (focused on fishing, skills development and agricultural intensification schemes as identified in the recent FPIC agreement for UT-1) as a form of local community development around hydropower projects; • Expanding the regulatory EMPs into a comprehensive ESMP (such as in the case of UT-1 Project) which would incorporate safeguards to manage localised social impacts linked to in-migration, resource requirements and community health and safety; • Conducting issue/theme specific studies for sensitivities within the area of influence of the hydropower project, such as assessment of flows for cultural practices, inventory of springs, etc. • Developing principles for all future land acquisition based on avoidance measures, compensation at replacement cost, informed consultation, and participation and emphasis on livelihood restoration of affected communities; • Supporting suppliers of sand, gravel and aggregates to implement sustainable mining techniques; • Overarching framework on Contractor Management with specific safeguards to manage unregulated fishing, access into forest areas, muck disposal and any other waste dumping, project-induced influx; • Developing and monitoring project specific grievance redress mechanisms. • Representatives from key developers could come together to agree on provisions of the Charter. The technical resource group could help the Trishuli Hydropower Developers Forum (THDF) formulate a Charter.	Trishuli Hydropower Developers Forum with support from Local Management Committees
Community-based River Guards across river reaches	• Each Local Management Committee could deploy Community-Based River Guards and associated field-level supervision to undertake the following: o Detect violation of restrictions, rules and regulations approved by the Local Management Committee for protection of river and tributaries and take corrective actions as permissible; o Maintain contact with the local community and promote awareness and education on importance of natural resources (including illegal sand mining and unregulated fishing); o Support implementation of incentive-based measures such as community based sustainable fishing. o Collect data on status of protection and awareness, record grievances, and report.	Local Management Committee
Preparation and Implementation of Sustainable Fishing Plans	• Mechanisms on regulated fishing managed by local communities in coordination with hydropower developers could be prepared by Local Management Committees with support from a Technical Resource Group. The basic principles followed could include establishing a conservation program, conducting research to estimate sustainable harvesting quotas, setting up a system of permitting for harvesting, utilizing the revenues generated to manage the conservation and harvesting program, and monitoring to ensure the program objectives including protection of fish populations and sustainability of the program are met.	Local Management Committee
Development of Indigenous Fish	• Captive (hatchery) breeding of fish species impacted by HPPs may be considered as a measure that is supplemental to other management measures	Local Management Committees supported by Fishery

Theme	Description	Responsibility
Hatcheries for Fish Stocking	such as protection, habitat management, and fish passages, but not as a substitute for them.	Research Centre (Fisheries Research Station (Nuwakot and Dhunche)
Farming of Commercially Valuable Fish Species	• Providing alternative means of incomes or livelihoods through promotion of fish farming could help in the reduction of anthropogenic pressures on the river ecosystems. There are several brown trout (Salmo Trutta) and rainbow trout (Oncorhynchus mykiss) farms, some of them started with international assistance (e.g. JICA) with considerable capacity and commitment. Such farms could be developed in areas where indigenous fish stocks are depleted due to overfishing.	Local Management Committees supported by Fisheries Research Centre
Preparation and Implementation of Sustainable Sediment Mining Plans	• Given that it is entirely plausible that the demand for sediment will continue to increase in the foreseeable future, achieving the High Management would necessitate management and control that could limit the impact of mining on the river and its tributaries in the face of increased demand/volumes being abstracted. This mining plans could be elaborated to include: o Ban of mining in sensitive areas and focusing/identifying non-sensitive areas to focus mining activities; o Mine outside the river bed only in the river banks, and ensure that any unavoidable mining in the river bed takes place in areas expected to be flooded by reservoirs instead in the projected dewatered reaches. o Implement on-site control of mining activities linked to equipment and techniques used, managing spoil disposal, etc. o Rehabilitate/restore habitats already degraded by mining, especially in the midstream reach; o Identification of alternative sources of aggregate for construction which includes: (a) Reuse spoil from construction of hydropower projects; (b) Using open rock quarries on hillsides (with due recognition of any springs) as source of gravel. • An important component of the sustainable sediment mining plans would be to appoint Community Based Mining Supervisors and Guards from within the Local Management Committees to enforce restrictions. • Depending on the level of pressure from mining, the number of supervisors and guards assigned for this purpose could vary, and where pressures are low, the responsibilities for implementation of the sustainable sediment mining plan could be assigned to the river guards. • These mining plans could be developed by Municipalities as sand and sediment mining enterprises are a major source of revenue. There is also an overlap between owners of sand mining entities and key local leaders (including municipality representatives). Municipalities may seek support from the Technical Resource Group for the identification of mining areas through modelling (to predict the location, quality and quantity of sediment deposits linked with hydropower projects), identification of key ecological sites or reaches within the system to identify no-go or restricted use areas and the necessary engagement with the affected mining and local community.	Local Management Committees with potential assistance from the District Coordination Committee.
Watershed Management	• A watershed management program could help improve water quality in the basin, critical for the protection of biodiversity and river-based livelihoods. Actions that could be supported by the THDF and Local Management Committees include: (a) programs focussing on areas including reforestation to meet community requirements for fuel wood and timber remaining within the limits of sustainable harvesting to reduce erosion and risk of landslides; and (b) Land use management. • The watershed management program could also link to any basin-level plans, benefit sharing plans, in partnership with the provincial government to allow for the coordinated planning and implementation of watershed and community investment initiatives. Suggestions for management of water use in both agriculture and households, and management of water quality at the local level, including enhanced community wastewater treatment should also be included.	Local Management Committees
Delineating no go areas for	• Local Management Committees could strongly advocate setting aside stretches of river and tributaries that are of high ecological importance to help preserve key features of aquatic biodiversity in the Basin (including spawning grounds of fish,	Local Management Committees

Theme	Description	Responsibility
Hydropower Development	and stretches/tributaries still in pristine condition, for example the undammed Nyam Nyam khola, a tributary of the Mailung Khola which is an important source site for common snowtrout for the Mailung Khola downstream of the dewatered area of the Mailung Khola HPP). Local Management Committees, through the THDF, could recommend certain no-go areas for consideration by DoED, NEA and MoWRIE. The Technical Resource Group could support in capacity building and in reaching out to the provincial and national government ministries/departments.	
Mahseer and Snowtrout Sanctuary	• Consider designating one or more important fish spawning tributaries (e.g., the Tadi Khola) as a Mahseer and Snowtrout sanctuary, which would remain free flowing (i.e., no hydropower development) and develop / foster domestic wastewater treatment and solid waste management to improve water quality and riparian and river health.	Trishuli Hydropower Developers Forum with support from Local Management Community-based river stewardship and Municipal Governments with the support of DFI

6.6.2.2. Cumulative Impact Assessment of Alternative Management Approaches

Table 6-9 and Figure 6-7 illustrate representative ecosystem integrity ratings along the Trishuli River under a Business As Usual Approach (i.e., continuation complying only with local regulation), a UT-1 Only High Management Approach (i.e. UT-1 will be the only project complying with IFC PS and implementing mitigation measures required therefrom), and an All Projects High Management Approach (e.g. all projects follow UT-1 leadership/ approach and implement mitigation measures compliant with IFC PS/ Good International Industry Practice, or GIIP) for each of the Project Development Scenarios. In summary, this analysis indicates the following (refer to Tables 6-5 and 6-6 relative to ecosystem integrity ratings of A to F):

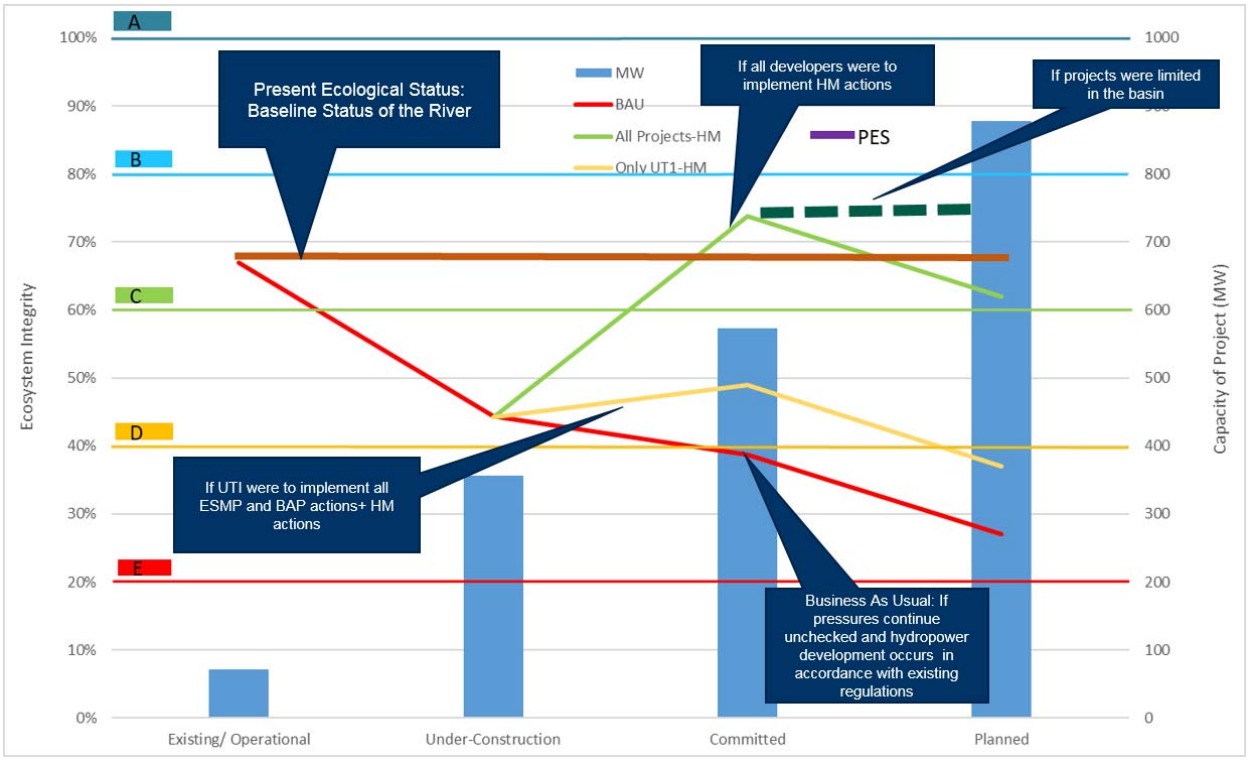
- **Present Ecological Status (PES)** – shows the Trishuli River maintaining existing ecosystem integrity of B/C assuming no new hydropower development or increase in external stressors;
- **Business as Usual (BAU) Approach** – shows ecosystem integrity of the Trishuli River degrading from existing B/C conditions, to C/D as Under Construction HPPs come on line, decreasing further to D as the Committed Project (i.e., UT-1 HPP) is constructed, and ultimately falling to D/E as future Planned Projects are developed. Clearly this would not be a sustainable outcome.
- **UT-1 Only High Management Approach** – also shows the ecosystem integrity of the Trishuli River degrading to C/D as Under Construction HPPs come on line, but shows a slight improvement, although still maintaining an ecosystem integrity of C/D, as the High Management measures that have been required for the UT-1 HPP are implemented, but then ultimately declining to an ecosystem integrity of D/E, because of the sheer magnitude of the impacts associated with 23 additional HPPs.
- **All Projects High Management Approach** - also shows the ecosystem integrity of the Trishuli River degrading to C/D as Under Construction HPPs come on line, but then an improvement to a B ecosystem integrity rating as High Management measures are required for the UT-1 Project and retro-fitted on the existing HPPs. In the Full Development Scenario, and given sheer magnitude of the impacts associated with 23

additional HPPs, the Trishuli River ecosystem integrity is ultimately predicted to degrade back to a C, even if all projects follow UT-1 leadership and apply GIIP per IFC PS. An ecosystem integrity rating of B could be maintained, however, if the future number of HPPs in the basin were limited, including the potential enactment of the Tadi Khola as a Mahseer and Snowtrout sanctuary.

Table 6-9: Ecosystem Integrity Based on Cumulative Impacts

Project Development Scenario	Existing	Under Construction	Full Development	With Future Planned Projects
BAU	B/C	C/D	D	E
UT-1 Only High Management Approach	B/C	C/D	C/D	D/E
All Projects High Management Approach	B/C	C/D	B/C^{+}	C
Limiting projects in the basin to create a Mahseer Sanctuary (e.g. Tadi Khola) all remaining projects with High Management supported by GoN and other stakeholders	B/C	C/D	B/C^{+}	B/C^{+}

Figure 6-7: Representative Ecosystem Integrity by Management Approach



Based on the DRIFT model results, the analysis above suggests that implementation of a High Management Approach can help maintain, or even improve, the ecosystem integrity of the Trishuli River Basin.

6.7. CIA CONCLUSIONS

Given the large number of proposed hydropower projects and other stressors in the Trishuli River Basin, continuation of a Business as Usual Approach is predicted to result in significant degradation of the Trishuli River and other important VECs, including terrestrial biodiversity, community livelihoods, cultural and religious sites, and water quality. NWEDC has committed to implementing a High Management Approach, at least for those measures under its control, which offers a sustainable development pathway to maintain, or potentially even enhance, current levels of ecosystem integrity and VEC conditions. This High Management Approach is envisioned as a cooperative approach that could be implemented through a combination of developer-driven mitigation measures, community-based monitoring, civil society and university technical support, and governmental oversight.

7. PROPOSED NEXT STEPS AND JULY 2018 ESAP STATUS UPDATE

7.1. COMPLEMENTARY ESAP UPDATES

Requirements resulting from the studies described above and further review from the Lenders group include the following:

- Fish Ladder
    - NWEDC will submit the proposed design of the headworks and fish ladder to the Lenders for their review and approval prior to the initiation of construction of the headworks. This submittal shall include a detailed description of the way the fish ladder is proposed to be built, maintained, and operated, and demonstrate that the fish ladder will be operational for, and able to withstand, the expected range of Trishuli River flows.
- Agency Consultation
    - NWEDC will conduct a final consultation with the LNP and the Nepal Department of Forests to document that it has satisfactorily completed all required compensation and mitigation relating to LNP and Nepal forest clearing regulations.
- Independent Panel Review
    - As required under the PDA, NWEDC will hire an independent advisory panel of experts not affiliated with the project that will be used during project preparation and implementation. The panel will include as a minimum, an environment health and safety expert, a hydropower engineering and dam safety expert, and indigenous peoples expert
- Biodiversity Management Plan
    - NWEDC will develop a stand-alone Biodiversity Management Plan (BMP), which will include the additional biodiversity management measures included in this Addenda for inclusion in the EPC CESMMP. The BMP should also include NWEDC's consultation with and strategy for working with stakeholder groups including LNP and Nepal Department of Forests. It should also describe how NWEDC's strategy for working with other stakeholders to comply with required mitigation measures such as (1) create a fish research and monitoring team including NWEDC staff, consultants, and university/government researchers; and (2) manage local fishing pressures through collaboration with local fishermen and local governments.
- Tunnelling Induced Groundwater Drawdown
    - NWEDC will monitor flow in the medium risk rated springs during tunnel construction to detect if project tunnelling is affecting flow in springs. If a change in flow is detected that cannot be attributed to changes in precipitation, then

NWEDC should inspect the tunnel and provide supplemental grouting. If supplemental grouting does not mitigate the impact, NWEDC should provide alternative water supply for the affected households

- LALRP Addendum
    - NWEDC will produce an LALRP addendum containing additional disclosure, consultation, compensation and other arrangements to ensure that the (6) recently identified transmission-line affected households are dealt with in accordance with Nepali and Lender land acquisition requirements.
    - NWEDC will Provide compensation for trees and crops that had been damaged and assessed as entitled for additional compensation in the LALRP.
- Indigenous Peoples
    - NWEDC will make financial and technical provision for full implementation of Project commitments in the Indigenous Peoples Plan, including, i.e. funding for agreed programs, logistical support for regular IPP implementation meetings and appointment the necessary internal and external staff and consultants/partners (e.g. an external monitor).
    - NWEDC will seek the free, prior, informed consent of the Guptephaka Community Forest User Group in relation to impacts of the 1.1 km transmission line on their resource use. Consent will be sought well prior to the start of transmission line construction, which is due to begin 3 years after mainstream project construction begins. The consent process will be appropriately scaled given the extent of impacts and associated agreements will be documented and disclosed in an addenda to the IPP.

7.2. KEY ACTIONS NEEDED FOR CUMULATIVE IMPACTS MANAGEMENT

Suggested actions at the basin level include the Implementation of High Management Actions through a combination of developer driven mitigation measures including:

- Developer's Charter on Sustainable Hydropower in Trishuli River Basin - a Vision and Commitments driven document prepared by representatives from key developers; such as NWEDA, Super Trishuli and NEA, and monitored by a sub-group of each Management Committee.
- Community-based River Guards / Stewardship across river reaches - Management Committee will deploy Community Based River Guards and associated field-level supervision.
- Preparation and Implementation of Sustainable Fishing Plans - mechanisms on regulated fishing managed by local communities in coordination with hydropower developers.

- Development of Indigenous Fish Hatcheries for Fish Stocking - stocking of fish bred in a hatchery where a hydropower project limits the access of the fish to its breeding areas as a means for mitigating the loss of breeding areas.
- Farming of Commercially Valuable Fish Species - providing alternative means of incomes or livelihoods through promotion of fish farming to help reduce anthropogenic pressures on the river ecosystems.
- Preparation and Implementation of Sustainable Sediment Mining Plans –develop mining plans that not only manage mining on the river and its tributaries but also appoints Community Based Mining Supervisors and Guards from within the Management Committees to enforce restrictions on mining.
- Watershed Management – develop and implement a watershed management program that can help improve water quality in the basin.
- Delineating no go areas for Hydropower Development - Management committees should strongly advocate the setting aside of stretches of river and tributaries that are of high ecological importance and can help in preservation of key features of aquatic biodiversity in the Basin.

7.3. UPDATED STATUS OF ESAP

The following items have been completed from the July 2018 ESAP:

- NWEDC will assume a leading role in the multi-stakeholder platform to manage the cumulative impacts and risks from multiple and cascading hydropower projects existing in, or planned for, the Trishuli River Basin. *Note: Partial completion. This is an ongoing requirement but NWEDC has begun this engagement with strong commitment.*
- NWEDC shall obtain all approvals for the totality of any additional project facilities terrestrial footprint in both forest land or located in the LNP. This shall include a full inventory of trees to be cut and revised forest clearance (if required) as per Ministry of Forest requirement and R&R plan.
- NWEDC shall provide the location and description of land proposed for donation to LNP to mitigate for the acquisition of government-owned LNP buffer zone land by the Project for lender review and approval that it meets the lenders No Net Loss policy. This shall include documentation that LNP has accepted the proposed land donation and that ownership of the land has been transferred to LNP. *Note: This is partially complete. NWEDC has proposed land to LNP, but the location of the land and approval by LNP have yet to be approved.*
- NWEDC shall complete the upgraded EFlows study including a connectivity assessment to better define the required mitigation and monitoring measures. *Note: see Section 3.2.*
- NWEDC must finalize and start implementation of the BMP in form and content acceptable to the Lenders. The BMP will include all the forestry, wildlife and terrestrial habitat management plans described in the ESIA documentation and local licenses, as

well as the updated Environmental Flow Management Plan (EFMP). This BMP shall also include a concrete Biodiversity Evaluation and Monitoring Program (BEMP) with metrics and Key Performance Indicators (KPI) to demonstrate No Net Loss of both terrestrial and aquatic Biodiversity *Note: This is partially complete. See Section 3.5 for draft BMP to be finalized by Fish Monitoring Advisor in collaboration with NWEDC and IFC*.

- NWEDC shall seek consent from affected IP communities for a draft package of project mitigation measures and benefits (an Indigenous Peoples Plan [IPP]) prior to commencement of the main phase of project construction. Once consent has been achieved, the Company will provide for full implementation of the agreement(s), including a suitable monitoring and evaluation mechanism that will be agreed to between NWEDC, affected IP community representatives and GoN representatives during the FPIC deliberations. *Note: see Section 4.0.*

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ATTACHMENT 1 – INDIGENOUS PEOPLES PLAN










Indigenous People's Plan: *Upper Trishuli-1 Hydropower Project, Nepal*

NWEDC
NEPAL WATER AND ENERGY DEVELOPMENT CO. PVT. LTD.

March 2019

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ACRONYMS LIST

Acronym	Meaning
ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
AJAC	UT-1 Adibasi Janajati Advisory Council
AoI	Area of Influence
BEMP	Biodiversity Evaluation and Monitoring Program
CCCS	Cross-Cultural Consulting Services, PLLC
CFUG	Community Forestry User Group
CHP	Cultural Heritage Program
CLOs	Community Liaison Officers
COD	Commercial Operation Date
CPA	Consent Process Agreement
CSR	Corporate Social Responsibility
CTVET	Council for Technical Education and Vocational Training
DAO	District Administration Office
DEG	German Investment Corporation
DFO	District Forest Office
DMP	Disaster Management Plan
EC	Executive Committee
EDP	Economic Development Program
EIA	Environment Impact Assessment
EM	External Monitor
EPC	Engineering, Procurement and Construction contractor(s)
ERM	Environmental Resources Management, Ltd.
ESIA	Environmental and Social Impact Assessment
ESMC	Environmental and Social Management Cell
ESMMP	Environmental and Social Management and Monitoring Plans
ESMS	Environmental and Social Management System
ESTP	Employment and Skill Training Plan
ET	Evaluation Team
FGD	Focus Group Discussions
FPIC	Free, Prior, and Informed Consent
GB	Governing Board
GoN	Government of Nepal
GRM	Grievance Review Mechanism
GWG	Grievance Working Group
IBSP	Industrial Benefit Sharing Plan
ICP	Informed Consultation and Partii
IDP	Internally Displaced Persons
IFC	International Finance Corporation
ILO	International Labor Organization
IMT	Internal Monitoring Team
IP	Indigenous Peoples
IPO	Indigenous Peoples Organization

IPP	Indigenous Peoples Plan
ISP	Infrastructure Support Program
IUCN	International Union for Conservation of Nature
LALRP	Land Acquisition and Livelihood Restoration Plan
LBSP	Local Benefit Sharing Plan
LNP	Langtang National Park
LPG	Liquified Petroleum Gas (Propane/Butane)
LRP	Livelihood Restoration Plan
NEA	Nepal Electricity Authority
NEFIN	Nepal Federation of Indigenous Nationalities
NFDIN	National Foundation for Development of Indigenous Nationalities Act
NGO	Non-Governmental Organization
NPR	Nepalese Rupee
NWEDC	Nepal Water and Energy Development Company Limited
PAF	Project-Affected Families
PAP	Project-Affected Persons
PC	Program Committees
PDA	Project Development Agreement
PS7	Performance Standard 7
PSM	Participatory Social Mapping
SDP	Social Development Program
SEP	Stakeholder Engagement Plan
SIMF	Social Impact Management Framework
SPS	Safeguard Policy Statement
TIA	Tripartite Implementation Agreement
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UT-1	Upper Trishuli-1 216MW Hydropower Project
VDC	Village Development Committee
WG	UT-1 Adibasi Janajati IPP & FPIC Working Group

1 INTRODUCTION[1]

1.1 BACKGROUND

The proposed Upper Trishuli-1 (UT-1) Hydropower Project (216MW) is on the Trishuli River within Rasuwa District of Central Development Region of Nepal. Nepal Water and Energy Development Company Limited (NWEDC) is developing the project and is considering financial support from a group of international financial institutions including IFC.

The Environment Impact Assessment (EIA) as required under the laws of the Government of Nepal (GoN) was carried out for the project and was approved in February 2013. With the involvement of international lenders, this environment and social impact assessment process carried out earlier was strengthened with supplementary studies and formulating complementary environment and social action plans in February 2015. In April 2015, Nepal suffered a large earthquake with epicenter within 100km radius of the proposed UT-1 project site. The earthquake brought death, destruction and disruption in social life and livelihood practices.

NWEDC responded promptly to this calamity with a series of community-support activities which continued the tradition of outreach to the community established by the Company since its earliest engagement in the Upper Trishuli area. Both pre- and post-earthquake, the Company has undertaken a number of community and infrastructure development activities as part of its Corporate Social Responsibility (CSR) activities, including supporting rebuilding of two schools in Haku Besi and Dhunche and one health center. For an account of these activities and other CSR initiatives, see Annex 1.

Though post-earthquake relief and reconstruction efforts addressed immediate humanitarian concerns, life and livelihood have not yet fully recovered. This

[1] This Indigenous Peoples Plan (IPP) version replaces two earlier IPP drafts publicly disclosed on the IFC website as well as one later IPP draft disclosed at the village level, and one still later version shared with village representatives prior to the vote on granting consent to the Project and the IPP. The first publicly disclosed version was created by the consulting firm Environmental Resources Management (ERM) and publicly disclosed by the International Finance Corporation (IFC) in March 2018. The second draft was revised by the consulting firm Cross-Cultural Consulting Services (CCCS) and disclosed by IFC publicly in July 2018. With the FPIC process being conducted in earnest, a new "Free, Prior, and Informed Consent" (FPIC)-informed IPP was drafted ("FPIC IPP Draft #1")—following the First Round of FPIC-compliant Consultations--and was disclosed during meetings held with the FPIC villagers at their Second Adibasi Janajati Advisory Council (AJAC) and Working Group (WG) Meetings in early September. Following these meetings, a second FPIC IPP Draft was created and shared with the village representatives during the Third AJAC and WG meetings in late October 2018. Thus, the latest IPP drafts were bottom-up FPIC-compliant versions created with village-level input provided by the national-level Indigenous Peoples Organization (IPO), Nepal Federation of Indigenous Nationalities (NEFIN). Authorship is thus shared between ERM and CCCS and relies partially on data supplied by both NEFIN and NWEDC. This final IPP version includes the results of the Third Meetings which both approved changes to the IPP and approved three documents which are included herein as annexes. NWEDC stands fully behind the provisions of this IPP.

special circumstance has greatly complicated the process of planning to mitigate and manage impacts attributable to the UT-1 project.

The international sustainability-consulting firm Environmental Resources Management (ERM) was selected to consolidate all prior impact assessments and supplemental and complementary studies into a single Updated Non-Technical Environmental and Social Impact Assessment Report (Updated ESIA), along with an updated Environmental and Social Management System (ESMS) and Environmental and Social Management and Monitoring Plans (ESMMP), including a Social Management Framework. The Indigenous Peoples Plan (IPP) is part of this Social Management Framework and addresses specific requirements of Indigenous Peoples (IP) as project-affected persons (PAPs) as per the policy requirements of IFC's Performance Standard 7 (PS7), the ADB Social Safeguard for Indigenous Peoples, and the AIIB Environmental and Social Standard 3: Indigenous Peoples.

The social impacts of UT-1 on the local population are addressed through a number of completed management plans publicly disclosed by NWEDC and IFC in late July 2018:[2]

- Land Acquisition and Livelihood Restoration Plan (LALRP)
- Stakeholder Engagement and Grievance Redress Plan
- Indigenous Peoples Plan (this document)

A Construction Environmental & Social Management Plan has also been disclosed, containing the framework for a other socially-oriented management plans such as a Cultural Heritage Management Plan, which will be developed by the Engineering, Procuring, and Construction contractors (EPC) prior to the start of construction.

In addition to these social management plans, as per provisions under the Project Development Agreement (PDA) signed between NWEDC and the GoN, NWEDC will develop and implement the following plans in consultation with the GoN:

- Local Benefit Sharing Plan (LBSP)
- Disaster Management Plan (DMP)
- Employment and Skill Training Plan (ESTP)
- Industrial Benefit Sharing Plan (IBSP)

The PDA describes the broad obligations of NWEDC towards these plans on the basis of which these detailed plans are developed by NWEDC in close collaboration with the GoN.

[2] Two plans will be developed to address issues relating to the workforce which will reside in the area during construction and operation: a) an Occupational Health and Safety Management Plan and b) a Workers Accommodation Management Plan.

This IPP examines the impact of the proposed project on Indigenous Peoples including their livelihood, culture and rights as members of the Tamang Indigenous Peoples communities. This IPP has also been used to facilitate consultation with affected indigenous communities for soliciting their comments and feedback for design of adequate and acceptable mitigation and benefit measures in a revised IPP. This consultation process has been carried out in compliance with the requirements of a "Free, Prior, and Informed Consent Process (FPIC)," as laid out in IFC's PS 7. See sections 4.3 and 4.4 for a fuller description of these consultations.

1.2 RELATIONSHIP OF THE IPP TO THE OTHER SOCIAL MANAGEMENT PLANS

1.2.1 The IPP and the LALRP

This Indigenous Peoples Plan responds to the requirements of IFC's PS7, while the Land Acquisition and Livelihood Restoration Plan (LALRP)—one of the EIA social management plans--responds to the requirements of PS5. As such, the mitigation measures specifically directed at mitigating, reducing, or avoiding negative effects of the land acquisition needed by NWEDC for the UT-1 Project are outlined in that document. Similarly, the benefits allocated to the Project Affected Families (PAF) who have lost land, assets, or access to such assets are also separately described in the LALRP and are not repeated here in the IPP. Thus, the IPP applies to all current and former residents of the ten project directly affected villages—the Project Affected Persons (PAP)--while the LALRP applies only to a subset of those villagers, the PAF.

1.2.2 The IPP and the PDA Social Development Plans: Laying the Groundwork for Future IPPs

As described above, of the PDA's four plans, one (the Disaster Management Plan) is completely extraneous to this IPP, while another one (the Industrial Benefit Sharing Plan) is aimed at support of businesses nationwide[3] and thus not an explicit part of the IPP. The two other plans do relate to the IPP, both the Local Benefit Sharing Plan and the Employment and Skills Training Plan.[4] However, financing for these plans will flow from revenues generated from the project once it is in operation and thus cannot be the source of the First IPP which will launch during construction. The budget and components of future, post-construction, IPPs will rely on financing derived from the LBSP and the

[3] The objective of IBSP is to enable Nepal-based firms to gear up to meet the needs for supply of goods and services at competitive prices in accordance with the timelines and quality standards required by the Company. Although not specifically aimed at either local PAPs or Indigenous Peoples, the IBSP could serve as a gateway over the years for involving local PAPs in providing industrial economic services to the Project, particularly if the skills-training components of the IPP make provision for such possibilities.

[4] It is worth noting that skills training will be part of this first IPP and encapsulated within the Capacity-Building Component (Section 6.4).

ESTP, both of which extend their benefits beyond the IPP itself to indirectly affected villages and communities in the surrounding *gaunpalika* (Rural Municipalities) and wards.

Brief descriptions of the two IPP-relevant PDA plans and their components:

- Local Benefit Sharing Plan: The main objective of the LBSP is to support the local development process through a) a local shares allocation scheme, b) a rural electrification project, and c) a community development program. Another key section of the LBSP describes how royalties generated from the project are shared with various government levels.[5] Of these four components, the first two are referenced in Section 5.4 of this IPP while the details of the latter two components will be worked out prior to project operation.
- Employment and Skills Training Plan: The Plan has two key components, a technical and vocational training program and merit-based scholarships for Diploma courses.[6] Both components are incorporated in this IPP.

The components and budgets allocated for IPPs from within both the LBSP and the ESTP will be incorporated in post-construction IPP components and budgets.

1.3 OBJECTIVES AND SCOPE OF THE IPP

This document records the efforts of NWEDC to minimize and/or mitigating adverse impacts from the project on the indigenous population in the Project Area of Influence (AoI). Where avoidance was not possible, NWEDC has planned mitigation measures, and this document provides a synopsis of that. This IPP also identifies potential measures to enhance the positive impacts and opportunities from the project for the local Indigenous People, the Tamang, and includes their active engagement with planning for their project-affected futures through their participation in the FPIC process.

[5] NWEDC will pay royalty to the GoN as per the provisions under section 11.22.2 of the PDA. There are two types of Royalty payable to the GoN. First, the Capacity Royalty which is NPR 200 per KW per annum. Second, the Energy Royalty which is 2% of the energy receipts for the first 15 years (from the Commercial Operation Date [COD]) and 10% of the energy receipts for the reminder term of the Concession period. This will contribute to the revenue of GoN which will be used for social welfare and economic development of the country. According to the Local Self-Governance Rules (2050 BS) the royalty generated from the project will be distributed as follows:

Royalty Allocation	*Government Level*	*Beneficiaries*
50%	Federal Government	Nation
25%	Provincial Government	Residents of the Region
25%	District	Residents of Rasuwa District

[6] The original ESTP was prepared based on literature review, survey of 369 PAFs, rapid market appraisal, field observation and informal meetings with district level government officers and workers of non-government organizations. The specific courses listed in this IPP in section 6.4 will be reviewed by the IPP's governing bodies once Plan implementation begins in earnest.

The specific objectives of this IPP are:

- To help preserve the religion, culture, life style, traditional knowledge, and skills of the local Indigenous People, the Tamang, so that they are passed on to new generations.
- To share relevant information on possible negative effects and mitigation measures as well as opportunities for project benefits with project-affected communities and their representatives. To strengthen Project environmental effects disclosure and provide timely, objective and complete information to the ten villages subject to the FPIC process ("FPIC villages") of the actual and/or potential impacts of the UT-1 Project on the environment, and the measures taken to prevent and/ or minimize any potential negative effects.
- To seek their suggestions for making the proposed mitigation measures and various action plans more effective, appropriate and acceptable to them by identifying opportunities and actions to enhance positive impacts of the project on the Tamang Indigenous People.
- To enhance the capacity of the residents of the ten Project-Affected villages to actively participate in the self-management of their own affairs. Such capacity-building could range from leadership training, to technical skills enhancing (e.g., for accounting, report-writing, budget preparation, traditional economic and cultural activities, business planning, driver's licenses), to heightened cultural and ethnic self-awareness.
- To enhance social, cultural, and economic development. Improving the lives and livelihoods of the Tamang Project-Affected People through the implementation of social and economic development plans in a culturally appropriate manner. Cultural revival, economic viability of traditional economic enterprises, employment preferences, and improved social conditions will be targeted areas for support. Long-term strategic planning with the concept of sustainable development (including perhaps ethnic hydro-tourism as an objective) will also be emphasized.

1.4 METHODOLOGY AND AUTHORSHIP OF IPP PREPARATION[7]

ERM was engaged by NWEDC to prepare the first drafts of an Indigenous Peoples Plan and it was their first draft which was publicly disclosed on the IFC's website in March 2018. This draft was based on inputs of ERM field teams which had been visiting the project area both prior to and after the 2015 earthquake.

In April of 2018, Cross-Cultural Consulting Services' (CCCS) Dr. Gregory Guldin was engaged by IFC to both guide an FPIC process for the UT-1 Project and to assist in IPP revision based on that process. In June, Nepal's preeminent Indigenous Peoples Organization—Nepal Federation of Indigenous Nationalities (NEFIN)—was engaged to facilitate the FPIC process, helping

[7] See Annex 2 for an introduction to the Plan contributors.

villagers select their representatives to negotiate with NWEDC and to express their IPP preferences and general demands of the Company. Repeated Consultation Rounds and meetings of the FPIC & IPP Working Group and the Adibasi Janajati (Indigenous Peoples) Advisory Council led to incorporating villager suggestions for IPP revision and recognition of their demands into the IPP itself both in the main text and in its annexes. (See Annex 2 for a fuller description of NEFIN's role in both the FPIC process and IPP formulation.)

Working closely with both NWEDC and NEFIN, CCCS produced the first FPIC-based IPP Draft in September 2018 and this was disclosed to village representatives during the Second WG and AJAC Meetings. A Second FPIC Draft was submitted to both the WG and AJAC prior to their late October Meetings and incorporated updates from both ERM and NEFIN. A Third FPIC Draft was produced immediately after the Third WG and AJAC Meetings were held to incorporate changes made before and during these meetings. This Third draft included inputs from Mr. Phurpa Tamang (a recognized scholar of Tamang cultural affairs and the AJAC's designated counsellor), NWEDC, NEFIN, ERM, and CCCS and was the version to which the communities' consent was granted on 1 November. A fourth and final IPP (this document) was produced mid-November to include all final corrections to the document as well as the documents passed at the concluding AJAC and WG meetings during which Consent for both the Project and the IPP were obtained.

1.5 APPLICABLE POLICY FRAMEWORKS

This IPP was prepared to meet the requirements of the IFC PS7: Indigenous People, the ADB SPS 2009, and the AIIB Environmental and Social Standard 3: Indigenous Peoples. The following table provides key provisions in these two applicable reference frameworks.

Table 1-1 Applicable Reference Framework Requirements for IPP and Free, Prior, and Informed Consent (FPIC)

Applicable Reference Framework	Requirements for IPP	Requirements for FPIC
IFC PS1: Assessment and Management of Environmental and Social Risks and Impacts	The part of PS1 dealing with Management Program envisages an IPP as a thematic plan and should be developed by qualified experts with substantive experience.	For projects with adverse impacts to Indigenous Peoples, the client is required to engage them in a process of Informed Consultation and Participation (ICP) and in certain circumstances; the client is required to obtain their Free, Prior, and Informed Consent .
IFC PS7: Indigenous People	• If adverse impacts are unavoidable, the project should prepare an Indigenous Peoples Plan outlining the actions to minimize and/or compensate for adverse impacts in a culturally appropriate manner • a free-standing IPP may be prepared, or it may be a component of a broader community development plan • The plan should detail actions to minimize and/or compensate for adverse social and economic impacts, and identify opportunities and actions to enhance positive impacts of the project on the Indigenous Peoples. • Where appropriate, the plan may also include measures to promote conservation and sustainable management of the natural resources on which the Indigenous Peoples depend • The plan should include a clear statement of roles and responsibilities, funding and resource inputs, a time-bound schedule of activities, and a budget. • The IPP shall be regular monitored and should be flexible to allow for it to be adapted as needed if circumstances change,	One of the objectives of the PS is to ensure the FPIC of the Affected Communities of Indigenous Peoples when the following circumstances are present • Impacts on Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use • Relocation of Indigenous Peoples from Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use • Significant Impacts on Critical Cultural Heritage
ADB SPS Safeguard Requirements 3: Indigenous People	• If the proposed project will have impacts, positive and/or negative, on Indigenous Peoples, the borrower/client will prepare an IPP in the context of the impact assessment and through meaningful consultation with the affected Indigenous Peoples communities. • The IPP will set out the measures whereby the borrower/client will ensure that:	• The borrower/client will undertake meaningful consultation with affected Indigenous Peoples to ensure their informed participation in o designing, implementing, and monitoring measures to avoid adverse impacts on them or, when avoidance is not possible, to minimize, mitigate, and compensate for such effects; and

Applicable Reference Framework	Requirements for IPP	Requirements for FPIC
	o that affected Indigenous Peoples receive culturally appropriate social and economic benefits; and o That when potential adverse impacts on Indigenous Peoples are identified, these will be avoided to the maximum extent possible. • Where this avoidance is proven to be impossible, based on meaningful consultation with indigenous communities, the IPP will outline measures to minimize, mitigate, and compensate for the adverse impacts. • The level of detail and comprehensiveness of IPPs will vary depending on the specific project and the nature of impacts to be addressed. The borrower/client will integrate the elements of the IPP into the project's design	o tailoring project benefits that accrue to them in a culturally appropriate manner. • For purposes of policy application, consent of affected Indigenous Peoples communities refers to a collective expression by the affected Indigenous Peoples communities, through individuals and/or their recognized representatives, of broad community support for the project activities listed in para. 30 of the SPS. Such broad community support may exist even if some individuals or groups object to the project activities. • To carry out meaningful consultation with affected Indigenous Peoples, the borrower/ client will establish a context-specific strategy for inclusive and participatory consultation, including approaches of identifying appropriate Indigenous Peoples representatives, and consultation methods appropriate to the social and cultural values of the affected Indigenous Peoples communities. • The borrower/client will pay special attention to the concerns of indigenous women and youth. • The consultation process and its results will be documented and reflected in the IPP. • the project will seek consent from the affected Indigenous Peoples communities in case the project is likely to result in the following impacts; o commercial development of the cultural resources and knowledge of Indigenous Peoples; o physical displacement from traditional or customary lands; and o commercial development of natural resources within customary lands under use that that would impact the livelihoods or the cultural, ceremonial, or spiritual uses that define the identity and community of Indigenous Peoples.

Applicable Reference Framework	Requirements for IPP	Requirements for FPIC
AIIB Environmental and Social Standard 3: Indigenous Peoples	• If Indigenous Peoples are present in, or have a collective attachment to, the proposed area of the Project, and are likely to be affected by the Project, the Borrower will prepare an Indigenous Peoples plan that is based on the social impact assessment prepared with the assistance of suitably qualified and experienced experts and that draws on indigenous knowledge and participation by the affected Indigenous Peoples communities. • Vulnerability is included in the generic definition of Indigenous People and requires to be addressed in the IPP. • The IPP will set out the measures whereby the borrower/client will ensure the following: o continued consultation with these affected Indigenous Peoples during Project implementation; o measures to ensure that affected Indigenous Peoples receive culturally appropriate benefits; o measures to avoid, minimize, mitigate, offset or compensate for any adverse Project impacts; and o culturally appropriate grievance procedures, monitoring and evaluation arrangements, and a budget and time-bound actions for implementing the planned measures are available. • The draft IPP must be disclosed for consultation, and evidence of broad community support sought by the Client must be provided. • A Grievance Redress Mechanism, taking into account Indigenous People's characteristics, must be put in place, and contain provisions for complainants to remain anonymous and be protected from retaliation if requested. • Monitoring must be conducted by suitably qualified and experienced experts, adopting a participatory approach.	• The borrower/client will carry out a process of meaningful consultation on the Project with affected Indigenous Peoples communities and concerned Indigenous Peoples organizations, in a culturally appropriate, accessible and inclusive manner, and facilitate their informed participation: (a) in designing, implementing and monitoring measures to avoid adverse impacts or, when avoidance is not possible, to minimize, mitigate, offset or compensate for such impacts; and (b) in tailoring Project benefits to affected Indigenous Peoples communities in a culturally appropriate manner. • To enhance affected Indigenous Peoples' active participation, the borrower/client will provide for culturally appropriate, and gender inclusive capacity development in the Project. • The Client will ensure that the FPICon process: (a) involves Indigenous Peoples' representative bodies and organizations (e.g., councils of elders, village councils or chieftains) and, where appropriate, other community members; (b) provides sufficient time for Indigenous Peoples' decision-making processes; and (c) allows for Indigenous Peoples' effective involvement in the design of Project activities or mitigation measures that may affect them either positively or adversely. • The Client/Borrower will engage in FPICon and obtain the broad support of the affected Indigenous Peoples if activities under the Project would: o have impacts on land and natural resources subject to traditional ownership or under customary occupation or use; o Cause relocation of Indigenous Peoples from land and limitations on access to natural resources subject to traditional ownership or under customary occupation or use; or

Applicable Reference Framework	Requirements for IPP	Requirements for FPIC
		o have significant impacts on Indigenous Peoples' cultural heritage.

For the purpose of this Project and its IPP, the IFC PS 7 has been deemed to be materially consistent with the relevant provisions of the Bank's Environmental and Social Policy and Environmental and Social Standard 3: Indigenous People.

1.6 INDIGENOUS PEOPLES/ INDIGENOUS NATIONALITIES IN NEPAL

The process of recognition of the rights of Indigenous Peoples in Nepal has made great progress. Until 1990 Indigenous Peoples' separate identities and concerns were largely ignored. This situation shifted with political change[8] in 1990 and gradually representatives from Indigenous Peoples, scholars and academic groups highlighted the socio-economic discrepancies between dominant groups and Indigenous Peoples and demanded special attention to them. The Self-Governance Act of 1998 for the first time recognized that Indigenous Peoples are excluded from the governance process and that they need to be brought into the national mainstream. The Act made provisions for their representation in Village, Municipal and District Development Councils. This law led to the adoption of a more specific law that defined and identified Indigenous Peoples.

In 2002, the National Foundation for Development of Indigenous Nationalities Act (NFDIN 2002) defined '*Adibasi Janajati*' as a group or community with its own mother tongue and traditional customary practices, distinct cultural identity, social structure and oral or written history. A comparative analysis of this definition vis-à-vis the definition of the Indigenous Peoples as per the International Labor Organization (ILO) Convention No. 169 and United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)[9] by several indigenous activists, scholars and representatives points to two issues of departure. First, NFDIN 2002 does not recognize the 'self-identification' of Indigenous Peoples. It has identified 59 *Adibasi Janajatis* and set a process of constituting a committee which will decide on such claims. Second, the existence of traditional political institutions is not a requirement for recognition of Indigenous Peoples.

Thus, NFDIN 2002 laid the foundation for identification of Indigenous Peoples in Nepal. The term "*Adibasi Janajati*" is translated as 'Indigenous Nationalities' in Nepal contrary to the international term 'Indigenous Peoples'. This to several scholars and authors is indicative of the political aspirations and territoriality which is an integral part of the Indigenous Peoples movement in Nepal since 1990s.

The strength of the Indigenous Peoples movement in Nepal was so strong that Nepal was the first country in Asia and second in Asia-Pacific to ratify ILO Convention No 169. Nepal ratified the ILO C-169 in September 2007 and also

[8] In 1990 Nepal made the transition from an absolute monarchy to constitutional democracy after the People's Movement (*Jana Andolan*) supported by multiple political parties was successful.

(1) [9] The convention No. 169 in its article 7 provides right to the indigenous and tribal people to decide their own priorities for the process of development. Article 12, 13, 14 and 15 safeguards rights of the indigenous people in the land and natural resources in territories traditionally occupied by them.

(2) The UNDRIP adopted in 2007 sets out the individual and collective rights of indigenous peoples, as well as their rights to culture, identity, language, employment, health, education and other issues . The goal of the Declaration is to encourage countries to work alongside indigenous peoples to solve global issues like development, multicultural democracy and decentralization.

voted in favor of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) in UN General Assembly. The twenty points agreement between Indigenous Peoples and the Nepal Government in 2007 which kick-started the on-going political process includes inclusion of Indigenous Peoples in the process of restructuring the State and the formation of Nepal's new Constitution. As a consequence, several Indigenous Peoples Organizations participated in the election to the Constituent Assembly and have contributed to the finalization of the Constitution.

The Constitution guarantees the right to social justice and participation in the state structure on the basis of the principle of social inclusion. Art 63.4.3(a) provides proportional representation of Indigenous Peoples in the Constituent Assembly. There is an intense debate in the Constituent Assembly on recognizing autonomous states (11 states and sub-states) territorial claims of different ethnic groups within the federal democratic structure of Nepal.

NFDIN 2002 not only identifies 59 Adibasi Janajati, it also divides them into four geographic regions. The mountain region or Himalaya has 17, Hills have 24, Inner Terai has 7 and Terai has 12 Indigenous People groups. NEFIN classifies them based on their social-economic status and vulnerabilities as follows: endangered groups, highly marginalized groups, marginalized groups, disadvantaged groups and advanced groups. NEFIN undertakes a number of development programs for Indigenous Peoples across the country and is represented in the project area by a local NEFIN branch and the Tamang Association. See Section 1.4 and Annex 2 for a fuller description of NEFIN and its role in the FPIC process and IPP preparation.

1.7 SCREENING OF CLIENT'S OBLIGATIONS UNDER PS7

IFC's PS7, para. 14 states 'if client proposes to locate a project on lands traditionally owned by or under the customary use of Indigenous Peoples and adverse impacts can be expected, client will take steps to protect the rights of the indigenous people.' The screening of the client's obligations vis-à-vis provisions of PS7 is presented in table below.

Table 1-2 Screening of the client's obligations vis-à-vis provisions of PS7

Provisions	Status
Document efforts to avoid and otherwise minimize the area of land proposed for the project	Client has minimized the land required for the project and avoided un-necessary acquisition of land for the project. The details are discussed in the land requirement and alternative analysis sections of this report.
Document efforts to avoid and otherwise minimize impacts on natural resources and natural areas of importance to Indigenous People	The requirement of the community forest land is minimized and the land will be used during construction phase only.

Provisions	Status
Identify and review all property interests and traditional resource uses prior to purchasing or leasing land;	The ESIA and LALRP processes have been undertaken to review property interests and traditional resource use as part of the planning process of the project.
Assess and document the Affected Communities of Indigenous Peoples' resource use without prejudicing any Indigenous Peoples' land claim. The assessment of land and natural resource use should be gender inclusive and specifically consider women's role in the management and use of these resources;	The assessment of the affected communities of IP and their resource use is conducted as part of this study and needs to be read in conjunction with the LALRP.
Rights under national law, including any national law recognizing customary use rights;	The legal requirements under the national law were screened. The Forest Act 2044, Forest Rules 2051 and Availing Forest Land for Other Purpose Procedure 2063 were referred. There is a provision of holding a general assembly of the concerned Community Forest Users Groups (CFUG) to seek their consent by the District Forest Office (DFO) prior to recommendation to the council of ministers to approve the use of forest land for non-forest use. According to the DFO, such a meeting was held for CFUGs affected by the UT-1 project and approval was granted on certain conditions. Though Nepal has ratified ILO C-169 and UNDRIP, no specific process has been established for the FPIC process in the country.
Offer Affected Communities of Indigenous Peoples compensation and due process in the case of commercial development of their land and natural resources, together with culturally appropriate sustainable development opportunities.	There is no law which recognizes the customary use rights over other natural resources such as landscape and water. However, the hydropower development policy of Nepal recognizes that hydropower development acts as a stimulus to bring long-term sustainable benefits to Nepal in general and local communities in particular. Therefore, it makes provision ofLBSP, Sharing IBSP, and ESTP as part of the responsibility of NWEDC.

In keeping with the impacts identified, certain mitigation measures have been identified. These mitigation measures are applicable on all the PAFs/land owners impacted by the project activities and are not specific to the indigenous population. In addition to this, certain key measures have been identified for the indigenous population to allow for the minimization of adverse impacts and maximization of opportunities created by the project. The following sub-section provides an understanding of the applicability of the requirement for an FPIC process.

1.8 APPLICABILITY OF THE FPIC REQUIREMENT

PS7, para. 14, deals with the circumstances in which free, prior and informed consent process has to be conducted. The conditions which trigger the FPIC for

this project are summarized in Table below. Note that ADB's SPS has similar provisions.

Table 1-3 Special Circumstances requiring FPIC and its relevance

Criteria	Relevance	Compliance Status
Impacts on lands and natural resources subject to traditional ownership or under customary use	The community forest land to be used for the project is part of the collectively owned natural resources by local Indigenous Peoples. The changes in the river condition due to project will also potentially impact customary use of the river and fish population in it.	The DFO is reported to have carried out the consultation with CFUGs and obtained consent holding General Assembly of these three concerned CFUGs as per Forest Rules 1995. As the process documentation is not available, the adequacy of the process could not be judged.
Relocation of IPs from lands and Natural Resources subject to traditional ownership or under customary use.	Project involves acquisition of 36 structures including 27 residential structures, 8 cowsheds, and 1 water mill. The residential structures included 14 primary residences, 5 secondary residences (only used seasonally) and 8 partially constructed houses. Out of the 14 primary residences 7 were prior to earthquake and 7 are post-earthquake. They impact 12 families.	This requirement is not considered applicable, per PS7 footnote 12, as affected homes were built on lands with recognizable tenure rights. The livelihood restoration and compensation for these land/assets are covered under the LALRP. It should be noted that the earthquake had damaged all structures and all familiesmoved to Internally Displaced Persons (IDP) camps. Approximately 380 families were living in those camps as of recently.
Critical Cultural Heritage	The river, streams and landscape affected by project activities were not found to be assigned cultural and spiritual value by local IPs communities. Hence, no critical cultural heritage is located in project impact area.	
Commercial use of Traditional Knowledge and Knowhow of IPs	Not Relevant	

As the project impacts the government-owned lands and natural resources subject to traditional ownership/under customary use of the Tamang (i.e., CFUG-administered forest land), the requirement of free, prior and informed consent for the project is triggered.

FPIC is thus a lender requirement and not currently required under Nepali law besides the DFO-led approval process referred to in the table above. The

original GoN decision to develop a hydropower project at this location and the subsequent acquisition of a portion of affected indigenous lands which occurred early in the project development process, pre-date Lender involvement and were not subject to an FPIC process.

Therefore, in the project-financing context for this specific project, the concept of seeking "prior consent" was defined as seeking consent from affected Tamang communities for a draft package—an IPP--of proposed impact mitigation measures and benefits prior to lending decisions by prospective financiers and prior to the main phase of UT-1 project development (i.e., prior to the main construction phase).[10] See Annex 3 for a description of the principles underlying Free, Prior and Informed Consent.

[10] Note too that during the series of meetings held by community representatives between 30 October and 1 November, consent was not only granted for the IPP but also for the UT-1 Project itself.

2 DESCRIPTION OF PROJECT

2.1 PROJECT LOCATION

The Project is located in the upper portion of the Trishuli River Basin, just downstream of the confluence of the Langtang Khola and the Bhote Khosi River. The Langtang National Park (LNP) forms the eastern boundary of most of the Project area. There are six existing operating hydropower projects and seven projects under construction within the Upper Trishuli River Basin. In addition, the Upper Trishuli-2 Project is proposed, but not yet under construction, and would be located approximately 0.5 kilometer upstream from the UT-1 dam. Two of the existing and two of the under-construction hydropower projects are on the main stem of the Trishuli River downstream of the Project (the nearest, UT-3A Hydropower Project, is approximately 1.5 kilometers away).

2.2 PROJECT FACILITIES

The Project consists of a 100.9-meter-wide diversion dam in a narrow gorge located on the Trishuli River 275 meters downstream of the confluence of the Langtang Khola with the Bhote Khosi River (Figure 2-1). The diversion dam creates a small 2.1-hectare (ha) impoundment and diverts up to 76 cubic meters per second (m^3/s) of water through a powerhouse with a 216-megawatt (MW) capacity, returning the water to the Trishuli River approximately 10.7 kilometers downstream of the dam.

Table 2-1 Overview of Upper Trishuli-1 project facilities

Project Facility	Description
Dam	100.9 m long x 30.85 m wide x 29.5 m high concrete gravity dam
Spillway Gates	Three 11.0 m wide x 16.5 m high spillway gates capable of passing 200 year storm (2,555 m^3/s)
Reservoir	2.1 ha impoundment at normal operating elevation (1255.0 m)
Intake Structure	Horizontal bell-mouth type intake with two 3.25 m wide x 6.5 m high roller gates on right side near spillway at intake elevation of 1247.0 m
Desander	Underground horizontal flushing type desander with 3 chambers each 115.0 m long, 10.0 m wide, and 23.93 m high designed to remove particle sizes of 0.2 mm or larger, with three sediment flushing channel connecting into a 3.4 m wide x 1.7 m high flushing tunnel
Headrace Tunnel	6.5 m diameter x 9.7 km long low pressure tunnel
Surge Tank	8.5 m diameter x 38 m high tank to manage pressure changes in headrace tunnel
Vertical Pressure Tunnel	6.5 m diameter x 292 m long concrete lined high pressure tunnel
Horizontal Pressure Tunnel	6.5 m diameter x 40 m long concrete lined high pressure tunnel
Penstock	110.7 m long x 1.6 m to 6.5 m diameter concrete (upper section) and steel (lower section) high pressure pipe
Powerhouse	Underground 3 vertical axis Francis turbine generating units each with 72 MW of capacity accessed by a tunnel
Tailrace Tunnel	Three 6.5 m diameter x 55.0 m long concrete lined pipes combining into one 6.5 m diameter x 178 m long concrete tunnel

Project Facility	Description
Tailrace Outlet	6.5 m diameter x 38.15 m long outlet at elevation 910.0 m
Transformer Cavern	Main transformer and 220 kV gas insulated switchgear
Cable Tunnel	381.5 m long
Take-off Yard	Underground facility that will house transformers, disconnecting switches, circuit breakers, current transformers, voltage transformers, bus bars, and other necessary protection equipment
Administrative Complex	Administration, Main Control, Generator, Worker Accommodation, and Security buildings

Source: DKJV 2017

ha = hectare; km = kilometer; kV = kilovolt; m = meter; mm = millimeter; m^3/s = cubic meters per second; mm = millimeters; MW = megawatt

2.3 ANCILLARY PROJECT FACILITIES

2.3.1 Access Roads

Vehicular access to the Project is from the public Betrawoti-Mailung-Syabrubesi Road (i.e., the road to China), via a public spur road, which was constructed by the nearby Mailung Hydropower Project, but is managed by the Mailung Rural Municipality. Nepal Water and Energy Development Company Limited (NWEDC) constructed a private bridge over Mailung Khola from the spur road to access their former construction camp and powerhouse site, but it was destroyed by the earthquake. NWEDC has constructed a new access to the powerhouse site, downstream of the former bridge, which includes a new 39.6 m long by 4.3 m wide Bailey Bridge (a type of portable, pre-fabricated, truss bridge) across Mailung Khola. As part of preparing for the main construction phase of the Project, NWEDC has spent several years constructing an 11.84-kilometer-long/5.5-meter-wide private road from the Mailung Khola Bridge (downstream) to the UT-1 dam site (upstream).

The Project will also take advantage of the newly constructed "Army Road," which follows along the east bank of the Trishuli River and ultimately extends to China. There will be two points of access to the Project from the Army Road:

- Near the powerhouse – a short access road and temporary 51.8 m long by 4.3 m wide Bailey Bridge across the Trishuli River to access the Army Road as well as the Mailung Worker Camp; and
- Near the dam site and Haku Besi – a short access road and temporary 39.6 m long by 4.3 m wide Bailey Bridge across the Trishuli River that connects the Army Road with the NWEDC Access Road.

2.3.2 Transmission Line

The Project will require construction of a 1184.5-meter-long single circuit 220 kV transmission line within a 30-meter-wide right-of-way. The transmission line will require the construction of five new 35-meter-high steel lattice towers from its take-off yard to the Tower AP-28 of Nepal Electricity Authority's (NEA)

proposed Chilime-Trishuli 220-kilovolt double circuit transmission line. The transmission line will have a minimum ground clearance of 11 meters.

In accordance with Nepalese regulations, NWEDC will permanently acquire the land for the five towers (with each tower having a 13 meter by 13-meter concrete pad) and will lease the remaining right-of-way land from the government. The take-off yard will be built within the powerhouse boundary on land already procured by the Project.

2.4 PROJECT DESIGN CHANGES DUE TO EARTHQUAKE IN APRIL 2015

NWEDC had initiated construction prior to the April 2015 earthquake. It had constructed a bridge over the Mailung Khola and also a worker camp at the Mailung School (adjacent to the powerhouse) to facilitate this construction of the Access Road. Approximately 5.1 kilometers out of 11.2km of the access road connecting to the dam site was completed at the time of earthquake. As a result of the earthquake, the bridge was damaged, the worker camp destroyed, and portions of the access road were impacted by landslides.

Consequently, NWEDC has constructed a new bridge over Mailung Khola downstream of the damaged bridge, relocated the worker camp for safety reasons to the east side of the Trishuli River, and has removed landslide debris covering portions of the access road. In addition, the Project design has been modified to take into account better defined seismic hazards (e.g., the Lender's Engineer specified a Maximum Credible Earthquake of 0.83 g [acceleration of gravity] for a 3,000-year recurrence period based on a Deterministic Seismic Hazard Analysis), changes in landscape conditions (e.g., landslides), and to optimize engineering aspects of the dam. The dam design has also been upgraded to withstand a 10,000-year flood event with a combination of spillway gates and an emergency spillway overflow, as well as revised to accommodate a fish ladder. These Project design changes are summarized in Table below.

Table 2-2 Project design changes due to earthquake in 2015

Project Feature	Original Design	Revised Design	Reason for Change
Dam	Spread concrete foundation Design discharge – 3,563 m^3/s at 5,000-year frequency	Floating foundation Design discharge – 3780 m^3/s at 10,000-year frequency Fish ladder included	Updated seismic design and to include a fish ladder
Intake	Spread concrete foundation Gravel trap at front of intake	Bored cast in-place pile Bed load sluice, settling basin and gravel trap	Updated seismic design To prevent sediment inflow
Powerhouse	Outdoor transformer	Transformer set in cavern	Updated seismic design
Take-off yard	Location – Station 0+800 Access Tunnel – 353 m Cable Tunnel – 183 m Penstock work adit – 196 m D/T Shaft work adit – 83 m	Location – Station 0+80 Access Tunnel – 377 m Cable Tunnel – 381.5 m Penstock work adit – 280 m D/T Shaft work adit – 150 m	Avoid landslide area

Project Feature	Original Design	Revised Design	Reason for Change
Access Roads	19 km	Revised alignment, reduced road length to 11.8 km by replacing some access roads with tunnels	Avoid landslide areas
Surge tank access	2,750 m access road with 18 m air vent tunnel	1,740 m air vent/access tunnel (no access road)	Avoid landslide area
Work adit-4	342 m tunnel	1,140 m tunnel	Avoid landslide area
Powerhouse Worker Camp	Powerhouse Worker Camp on west side of river near Mailung Khola	Powerhouse Worker Camp relocated to east bank of Trishuli River	Avoid landslide area

Source: UT-1 HEP Detail Design Report, DKJV, 2017

km = kilometer; m = meter; m^3/s = cubic meter per second

2.5 PROJECT CONSTRUCTION AND TEMPORARY WORKS

Project construction is expected to take approximately 60 (5 years) months to complete and will include establishment of temporary worker camps, infrastructure, river diversion works, quarries, and spoil disposal areas, which are described below.

2.5.1 Project Workforce

Project construction is expected to employ approximately 1,090 skilled, semi-skilled, and unskilled workers over the 60-month construction period. While the ESIA includes indicative figures of approximately 10 to 15 percent of the workforce to be recruited locally (with the remainder from elsewhere in Nepal or expatriates), up to 50% of the unskilled portion of the workforce might be local and the semi-skilled local portion might be considerably higher than the figures reflected in the ESTP-PDA related GoN-approved plan. Temporary Worker Camps

The Project will require four worker camps, each including accommodations, mess hall, medical clinic, recreation facilities, parking areas, and various offices, workshops, warehouses, storage areas, waste management facilities, and infrastructure. An overview of the proposed workers accommodation is provided in table below.

Table 2-3 Overview of the proposed temporary workers camps during construction phase

Worker Camp	Location	Capacity	Timing
Phoolbari	Near dam site	Not yet determined	2019 - 2023
Thangu	Near Adit #1	400 workers	2020 - 2023
Bajet Phat	Near Adit #2	380 workers	2019 - 2022
Mailung	Near powerhouse and take off yard	500 workers	2018 - 2023

2.5.2 *Construction Yards and Infrastructure*

The construction phase will also involve setting up construction yards with facilities such as batch plants, stone crushers, and storage yards for construction materials and equipment.

- Batch Plants – three Batch Plants are proposed for making concrete, one in the Phoolbari area near the dam site, one in the Tumda Dagar area near Adit #3, and one in the Mailung area near the powerhouse and take off yard.
- Crushing Plant – one Crushing Plant in the Tumda Dagar area near Adit #3.
- Construction and Equipment Yards – several construction and equipment storage yards near the worker camps.

All of these facilities are located on the west side of the Trishuli River across from Langtang National Park with the exception of the Mailung Worker Camp, which is located on previously disturbed land on the east side of the Trishuli River within the LNP buffer area.

The Mailung Worker Camp was relocated to the east side of the river for worker health and safety reasons as the original worker camp, which was located on the west bank of the river, was severely damaged during the 2015 earthquake, which resulted in the death and injury of many community members and construction workers present in the valley when it struck. This facility will be located on 4.16 ha of land, of which approximately 2.80 ha are located within the LNP buffer zone and will be leased for 7 years from the Park, and 1.36 ha, which will be leased from a private landowner. This selected site was the only site with suitable topography and safe from earthquake-induced landslides in reasonable proximity to the powerhouse. NWEDC, with the consent of LNP and the Buffer Zone Committee of Ramche, submitted an Updated Environmental Management Plan addressing potential impacts associated with this revised worker camp location, which was approved by the Nepal Ministry of Population and Environment on 31 December 2017. After construction is complete and/or the lease expires, NWEDC will return the 2.80 ha to Langtang National Park.

Project construction will require sources of power, water, wastewater treatment, and fuel storage as summarized in Table 2-4.

Table 2-4 Overview of supporting infrastructure during construction phase

Requirement	Infrastructure	Capacity	Comments
Power	Diesel generation sets	5 MW	Facilities at each worker camp and construction yard.

Water	Water treatment plant and storage tanks	189,500 liters per day	Water source – groundwater. Facilities at each worker camp.
Wastewater	Wastewater treatment plant	175,500 liters per day	Facilities at each worker camp. Discharge to Trishuli River
Fuel Storage	Diesel	2,000,000 liters	Facilities at each worker camp. Aboveground tank with secondary containment

MW = megawatt

2.5.3 *River Diversion Works*

River diversion works are required to safely divert the river flow during construction so that it will not damage construction activities. The diversion works are divided into upstream and downstream cofferdams to cut off the river flow and direct it to a diversion tunnel to bypass construction activities. This design was selected taking into consideration the narrow river width, hydrologic conditions, cost, and worker safety.

2.5.4 *Quarry Sites*

The Project will require approximately 120,000 cubic meters of aggregate material for impervious core material, coarse and fine aggregates, riprap stone, and boulders, and approximately 60,000 cubic meters of sand. These materials will primarily be obtained from four quarry sites, all located on west side of the Trishuli River in the Project area, although some of the material will be sourced from Project tunneling and excavation. These quarry sites have been selected based on test pits, laboratory analysis, an assessment of the volume and quality of aggregate available to meet overall Project demand, and avoidance of LNP. Excavation of material from the quarries, as well as excavation of the underground Project facilities (e.g., powerhouse, tunnels, and transformer cavern) will require blasting.

Table 2-5 List of quarry sites

Quarry Site #	Location	Permanent Land Area (ha)	Temporary Land Area (ha)	Total Land Area (ha)
1	Downstream of dam	0	1.27	1.27
2	Thangu area (near Haku Besi)	0	0.77	0.77
3	Tumda Dagar area (near	0	1.30	1.30
4	Near take-off yard	0	6.27	6.27
	Total	0	9.62	9.62

ha = hectare

2.5.5 *Excavation and Spoil Disposal Areas*

The Project originally required the excavation of approximately 2.7 million cubic meters of material, the reuse and/or replacement of approximately 0.3

million cubic meters, and ultimately the disposal of approximately 2.4 million cubic meters. As a result of the earthquake, there will be an increase in access tunnel excavation as the surge tank access road has been converted to a tunnel, but this increase in tunnel excavation is offset by a reduction in access road excavation, with no appreciable change in total excavation volumes. There is approximately 14,000 cubic meters of landslide debris covering some segment of the already constructed access road that will require removal.

NWEDC proposes 9 spoil disposal areas as summarized in Table 2-6. Please note that none of the spoil disposal areas are located in Langtang National Park. These nine proposed spoil disposal areas have sufficient capacity to accommodate the slight increase (<1 percent) in total excavation volume resulting from the removal of landslide debris.

Table 2-6 List of spoil disposal areas

Spoil Disposal Areas (DA)	Location	Spoil Capacity (m^3)	Size (ha)
DA-1	Mailung	190,919	1.09
DA-2	Mailung	278,047	1.65
DA-3	Mungtabar	99,478	2.09
DA-4	Dharnatar & Tungabagar	862,674	5.38
DA-5	Bugetphat	291,565	2.59
DA-6	Bugetphat	418,369	2.22
DA-7	Thangu	358,860	1.79
DA-8	Phoolbari	52,780	0.26
DA-9	Phoolbari	95,600	0.48
Total		2,648,652	17.56

2.6 PROJECT OPERATIONS

This section briefly describes Project operations, including facilities, workforce requirements, operational mode, sediment management, and power generation.

2.6.1 Operational Facilities and Workforce

The Project will be operated from an Operations Center, which will include several buildings (Administration, Main Control, Generator, and Security) located near the take-off yard at the Powerhouse Site and employ approximately 72 workers. Because of its remote location, accommodations for all operational staff will be provided at the Project site.

2.6.2 Infrastructure

Infrastructure to support the operations workforce is summarized in Table 2-7.

Table 2-7 Operation phase infrastructure summary

Requirement	Infrastructure	Capacity	Comments
Power	UT-1 Project	11.2 GWH	Transformer to transform generation voltage to transmission voltage
Water	On-site water treatment plant	8,640 liters per day	Water source – local springs near Operations Centre
Wastewater	On-site wastewater treatment plant – package plant or community septic system	6,912 liters per day	Discharge point- Trishuli River near Operations Centre
Fuel Storage	Diesel	12,000 liter	Aboveground tank with secondary containment

2.6.3 Water Management and Operational Regime

The Project is designed to operate continuously as a run-of-river facility, diverting up to 76 m^3/s of water from a small reservoir created by the dam. The diverted water will be transported via tunnels to an underground power station. The Project discharges the water back to the Trishuli River downstream of the dam, creating a 10.7-kilometer-long diversion reach. Flows in excess of 76 m^3/s will spill over the dam into the diversion reach.

2.6.4 Sediment Management

The Project design includes a de-sander to trap sediments with a particle size as small as 0.2 millimeters so as to protect the turbines, which can be damaged by exposure to large sediment particles, and to help maintain the Trishuli River's natural sediment balance. The sediment deposited in the three flushing channels will be periodically flushed out with flows of 6.0 m^3/s per channel over a 3-hour period about 5.5 days per year. The sediment will be discharged to the diversion reach a short distance downstream of the dam.

2.6.5 Power Generation

The Project has a capacity of 216 MW and based on historic river flow records, is predicted to generate about 1,440 gigawatt hours per year, as summarized in Table 2-8.

Table 2-8 Overview of power generation capacity of UT-1

Project Component	Description
Installed Capacity	216 MW
Turbines	Three vertical Francis turbines of 72 MW capacity each
Net head	327 m (for 3 units generation)
Design Discharge	Q_{50} – 76 m^3/s
Maximum Diversion Flow	76 m^3/s

Project Component	Description
Average Annual Energy	1533.1 GWH

GWH = gigawatt hour; m = meter; m3/s = cubic meters per second; MW = megawatt

3 BASELINE INFORMATION OF INDIGENOUS PEOPLE IN THE PROJECT AREA OF INFLUENCE

3.1 AREA OF INFLUENCE

The Environmental AoI is extended upstream approximately 2 kilometers, and downstream approximately 2 kilometers to where the Upper Trishuli-3A Hydropower Project is partially constructed. The Project is located in a steep canyon, so the extent of Project nuisance impacts (e.g., noise, fugitive dust, air emissions) is very limited, but we have assumed the AoI extends approximately two kilometers laterally from the Trishuli River (See Figure 3.1).

The land take for the Project is from ten villages: Haku Besi, Sano Haku, Thulo Haku, Nesing, Gogone, Tiru, Thanku, Mailung, Ghumchet, and Phoolbari). With the introduction of a new Constitution in 2015 and accompanying change in the administrative structure of Nepal the administrative boundaries of the project area also have changed (See Figure 3.2). The wards and Gaunpalikas within which the project footprint lies are listed below in Table 3.1.

Table 3-1 List of Impacted Villages and Administrative Units for Project AoI

Impacted Village Names	Old Administrative Structure (Village Development Council)	New Administrative Structure (Gaunpalika & Nagar Palika)
, Sano Haku, Nesing	Haku Ward No. 3	Amachhodingmo, Ward No. 2
Thulu Haku, Haku Besi	Haku Ward No. 3	Amachhodingmo, Ward No. 1
Gogone and Tiru	Haku Ward Nos.r 8 & 9	Uttargaya, Ward No. 1
Mailung	Dada Gaun Ward No. 9	Uttargaya, Ward No. 1
,Thanku	Haku Ward No. 5	Amachhodingmo, Ward No. 1
Phoolbari	Haku Ward No.3	Amachhodingmo, WardNnumber 1 & 2
No directly affected villages	Ramche	Kalika, Ward No. 1
No directly affected villages	Dhunche	Gosaikunda, Ward No. 6
Gumchet	Ramche	Kalika, Ward No. 1

Source: NWEDC

Under the former structure, the Project was directly affecting 3 of the 18 Village Development Committees (VDC) in the district (i.e., Dhunche, Ramche and Haku); however, now it is affecting four of the five gaunpalika in the Rasuwa District. These four gaunpalika are Amachhodingmo, Uttargaya, Kalika and Gosainkunda. We expect that in discussions with the GoN the LBSP and aspects of other development plans will be extended to these gaunpalika.

Figure 3.1 Socio-economic Area of Influence

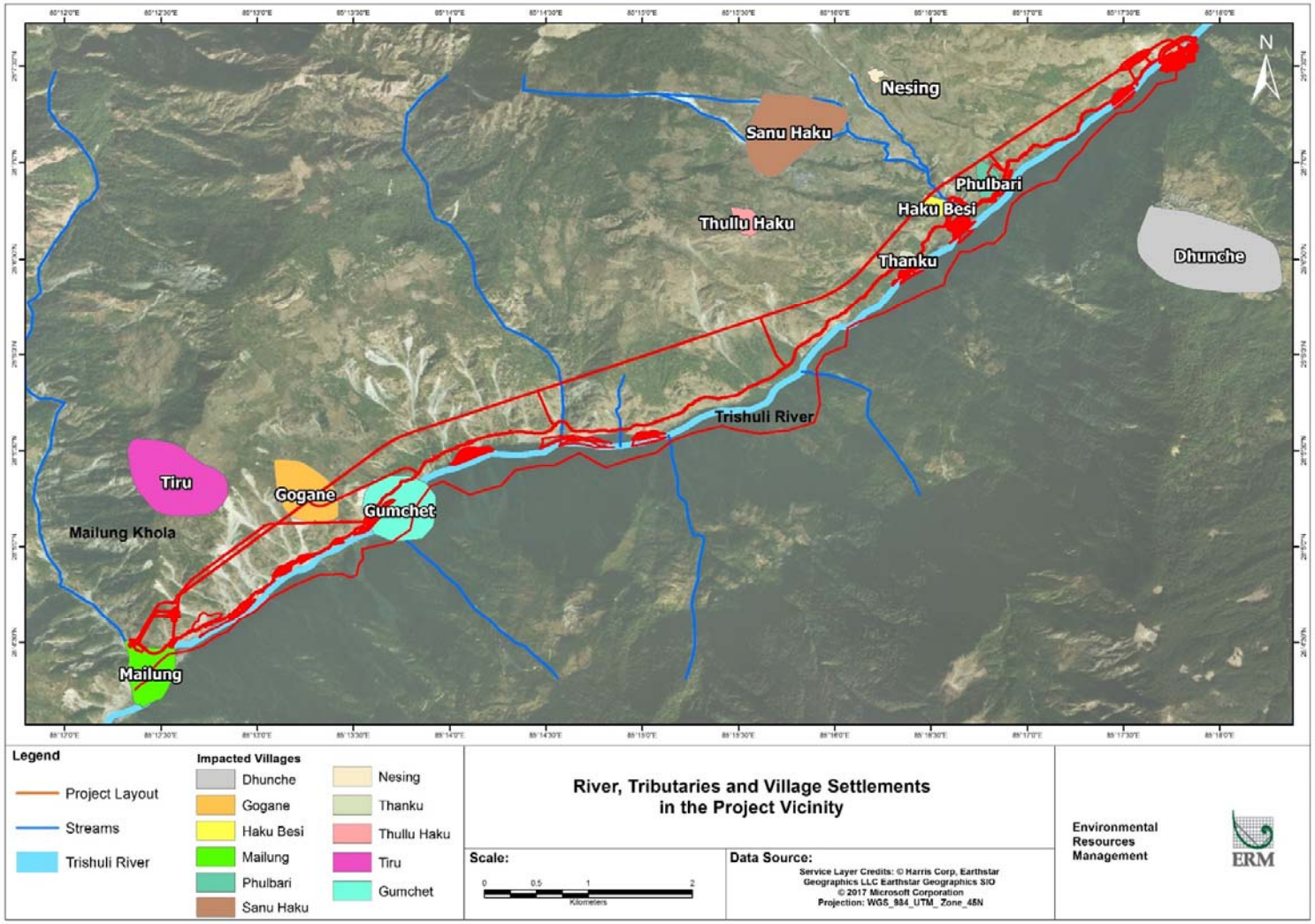
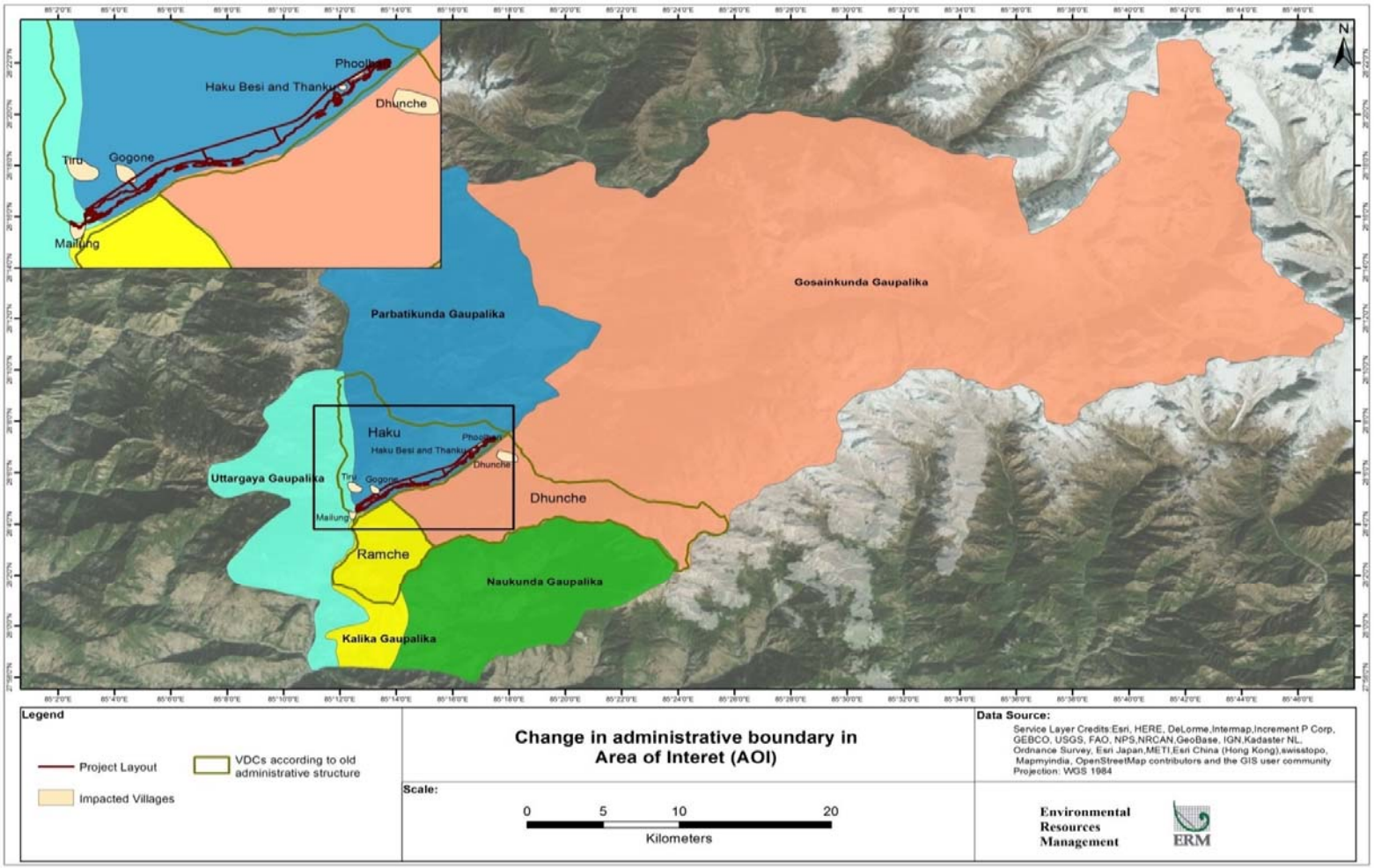


Figure 3.2 Project Layout against the Revised Administrative Structure



3.2 ETHNOGRAPHIC PROFILE OF INDIGENOUS PEOPLES COMMUNITIES

The Tamang ethnic group (Indigenous People; *Adibasi Janajati*) overwhelmingly predominate in the 10 FPIC villages of the AOI with only scattered members of other groups such as the Gurung, Newari, and Dalit (see Table 3.2 for pre-earthquake figures for the old administrative boundaries in the general AOI; these figures include both the 10 FPIC villages as well as the other communities in their proximity).

Table 3-2 Ethnic Composition in Project Footprint Village Development Committees

VDC	Tamang	Brahman	Chhetri	Gurung	Magar	Newar	Tharu	Dalit	Other	Total
Dhunche	2.64	0.59	0.22	0.77	0.10	0.33	0.01	0.24	0.41	5.311
Haku	5.32	0.02	0.00	0.19	0.00	0.03	0.00	0.13	0.02	5.712
Ramche	4.73	0.04	0.03	0.00	0.00	0.00	0.03	0.05	0.03	4.908

Source: VDC Profile, 2006; population figures given in thousands.

3.2.1 The Tamang

Tamang comprise the overwhelming majority of the population (93.6%) in the project area, though a sprinkling of other ethnic groups such as Gurung and Dalits are also reported. It is significant to note that the PAF are comprised primarily of Tamang, as has been discussed in the socio-economic baseline for the project area presented in the LALRP. The ten most-affected communities—and thus the FPIC villages—are even more homogenously Tamang, with only a scattering of non-Tamang among their village populations.

Demographically, Tamang constitute 5.8% of the total population of Nepal (as per the 2011 Census data) and are the fifth most numerous ethnic group. They are located around the Kathmandu Valley and their ancestral territory encompasses Sinduli, Kabhre, Sindupalchok, Rasuwa, Nuwakot, Dhading and Makawanpur Districts. They refer to their ancestral territory as *Tamsaling*. In Rasuwa district the two predominant groups are the Tamang and the Gurung. Tamang are identified as one of the 24 hill tribes and which is considered a marginalized group as per NEFIN's 2002 classification.

The demographic profile of the Tamang population in comparison with the total population of Nepal is presented in ***Table 3-3.***

Table 3-3 Demographic profile of Tamang vs. Nepali population

Attribute	Tamang Population	Nepal Population
Average Population Growth	1.83%	1.35%
Sex Ratio	94 females per 100 males	94 females per 100 males
Average HH Size	4.6	4.9
Literacy	62.7%	66%
Absentee Population	6.9%	7.3%
% of population above 5 years who are attending School / College	65.2%	66.4%

Attribute	Tamang Population	Nepal Population
% of population with access to improved source of Drinking Water	79.7%	85.4%
% of population with access to Toilet facility	58.8%	61.2%
% of population with access to clean cooking energy	22.4%	23.5%
% of population with access to Electricity	70.4%	67.3%
Economically Active Population (Above 10 years)	61.6%	54.8%
Employed Population (Above 10 years)	55.9%	48.8%

Source: Census 2011 data

As depicted in ***Table 3-3*** above, the average growth of the Tamang population from 2001 to 2011 has been 1.84%, whereas the total population of Nepal has grown at 1.35% during this period. The average household size of the Tamang population is 4.6 while that of the rest of the Nepali population has been 4.9. The literacy rate of the Tamang population is 62.7%% which is slightly lower than the literacy rate for Nepal's total population of 66%. Similarly, nearly 65% of the Tamang population has attended schools and colleges, comparable to the 66.4% of Nepali population attending schools/colleges. Given that most Tamang reside in remote locations with limited access to educational infrastructure, the literacy rate might not rise significantly in the next few years without targeted interventions.

In terms of access to physical infrastructure, the Tamang population is understood to be comparable to the rest of the population in terms of access to electricity, clean cooking energy, clean drinking water and toilets, as the total population of Nepal.

In terms of economically active population and employed population, the proportion in the Tamang population (61.6% and 60% respectively) is higher when compared to Nepal's total population (55% and 49% respectively).

While a detailed socio-economic profile of the community in the AoI is provided in the ESIA and LALRP, an overview of the socio-cultural profile of Tamang population in the AoI is provided below.

3.2.2 Tamang Culture and Society

The Tamang Worldview

The Tamang follow a religious syncretism of animism and Tibetan Buddhism (*aka* Lamaism, which is itself a syncretic blend of the animist Bon religion and Mahayana Buddhism). People of the project area live together with supernatural elements such as spiritual beings, sacred places, feared places, altars, and evil spirits. They organize *puja* (sacred ceremonies) to pay respect to Mother Earth when embarking on a significant project such as opening a new road, building a new house, or any other such activity. They believe in the sacred character of the natural world, from the land, mountains and forest to water resources such as streams and river, wetlands, lakes, and ponds, and to the sky, Earth, Moon, Sun and stars—all of which are seen as sacred and worshipped accordingly to show respect. Similarly, they used to chant *mantras*

when plowing the field or felling a tree so as to avoid harming living creatures as small as insects.

Tamang believe that human activities can disturb the spirits of souls, and therefore some sort of compensation is required. Likewise, they pay tribute to the mountains, water and their ancestral land. They mostly celebrate the nationally known festivities along with other ethnic groups. However, there is a revival of a few specifically Tamang rituals and festivals in recent years.

Their religious specialists are the *Lama* and *Bonpo* (*Jhankri*). For the life cycle ceremonies of birth, marriage, and funerals, Lama and Bonpo perform puja by offering fruits, burning incense, lighting the raw ghee lamp (*chhemi*), offering uncooked rice, erecting a *Tormo* (structure) of rice and flour, and by offering liquor/*chhang* (Tibetan beer), milk, and water to the spirits. Each activity is initiated by putting local liquor in a *damp*i (a kind of wooden pot) and chanting "*Sylkar Serkim"* by the Lama and Bonpo. All family members before praying put raw ghee on their forehead (this practice is called "*Temrel-Hyarka"* in Tamang). Lamas also have responsibilities in curing illness, which is seen to be the result of supernatural as well as physiological disorders. In the Tamang religion, Tibetan Buddhism has integrated age-old Tamang traditions of indigenous healing practices with the use of medicinal plants.

Language

The Tamang language is the most widely spoken Sino-Tibetan language in Nepal and is a Tibeto-Burman and tonal tongue. Several dialects exist and the Tamang in the project area are primarily Western Tamang speakers. Recently there has been a strong promotion of their language and culture through radio programming and the mass media and it's been introduced in some schools. Tamang has its own *Tamhyg* script which is similar to both the Nepali standard Devanagari and Tibetan scripts. In addition, for ritual purposes and sacred literature, Tamang use the *Sambotta* script, which is also used by Tibetans, Bhutanese, and Nepal's Sherpa.

Socio-Political Institutions and Kinship Structure

Tamang culture is characterized by various social institutions such as *Nangkhor, Gedung, Chokpa* and *Ghyang*. Tamang communities are organized, maintained and regulated through these social institutions and these customary social institutions are partially active in the project area. A *Choho* or *Mulmi/Mukhya* or *Jyo* is recognized as a local leader who serves voluntarily for the general welfare. The *Mulmi or Mukhya* is chosen democratically by the households of his community and *Ditthha*, *Chok* and *Burauli* help him carry out his duties.

During regularly held meetings (*hyulchhok*) laws and regulations (*hyulthhim*) are proposed, discussed and adopted for the village community. As things change, these guides can be amended or annulled, as necessary. However, the state's new socio-political structure is fast replacing the customary leadership structure. Similarly, the Nepal Tamang *Ghhedung* (Association) has been registered as an ethnic political institution formally and is actively working across the country.

Tamang communities are a ranked society which is organized into several clan groups with clans comprised of extended families. Upon marriage newlyweds live apart from their parents taking a portion of their property with them.

Nevertheless, close coordination among family members persists and their family embeds its members from birth till old age. A married couple in this way establishes themselves as a new unit of the society and one that is obliged to fulfil their responsibilities as a village household.

Traditional Dress

The practice of wearing Tamang clothing has been disappearing rapidly, leaving only a few traditionalists so garbed. Today, one will only find Tamang women wearing such dress during traditional festivals. The major Tamang men's clothes in the project area includes *chhugu, bau, phungsyo, labedasuruwal, kenam, syade*, and *patuka* (clothing) with *khukuri* (knife). They wear a ring (*Butital*) made of gold, silver and brass and hang an ornamental precious stone (a *yu* or *si*) around their neck, with a garland made of coral on each side. Women wear a*ndung, bure sukre, jya, cholo, dormo, pankap, jyaa, shyade and Chye*. They also wear garlands made of *biru, si, yu, and gua*, wear *ganjen* made of gold and silver, and wear s*embu* (shoes). Most of their dresses are made of sheep's wool.

Indigenous Knowledge and Skills

Tamang people are rich in terms of their traditional knowledge, skills and arts. Men are obliged to plough and work the land, while fashioning products related to Himalayan bamboo, wood and stone to build cowsheds and provide materials needed in the cowshed. They also should be skilled in singing, dancing, and playing musical instruments. This gives a man prestige and makes him a good marriage prospect. Similarly, a woman should be skilled in hand sewing *Radi* (traditional carpet), *Patuka (belt)*, *Bau (coat),* and other woolen handicrafts. Trained in such talents by parents and grandparents, girls can also improve their marriage chances. Other desirable female skills include:

- *Kwan raba* - cloth making
- *Chhaiki-ge* - basket and rope making
- *Syugu soba* - handmade paper making
- *Sing so* - wooden crafts
- *Thangku briba* - religio-cultural paintings
- *Brama soba (Marcha)* - herbal yeast making
- Bamboo products
- *Alum – local noodle soup*
- *Baavar Geng* - a kind of bread cooked in oil or ghee

Literacy Rate and Education

The Tamang population in the project area of impact (AOI) reported a literacy rate of 69.6%, which is the second lowest literacy rate among ethnic groups in the AOI. The male literacy rate is 78.4% while the female literacy rate is 59.9%. More than 50% of the literate population is educated only at the primary school level.

Livelihood Profile

The traditional occupations of the Tamang in the project area have been livestock herding and growing maize and potatoes (subsistence economy). Prior to the 2015 earthquake, more than 40% of the population in the AOI were engaged in agriculture. Forests were also a key part of the Tamang livelihood and lifestyle since they are sources of fuel, fodder and pasture, while also serving as sacred places hosting nature spirits and deities. However, post-

earthquake, the dependence on agriculture and natural resources has declined due to loss of access and damage to agricultural land and forest resources. Consequently, there has been a steady increase in dependence upon wage labor in construction and stone breaking. The area has also experienced heavy outmigration as many households have at least one member working abroad, particularly to rubber and palm plantations in Malaysia and Indonesia.

Since the earthquake, livelihoods have become more precarious as people rely increasingly on unstable income sources. Most of the locals involved in wage labor are engaged for about one to two weeks per month. This has been resulted in the PAFs diversifying their livelihood sources, with income from labor work being supplemented by livestock/poultry farming, agriculture, weaving, basketmaking and the sale of homemade alcohol. Also, while pre-earthquake most women were engaged in subsistence agricultural or livestock farming activities, presently a greater number of women are reported to be engaged in income generating activities, primarily land and livestock trading. Another shift post-earthquake has been the increased burden on the young as their elders (those 50 years and above) lose access to agricultural land and livestock holding but lack the skills or physical stamina to undertake wage labor. While pre-earthquake the elderly could sustain themselves through agriculture or livestock tending, they are now nearly totally dependent upon the younger generations for support.

3.3 VILLAGE PROFILES OF TEN FPIC VILLAGES

During July of 2018, NEFIN conducted a Preliminary Social Mapping (PSM) of the ten FPIC villages, including village profiles, a needs assessment, and prioritization preferences for mitigation and benefits measures[11]. Table 3-4 below provides a summary of the village profiles.

Table 3-4 Ten FPIC Communities Village Profile Overviews

1. Gogane											
Total Population	**Total Household**	**Socio-Economic Status**								**NGOS/ INGOS**	**Functional Formal and Informal Organizations**
		Occupation	**Livestock**	**Facilities and Amenities**				**Health Facilities**	**School**		
				Electricity	**Communication Facilities**	**Drinking water Supply**	**Sanitary facilities**				
790	230	Agriculture and animal husbandry	Cow and Buffalo	No	No	No	No	EPI Clinic	Primary School (up to 5 grade)	No	Women Group
2. Sano Haku											
Total Population	**Total Household**	**Socio-Economic Status**								**NGOS/ INGOS**	**Functional Formal and Informal Organizations**
		Occupation	**Livestock**	**Facilities and Amenities**				**Health Facilities**	**School**		
				Electricity	**Communication Facilities**	**Drinking water Supply**	**Sanitary facilities**				
435	114	Agriculture and animal husbandry	Cow, buffalo, sheep, goat and Yak	Yes	Not good	Yes (but not for all house-holds)	Not good	No	Primary School (up to 5 grade)	No	-------

[11] The PSM for Nesing was carried out in late August, 2018.

3. Haku Besi

Total Population	Total Household	Socio-Economic Status								NGOS/ INGOS	Functional Formal and Informal Organizations
		Occupation	Livestock	Facilities and Amenities				Health Facilities	School		
				Electricity	Communication Facilities	Drinking water Supply	Sanitary facilities				
203	42	Agriculture, Labor work and animal husbandry	Cow buffalo goat, pig	Yes	Not good	Yes (but not for all house-holds)	Not good	No	Primary School (up to 8 grade)	No	• Women group • Youth society

4. Phoolbari

Total Population	Total Household	Socio-Economic Status								NGOS/ INGOS	Functional Formal and Informal Organizations
		Occupation	Livestock	Facilities and Amenities				Health Facilities	School		
				Electricity	Communication Facilities	Drinking water Supply	Sanitary facilities				
149	25	Agriculture, Labor work and animal husbandry	Cow buffalo goat, pig	Yes	Not good	Yes (but not for all house-holds)	Not good	No	No	No	No

5. Tiru

Total Population	Total Household	Socio-Economic Status								NGOS/ INGOS	Functional Formal and Informal Organizations
		Occupation	Livestock	Facilities and Amenities				Health Facilities	School		
				Electricity	Communication Facilities	Drinking water Supply	Sanitary facilities				
1372	165	Animal husbandry and labor work	Cow, buffalo, goat, and sheep	No	No	Yes (but not for all house-holds)	Not good	No	Primary School (up to 3 grade)	• Youth club • women group • Saving and	No

										credit co-operative group	

6. Thulo Haku

Total Population	Total Household	Socio-Economic Status								NGOS/ INGOS	Functional Formal and Informal Organizations
		Occupation	Livestock	Facilities and Amenities				Health Facilities	School		
				Electricity	Communication Facilities	Drinking water Supply	Sanitary facilities				
2500	300	Agriculture, animal husbandry and business	Cow, buffalo, pig, and goat	Yes	Yes	Not good	No	• Health post • EPI Clinic	• Primary School • Lower secondary school • Higher Secondary	• Children development center • Haku social development committee	• 3 different women groups

7. Gumchet

Total Population	Total Household	Socio-Economic Status								NGOS/ INGOS	Functional Formal and Informal Organizations
		Occupation	Livestock	Facilities and Amenities				Health Facilities	School		
				Electricity	Communication Facilities	Drinking water Supply	Sanitary facilities				
81	22	Agriculture, animal husbandry, foreign employment, wages work	Cow, buffalo, ox and goat	No	Only mobile phone	No	No	No	No	No	No

8. Mailung

Total Population	Total Household	Socio-Economic Status								NGOS/ INGOS	Functional Formal and Informal Organizations
		Occupation	Livestock	Facilities and Amenities				Health Facilities	School		
				Electricity	Communication Facilities	Drinking water Supply	Sanitary facilities				
386	28	Wages work	No	No	No	No	No	No	No	No	No

9. Thangu

Total Population	Total Household	Socio-Economic Status								NGOS/ INGOS	Functional Formal and Informal Organizations
		Occupation	Livestock	Facilities and Amenities				Health Facilities	School		
				Electricity	Communication Facilities	Drinking water Supply	Sanitary facilities				
139	27	-------	--------	No	No	No	No	No	No	Poverty alleviation program.	No

10. Nesing

Total Population	Total Household	Socio-Economic Status								NGOS/ INGOS	Functional Formal and Informal Organizations
		Occupation	Livestock	Facilities and Amenities				Health Facilities	School		
				Electricity	Communication Facilities	Drinking water Supply	Sanitary facilities				
375	74	Mostly farming but also some crafts	Cow, Goat and Sheep	Yes	No	Yes but not for all hhs	Yes (but poor quality)	EPI Clinic (or go to Thulo Haku)	Yes (Primary School till 5th grade		Women Development Group and Health women Group; Community Forest Users Group

4 INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

Since project inception, NWEDC has engaged with local communities in a process that recognized their human rights, dignity, aspirations, culture, and natural resource-based livelihoods. This chapter provides an overview of the engagement process undertaken by NWEDC.

4.1 BRIEF OVERVIEW OF PREVIOUS CONSULTATIONS

The project preparation or pre-construction activities started during 2010 and there has been a continuous record of engagement with the local community since then. An overview of these consultation process with local community is provided in this section.

4.1.1 Consultations with Affected Households During Land Acquisition Process

The affected community has been consulted since 2009-2010, when the project was conceptualized. The initial consultations were held with households for procuring their land through a negotiated settlement. During the land acquisition process, meetings were conducted with the land sellers both at household level and ward level (in Mailung, Gogone and Haku Besi). The purpose of these meetings was to provide the land owners, PAFs and other community representatives with information pertaining to the project, the land requirement for the project and the proposed entitlements/compensation.

These meetings were followed by a public hearing, held in March 2013, post completion of the EIA. The purpose of the public hearing was to provide a more detailed project understanding and finalize the compensation amount for the land purchase. As per the records made available, two formal meetings were conducted in the case of guthi land. NWEDC representatives and local villagers of Haku Besi (Wards #7 & 3) met on 19th January 2013 to agree on the rates and terms of transfer of the tenancy rights. Subsequently a meeting was held at NWEDC head office, Nakshal, Kathmandu between guthi land tenants of Haku Besi and NWEDC for which 16 villagers were present.

The sale and lease deeds signed by the respective land owners are indicative of acceptance of the terms of the agreements by land owners; however, the disclosure and consultation process followed during the land acquisition stage was not documented adequately.

The consultation with Community Forest Users Groups on leasing the communally held land and land-based resources was led by DFO following due process of law under Forest Rules 1995. There were 422 members of households in the affected CFUGs, of which 90% were Tamang, 8% were Gurung and the remaining 1% were Newar and Dalit.

4.1.2 Consultations with affected Households during EIA Study

Consultations were held with local communities at various stages of the Environment Impact Assessment (EIA) and ESIA[12]. The purpose of these consultations was to develop an understanding of their perception of the project and its activities, as well as their perceived impacts of the project on them. The key engagement activities undertaken as part of the impact assessment process included public meetings and consultations and surveys as discussed below:

Public Meetings, 2012: In the months of September and October, public meetings were held in the villages of Mailung, Haku Besi and Gogone, with various local stakeholders including the land owners, PAFs and community representatives. As part of these meetings information regarding the project was disclosed, including the capacity of the project, the location of the key facilities, and the land requirement for the project including the requirement for community forest land and the potential benefits to the community in terms of compensation, employment and training. As part of this meeting, the compensation rates for the land to be procured were also discussed.

Public Meetings, 2013: In continuation of the public meetings, following the measurement of private land, consultations and meetings were undertaken in February 2013 with the land owners, for the purpose of negotiations for the land purchase. Following this, after the completion of the EIA study, a public hearing was held in March 2013. The purpose of this public hearing was to provide an understanding of the project and to finalize the compensation amount for the land purchase. It is reported that as part of the public hearing, the land owners were promised jobs, shares in the project, training as well as community benefits, such as development of road and a school for the community. It is reported that the land owners had earlier demanded a compensation rate of NPR 10 lakh per ropani, however this was negotiated down to NPR 5 lakh per ropani. As part of the meeting, the final compensation package was agreed upon with the community and their signatures were taken as agreements. Apart from these consultations, meetings were also undertaken with the District Administration Office (DAO), Forest Department and Survey Department to finalize the compensation rates and the land procurement process.[13]

4.1.3 Consultations with Affected Households during LALRP Preparation in 2015

In addition to the consultations undertaken during the EIA process, further consultations were undertaken as part of the Land Acquisition and Livelihood Restoration Plan (LALRP) preparation process in 2014-15. The purpose of these consultations was to develop an understanding of the impacts of land take, the adequacy of the compensation provided and the utilization of the same and

[12] Carried out by Jade Consult.

[13] Please refer to the LALRP sections 5.1.2-5.1.6 for a fuller description of the LALRP, ESIA, and related consultation processes.

possible livelihood restoration activities that can be introduced. The following table provides a list of consultations undertaken and the purpose of the same.

Table 4-1 List of Stakeholder Consultations undertaken in 2015

S. No	Stakeholder Group	Village/ VDC	Date	Number of Participants	Purpose
1	Community Forestry User Group (CFUG)	Mailung	18-11-2014	2	To develop an understanding of the working of the working of the CFUGS, the impact of the project on the guthi land and the compensation paid for the same
2	Jan Sarokar Samiti	Mailung	11-01-2015	2	To develop an understanding of the Jan Sarokar Samiti for the project
3	Community Forestry User Group	Haku Besi	13-1-2015	22	To develop an understanding of the working of the working of the CFUGS, the impact of the project on the guthi land and the compensation paid for the same
4	Tamang	Haku Besi	12-01-2015	18	To develop an understanding of the socio-economic profile of the indigenous group, there relationship with the other communities, the impacts from the project and the expectations from the project
5	Women	Haku Besi	13-01-2015	11	To develop an understanding of the socio-economic status of women, their understanding of the project and its potential impacts and their expectations from the project
6	Tamang	Haku Besi	13-01-2015	4	To develop an understanding of the socio-economic profile of the indigenous group, there relationship with the other communities, the impacts from the project and the expectations from the project
7	Youth	Haku Besi	14-01-2015	16	To develop an understanding of the perception of the stakeholder group in regards to the project, the changing socio-economic profile of the villages and the expectations from the project
8	Women	Mailung	10-02-2015	3	To develop an understanding of the socio-economic status of women, their understanding of the project and its potential impacts and their expectations from the project
9	Women	Mailung	11-02-2015	2	To develop an understanding of the socio-economic status of women, their understanding of the project and its potential impacts

S. No	Stakeholder Group	Village/ VDC	Date	Number of Participants	Purpose
					and their expectations from the project
11	Fishing Group	Karakchapul	12-02-2015	3	To develop an understanding of the nature of the fishing activities in the area and the potential impacts of the project on the same and the possible mitigation/compensation measures that can be put in place
12	Community Forest User Group	Mailung	12-02-2015	1	To develop an understanding of the working of the working of the CFUGS, the impact of the project on the guthi land and the compensation paid for the same

4.1.4 Consultations undertaken as part of Post-Earthquake Assessment in 2016

In 2016, ERM was contracted to undertake an environmental and social gap analysis and status assessment of the project and the AoI, in the post-earthquake period. One of the key activities undertaken as part of this assessment was the consultations with the internal and external stakeholders. The following table provides a summary of the consultations undertaken during this period.

Table 4-2 Consultations with Local Community in IDP Camps after Earthquake

S. No	Stakeholder Group	Location	Date	Key Issues
1.	Local Community,	Mailung	5th April 2016	• Understanding of the impacts from the earthquake; • Status and understanding of the various relief activities being undertaken by the project, NGOs and government in IDP camps; • Change in socio-economic baseline in the area post the earthquake, in terms of social structure, livelihoods and access to infrastructure and services; • Key concerns of the local community in the post-earthquake scenario; • Key expectations of the community from the project and the government
2.	Local Community, in IDP Camp,	Naubise	5th April 2016	
3.	Local Community, in IDP Camp,	Bogetitar	6th April 2016	
4.	PAFs in IDP Camps	Across IDP camps	6th April 2016	
5.	Local Community, in IDP Camp,	Farm Camp	7th April 2016	
6.	Local Community, in IDP Camp,	Kebutol	7th April 2016	
7.	Local Community, in IDP Camp,	Pradhi-karan	7th April 2016	

As part of this gap assessment, ERM engaged with the Tamang population, as part of the larger community. The focus however was on the experiences and issues being faced by the community post-earthquake.

4.1.5 *Consultations undertaken in 2017*

In 2017, Focus Group Discussions (FGD) and key informant interviews were undertaken with key stakeholder groups. The following table provides consultations undertaken with the local community.

Table 4-3 Consultation with Local Community as part of the Land Acquisition and Livelihood Restoration Plan (LALRP) Upgrading Process

S. No	StakehPolder Name	Date	Mode of Consulation	Summary of Consultations Undertaken
1.	Women group from Haku VDC	5th May 2017	FGD	A discussion with the various stakeholder groups on the following aspects: • The impacts from the earthquake • Present livelihood profiles • Role of the project in earthquake relief • Present perceptions of the project • Present expectations from the project in terms of LALRP activities
2.	Women Group from Haku VDC	5th May 2017	FGD	
3.	Tamang Women Group from Satbise	1st May 2017	FGD	
4.	Mixed group in Nuabise	8th May 2017	FGD	
5.	Mixed group in Bogetitar	7th May 2017	FGD	
6.	Mixed Youth Group	29th April 2017	FGD	
7.	Mixed Group from Farm Camp	12th April 2017	FGD	
8.	Women Shop Owner in Nuabise	8th May 2017	KII	
9.	Women Shop Owner in Nuabise	8th May 2017	KII	
10.	Mixed Group in Khalde	13th April 2017	FGD	
11.	Politician in Nuabise	13th April 2017	KII	
12.	Women returned after Foreign Employment	2nd May 2017	KII	
13.	Men's Group in Mailung	14th April 2017	FGD	
14.	Men's Group from Haku VDC	6th May 2017	FGD	

Note: FGD: Focused Group Discussion
KII: Key Informant Interview

These discussions and interviews were aimed at supplementing and triangulating the information made available during the PAF survey and also for collecting additional qualitative data on certain key areas, such as Non-governmental organization (NGO) activity in the area, and livelihood restoration mechanisms.

4.2 *PUBLIC DISCLOSURE OF ESIA AND IPP*

A non-technical summary of the project impacts as outlined in the ESIA with extensive use of infographics was prepared in English and translated into Nepali. These materials were displayed and circulated among the local communities in nine affected villages in the project area during early June of 2018 (and also to a tenth village, Nesing,[14] when it was added to the FPIC

[14] Nesing wasn't originally identified as an FPIC-standard affected village but during consultations in June and July 2018, their representatives approached the Working Group and

process in August 2018). NWEDC held village level disclosure meetings where community relation officers with proficiency in Tamang explained the project details, its potential impacts and what mitigation measures are planned towards mitigating or reducing these impacts.

Also, during early June 2018, NEFIN—Nepal's preeminent Indigenous Peoples organization—was engaged by IFC to conduct initial village-level mobilization meetings to explain the FPIC process. An FPIC mobilization and village delegates selection process was held on site in the affected villages and in the two IDP camps in mid-June. A Participatory Social mapping (PSM) and two rounds of village-level consultations were also carried out in the ensuing months to focus on gathering local IP inputs to two IPP drafts which were disclosed to the villagers. See also section 4.4 below.

4.3 PROCESS FOR SEEKING FPIC FOR THE IPP

The FPIC process incorporated a shared tripartite (NWEDC, community, local government) decision-making approach for Indigenous Peoples Plan (IPP) creation and aimed at development of a mechanism for joint management of IPP implementation and a Grievance Redress Mechanism (GRM). The process has been carried out via the below steps.

Step 1: Project Disclosure: ESIA and related plans disclosed by NWEDC to members of the original 9 project-affected villages (including those in IDP camps).

Step 2: Village Mobilization and Representatives Selection: IPO NEFIN mobilized villages to inform them about the FPIC process and the IPP and to facilitate their selecting representatives to an UT-1 Adibasi Janajati Advisory Council (AJAC) meeting. Seven of the larger villages chose 10 representatives each while two of the smaller ones (hamlets rather than villages) just 2 and 3 representatives for a total AJAC membership total of 75. They were selected from various social strata to ensure community social inclusion (see Annex 4).

Step 3: Local Government and NWEDC WG representatives selected.

These IPP partners selected representatives to join in a collaborative UT-1 Adibasi Janajati IPP & FPIC Working Group (WG) to manage the IPP/FPIC process. Local governments chose 3 members to serve on the WG (one from each of the three Wards in which the villages are located) and 2 ex-officio members were appointed from NWEDC.

Step 4: UT-1 Adibasi Janajati Advisory Council Meeting #1: Village representatives were educated about the project, the IPP preparation process and the FPIC process. They selected 2 members from each village (one woman, one man) to serve on a Working Group while FPIC and IPP capacity building was conducted by NEFIN.

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then NWEDC with a request to be included. After exploration of their degree of impact by the Project, the village was added as a full member of the FPIC group and their representative bodies, the AJAC and the WG.

Step 5: UT-1 Adibasi Janajati FPIC & IPP Working Group Meeting #1: (i) clarification of the roles of the AJAC vs. the WG, (ii) determination of the consent process, approval of a Consent Process Agreement [CPA; see Annex 5], (iii) direct discussion with NWEDC of outstanding project issues.

Step 6: Participatory Social Mapping: To confirm the social impact assessment and related studies conducted for the ESIA and other project planning documents, a PSM was carried out by NEFIN with the support of members of the AJAC. This Social Mapping combined a Village Profile with a needs assessment which helped inform the contents of this IPP.

Step 7: Consultations Round 1: To collect community development priorities, a presentation was held by NEFIN of results of Participatory Social Mapping and discussion of possible mitigation, benefits and management structure in an IPP; collection of concerns and requests for draft IPP.

Step 8: Nesing Added as a Tenth FPIC Village: Mobilization of Nesing Villagers, PSM activities, and selection of representatives to AJAC and WG, raising their total number of members to 85 and 20 (villagers), respectively.

Step 9: AJAC Meeting #2: Consolidation of IPP priorities based on Consultation Round 1 and Participatory Social Mapping.

Step 10: WG Meeting #2: Confirmation of selection of IPP Programs; local government (Ward Chairs) join the process; instructions for IPP writing relayed to CCCS; confirmation of CPA.

Step 11: Drafting/revising of IPP based on Consultation Round 1 input.

Step 12: Consultations Round 2—IPP Confirmation: submission of detailed Plan with proposed components, management structure and total budget to 10 villages by NEFIN.

Step 13: Revision of Draft IPP by CCCS based on community inputs as gathered by NEFIN. Disclosure of revised IPP #2 to communities.

Step 14: UT-1 WG Meeting #3. Process Decision Point: reviewed latest revisions to IPP and made adjustments; determined another consultation round was not needed; conducted mediation with NWEDC on a demands framework agreement to resolve outstanding issues.

Step 15: UT-1 AJAC Meeting #3: Consent Decision. The consent process was carried out seeking approval for i) the revised IPP (FPIC Draft #3), ii) the Demands Framework Agreement, and iii) a document spelling out three-sided implementation arrangements by AJAC community representatives, the three local Ward governments, and the Company. A Consent Statement was approved by acclamation and signed by all 71 AJAC members present and voting.

Step 16: Consent Statement Consecration and Turnover to NWEDC: Formal Consent was granted by the community for both the Project and the IPP by means of a puja carried out by lamas and bonpo (shamans) wherein the Company received the signed Consent Statement**.**

Step 17: IPP Implementation: When Project Financial Closure is obtained, NWEDC will initiate IPP implementation under tripartite supervision to ensure that each party fulfils their commitments.

Note on languages for disclosure: Communications with the local communities have been carried out in Nepali, supplemented by Tamang as necessary. For those community members with limited literacy in any language, verbal explanations and info-graphics have buttressed the written textual documentation.

4.4 FPIC PROCESS CONSULTATIONS

Thus, during the FPIC process outlined above in section 4.3, three separate and dedicated consultations rounds were held with the Project-Affected Villages:

- June 2018: NEFIN mobilizers visited the original nine FPIC villages (either at the original site or in the displaced persons camps) to inform villagers about the project, the FPIC process, and the IPP. At these meetings, too, village representatives were selected to join the AJAC.
- July 2018: NEFIN mobilizers, working closely with the village representatives on the AJAC carried out the Participatory Social Mapping and gathered PAP recommendations for the IPP in the then nine FPIC villages.
- July/August 2018: NEFIN carried out the First Round of Consultations with those from the nine villages, gathering specific recommendations from each village for the IPP as to benefits and mitigation measures; see Annex 6. These recommendations were fed into the IPP PAP/FPIC Draft #1. At the end of August, special consultations were held with Nesing village to bring them into the FPIC process.
- September/October 2018: NEFIN carried out the Second Round of Consultations with those from the now ten FPIC villages to gather their feedback on the disclosed IPP PAP Draft #1.
- October/November 2018: This feedback produced IPP FPIC Draft #2 which was disclosed to the communities and the WG prior to the Third AJAC's consent decision.

4.5 PARTICIPATORY IPP DEVELOPMENT PROCESS

A community-led participatory approach was adopted for the development of the IPP to ensure a planning and decision-making process which provided an opportunity for often disenfranchised groups to be heard. The Participatory Social Mapping was conducted for all affected villages led by AJAC members in their respective villages with the aim to collect the data on community layout, infrastructure, demography, health and other socioeconomic patterns which would further serve as a village profile to guide the AJAC and community members for listing the community priorities to be included in the IPP.

After the PSM, the village profile and situation report were discussed with community members prior to the development of a village-level IPP which provided the basis for a needs analysis and the setting of priorities for the IPP.

As a result of the series of consultations with community people, AJAC and Working Group, the Tamang villagers' priorities were documented in three batches: a) village-level demands, b) village-level IPP preferences, and c) village-level infrastructure priorities. The participatory approach facilitated community ownership and thus helped to build a strong basis for ongoing involvement and felt accountability towards the IPP. NEFIN facilitated the entire process of community-level planning and development of the IPP.

4.6 STATUS OF COMMUNITY DEMANDS FOR INFRASTRUCTURE AND OTHER PLANNING NEEDS BEYOND THE IPP

During the Second WG and AJAC Meetings, the community representatives decided to separate out infrastructure plans and other various community demands from the IPP. However, those demands (see Annex 6A) were by no means forgotten. Instead, during those meetings—and then again during the Second Round of Consultations held in the villages a few weeks later—the communities decided that their desire for continued dialog with NWEDC on those issues must be part of the understanding upon which the FPIC process must be based. During the Third Working Group and Third AJAC Meetings, these demands were further clarified and these new items added to a new Annex 6D. The other sections of Annex 6--sections B and C--might very well serve as reference points for IPP component programmatic activities as outlined in Chapter 6.

4.7 ACHIEVING CONSENT AND ITS SUPPORTING DOCUMENTS

During the Meetings of the Third WG and AJAC Meetings held 30 October till 1 November, the 71 community representatives approved three documents:

A Framework Agreement for Consensus Agreement Relating to Community Demands Presented by the UT-1 FPIC & IPP Working Group. This document contained the pledge of NWEDC to engage in a process of dialog to respond to the multiple demands enumerated in Annex 6A and 6C. During the Meetings, NWEDC CEO Yi Bo-Seuk announced the immediate acceptance of the demand for a *konguer puja* to be held both prior to major project construction and prior to project operation while also announcing the gift of two ambulances to the communities. Signed by both AJAC members and Mr. Yi. See Annex 7.

Statement of Consent for the UT-1 Project and the UT-1 IPP. This is the key document granting the ten FPIC villages' consent (via their AJAC representatives) to both the UT-1 Project construction and to the UT-1 IPP. Note that although the FPIC process had been aiming all along for consent for the IPP only, the AJAC delegates decided that they also consented to the project itself. Signed by 71 of the 85 AJAC members—all of those who were present for the AJAC meeting since 14 representatives did not attend for personal reasons. See Annex 8.

UT-1 Tripartite Agreement for IPP Implementation. In this innovative document, the Company, the AJAC and the three Ward Chairs all agreed on their joint responsibilities to implement the IPP. All three partners signed the Agreement. See Annex 9.

5 SOCIAL AND ENVIRONMENTAL IMPACT ASSESSMENT

A detailed ESIA and LALRP for the project was undertaken. These studies detail both social and environmental risks and likely effects of the project on the majority-Tamang communities affected. The LALRP deals with the project's direct effects related to the land and assets procurement process. This section provides an overview of potential environmental impacts at the habitat level as well as potential social effects to be experienced at the collective or community level. Lastly, this section also lays out specific compensatory mitigation initiatives NWEDC will offer to PAP.

5.1 AVOIDANCE OF ADVERSE IMPACTS

Complete avoidance of impacts on the local Tamang population was not possible. From an environmental perspective, there are already six operating hydropower projects on the Upper Trishuli River, including two along the mainstem of the Trishuli River downstream of the UT-1 Project, and seven more hydropower projects under construction, including the UT-3A project located approximately 1.5 kilometers downstream of the UT-1 Project. Fishery data suggest that the Common Snowtrout (*Schizothorax richardsonii*) population (an IUCN-listed vulnerable species; see Section 6.2.1.1) may be limited in the Trishuli River upstream of confluence with the Mailung Khola tributary (i.e., the approximate location of the UT-1 powerhouse) by the river's cold temperature. Therefore, the proposed location optimizes power generation, while minimizing potential environmental impacts.

NWEDC has carefully located Project facilities to avoid or minimize environmental and social impacts. For example:

- Underground facilities – Locating several Project facilities underground, although primarily for engineering and safety reasons, also avoids disturbance of steep slopes, natural vegetation, and agricultural lands, and minimizes private land acquisition.
- Facilities along the west bank of the Trishuli River – Locating the headrace tunnel, penstock, and powerhouse along the west bank of the Trishuli River minimizes impacts to the Langtang National Park, which is located along the east bank of the river.
- Location of quarry and spoil disposal sites – Locating these facilities so as to avoid cultivated and forest land minimizes impacts to local communities and the environment.
- Location of the Powerhouse Site worker camp – The Powerhouse Site worker camp has been relocated to the east bank of the Trishuli River to reduce landslide risk and to enhance worker safety, since the former worker camp at Mailung School was severely damaged in the 2015 earthquake, resulting in many injuries and fatalities. Suitable sites for a worker camp in the Project area are limited by topography. The proposed site, although within the LNP buffer area, is isolated from most of the remainder of the park by steep slopes and by the Betrawoti-Mailung-Syabrubesi Road area,

which is already disturbed and has little tree cover, and is not currently occupied, although it was prior to the earthquake.

5.2 NATURAL RESOURCES MANAGEMENT

As detailed in the ESIA and LALRP (especially pages 100-107), post-earthquake local Tamang communities' reliance on the local habitat for subsistence and income was substantially reduced. The sections below summarize both likely project ecological impacts and mitigation measures to be undertaken.

5.2.1 Impact on Use of Community Forest

The land procurement for the project involved 76.62 Ha of community forest land owned by government. This community forest land is located in Haku VDC and was under the supervision of five community forest user groups (CFUGs). The membership details of these CFUGs is provided in the table below.

After this data was collected, Nehasing Jomokharka Community Forest User Group in Nesing Village was also included as an affected group; however, details of project effects on community forests in terms of numbers of trees/seedlings is not yet known. There is a possibility that one additional Community Forest User Group may be impacted by the short transmission line (1.1 km, 5 towers) that will link the project to the grid. If that is confirmed to be the case, NWEDC will follow a process led by NEFIN to ensure that an FPIC agreement is entered into with this CFUG.

Table 5-1 Names and Membership Profile of CFUGs affected by Acquisition of Community Forest Land

Name of the CFUG	*EC Members*	*General Member HHs*	*Total Member HHs*	*RM/Wards*[15]	*Male*	*Female*	*Persons*
Dachhin Kalika	11	164	175	U/1,9	494	485	979
Darnashila	9	51	60	U/1	117	181	349
Kanyadevi Lumbudanda	9	25	34	A/1	64	76	140
Bratar	9	36	45	A/1	97	87	184
Larbangpakha	12	96	108	A/1	NA	NA	NA
Nehasing	21	NA	71	A2	NA	NA	NA
Total	50	372	493		772	829	1652

These CFUGs are managing a larger community forest area and the loss of area for UT-1 project would constitute approximately 11% of the total forest area. The community forests are in general used for collection of timber and NTFPs. Consultation with the *ilaka* (sub-district) Forestry official suggested that the

[15] U=Uttargaya Rural Municipality (Gaunpalika); A=Amachhodingmo RM (Gaunpalika)

quality of forest in the area acquired was poor and that NTFP species with high market potential were limited.

Table 5-2 Community Forest affected by the project & area diverted for the project

SN	Present Status of CFUG after reorganisation	Total area (ha)	Impacted Area (ha)	% or Area Acquired	Number of trees/ seedlings to be cut
1	Daksin Kalika	373.92	17.25	5%	330
2	Dharnasila Kanya	126.86	24.57	19%	736
3	Bratar	14.22	0.99	7%	105
4	Lumbudanda		9.85		138
5	Larbangpakha	206.36	23.96	12%	308
	Sub-Total	**707.14**	**76.62**	**11%**	**Total 3856 (1617 trees; 2239 seedlings)**
6.	Nehasing Jomokharka Community Forest User Group	120.18	-	-	-
	Total	**927.32**	**-**		**-**

Source: NWEDC, 2015/2018

Upon receiving the application for requirement of the forest land, the DFO communicated the land requirements and its potential impacts to the committee members and a general assembly was held to obtain consent from the members. Based on the outcome of the meeting with executive committee and general assembly, the DFO presented a report to the Nepal Ministry of Forestry, which then was forwarded it to the Council of Ministers for its review and approval of the lease agreement. After the payment of the lease fee by NWEDC, the DFO signed the lease agreement.

DFO held meetings with CFUGs in December 2015 when identification of the required land and demarcation of the trees to be cut were made. The second meeting was held in February 2015 prior to the cutting of the trees. While clearing the community forest land, the trees were cut and stacked in the area at the cost of the Project. DFO later handed them over to the concerned CFUGs for their use or sale, as they deemed appropriate. The Project has also provided monetary compensation for the trees/seedlings lost.

Most of these community forest lands were acquired for obtaining the RoW for the Access Road. During the construction of the road, a number of trees in the outside of the area acquired for the project were reported to be impacted as the debris from the blasting and excavation fell down the hill slope. CFUGs consulted informed that complaints were made to the Ilaka officer and the Project (both officially and unofficially) to record the damage and compensate accordingly. The Ilaka officer had finally agreed to inspect the community forest areas by the access road construction (during the last week of February 2015). However, the Gorkha earthquake and subsequent landslides resulted in extensive damage to the community forest area. Since, the earthquake occurred

before the inspection by the Ilaka officer could be completed, there is no clarity on the additional trees that were impacted by the project activities.

Mitigation Measures Planned

Considering the above context, the following additional mitigation measures have been identified under LALRP:

- Provide support to the community forest management initiatives
- Compensation payment for the extra trees lost during the access road construction. Any other construction related damages on trees to be routed through grievance process of the project[16] (refer to the Stakeholder Engagement Plan [SEP] and the Grievance Redress Mechanism [GRM]). This payment shall be undertaken in keeping with the provisions of the forest lease agreement signed between DFO and the project which mentions that, "*In the case of any loss or damage out of the forest area made available in the course of construction of the infrastructure or any other construction works, the maintenance, reconstruction and repair thereof shall be carried out by the Project itself. In case of loss or damages to trees and Plants, an action shall be taken as per the monitoring report of the DFO in accordance with Forest Act and Rules*". This payment of compensation will be undertaken on a regular basis, in a timeline agreed upon with the CFUGs.
- Prohibit firewood usage by the construction workers and ensure there is provision of LPG or other alternate fuel
- Implementation of the code of conduct put in place as part of the Construction E&S Management Plan
- Conduct training and capacity building of the CFUGs for rejuvenation and management of community forest area. Financial Literacy training may also be provided to the CFUG members for the management of the cash compensation received.

5.2.2 Impact on Fish Resources and Fishing

The Project will change the river habitat by creating a 2.1 ha reservoir, constructing a dam across the river, and creating a 10.7-kilometer-long diversion reach that will experience reduced flows. The Project is located at a relatively high elevation in the Trishuli River Basin where high gradient and cold water temperatures limit fish biodiversity. The common snowtrout is by far the most abundance species found in the Project AoI. This is classified as "Vulnerable" by the International Union for Conservation of Nature (IUCN), and is a migratory species that moves upstream in the spring to spawn.

The Project will divert up to 76 m^3/s of flow from the 10.7-kilometer segment of the Trishuli River between the dam and the powerhouse (i.e., the diversion reach). This flow diversion will reduce the width and depth of water in the

[16] This Project-level GRM is separate from the GRM for this IPP.

diversion reach; thereby potentially impacting aquatic habitat and fish. In Nepal, hydropower projects are required to release 10 percent of the minimum monthly average flow to preserve the minimum habitat required to support fish and other aquatic life in the diversion reach, and to preserve flow continuity for fish movement/migration through the Project area, which is referred to as an environmental flow, or Eflow. NWEDC has proposed an Eflow that is higher than that required by Nepalese regulations, essentially providing 10 percent of the average monthly flow, rather than the minimum average monthly.

NWEDC also will install a fish ladder to allow the upstream and downstream passage of migrating common snowtrout. The fish ladder design was reviewed and found acceptable in ESIA. The provision of sufficient flow to enable upstream migrating adult common snowtrout to navigate through the diversion reach to the proposed fishway at the dam is critical to the success of the fishway. NWEDC will implement an Adaptive Management Approach based on intensive monitoring during the Project's first few years of operation to ensure migrating common snowtrout are able to reach their spawning grounds upstream of the UT-1 dam.

It is worth noting that affected villages are typically located high above the river bed for safety reasons and do not rely on the main stem of the Trishuli for drinking water or other purposes (water is drawn from mountain streams feeding into the Trishuli instead). According to consultations undertaken, fishing activities in the project impacted stretch were undertaken by approximately 13 families for sustenance and recreation. Fishing was not identified as a primary livelihood activity by any family. The financial value of fishes caught by these households was estimated to be approximately NR 20-25000 per annum. In the post-earthquake period, as people lived in IDP camps which were farther from the river, fishing practices reported by PAFs surveyed shows a sharp decline. However, the situation is currently fluid with people starting to resettle, and the use of the river for fishing will be monitored.

Mitigation Measures Planned in ESIA and LALRP

The impacts on river and fish (e.g., impoundment of riverine habitat, reduced flow, and fragmentation of the river) are inherent in the design of the Project and cannot be avoided. The next step in the mitigation hierarchy is minimization. The size of the impoundment (and the consequent loss of riverine habitat) also cannot be minimized further. The loss of aquatic habitat in the diversion reach will be minimized through the Eflow.

Common snowtrout has been selected as the indicator species for Eflow analysis; based on the available information on its habitat requirements, the Eflow is likely to be sufficient to maintain habitat connectivity and support spawning in the diversion reach, although there is predicted to be a decrease in common snowtrout populations, but this is based on assumed fish ladder effectiveness.

Under existing conditions, the sampling data suggests the diversion reach only supports a small population of common snowtrout. Therefore, the impact of the

Project on fish population in the diversion reach is likely small. In any case, the implementation of the robust Eflow Adaptive Management Program as a key component of the Biodiversity Management Plan. NWEDC will conduct further studies as part of the Biodiversity Evaluation and Monitoring Program (BEMP) on the timing of common snowtrout upstream and downstream migration, the flow depth required to allow upstream migration, and their preferred spawning location (e.g., along the mainstem of the river or in tributaries). NWEDC will share these results with the government and other hydropower developers, along with the design and passage effectiveness of the fish ladder, to help minimize hydropower impacts on aquatic habitat in Nepal and throughout the Himalayan region. NWEDC's commitments towards this include the following:

- Contract with an international fishery biologist to oversee Project construction and early operations
- Develop and conduct a robust Biodiversity Evaluation and Monitoring Program and share any enhanced understanding of common snowtrout biology with the Government of Nepal and other hydropower developers in the Himalayan region;
- Demonstrate No Net Loss of common snowtrout with monitoring metrics
- Apply an Adaptive Management Program to ensure common snowtrout are able to successfully reach their spawning grounds upstream of the dam
- Implement the Project's Biodiversity Management Plan
- Monitor the fishing activity till the initiation of construction and provide entitlements as defined in the LALRP where fishing-based livelihoods are affected as a result of the project construction or operations.

5.2.3 Impact on Ecosystem Services

As Indigenous Peoples' livelihood and cultural practices are usually interwoven with the natural resources in their habitats, impact on ecosystem services is a significant aspect to be examined. The ESIA has assessed impacts of ecosystem services and an overview is provided here.

Table 5-3 Impact on Ecosystem Services

Ecosystem Service	Description
Provisioning Services	

Ecosystem Service	Description
Food: wild caught fish	According to the discussions undertaken with the local community before the 2015 earthquake, 13 households were reported to be fishing in the river for sustenance and/or recreational purposes. These households did not depend on fishing as a primary source of income. However, the fishing activities were reported to play an important part during the 6 months when agricultural produce was not sufficient for sustenance. However, in the post-earthquake period, none of the local community was reported to be undertaking fishing activities. The 13 Project-Affected Families identified in 2015 could not be located during the site visit in 2017.
Food: wild meat	None of the local community members were reported to be undertaking hunting in the AoI.
Food: cultivated crops	In the pre-earthquake survey of 2015, agriculture was reported as the main source of livelihood for the local community in the AoI. However, in the post-earthquake period, the dependence on agriculture is reported to have been reduced, due to loss or access to and damage to agricultural land. According to the information available, some of the local community, especially in the villages of Haku Besi, Thanku, and Phoolbari, intend to return to their original villages. Those who return are expected to undertake agriculture on their remaining land. In the IDP camps the avenue for agriculture is limited as the crop sharing agreements does not seem to be too encouraging for the people. Agricultural activities could be further impacted due to alteration of water resources/ quality due to Project activities and loss of land where the Project requires 20.6 ha of agricultural land.
Food: herbs and plants	Prior to the earthquake, the communities were understood to supplement their diet with uncultivated resources during times of scarcity. Though this dependence has reduced post-earthquake, it is likely to pick up again if the communities return to their original villages. Loss of forest resources in the Project footprint area (76.7 ha) due to Project activities also affects the access to community forest; however, it was reported to be only 11% of the total affected community forest.
Livestock Farming	Livestock farming was reported to be an important source of sustenance and livelihood in the pre-earthquake period. However, as a result of the earthquake, most of the Project-affected families lost their livestock holdings to a great extent. According to the discussions undertaken, it is understood that most of the households, aim to rebuild/restore their livestock holdings if they move back to their original villages. The community did not report major impact on the livestock due to diversion of the community forest land for the Project. Post-earthquake the community, (wherever accessibility to the native villages is feasible) trying to build up on remaining livestock. These livestock cannot be brought to the IDP camps as the livestock is not able to sustain the changed climate as well as access to grazing land is turning out to be a limitation.

Ecosystem Service	Description
Biomass Fuel	The primary source of fuel in the villages in the AoI is firewood, collected at the household level from the surrounding forests. Loss of forest resources in the Project footprint area (76.7 ha) could thus have an impact on the availability of firewood for the community residing in the immediate vicinity. However, with the people shifting in the IDP camps the fuel source has changed. The mobilization of labor during the construction stage could put pressure on the community forest in case cooking is done with firewood sourced from the community forest.
Timber and wood products	Timber and wood products are commonly used for construction, furniture, farming, fishing, and household utensils by local communities residing in the original villages. Loss of forest resources due to vegetation clearance (76.7 ha), inundation, or decreased water retention in soil could have an impact on dependent communities.
Non-timber Forest Products	Resin, leaves, grasses, and bamboo are commonly utilized non-timber forest products for domestic use and sale by the communities in the villages. According to the discussions it is understood that a few households reside in the internally displaced persons camps but make regular fortnightly trips to the forests in the AoI for collecting bamboo to make baskets.
Freshwater	Even though e-flow will involve reduced flow in the main stem of the Trishuli, communities do not rely on this water for drinking purposes. However, there are several springs in the Project's AoI and 16 of the 45 identified are considered more vulnerable given their status of main sources for water supply for the communities in their vicinity. Those which could potentially be impacted by project-related tunneling activities will be monitored and any adverse impacts mitigated (i.e., by provision of replacement water sources). Some of these springs were reported to have gone dry post-earthquake; however, this could not be confirmed.
Regulating Services	
Regulation of air quality Climate Regulation: global Climate Regulation: local Regulation of water timing and flows Water purification and waste treatment Erosion regulation Fire regulation Pest regulation Pollination	The Project footprint area comprises relatively degraded community forests and even though there may some impact on local climate regulation, these are likely to be low. Changes in water release timing and flow have been predicted to have some impacts on the blunt-nosed snowtrout, *Schizothrax richardsonii*, a species that is harvested for sustenance. However, as indicated earlier, present fishing levels are low to fish absence and any impacts to fish numbers are unlikely to impact livelihoods. Given the steep slopes in the Project footprint area, vegetation clearing in the Project footprint area (76.7 ha) and the 2.6 ha of LNP will impair erosion regulation and thereby runoff regulation which could impact water quality in the Trishuli River.
Cultural Services	
Spiritual, religious or cultural value	Villagers worship some forest-based deities in the AoI. Several tree species are considered sacred and components of many plant species are used in rituals and cultural festivals.
Traditional practices	Traditional places in the AoI include river banks that are utilized for cremation and religious practices. However, no cremation ground is expected to be impacted by the Project activities, based on consultations undertaken during the ESIA process. Post-earthquake, the community living in IDP camps near Naubise have identified new burial place which will not be impacted by the Project.
Supporting Services	

Ecosystem Service	Description
Aesthetic value	The aesthetic value can be negatively affected by the loss of forest resources, decreased water flow and by Project development (e.g., powerhouse, transmission lines, base camp, construction). There are no obvious non-use values associated within the Project AOI.
Primary production Non-use value of biodiversity (e.g. existence, bequest value) Nutrient cycling Water cycling Soil formation	With lower e-flows the DRIFT modelling has indicated that algae concentrations upstream and downstream of the dam will increase. But due to continued flow, although reduced, this will not result in impacts to fish harvested for sustenance. There will be a decrease in primary production due to clearing of vegetation in the Project footprint area leading to decreased biomass for utilization by local communities and impacts to water and nutrient cycling and perhaps soil formation. These areas will thereby experience lower primary productivity in the future even if revegetation and rehabilitation of top soil were to occur, given that natural ecosystems, even though modified, have been replaced.
Habitat provision	Terrestrial habitats are not used by local communities for hunting and there is presently negligible extraction of aquatic fauna in aquatic habitats.

Mitigation Measures Planned in LALRP and ESIA

The EPC contractor(s) will be responsible for implementing key measures for minimizing and mitigating these impacts as required in the Environmental and Social Management and Monitoring Plans (see its Appendix B). Prime among these are:

- Formulation and implementation of a livelihood restoration plan
- Avoidance of culturally and religiously significant sites for the locals
- The ESMMP for the construction phase should be widely socialized and understood by the Project contractors and the local communities, so that there is all around confidence that vital ecosystem services will not be impaired in the long run even if there are any temporary disruptions to any of these services
- Replanting of trees and vegetation to stabilize slopes through local CFUGs which will also provide an opportunity for employment
- Establish a grievance redressal mechanism for the local community

5.2.4 Environmental Protection Measures

Some of the environmental protection measures in EIA which will also benefit local communities are:

- The erosion of river banks will be minimized by implementing river bank protection measures in susceptible site downstream of weir
- The area equivalent to occupied forest area (27.20 hectares) for project physical infrastructures will be afforested and protected for 5 years and handed over to concerned stakeholders as per the Forest Guideline for the Allocation of the Forest land to other Development Projects. The afforestation area will be as per the area designated by the respective district forest office and Langtang National Park (LNP).

- The project will carry out compensatory plantation of 4,797 felled trees at a ratio of 25 seedlings for each lost tree equivalent to 119,925 seedlings as per the Forest Guideline, 2006 in an area as directed by the District Forest office of Rasuwa district and LNP authorities
- The construction workers will be prohibited from collecting firewood, timber and other forest products from the local community forest of Haku VDC and such acts will be deemed illegal

5.3 SOCIAL IMPACTS AND MITIGATION MEASURES

5.3.1 Impacts on Tradition and Culture of IPs due to In-migration and Influx

The Project is expected to employ approximately 1,090 skilled, semi-skilled, and unskilled workers over a 60-month construction period. In terms of influx of labor and migrant population in the area, the highest risk villages are Mailung, Phoolbari and Haku Besi because of their proximity to the proposed worker camps.

In addition to the influx of labor in the area, Project development may also result in the in-migration of the general population seeking to take advantage of the economic and development opportunities created in the area, or worker families that relocate to the Project area. The local Tamang as distinct social and cultural communities can be affected by an influx of thousands of outsiders.

The inventory of religious and cultural sites prepared during ESIA lists the following cultural sites.

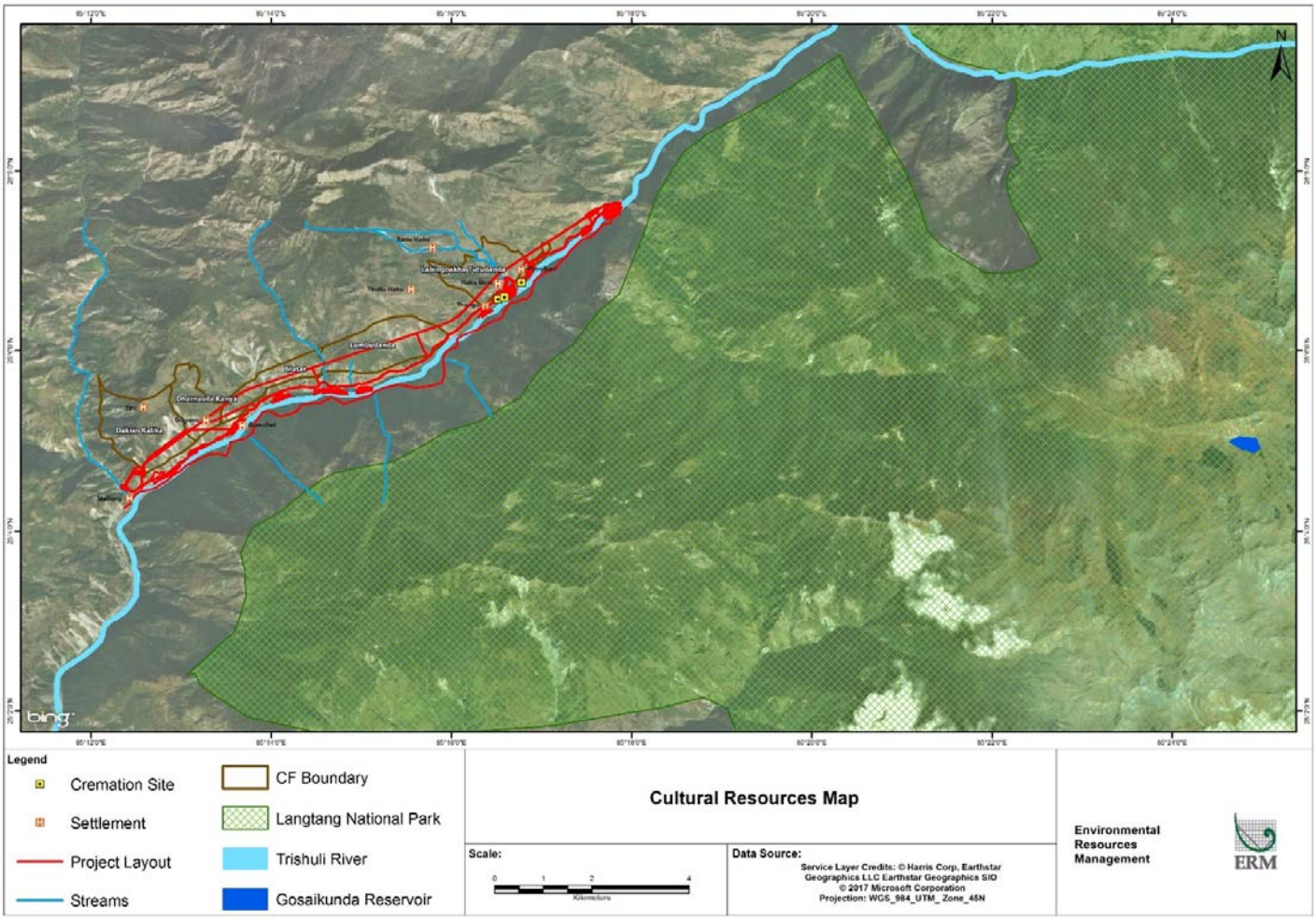
Table 5-4 List of Sacred Sites

VDC Name	Cultural Practices	Cultural Sites
Haku	There are no built shrine structures in the area acquired for the project. Locals worship their local deities (demons, gods, natural powers) on open land close to the stream (Khola) near the village. They celebrate festivals like Dashain, Bhadra Purnima, Shrawne, and Maghe Sankranti, and Buddha Jayanti of the Hindu and Buddhist religions. The famous Mane Dance is observed during September/October each year.	The dead are normally buried. Burial places are located in the upper part of the hills.
Dhunche	Menchyau Dupchyo is a sacred site uphill from the village and Pasang Lamu Highway, which is about 3 hours walk within LNP. There is a cave located there and springs originate from that place, where people usually bath in the month of Magh. Every year in the month of Magh, many pilgrims from Dhunche and Ramche visit the site and bathe there. They believe that the many illnesses like scabies, wounds, headaches, and many others will be cured after the bath. The Tamang worship the Paiyu tree as a god.	The constructed structure at the burned place is called Purgam in Tamang language. At the locality, there are about eight Purgams.

VDC Name	Cultural Practices	Cultural Sites
Dhunche	Dupla Sambling Gumba is located near to the settlement. People offer prayer in each Dashain. Purnima and Aunsi in the Gumba. A special Mela organized at this site in Buddha Purnima (Baisakhi Purnima). Chenti Garpu, one of the shrines, is nearer to the settlement and people offer Bhumi Puja in the shrine in Fagu Purnima, Jestha Purnima, and Janai Purnima. Tulkuchheling Monastery is also located in the middle of Dhunche Village.	At the locality, there are about 16 Purgams.
Ramche	Most of the villagers celebrate Dashain, Tihar, Maghe Sankranti, Shrawan Sankranti but none of them celebrate Loshar.	Most of the locals use their own land as crematory sites for the dead. Lamas cremate their dead at the summit of the hill.

Source: ESSA 2014

Figure 5.1 Important Sacred Sites in Project Area



Mitigation Measures-Planned in ESIA and LALRP

To minimize the adverse cultural influence on the host community and to avoid conflict with them, the Engineering, Procurement, and Construction contractor will be responsible for implementing mitigation measures as required by the Environmental and Social Management and Monitoring Plan. Relevant mitigation measures in this aspect are as follows:

- Prioritize the recruitment of local community residents in the Project
- Provide adequate training to the non-local workers in the Project, especially in terms of interaction with the local indigenous community members
- Provide support to improve access to sacred sites or their beautification
- Support to encourage preservation and promotion of cultural practices
- Put in place a grievance redressal mechanism for the host communities
- Allow local residents to report concerns associated with cultural heritage impact (e.g., loss of access) and loss of cultural values through the grievance mechanism
- Establish and enforce a Worker Code of Conduct for the Project, including compliance with this Code in the Engineering, Procurement, and Construction (EPC) contract, and ensuring all workers are trained and understand its requirements

5.3.2 Beneficial Effects of the UT-1 Project: Livelihood and Employment Opportunities

Potential positive impacts expected from the project include livelihood and income opportunities due to the project. The construction phase of the project will result in an increase in the job and livelihood opportunities for the local community. These opportunities will include unskilled, semi-skilled and skilled labor, petty contracts, and creation of market/ indirect benefits for small businesses. Furthermore, combined with the skills-training and local employment preferences to be proffered through this IPP as well as by contractors, post-construction operation-phase employment opportunities will also open up for local Tamang. The overall NWEDC commitment to livelihood and employment enhancement are well reflected in both the LBSP and the ESTP plans. See also Section 5.4.3 below.

5.3.3 Company Pledge to Provide Compensation for Project-Induced Damages

Project impacts and their mitigation measures are well documented in the EIA and in the ESIA documents and the Company is committed to implement these mitigation measures. However, should the construction and operation of the UT-1 Project cause unforeseen material damage to PAP and their villages, NWEDC will take full and appropriate ameliorative and compensatory measures based on evidence of unforeseen material damage affecting PAP.

Evidentiary verification of such unforeseen material damage will be carried out in consultation with both the affected people and professional expert assessments.

5.4 SPECIAL COMPENSATORY COMMUNITY-LEVEL MEASURES

Aside from the compensation measures described in the LALRP, NWEDC commits to the following initiatives to benefit UT-1 PAP.

5.4.1 Local Shares Allocation to Project Affected Communities

NWEDC has pledged to keep Project Affected People informed in advance about the plan and process of giving opportunity for investment in the Project. Project Affected people are those who will be required to be resettled and rehabilitated as a result of the Upper Trishuli -1 Hydropower Project of 216MW ('Project'), and who are natural persons and residing permanently in Rasuwa District at the date on which the construction activities for the Project commences.

As a part of the Company's obligations under the PDA signed on 26 December 2016 with the Government of Nepal and also as a corporate social responsibility to contribute to society, Nepal Water & Energy Development Company Pvt. Ltd. will be offering up to 10% (maximum) of the Company's shares to the Project Affected People.

The purchase price of the share will be at face value. NWEDC will be offering such shares within a period of 3 years from the date of financial close. The Government of Nepal and the Company will jointly develop a local share allocation plan and it will be implemented with the aim of ensuring that it is not cumbersome.

5.4.2 Rural Electrification Plan

NWEDC and GoN will jointly prepare a Rural Electricity Plan that will create a 'free electrification area' and define numbers of beneficiary households. The 'free electrification area' is defined by law as within a 500m radius of the headworks and the power station. Prior to the Commercial Operation Date (COD), NWEDC will build the distribution network and after the COD, the Company shall supply (at its own cost) twenty (20) kWh of electrical output ("Local Free Power") each month during the term without charge to each eligible household within the free electrification area.

Electricity delivery will commence after project operation begins, currently estimated to occur during 2022.

5.4.3 Employment Preferences

- Local people will be prioritized for employment in project construction works
- Life insurance will be made available to project hires
- Dalits will be prioritized in project works as per their skills and capacities with certain percentages reserved for Dalits.[17]

[17] Dalits are a social group located at the bottom (or outside) of the varna/caste system (also known as "untouchables") and as such subjected to discrimination and segregation. Given their vulnerable socio-economic standing, the Project will also extend employment preferences to them.

6 DEVELOPMENT MEASURES

During July 2018 NEFIN conducted a Preliminary Social Mapping which, among other activities, gathered priorities from villagers of the original nine FPIC villages as to their preferences for benefit measures to be supported by the IPP (the priorities of the later added tenth village, Nesing, were collected subsequently). Then, first in August, during the First Round of Village Consultations (see Section 4.4), and later in September/October during the Second Round of Village Consultations further demands addressed to the Project as a whole were made during village-level problem analysis and planning sessions (see Annex 6). Some of the measures suggested during both of these exercises are listed below. While the Second AJAC Meeting fixed the number and content of Plan Components, budget allocations for these programs will be set by the villagers' representatives later by the IPP Governing Board. It is anticipated that the measures listed in Annex 6 will both serve as reference points for specific activities/projects to be included in the IPP (6B and 6C particularly) and for further discussions with the Project and local government 6A and 6D particularly).

6.1 CULTURAL HERITAGE PROGRAM (CHP)

Table 6-1 Possible Components/Projects covered in CHP

• Component	• Project	• Description
Tamang Community Events	Community Events	• Support to major cultural events in support of Tamang cultural heritage and identity
Heritage Preservation	• Sacred sites preservation	• Provide support to improve access to sacred sites or their beautification
	• Cultural Practices	• Support to encourage preservation and promotion of cultural practices and knowledge • Document Tamang community practices • Thanka Training Program/Center • Preparation of area for Tamang funerary rituals
	• Tamang Culture Museum	• Prepare for systematic preservation of Tamang cultural artifacts • Documentation of Tamang culture, including script of lama and Jhakri • Preservation of Jhong

Table 6-2 Possible Components/Projects covered in SDP

Component	Project	Description
Education	• Furniture and Stationaries Supply	• Support to schools to purchase desks, tables, chairs, blackboard, books for library, etc.
	• Computer and IT Peripherals	• Support to schools for purchasing computers and peripherals such as UPS, printers, LCD projectors, etc.
	• Scholarships	• Incentives for study for poor
	• Tamang language	• Support preparation of Tamang language teaching materials • Training of Tamang language teachers
Health	Furniture support to health centers	• Support to purchase furniture including desks, beds, tables, chairs, notice boards, stretchers, etc.
	Support to birthing centers	• Support to establish birthing centers which includes construction of building, furniture and requisite equipment.
	Ambulance service	• Service for health emergencies.
	Sanitation	• Sanitary awareness campaigns; solid waste management training • Water management program
	Nutrition	• Health and Nutrition training
Tamang Community Organization and Events	Community Organizations	• Support to community organizations for training programs, infrastructure, equipment, etc. • Provide support for sport activities
Women's Empowerment	Training	• Support for women-focused training • Establishment of Traditional Dress Training Center • Dedicated scholarships for girls

6.3 ECONOMIC DEVELOPMENT PROGRAM (EDP)

Table 6-3 Possible Components/Projects covered in EDP

Component	Project	Description
Agriculture & Animal Husbandry	• Training • Equipment • Technical Services	• Agriculture and livestock rearing • Agriculture and livestock rearing • Land assessment; soil testing • Marketing advice • Water mill management
Cottage industries	Production support	Support for purchase assistance of equipment, assistance in procuring raw materials, market linkages and capacity building trainings
Eco-tourism	Eco-tourism	Support to include promotion and marketing of home-stays and associated training for trekking, camping, sight-seeing etc..

6.4 CAPACITY-BUILDING

6.4.1 Technical and Vocational Training

Skills training will be provided by a number of training service providers. The trainings will be Council for Technical Education and Vocational Training (CTVET)-endorsed Level-1 training courses which include 390 hours of training over 90 days. Depending on community interests, a wide variety of types of training can be offered. Annex 10 provides some possibilities for community consideration.

Post-training support is critical to ensure that training leads to employment. As a facilitator, NWEDC will try its best to accommodate training beneficiaries within the project by providing employment opportunities. However, the project will strictly follow its existing recruitment standards by giving preference for indirect employment through outsourcing in major contract works based on specific requirements and suitability of the candidates. On the other hand, skill training providers will guide trainees for job placement and employment opportunity after the successful completion of training. In addition, the Company will encourage contractors and sub-contractors to give local preference for skilled and semi-skilled job positions.

In addition, a component focused on enhancing agricultural skills for women can also be provided as well as courses in traditional Tamang clothing preparation.

6.4.2 Merit Scholarship for Diploma Courses

The CTEVT-designed three-year semester system course is aimed at producing middle level technical workforce equipped with knowledge and skills related to the areas of civil engineering, surveying, sub-overseer, etc. The IPP can

provide merit-based diploma level scholarships to eligible students from project-affected families.

6.5 SPIRITUAL CONTEXT FOR ALL IPP ACTIVITIES

Recognizing and respecting the spiritual practices, beliefs, and world view of the mostly Tamang members of the PAP, all official and formal activities undertaken under the IPP (such as governance body meetings or program initiations) shall conduct the appropriate ceremonies and/or rituals as recommended by local spiritual specialists.

7 IPP GOVERNANCE STRUCTURE

The IPP will be carried out with the active participation of the indigenous community and will be overseen by a Governing Board (GB) and Executive Committee (EC) whose work will be supplemented by Program Committees and an NWEDC IPP support unit. The IPP will remain in force over a five-year period and will be jointly managed by representatives of the local indigenous population (members of the UT-1 Adibasi Janajati Advisory Council), local government representatives, and NWEDC. The latter three entities have agreed to enter into this mutually beneficial partnership arrangement to co-supervise and co-oversee IPP management (see Annex 9).

7.1 PARTNER INPUT REQUIREMENTS

The three partnering entities for this UT-1 Indigenous Peoples Plan are NWEDC, local governments (the three most affected Ward Chairs) and the local communities. Each will contribute in its own way to Plan implementation according to agreements discussed during the consultation process under way between June and October 2018 and summarized in the UT-1 IPP Tripartite Implementation Agreement (TIA; see Annex 9). At the minimum, inputs from the partners would include the following:

- NWEDC: The Company will finance the IPP according to a fixed budget over the five-year duration of the first IPP. The Environmental and Social Management Cell (ESMC) of NWEDC to be established for this Project will work with the IPP governing bodies established in this Plan to coordinate IPP activities for both mitigation efforts and benefits sharing. At present, there are two Community Liaison Officers (CLOs) engaged at the project site, one of whom is a Tamang PAF. In addition to this the recruitment of a female Mobilization officer shall be considered at the time of IPP implementation. This internal institutional structure will be further strengthened as necessary through engagement of experts/scholars working with the Tamang community or NGOs working in the area.
- Local Governments: The three Ward governments in which the 10 IPP villages are located will participate in the governance bodies of the IPP and help coordinate IPP activities with local government plans and programs.
- Indigenous Peoples of the Affected Communities: Members of the 10 IPP villages shall serve on the IPP governance bodies (AJAC, the GB, and the Program Committees [PC]) and shall both receive and contribute information on how the Plan is operating and provide feedback on the Project's progress. These villagers will directly participate in Plan co-management and supervision.

7.2 GOVERNANCE BODIES

7.2.1 UT-1 Adibasi Janajati Advisory Council

The AJAC represents the broadest representation of Project-Affected Persons, households, communities, and thus serves as the highest body in the UT-1 IPP governance process. Broadly representative of the ten FPIC villages, the AJAC will conduct an annual meeting to review the year's governance body reports and to advise on the future year's budget and Plan implementation. It will issue guidance to the Governing Board (including recommendations as to measures to implement evaluation report suggestions), which will in turn ensure that the general instructions received from the AJAC are indeed implemented by IPP governance bodies.

AJAC representatives will be selected during village meetings similar to those held in June of 2018 for the FPIC process. They will serve a term of 2.5 years with those members elected in June 2018 carrying over their service for the first half of the First IPP's implementation period.

7.2.2 UT-1 IPP Governing Board

The Governing Board (composed of representatives from the three Plan partners—AJAC, NWEDC, the 3 Wards, and NEFIN) will be the chief management oversight body for the implementation of the IPP. It will set the objectives and implementation guidelines for the IPP as set out by the AJAC, review all reports generated by those administering the IPP or monitoring it, have final word on grievances brought to the IPP grievance mechanism and on decisions made by the Program Committees, review the performance of Plan implementation, and hold regularly scheduled meetings to provide ongoing direction to the Plan.

Membership on the Governing Board shall be comprised of the following:

- Indigenous Community Representatives: 20 members (one man and one woman from each village) selected from the UT-1 Adibasi Janajati Advisory Council to carry out such function; for the initial operation of the Plan, these will be members selected by the AJAC to serve on the UT-1 FPIC and IPP Working Group.
- NWEDC Representatives: The Environmental and Social Manager and two of the Company CLOs shall be Company representatives on the Governing Board.
- Local Government Representatives: The Ward Chairs of the three Wards directly affected by the UT-1 Project (or their representatives) will each retain a seat on the GB.
- NEFIN: One representative each from the NEFIN Central and NEFIN District Committees will retain a seat on the GB.

Selection Process: Each of the GB partners—AJAC, NWEDC, the Wards, and NEFIN—will select their own representatives to the GB.

Terms of Office: Governing Board members shall serve a term of 2.5 years, after which the participating parties shall decide either to reappoint members or replace them. For the AJAC members, gender balance will be maintained for their GB representation.

Meeting Frequency: The GB shall meet a minimum of four times per year; each meeting will be called by the officers of the GB in consultation with the partners.

Governing Board Officers: A Chair, Vice-Chair, Secretary, and Treasurer shall be selected from among the GB members annually so as to achieve gender balance and serve for one year with the possibility of one re-election during each of the five-year Indigenous Peoples Plans. Their functions are as follows:

- The GB Chair will preside over all GB meetings, consult with other GB Officers as to the times and agenda of GB meetings, and serve on the GB Executive Committee.
- The GB Vice-Chair will preside over GB meetings, in the Chair's absence, assist the Chair in carrying out his/her activities, and serve on the EC.
- The Secretary will be responsible for taking the minutes of the meeting, helping the NWEDC IPP support staff plan and document GB activities, , and serve on the EC.
- The Treasurer will work closely with the NWEDC IPP support staff to ensure that IPP financial and budget matters are available on a timely basis to GB members, as necessary, and serve on the EC.

7.2.3 Governing Board Executive Committee

The GB Executive Committee will be comprised of the four GB officers (Chair, Vice-Chair, Secretary, and Treasurer) and will act on behalf of the Governing Board in-between meetings of the GB, with the understanding that EC decisions are reviewable by the GB. All three partners will be entitled to one ex-oficio member of the EC if they are not already represented as GB officers on the EC. The EC will meet as needed as determined by the Chair. The main functions of the EC are to enable rapid decision-making when required for smooth IPP implementation and to resolve IPP grievances in the context of the IPP Grievance Mechanism or regarding grant allocations by the Program Committees.

7.2.4 Program Committees (PC)

Each of the four programs described in Section 6 (Cultural Heritage, Social Development, Economic Development, and Capacity Building) will have a

committee to oversee the program's operation and to issue guidelines for component and sub-component selection and implementation.

Role of the Committees: Each committee will decide how to apportion funding for any components that fall within its jurisdiction. Similarly, the committees will determine procedures for selection of Program Components and activities to be supported.

Selection and Term of Members: Each village will select one representative from among the village Advisory Council members not serving on the WG to serve on each of the four PC. Village representatives will rotate by gender each 2.5-year term.

7.3 IPP SUPPORT UNIT

Support for the IPP implementation will be based in the Company's ESMC. This unit will be the focal point of communication among the three partners (AJAC, Company, and the local ward governments) and between the IPP and the ten directly affected villages. The Unit will issue regular reports on the Plan's progress, oversee financial disbursements, and coordinate other aspects of Plan implementation as necessary. The Unit will maintain an independent stance in relation to the Company and the Unit's work will be evaluated periodically by the three Plan partners.

7.4 REPORTING, MONITORING, EVALUATION, AND DISCLOSURE

7.4.1 Reporting Requirements

- Progress Reports: The UT-1 IPP support unit established by NWEDC will issue IPP Progress Reports quarterly prior to meetings of the Governing Board
- Governance body Reports: Each of the committees (EC and PCs) will prepare a report on its activities quarterly prior to meetings of the Governing Board
- Monitoring Reports: Both internal and external monitoring reports will be issued at regular intervals (TBD)
- Evaluation Reports: Both during year 3 and year 5 of the IPP implementation period, evaluation reports conducted by an external third party will be prepared

7.4.2 Internal Monitoring

Monitoring of Plan grant and benefits implementation as well as the efficacy of mitigation measures is an important part of Plan implementation. The IPP partners will establish an internal monitoring team (IMT) to conduct such

monitoring activities. The IMT will be composed of at least one representative of each of the three partners and monitoring will take place according to a schedule decided on by the GB but minimally at least annually. Internal monitoring will involve visiting beneficiaries and analyses of reports, including financial documentation. The IMT will devise a monitoring matrix complete with input, process and output indicators. Each monitoring effort will result in a monitoring report shared with the AJAC, GB, and the External Monitor.

In addition, members of each village's UT-1 Advisory Council will meet with the IMT to provide their assessments (verbally and/or in writing) of Plan implementation progress and to assist the IMT activities in their village.

7.4.3 External Monitoring

To provide third party independent insights and feedback to the IPP, the Project will engage an External Monitor (EM) to conduct semi-annual monitoring and evaluation activities during the period of IPP implementation. Such external monitoring will provide the Plan partners and the AJAC with independent verification of Project compliance with the UT-1 IPP, provide periodic objective assessment of the IPP program implementation, and identify issues so that the Plan partners and the AJAC can develop corrective actions.

The EM shall be a social science professional with extensive international experience in Indigenous Peoples project development and supervision.

EM responsibilities include:

- Acting as advisor on UT-1 IPP implementation for all three Plan partners
- Reviewing internal monitoring and reporting procedures, internal monitoring records, as well as identifying any areas of non-compliance, recurrent problems, or potentially disadvantaged groups
- Reviewing reports submitted by all governance bodies and the Plan Support Unit
- Reviewing IPP-related grievance records for evidence of significant non-compliance or recurrent poor performance in program implementation; prior to each monitoring visit, the EM will be provided with a full list of resolved and unresolved IPP-related grievances along with the reports of the grievance working groups.
- Conducting discussions with the AJAC, WG, and/or the three Plan partners on IPP implementation and making recommendations, as appropriate
- Interviewing a cross-section of UT-1 IPP stakeholders (individuals and organizations) and meet with the WG members and relevant local government agencies; interviewees should include both successful and unsuccessful grant/credit applicants, along with both supporters and critics of the Plan
- Acting as an observer at meetings of the AJAC and at least one GB meeting per year
- Assessing overall IPP compliance with international standards

- Conducting External Monitoring Reviews in Rasuwa District; upon mutual agreement with NWEDC and in consultation with the GB EC, additional reviews may be scheduled as necessary
- Preparing an External Monitoring Report upon the conclusion of each External Monitor Review, which will be sent to all three Plan partners, the AJAC, and disclosed publicly
- Working with a team, composed of a Nepali social scientist and an independent Indigenous Peoples representative, to conduct an IPP Midterm Evaluation during the middle of the third year of Plan implementation, and a Plan Completion Evaluation during the middle of the concluding year (see Section 7.4.4)

7.4.4 Evaluation

Two formal evaluations undertaken by an Evaluation Team (ET) will take place during the 5-year duration of the IPP. The first will be conducted mid-way through plan implementation during Year 3 while the second will be conducted during the final year of plan implementation. These evaluations will assess to what degree Plan objectives are being fulfilled and recommend to the Governing Board Plan changes to enhance Plan effectiveness.[18] The evaluations will be based on EM Reports, internal Plan monitoring and implementation reports, visits to the Project site and on other data sources as appropriate. The evaluations will result in a "Midterm Evaluation Report" and a "Plan Completion Evaluation Report" which will be submitted to the AJAC and the Plan partners and disclosed publicly. EM Reviews will be superseded during years 3 and 5 by these evaluation efforts.

The ET will be composed of two social science professionals (one of them being the EM) and one representative of Nepal's Indigenous Peoples who is not from Rasuwa District. NWEDC will select the two social science professionals in consultation with the GB and/or the GB EC while the Indigenous Peoples representative will be nominated by Nepal's Federation of Indigenous Nationalities (NEFIN).

7.4.5 Disclosure

The project shall undertake regular information disclosure through the project operation lifecycle. This information disclosure shall be as per the SEP adopted for the project. The mandatory disclosure shall be comprised of the monitoring and review reports in keeping with the Social Impact Management Framework (SIMF) and regulatory requirements. The project will also organize public meetings and consultations, at least on an annual basis. These consultations

[18] Recommendations derived from the first, mid-term, evaluation will be considered by the Governing Board to be implemented during the second half of the Plan's five-year run. Recommendations from the second, plan completion, evaluation will be utilized during planning for the succeeding IPP. All GB decisions as to Plan revisions will be put to the AJAC for final approval.

shall be aimed at providing a general update of the project status and activities to the local community and receiving their feedback on any key aspects.

In addition, and in regards specifically to the IPP, the following documents will be disclosed to the public:

- UT-1 IPP progress reports
- UT-1 evaluation reports
- Program Committee reports
- UT-1 IPP Grievance procedure
- External Monitor reports

7.5 IPP GRIEVANCE REDRESS MECHANISM

Another key form of governance is providing PAP with access to an IPP Grievance Redress Mechanism (GRM) formulated specifically for the UT-1 Indigenous Peoples Plan. This GRM is aimed at allowing all IPP stakeholders to communicate any concern or grievance in a format which is convenient to them. In keeping with the literacy profile of the local community, the option of communicating the grievances verbally is made available.

Scope and Responsibilities
The IPP GRM is applied to all grievances received in relation to IPP implementation; it is not applied to grievances the subject of which is not related to IPP implementation.

The following are the main responsibilities defined in carrying out the GRM:

Governing Board:

- reviews the report on the status of resolving grievances for the reporting period
- makes decisions on closing grievances when no mutual agreement has been reached with the complainant and/or for which no additional future actions can be reasonably taken
- makes decisions about changes/corrective measures in the IPP management system or other changes, determined as necessary during grievance investigation/resolution

GB Executive Committee:

- appoints a 3-person (not all of the same gender) Grievance Working Group (GWG) in a timely manner
- provides support on grievance resolution to the Grievance Working Group
- makes recommendations about changes/corrective measures in the IPP management system or other changes which were

determined as necessary during grievance investigation/resolution

Grievance Working Group:

- assesses the grievance and investigates the incident giving rise to the grievance
- investigates and resolves the grievance within the specified timeframes
- provides to the IPP support unit reports on the grievance status, including planned activities and measures taken
- provides feedback on the effectiveness of the GRM and/or initiates changes/corrective measures for the IPP GRM or other changes determined as necessary during grievance investigation and resolution
- provides recommendations to the Governing Board on grievance close-out
- interacts/communicates with the complainant as part of grievance investigation and resolution
- interacts/communicates with third parties in the framework of grievance investigation and resolution (subject to the signing by the complainant of the Consent to disclosing grievance-related information to the third parties)
- prepares letters to the complainant on the status of grievance review and actions/measures being taken
- participates in signing of letters of grievance resolution together with complainants

IPP Unit in NWEDC

- coordinates the public awareness of the GRM either by means of written materials or during public meetings
- confirms the receipt of a grievance in writing to the complainant within the specified period
- registers all grievances within the specified period
- interacts/communicates with the complainant
- advises the Governing Board on recommendations of the Grievance Working Group for grievance close-out
- prepares the necessary reports on the status of resolving grievances for the reporting period

IPP Partners

- inform the public of the Procedure by means of distributing written materials and conducting public meetings
- assist complainants in submitting grievances (e.g., filling in the Grievance Form, clarifying channels for submitting grievances)

AJAC Members

- inform the public of the GRM by means of distributing written GRM materials and conducting public meetings
- assist complainants in submitting grievances (e.g., filling in the Grievance Form, clarifying channels for submitting grievances)

7.5.1 Definitions

Grievance
A grievance is a statement of complaint by an individual, a group of individuals, or an organization, reflecting concern and/or dissatisfaction with IPP implementation.

Complainant
A complainant is an individual, a group of individuals, or an organization initiating a grievance. The grievance may be sent on behalf of the complainant by the third party(-ies).

Grievance Working Group
The Grievance Working Group is the grievance resolution process owner. The Grievance Working Group includes at least one representative from each IPP Partner as part of the GB Executive Committee. When appointing the Grievance Working Group members, any conflict of interest shall be avoided in relation to a particular grievance.

Collective Grievance
A grievance simultaneously submitted by several individuals on the same issue. For such group of individuals, it is recommended to choose a single contact person (agreed to by all the complainants), who will be authorized to interact with the Grievance Working Group regarding the grievance settlement process on behalf of the entire group.

Anonymous Grievance
If the submitted grievance does not contain information on the complainant and/or does not contain contact information, such grievance shall be considered anonymous. Although resolution of such grievance might take longer and/or there may be other difficulties to its investigation and resolution, the grievance shall be registered and processed in the same way as any other grievance.

Overdue Grievance
If the grievance remains unresolved or measures were not coordinated with the complainant within 45 business days after the grievance registration, such grievance shall be considered "overdue" (or "not resolved in a timely manner"). The IPP support unit shall provide information to the Governing Board on overdue grievances for review and making decisions on further actions.

Confidentiality
When submitting/receiving a grievance, the complainant shall be offered an opportunity to sign a consent agreement to processing personal data and

disclosing grievance-related information to third parties by the IPP support unit, the Grievance Working Group, the Executive Committee, the Governing Board, and the IPP Partners.

If the complainant refuses to sign the consent agreement to processing personal data and disclosing grievance-related information to third parties, all the IPP parties involved in the grievance review and resolution shall maintain confidentiality when dealing with third parties on the issues related to this grievance.

7.5.2 Grievance Management Procedure Stages

The grievance management procedure shall include the following stages:

- Step 1—grievance receipt
- Step 2—grievance assessment, registration, assignment of a process owner
- Step 3—grievance acknowledgment
- Step 4—investigation, resolution, and communication with the complainant
- Step 5—grievance close-out
- Step 6—reporting and monitoring

Details of these GRM steps will be developed prior to official launch of the IPP.

8 *BUDGET ESTIMATES, FINANCING, AND FUTURE IPP*

The total IPP budget for the five-year duration of this first IPP will be USD 1,125,000 (USD 225,000 per annum). Allocation of this IPP budget among the four proposed programs (Cultural Heritage, Social Development, Economic Development, and Capacity-Building) will be set by the IPP Governing Board while the components of each Program will be set by the four Program Committees. Likewise, specific projects and activities under each component will be determined by IPP Program Committees following IPP inception.

NWEDC is committed to developing and supporting future Indigenous Peoples Plans beyond the expiration of this First (construction phase) IPP after five years. The design of future plans beyond the First Plan will depend on the lessons learned from previous plans in terms of governance, implementation and budgeting. Planning for the Second IPP will begin in earnest during Quarter 1 of the First IPP's final year.

ANNEX 1: NWEDC CSR AND POST-EARTHQUAKE HUMANITARIAN SUPPORT

After the 2015 earthquake, NWEDC proactively engaged with the local community to provide relief and rehabilitation support to the earthquake affected communities. As a part of this engagement, NWEDC, in partnership with IFC, DEG (the German Investment Corporation), the local governments and community-based organizations, undertook relief activities, including providing livelihood and sustenance support to people living in internally displaced persons camps. In addition, the company is helping to rebuild two schools and one health center; remove rubble; and open up local roads for local communities. These efforts have resulted in tremendous goodwill and trust in the Project and NWEDC by local communities (https://youtu.be/s39c3D9Zr6k).

NWEDC has worked to achieve community support and the social license to operate the Project. While the affected communities and other stakeholders may initially have had some concerns regarding the Project, the overall perception is now generally positive. As a result of the April 2015 earthquake, the concerns of the local people have changed as they struggle to restore their homes and livelihoods and adjust to a reorganized government administrative structure, increased land prices, and other changes triggered by the earthquake. The communities clearly view the Project as a source of local development, primarily in the form of access improvements, job opportunities, and benefit sharing.

A. Post-Earthquake Relief-Related Activities and Beneficiaries

S.N.	Particulars	Indicators in unit	Number
1.1	Rice	Households	841
		Tons	44.2
1.2	Pulse/Cooking oil	Households	841
		Liter	1715
1.3	Light	Number	0
1.4	Drinking Water (Water Tank)	Number	75
1.5	Toilet Pan	Number	50
Q1.6	Camp Cleaning	Number	0
2.1	CGI Sheet	Bundle	1,606
2.2	Bamboo	PCS	4000
2.3	GI Wire	Kgs	2,009.20
3.1	Mobile Health Camp	Persons	390
3.2	Medicine Support		
3.3	Material Support to Mobile School	Nos	6
3.4	Support to School Building Construction	Nos	2
3.5	Support to Health Post	Nos	1
4	Transportation		-
5	Audit		-
6	Others(Mobilization and Monitoring Cost etc.)		-

B. CSR activities Aside from Post Earthquake Relief Projects		
Year	**Major Activities**	**Quantity**
2016	Local Radio Station Support	1
	Sport Activities Support	1
2017	Local Clubs	2
	Youth Clubs	1
	Local Radio Support	2
	Wildlife Conservation Activities Support	1
	Sport Activities Support	2
	Rural Municipalities	1
2018	Youth Clubs	2
	Rural municipalities	1
	Nepal Army Support	1
	Medical Support	2
	Sport Activities Support	1

ANNEX 2: ORGANIZATIONAL CONTRIBUTORS TO THE IPP & FPIC PROCESS

As described above (Section 1.4), four organizations contributed to IPP preparation: ERM, NEFIN, CCCS, and NWEDC. Below is a brief description of each, including a description of NEFIN's role in both the FPIC process and IPP preparation.

Environmental Resources Management (ERM) in India

ERM has had a presence in India since 1995 and today is the leading provider of environmental, health & safety, risk and social consulting services in the Indian market. With over 170 full time staff working out of offices in New Delhi/ Gurgaon, Mumbai, Ahmedabad, Bengaluru and Kolkata, ERM has unparalleled capacity and reach in the region.

ERM is uniquely qualified in the Indian and South Asian region (including Nepal) to provide advice and assistance for all phases of a company's evolution. Whether it's reducing risk and liability exposure associated with a transaction, improving environmental, health and safety performance of an operational asset, or mitigating social, community and reputational risks for a major capital project, we can leverage our local and global networks to assemble the best team to meet your needs. ERM's regulatory advisory experience in India also includes the framing of new environmental and sustainable development policies and legislation.

Over the past 23 years ERM has established a well-recognized and distinguished track record in international development and environmental and social studies for a wide range of clients, including multilateral agencies and development banks as well as bilateral donors. ERM has undertaken more than 700 such projects in the last ten years (2008-2018) in the India and South Asia.

With its core competencies in EHS and social services, ERM is extremely well placed to re-position itself as a full sustainability services company that focuses on the long-term goals of its clients and help them identify and work towards their sustainability agenda and contribution. ERM is one of the world's leading providers of sustainable finance consulting services to both Lenders and Project Developers and offers a wide range of specialist advice on managing environmental, community, health & safety, and labor-related risks across many industry sectors.

In addition to being ISO 9001 certified, ERM is also accredited by NABET/ QCI (Government of India) as an Environmental Impact Assessment (EIA) Consultant for projects requiring Environmental Clearance from Ministry of Environment and Forests (MoEF) or State EIA Authorities (SEIAAs) for key industrial and infrastructure sector projects. ERM also has one of the leading sustainable safety and contaminated site management teams in the country.
See also https://www.erm.com/en/locations/india/

Nepal Federation of Indigenous Nationalities (NEFIN)

Upon the collapse of the monarchy and the rise of multiparty democracy, the Indigenous Peoples movement in Nepal began to organize more freely. With Nepal's Indigenous Peoples starting to raise their voices and demanding due recognition for their rights, the Nepal Federation of Indigenous Nationalities (NEFIN) was stablished in 2047 B.S (1991 CE).

NEFIN affiliates the 58 ethnic groups which have been recognized by the National Foundation for Development of Indigenous Nationalities (NFDIN) Act 2058, in which ethnic groups are categorized not on the basis of geography but on the basis of socio-economic, cultural, and political awareness. These groups are categorized as:

- Endangered Group 10
- Highly Marginalized Group 12
- Marginalized Group 19
- Disadvantaged Group 15
- Advanced Group 2

The Constitution of 2072 B.S. (2015 CE) has also articulated the rights of Indigenous Peoples and in combination with other laws and policies to ensure the rights of the Indigenous Peoples, the National Foundation for Development of Indigenous Nationalities (NFDIN) (established in 2058 B.S. [2002 CE]) has become the pioneer for underpinning the rights of Indigenous Peoples in Nepal.

As a federation of Indigenous Peoples Organizations (IPOs), NEFIN is comprised of one male and one female representative from each IPO making for a total of 112 federal council members. Thus, each of the recognized indigenous groups regardless of their population has the same representation which means the most endangered ethnic group like the *Kusunda* with a population of only 165 has the same representation as the *Magar* with 1.9 million souls. An annual meeting of the federal council members is organized by NEFIN to review and reform the strategic approaches and issues relating to Indigenous Peoples' rights.

The federal assembly is the supreme body of NEFIN, which is supported by a Federal Council Secretariat. Similarly, under the Federal Council Secretariat there are 7 Province Coordination Councils (PCCs), 77 District Coordination Councils (DCCs) and more than 2,300 Village Coordination Councils (VCCs). Alongside these bodies exist federations of indigenous youth, students, lawyers, artists and film makers, journalists and women; these affiliated organizations make NEFIN a presence throughout the country and the only national indigenous organization federation recognized by the Government of Nepal. In addition, NEFIN maintains a rich trove of technical expertise with a team of Indigenous Peoples experts, authors, researchers, human rights workers, FPIC experts and women's rights experts functioning to achieve

common goals. NEFIN has also conducted various research projects and has a significant publication output as well.

NEFIN works for the improvement of the socio-economic status, livelihood and overall wellbeing of the indigenous peoples in Nepal along with the protection of their rights. Various projects on Income Generation Activities (IGAs) has been conducted. NEFIN has also been conducting various capacity building interventions on indigenous human rights, awareness-raising and training on FPIC, and sensitization on the rights of Indigenous Peoples as stipulated in ILO 169, UNDRIP 2007 and the constitution of Nepal. NEFIN has also been working on climate change issues at all levels partnering with various national and international partners since 2009 CE. FPIC is one part of the climate change program for which NEFIN has been working for a long time.

In sum, NEFIN works for the collective rights of the Indigenous Peoples. It works through advocacy and lobbying for the rights of the Indigenous Peoples over their lands, territories and resources. Thus, given its rich experience and at the request of IFC, NEFIN has been working to provide technical assistance for developing the IPP and to ensure FPIC is carried out properly for the Tamang community of 10 most affected villages of Rasuwa district which are located in the immediate area of the Upper Trishuli-1, 216 MW Hydro Power Project. Mr. Kiran Sunuwar, Vice Chair of NEFIN, led the FPIC process and mobilized his capable team composed of central NEFIN leaders as well as the local NEFIN chapter to carry out successfully the FPIC process and contribute to IPP development

NEFIN's Role in the FPIC Process for UT-1 Project

FPIC is a decision-making process by indigenous communities, especially those who are at high risk of possible adverse effects due to the project. NEFIN stands in the lead role for the implementation of FPIC in the highly affected area of UT-1, 216 MW Hydro-Power Project.

The roles of NEFIN involved the following:

- Conducting field visits, literature reviews, consultation and dialogue with the community and involved stakeholders of the most affected area of the project regarding the status and issues of IPs to initiate the FPIC process.
- Critical analysis of the Indigenous People of most affected villages in terms of loss, challenges and risk of possible threats due to the project.
- Conducting community mobilization and capacity building at various levels for raising people's awareness regarding indigenous rights on ancestral land and resources, ILO 169, UNDRIP 2007 and other existing national and international legislation and policies on IPs human rights.
- Finalizing the structure and function of the UT-1 Adibasi Janajati Advisory Council (AJAC) and UT-1 FPIC & IPP Working Group (WG)

members for the effective community participation and involvement in the decision-making process of FPIC.

- Ensuring the significant participation of women and ensuring their representation throughout the FPIC process.
- Supporting the community in the formation of both the AJAC and WG through technical backstopping.
- Conducting AJAC and WG meetings in the villages and at the district level for decision-making, capacity building, negotiations and dialogues with NWEDC.
- Conducting consultations meeting and coordination with the local government bodies, government counterparts, Tamang Dhedung Sangh, community leaders, human rights activists and political leaders for the coordination and smooth implementation of the FPIC process.
- Conducting community consultation meetings and providing technical assistance for the preparation of IPP priorities lists for each village, for an infrastructure plan and for a listing of overall demands prior to obtaining "semi consent" from the communities to their AJAC members.
- Developing a strategy and approach for community mapping and community level planning to develop the IPP through effective community participation and community ownership.
- Designing tools and templates for Participatory Social Mapping (PSM) to collect the data on community layout, infrastructure, demography, health and other socio-economic patterns which would further guide the FPIC team, AJAC and community people for listing the community priorities to be included in an IPP.
- Capacity-building of Adibasi Janajati Advisory Council (AJAC) members and Social Mobilizers (SM) on PSM and listing of community priorities.
- Conducting PSM of most affected villages through mobilization of social mobilizers and technical assistance to AJAC members to conduct Participatory Social Mapping.
- Documentation of data, gap analysis and interpretation of the results from the PSM for the evidence-based planning for significant intervention and relevant activities.
- Designing tools and templates to be used for the community-level planning and setting of the priorities for the IPP.
- Conducting community-level planning through community consultation for setting IPP priorities and listing their demands, through active participation of community people and AJAC members.
- Providing technical support for evidence-based planning and ensuring the bottom-up approach for setting of the priorities and activities of each highly affected village and ensuring that the women's priorities and activities are included.

- Documentation and accumulation of priority lists for IPP of each village, for an Infrastructure Plan and for an overall list of local Indigenous Peoples' demands to be submitted to NWEDC for further negotiation and dialogues prior to the final consent decision.

Cross-Cultural Consulting Services, PLLC

CCCS is an international consulting firm based in the USA that supports private and public sector actors in the field of international social development. Nearly unique among social development consultancies, CCCS specializes in policy frameworks safeguarding the rights of Indigenous Peoples and stakeholders who are particularly vulnerable to social impacts arising from development projects. Our particular emphasis is on establishing and maintaining cross-cultural dialogue that is sensitive to the needs of all parties involved. CCCS has also pioneered in the implementation of the Free, Prior and Informed Consent (FPIC) process across multiple sectors and subcontinents. (http: www.crossculturalconsult.com). Dr. Gregory Guldin, CCCS President, facilitated the FPIC process on behalf of IFC and the other Lenders for this UT-1 Project.

Nepal Water and Energy Development Company Pvt Ltd.

The Proposed Upper Trishuli-1 (UT-1) Hydropower Project (216MW) is on the Trishuli River within Rasuwa District of Central Development Region of Nepal. Nepal Water and Energy Development Company Limited (NWEDC) is developing the project and is considering financial support from a group of international financial institutions including IFC. The Indigenous Peoples Plan (IPP) is part of this Social Management Framework and addresses specific requirements of Indigenous Peoples as project-affected persons (PAPs) as per the policy requirements of IFC's Performance Standard 7 (PS7) and the ADB Social Safeguard for Indigenous Peoples. To facilitate and support the FPIC process Mr. Ashok Baniya, NWEDC's Environmental and Social Manager, led the process on the behalf of the Company. In addition, NWEDC's two Community Liaisons--Mr. Suman Bhatta and Mr. Kami Tashi--supported the FPIC process. Similarly, NWEDC engaged Mr. Phurpa Tamang—Tamang lawyer and sociologist--as its local FPIC consultant to a) resolve disputes arising during the FPIC process, b) enhance the Tamang cultural components in the IPP, and c) serve as interpreter/translator to prepare the IPP in the Nepali and Tamang languages.

ANNEX 3: PRINCIPLES OF FREE PRIOR INFORMED CONSENT

Principles	Attributes
Free	• This principle implies the process should be conducted in the absence of any manipulation, coercion or intimidation from any other groups, bodies and entities in the decision-making process of indigenous peoples. • Any external influence that hinders self-determination in the process of decision-making and the outcome of their decision is a clear violation of this principle. • Consent cannot be valid if it is taken from the authority or the group that is not recognized by the indigenous communities or not accountable to them. Further, the independence of their decision-making process and the outcome must be verifiable with the members of the indigenous communities.
Prior	• The informed consent must be sought first as a precondition before implementing any activity and project. • It is an advanced authorization from affected indigenous peoples' communities before the commencement of any activities or project. • It shall respect the time requirements of indigenous peoples' consultation and consensus processes defined by them. • The prior consent requires a comprehensive procedure to ensure that indigenous peoples have sufficient time to understand, analyze and discuss the information they receive collectively. All parties requiring the consent of indigenous peoples must thereby engage them in good faith discussions to reach a mutual agreement on the timeline of the decision-making process. • The element of prior also denotes respecting the duration of time for indigenous peoples to undertake their decision-making process according to their pace and circumstances.
Informed	• This is a core element of the FPIC decision-making process to reach or achieve a well-informed decision. It is thereby important not only to have access to information, but also to clearly understand the information provided to them. • If necessary, information should be translated to the local language and put in a form and manner that is understood by the indigenous communities to facilitate better understanding. • Further, indigenous community members must have a level of satisfaction on the level of information provided to them. • This includes information to clarify or answer their questions as well as information that shall provide them with a comprehensive understanding especially on the implications of the activity, project or matter for their collective decision. • Information disclosure for the FPIC process should include full and legally accurate exposure of data pertaining to any activity or proposed developments or projects. • The project proponent is responsible for the full disclosure of the information to indigenous communities, including providing the information in forms understood to them. Indigenous communities shall also have the freedom to secure additional information from other sources, besides the project proponent.
Consent	• It is a collective decision-making process of indigenous peoples that entails several steps. This may include series of consultation as needed and it should allow enough time for indigenous communities to undertake their own internal deliberations prior to making their collective decision. • The consultations shall allow community members, including women and youth, to express their views, raise their concerns, seek additional information, if needed, and seek clarifications on their questions and/or concerns. • It should be transparent, inclusive and well-informed with meaningful and accountable participation of the indigenous leaders in the consultation processes and the collective decision-making process.

Principles	Attributes
	• The consultation processes shall be documented properly. The project proponents shall provide for more information, if requested, and respond to the clarifications and conditions set by indigenous communities. In addition, consultations require an effective system of communication and understanding information among indigenous peoples.

Source: UN- REDD Programme: Guidelines on Free, Prior and Informed Consent, 2013

ANNEX 4: VILLAGE-LEVEL REPRESENTATIVES SELECTION PROCESS

- Community level interaction and village mobilization was conducted in 9 events in 9 villages of highly affected areas of UT-1 Project from 15th -22nd June, 2018 and separately for the added village Nesing in August, 2018.
- NEFIN in coordination with its District Coordination Council (DCC) made the field mobilization successful in all of the highly affected 10 villages *(Detail of the plan for the community level interaction and village mobilization in Annex I).*
- Having interaction about the current situations and the progress of UT-1,project and the potential consequences that could lead to have an adverse effect to the indigenous peoples and their lands, the indigenous peoples were made aware of the FPIC process and its significance in the project context.

- The FPIC experts shared the significance of FPIC process and Indigenous People's Plan (IPP) in context of the rights of Indigenous Peoples to their land, territories and natural resources, where they also made reference to International Labor Organization (ILO) C No: 169 and United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).
- After the sensitization regarding the FPIC process, the process was welcomed by the and a collective decision was made for the indigenous community to engage successfully in the FPIC process.
- An Adibasi Janajati Advisory Council comprised of ten members was formed in each village with fewer than 10 members in those villages where the total number of household is less than 25. Those villages were *Thankku* and *Gumchet* where the number of household is less than 25, which allocated them 3 and 2 Advisory Council members respectively.
- The members of Adibasi Janajati Advisory Council were selected from amongst the IP and by the IP on the basis of following criteria to ensure social inclusion and gender balance (at least 3 women);

Category	***No. of Member***
Lama	1
Jhakri/Traditional Shaman	1
Representative of Community forest (Women)	1
Youth Representative (Women)	1
Social Leader (Women)	1
Teacher	1
Landless/Poor	2
Social Worker/Social Leader	2
Total	***10 Members***

ANNEX 5: CONSENT PROCESS AGREEMENT FOR UT-1 HYDROPOWER PROJECT

On June 25, 2018 at Battar, Rasuwa District, the 75 village representatives selected in the previous two weeks in an open, transparent, inclusive and democratic process to serve on the UT-1 Adibasi Janajati Advisory Council (AJAC) selected 18 of their number to serve on a Working Group (WG) to guide the FPIC process for the UT-1 project. These 18 Members ot the UT-1 Adibasi Janajati FPIC & IPP Working Group met for two days over June 26 and 2 7, and during that time considered how a consent decision would be recognized within the FPIC principle guidelines of IFC's PS7.

After due and spirited deliberations, the WG agreed on:

- The Advisory Council was the appropriate body to make the decision on behalf of their communities on whether to grant or withhold consent to the UT-1 Indigenous Peoples Plan
- The "Consent Decision" would be placed before the AJAC as a yes or no vote on the contents of the IPP; this would only occur after at least two rounds of consultations at the village level and multiple meetings of both the AJAC and the WG. During the Third Meeting of the Working Group, they would decide if the PAP communities and the AJAC were ready to make a consent decision.
- At such a Consent Decision Meeting of the AJAC, the representatives would first discuss the latest draft of the IPP, suggest changes, and deliberate openly and freely on its merits and demerits.
- In case of the absence of consensus on the Consent decision among the AJAC members, a simple majority of those present and voting would decide the issue, with both an 80% quorum (68 members, after the later addition of Nesing's ten representatives) of the AJAC required to be present and votes attested to by written signatures recording the yes or no votes.
- If consent was achieved, the Advisory Council was the appropriate body to authorize the Working Group members to continue working with the IPP as its Governing Board members to plan, launch, and initiate the Plan
- If consent was achieved, the Advisory Council was the appropriate body to work with NWEDC and local Ward governments (if they are willing to do so) in a Tripartite Agreement to implement the Plan
- If consent was not achieved, the AJAC would advise the WG as to whether another round of consultations was needed or if NEFIN should serve as mediator in a Good Faith Negotiation (GFN) process to resolve the situation.

ANNEX 6: PROBLEM ANALYSIS AND PLANNING BY VILLAGE

This Annex encapsulates the discussions held within each village during the PSM process and the First and Second Rounds of Consultations to elucidate key needs and the PAP IPP recommendations/demands flowing from such needs. Section "A" summarizes the demands of the 10 villages and points to the sections of the IPP which relate to those issues. In some cases, the demands were dealing with the immediate pre-construction land acquisition and compensation issues, rather than appropriate to a long-term social development plan, and thus they are referred to the LALRP. Section "B" details the particular issues and concerns of each of the affected villages covered by the IPP. In addition, there are some issues listed here that will not be covered by the IPP but which nevertheless are issues which the villagers want to be in continuing dialog and negotiation with NWEDC on once main project construction begins: Section "C" deals with infrastructure priorities while Section "D" covers demands articulated during the Third WG and AJAC Meetings.

Section 6A: Summary of the IPP Demands/Requests of the FPIC Villages

SN	Thulo Haku	Sano Haku	Haku Besi	Fulbari	Thangu	Mailung	Gogane	Tiru	Gumchet	Nesing	Company Response: in IPP or other Document
1	Free Share to most affected area	Free Share to most affected area	Free Share to most affected area	Free Share to most affected area	Free Share to most affected area	Free Share to most affected area	Free Share to most affected area	Free Share to most affected area	Free Share to most affected area	Free Share to most affected area	5.4.1
2	Free electricity to most affected area	Free electricity to most affected area	Free electricity to most affected area	Free electricity to most affected area	Free electricity to most affected area	Free electricity to most affected area	Free electricity to most affected area	Free electricity to most affected area	Free electricity to most affected area	Free electricity to most affected area	5.4.2
3	Constructio n of motorable roads	Construction of motorable roads	Construction of motorable roads	Construction of motorable roads	Construction of motorable roads	Construction of motorable roads	Construction of motorable roads	Construction of motorable roads	Construction of motorable roads	Construction of motorable roads	
4	Free excavator, fuel and	Free excavator, fuel and	Free excavator, fuel and	Free excavator, fuel and	Free excavator, fuel and	Free excavator, fuel and	Free excavator, fuel and	Free excavator, fuel and	Free excavator, fuel and	Free excavator, fuel and	

	operator to construct road	operator to construct road	operator to construct road	operator to construct road	operator to construct road	operator to construct road	operator to construct road	operator to construct road	operator to construct road	operator to construct road	
5	Ambulance service	Ambulance service	Ambulance service	Ambulance service	Ambulance service	Ambulance service	Ambulance service	Ambulance service	Ambulance service	Ambulance service	*NWEDC agreed to this demand at AJAC 1/11/18 meeting*
6	NWEDC employment to locals (at least one from each HHs) as per qualifications	NWEDC employment to locals (at least one from each HHs) as per qualifications	NWEDC employment to locals (at least one from each HHs) as per qualifications	NWEDC employment to locals (at least one from each HHs) as per qualifications	NWEDC employment to locals (at least one from each HHs) as per qualifications	NWEDC employment to locals (at least one from each HHs) as per qualifications	NWEDC employment to locals (at least one from each HHs) as per qualifications	NWEDC employment to locals (at least one from each HHs) as per qualifications	NWEDC employment to locals (at least one from each HHs) as per qualifications	NWEDC employment to locals (at least one from each HHs) as per qualifications	5.4.3
7	Local contractors should get priority in local IPP activities	Local contractors should get priority in local IPP activities	Local contractors should get priority in local IPP activities	Local contractors should get priority in local IPP activities	Local contractors should get priority in local IPP activities	Local contractors should get priority in local IPP activities	Local contractors should get priority in local IPP activities	Local contractors should get priority in local IPP activities	Local contractors should get priority in local IPP activities	Local contractors should get priority in local IPP activities	5.4.3
8	Konguer Puja for all main Project activities	Konguer Puja for all main Project activities	Konguer Puja for all main Project activities	Konguer Puja for all main Project activities	Konguer Puja for all main Project activities	Konguer Puja for all main Project activities	Konguer Puja for all main Project activities	Konguer Puja for all main Project activities	Konguer Puja for all main Project activities	Konguer Puja for all main Project activities	*NWEDC agreed to this demand at AJAC 1/11/18 meeting*
9	NWEDC job offers to locals should include life insurance	NWEDC job offers to locals should include life insurance	NWEDC job offers to locals should include life insurance	NWEDC job offers to locals should include life insurance	NWEDC job offers to locals should include life insurance	NWEDC job offers to locals should include life insurance	NWEDC job offers to locals should include life insurance	NWEDC job offers to locals should include life insurance	NWEDC job offers to locals should include life insurance	NWEDC job offers to locals should include life insurance	5.4.3
10			Company should be	Company should be		Company should be	Company should be				5.3.3

			accountable for any kind of further destruction caused by project	accountable for any kind of further destruction caused by project		accountable for any kind of further destruction caused by project	accountable for any kind of further destruction caused by project				
11			Compensation of occupied land, forests and other resources	Compensation of occupied land, forests and other resources							LALRP
12			Compensation of occupied new land, forests and other resources shold be done as per Rasuwagadhi Hydro Scheme								LALRP
13			Resettlement of village								LALRP
14						Land Compensation should be uniform	Land Compensation should be uniform				LALRP
15					Resettle landless with one house one plot	Resettle landless with one house one plot	Resettle landless with one house one plot				LALRP
16				Fair market price for land compensation	Fair market price for land compensation		Fair market price for land and structures compensation				LALRP

17			Grants to local cooperatives		Grants to local cooperatives						
18			Distribution of 20 % royalty to local people		Distribution of 20 % royalty to local people						
19	Use of technology that uses less vibration caused by blasting	Use of technology that uses less vibration caused by blasting	Use of technology that uses less vibration caused by blasting	Use of technology that uses less vibration caused by blasting	Use of technology that uses less vibration caused by blasting	Use of technology that uses less vibration caused by blasting	Use of technology that uses less vibration caused by blasting	Use of technology that uses less vibration caused by blasting		Use of technology that uses less vibration caused by blasting	
20										All project equipment crossing through village should be safely managed	
21										Construct playground	
22						Free education to the children of those families whose land has been occupied by project	Free education to the children of those families whose land has been occupied by project				

Section 6B: Problem Analysis and IPP Issues by Village

Thulo Haku ***Gaunpalika*** **(Rural Municipality): Amachhodingmo** **Ward No: 1**

S.N	Sector	Major Problems (What?)	Root Cause of Problem (What?)	Proposed Solutions (How to do)	Proposed Activities (What to do ?)
1	Infrastructure	Risk of recurring landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Community based afforestation and IP forest conservation program.
2	Infrastructure	Lack of transportation	Lack of motorable roads/bridge	Development of track and motorable roads	Maintenance of foot track
3	Economic Development	Unemployment in youth	Lack of skills and trainings to be involved at IGAs	Skilled based and vocational trainings	Vocational trainings: Overseer, ANM, Plumbing, Electrician, Driving, Heavy vehicle operator, Computer operator, Hospitality training, mechanics and welding, etc.
					Skill based Training for developing cultural dresses and accessories like Bakhu, Radi etc.
					Support in developing cottage scale industries
					Support in marketing of products that have been produced in the village
					Support to promote eco-tourism
4	WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines Increase	awareness and management of waste	Trainings and awareness program on solid waste management and environment sanitation
					Construction of dumping sites for waste management and drainage system.
					Support on construction of water sealed latrines.
5	Health	Maternal Mortality, inaccessible quality health services	Lack of equipment, and lack of trained health worker and birthing centers	Procurement of equipment and management of trained health workers	Support necessary equipment and physical facilities to establish Birthing centers
					Support in management of trained health facility staff and Skilled Birth Attendant (SBA).
6	WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Trainings and awarness program on solid waste management and envionnment sanitation
					Construction of dumping sites for waste management and drainage system.
					Support on construction of water sealed latrines.
7i	Education	Low education status	Lack of proper facilities and infrastructure of school	Management of physical facilities, qualified staffs and infrastructures	Support furniture and other amenities, educational material
					Provide education in Tamang language and provide necessary educational material in Tamang

					Provide scholarship to essential student from economical backward family.
					Support in management of qualified teachers where necessary
8	Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skill and knowledge in modern agriculture technique	Training regarding modern agriculture, cash crop and animal husbandry.
					Assessment of agricultural land, soil testing
					Support in the marketing of the agriculture products
					Support in construction of irrigation canal.
					Distribution of equipment.
9	Women Development	Lack of skills and development of women	Lack of access to resources/ lack of access to school/ low economic status; lack of traditional skill training center	Development of skills and knowledge of women; development of cultural dress center	Skill based training to women on sewing and weaving of traditional dresses and items.
					Support necessary equipment.
					Provision of scholarship to girls for who desire for higher studies
					Support for women-focused trainings and resources
					Construction of Traditional Dress Training Center
					Awareness on women education
10	Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of *Gumba,* preservation of *Mane*
					Documentation of culture and traditional knowledge of Tamang.

					Support in developing Museum for Tamang culture.
					Construction of funeral sites
					Construction of Goppokunda, management and preservation program

Sano Haku (Kaksing) Amachhodingmo RM Ward No: 2

S.N	Sector	Major Problems (What?)	Root Cause of Problem (What?)	Proposed Solutions (How to do)	Proposed Activities (What to do ?)
1	DRRM	Risk of occurring landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Community-based afforestation and IP forest conservation program.

2	Infrastructure	Lack of transportation	Lack of motorable roads/bridge	Development of track and motorable roads	Construction of motor tracks, drains and bridge
3	WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Trainings and awareness program on solid waste management and environment sanitation
4	Infrastructure	Internal displacement	Landslides/ Earthquake	Support in resettlement of the displaced community	Implementation of IFC/ PS 7
5	Health	No access to quality health services	Lack of adequate infrastructure and equipment for ORC clinic and Immunization clinic	Development of infrastructures and physical facilities	Support for stretchers Support in awareness program related to health and nutrition
6	Education	Low education status	Lack of proper facilities and infrastructure of school	Management of physical facilities, qualified staffs and infrastructures	Support furniture, teaching materials and other equipment Support in management of qualified teachers where necessary
					Provide education materials in Tamang language
					Provide scholarship to essential student from economical backward family.
7	Women Development	Lack of skills and development of women	Lack of access to resources/ lack of access to school/ low economic status	Development of skills and knowledge of women	Skill based training to women on sewing and weaving of traditional dresses and items. Support necessary equipment. Awareness of importance of women's education Provision of scholarship to girls for who desire for higher studies
8	Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skill and knowledge in modern agriculture technique	Training regarding modern agriculture, cash crop and animal husbandry Assessment of agricultural land, soil testing Support in the marketing of the agriculture products Support in construction of irrigation canal Distribution of equipment
9	Economic Development	Unemployment in youth	Lack of skills and trainings	Skilled based and vocational trainings	Vocational trainings: Overseer, ANM, Plumbing, Electrician, Driving, Heavy vehicle operator, Computer operator,

			to be involved at IGAs		Hospitality training, mechanics and welding, etc.
					Skill based Training for developing cultural dresses and accessories like Bakhu, Radi etc..
					Support in developing cottage scale industries
					Support in marketing of products that has been produced in the village.
10	Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Support for re-construction of *Gumba,* preservation of *Mane*
					Documentation of culture and traditional knowledge of *Tamang.*
					Support in developing Museum for Tamang culture.
					Conservation of Kunda
					Support in community ground (for cultural purposes-Ghewa)
					Support in training on transferring of traditional knowledge to youth

Haku Besi (Kaksing) Amachhodingmo RM Ward No: 1

S.N	Sector	Major Problems (What?)	Root Cause of Problem (What?)	Proposed Solutions (How to do)	Proposed Activities (What to do ?)
1	Infrastructure	Lack of transportation	Lack of motorable roads/bridge	Development of track and motorable roads	Construction of foot tracks
2	DRR	Landslides risk	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Community based afforestation and IP forest conservation program
3	Education	Low education status	Lack of proper facilities and infrastructure of school/ low economic status	Management of physical facilities, qualified staffs and infrastructures	Support furniture, education materials and other equipment
					Support in management of qualified teachers where necessary
					Provide education and education materials in Tamang language
					Provide qualified teachers
					Provide sports materials
					Support for at least 5 students yearly for higher international and national education
					Provide scholarship to essential student from economical backward family.
4	Health	No access to quality health services	Lack of adequate infrastructure and equipment	Development of infrastructures and physical facilities	Provide stretchers

			for ORC clinic and Immunization clinic		
					Awareness program for Health and nutrition
5	Economic Development	Unemployment in youth	Lack of skills and trainings to be involved at IGAs	Skilled based and vocational trainings	Vocational trainings: Overseer, ANM, Plumbing, Electrician, Driving, Heavy vehicle operator, Computer operator, Hospitality training, mechanics and welding, etc.
					Skill based Training for developing cultural dresses and accessories like Bakhu, Radi etc..
					Support in developing cottage scale industries
					Support to promote eco-tourism
					Support in marketing of products that have been produced in the village.
6	Women Development	Lack of skills and development of women	Lack of access to resources/ lack of access to school/ low economic status	Development of skills and knowledge of women	Skill based training to women on sewing and weaving of traditional dresses and items.
					Support necessary equipment.
					Maintenance of village women's building
					Provision of scholarship to girls for who desire for higher studies
7	Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skill and knowledge in modern agriculture technique	Training regarding modern agriculture, cash crop and animal husbandry
					Assessment of agricultural land, soil testing
					Support in the marketing of the agriculture products
					Support in construction of water mill
					Distribution of equipment
8	WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Trainings and awareness program on solid waste management and environment sanitation
					Construction of drainage system. .
9	Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of *Gumba,* preservation of *Mane*
					Documentation of culture and traditional knowledge of *Tamang.*
					Conservation of Larwang (Indreni Kunda)
					Support in developing Museum for Tamang culture.
					Construction of Chaoutari

Phulbari **Amachhodingmo RM** **Ward No: 1**

S.N	Sector	Major Problems (What?)	Root Cause of Problem (What?)	Proposed Solutions (How to do?)	Proposed Activities (What to do ?)
1	Disaster Risk Reduction (DRR)	Risk of landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Community based afforestation and IP forest conservation program
2	Infrastructure	Lack of transportation	Lack of motorable roads/bridge	Development of track and motorable roads	Construction of foot and motor tracks, drains and bridge
3	Health	No access to quality health services	Lack of adequate infrastructure and equipment for ORC clinic and Immunization clinic	Development of infrastructures and physical facilities	Support such asstretchers
					Support on awareness program on health
4	Education	Low education status	Lack of proper facilities and infrastructure of school/ low economic status	Management of physical facilities, qualified staffs and infrastructures	Construction of primary school building, support furniture, teaching materials, etc.
					Support in management of qualified teachers where necessary
					Construction of road to school.
					Provide scholarship to essential student from economical backward family.
5	Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skill and knowledge in modern agriculture technique	Training regarding modern agriculture, cash crop and animal husbandry
					Assessment of agricultural land, soil testing
					Support in the marketing of the agriculture products
					Support in construction of water mills
					Distribution of equipment.
6	WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Trainings and awareness program on solid waste management and environment sanitation
					Construction of dumping sites for waste management and drainage system.
7	WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking water	Construction of reservoir tank and fencing of water source.
					Construction of water supply pipeline and tap at HHs.
8	Economic Development	Unemployment in youth	Lack of skills and trainings to be involved at IGAs	Skilled based and vocational trainings	Skill based Training for developing cultural dresses and accessories like Bakhu, Radi et,c.
					Vocational trainings: Overseer, ANM, Plumbing, Electrician, Driving, Heavy vehicle operator, Computer operator, Hospitality training, mechanics and welding, etc..

					Support in developing cottage scale industries
					Support in marketing of products that has been produced in the village.
9	Women Development	Lack of skills and development of women	Lack of access to resources/ lack of access to school/ low economic status	Development of skills and knowledge of women	Skill based training to women on sewing and weaving of traditional dresses and items, and other skills.
					Awareness of importance of women's education
					Provision of scholarship to girls for who desire for higher studies
10	Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of *Gumba,* preservation of *Mane*
					Documentation of culture and traditional knowledge of *Tamang.*
					Support in developing Museum for Tamang culture.
					Support for preservation of Larquing (Indreni Kunda).

Thangu **Amachhodingmo RM** **Ward No: 1**

S.N	Sector	Major Problems (What?)	Root Cause of Problem (What?)	Proposed Solutions (How to do)	Proposed Activities (What to do ?)
1	Transportation	Lack of transportation	Lack of motorable roads/bridge	Development of track and motorable roads	Construction of foot tracks
2	Infrastructure	Risk of landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Community-based afforestation and IP forest conservation program.
					Training on disaster mitigation and preparedness
3	Health	No access to quality health services	Lack of adequate infrastructure and equipment for ORC clinic and Immunization clinic	Development of infrastructures and physical facilities	Support Stretcher acquisition.
					Awareness program in health and nutrition.
4	Education	Low education status	Lack of proper facilities and infrastructure of school/ low economic status	Management of physical facilities, qualified staffs and infrastructures	Provide education materials in Tamang language
					Support for at least 5 students yearly for higher international and national education
					Provide scholarship to essential student (priority to girls) from economical backward family.
5	Economic Development	Unemployment in youth	Lack of skills and training to be involved at IGAs	Skilled based and vocational training	Vocational trainings: Overseer, ANM, Plumbing, Electrician, Driving, Heavy vehicle operator, Computer operator,

					Hospitality training, mechanics and welding, etc.
					Skill-based training for developing cultural dresses and accessories like Bakhu, Radi, etc.
					Support in developing cottage scale industries
					Skill based training to women on sewing and weaving of traditional dresses and items.
					Support necessary equipment.
					Training regarding modern agriculture, cash crop and animal husbandry
					Support in the marketing of agricultural products
					Distribution of equipment
					Support in marketing of products that have been produced in the village.
6	Women Development	Lack of skills and development of women	Lack of access to resources/ lack of access to school/ low economic status	Development of skills and knowledge of women	Skill based training to women on sewing and weaving of traditional dresses and items
					Support necessary equipment.
					Provision of scholarship to girls for who desire for higher studies
7	WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Trainings and awareness program on solid waste management and environment sanitation
					Support on construction of water sealed latrine.
8	Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of *Gumba,* preservation of *Mane*
					Documentation of culture and traditional knowledge of *Tamang.*
					Support in developing Museum for Tamang culture
					Support in training on transferring of traditional knowledge to youth
					Construction of Community Hall

Mailung **Uttargaya RM** **Ward No: 1**

S.N	Sector	Major Problems (What?)	Root Cause of Problem (What?)	Proposed Solutions (How to do)	Proposed Activities (What to do ?)
1	Infrastructure	Lack of transportation	Lack of motorable roads/bridge	Development of track and motorable roads	Construction of motor tracks, drains and bridge
2	Infrastructure	Risk of landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Community-based afforestation and IP forest conservation program
					Forest preservation and management training
3	Economic Development	Unemployment in youth	Lack of skills and trainings to be involved in IGAs	Skills-based and vocational trainings	Vocational trainings: Overseer, ANM, Plumbing, Electrician, Driving, Heavy vehicle operator, Computer operator, Hospitality training, mechanics and welding, etc.
					Skill-based training for developing cultural dresses and accessories like Bakhu, Radi etc..
					Support in developing cottage scale industries
					Support promotion of eco-tourism
					Su[port for construction of water mill.
					Support in marketing of products that have been produced in the village
4	WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Trainings and awareness program on solid waste management and environmental sanitation
5	WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking water	Reconstruction of water tap and management and distribution of water in camp.
6	Education	Low education status	Lack of proper facilities and infrastructure of school/ low economic status	Management of physical facilities, qualified staffs and infrastructures	Maintainance of school building in Khalte, support furniture and other amenities
					Support in management of qualified teachers where necessary
					Support in teacher for mother tongue (Tamang) and education materials
					Provide scholarship to essential student from economical backward family.
7	Health	No access to quality health services	Lack of adequate infrastructure and equipment for ORC clinic and Immunization clinic	Development of infrastructures and physical facilities	Awareness program on health and nutrition
					Management of trained staff for CHU and Immunization Clinic
					Support physical amenities like furniture, necessary medical equipment, stretchers

8	Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skill and knowledge in modern agriculture technique	Training regarding modern agriculture, cash crop and animal husbandry
					Assessment of agricultural land, soil testing
					Support in the marketing of the agriculture products
					Distribution of equipment
9	Women Development	Lack of skills and development of women	Lack of access to resources/ lack of access to school/ low economic status	Development of skills and knowledge of women	Skill-based training to women on sewing and weaving of traditional dresses and items
					Support necessary equipment
					Provision of scholarship to girls who desire for higher studies
10	Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of *Gumba,* preservation of *Mane*
					Documentation of culture and traditional knowledge of *Tamang.*
					Support in developing Museum for Tamang culture.
					Construction of traditional funeral locations for death rituals of Tamang.
					Training of youths on traditional knowledge and transferring of knowledge.
					Waiting Place for visitors
					Construction of Community Hall

Gogane **Uttargaya RM** **Ward No: 1**

S.N	Sector	Major Problems (What?)	Root Cause of Problem (What?)	Proposed Solutions (How to do)	Proposed Activities (What to do ?)
1	Infrastructure	Risk of landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Community-based afforestation and IP forest conservation program
					Forest preservation and management Training
2	Economic Development	Youth unemployment	Lack of skills and training to be involved in IGAs	Skilled-based and vocational training	Skill-based training for developing cultural dresses and accessories like Bakhu, Radi, etc.
					Support in developing cottage scale industries
3					Vocational trainings: Overseer, ANM, Plumbing, Electrician, Driving, Heavy vehicle operator, Computer operator, Hospitality training, mechanics and welding, etc.

					Training on cash crop and animal husbandry
					Construction of water mill
					Support in marketing of products that has been produced in the village.
64	WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Trainings and awareness program on solid waste management and environment sanitation
5	WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking water	Reconstruction of water tap and management and distribution of water in camp
6	Education	Low education status	Lack of proper facilities and infrastructure of school/ low economic status	Management of physical facilities, qualified staffs and infrastructures	Maintenance of school building in Khalte, support for furniture and other amenities
					Support in management of qualified teachers where necessary
					Support in teacher for mother tongue (Tamang) and education materials.
					Provide scholarship to essential student from economical backward family.
7	Health	No access to quality health services	Lack of adequate infrastructure and equipment for ORC clinic and Immunization clinic	Development of infrastructures and physical facilities	Management of ORC/Immunization Clinic
					Awareness program on health and nutrition
					Support physical amenities like furniture, necessary medical equipment, stretchers.
8	Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skills and knowledge of modern agricultural techniques	Training regarding modern agriculture, cash crop and animal husbandry
					Assessment of agricultural land, soil testing
					Support in the marketing of the agriculture products
					Distribution of equipment
9	Women Development	Lack of skills and development of women	Lack of access to resources/ lack of access to school/	Development of skills and	Skill-based training to women on sewing and weaving of traditional dresses and items

			low economic status	knowledge of women	Awareness program on women education
					Support necessary equipment.
					Provision of scholarship to girls who desire higher studies
11	Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of *Gumba,* preservation of *Mane*
					Documentation of culture and traditional knowledge of *Tamang.*
					Support in developing Museum for Tamang culture.
					Construction of traditional funeral spots for death rituals of Tamang
					Training of youth in traditional knowledge
					Gogane (Tongba Bagar) religious site preservation

Tiru **Uttargaya RM** **Ward No: 1**

S.N	Sector	Major Problems (What?)	Root Cause of Problem (What?)	Proposed Solutions (How to do)	Proposed Activities (What to do ?)
1	Infrastructure	Lack of transportation	Lack of motorable roads/bridge	Development of track and motorable roads	Construction of footpath in the village
2	DRR	Risk of landslides	Deforestation/ Blasting	Support in refunctioning of micro hydro which is the only source of electricity in the community	Reconstruction of the damaged parts of the micro hydro to be able to function again until the UT-1 218 MW will be fully functional.
					Disaster preparedness and readiness training
3	Infrastructure	No electricity	Community Micro hydro has been destroyed due to earthquake		
4	Health	No access to quality health services	Lack of HF in the community	Development of infrastructures and physical facilities of the Health facilities	Awareness program on health and nutrition.
					Support in the management of trained health workers, Skilled Birth Attendants (SBA).
					Support for physical amenities like furniture, necessary medical equipment, stretchers
5	Education	Low education status	Lack of school.	Management of physical facilities, qualified staffs and infrastructures for schools.	Support for furniture and other amenities
					Support for education materials in Tamang
					Support in management of qualified teachers and teachers for mother tongue

					Provide scholarship to essential student from economical backward family.
6	Economic Development	Youth unemployment	Lack of skills and trainings to be involved at IGAs	Skilled-based and vocational trainings	Vocational training: Overseer, ANM, Plumbing, Electrician, Driving, Heavy vehicle operator, Computer operator, Hospitality training, mechanics and welding, etc.
					Skill-based training for developing cultural dresses and accessories like Bakhu, Radi.
					Support in developing cottage scale industries
					Support in the promotion of eco-tourism
					Construction of water mill
					Support in marketing of products that has been produced in the village.
7	Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skill and knowledge in modern agriculture technique	Training regarding modern agriculture, cash crop and animal husbandry
					Assessment of agricultural land, soil testing
					Support in the marketing of the agriculture products
					Distribution of equipment.
8	WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Trainings and awareness program on solid waste management and environmental sanitation
9	WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking water	Construction of reservoir tank and fencing of water source.
					Construction of water supply pipeline and tap at HHs.
10	Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of *Gumba,* preservation of *Mane* and *Kunda*
					Documentation of culture and traditional knowledge of *Tamang*
					Support in developing Museum for Tamang culture
					Construction of traditional funeral spots for death rituals of Tamang.
					Training of youth in traditional knowledge
					Support in the training of Thanka Painting and Lama.
					Support in the documentation of Tamang culture, script of lama and Jhakri.

					Support in the development of profile and documentary of Tamang community
11	Women Development	Lack of skills and development of women	Lack of access to resources/ lack of access to school/ low economic status	Development of skills and knowledge of women	Skill based-training for women on sewing and weaving of traditional dresses and items
					Support necessary equipment
					Provision of scholarship to girls for higher studies

Gumchet **Kalika RM** **Ward No: 1**

S.N	Sector	Major Problems (What?)	Root Cause of Problem (What?)	Proposed Solutions (How to do)	Proposed Activities (What to do ?)
1	DRR	Risk of landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Community-based afforestation and IP forest conservation program
					Training on Disaster Preparedness and Readiness
2	Education	Low education status	Lack of proper facilities and infrastructure of school/ low economic status	Management of physical facilities, qualified staffs and infrastructures	Support educational materials to students (Books, bag, accessories)
					Provide scholarship to essential student from poor family.
3	WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Trainings and awareness program on solid waste management and environmental sanitation
					Support of construction of water-sealed latrine (immediately)
4	WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking water	Distribution of pipe from water source to houses (immediately)
5	Health	No access to quality health services	Lack of adequate infrastructure and equipment for ORC clinic and Immunization clinic	Development of infrastructures and physical facilities	Construction of Out Reach Clinic/ Immunization Clinic
					Support physical amenities like furniture, necessary medical equipment, stretchers
6	Economic Development	Youth unemployment	Lack of skills and trainings		Vocational trainings: Overseer, ANM, Plumbing, Electrician, Driving, Heavy vehicle

			to be involved at IGAs	Skilled-based and vocational trainings	operator, Computer operator, Hospitality training, mechanics and welding, etc.
					Skill-based Training for developing cultural dresses and accessories like Bakhu, Radi etc.
					Support in developing cottage scale industries
					Support in construction of water mill
					Support in promotion of ecotourism
					Support in marketing of products that have been produced in the village
7	Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skill and knowledge in modern agriculture technique	Training regarding modern agriculture, cash crop and animal husbandry
					Assessment of agricultural land, soil testing
					Support in the marketing of agriculture products
					Distribution of equipment
8	Women Development	Lack of skills and development of women	Lack of access to resources/ lack of access to school/ low economic status	Development of skills and knowledge of women	Skill-based training to women on sewing and weaving of traditional dresses and items
					Support with necessary equipment
					Provision of scholarship to girls who desire for higher studies
9	Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of *Gumba,* preservation of *Mane*
					Documentation of culture and traditional knowledge of Tamang language
					Construction of traditional funeral spots for death rituals of Taman
					Training of youths on traditional knowledge

Nesing **Amachhodingmo RM** **Ward No: 2**

S.N	Sector	Major Problems (What?)	Root Cause of Problem (What?)	Proposed Solutions (How to do)	Proposed Activities (What to do ?)
1	DRR	Risk of landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Community-based afforestation and IP forest conservation program
2	Education	Low education status	Lack of proper facilities and infrastructure of school/ low economic status	Management of physical facilities, qualified staffs and infrastructures	Support furniture and other amenities to primary school

					Provide scholarship to essential student from poor family.
					Support in management of qualified teachers and teacher for mother tongue
					Support in establishment of child care centers/ Early Childhood Development (ECD) along with the staffs
3	WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Trainings and awareness program on solid waste management and environmental sanitation
					Construction of dumping sites for waste management and drainage system
4	WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking water	Preservation and management of Tin dhare (Water reservoir)
5	Health	No access to quality health services	Lack of HF in the community	Development of infrastructure and physical facilities	Maintenance of building for the establishment of Community Health Unit.
					Support in the management of trained health workers.
					Support physical amenities like medical equipment, furniture, necessary medical equipment, stretchers
6	Economic Development	Youth unemployment	Lack of skills and trainings to be involved at IGAs	Skilled-based and vocational trainings	Vocational training: Overseer, ANM, Plumbing, Electrician, Driving, Heavy vehicle operator, Computer operator, Hospitality training, mechanics and welding, etc.
					Skill-based Training for developing cultural dresses and accessories like Bakhu, Radi, etc.
					Support in developing cottage scale industries
					Support in marketing of products that have been produced in the village
	Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skill and knowledge in modern agriculture technique	Training regarding modern agriculture, cash crop and animal husbandry
7					Assessment of agricultural land, soil testing
					Support in the marketing of agriculture products
					Distribution of equipment.
8	Women Development	Lack of skills and development of women	Lack of access to resources/ lack of access	Development of skills and	Skill-based training to women on sewing and weaving of traditional dresses and items
					Support with necessary equipment

			to school/ low economic status	knowledge of women	Provision of scholarship to girls who desire for higher studies
9	Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of *Gumba* (along with *the Thanka training center),* preservation of *Mane*
					Documentation of *culture and traditional knowledge of Tamang*
					Construction of traditional funeral spots for death rituals of Tamang.
					Support in developing Museum for Tamang culture.
					Training of Thanka and establishment of Thanka Training Center.
					Support equipment like dishes and other animeties for Cultural ceremony.
					Preservation of Jhong
					Training of youths on traditional knowledge

Section C: Infrastructure Priorities Planning by Village

This Section records the infrastructure priorities of each of the ten most-affected villages. Such priorities will be used as the basis of discussions with NWEDC and others regarding future village development measures.

Infrastructure Priorities Planning

Name of Village: Phoolbari

Sector	Major Problems (What?)	Root Cause of Problem (Why?)	Proposed Solutions (How to do?)	Proposed Activities (What to do?)	Remarks
Infrastructure	Internal displacement	Landslides/ Earthquake	Support in resettlement of the displaced community/ Compensation	Implementation of IFC/ PS 7	LALRP
DRR	Risk of occurring landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Construction of Gavion wall, protection wall and drainage system	LBSP,LDP
Transportation	Lack of transportation	Lack of motorable roads/bridge	Development of track and motorable roads	Construction of motor tracks and drains.	LBSP, LDP
Health	No access to quality health services	Lack of adequate infrastructure and equipment for ORC clinic and Immunization clinic	Development of infrastructures and physical facilities	Construction of Out Reach Clinic/ Immunization Clinic	LBSP, LDP
				Support physical amenities like furniture, necessary medical equipment	LBSP, LDP
Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skill and knowledge in modern agriculture technique	Construction of seed distribution center	LBSP, LDP
WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking water	Construction of reservoir tank and fencing of water source.	LBSP, LDP
				Construction of water supply pipeline and tap at HHs.	LBSP, LDP

WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Support on construction of water sealed latrine.	LBSP, LDP
Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of community hall	LBSP, LDP* with community partnership

Infrastructure Priorities Planning

Name of Village: Sano Haku **Name of Rural Municipality: Amachhodingmo RM** **Ward No: 2**

Sector	Major Problems (What?)	Root Cause of Problem (Why?)	Proposed Solutions (How to do?)	Proposed Activities (What to do?)	Complete Until(When?)	Estimated Budget	Remarks
DRRM	Risk of occurring landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Construction of Gavion wall, protection wall, drainage system			LBSP, LDP
Transportation	Lack of transportation	Lack of motorable roads/bridge	Development of track and motorable roads	Construction of motor tracks, drains and bridge			LBSP, LDP
Infrastructure	Internal displacement	Landslides/ Earthquake	Support in resettlement of the displaced community	Implementation of IFC/ PS 7			LBSP, LDP
Agriculture	No development in agriculture	Lack of skills and knowledge on modern	Skill and knowledge in modern agriculture technique	Construction of seed center			LBSP, LDP

		agriculture technique					
WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking water	Construction of reservoir tank and fencing of water source.			LBSP, LDP
				Construction of water supply pipeline and tap at HHs.			LBSP, LDP
WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Support on construction of water sealed latrine and drainage system.			LBSP, LDP
Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of Gumba (Pangling)			LBSP, LDP
				Construction of Community Hall			LBSP, LDP

Infrastructure Priorities Planning

Name of Village: Thangu **Name of Rural Municipality: Amachhodingmo RM** **Ward No: 2**

Sector	Major Problems (What?)	Root Cause of Problem (Why?)	Proposed Solutions (How to do?)	Proposed Activities (What to do?)	Complete Until(When?)	Estimated Budget	Remarks
DRRM	Internal displacement	All land has been bought by company	Support in resettlement of the displaced community	Resettlement of the community in a new place.			LALRP

Infrastructure	Lack of transportation	Lack of motorable roads/bridge	Development of track and motorable roads	Construction of motor tracks and drains			LBSP, LDP
Infrastructure	Risk of occuring landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Construction of Gavion wall, protection wall and drainage system			LBSP, LDP
Health	No access to quality health services	Lack of adequate infrastructure and equipment for ORC clinic and Immunization clinic	Development of infrastructures and physical facilities	Construction of Out Reach Clinic/ Immunization Clinic			LBSP, LDP
				Support physical amenities like furnitures, necessary medical equipment, etc			LBSP, LDP
Education	Low education status	Lack of proper facilities and infrastructure of school/ low economic status	Management of physical facilities, qualified staffs and infrastructures	Construction of school building, support furniture and other amenities			LBSP, LDP
				Support in management of qualified teachers where necessary			LBSP, LDP
							LBSP, LDP
WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking water	Construction of reservoir tank and fencing of water source.			LBSP, LDP
				Construction of water supply pipeline and tap at HHs.			LBSP, LDP
WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Support on construction of water sealed latrine.			LBSP, LDP
Culture	Neglect of indigenous culture	Westernization	Promotion and development of	Construction of Community Hall			LBSP, LDP

			cultural infrastructures				

Infrastructure Priorities Planning

Name of Village: Thulo Haku **Name of Rural Municipality: Amachhodingmo RM** **Ward No: 2**

Sector	Major Problems (What?)	Root Cause of Problem (Why?)	Proposed Solutions (How to do?)	Proposed Activities (What to do?)	Complete Until(When?)	Estimated Budget	Remarks
Infrastructure	Lack of transportation	Lack of motorable roads/bridge	Development of track and motorable roads	Construction of motor tracks and drains			LBSP, LDP
Infrastructure	Risk of occuring landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Construction of Gavion wall and protection wall			LBSP, LDP
Education	Low education status	Lack of proper facilities and infrastructure of school	Management of physical facilities, qualified staffs and infrastructures	Construction of school building, support furniture and other amenities			LBSP, LDP
Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skill and knowledge in modern agriculture technique	Construction of seed distribution center			LBSP, LDP
WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking water	Construction of reservoir tank and fencing of water source.			LBSP, LDP
				Construction of water supply pipeline and tap at HHs.			LBSP, LDP

WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Support on construction of water sealed latrines.			LBSP, LDP
Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of community hall			LBSP, LDP

Infrastructure Priorities Planning

Name of Village: Haku Besi **Name of Rural Municipality: Amachhodingmo RM** **Ward No: 2**

Sector	Major Problems (What?)	Root Cause of Problem (Why?)	Proposed Solutions (How to do?)	Proposed Activities (What to do?)	Complete Until(When?)	Estimated Budget	Remarks
Infrastructure	Lack of transportation	Lack of motorable roads/bridge	Development of track and motorable roads	Construction of 216 MW motor road through village			LBSP, LDP
				Construction of bridge if necessary			LBSP, LDP
Infrastructure	Risk of reoccurring landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Construction of Gavion wall and protection wall			LBSP, LDP
Education	Low education status	Lack of proper facilities and infrastructure of school	Management of physical facilities, qualified staffs and infrastructures	Construction of school building			LBSP, LDP
Health		Lack of adequate		Construction of Out Reach Clinic/ Immunization Clinic			LBSP, LDP

	No access to quality health services	infrastructure and equipment for ORC clinic and Immunization clinic	Development of infrastructures and physical facilities	Support physical amenities like furniture, necessary medical equipment			LBSP, LDP
				Support in trained HWs			LBSP, LDP
				Construction of Psychosocial counselling center			LBSP, LDP
WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking water	Construction of reservoir tank and fencing of water source			LBSP, LDP
				Construction of water supply pipeline and tap at HHs			LBSP, LDP
Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skill and knowledge in modern agriculture technique	Construction of seed distribution center			LBSP, LDP
Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of community hall			LBSP, LDP
				Construction of old age home			LBSP, LDP

Infrastructure Priorities Planning

Name of Village: Nesing **Name of Rural Municipality: Amachhodingmo RM** **Ward No: 2**

Sector	Major Problems (What?)	Root Cause of Problem (Why?)	Proposed Solutions (How to do?)	Proposed Activities (What to do?)	Complete Until(When?)	Estimated Budget	Remarks
Infrastructure	Risk of recurring landslides	Deforestation/ Blasting	Management and conservation of	Construction of Gavion wall, protection wall, drainage systems			LBSP, LDP

			forests and drainage systems				
Infrastructure	Lack of transportation	Lack of motorable roads and bridge	Development of track and motorable roads	Construction of motor tracks, bridge, drains and gavion walls			LBSP, LDP (through dam site to Nesing)
WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Support on construction of water sealed latrine.			LBSP, LDP
WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking water	Construction of reservoir tank and fencing of water source.			LBSP, LDP
				Construction of water supply pipeline and tap at HHs.			LBSP, LDP
Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of Community Hall			LBSP, LDP

Infrastructure Priorities Planning

Name of Village: Gogane **Name of Rural Municipality: Uttargaya RM** **Ward No: 1**

Sector	Major Problems (What?)	Root Cause of Problem (Why?)	Proposed Solutions (How to do?)	Proposed Activities (What to do?)	Complete Until(When?)	Estimated Budget	Remarks
Infrastructure	Internal displacement	Construction of project/Landslides/ Earthquake	Support in resettlement of the displaced community	Implementation of IFC/ PS 7			LALRP
				Construction of house according to EIA and public hearing			LALRP

Infrastructure	Lack of transportation	Lack of motorable roads/bridge	Development of track and motorable roads	Construction of motor tracks, drains and bridge			LBSP, LDP
Infrastructure	Risk of occuring landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Construction of Gavion wall, protection wall, drainage systems			LBSP, LDP
WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking water	Construction of reservoir tank and fencing of water source.			LBSP, LDP
				Construction of water supply pipeline and tap at HHs.			LBSP, LDP
WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Construction of dumping sites for waste management and drainage system.			LBSP, LDP
				Support on construction of water sealed latrine.			LBSP, LDP
Education	Low education status	Lack of proper facilities and infrastructure of school/ low economic status	Management of physical facilities, qualified staffs and infrastructures	Construction of school building, support furniture and other amenities			LBSP, LDP
Health	No access to quality health services	Lack of adequate infrastructure and equipment for ORC clinic and Immunization clinic	Development of infrastructures and physical facilities	Construction of Community Health Unit (CHU).			LBSP, LDP
				Management of trained staff for CHU.			LBSP, LDP
				Support medicine and physical amenities like furniture, necessary medical equipment, stretchers, etc.			LBSP, LDP
Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skill and knowledge in modern	Support for construction of seed center			LBSP, LDP

			agriculture technique				

Infrastructure Priorities Planning

Name of Village: Tiru **Name of Rural Municipality: Uttargaya RM** **Ward No: 1**

Sector	Major Problems (What?)	Root Cause of Problem (Why?)	Proposed Solutions (How to do?)	Proposed Activities (What to do?)	Complete Until(When?)	Estimated Budget	Remarks
Infrastructure	Internal displacement	Construction of project/Landslides/ Earthquake	Support in resettlement and reconstruction of the displaced community	Implementation of IFC/ PS 7			LALRP
				Support in the construction of model village			LALRP
Health	No access to quality health services	Lack of HF in the community	Development of infrastructures and physical facilities of the Health facilities	Construction of Health post			LBSP, LDP
				Support to establish Birthing center and its necessary infrastructures			LBSP, LDP
Education	Low education status	Lack of school.	Management of physical facilities, qualified staffs and infrastructures for schools.	Construction of Secondary level school building			LBSP, LDP
Infrastructure	Lack of transportation	Lack of motorable roads/bridge		Construction of motor tracks, drains and gavion walls			LBSP, LDP

			Development of track and motorable roads	Construction of foot trail from Mailung to Tiru			LBSP, LDP
Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skill and knowledge in modern agriculture technique	Construction of seed center			LBSP, LDP
WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Construction of dumping sites for waste management and drainage system			LBSP, LDP
				Support of construction of water-sealed latrine			LBSP, LDP
WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking	Construction of reservoir tank and fencing of water source			LBSP, LDP
				Construction of water supply			LBSP, LDP
			water	pipeline and tap at HHs			
DRR	Risk of occuring landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Construction of Gavion wall and support wall to reduce the landslides			LBSP, LDP
Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of Community Hall			LBSP, LDP

Infrastructure Priorities Planning

Name of Village: Gumchet **Name of Rural Municipality: Kalika RM** **Ward No: 1**

Sector	Major Problems (What?)	Root Cause of Problem (Why?)	Proposed Solutions (How to do?)	Proposed Activities (What to do?)	Complete Until(When?)	Estimated Budget	Remarks
WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Construction of dumping sites for waste management and drainage system.			LBSP, LDP
WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking water	Construction of reservoir tank and fencing of water source.			LBSP, LDP
				Construction of water supply pipeline and tap at HHs.			LBSP, LDP
Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of Community Hall			LBSP, LDP
Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skill and knowledge in modern agriculture technique	Construction of seed center			LBSP, LDP
DRR	Risk of occuring landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Construction of Gavion wall, protection wall, drainage systems			LBSP, LDP
Infrastructure	Lack of transportation	Lack of motorable roads/bridge	Development of track and motorable roads	Construction of foot train from Gumchet to Gran/ Ramche			LBSP, LDP

Infrastructure Priorities Planning

Name of Village: Mailung **Name of Rural Municipality: Uttargaya RM** **Ward No: 1**

Sector	Major Problems (What?)	Root Cause of Problem (Why?)	Proposed Solutions (How to do?)	Proposed Activities (What to do?)	Complete Until(When?)	Estimated Budget	Remarks
Infrastructure	Internal displacement	Construction of project/Landslides/ Earthquake	Support in resettlement of the displaced community	Implementation of IFC/ PS 7			LALRP
				Construction of house according to EIA and public hearing			LALRP
WASH	Lack of safe drinking water	Unmanaged source of drinking water	Management and Preservation of source of drinking water	Construction of reservoir tank and fencing of water source.			LBSP, LDP
				Construction of water supply pipeline and tap at HHs.			LBSP, LDP
WASH	Lack of Hygiene and Environment sanitation	Lack of awareness/ lack of sanitary latrines	Increase awareness and management of waste	Construction of dumping sites for waste management and drainage system.			LBSP, LDP
				Support on construction of water sealed latrine.			LBSP, LDP
Education	Low education status	Lack of proper facilities and infrastructure of school/ low economic status	Management of physical facilities, qualified staffs and infrastructures	Construction of school building, support furniture and other amenities			LBSP, LDP
Health	No access to quality health services	Lack of adequate infrastructure and equipment for ORC clinic and Immunization clinic	Development of infrastructures and physical facilities	Construction of Community Health Unit (CHU)			LBSP, LDP
				Management of trained staff for CHU			LBSP, LDP
				Support medicine and physical amenities like furniture, necessary medical equipment, stretchers			LBSP, LDP

Agriculture	No development in agriculture	Lack of skills and knowledge on modern agriculture technique	Skill and knowledge in modern agriculture technique	Support in construction of seed center			LBSP, LDP
Culture	Neglect of indigenous culture	Westernization	Promotion and development of cultural infrastructures	Construction of Community Hall			LBSP, LDP
				Construction of Welcome gate			LBSP, LDP
Infrastructure	Lack of transportation	Lack of motorable roads/bridge	Development of track and motorable roads	Construction of motor tracks, drains and bridge			LBSP, LDP
				Construction of foot track			LBSP, LDP
Infrastructure	Risk of recurring landslides	Deforestation/ Blasting	Management and conservation of forests and drainage systems	Construction of Gavion wall, protection wall, drainage systems			LBSP, LDP

Section 6D

Demands identified during the Third Meetings of the Working Group and AJAC of the UT-1 Project held on October 31 and 1 November 2018:

1. Access road from Mailing to Dam Site should be constructed according to the previous design of the Project.

2. Free shares should be distributed to highly affected villages.

3. Minimum units of electricity should be provided free of cost to highly affected villages.

4. In addition to the villages which have been identified as of now as highly affected villages, some villages may be added in the list of highly affected villages upon evaluation of potential effects in the future.

5. While appointing employees, regardless of the level, first priority should be given to highly affected villages depending on availability of candidates having qualification and capability. If such villages do not have people of such qualification and capability, then the appointment may be made from the locals of the district. Further, while appointing the employees, the UT-1 Governing Board and UT-1 Adibasi Janajati Advisory Council should be consulted.

6. First level of contractors appointed by the company to carry out the project construction should give petty contract works to the local contractors directly in accordance with their capability.

ANNEX 7: FRAMEWORK FOR CONSENSUS AGREEMENT RELATING TO COMMUNITY DEMANDS PRESENTED BY THE UT-1 FPIC AND IPP WORKING GROUP

Various environmental and social issues were raised during meetings of the UT-1 Free Prior and Informed Consent (FPIC) & Indigenous Peoples Plan (IPP) Working Group (WG) and the UT-1 Adibasi Janajati Advisory Council (AJAC), the bodies constituted for preparation of the Indigenous Peoples Plan in the 10 highly project-affected villages according to the FPIC process. After several rounds of meetings, it was realized that some of the demands from the community can be included in the IPP and that some of them could not be addressed in the IPP due to several factors including available budget, financial feasibility of the project and the Project Development Agreement that has been signed with the Government of Nepal.

During the third round of WG meetings held on October 30 and 31, 2018 some additional demands from the community were identified and it was noted that some demands were already included in Section (A) of Annex 6 of the IPP. Members of the Working Group and the Company therefore decided to add a new Section (D) of Annex 6 to include such demands. This section (D) shall be considered to be an integral part of the IPP by the Company Management and that continuous discussions shall be held to address such demands, subject to economic viability of the Project, prevailing laws of Nepal, the collective rights of Indigenous Peoples, the Project Development Agreement signed with the Government of Nepal and the financing documents. Both parties have signed and exchanged this document in the meeting hall of Hotel Water Tower in Ward No. 4 of Bidur Municipality of Nuwakot District. The demands presented by the representatives of the community which will be mentioned in the Section (A) and (D) of Annex 7 of the IPP are enclosed with this document.

Dated: October 31, 2018, Wednesday

From the FPIC Working Group of Indigenous People:

S.N.	Name	Address	Signature
01	Sangke Dolma Tamang	Mailung	
02	Ashabir Tamang	Mailung	
03	Karsang Tempa Tamang	Thulo Haku	
04	Phurchyng Tamang	Thulo Haku	
05	Dhan Bahadur Tamang	Sano Haku	
06	Subita Tamang	Sano Haku	
07	Kami Bahadur Tamang	Phoolbari	

08	Saraswati Tamang	Phoolbari	
09	Chheku Lama Tamang	Gogane	
10	Butti Maya Tamang	Gogane	
11	Balbod Tamang	Tiru	
12	Phulmaya Tamang	Tiru	
13	Kami Dawa Tamang	Hakubesi (Kaksing)	
14	Norsang Tamang	Hakubesi (Kaksing)	
15	Man Bahadur Tamang	Thangu	
16	Nangsi (Durgamaya) Tamang	Thangu	
17	Lawang Tamang	Gumchet	
18	Phurpa Yangen Tamang	Gumchet	
19	Satprasad Tamang	Nesing	
20	Manita Tamang	Nesing	

For and on behalf of
Nepal Water & Energy Development Company Pvt. Ltd.:

Name: Bo Seuk Yi

Signature:
Position: Chief Executive Officer

Company Stamp

Date: October 31, 2018

In presence of:

1. Bam Bahadur Tamang, Ward Chair, Uttargaya Rural Municipality Ward No. 1, Rasuwa.
2. Nima Dindu Tamang, Ward Chair, Amachhodingmo Rural Municipality Ward No.1, Rasuwa.
3. Dawa Norchung Tamang, Ward Chair, Amachhodingmo Rural Municipality Ward No.2, Rasuwa.
4. Jagat Bahadur Baram, Chairperson, Secretariat of Federal Council, Nepal Federation of Indigenous Nationalities

Witness the from Community:

Phurpa Tamang, aged 48, and a resident of Rasuwa District, Gosainkunda Gaunpalika, Ward No. 5

Witness from the Company:

Mahesh Kumar Thapa, aged 48, and a resident of Kathmandu District, Budhanilkantha Municipality Ward No. 2

ANNEX 8: STATEMENT OF CONSENT FOR THE UPPER TRISHULI-1 HYDROPOWER PROJECT & THE UT-1 IPP

We, the authorized participants of the UT-1 Adibasi Janajati Advisory Council (AJAC), hereby affirm that:

1. We are convinced that the UT-1 Indigenous Peoples Plan (IPP) was prepared successfully according to the international Free, Prior, and Informed Consent (FPIC) principles and with our meaningful input.

   Our selection as delegates from our ten project-affected villages was conducted in a transparent, accessible, and democratic fashion which resulted in the selection of a group of representatives broadly inclusive of our village population.

   Meetings of both the AJAC and its executive body, the UT-1 FPIC & IPP Working Group, were likewise carried out as per FPIC principles.

   Consultations regarding the content and format of the First UT-1 Indigenous Peoples Plan (2019-2023) were held according to current international standards (and particularly IFC's PS7). The consultations were held in all ten villages (or in the areas of their temporary displacement) and included meetings with the local population as well as their ward administration representatives. Aside from a preparatory round to familiarize villagers with the process and to select representatives, these meetings were held in two rounds during July 2018 and October 2018. Such discussions were carried out without compulsion, were held early enough for us to discuss the issues at length, and were accompanied by the relevant information regarding the UT-1 Project for us to formulate our own independent assessment of the Project and the proffered IPP.

2. We acknowledge the objectives of the First UT-1 Indigenous Peoples Plan:

   a) To help preserve the religion, culture, life style, traditional skills and knowledge of the local Indigenous People, the Tamang, so that they are passed on to new generations.

   b) To share relevant information on possible negative effects and mitigation measures as well as opportunities for project benefits with project-affected communities and their representatives. To strengthen Project environmental effects disclosure and provide timely, objective and complete information to the ten FPIC villages of the actual and/or potential impacts of the UT-1 Project on the environment, and the measures taken to prevent and/ or minimize any potential negative effects.
   c) To seek community suggestions for making the proposed mitigation measures and various action plans more effective, appropriate and acceptable to them by

identifying opportunities and actions to enhance positive impacts of the project on the Tamang Indigenous People.

d) To enhance the capacity of the residents of the ten Project-Affected villages to actively participate in the self-management of their own affairs. Such capacity-building could range from leadership training, to technical skills enhancing (e.g., for welding, accounting, report-writing, budget preparation, traditional economic and cultural activities, business planning, driver's licenses), to heightened cultural and ethnic self-awareness.

e) To enhance social, cultural, and economic development. Improving the lives and livelihoods of the Tamang Project-Affected People through the implementation of social and economic development plans in a culturally appropriate manner. Cultural revival, economic viability of traditional economic enterprises, employment preferences, and improved social conditions will be targeted areas for support. Long-term strategic planning with the concept of sustainable development (including perhaps ethnic hydro-tourism as an objective) will also be emphasized.

3. We approve the general content and principles of this First UT-1 Indigenous Peoples Plan as shared with us during this Third Meeting of the UT-1 Adibasi Janajati Advisory Council and affirm that by our signatures we AJAC members agree to co-implement the IPP as per the UT-1 Tripartite Implementation Agreement duly signed by the three partners (AJAC, Ward Chairs, NWEDC).

4. We appreciate NWEDC's commitment to work with us on our outstanding demands, as referenced in the AJAC Demands Framework Agreement through continuing dialog.

In recognition of the above and acknowledging the broad community support which the UT-1 Indigenous Peoples Plan has received, we—as representatives of our communities--grant our consent to the UT-1 Hydropower Project based on the implementation of the First UT-1 Indigenous Peoples Plan and so indicate by affixing our signatures below.

Signed

_____

UT-1 Adibasi Janajati Advisory Council Members (name and village)

Khalde Uttargaya-5, Rasuwa. November 2, 2018

ANNEX 9: UT-1 TRIPARTITE AGREEMENT FOR IPP IMPLEMENTATION

A MUTUAL COOPERATION AGREEMENT
between the UT-1 Adibasi Janajati Advisory Council, local Government representatives, and the Nepal Water & Energy Development Company Pvt. Ltd.

Battar, 1 November 2018

The UT-1 Adibasi Janajati Advisory Council (hereinafter referred to as the Advisory Council), the Ward chairs of the three most project-affected Wards (hereinafter referred to as the Government), represented by Nima Dindu Tamang (Ward 2, Amachhodingmo RM; Dawa Norchung Tamang (Ward 2, Amachhodingmo RM) and Bam Bahadur Tamang (Ward 1, Uttargaya RM); and the Nepal Water & Energy Development Company Pvt. Ltd. (NWEDC), represented by Chief Executive Officer Bo-Seuk Yi (hereinafter collectively referred to as the Parties) through this statement jointly declare their intent to collaboratively implement the UT-1 IPP (Note that the IPP's Annex 6A and 6D will be separately dealt with under the AJAC Demands Framework Agreement signed 31 October, 2018). This Agreement thus recognizes the role of a partnership between the local Indigenous Peoples, local government authorities, and the Company for the purpose of the sustainable development of the indigenous community based on the applicable Nepali and international standards with respect to the Indigenous Peoples of the Project area.

The First UT-1 Indigenous Peoples Plan (hereinafter referred to as IPP) is the result of joint efforts, talks, and consultations between local indigenous communities, the Advisory Council, NWEDC, and the three local ward chairs. It should be noted that the Nepal Federation of Indigenous Nationalities (NEFIN) was a key facilitator of this process, beginning in June, 2018. Thus, the three Parties have been involved in the creation of the IPP and thereby undertake to continue cooperation during its implementation and in close interface with the IPP coordination staff located in NWEDC.

The Parties:

- respect each other and recognize that each of the Parties has its own views, opinions, and tasks
- respect the priority right of the local Tamang Indigenous People to use the resources of fauna and flora and their growing aspiration for self-governance and control over the environment of their native habitat
- emphasize the distinctive spiritual ties of the Tamang People to their land and the paramount importance of the preservation and protection of their habitat as a pre-condition for their ethnic survival and development
- recognize that development and production of hydropower and construction of its facilities affect local peoples' native habitat, customary way of life, economic activities, and crafts
- recognize mutual intent to establish closer contacts between the Parties
- take into account the need for informed consultations with the local communities in the spirit of the IFC PS7 policy requirement of Free, Prior, and Informed Consent (FPIC) which guided the consultations producing the IPP

- recognize the local Indigenous Peoples' right to define their sustainable development priorities
- recognize the need for coordination with local ward governments and support by NWEDC
- point out that the project-affected Indigenous Peoples live in villages in vulnerable geological and climatic conditions without a well-developed infrastructure, facing acute social and economic problems related to the preservation and development of traditional economic activities and sustenance of their culture and language
- appreciate the aspiration of NWEDC, exercising economic activities within the areas of the ten project-affected villages, to contribute to the institutional, social, and economic development of the indigenous community
- assume obligations and take decisions based on the principles of equal partnership, transparency, and prompt notification and rely on a joint responsibility with the Indigenous People while interacting with each other

1. Agreement Objectives

This Agreement has been undertaken to coordinate the Parties' efforts to implement the UT-1 IPP and to bolster their cooperation to enhance the sustainable economic, social, and cultural development of the Indigenous People on the basis of mobilization of the internal resources of the indigenous community.

2. Subject of the Agreement

The subject of this Agreement is the collaboration between the Advisory Council, NWEDC, and the three ward chairs on the following issues:

- establishment of the coordination authorities in the UT-1 IPP management structure
- preparation and holding of an annual joint meeting of the partner top managers to review IPP implementation
- preparation and conduct of the internal monitoring of the IPP progress
- generation of recommendations for the adoption of regulations as related to the efficient implementation of the IPP, development of the Tamang Indigenous People, protection of their native habitat, and preservation of their customary activities, culture, and language

3. Liabilities of the Parties

While acting in the framework of this Agreement,

3.1. The Advisory Council shall:

- confirm two representatives from each of the ten FPIC villages to serve on the IPP Governing Board
- appoint one representative of the Council to serve on the IPP Internal Monitoring Working Group
- ensure the promotion of the experience of UT-1 IPP implementation as appropriate
- while acting with the Government and NWEDC, exercise joint control over the implementation of the UT-1 IPP via its representatives on the Governing Board

- while acting jointly with NWEDC, take measures for the minimization or prevention of the adverse impact on the customary way of life and economic activities in view of the implementation of the UT-1 Project, as disclosed by ongoing environmental monitoring
- ensure the participation of the Indigenous People in local communities in obtaining the benefits as provided by the UT-1 IPP
- keep in regular communication with NEFIN about the progress of the Advisory Council's collaboration with both its partners in implementing the IPP
- inform the community about IPP progress at meetings in the project-affected villages and in the mass media
- interact with the local communities, the Tamang Association, public organizations, ethnic enterprises, and other associations on the issues of UT-1 IPP implementation
- interact with the IPP Support Unit at NWEDC
- interact with local government authorities in the ten FPIC villages on the issues of UT-1 IPP implementation

3.2 The Government shall:

- appoint three representatives of the Government (representing each of the three wards) to serve on the IPP Governing Board
- appoint one representatives of the Government to serve on the IPP Executive Committee if they are not already represented
- appoint one representative of the Government to serve on the UT-1 IPP Internal Monitoring Working Group
- interact with the IPP Support Unit to be established in NWEDC
- ensure that the successful aspects of the UT-1 IPP implementation are promoted, as appropriate
- coordinate the work of the local government executive authorities for UT-1 IPP implementation
- take steps necessary to help ensure successful implementation of the UT-1 IPP

3.3. NWEDC shall:

- appoint three representatives of NWEDC to serve on the IPP Governing Board
- appoint one representative of NWEDC to serve on the IPP Executive Committee if it is not already represented
- appoint one representative of NWEDC to serve on the IPP Internal Monitoring Working Group
- while acting jointly with the Advisory Council, take measures for the minimization or prevention of any adverse impacts on the customary way of life and economic activities due to the implementation of the UT-1 Project, as disclosed by ongoing environmental Project monitoring
- ensure that the successful aspects of the UT-1 IPP implementation are promoted, as appropriate
- ensure the funding of traditional economic activities and social development support programs under UT-1 in the amount of US$ 1.125 million (one million one hundred twenty-five thousand) in total for five years, starting from Financial Close

5.3. **Areas of Cooperation**

5.3. The three Parties recognize that in the coming decades the future of these Project-affected villages and others in Rasuwa District will be closely related to the development of energy resources in the area. In order to assist in the sustainable development of the Tamang people and other Project-affected communities, the three Parties will attempt to achieve the basic objectives of the UT-1 IPP including:

- **Enhancing the capacity of the residents of the ten Project-Affected villages to actively participate in the self-management of their own affairs**. Such capacity-building could range from leadership training, to technical skills enhancing (e.g., for accounting, report-writing, budget preparation, traditional economic and cultural activities, business planning, machinery operation licenses), to heightened cultural and ethnic self-awareness.
- **Enhancing social, cultural, and economic development**. Improving the lives and livelihoods of the Tamang Project-Affected People through the implementation of social and economic development plans in a culturally appropriate manner. Cultural persistence, economic viability of traditional economic enterprises, employment preferences, and improved social conditions will be targeted areas for support. Long-term strategic planning with the concept of sustainable development as an objective will also be emphasized.
- **Disclosure of information about the environmental impact of the project**. Ensure the timely provision of objective and complete information for the local communities about the existing and/or potential impact of the UT-1 Project on the environment and about the measures taken to prevent and/or to minimize any possible adverse effects.

5. Particular Terms and Conditions

This Implementation Agreement also provides for the following:

5.1. Holding of regular (at minimum annual) meetings between high-ranking officers of the local Government, NWEDC, and the Advisory Council for considering the issues directly related to the subject hereof.

5.2. Any amendments and supplements hereto may only be made by mutual consent of the Parties in the form of a protocol to be signed by all three Parties.

5.3. In the event it is desired by the Parties, additional Agreements may be adopted by mutual consent of all the Parties.

6. Validity and Termination of Agreement

6.1. This Agreement has been made on 1 November, 2018 and shall take effect as soon as signed by the three Parties and the IPP is officially launched.

6.2. This Agreement has been made in Nepali and English, one copy in each language for each of the Parties. In the event of any discrepancy between the Nepali and the English texts of this Agreement, the English text shall prevail.

6.3. This Agreement may be terminated by mutual consent of the Parties.

Signatures of the Parties

As attested to by their signatures below, each of the Parties commits to carrying out the terms of this Implementation Agreement:

Adibasi Janajati Advisory Council	Ward Governments	Nepal Water & Energy Development Company
Signed	Signed	Signed

ANNEX 10: POSSIBLE TECHNICAL AND VOCATIONAL TRAINING PROJECTS

SN	Name of training	Basic contents	Duration	
			Hours	Month
1.	Tailoring	Introduction & identification of measurements, tools & equipment, safety & precautions, Installation of tailoring machine, *measurement, design, cutting, weaving,* finishing, account, management, communication, entrepreneurship development	390 hours	3 months
2.	Mason	Health & safety measures, Basic knowledge of masonry, knowledge of cement and plaster, Stone Masonry, Stone Masonry, foundation, Bamboo & Wooden Plank,	390 hours	3 months
3.	Building Electrician	Basic knowledge of electricity, health & safety, instruments, drawing, wiring, earthling, maintenance, communication, entrepreneurship	390 hours	3 months
4.	Basic computer	Introduction to Computer, Operating System CUI: DOS GUI: Windows XP, Windows 7, Windows 8, Open source, Word Processing Program, Spreadsheet Program, Presentation Program, Database Program, Photo Editor Program, Email, Internet & Webpage & Networking, Computer Security.	220 hours	2 months
5.	Carpenter	Introduction to wood work; bench work related to carpentry; perform members erection in horizontal and vertical alignment; erect formwork for different foundations; formwork erection for column, beam and slab in separately and combinable situation; apply simple mathematical techniques; occupational health and safety measures	390 hours	3 months
6.	Indian cook	Equipment, tools and security, Personal Hygiene, workspace cleanliness and food security, Pre-preparation, Continental cuisine, Indian cuisine, Chinese Cuisine, Nepali thali	390 hours	3 months
7.	Light vehicle driving	Understanding the vehicle, function of parts and its controls, Basic driving skills: road signs, signal lights, and road markings, Rules of the road: speed limits, railroad crossings, and laws on texting and cell phone use. Sharing the road with pedestrians, bicyclists, commercial vehicles, motorcyclists, and wildlife	390 hours	3 months
8.	Gabion weaver	Use of equipment and tools; safety measures; preparatory tasks for gabion weaving, Functions of "charkha" (weaving machine), Rings of gabion wires and weaving styles, weaving, finishing, storage and record keeping, practical mathematics, occupational health and safety, communication	390 hours	3 months
9.	Heavy equipment	Introduction of Excavator, safety measure, daily monitoring of machine, Start Engine and Test Machine Functions, Perform Excavator Operation, Transport, Maintenance, management, communication & managerial skill, entrepreneurship skill,	390 hours	3 months
10.	Motorcycle repair	Motorcycle service and beginner mechanic, motorcycle electrical mechanic, motorcycle engine and transmission mechanic, motorcycle driving, common module	390 hours	3 months

SN	Name of training	Basic contents	Duration	
			Hours	Month
11.	Plumbing	Safety measure, instrument and tools, basic bench-work, fitting of polythene pipe, layout design, fixing of sanitary unit and its maintenance, cost estimation, communication, management & entrepreneurship development	390 hours	3 months
12.	Security guard	Security management, security service, security tools, electronic security tools, security provision at workplace, receiving orders, gatekeeping, safety of personnel and physical property	390 hours	3 months
13.	Welding	Perform cutting and notching; straight cutting by hand; Introduction of snips and its types; marking and layout; circle cutting by hand; cut irregular figure; seaming; bending; classification and application of welding types; groove single seam, etc..	390 hours	3 months
14.	Beauty parlour	Shampooing hair; cutting hair in simple way; performing hair blow dry/setting; setting roller; performing simple hair massage; performing simple hair put up; applying herbal hair dye; shaping eyebrow; performing face cleansing; applying simple make-up; performing manicure/pedicure; removing unwanted hair in simple method (waxing/threading, tweezers); and applying *Mehendi* art	390 hours	3 months

The eligibility criteria for these trainings are:

- Education: basic reading, writing and numeracy skills or as entry criteria of CTEVT
- Age between 16 to 45 years
- Training participants should be the permanent residents from the project affected 9 villages included in this IPP
- Trainees must possess valid Nepali citizenship certificate

ATTACHMENT 2 – GROUNDWATER DRAWDOWN HAZARD ASSESSMENT

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Technical Memo

To	Pablo Cardinale, IFC
From	David Blaha, Stacy Dwyer, and Zack Walter
Date	November 28, 2018
Reference	0456965
Subject	Drawdown Hazard Index for Trishuli-1 Hydroelectric Project Tunnel

The Upper Trishuli-1 Hydroelectric Project is a proposed hydropower project located in north central Nepal, which will install an underground tunnel beneath the northwest slope of the Trishuli River valley that roughly parallels the course of the river. There are 46 unique springs (or seeps, referred herein as 'water-points') in the region of the proposed project. The springs in this project area are used for drinking purposes, irrigation, and animal feeding.

This memo details a risk assessment to predict which, if any, of these water-points might be affected. The Drawdown Hazard Index was utilized to evaluate the possibility of negative hydrologic impacts to any one of these springs' discharge. The evaluation is intended to be a screening-level assessment of drawdown risks to springs, with the objective of ranking springs and risks. It does not replace more detailed hydrogeological assessment that are more adequate to quantify hydrologic impacts such as spring flow reduction or elimination.

Drawdown Hazard Index Methodology:

The Drawdown Hazard Index (DHI, Dematteis et al. 2001) was used to calculate the potential risks of drawdown of any of the water-points that might be affected by the construction of the Upper Trishuli-1 Hydroelectric Project. This is done by identifying possibly vulnerable water-points because of critical conditions using a mathematical formulation. The variables in the formulation are the geologic and hydrologic conditions that a specific water-point experiences and the final DHI Risk score is the probability that that water-source will or will not experience drawdown.

System variables include:

1) *Fracture Frequency (FF)* – the volumetric joint count (Jv) that is derived from the number of fractures per linear meter (λ) for the discontinuity sets.
2) *Rock Mass Permeability (MK)* – describes the overall permeability of lithological units including discontinuities.
3) *Overburden (OV)* – depth of overlying material.
4) *Plastic Zone Radius (PZ)* – the width of the effected zone of the excavation of the tunnel on the surrounding material as to degrade that material by creating new fractures and discontinuities.

These variables interact and influence each other in a natural setting, for this reason a normalized global interaction matrix was used to determine and assign weights to the system variables (Dematteis et al. 2001). This is used to account for the varying magnitude in changes felt by the whole system when just one change is encountered in one variable.

The Potential of Inflow Index (PI) is the sum of the weighted system variables by the parameters assigned to those variables through a study of the system. The PI is calculated for a given tunnel section.

$$PI = \frac{(41 \times FF) + (22 \times MK) + (17 \times OV) + (20 \times PZ)}{100}$$

The DHI is then calculated for a specific water-point on the surface using the PI of the tunnel section and adjusting for additional variables.

The adjustment factors are:

5) *Intersection of Main Faults (IF)* – defines if water-points are affected by elements of elevated permeability.
6) *Spring Type (ST)* – source or water: surface, deep, or mixed.
7) *Distance from Tunnel (DT)* – in meters.

$$DHI = \frac{(41 \times FF) + (22 \times MK) + (17 \times OV) + (20 \times PZ}{100} \times (IF + 1) \times (ST + 1) \times (DT + 1)$$

Analysis:

In order to transpose the project area specific data into the DHI index the data needs to be normalized against the index's framework and assigned a value between zero and one for each variable (Table 1). DHI predicts that the smaller the value the less likely the water-point will be negatively impacted by the installation of the tunnel.

The following table provides the absolute and normalized DHI Value Indices (adapted from Dematteis et al. 2001).

Table 1: Variable DHI Value Indices

Fracture Frequency (FF)	λ (fractures/m): 0 – 5 – 10 – 15 – 20 index: 0 – 0.25 – 0.5 – 0.75 – 1
Rock Mass Permeability (MK)	Peremab. degree: very low – low – medium – high index: 0 – 0.33 – 0.66 – 1
Overburden (OV)	thickness (m): <50 – 50 – 100 – 200 – >200 Index: 0.9 – 0.5 – 0.25 – 0.1
Plastic Zone Radius (PZ)	radius: 0 – 10 – 20 – >30 index: 0 – 0.3 – 0.7 – 1
Intersection of Main Faults (IF)	intersection with main conductive fracture connected with water point: NO = 0, YES = 1 index
Spring Type (ST)	type: superficial = 0, intermediate = 0.5, deep flow system = 1 index
Distance from Tunnel (DT)	distance (m): >800 – 600÷800 – 400÷600 – 200÷400 – 100÷200 – <100 index: 0 – 0.1 – 0.2 – 0.4 – 0.8 – 1

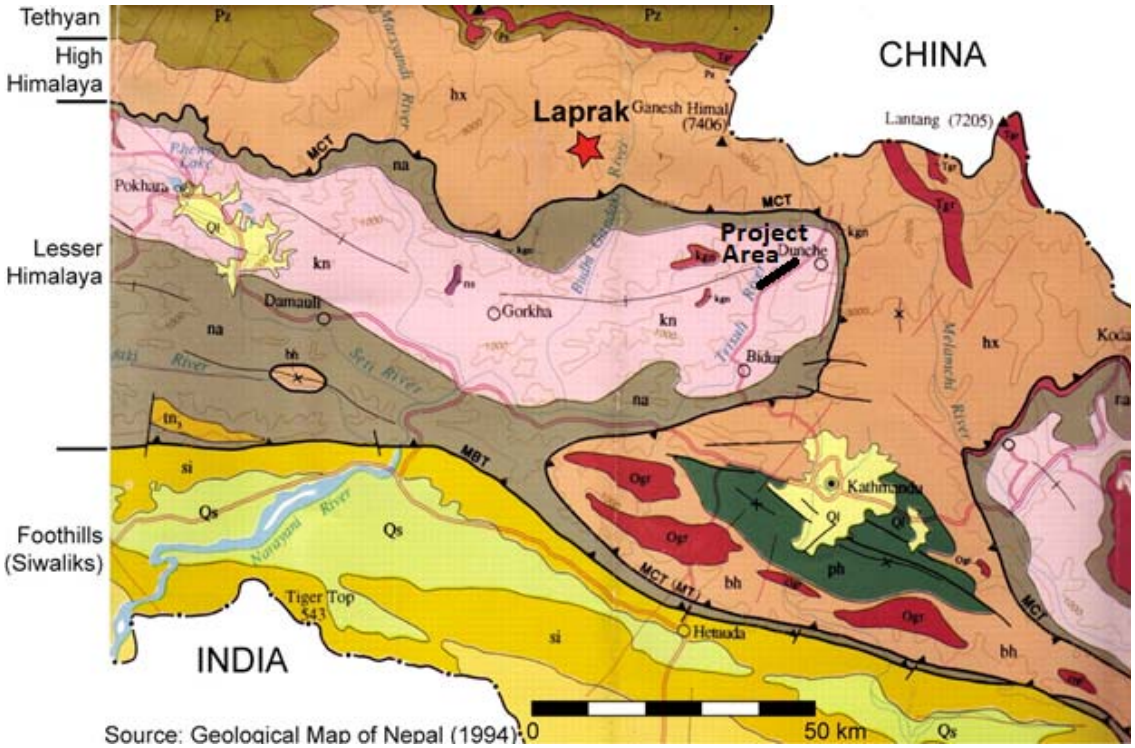
A description of each DHI Value Index is provided below.

1) *Fracture Frequency (FF)*

Nepal has at least 92 mapped active faults and the whole country is considered to consist within a high seismic hazard zone according to the National Society for Earthquake Technology-Nepal (NSET). A major thrust fault, the Main Central Trust, boarders the project area to the north (~ 15km away), east (~8km away), and south (~30km away). There is also an anticline feature that abuts up to the project area (Figure 1). Tectonic

forces thrusting the Himalayan Mountains over the Indian plate account for the rock stresses and creation of rock fracturing in this area.

Figure 1: Geologic Map of project area



According to Appendix A-4 of the ESIA, the spacing of discontinuities throughout the rocks in the project area varies into 4 categories: 0.06 ~ 0.20, 0.20 ~ 0.60, 0.6 ~ 2.0, and >2 meters. The mean of this data is one discontinuity every 0.20 to 0.60 meters. This indicates that, on average, there should be 3.3 (average for 5 to 1.67) fractures per linear foot.

Table 2: Volumetric Joint count (Jv)

Spacing of Discontinuities (m)	Numbers of Fracture per Linear Foot (λ)	Number of Rock Samples
0.06 ~ 0.20	16.67 ~ 5	7
0.20 ~ 0.60	5 ~ 1.67	24
0.6 ~ 2.0	1.67 ~ 0.5	7
> 2	0.5	4

Referring back to Table 1, 3.3 fractures per linear foot has been assigned a DHI value index of roughly 0.1875. For the purposes of this evaluation, the DHI of FF for this formation is 0.1875.

2) *Rock Mass Permeability (MK)*

The Upper Trishuli-1 Hydroelectric Project area belongs to Lesser Himalayan Crystalline in Central Nepal. In the project site the Lesser Himalayan Crystalline rocks are represented by schist unit, gneiss unit, and deposits (talus). The schist unit is the predominant rock type in the project site. Rock types of the Powerhouse and Weir site are within the schist unit. Schist unit consists of mica schist, quartzitic schist, and quartzite. The gneiss unit is strong and blocky to massive in nature of the project site. The talus deposits are rarely more than 8 to 10 meters thick and does not appear to be relevant in this analysis. Discounting for fracturing accounted for in FF, this geologic unit is rated as having a low permeability.

Referring back to Table 1, a low permeability has been assigned a DHI value of 0.33. For the purposes of this assessment, the DHI of MK for this formation is 0.30.

3) *Overburden (OV)* – depth of overlying material

According to Table 1, there are four discrete DHI values that can be assigned to varying overburden thicknesses (Table 3). These were applied to each individual water-point.

Table 3: Overburden Thickness Index

Thickness (m)	<50	50 – 100	100 – 200	>200
DHI Value	0.9	0.5	0.25	0.1

4) *Plastic Zone Radius (PZ)*

The PZ accounts for the size of the opening of the tunnel, the construction techniques, and quality in one variable. The construction technique of the excavation is blasting and it was indicated during the design of the tunnel, that if poor rock (cracked, fractured, or otherwise unconsolidated) is encountered, the area in question will be cemented over to discourage water infiltration. The plastic zone in the surrounding rock mass becomes larger with increasing magnitude of stress; the greater the overburden thickness, the larger the PZ becomes. PZ is measured in equivalent excavation radius units.

Referring back to Table 1, a conservative 10 radius units has been assigned a DHI value of 0.30. For the purposes of this investigation, the DHI of PZ for this formation is 0.30.

5) *Intersection of Main Faults (IF)* – defines if water-points are charged by elements of elevated permeability.

As discussed above, no major faults are mapped in this area.

6) *Spring Type (ST)* – source or water: surface, deep, or mixed.

The source type of each spring was determined in accordance with the information provided in Appendix B: Complementary Environmental Baseline. If the water-point experienced seasonal fluctuations in quantity of water supplied, but was still a source of water year-round, the water-point was assigned an intermediate rating. If the water-point dried up in the dry season, the water-point was assigned a superficial rating. If the water-

point experiences no seasonal changes, the water-point was assigned a deep rating. The associated DHI values with these ratings are expressed in Table 4.

Table 4: Spring Type Index

Spring Type	Superficial	Intermediate	Deep Flow System
DHI Value	0	0.5	1

7) *Distance from Tunnel (DT)*

The distance from each water-point to the tunnel was measured using an ArcGIS program accounting for 3-D directionality. The value assigned to each water-point is the distance from the tunnel to the surface expression of the water-point. According to Table 1, six discrete DHI values can be assigned to varying distances (Table 5). These were applied to each individual water-point, as presented in Table 6.

Table 5: Distance Index

Distance (m)	> 800	600 – 800	400 – 600	200 – 400	100 – 200	<100
DHI Value	0	0.1	0.2	0.4	0.8	1

Results and Conclusions:

DHI values associated with each water-point indicate that all forty-six of the springs are rated at having low or medium risk of partial drawdown, with no water-points receiving a negligible or high risk warning. The data used is shown in Table 6.

- Negligible: DHI <0.2 null to minimal drawdown (high probability)
- Low: 0.2< DHI <0.6 Partial drawdown
- Medium: 0.6 < DHI < 0.7 Partial to complete drawdown
- High: DHI > 0.7 Complete Drawdown (high probability)

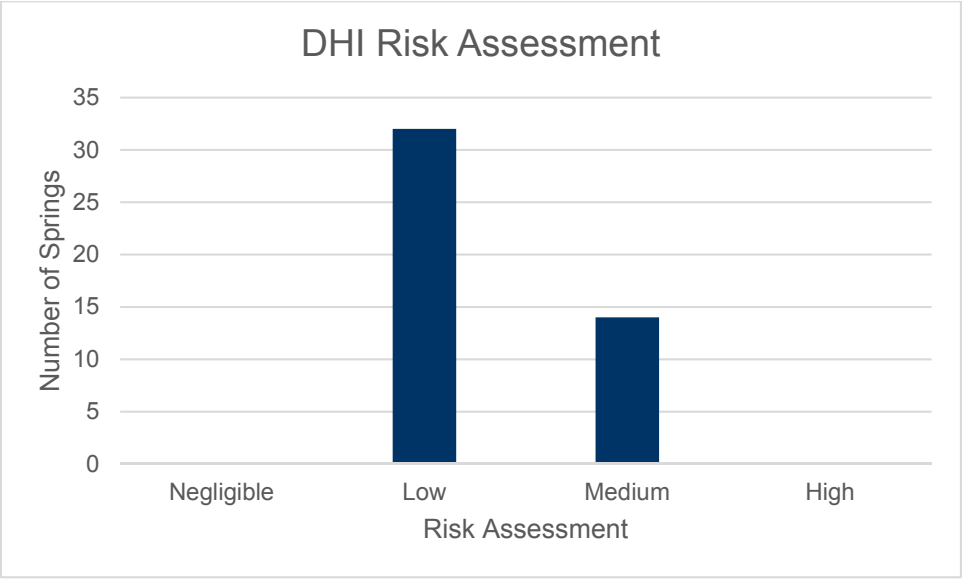


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Table 6: DHI Value Risk Assessment

Water-point	DT (Distance from the tunnel)		IF (Intersection with major faults)		ST (Spring type - deep or shallow)		FF (Frequency of Fracturation)		MK (Degree of Permeability)		OV (Overburden)		PZ (Amplitude of the Pastic Zone)		DHI Vaule	Risk Assessment
	Measurement (m)	DHI Value	Measurement	DHI Value	Measurement	DHI Value	Measurement (λ)	DHI Value	Measurement	DHI Value	Measurement (m)	DHI Value	Measurement	DHI Value		
Budget form Mul	569.536	0.2	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	393	0.1	~10	0.30	0.395775	Low
Bhatermul	562.423	0.2	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	338	0.1	~10	0.30	0.395775	Low
#3 Bhatermul	212.272	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	137	0.25	~10	0.30	0.515288	Low
Nagh Dhungamul	325.656	0.4	No	0	Superficial	0	1.67 to 5	0.1875	Low	0.30	317	0.1	~10	0.30	0.307825	Low
Gumboatingmul	323.501	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	192	0.25	~10	0.30	0.515288	Low
Kulumul	194.385	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	151	0.25	~10	0.30	0.662513	Medium
Thankukola mul	174.252	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	154	0.25	~10	0.30	0.662513	Medium
Wamrang mul	254.768	0.4	No	0	Superficial	0	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.343525	Low
Besimul	288.205	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.515288	Low
Unidentifed mul #1	214.717	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	172	0.25	~10	0.30	0.515288	Low
Unidentifed mul #2	214.717	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	172	0.25	~10	0.30	0.515288	Low
Fulbarimul	125.843	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	137	0.25	~10	0.30	0.662513	Medium
Peepal botmul	173.182	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	152	0.25	~10	0.30	0.662513	Medium
Prajomul	137.946	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	188	0.25	~10	0.30	0.662513	Medium
Majhowamul	162.035	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	137	0.25	~10	0.30	0.662513	Medium
Gansingmul	123.023	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	137	0.25	~10	0.30	0.662513	Medium
Chitaumul	185.991	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	200	0.25	~10	0.30	0.662513	Medium
ThuloDhungamul	424.749	0.2	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.441675	Low
Manchumul	1559.627	0	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.368063	Low
Mnchu mul-2	551.562	0.2	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	154	0.25	~10	0.30	0.441675	Low
Mnchu mul-3	648.761	0.1	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	154	0.25	~10	0.30	0.404869	Low
Ghattekholamul	658.186	0.1	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	151	0.25	~10	0.30	0.404869	Low
Panglingkholamul	1890.013	0	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	192	0.25	~10	0.30	0.368063	Low
Sano hakumul	996.211	0	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.368063	Low
Chanchane mul-1	710.201	0.1	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	465	0.1	~10	0.30	0.362794	Low
Chanchane mul-2	712.992	0.1	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	465	0.1	~10	0.30	0.362794	Low
Amchuroamul	10373.373	0	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	75	0.5	~10	0.30	0.431813	Low
Thangachuebamul	505.208	0.2	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	71	0.5	~10	0.30	0.518175	Low
Kulmowamul	342.376	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	137	0.25	~10	0.30	0.515288	Low
Bhumedhanmul	353.330	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	215	0.1	~10	0.30	0.461738	Low
Milisongmul	277.353	0.4	No	0	Superficial	0	1.67 to 5	0.1875	Low	0.30	287	0.1	~10	0.30	0.307825	Low
Kakasongmul	249.075	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	170	0.25	~10	0.30	0.515288	Low
Gulunglungmul	159.202	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.662513	Medium
Gulunglung mul-2	162.005	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.662513	Medium
Gulunglung mul-3	162.800	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	177	0.25	~10	0.30	0.662513	Medium
Chirwatikhola mul	153.479	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	170	0.25	~10	0.30	0.662513	Medium
chirwati mul	145.851	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	170	0.25	~10	0.30	0.662513	Medium
Thungbar mul	538.623	0.2	No	0	Superficial	0	1.67 to 5	0.1875	Low	0.30	229	0.1	~10	0.30	0.26385	Low
Garuwa mul	458.106	0.2	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	137	0.25	~10	0.30	0.441675	Low
ThuloDhunga mul	311.910	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	131	0.25	~10	0.30	0.515288	Low
Thangachanwameri m	239.857	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	137	0.25	~10	0.30	0.515288	Low
Ghattekholamul	159.320	0.8	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	123	0.25	~10	0.30	0.662513	Medium
Ghattekhola mul-2	209.182	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	123	0.25	~10	0.30	0.515288	Low
Khuleamul	475.661	0.2	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	56	0.5	~10	0.30	0.518175	Low
Chiuribotmul	331.783	0.4	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	141	0.25	~10	0.30	0.515288	Low
Bhakchung Khola	1587.745	0	No	0	Intermediate	0.5	1.67 to 5	0.1875	Low	0.30	297	0.1	~10	0.30	0.329813	Low

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This risk assessment is driven by geological and hydrogeological factors, and does not take into consideration potential risks to communities (e.g., springs providing water to villages) into the risk rating. Figure 2 shows the location and risk rating of each spring relative to local communities. Appendix A identifies the agricultural, domestic, and animal use of each spring.

These data indicate that several of the Medium Risk rated springs are used for agricultural use and serve as a source of domestic water for some villages:

- Thanku – Springs #6 and 7
- Phulbari – Springs #12, 13,14,15, and 16
- Haku Besi – Spring #17
- Gogone – Springs #33, 34, 35, 36, 37, and 42

NWEDC indicates that it will grout the tunnel when construction encounters any significant groundwater seepage, which should reduce the potential for the UT-1 Project affecting any springs relied on by local villages.

ERM further recommends that NWEDC monitor flow in the medium risk rated springs during tunnel construction to detect if the project tunneling is affecting the flow in springs. If a change in flow is detected that cannot be attributed to changes in precipitation, then NWEDC should inspect the tunnel and provide supplemental grouting. If supplemental grouting does not mitigate the impact, NWEDC should provide alternative water supply for the affected households.

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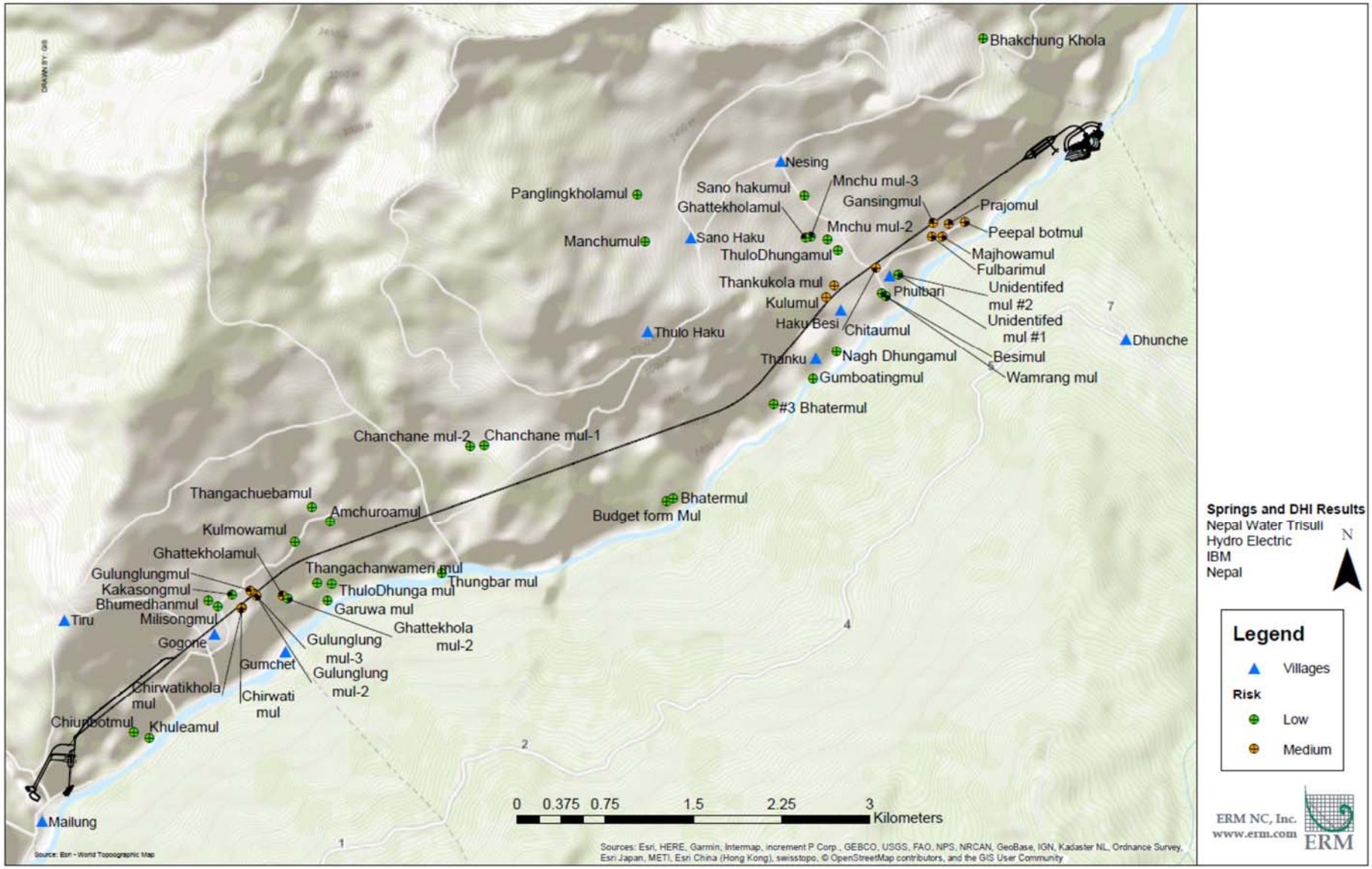

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Limitations and Restrictions:

This is a high level risk assessment and should be updated as new information becomes available. That being said, there are other considerations that should be acknowledged that have already incorporated into this assessment.

- DHI: Since the original creation of the DHI (Dematteis et al. 2001), new variables have been proposed to the original equation to account for more interplay between the variables and better reflect the actual hydrogeological and geologic conditions that a site area experience. For the purposed of this study, the topographic effect (ET) that Torri et al. (2007) proposed was not included because this variable was not part of the original equation. Additionally, the available dataset does not have this information readily available and it cannot be calculated accurately.
- Major faults (FF): Any fault or sheer zone not adequately mapped and accounted for would drastically increase the permeability of the rock and increase the drawdown risk to the water-point in question.
- Rock permeability (MK): Further hydraulic testing utilizing slug tests would give an exact hydraulic conductivity value that could more accurately represent discrete sections of the tunnel.
- IF, FF, and MK were utilized ubiquitously across the entire length of the tunnel, without specific discreet values. Usually a 300m-tunnel segment is thought to be a more representative sample, but because of the data available for this study, the tunnel is assessed as one unit. Without more individualist data, averages and professional judgement were used.

ATTACHMENT 3 – SUPPLEMENTAL SOCIAL INFORMATION – NESING VILLAGE

Supplemental Social Information

Nesing Village

8 March 2019

Prepared for:
Nepal Water and Energy Development Company (NWEDC) and International Finance Corporation (IFC)

The business of sustainability

ERM

CONTENTS

List of Tables

Acronyms and Abbreviations

CFUG	Community Forestry User Group
FPIC	Free, Prior, and Informed Consent

1. INTRODUCTION

The Village of Nesing was added to the Free, Prior, and Informed Consent (FPIC) process of the Upper Trishuli 1 ("UT-1" or the "Project") project following the initial consultations with the local community. This summary presents the findings/observations from the consultations undertaken at Nesing village in October 2018.

As part of the site visit, consultations were undertaken with the local community in the village and the Community Forest Working Committee Member. Presented below is a brief profile of the village in terms of demographics, livelihoods, and dependence on the community forest and the Trishuli River. In addition, key feedback received in terms of interaction with the project and key expectations from the project are also provided.

1.1 Socio-Economic Profile of the Nesing Village

The following table provides the socio-economic profile of the Nesing village. This profile is based on the October 2018 consultations with the local community.

Table 1-1: Nesing Village Socio-Economic Profile

<table>
<tr><th>Category</th><th>Details</th></tr>
<tr><td>Demographic Profile</td><td>

The village Nesing is comprised of 73 households, with a population of approx. 593. Of these households, only two belong to the Dalit population, the rest are Tamang.
The village lies in the Parvati Kunda Gaon Palika, ward 2, which has now been renamed as the Aama Chodunga Gaon Palika

</td></tr>
<tr><td>Livelihood Profile</td><td>

The main sources of livelihood for the community are agriculture and livestock holdings.
The main livestock groups include yak, cow, buffalo, goat, hen and sheep. The community also maintains cross breeds between yaks and cows called the 'Jomo', useful for milk and Cheese;
The community consumes the meat to the yak, cow, and Jomo only if the animal dies due to natural causes; however, buffalo, goat and sheep are used for meat as well
The main crops grown by the village include potato, corn, beans, wheat, millet, maize, barley and naked barley. The agriculture is primarily subsistence agriculture, with only a small proportion of farmers selling potatoes. The crop season is as follows

<table>
<tr><th>Crop</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>Jun</th><th>Jul</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td>Beans</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Naked Barley</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Potato</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Maize</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Barley</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Wheat</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

In order to ensure productivity of the land, most land owners alternate agricultural activities across their land parcels, with land parcels being left fallow during alternative seasons

</td></tr>
</table>

	■ In addition to the farm based livelihoods, the local community (especially the younger population) depends on wage labour for income. This wage labour is primarily in the tourism sector as guides and porters. Some of the younger population also migrate to other parts of Nepal and other countries (primarily middle east and India) for labour ■ There are a few individuals who are also engaged in the service sector, in government and non-government work sectors
Community Forest and the Dependence on the same	■ The community forest for the village is named Jhomo Kharkha Community Forestry User Group (CFUG). However, the respondents were not sure of the total area of CFUG land ■ The CFUG has 71 user households and 21 committee members, of which 9 are women ■ The vegetation in the community forest area is primarily pine trees ■ The dependence on the community forest is primarily in terms of the following: - collection of grass for fodder - 6 months in a year - firewood-only; 4-5 households have gas, the rest are dependent on firewood year round, - timber – all year round on an as-needed basis - red mushrooms (Rato Chyau) for commercial value - these are only found in the monsoon seasons and are sold primarily in China. The value of these is NPR 7,000/kg - Ban mara - for cuts - Chiraitu - for fevers/coughs - Bojho - for coughs - Wild tea - Singha tree - believed to cure " possessions", used by witch doctors ■ Hindered access to the community forest would result in an expenditure of 2,000 NPR for gas per month. The average cost of constructing a house with timber is 1,50,000 NPR ■ On average, the community reported earning approx. 1,00,000 from the NTFPs and mushrooms collected from the CFUGs ■ The common fauna found in the area (CFUG and Langtang) includes musk deer, bear, porcupine, wild boar and various frog species ■ There are three religious sites within the community forest area: - Parankharkha Kunda -in the north towards the summit of the mountain - Lai Than – a place within the community forest where prayers are offered every full moon - Yurmu Kunda – Teen Dhara Kunda – also in the north of the community forest area

	■ The main source of water in the village is the Haajung khola (shared with village Grey), which provides water for 3-4 months. The remainder of the year, the main source of water is the Teen Dhara Kunda. There are three water mills in the village, two of which derive their water from the Teen Dhara Kunda and one from the Haajung Khola. the two mills connected to the Teen Dhara Kunda run for 6 months. These Kholas and Kundas are connected to the village through pipes which supply water to common taps in the village area ■ During the month of Badho (Purnima) there are prayers offered at the two Kundas (ponds) ■ According to the community, these religious sites and Kundas are in the north of the community forest and are not expected to be impacted by the project directly ■ However, there is one smaller Kunda in the impacted area - Chengu Kunda/ Yachungva Kunda – the local belief surrounding this Kunda is that the water from this Kunda cures diseases ■ Apart from this, the project is expected to impact the collection of herbs, red mushrooms and the Singha tree ■ Prior to the earthquake, the community was required to pay the CFUG for the timber used, however, since the earthquake no payment has been made
Dependence on Trishuli River	■ The community did not report any specific dependence on the river in terms of fishing. Reportedly no household engages in fishing activities. if required, the local community purchases fish from Dhunche or Syfru ■ The community reported that most households (barring 5-6) have private land (with Lal Purzas) near the river/dam area, this is called Nechanva. This was primarily used to grow paddy. The community used this land primarily for agricultural purposes, and lived in the land temporarily; however, this land was damaged by the landslides post-earthquake and since then has not been used by the community for cultivation. ■ None of this private land is reported to be within the project footprint area. it is understood to be 20 metres above the dam area
Impact of Earthquake	■ The village was not severely hurt due to the earthquake, with most of the community not evacuating the village. Only 4-5 households migrated to Syfru Besi, Dhunche and Kathmandu and these have since then returned to the village. However, some structures were damaged due to the earthquake. According to the geological survey undertaken, this village is safe for habitation ■ Some households have migrated to Dhunche and Kathmandu for better education opportunities for their children ■ At the time of the earthquake, the community was provided sustenance support from NGOs - in the form of Tarpolin Sheets and food ■ The government provided monetary support for re-building structures. A total of 3 lakh NPR was provided in three instalments for the same (50,000-1,50,000-1,00,000) ■ According to the community, all members of the community have received the monetary support for rebuilding their structures, except for 4 households (3

	Tamang and 1 Dalit) who were not present in the village at the time of the initial survey ■ One of the biggest losses from the earthquake was stored seeds for the next agricultural cycle. This impacted the immediate cropping cycle of potato, maize and barley in that year ■ Due to that fact that most of the youth had migrated to other cities immediately after the earthquake for quick cash, there was also a shortage of labour in agriculture. This continues to persist at a lower level ■ For two years after the earthquake, they were sustained through government and NGO support as well as using the land parcels that were not impacted by landslides ■ 30 people (6 women and 24 men) received training with certifications in house construction by Malritas Nepal. Most of these people, used this training to rebuild the houses in the village itself. Some men have continued to use this skill in Dhunche and other cities ■ As part of the training, a daily allowance of NPR 250 per day was provided. The training was held within the village itself, and was for a duration of 50 days.

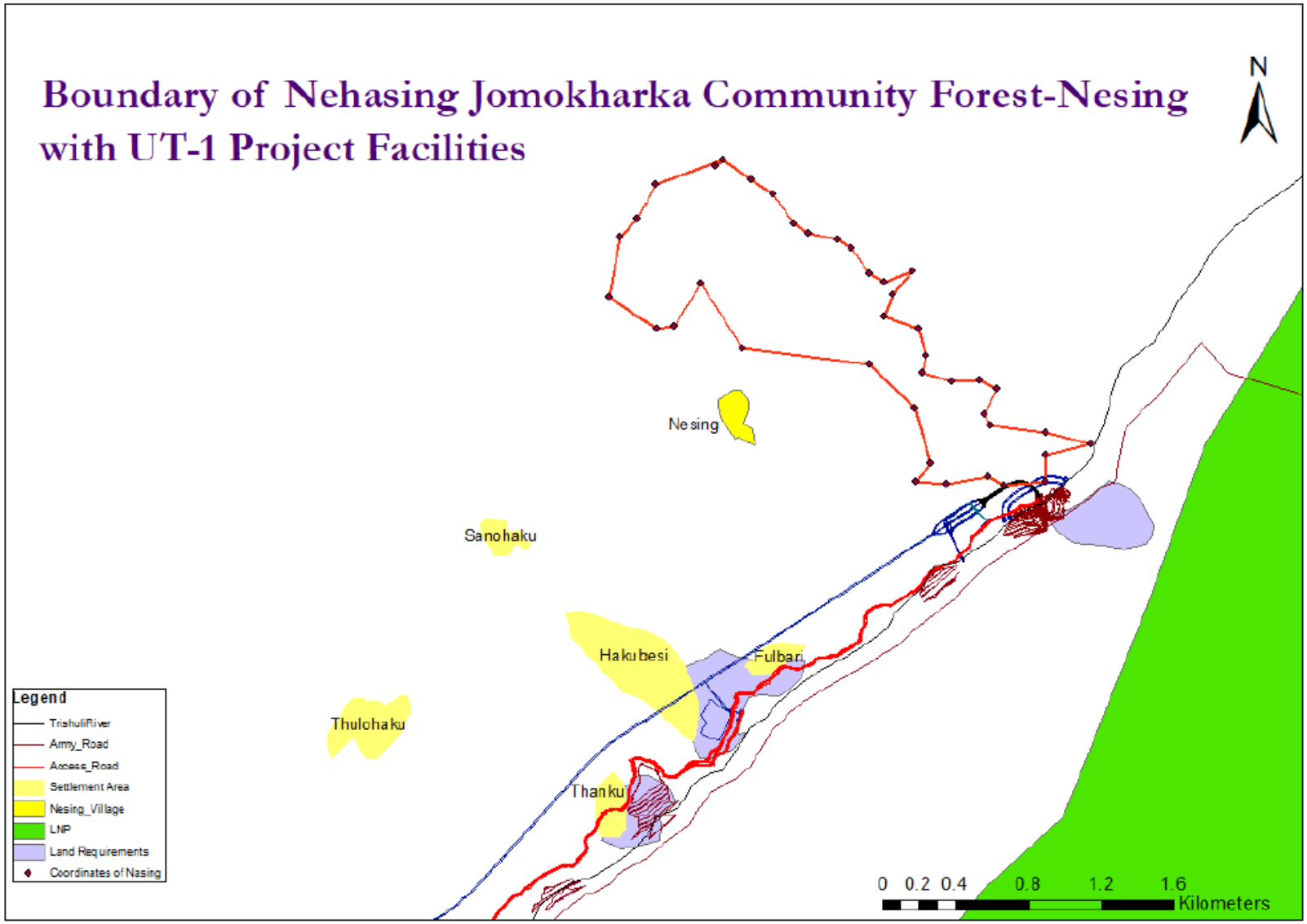
2. KEY STAKEHOLDER FEEDBACK

As stated above, consultations were undertaken with the local community members (including women representatives from the village) and a Community Forest Working Committee Member. Key feedback received as part of the consultations is as follows:

- Engagement by the Project:
  - The community reported that Nesing village and potential impacts from the project were not covered as part of the previous assessments, they were not adequately informed of the project footprint and the land affected by the project
  - However, once the community flagged this issue with the project and lenders, immediate action was taken to ensure the involvement of the village in the FPIC process. A total of 10 members are part of the working committee formed for the FPIC process. This comprises of 2 women, 2 Lama, 2 socially active members of the community and 2 elderly community members;
  - It was the understanding of the community members that post the completion of the FPIC process, an agreement will be signed between the project and the local community stating the commitments of both the parties, which would be binding in nature and would guide the project activities (*It should be noted that this process has since been completed)*
  - NWEDC undertook disclosure of the project, its potential impacts and proposed mitigation measures at the village level as well;
- Key Potential Impacts:
  - The main concern of the community was the loss of CFUG area which is within the area identified for the dam.
  - Another concern of the community was in terms of the impacts on the village from the blasting activities
  - The dependence on the CFUG land overall is in terms of collection of fodder, timber, firewood and NTFPs including herbs, red mushrooms and the Singha tree;
  - There are also three religious sites and ponds each within the CFUG area. These however are in the northern portion of the CFUG and are not expected to be directly impacted by project activities. However, one small Kunda is in the impacted area (Chengu Kunda/ Yachungva Kunda). According to local belief, this Kunda's water cures diseases
  - However, the village was appreciative of the improved connectivity due to the construction of the project road near Haku Besi and the army road on the other bank
  - The community did not report any specific dependence on the river in terms of fishing. Reportedly, no household engages in fishing activities. if required, the local community purchases fish from Dhunche or Syfru
  - The community reported that most households (barring 5-6) have private land (with Lal Purzas) near the river/dam area, this is called Nechanva. This was primarily used to grow paddy. The community used this land primarily for agricultural purposes, and lived in the land temporarily. however, this land was damaged by the landslides post-earthquake and since then has not been used by the community for cultivation.
  - None of this private land is reported to be within the project footprint area. it is understood to be 20 meters above the dam area. However, this land may be indirectly impacted due to activities such as blasting
- Key Expectations from the Project:
  - Employment for local community members

- Protection of religious structures and locations of the community
- Skill development trainings
- Protection of the Tamang culture
- Reconstruction of Ghyan Ghumbha
- Protection of Teen Dhara Kunda
- Provision of irrigation
- Drinking water for livestock
- Protection of structures and lands from impacts of blasting and mitigation of any impacts from the same
- Restoration of Nechanva land and provision of irrigation in the same

ATTACHMENT 1 NESSING VILLAGE LOCATION


Boundary of Nehasing Jomokharka Community Forest-Nesing with UT-1 Project Facilities
N
Nesing
Sanohaku
Hakubesi
Fulbari
Thulohaku
Thanku
Legend
TrishuliRiver
Army_Road
Access_Road
Settlement Area
Nesing_Village
LNP
Land Requirements
Coordinates of Nasing
0 0.2 0.4 0.8 1.2 1.6
Kilometers