Environmental and Social Impact Assessment (Draft): Appendices (Part 1)

Project Number: 49086-001
March 2018

NEP: Upper Trishuli 1 Hydropower Project

Prepared by Environmental Resources Management (ERM)

Appendix A
Environmental and Social Management System

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ATTACHMENTS

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ACRONYMS AND ABBREVIATIONS

CESMP	Construction Environmental and Social Management Plan
CSE	Construction Supervision Engineer
E&S	environmental and social
EHS	environmental, health, and safety
EIA	Environmental Impact Assessment
EPC	engineering, procurement, and construction
ESHS	environmental, social, health, and safety
ESIA	Environmental and Social Impact Assessment
ESMMP	Environmental and Social Management and Monitoring Plans
ESMC	Environmental and Social Management Cell
ESMS	Environmental and Social Management System
EST	Environmental Supervision Team
ESST	Environmental and Social Supervision Team
GIIP	Good International Industry Practice
GM	General Manager
IFC	International Finance Corporation
NWEDC	Nepal Water and Energy Development Company
O&M	operations and maintenance
OE	Owner's Engineer
PMO	Project Management Office
SEO	Safety and Environmental Officer
SOP	Standard Operating Procedure

1. INTRODUCTION

1.1. PURPOSE

The Environmental and Social Management System (ESMS) has been prepared for Upper Trishuli-1 Hydropower Project (Project) for the purpose of defining standards, protocols, and procedures at the project level for managing environmental and social risks and opportunities associated with the project construction and operation activities. The ESMS establishes the Project's commitment to put in place an adequate management system to manage the environmental and social (E&S) impacts and associated risks arising from the Project, as well as to ensure that the Project is developed and operated in a sustainable manner. The applicable reference framework against which the ESMS has been developed included national, international, and lender regulations, which have been included in Chapter 5, Applicable Legal and Lender Requirements.

1.2. OVERVIEW

The ESMS developed by Nepal Water and Energy Development Company (NWEDC) for the Project defines the environmental, social, health, and safety (ESHS) principles, objectives, and protection measures that ensure the project does not cause any harmful impacts. Contractors, including engineering procurement and construction (EPC) contractor and operation and maintenance (O&M) contractor, will follow the ESMS. NWEDC retains ultimate responsibilities for the environmental, health, and safety (EHS) performance of all contractors.

This ESMS will be updated and/or revised as necessary to address the prevailing conditions and stage of the Project. Responsibilities for implementation of identified mitigation or management actions are outlined in the Environmental and Social Management and Monitoring Plans (ESMMP) for the Project. NWEDC's Environmental and Social Management Cell (ESMC) along with the Owner's Engineer (OE) will oversee and monitor the implementation of relevant ESMMP elements by the EPC/O&M contractors and subcontractors. ESMC and OE will monitor, audit, and assess the compliance of the EPC contractor's implementation of the relevant aspects of the ESMMP during the construction phase and ensure that corrective actions are taken when necessary to maintain EHS performance in line with international standards and Good International Industry Practice (GIIP).

This ESMS should be read along with the ESMMP and update accordingly, should there be relevant changes to the Management plans.

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2. COMPANY ESHS POLICY

NWEDC adopted an Environmental and Social Policy Statement on 19 December 2016, which was formally executed by its Chief Executive Officer, Bo Seuk Yi (see Attachment 1).

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3. COMPANY EHS STAFFING

The Project will establish an organisational structure at the corporate and site level to manage environmental, health, safety and social impacts and to aid in meeting their respective goals and objectives as well as implementing the Project's commitment through their respective policies. Figure 1 highlights the Project's development and management organisational structure.

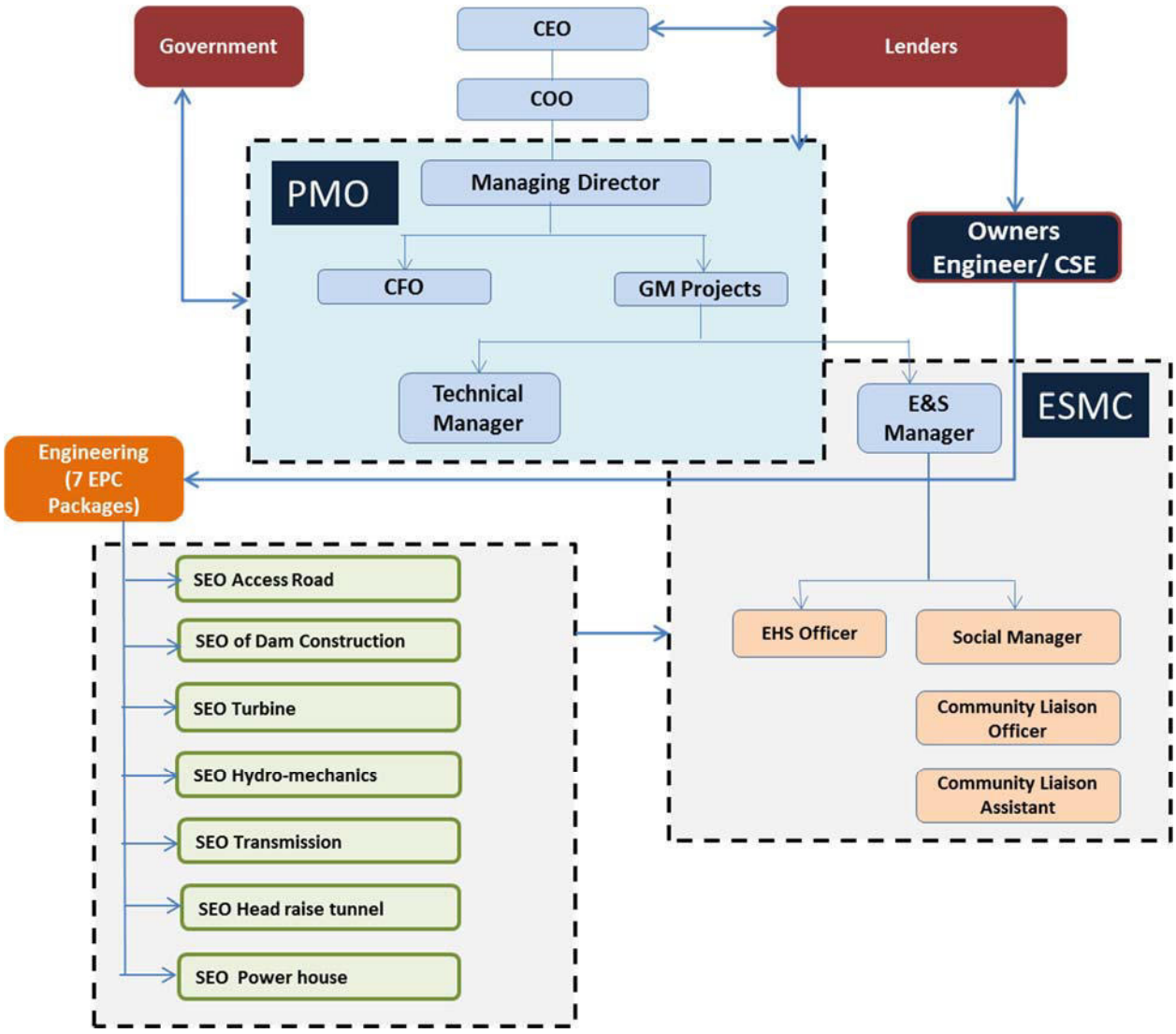

Figure 1: UT-1 ESMS Implementation Organisational Chart

3.1. KEY STAKEHOLDERS FOR ESMS IMPLEMENTATION

The Project Management Office (PMO) has the ultimate responsibility for the Project and is supported by the ESMC in managing the environmental and social impacts. The ESMC will be responsible for the overall implementation of the ESMS and for ensuring the Environmental Impact Assessment (EIA) recommended mitigation and monitoring actions are implemented,

monitored, assessed, evaluated, and disseminated to project stakeholders for feedback and improvements. The ESMC will consist of the following personnel:

- An Environmental and Social (E&S) Manager at the corporate level (already appointed);
- One Social Manager supported by two community liaison officers at the site level; and
- Two to three E&S officer (already appointed).

3.2. ROLES AND RESPONSIBILITY

3.2.1. Construction Phase

See Table 1 for the various departments and personnel that will play an integral role in the implementation of the ESMS. In addition to the various departments and responsibilities presented in Table 1, the Corporate E&S Manager will present the key observations, findings, and issues as well as the findings of the external consultant/OE's findings to the Board on a monthly basis.

Table 1: Department Roles and Responsibilities in the Construction Phase

Designation	Description	Responsibilities (not limited to)
Project Management Office (PMO) ESMS committee (PMO and Environmental and Social Manager)	The PMO will comprise of the General Manager (GM) Projects, Chief Financial Officer, MD and other personnel who the MD might authorize. The PMO has the overall responsibility to ensure management of the environmental and social impacts of the project.	• Remove the Contractor's representative or any employee(s) from the site or work or suspend the representative or employee if the Contractor or his employees fails to implement Environmental and Social Management and Monitoring Plans (ESMMP) until the matter is remedied. • Submit performance reports to the Lenders as per an agreed upon frequency, detailing the progress of the ESMS and any other issues therein. • Approve the qualifications and criteria for members in the Environmental and Social Management Cell (ESMC) and the Environmental Supervision Team. • Along with the E&S Manager, act as the ESMS Committee and meet once a month to discuss on the key aspects of ESMMP implementation for the Project based on the reports from Environmental and Social Management Cell (ESMC) and Owner's Engineer (OE).
Environmental and Social Management Cell (ESMC)	The ESMC will consist of community liaison officers, Environmental Health and Safety Officer, Social Manager, and one Environmental Manager. The Environmental Manager at corporate leads the ESMC.	• Ensure that the Environmental Impact Assessment (EIA) recommended mitigation and monitoring measures are being implemented, monitored, assessed and evaluated. • Obtain the necessary compliances and permits for the Project. • Provide progress/performance reports to the PMO in the ESMS committee meetings. • Stop construction in emergency situations where consultation with the Construction Supervision Engineer (CSE) or the Environmental Supervision Team (EST) is not immediately possible. • Conduct periodical inspection of construction site. • Consult and/or communicate with the local communities, project-affected people, regulatory agencies, and other stakeholders during the project preparation and construction to ensure that they have full knowledge of project progress, potential issues and mitigation actions, and to listen and respond to their concerns, suggestions and demands for environmental and community protection. • Maintain open and direct lines of communication with Contractors, CSE/OE and the Environmental and Social Supervision Team (ESST) with regard to E&S matters.
Site-level EHS Team, ESMC	Will be located on-site and will report directly to the E&S Manager. They form a part of the ESMC.	• Monitor the environment health and safety activities of the Contractors on-site against the requirements in the ESMS and Management Plans. • Supervise the baseline, compliance, and impact monitoring of construction contractor's activities and advise the on-site engineers of needed actions at the site during regular environmental management meetings. • Provide needed corrective action as per the field requirements to minimize impacts. • Analyse and review the environmental monitoring report of the project construction and forward to the Corporate E&S Manager for review by stakeholders.

Designation	Description	Responsibilities (not limited to)
Site level Community Liaison Officers, ESMC	Community Liaison Officers will work in close proximity to the affected communities and settlements near the Project site. They will report directly to the Social Manager and form a part of the ESMC;	• Handle community grievances. • Implement the Livelihood Restoration Plan and the Project Development Agreement requirements related to community development and benefit sharing. • Maintain direct communication with the community on matters related to the project. • Understand the concerns of the community and communicate to the E&S manager.
Owner's Engineer (OE)/Construction Supervision Engineer (CSE)	OE/CSE will verify the ESMMP implementation and provide support as necessary. OE/CSE will be responsible for monitoring EPC contractor's compliance to the environmental issues listed in the ESMMP. The OE/CSE will report to the PMO/ESMS committee through E&S manager; The OE/CSE will supervise construction works according to the provisions of EIA, the Environmental and Social Specifications for Contractors and direct the construction contractor in consultation with the environmental engineers for the environmental improvement	• Preside over monthly Environmental Management and Health and Safety Meetings of the supervision engineers, contractors and Environmental Engineers. • Supervise the Contractor's compliance with contract specifications, including the implementation and operation of environmental mitigation measures and ensure their effectiveness, and other aspects of the ESMMP Implementation Plan. Major noncompliance by the Contractor will be cause for suspension of works and other penalties until the non-compliance has been resolved to the satisfaction of the ESMC. Contractors are also required to comply with national and municipal regulations governing the environment, public health and safety. • Instruct the Contractor(s) to take remedial actions within a specified timeframe and carry out additional monitoring, if required, according to the contractual requirements and procedures in the event of non-compliances or complaints. • Supervise the Contractor's activities and ensure that the requirements in the ESMMP and contract specifications are fully complied with. • Instruct the Contractor(s) to stop activities which generate adverse impacts, and/or when the Contractor(s) fails to implement the ESMMP requirements / remedial actions instructed by the ESMC. • Participate in the joint site inspection with ESMC. • Order site protection and report to the relevant authorities and the ESMC if the Contractor discovers cultural relics by chance. • Request and monitor Contractors' felling of trees and vegetation and ensure they are strictly in accordance with the pre-determined area, numbers, species, etc. • Engage a qualified staff, preferably a landscape architect, to review and monitor the Contractor's submitted Clearing, Revegetation and Restoration Management Plan (included in Contractor's environmental specifications), and to supervise the Contractor's landscaping works. • Monitor noise levels at sensitive receptors by use of portable noise monitoring kit. Monitoring will take place during intensive construction activities, such as excavation, piling, power generation, material transport and night time construction and will be conducted near villages, schools, and other sensitive receptors along the project alignment. • Conduct visual inspections to check for air-borne dust during demolition, bulk material handling and storage, and transportation routes near the villages;

Designation	Description	Responsibilities (not limited to)
		• Conduct visual inspections to check water quality in receiving rivers, fish ponds, and lakes affected by the construction activity. Check for turbidity, odour, colour, fish kills, etc., at discharge points in water bodies adjacent to construction sites and construction camps. • Prepare reports for environmental monitoring data and site environmental conditions. • Adhere to procedures for carrying out grievance and complaint investigations. • Review and approve relevant Standard Operating Procedures (SOPs) prepared by the Safety and Environmental Officer (SEO) and EPC Contractor in coordination with ESMC.
EHS personnel of OE/CSE	OE/CSE is expected to have EHS personnel to look after the E&S performance of the project.	• Carry out environmental site inspections to assess and audit the Contractors' site work practices, equipment, and work methodologies with respect to pollution control and adequacy of environmental mitigation measures implemented. • Monitor compliance with environmental protection measures, pollution prevention, and control measures and contractual requirements. • Investigate complaints and recommend any required corrective measures. • Advise the Contractor on environment improvement, awareness, and proactive pollution prevention measures. • Complete start-up, weekly, monthly, and site-closure checklists. • Follow the procedures in the ESMMP and recommend suitable mitigation measures to the Contractor in the case of noncompliance. Carry out additional monitoring of noncompliance within the specified timeframe. • Submit Contractor’s ESMMP Implementation Plan reports to the ESMC and relevant administrative authorities, if required. • Keep detailed records of all site activities that may pertain to the environment. • Supervise construction works where environmental management is a key aspect (e.g. in sensitive areas, with high environmental risk, etc.). • Keep a photographic record of progress on site from an environmental perspective. • Keep a register of complaints in the site office and recording and dealing with any community comments or issues. • Keep a record of on-site incidents and accidents and how these were dealt with. • Implementing the BMP with the support of the ESST
EPC Contractor and contractors for separate work packages	Key responsibility for implementation of the requirements of the mitigation activities in the construction ESMMP. The EPC contractor will be responsible for subcontractor(s) performance including	• Develop a project specific CESMP and elaborate other parallel sub plans. • Provide a construction site layout plan that identifies key activity area including laydown, accommodation and parking etc. prior to commencement of works. • Produce detailed method statements relating to key activities that include specific reference to requirements of the plans contained herein during the Project progression. • Provide all training necessary to oversee and implement ESMMP requirements. • Be responsible for producing comprehensive suite of EHS management and coordination procedures.

Designation	Description	Responsibilities (not limited to)
	subcontractor(s) adhere to the requirements of the Construction Environmental and Social Management Plan (CESMP).	• Identify a full-time person on site with dedicated EHS responsibilities to oversee works on site (SEO). • Ensure that all subcontractor(s) have dedicated EHS staff to implement the CESMP and monitor and manage this on an on-going basis. The subcontractor(s) staff will be required to liaise closely with the EPC contractor EHS staff, including the provision of monthly reports and participation in weekly construction review meetings. • Comply with relevant legislative requirements governing environment, public health, and safety. • Work within the scope of contractual requirements and other tender conditions. • Organize representatives of the construction team to participate in the joint site inspections undertaken by the ESMC. • Carry out any corrective actions as instructed by the ESMC or the OE. • Provide information to and update the OE regarding works activities that may result in adverse environmental conditions. • In case of non-compliances/discrepancies, carry out investigation and submit proposals on mitigation measures, and implement remedial measures to reduce environmental impacts. • Stop construction activities that generate adverse impacts upon receipt of instructions from the ESMC or OE. Propose and carry out corrective actions and implement alternative construction method, if required, to minimize environmental impacts. Major noncompliance by the Contractor will be cause for suspension of works and other penalties until the noncompliance has been resolved to the satisfaction of the ESMC.
Workplace Safety and Environmental Officer (SEO) of each of the seven packages	To be appointed by each of the EPC contractors for relevant work packages.	• Oversee the Contractor's internal compliance with the ESMMP requirements and ensure that the environmental specifications are adhered to. • Carry out regular environmental site inspections to monitor compliance with the environmental protection measures • Submit the Contractor's ESMMP Implementation Plan to the ESMC, EST, PMO, and other relevant authorities as required. • Prepare relevant SOPs as required, detailing the step-by-step actions, responsibilities, and the monitoring mechanism and get it approved with ESMC. • Investigate complaints and recommend any mitigation measures. • Prepare relevant reports and submit to the ESMC and OE/SCE as per pre-identified frequencies; • Inform both OE/SCE and ESMC about any incidents/accidents within 12 hours. • Work in close coordination with ESMC's site team. • Take prime responsibility for practical implementation of the environmental management. • Oversee and ensure the implementation of the CESMP and parallel management plans (with support from the EPC contractor EHS Expert and Construction Manager and ensure all contractors and subcontractors are in compliance with the CESMP requirements. • Review and report performance to the EPC contractor Construction Manager.

Designation	Description	Responsibilities (not limited to)
		• Review subcontractors' environmental protection/mitigation measures to ensure compliance with the CESMP. • Report any CESMP noncompliances to the EPC contractor Construction Manager on a daily basis. • Carryout regular environmental awareness sessions and assist personnel in applying environmental standards on site. • Conduct regular audits/inspections to check that committed impact mitigation measures are being implemented. • Act as the first point of contact on environmental matters for the EPC contractor, for the government authorities, other external bodies and the general public
ESST (Environment and Social Supervision Team)	ESST on-site comprising of EPC site head and SEO, OE/CSE Engineer and E&S person (representatives of ESMC) and site head	• Meet once a month to discuss on E&S aspects and ESMMP implementation. • Carry out audits as relevant. • Monitor the implementation of the BMP. • Discuss on correction actions required. • Agree on key decisions to be taken. • Report to the PMO the minutes for approval of any key decisions and/or sanctions.

3.2.2. Operations Phase

The proposed operations phase organizational structure is shown in **Error! Reference source not found.**. The Environment and Social Supervision Team (ESST) will be comprised of the O&M site head and SEO, representatives of ESMC, and site head, and will meet once in a month to discuss on the overall E&S performance, ESMMP implementation, and take key decisions as relevant. The Minutes of the Meeting will be sent to the PMO at the corporate level for approval and sanctions as necessary. Also many of the OE functions during the construction phase will be taken over by the ESST during the operations phase as the accident/incident analysis etc.

The roles and responsibility will be similar to construction stage apart from the CSE/OE which will cease to exist beyond two years of operations stage; i.e. the period from which NWEDC awards Provisional Acceptance Certificate (PAC) to EPC contractor to the time NWEDC awards Final acceptance certificate (FAC).

An external consultant should be hired by NWEDC to monitor the progress on a six-monthly basis in the operations phase depending upon its internal monitoring requirements or lenders requirement.

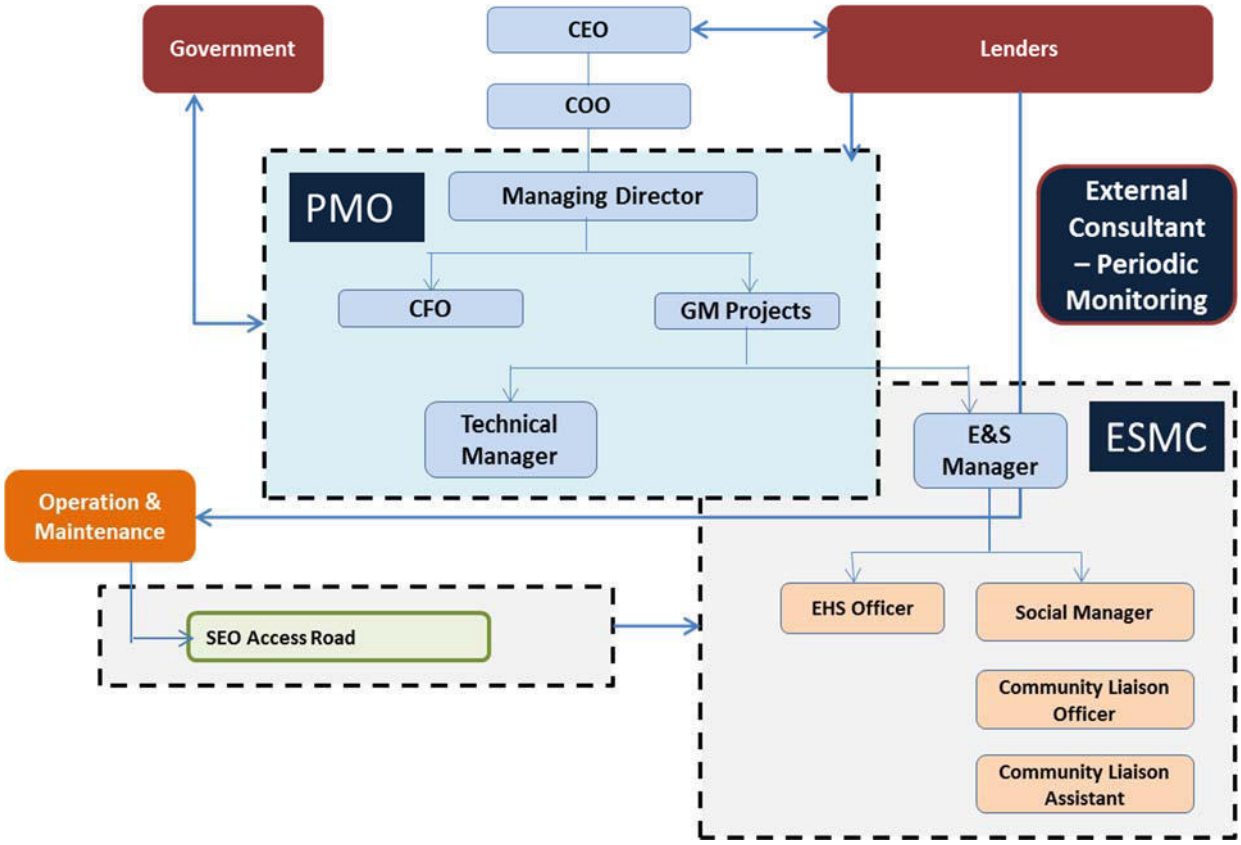

Figure 2: UT-1 ESMS Implementation Organisational Chart (Operation Stage)

4. CODE OF CONDUCT

A major concern during the construction of large hydroelectric projects is the potential negative impacts that might arise from the interaction of outside workers with local communities. For this reason, it is required that NWEDC establish a Code of Conduct that emphasizes the importance of appropriate behaviour, respect for local communities and customs, and compliance with relevant Nepalese laws and regulations.

All contractors of NWEDC should sign and follow the Code of Conduct. Each NWEDC and Contractor employee working on the Project shall be informed of the Code of Conduct once she/he has signed the contract to work for the Project. The Code of Conduct should be available to local communities at the Public Information Centres established for the Project.

The Code of Conduct should address at least the following topics:

- All the workers/labourers shall comply with the laws and regulations of Nepal;
- All illegal substances, abuse of drugs and alcohol, carrying of firearms, as well as pornographic material and gambling shall be prohibited;
- Fighting (physical or verbal), creating nuisances and disturbances in or near communities, or disrespecting local customs and traditions shall be prohibited;
- Smoking shall only be allowed in designated areas;
- Workers shall follow appropriate standards of dress and personal hygiene while visiting local communities and in the accommodation quarters; and
- Workers visiting the local communities shall behave in a manner consistent with the Code of Conduct.

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5. APPLICABLE LEGAL AND LENDER REQUIREMENTS

The ESMS has been prepared in compliance with the identified reference framework, which includes both applicable environmental and social regulations of Nepal as well as international standards such as the International Finance Corporation (IFC) Performance Standards, in keeping with the Lender requirements. Table 2 provides a brief overview of the regulations. Detailed analysis of the reference framework governing the project is provided in Chapter 3, Legislative and Regulatory Framework, of the Summary Environmental and Social Impact Assessment (ESIA).

Table 2: Applicable Reference Framework

S.No	Reference Framework	
1	Nepal Laws and Act	• Constitution of Nepal 2072 BS (2015 AD) replacing the Interim Constitution of Nepal, 2007 AD • Environmental Protection Act, 1997 • Nepal Environmental Policy and Action Plan 1993 • The Water Resources Act 1993 • Water Resource Regulation, 1993; Local Self Governance Act, 2055 BS (1998 AD) • Wildlife Protection Act, 1958 (2015 BS) • National Park and Wildlife Conservation Act, 1973 • Aquatic Life Protection Act, 1961 and First Amendment, 1998 • Soil and Watershed Protection Act, 1982 • Solid Waste Management and Resource Mobilization Act, 1987 • Forest Act, 1993 • Hydropower Development Policy, 2056 (2001) • Electricity Act, 2049 BS (1992) AD • Explosives Act, 1961 • Local Self Governance Act, 1998 • Land Acquisition Act, 2034 (1977) • Agriculture (New Arrangements) Act (1963) • Land Administration Act (1963) • Land Reform Act, 2021 (1964) • The Land Revenue or Malpot Aien (Land Administration and Revenue) Act 2034 BS (1977) • Land (Survey and Measurement) Act, (1963) • The Land (Measurement and Inspection) Act, 2020 BS (1962, as amended) • Land Acquisition, Resettlement and Rehabilitation Policy for Infrastructure Development Projects, 2071 BS (2015 AD) • The Guthi Corporation Act, 2033 BS (1976) Second Amendment 1993.
2	Nepal Rules and Regulations	• Environmental Protection Rules, 1997 • Forest Rule, 1995 • Local Self Governance Regulations, 1999 • Electricity Rules, 1993 • National Park and Wildlife Conservation Rules, 1974 • Agricultural Perspective Plan, 1995 • Forest Sector Master Plan, 1988 • Nepal Biodiversity Implementation Plan, 2003 • Revised Forest Policy, 2000 • National Conservation Strategy, 1988

S.No	Reference Framework	
		• Poverty Reduction Strategy, 2002 • Water Resources Strategy, 2002.
3	International Treaties and Conventions	• Convention on International Trade of Endangered Species • Convention on Biological Diversity 1992 • Ramsar Convention, 1971 • International Tropical Timber Agreement, 1983 • Basel Convention, 1992 • Biodiversity Convention, 1992 • ILO 169: Convention on Indigenous People
4	Guidelines	• National EIA Guidelines, 1993 • EIA Guidelines for Water Resource Sector 1994 • EIA Guidelines for Forest Sector, 1995 • Community Forest Guidelines (2001) & Inventory Guidelines (2005) • Guidelines of Use of Forestland for Other Purposes, 2006 (2063 BS) • National Health Care and Waste Management Guideline, 2002 • Guidelines on Environmental Management Plan, Monitoring and Auditing Published by MoEST, 2006 • Environmental Management Guidelines, (Road),1997 • Forest Product Collection and Sales Distribution Guidelines, 2000 (2057 BS) • Buffer Zone Management Guidelines, 1999
5	International requirements	• IFC Performance Standards (PS 1-8), 2012 Edition • IFC/WB General EHS Guidelines (April 30 2007) • EHS Guidelines for Electric Power Transmission and Distribution (2007) • ADB Safeguard Policy Statement, 2009 • World Bank Operational Policies • OP 4.01: Environmental Assessment • OP 4.04: Natural Habitats • OP 4.10: Indigenous People • OP 4.11: Physical Cultural Resources • OP 4.12: Involuntary Resettlement • European Investment Bank's Statement of Environmental and Social Principles and Standards, 2009

EHS = environmental health and safety; EIA = Environmental Impact Assessment; IFC = International Finance Corporation; ILO = International Labour Organization; WB = World Bank

5.1. RISK MANAGEMENT

A Regulatory EIA (June 2012) and a Supplementary ESIA (December 2014) have been undertaken for the Project, per IFC Performance Standards. These documents identify the major environmental, ecological, and social impacts due to the construction and operation of the project. A Cumulative Impact Assessment was also carried out considering the all the project in the entire Trishuli watershed.

The studies assessed the impacts based on duration, extent, and magnitude during the construction and operation phases, and proposed mitigation measures that will need to be implemented. In addition, an impact assessment is presented in Chapter 7, Key Project Environmental and Social Impacts, Risks, and Mitigation, of the Summary ESIA.

Based on the measures identified, construction and operation phase management plans have been developed to ensure the impacts are managed and the appropriate mitigation measures are in

place. These plans include the following management plans for construction and the operations phase. See Appendix B, Environmental and Social Management and Monitoring Plans, for a detailed discussion of these management plans.

5.1.1. Construction and Phase Management Plans

The following management plans have been developed for the construction phase of the project:

- Air Quality
- Blasting and Explosives
- Cultural Heritage
- Emergency Preparedness and Response
- Excavation, Slope Stability, Sediment and Erosion Control
- Materials Handling and Storage
- Noise and Vibration Control
- Occupational Health and Safety
- Site Security Site
- Rehabilitation and Landscaping
- Spill Prevention and Response
- Spoil Management and Disposal
- Traffic
- Waste Management Plan
- Wastewater management
- Water Quality
- Worker Accommodations
- Stockpiles, Quarries, and Borrow Pits Impact Management
- Maintenance Management Plan

The following management plans have been developed for the operations phase of the project:

- Key Highlights of Operation Phase Mitigation Measures
- Environmental Flow Management Plan

The following general management plans have been developed for the project:

- Biodiversity Action Plan
- Stakeholder Engagement/Grievance Redress Mechanism
- Land Acquisition and Livelihood Restoration Plan

- Indigenous and Vulnerable Peoples Development Plan
- Labour Influx Management Plan
- Plans Required by the PDA
- Cumulative Impacts Management Plan; and
- Environmental and Social Management and Monitoring and Reporting Plan.

These management plans will be implemented during the pre-construction, construction, and post-construction phases of the Project development. The Contractors must be made aware of these management plans and sufficient training on implementation of the same must be provided to the workers as planned by the ESMC and agreed upon with EPC and O&M contractors.

Regular monitoring of the management plan implementation will need to be conducted by the SEO and verified by EHS personnel of OE/ESMC. The schedule of monitoring will be agreed upon with the Lenders and in keeping with the requirements in the management plans, if any.

5.1.2. Operation Phase Management Plan

During the operation phase of the project, the main impact will be due to the improper management of environmental flow in the area, which will lead to deterioration of water quality and will subsequently impact aquatic habitat. Hence, the major management plan for implementation during this phase is the Environmental Flow Management Plan. Additionally, the O&M Contractors will need to implement key mitigation measures to ensure protection of environmental and socioeconomic conditions of the project site

The site EHS team within the ESMC will be in charge of ensuring that the Contractors comply with the specifications as set in the Management Plans. In addition, SEO will also ensure monitoring of management plan implementation during the project activities.

Progress reports tracking the performance of the ESMP will be sent by the ESMC for review by the Lenders, and any changes required will be submitted for review and approval. ESMC will also consolidate the findings and observations of the OE. ESMC will rely on its site level E&S staffs.

If the Contractor or his employees fail to implement the ESMMP, the PMO can have the Contractor's representative or any employee(s) removed from the site or stop work or suspended until the matter is remedied.

External consultants should also be hired on annual basis to track the performance of the ESMS implementation, including the ESMMP implementation and E&S status of the Project. These reports should be shared with the PMO and lenders and action taken based on the same to meet the gaps.

6. ESHS TRAINING

Training is one common method of supplying individuals with additional skills and knowledge. To be successful, training programs need to be thought out carefully and systematically. A robust social, environmental, health, and safety training plan is important for effective implementation of an ESMS.

An annual training calendar must be developed by the E&S manager and approved by the PMO for external trainings. Sector specialists from within the organization or from the EPC/O&M contractors or OE organization may provide the training. Training records will be maintained by the ESMC, especially internal trainings, and by NWEDC's Human Resource department, which will keep track of both internal and external trainings.

6.1. E&S-RELATED CAPACITY BUILDING FOR THE SITE-LEVEL ESMC STAFF

The ESMC staff, especially site-level staff, is required to undergo training for capacity buildings. The same should be done through both in-house and external trainings. This will ensure that they have adequate capacity for implementation of the ESMMP.

6.2. EHS-RELATED TRAINING FOR THE EPC AND O&M WORKERS/STAFF

The SEO, along with relevant personnel in the EPC/O&M team, will ensure that EHS induction and job-specific training are identified based on the existing capacity of project personnel, relevant site activities, and job assigned to an individual. The EPC/O&M SEO will also be in charge of ensuring that the trainings are provided as required and records of the same are maintained if required for review. Table 3 provides a list of trainings that should be carried out on routine basis.

Table 3: Project Operations Training Requirements

SN	Type of Training	Implementation Authority	Frequency	Documentations
1	Workshops to integrate ESMS requirements, including ESMMP with contractors' work plan	ESMC with EPC Contractor	Prior to site mobilization for construction activities	The outcome should be to clearly define the requirements/ frequencies from the EPC: Plans, SOPs, records, reports, etc., to be developed/ maintained by EPC
		ESMC with O&M Contractor	Prior to site mobilization for O&M	The outcome should be to clearly define the requirements/ frequencies from the EPC: Plans, SOPs, records, reports, etc., to be developed/ maintained by O&M.
2	Induction Trainings related to EHS and site	EPC Contractor with SEO	Prior to start of construction with quarterly refreshers as staff gets inducted	Records of person inducted and training provided
		O&M Contractor with SEO	Prior to start of O&M and as staff gets inducted and quarterly refreshers	Records of person inducted and training provided

SN	Type of Training	Implementation Authority	Frequency	Documentations
3	Job-specific safety training	EPC Contractor with SEO and relevant department	On the job prior to start of work	Records of type of training
		O&M Contractor with SEO and relevant department	On the job prior to start of work	Records of type of training
4	Environment, occupational health and safety, including PPE, fire safety, etc.	EPC Contractor and SEO	Regularly (bi-monthly) during construction	Records of training
		O&M Contractor with SEO	Monthly during operations phase	Records of training
5	Emergency response preparedness	EPC Contractor with SEO and ESMC	Regularly (bi-monthly) during construction	Records of trainings, mock drills, etc.
		O&M Contractor with SEO and ESMC	Quarterly during operations phase	Records of trainings, mock drills, etc.
6	Ecology/biodiversity conservation training	EPC contractor with SEOs and ESMC	Quarterly during construction	Records of training
		O&M contractor with SEOs and ESMC	Six- monthly during operation phase	Records of training
7	Handling community engagements and grievances	SEO, EPC and ESMC with HR	Quarterly during construction	Records of training
		SEO, O&M and ESMC with HR	Six- monthly during operation phase	Records of training
8	Training for security staff	EPC contractor with SEOs and ESMC	Quarterly during construction	Records
		O&M contractor with SEOs and ESMC	Six- monthly during operation phase	Records of training
9	Driver training	EPC contractor with SEOs and ESMC	Quarterly during construction	Records of training
		O&M contractor with SEOs and ESMC	Six- monthly during operation phase	Records of training
10	Operational trainings	O&M Contractor with SEO	Operations phase	Annual calendar with type of trainings planned
11	Environmental and social management training	EST	Throughout construction and operation phases.	Records
12	Internal training for capacity building of ESMC staff	Corporate E&S manager and personnel from relevant department	As decided	Records
13	External training for capacity building of ESMS staff	External agencies	As decided	Records
14	Others as identified			

ESMC = Environmental and Social Management Cell; EPC = engineering, procurement, and construction; O&M = operations and maintenance; PPE = personal protective equipment; SEO = Safety and Environmental Officer

Any other applicable training will be identified and implemented during the project life cycle as part of mitigation measure and also capacity building of the staffs. Also, general environmental awareness will be increased among the Project team and workers to encourage the implementation of environmentally sound practices and compliance requirements of the Project. This will help in minimising adverse environmental impacts, ensure compliance with the applicable regulations and standards, and achieve performance beyond compliance. The same

level of awareness and commitment will be imparted to the contractors and subcontractors prior to the commencement of the project. To ensure the competency of the employees, the Contractor will establish and maintain procedures to ensure that employees and workers are aware of the following:

- The significant environmental aspects and safety risks, actual or potential, of their work activities and consequences and the benefits of improved personal performance;
- Their role and responsibility in meeting policy and procedure requirements and health, safety, and environmental arrangements, including emergency preparedness and response requirements; and
- The potential consequences if operating procedures are not followed.

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7. REPORTING AND MONITORING

The E&S Manager will overlook the reporting and monitoring program of the Project. The objective of the reporting and monitoring program will be:

- To track performance of the project and compare it against the established benchmarks or requirements as set in the ESMS;
- To record information to track performance and establish relevant operational controls;
- To establish key quantitative and qualitative measures for social, environment, ecology, health, and safety indicators;
- To verify compliance against the applicable reference framework and progress towards the desired outcomes; and
- To identify any necessary preventive and corrective actions that will need to be updated into the ESMS.

The E&S Manager will receive periodic performance reviews of the effectiveness of the ESMS from the ESST on site. Based on the results, the ESMC will take necessary actions to ensure effectiveness of the ESMS. The ESMC will be presenting these reports in the ESMS committee on a monthly basis.

7.1. INTERNAL AND THIRD-PARTY REPORTING PROTOCOL

An internal reporting system shall be established to periodically monitor the effective implementation of the ESMS. Inspection and audits finding or any other informational requirements from the project shall be communicated by the SEO of EPC/O&M Contractor to the site-level ESMC on a regular basis. The site-level ESMC staff will report to the E&S Manager, who will then discuss these reports with the PMO in the ESMS committee meeting. As mentioned in Section 1.3.2, the PMO will also work as the corporate-level ESMS committee with inclusion of the E&S Manager.

The communication from the project level will be obtained by the site-level ESMC staff from the different SEOs of the seven EPC Contractors: access road construction, dam construction, hydro-mechanics, transmission line, etc.

The on-site activities will be monitored through the following mechanisms:

- SEOs of the EPC/O&M contractors;
- Site-level ESMC personnel;
- CSE/OE along with its EHS personnel during the construction Phase;
- E&S Manager/ESMC;
- Overall supervision and decision making by ESST; and
- PMO (through ESMC, EST as well as CSE/OE).

The reporting mechanisms are discussed below.

7.1.1. Contractor's Reporting Protocol

The Contractors and subcontractors on-site will be required to follow the environmental and social specifications as mentioned in the management plans for the construction and operation phases of the Project. The activities carried out will be supervised by the SEO and EHS personnel of CSE/OE and any deviations/noncompliances reported to ESMC and further to ESST and PMO.

The EPC Contractor's SEO will report directly to the CSE/OE during the construction phase and the O&M contractor's SEO will directly report to the ESMC. The contractor will be required to provide regular reports to the CSE/OE and ESMC regarding the following:

- Weekly/daily safety meeting and activities undertaken;
- Attendance for EHS trainings undertaken;
- Details and activities undertaken as part of the monthly environmental meetings;
- Attendance sheet on-site;
- Status report on ESMMP implementation;
- All the above might be consolidated into weekly/Monthly EHS monitoring report from contractor;
- Any major accident/incident on site and steps undertaken to manage it (these reports need to be submitted within 24 hours); and
- Collect and report on data as requested by ESMC;

7.1.2. CSE/OE Reporting Protocol

The CSE/OE is in charge of supervising the various construction works such as civil work, electric installation work, etc. The EHS personnel of OE/CSE will also monitor the implementation of the environmental, health and safety measures as specified in the management plans. The CSE/OE will review and approve the SOPs to be used by the Contractors during the construction activities of the Project. Any monitoring reports/checklists prepared by the CSE/OE will be reviewed by the ESMC before being sent to PMO.

Additionally, the CSE/OE will supervise and head monthly environmental meetings to discuss any major environmental and social issues that have been faced during the project development. The CSE/OE will maintain a record of the topics discussed during these meetings and any corrective actions taken based on the outcome of the meeting discussion. The CSE/OE will provide the following reports to the PMO and Corporate E&S Manager who will be presenting it to corporate ESMS committee (including all PMOs):

- Monthly/periodic status report of E&S aspects on site covering only key issues and findings from reviewing and supervision activities;

- The OE shall also collect and report on data as requested by the PMO/ESMC;
- Immediate information on any incidents/ major deviations from the SOPs;
- Analysis of any incidents/major deviations within an agreed time frame;
- At the end of the commissioning, the OE/CSE shall prepare a final report summarizing the key findings from their work, the number of infringements, resolutions, etc., as well as advice and guidance for how such assignments should be conducted in the future.

7.1.3. Environmental and Social Management Cell's Reporting Protocol

As a minimum the ESMC shall prepare the following written reports and submit to the E&S Manager, ESMC.

Site Level

- Weekly report of non-compliance issues;
- Summary monthly report of key issues and findings from auditing activities;
- Summary monthly report of key issues arising from CSE/OE supervision activities during construction phase;
- Consolidated summary report from Contractor's monthly report; and
- Collect and report on data as requested by corporate ESMS committee;

Corporate Level

- Monthly summary of the E&S status on site to PMO; and
- Final report summarizing Project's environmental performance as desired by corporate ESMS committee.

7.1.4. Environmental and Social Supervision Team's Reporting Protocol

The ESST will meet once a month during the construction phase and quarterly during the operations phase, and in case of any emergencies as required:

- Minutes of meeting to corporate ESMS committee highlighting any key issues with respect to ESMMP implementation and E&S performance;
- Any decisions/approvals required from corporate ESMS committee; and
- Analysis of any incidents/major deviations within an agreed time frame especially during operations phase;

A list of records to be maintained by the ESST is included in Table 4.

Table 4: List of Environmental and Social Records to be Maintained during Construction Phase

Category	Record
General	• Environmental training records (e.g. attendance records for environmental awareness training, topics covered) • Environmental permits and licenses • Site inspection records • Construction program and schedule • Records identified to be maintained in the SOPs prepared by EPC/O&M • Records as per requirements under various E&S Management Plans; • Equipment maintenance and repair records • Correspondence with concerned parties and other parties in relation to environmental matters • HIV/AIDS information • Meeting minutes
Noise control	• Updated list of powered mechanical equipment currently on site • Details of examination periods and the results if any environmental sensitive receivers such as local schools, hospitals, resident villages may be affected. • Records of noise levels near sensitive receptors
Water pollution control	• Records of quantities of collected spent bentonitic slurries and/or drilling mud for reuse, reconditioning and disposal • Records of maintenance and cleaning schedules for sediment and oil/grease traps • Records of toilet sewage disposal (where connection to existing sewer is not undertaken) • Records of the wastewater final discharge quantity and the pollutants concentration • Plans of construction site drainage
Waste management	• Copies of relevant valid licenses as provided by employed waste haulers and waste collectors • Records of quantities of reused and recycled waste • Waste disposal records
Atmosphere	• Route and the program of the construction material transportation • Mitigation measures on the atmosphere effect such as sprinkling • The monitoring results of the atmosphere quality
Culture property	• Drawings of the identified culture property sites (if any) • Log of construction near culture property sites (if any) • Records of discoveries during construction (if any)
Land contamination	• Preliminary analysis results of materials suspected to be contaminated (if any)
Ecological resources	• Records of sensitive ecological resources locations and associated protection plan
Storage of explosives, chemicals, and hazardous substances	• Drawings of storage facilities • Logs of inventory and consumption • Material data sheets of all substances kept on site
Emergency/accident/incident	• Emergency accident/incident records • Investigation Reports
Grievance	• Records of Grievance registered
Corrective and preventive action plan	• Corrective and preventive action request records and forms
Other records	• As per regulatory requirement from different authorities

E&S = environmental and social; EPC = engineering, procurement, and construction; O&M = operations and maintenance

7.2. EXTERNAL REPORTING FOR REGULATORY COMPLIANCE

The main regulatory bodies for obtaining permits/approvals/licenses during the Project lifecycle include:

- The Ministry of Science, Technology and Environment
- Ministry of Energy/Department of Electricity
- Ministry of Forest and Soil Conservation
- Department of Forest and its district offices

The ESMC will be responsible for obtaining the required environmental, ecological, and social (mainly land) approvals and licenses from the regulatory authorities. They will prepare any necessary documents that need to be submitted on a regular basis, such as air/noise/water monitoring results to assess the performance of the project against environmental and social parameters. The ESMC will also be responsible for organising any visits to the site or consultations with the local communities if required by the regulatory authority.

The ESMC team should consolidate list of reports to be maintained as part of the Regulatory compliances and submit the same to the regulatory authorities as per the desired frequencies. The data for the same may be taken from the EPC/O&M contractors as relevant.

Some of the reports that can be maintained internally by the project team for review of project performance are shown below in Table 5.

Table 5: Reporting Matrix

Key Report to be Generated	Reporting To	Responsibility for Report Preparation	Frequency
Internal and Third-Party Reporting			
EHS Monitoring report with details regarding: Safety meetings; EHS Training details; ESMMP Implementation status report.	ESMC	EPC SEO O&M SEO	Weekly/monthly
Accident/incident report	ESMC	EPC SEO O&M SEO	As applicable
Report on noncompliance issues	ESMC Manager	ESMC	Weekly
Key issues and findings report	ESMC Manager	ESMC	Monthly
Summary of Contractor report	ESMC Manager	ESMC	Monthly
Summary of E&S Status	ESMC Manager	ESMC	Monthly
Minutes of environmental meeting	PMO	ESST	Monthly during construction phase and quarterly during operation phase
Accident/incident analysis	PMO	ESST	As applicable
Summary E&S status reports of the supervision activities	PMO and Corporate E&S Manager	OE/CSE	Monthly/as agreed
Immediate information on any incidents/ major deviations from the SOPs	PMO and Corporate E&S Manager	OE/CSE	As applicable
Analysis of any incidents/major deviations within an agreed time frame;	PMO and Corporate E&S Manager	OE/CSE	As applicable

Key Report to be Generated	Reporting To	Responsibility for Report Preparation	Frequency
Final report summarizing the key findings from their work, the number of infringements, resolutions, etc., as well as advice and guidance for how such assignments should be conducted in the future.	PMO and Corporate E&S Manager	OE/CSE	At the end of commissioning
External Reporting for Regulatory Compliance			
Compliance reports: As per Project approvals/permits as per regulatory requirements from Ministry of Science, Technology and Environment Ministry of Energy/Department of Electricity, Ministry of Forest and Soil Conservation/ Department of Forest and its District Office/Other government authorities as relevant	Relevant authorities	ESMC	As required by the regulatory authority
Lender's Reporting Requirements			
Environmental and Social Performance Reports, which will summarise: • Environmental and social impacts observed and progress as per the ESMP, RAP, or any other management plans under implementation; • Any areas of noncompliance or other issues; • Performance review of the effectiveness of the ESMS; • Any new/unreported environmental, ecological or social impacts observed on-site; and • Reports of any third party audits/studies.	Lenders	PMO	Based on the frequency as agreed upon with the Lenders

7.3. LENDER'S REPORTING REQUIREMENTS

The ESMS committee will review, approve, and submit environmental and social performance reports at the frequency agreed upon with Lenders, with respect to the project operations. The reports will be sent to the ESMS committee by the E&S Manager of the ESMC team. These reports will summarize the following:

- Environmental and social impacts of projects observed by the project proponent, including progress as per the Environmental and Social Management plan, Resettlement Action Plan, or any other similar management plans under implementation;
- Any areas of non-compliance or other issues arising from the implementation of the suggested environmental and social safeguards;
- Performance review of the effectiveness of the ESMS ;
- Any new/unreported environmental, ecological or social impacts observed on-site and which need to be included in the ESMS; and
- Reports of any third party audits/studies.

8. CONTRACTOR MANAGEMENT

Contractors refer to the teams appointed by NWEDC to undertake the construction activities as well as O&M for the Project. The Contractor(s), its subcontractor(s), and employees shall minimise impacts that may result from Project construction and operational activities, and comply with the mitigation measures set forth in the ESMMP to prevent harm and nuisances to local communities. The duties of the contractor(s) and subcontractor(s) include but are not limited to:

- Compliance with relevant legislative requirements governing environment, public health and safety;
- Work within the scope of contractual requirements and other tender conditions;
- Comply with the ESMMP requirements as mentioned in the ESIA;
- Organise representatives of the construction team to participate in the joint site inspections undertaken by the ESMC;
- Carry out any corrective actions as instructed by the ESMC, OE/CSE, and/or ESST;
- Provide and update information to the OE/CSE and ESST regarding works activities that may result in adverse environmental conditions;
- In case of noncompliances/discrepancies, carry out investigation and submit proposals on mitigation measures, and implement remedial measures to reduce environmental impacts;
- Stop construction activities which generate adverse impacts upon receipt of instructions from the OE/CSE, ESMC, or ESST;
- Propose and carry out corrective actions and implement alternative construction/operational method, if required, to minimize environmental impacts; and
- Major noncompliance by the Contractor will be cause for suspension of works and other penalties until the noncompliance has been resolved to the satisfaction of the ESMC and OE/CSE.

8.1. MINIMUM ENVIRONMENTAL AND SOCIAL STANDARDS TO BE MET BY CONTRACTOR

The contractor must comply with the minimum environmental and social standards presented in the Attachment 2 Minimum E&S Standards to be met by the Contractor, for the Project.

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9. MANAGEMENT OF CHANGE

The procedures provided here will be applicable for instances when there are changes to the facilities (equipment, operation procedures, materials, and operating conditions) as well as changes to the organisational structure or designated person due to operational necessity. To ensure that the ESMS is adaptive to the changes that will be faced during the Project lifecycle, the following actions will need to be implemented by the ESMC and monitored by the PMO:

- The ESMMP will be reviewed and amended in accordance to the Project design and status as it evolves. Key information about changes to the Project design will be regularly reviewed and site visits will be undertaken by the ESMC staff in coordination with SEOs and relevant personnel to ensure the same and to identify any environmental, social or ecological impacts to the Project.
- The ESMC and PMO will have the authority to select the staff to oversee the environmental and social activities of the Project. During change in management of the Project, the new staff will obtain the induction training, that will cover, but not be limited to, the following aspects:
  - General health and safety training;
  - Briefing on the E&S performance of the Project;
  - Training regarding the project policies and objectives;
  - Regular audits that need to be conducted; and
  - Reporting protocol to be followed.
- The ESMMP implementation will be monitored regularly throughout the lifecycle of the Project to assess its effectiveness during project operations. Evaluation will be undertaken through continuous communication with the relevant stakeholders, namely contractors, subcontractors, workers, community, etc. Additionally, this will be supported through the data obtained from the monitoring audits and reviews conducted on a regular basis.
- The ESMMP will be changed or updated based on the feedback obtained from the contractors as well as from the data obtained through reviews and audits. The areas of improvement will be identified and mitigation measures for the same will be integrated into the ESMS, after approval from the PMO and lenders.

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ATTACHMENT 1

NWEDC Environmental and Social Policy Statement

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NWEDC
NEPAL WATER & ENERGY
DEVELOPMENT COMPANY

Nepal Water & Energy
Development Company Pvt. Ltd.
3rd Floor, Four Square Complex,
Narayan Chaur, Naxal, Kathmandu, Nepal
Tel: 014412257 | 014412557

Environmental and Social Policy Statement

Nepal Water & Energy Development Company Pvt. Ltd. (NWEDC) declares that a core value in the management of our company is environmental protection and social responsibility. NWEDC commits to comply with national and good international industry practices in the hydropower industry in the construction and operation of all our projects, and further commits to:

- Comply with all applicable environmental and social regulations and World Bank Group Performance Standards on Environmental and Social Sustainability without compromise;
- Promote a working environment to provide women with opportunities for gainful employment and advancement in the workplace;
- Provide a safe and healthy working environment to all employees and contract workers;
- Adopt mitigation strategies to avoid, reduce, or compensate environmental degradation, pollution and adverse social impacts, and adapt to the impact of climate change of our projects;
- Provide benefits to the communities affected by our projects that promote the enhancement of their livelihoods;
- Identify, avoid or actively manage all project related risks to the health, safety and security of affected communities;
- Minimize land acquisition and involuntary resettlement and ensure that affected households are fairly compensated and actively assisted to restore and improve their livelihoods and living conditions;
- Foster biodiversity conservation and sustainable management of living natural resources, minimize our environmental footprint, and reduce the depletion of bio-diversity and ecosystem services by applying the latest technology in combination with local knowledge and practice;
- Recognize the values of indigenous peoples living within the areas of influence of our projects and take appropriate actions to address and satisfy their concerns;
- Understand and respect the culture, heritage and religious beliefs of the communities living within the areas of influence of our projects;
- Disclose all relevant project information to stakeholders in a timely and inclusive manner and to maintain open lines of communication with stakeholders throughout the life of a project; and
- Organize, train and equip our project management teams to identify and address environmental and social issues throughout the life of a project.

NWEDC is committed to continuous improvement in the management of the environmental and social impacts of our projects through monitoring, evaluation and implementation of appropriate corrective actions whenever needed. The Management of NWEDC understands that responsible environmental and social performance is a priority for our company.

Bo Seuk Yi
Chief Executive Officer

NWEDC
NEPAL WATER & ENERGY
DEVELOPMENT COMPANY

19.12.2016

ATTACHMENT 2

Minimum E&S Standards to be met by the Contractor

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The contractor should develop plans, SOPs, formats, maintain records, and submit reports as agreed upon with the Nepal Water and Energy Development Company. These should be set out clearly and agreed upon during pre-mobilization workshops for construction and operations and maintenance phase. The following table indicates a list of minimum environmental and safety standards to be met by the contractor.

Issues	**Key Principle / Mitigation Standard**	**Minimum Mitigation Method**
Unemployment of local labour	Villagers shall not be disadvantaged by the influx of outside workers	• Have a Human Resources Policy • Hire local labour as much as possible • Encourage women to work in the Project
Workers intruding on village life and disrespecting traditional cultural values.	Workers shall respect local traditions and culture	• Education and orientation of outside workers to local culture and social norms before the start of work • Have an environmental training program for workers
Health issues	Contractor to present a Health Management Plan	• The Health Program shall be made available to the communities • Implement a vaccination program • Provide education program on sexually transmitted diseases HIV/AIDS, tuberculosis and other illnesses • Provide periodical health check to construction workers • Implement measures against malaria if applicable
Workers' Camps and Work Sites		
Water supply affecting ecology or village water supply	Camp to provide its own water supply that does not affect village water supply	• Any water supply sources should be located so that it does not adversely affect the villages supply • The intake of water from streams for water supplies should leave residual flows in the watercourses • Storage tanks should be used to buffer water supplies
Wastewater discharges affecting water quality	Wastewater to be treated prior to discharge	• Sewage disposal methods should be designed to the standards outlined by the Nepalese government
Solid waste polluting the environment and causing health hazards	No waste to be burnt or buried on site	• All solid waste shall be removed from site and disposed of at a municipal landfill or at an approved disposal site
Camps using local services and resources, at the expense of villagers	Camps shall not affect local resources, infrastructure, utilities	• Locations of camps shall be approved by ESMC and local authorities • Provide adequate housing to outside workers with potable water and proper medical and sanitary facilities • Camps shall be self- sufficient in resources and services • Camps to be secure and discourage workers from leaving the camp

Issues	Key Principle / Mitigation Standard	Minimum Mitigation Method
Village Impacts		
Deterioration of current quality of life and traditional livelihoods	Villagers should have the ability to communicate issues to ESMC, EST, SEO, and Contractors. Villagers have the expectation that issues will be addressed and resolved by negotiation. Meetings shall be undertaken to ensure villager's concerns are recorded and addressed. Villagers shall be adequately informed of all potential hazards to health and safety.	• Set up a communication network for discussing issues with ESMC, EST, SEO, Contractors. Complaints should be directed to the ESMC full-time safeguards staff • ESMC to manage a grievance mechanism, and have staff on site at all times to manage grievances • The Contractor's Health Management Plan shall be made available to the communities • Developing village protocol that could serve as a guideline for outside workers • A complaints record shall be kept of all issues raised by villagers in response to construction activities as well as the remedial actions taken and the turnaround time for the response and actions noted
Health and safety risks from such activities as increased traffic, blasting, operation of heavy machinery, etc.; traffic causing safety risks to villagers	Safety risks shall be minimised. Villagers have the expectation that issues will be addressed and resolved by negotiation.	• OHS management in Chapter 11
Nuisance issues such as noise, dust and vibration	Nuisances shall be minimised. Villagers have the expectation that issues will be addressed and resolved by negotiation.	• Noise management in Chapter 11
Sediment affecting river water uses	Sediment discharges to the river shall be minimized	• Erosion and sediment control in Chapter 11
Construction Issues		
Construction of access roads can affect cultivated areas, sensitive areas and cause noise, dust and erosion	New access roads should not disrupt village life and affect ecosystems, and agricultural land	• Design and location of access roads shall be approved by a road engineer and 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
Erosion and sedimentation caused by the construction activities	Erosion and sedimentation have to be maintained to a minimum to avoid changes in water flow patterns, loss of productive land, landslides, and destruction of surface vegetation	• Protect all areas susceptible to erosion by installing necessary temporary and permanent erosion and sediment control structures. • Conserve as much vegetation as possible • Initiate revegetation after completion of construction works

Issues	Key Principle / Mitigation Standard	Minimum Mitigation Method
Noise and vibration associated with construction activities, excavation and blasting	Noise must not unreasonably intrude on traditional village life	• Keep a current list of all noise and vibration producing machinery • Machinery operation to occur only during designated hours (to be confirmed by Contractor in agreement with villagers) • Blasting to occur at the same time each day, and / or a warning siren should sound prior to blasting • Use of complaints register and procedures to address issues as they arise • Work to be carried out in daylight, in typical working hours • Concrete batching plants and other noisy equipment to be located as far as practical from villages
Dust generation from construction activities	Dust must not cause a hazard or nuisance to village life	• Dust generating operations to occur only during designated hours (to be confirmed by contractor in agreement with villagers) • Use of complaints register and procedures to address issues as they arise • Concrete batching plants and other dusty equipment to be located as far as practical from villages
Increased utilization of roads by traffic associated with construction activities	There should be no significant increased risk to local populations from traffic associated with the Project	• Road upgrades, including signage, speed humps, re-grading • Wetting of roads to reduce dust during the dry season, and as necessary • Training of locals regarding the hazards of traffic • Training of vehicle drivers regarding the driving risks through villages and along remote roads • Use of complaints register and procedures to address issues as they arise
Pollution risk activities occurring on site	Develop appropriate storage, transport and use practices for storage and handling of mixed classes of dangerous goods in packages and intermediate bulk containers. There shall be no solid or liquid waste disposal directly or indirectly to any water course (whether flowing or not).	• Keep a current list of all potentially • Contaminating materials used onsite • Develop and implement appropriate storage, transport and use practices to recognized standards • Solid waste disposal shall be taken off site

Issues	Key Principle / Mitigation Standard	Minimum Mitigation Method
Clearing, Revegetation and Restoration of Construction Sites		
Loss of productive land, disturbance of soil profile, loss of habitats for animals. Lack of appropriate compensatory planting at the end of construction or use of non-native species	Clearing activities shall allow the existing usage of land to continue as long as is practicable. Avoid discharging sediments and vegetation material into watercourses cultivated land, an irrigation canals. Initial revegetation of exposed areas as soon as possible.	• 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 • Save as much topsoil as possible • Appropriate local native species of vegetation shall be selected for the compensatory planting and restoration of the natural landforms. • Establish a method for timber salvage with participation of local communities • All affected areas should be landscaped and any necessary remedial works should be undertaken without delay including revegetation and reforestation.
Earthworks, Fill Slopes, Cuts, Borrow Pits, Quarries, Disposal Sites, Stockpiles		
Generation of suspended solids from bare ground and runoff into watercourses	Construction activities should not give rise to storm water containing elevated suspended solids. Provide treatment to achieve 75% reduction in suspended solids.	• No direct discharge of sediment laden water without treatment • Earthworks and land clearance should be minimized and phased • Storm water should be diverted around exposed areas • Any discharges to watercourses should occur during high flow and / or discharged as close to the outfall as possible to maximize mixing • Stockpiles, borrow pits, quarries, disposal sites should be located at least 50 metres 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
Introduction of invasive species	Fill material should not contain invasive species.	• The use of imported fill shall be minimized • Machinery should be cleaned prior to working on site to reduce the opportunity of the spread of weeds
Disturbance of natural habitats for spoil alluvial material.	Soils should be reused where possible in the development – to reduce the need for spoil sites and the need to import fill.	• Limit extraction of material to approved and demarcated quarries and borrow pits • Stockpile and reuse soils before excavating new soils / alluvium • Stockpiles should be compacted as much as practical and not be exposed for extended periods • Stockpiles should be reused as soon as practicable • Storm water should be diverted around stockpiles
Efficiency of control measures over time	Control measures should continue to work appropriately throughout the construction period	• Earthworks control measures should be inspected and maintained in efficient operating condition over the construction period

Issues	Key Principle / Mitigation Standard	Minimum Mitigation Method
Work in Watercourses		
Sediment discharges arising from working in and near the river	Work in the wetted area of the riverbed should be minimized, and only in relation to the construction of the power house, weir and intake structure or to insert culverts for stream crossings	• 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 • Diversion of the river around the work area where possible • Culverts shall be placed in access tracks where they cross streams more than 3 metres wide and 0.5 metre deep
Tunnels		
Contaminants in water discharged from tunnels during construction	No direct discharges of tunnels water to any water course. Provide treatment prior to discharge to achieve 75% reduction in suspended solids.	• Settlement ponds and /or sediment infiltration devices • Monitoring immediately upstream and 50 metres 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 should occur during high flow and / or discharged as close to the outfall as possible to maximise mixing • Spill kits and emergency procedures should be used for spills of chemicals, fuels and oils and staff trained
Concrete, Cement		
Contaminants in water discharged from concrete manufacturing, including a rise in pH	No direct discharges of concrete batching water to any water course. Provide treatment prior to discharge to achieve 75% reduction in suspended solids.	• Settlement ponds and / or sediment infiltration gallery • Monitoring immediately upstream and 50 metres 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 should occur during high flow and / or discharged as close to the outfall as possible to maximise mixing • Water to be reused where possible in the process • Procedures for handling of unhydrated cement material and wet cement to avoid spills
Community nuisances	Noise and dust must not unreasonably intrude on traditional village life	• Concrete batching plants and other noisy / dusty equipment to be located at least 100 metres from villages
Material Handling, Use and Storage		
Pollution risk associated with the storage and use of fuels, chemicals, explosives, hazardous substances	No oil, lubricants, fuels or containers should be drained or dumped to ground or waterways. Accidental spills shall be minimized, and procedures put in place to clean up the environmental damage.	• Keep a current list of all chemical and hazardous substances stored on site • Keep the Safety Data Sheet of all hazardous materials used on site • Develop appropriate storage, transport and use practices to recognized standards • Explosives, chemicals and hazardous substances to be handled by authorized personnel • Diesel to be stored in truck tankers or in overhead tanks to a maximum of 5,000 litres • Diesel to be stored on flat ground and 50 metres from a waterway

Issues	Key Principle / Mitigation Standard	Minimum Mitigation Method
		• Dikes to capture 100% of fuel must be placed around fuel storage areas • All refuelling of vehicles and plant to be done on flat ground • All significant vehicle and plant maintenance shall be undertaken offsite where possible • Spill kits and emergency procedures should be used and staff trained • There shall be no deliberate discharge of oil, diesel, petrol or other hazardous materials to the surrounding soils and waterways
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	Equipment and vehicles shall not reduce air quality. No oil, lubricants, fuels used for the maintenance of equipment should be drained or dumped to ground or waterways. Construction debris shall be disposed at approved disposal sites	• 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
Safety Issues		
Health and safety risks from such activities as increased traffic, blasting, operation of heavy machinery, etc.	Health and safety risks to villagers and workers shall be minimized	• Provide personal protective equipment and clothing (goggles, gloves, dust masks, hard hats, steel-toed boots, etc.,) for construction workers and enforce their use • Follow national regulation on blasting • Inform villages one week in advance of the blasting event blasting is prohibited during night-time hours • Establish a methodology to be followed in case of fire • Remove workers from tunnels and underground construction in case a hazardous gas is present • Respond to emergencies in a prompt matter
Traffic causing safety risks to road users	Construction traffic will be managed to minimize the impact on existing road users	• Signage to be used to identify current risks to road users • EST and Contractors to discuss • major traffic issues with village representatives • Establish pedestrian routes • Heavy traffic to avoid the hours when school children walk to and from school
Archaeological and cultural site disturbance		
Finding and disturbance of previously unknown sites	No sites shall be disturbed once identified	• Chance find procedure in Chapter 11

Issues	Key Principle / Mitigation Standard	Minimum Mitigation Method
Flora and Fauna		
Wildlife populations may be adversely affected by direct losses of individuals (e.g.: mortality, injury) or modification of habitat. Destruction of native vegetation and land outside proposed working areas.	Sufficient trainings on ecological protection and mitigation measures shall be provided to construction workers and site management staff	• Demarcate natural habitats for sensitive, rare, threatened and/or endangered species before the commencement of construction activities • Ensure that no hunting, fishing, trapping, shooting, poisoning or otherwise disturbance of any fauna takes place • Delineate with temporary construction fencing the vegetation to be preserved • Ensure that the vegetation to be preserved is kept undamaged • Prohibit use of fire wood and the burning of vegetation • Install sediment control measures to prevent siltation of water courses

ESMC = Environmental and Social Management Cell; EST = Environmental Supervision Team; SEO = Safety and Environmental Officer

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Appendix B
Environmental and Social Management and Monitoring Plans

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ACRONYMS AND ABBREVIATIONS

AoI	Area of Influence
BMP	Biodiversity Management Plan
CIA	Cumulative Impact Assessment
CIMP	Cumulative Impacts Management Plan
CITES	Convention on International Trade in Endangered Species
CR	Critically endangered

DRIFT	Downstream Response to Induced Flow Transitions
Eflow	Environment flow
EFMP	Environmental Flow Management Plan
EIA	Environmental Impact Assessment
EN	Endangered
EPC	Engineering, procurement, and construction
ERP	Emergency Response Plan
ESIA	Environmental and Social Impact Assessment
ESMC	Environmental and Social Management Cell
ESMMP	Environmental and Social Management and Monitoring Plan
ESMS	Environmental and Social Management System
EST	Environmental Supervision Team
ha	Hectare
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
km/hr	kilometres per hour
LALRP	Land Acquisition and Livelihood Restoration Plan
LC	Least Concern
LNP	Langtang National Park
MSDS	Material Data Safety Sheet
NT	Near Threatened
NWEDC	Nepal Water and Energy Development Company
O&M	Operations and maintenance
PDA	Project Development Agreement
PH	Power House
PS	Performance Standards
RLNM	Red List of Nepal's Mammals
SEO	Safety and Environmental Officer
VU	Vulnerable

1. CONSTRUCTION ESMMP

1.1. PURPOSE

This Plan presents the Environment and Social Management and Monitoring Plan (hereafter referred to as the ESMMP) for the construction phase of the Upper Trishuli-1 Project. The ESMMP has been formulated based on the Project understanding and impact assessment undertaken in the Environmental and Social Impact Assessment (ESIA). The ESMMP is comprised of the following:

- Summary of Management Plans to be formulated by engineering, procurement, and construction (EPC) Contractor and other contractors, which will be implemented during the Construction Phase of the Project; and
- Detailed Management Plans for specific impacts or areas of concerns.

It should be noted that some of the plans have been formulated as part of the previous assessments. These plans shall be updated in keeping with the present context. In addition to this, certain additional plans have been formulated as part of the requirements of the applicable reference framework and the requirements of the Project Development Agreement (PDA).

1.2. SUMMARY OF MANAGEMENT PLANS TO BE DEVELOPED BY EPC

This section identifies the Construction Phase Management Plans to be developed and implemented by the EPC Contractor. Guidance is provided for each of these plans regarding their minimum content.

1.2.1. Air Quality Management Plan

The Contractor shall propose and develop methods and actions to control dust resulting from construction-related activities, such as excavation, drilling, blasting, use of heavy equipment, quarry sites, crushing and concrete batching plants, earthworks including road construction, embankment and channel construction, haulage of materials, and construction of worker camps prior to the start of Project construction activities. In particular the Contractor shall ensure the following safeguards are in place:

- Dust and particulate material emissions shall be minimised at all times to avoid impacts on surrounding communities, and especially to vulnerable people (e.g. children, elders).
- Phased removal of vegetation shall be practiced to prevent large areas from becoming exposed to wind.
- Surface clearing activities shall be restricted to Project foot print.
- Batching plant, cement plant, crushers, and other construction facility shall be established away from the residential and ecological sensitive receptors.
- Crushers shall use a high-efficiency dust suppression system.

- Vehicle speed shall be restricted to 15 kilometres per hour (km/hr) at site to minimise potential for dust generation in the surroundings.
- Paved roads shall be cleaned and unpaved roads shall be stabilized to reduce offsite tracking of soils and avoid dust generation.
- Diesel generators for power supply shall be optimally operated and regularly maintained to ensure emissions from fuel combustion remain at design levels.
- Machinery shall be turned off when not in use.
- Provisions for use of kerosene oil or liquefied petroleum gas as the primary fuel by the labour shall ensure reduction in dependency on forest related products.
- Dust screens shall be placed around construction areas, paying particular attention to areas close to local communities.
- Spraying of water shall be carried out as needed on dirt roads, cut areas and soil stockpiles or fill material. The water spray operation shall be carried out in dry and windy days, at least twice a day (morning and afternoon). The frequency of water spray near local communities shall be increased as needed.
- Access roads shall be paved with gravel in the sections which are located in close proximity to the communities and other sensitive receptors, to reduce generation of air-borne dust.
- Adequate ventilation system and other measures to control concentration of air pollutants within tunnels shall be provided.
- Construction equipment/vehicles that generate significant air pollution (above the applicable limit), and those which are poorly maintained shall not be allowed on-site.
- Concrete batching plants, asphalt plants, mixing stations, and crushing plants shall be operated with approved fitted dust control devices only.
- The truck transporting powder materials, such as cement, sand, and lime, shall be covered entirely with clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle. Overflow of material shall be avoided. All the stockpiled materials and sloped surface shall be covered with impervious sheeting to reduce dust emissions.
- Linking roads shall be maintained in good condition to reduce dust and noise emitted while using these roads for transportation.
- The exhaust gases from construction machinery and vehicles are accepted. However, the engines shall be inspected and adjusted as required to minimise pollution levels. Exhaust fumes shall comply with relevant Nepalese standards on fumes.
- Use low sulfur diesel fuel for diesel-powered equipment and vehicles to the extent available.
- Regular (monthly) maintenance of all vehicles in accordance with manufacturer specifications shall be undertaken mandatorily.

1.2.2. Blasting and Explosives Management Plan

Any blasting activity pertaining to access road, adit, or any other construction activity shall consider the following:

- Before blasting is carried out, a detailed survey shall be conducted in the nearby communities to evaluate the degree of impacts that may be caused due to the blasting activity (e.g. possible damage to structures or infrastructure due to vibration, effects on animals, local residents, etc.).
- Survey of structures (house and shed) located within 250 metres on either side of Adit 1 access road at Hakubesi before construction shall be conducted to verify condition of these structures.
- Compensation shall be provided for these structures if reported to be damaged while blasting activities are carried out.
- The Contractor shall ensure that the site of overburden depth and with proper alignment (with respect to rock type and geological structures) is selected for tunnel excavation to reduce instabilities within the tunnel.
- No blasting shall be allowed by the Contractor during night time unless prior approval is obtained from the government authority and the Environmental Supervision Team (EST) and local residents are notified in advance.
- The Contractor shall take necessary precautions to prevent damage to special features in the surroundings (e.g. ecological, historical, or culturally important areas) and the general environment.
- Only trained personnel on blasting operations shall carry out the procedure.
- The Contractor shall provide temporary, but proper, foundation supported with rubber padding to control vibrations.
- The Contractor shall adopt optimised blasting techniques using delay detonators, blasting in confined areas (inside the tunnels).
- The equipment or machineries generating vibrations shall be placed in strong foundation and shall minimise any off-site ground vibrations.
- Prior to a blasting event, water shall be sprayed on the surface of the blast area to increase its moisture content, and wire mesh, gunny sacks, and sandbags shall be used on top of the blast area at each shot to prevent flying rocks and dust. Blasting shall not be carried out in adverse weather conditions. Spraying shall be conducted after the blast to control fugitive dust.
- The Contractor shall provide notification to any occupants of surrounding land at least one week prior to blasting activity, and shall address any concerns that they may have.
- The blasting event shall be announced with sirens, or other devices to allow the warning to be heard at up to 1 kilometre distance;

- The Contractor shall ensure that any unauthorized persons shall be located a safe distance (e.g. at least 200 metres) away from the blasting point.
- Before the detonation takes place, the Contractor shall check that there are no people inside the controlled area.
- The use of electric detonators shall be prohibited during thunderstorms.
- If there has been a failure in the blasting operation, only competent personnel may be allowed on site to do the work necessary to detonate the explosive, or completely redo the blasting.
- The quantity of blasting materials shall be carefully controlled according to the real situation requirements to avoid unnecessary breakage of rock mass.
- State of the art drilling machines provided with dust extraction system shall be used.
- Good quality explosives having proper oxygen balance with regular checking shall be used.
- The Contractor shall ensure proper stemming after charging of explosives. Proper stemming material (stone chips and drill cutting) will help in minimizing dust throw hence lower spread of dust particles in ambient air or within tunnel or adits.
- The Contractor shall regularly check the date of manufacture/expiry for effective use of explosives.
- Notify local communities before blasting
- Magazine area shall be located away from settlement or easy access locations.
- The Contractor shall provide strict security and restricted entries in magazine area.
- The Contractor shall provide good firefighting system at the explosive storage area.
- Specific training on explosive handling and safety management shall be provided to the employees appointed in magazine area.

1.2.3. Cultural Heritage Management Plan

According to the 2014 Environmental Impact Assessment (EIA) Report, historical and archaeological sites as well as temples are absent in the affected village development committees. Only a museum and two Ghumpas are reported in the Project's area of influence. However, the Contractor shall put in place the following measures in case sites or artefacts with archaeological or historical value are discovered during the Project construction activities:

- The Contractor shall undertake consultations/engagement with the local community in advance of blasting, drilling, or ground disturbing works to determine if:
  - The site is of cultural heritage or archaeological importance;
  - Artefacts are likely to be found;
  - The area has been/ is used as a burial ground.

- These consultations shall be undertaken in keeping with the larger Stakeholder Engagement Plan formulated for the Project. If any such risk is identified, then a detailed assessment of the site shall be conducted by an archaeologist or cultural heritage expert.
- If buried artefacts are encountered during the drilling or levelling activities, all activities in the vicinity of the site shall be stopped. The operators and worker shall be briefed about identification of artefacts and other chance find items to help them detect such finds.
- Workers shall report the findings to the Contractors, Workplace Safety and Environmental Officer (SEO) and EST immediately.
- The Contractor shall notify the Environmental and Social Management Cell (ESMC) and local or national relevant authorities (within 24 hours of the discovery).
- Once confirmed, the discovered find/feature/ site shall be delineated by the SEO or EST.
- The find location and all remains shall be left in place.
- The area shall be secured to prevent any damage or loss of removable objects.
- A night guard shall be arranged until the responsible local authorities take charge of the situation.
- Relevant local or national authorities shall arrive to the site within 48 hours and shall be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. The job of these authorities is:
  - Describe the artefact or historical remain;
  - Define the scale of the site/object;
  - Perform a preliminary evaluation;
  - Set up a plan to protect and handle the discovery; and
  - Determine the significance of the discovery.
- The significance and importance of the findings should be assessed via a Cultural Heritage Assessment, according to the various criteria relevant to cultural heritage, which include the aesthetic, historic, scientific/ research, social and economic values.
- Decisions on the procedures to handle the finding shall be taken by the responsible authorities, which could include conservation, preservation, restoration and salvage.
- If the cultural sites and/or relics are of high value and site preservation is recommended by the professionals and required by the relevant local or national authority, the Project's Proponent shall need to make necessary design changes to accommodate the request and preserve the site.
- Decisions concerning the management of the finding shall be communicated in writing by relevant authorities to the Project's Proponent.
- Construction works should resume only after permission is granted from the responsible local authorities concerning safeguard of the cultural resource.

- The staff, contractors, and contractual workmen engaged in Project activities that may result in a chance find shall be trained in the requirements of this plan. Refresher trainings shall be provided as appropriate.

1.2.4. Emergency Preparedness and Response Management Plan

1.2.4.1. Fire Control

- The Contractor shall submit a fire control and fire emergency method statement to ESMC and EST for approval.
- The method statement shall detail the procedures to be followed by the workers in the event of fire.
- The Contractor shall take all reasonable steps to avoid increasing the risk of fire through activities on site.
- The Contractor shall ensure that basic fire-fighting equipment is available and well-maintained at all camp areas and facilities.
- The Contractor shall appoint a Fire Officer who shall be responsible for ensuring immediate and appropriate action is implemented in the event of a fire.
- The Contractor shall ensure that all site personnel are aware of the procedure to be followed in the event of a fire.
- Mock fire drills shall be conducted to prepare workers in case of an emergency. The records of the same will be maintained by the Contractor on site.
- Any work that requires the use of fire may only take place at a designated area approved by the EST and must be supervised at all times.
- Fire-fighting equipment should be made available at various locations within the site and especially near the designated fire work area.

1.2.4.2. Hazardous Gases

The Contractor shall ensure the following safeguards are in place in case of accidental release of hazardous gases.

- The Contractor shall establish a plan to guarantee the safety of all personnel working in tunnels and underground excavations.
- If there is hazardous gas (such as coal gas) in the tunnels or underground excavations, all construction activities must stop immediately and construction workers shall withdraw from the site immediately. The Contactor must take corrective action and the construction must not re-start until there is no longer a danger.
- The Contractor shall monitor, record, and report the situation of the hazardous gas at the construction site to make sure that the hazardous gas emission has not exceeded the established standards.

- The Contractor shall provide suitable ventilation and dust extraction systems as per the requirement and manpower working at the tunnels/adit/powerhouse or any other underground working area.
- The Contractor shall regularly monitor atmospheric conditions.
- The Contractor shall develop rescue procedures including use of self-rescuers.
- The Contractor shall conduct training for work in confined spaces for various workers to be engaged.
- The Contractor shall use the correct personal protective equipment.
- The Contractor shall install an online real-time gas monitoring system, including analysis equipment, a security light, and an alarm system to provide visual and auditory alerts when elevated concentration of gases is detected.

1.2.5. Excavation, Slope Stability, Sediment and Erosion Control Management Plan

1.2.5.1. Underground Excavations

The Contractor shall ensure the following safeguards are in place during excavation. These specifications are applicable to all underground excavations such as the desander, settling basin at the intake structure, tunnels, the surge tank, the powerhouse, etc.

- Before any underground excavation starts, the areas for disposal of excavated earth shall be selected in order to minimise the occupation of land. Excavated soil shall be used in the construction activities or disposed at the approved spoil disposal sites.
- The Contractor shall provide adequate ventilation systems and other measures to control the concentration of air pollutants within tunnels and underground excavations. Concentration of gases shall be monitored, recorded, and reported in confined spaces.
- Wastewater resulting from the construction activities shall be collected in settling ponds or tanks for solids removal. Solids shall be removed from site and the supernatant will be reused or discharged depending on the final quality. Wastewater shall not be discharged into water bodies without any prior treatment.
- Slopes shall be protected with vegetation or retaining walls.
- The excavated materials shall be used, wherever possible, in backfilling and levelling activities.
- Workers shall be provided with the proper protective equipment (e.g. masks, earmuffs, safety boots, helmets).
- The Contractor shall develop an emergency plan to handle unexpected accidents such as the collapse of tunnels and poisoning caused by gases in the underground excavations. The Contractor shall train staff to handle accidents.

- Staff shall also be trained in fire control, emergency call, and in the rescue and transportation of injured workers to health centres or the medical facilities, if available, established for the Project.
- Training on safety and personal security shall also be provided to the tunnel workers and administration staff. This training shall be incorporated into the training plan provided by Contractors to their workers.
- The use of explosives in underground excavations shall follow the rules and regulations established in Nepal.
- Temporary traffic regulations shall be implemented and signs shall be posted inside the tunnels. The movement of equipment, machinery and workers within the tunnels shall be directed by trained personnel.
- The Contractor shall install a temporary maintenance station that shall be in charge of daily maintenance and repairs to ensure the proper functioning of the equipment and machinery, close-circuit TV, and the lighting and ventilation systems inside the tunnels and underground excavations.
- The Contractor shall protect against rock-fall by the following:
  - Regular inspection of tunnel and scaling where needed;
  - Mechanically scaling and bolting;
  - Provision of ground support;
  - As soon as possible with overhead protection if done manually changing of ground support methods.
- The Contractor shall protect against high water and mud inflow by the following:
  - Grout old drill holes;
  - Pre-grout before excavation starts;
  - Probing, drilling and draining;
  - Including provision for dewatering and pumping; and
  - Providing sump and excellent drainage systems.

1.2.5.2. Erosion and Sedimentation

Site activities shall be carefully managed in order to avoid soil erosion and sedimentation of downstream waterways that can impact aquatic ecosystems. Even though the muck from the existing landslide after the April 2015 earthquake has disturbed the baseline, the Contractor should take reasonable precaution. Erosion and sedimentation shall be controlled during the construction of the Project by implementing the following mitigation measures:

- Silt fencing shall be provided around stockpiles at the construction sites close to river/tributaries/ and springs. The fencing needs to be provided prior to commencement of earthworks.
- The Contractor shall ensure the establishment of an appropriate drainage system in and around the spoil and muck disposal areas on-site.
- Muck disposal sites shall be provided with retaining walls and other engineering and biological control measures to mitigate erosion.
- The capacity/volume of the muck dumping sites shall be more than the volume of the muck to be disposed taking into consideration the swelling factor.
- Areas of the site that are not approved for construction activities shall be maintained in their existing conditions and shall remain untouched.
- The Contractor shall ensure that minimal ground area is disturbed during the construction phase. The Contractor shall ensure that the disturbed area is stabilised as quickly as possible, drainage is controlled, and the sediments are trapped onsite to prevent runoff.
- The Contractor shall erect erosion control barriers around the perimeter of cuts, disposal pits, and roadways.
- All areas susceptible to erosion shall be protected by installing necessary temporary and permanent drainage works as soon as possible and by taking any measures necessary to prevent storm water from concentrating in streams and scouring slopes, banks, etc.
- Terraces and other erosion control measures shall be implemented, where necessary to prevent soil erosion.
- As a general rule, slopes exceeding 35 percent shall not be machine cleared (bulldozer).
- The Contractor shall preserve as much vegetation as possible as it is beneficial in the following areas:
  - Floodplains;
  - Buffers;
  - Wetlands;
  - Stream banks;
  - Steep slopes; and
  - Other sensitive resource areas where it might be difficult to establish, install, or maintain erosion control devices.
- The topsoil with its leaf litter and organic matter shall be conserved, and reapplied to local disturbed areas to promote the local native vegetation growth.
- The Contractor shall add local, native grass seed and mulch to barren erosive soil areas or closed construction surfaces.

- The Contractor shall ensure that erosion control measures are implemented before the rainy season begins, preferably immediately before construction starts. Erosion control measures shall be installed at each construction site.
- Slope breakers such as silt fences, staked hay or straw bales, or sand bags shall be installed to reduce runoff velocity and divert water off the construction site.
- Slope breakers shall be installed on slopes greater than 5 percent, where the base of the slope is less than 15 metres from water bodies, wetlands, and road crossings.
- The Contractor shall reduce water speed and volume by increasing the number of drainage culverts and selecting proper places for duct placement to avoid erosion effects.
- Retaining and gabion walls shall be built to prevent scouring of river banks at strategic locations, especially upstream of the river above the dam.
- The bank of the river especially around the tailrace outlet shall be protected using inlet control structures and proper protection works.
- Sediment control structures shall be installed where necessary to slow or redirect runoff and trap sediment until vegetation is established. These control structures include windrows of logging slash, rock berms, sediment catchment basins, straw bales, brush fences, silt fences, silt curtains, fibre rolls, etc.
- Water flow through construction sites or disturbed areas shall be controlled with ditches, berms, check structures, live grass barriers, and rock liner.
- Ground surface at the site offices shall be paved in concrete, in order to minimise soil erosion.
- Until vegetation is successfully established, erosion control measures shall be maintained.
- Water shall be sprayed as needed on dirt roads, cuts, fill material and stockpiled soil to reduce wind-induced erosion.
- Larger changes in the landscape from quarries, tunnel spoil tips, etc., shall be landscaped and replanted, both to reduce erosion problems and to reduce the visual impact of the construction.
- Exposed soil and material stockpiles shall be protected against wind erosion and the location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors.
- All structures to control erosion and sedimentation shall be inspected routinely (monthly) to ensure that they are working properly.
- Traffic and movement over stabilized areas shall be restricted and controlled, and damage to stabilized areas shall be repaired and maintained to the satisfaction of EST.
- Potential impacts/activation of landslides shall be monitored regularly.

1.2.5.3. Earthworks, Cuts, and Fill Slopes

Earthworks, cuts, fill slopes, and spoil sites shall be carefully managed to minimise negative impacts on the environment through the following measures:

- The Contractor shall maintain stable cut and fill slopes at all times and cause the least possible disturbance to areas outside the prescribed limits of the construction works.
- All earthworks shall be properly controlled, especially during the rainy season.
- The Contractor shall complete cut and fill operations to final cross-sections at any one location as soon as possible and preferably in one continuous operation to avoid partially completed earthworks, especially during the rainy season.
- To protect any cut or fill slopes from erosion, in accordance with engineering drawings, cut-off drains and toe-drains shall be provided at the top and bottom of slopes and be planted with grass or other cover. Cut-off drains shall be provided above high cuts to minimise water runoff and slope erosion.
- Slope works and earth moving/excavation shall be conducted in order to minimise exposure of soil surface both in terms of area and duration.
- Temporary soil erosion control and slope protection works shall be carried out in sequence to the construction.
- During the cutting, backfilling, and levelling activities, the cut material with the best mechanical properties shall be used for backfilling. In the sections where the suitable excess material from excavation might be insufficient, the required volumes shall be extracted from quarries previously authorized by EST.
- Any excavated cut or unsuitable material shall be disposed of in designated disposal areas as agreed to by EST.

1.2.6. Materials Handling and Storage Management Plan

Environmental considerations shall be taken into account in the handling, use and location of any material storage areas.

1.2.6.1. Transportation

- The Contractor shall ensure that all suppliers and their delivery drivers are aware of procedures and restrictions (e.g. restricted areas) while navigating through the roads near the site.
- Material shall be appropriately secured in the vehicles to ensure safe passage between destinations during transportation.
- Loads shall have appropriate cover to prevent them from blowing during transit.
- The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.

- All stockpiles shall be covered and uncovered stockpiles and transfer points shall be periodically water sprinkled to minimise fugitive dust generation.
- Construction spoils including bituminous material and other hazardous materials shall be secured so that they shall not leach into the groundwater.
- Entry/exit routes and transportation timings for heavy transport vehicles shall be planned to minimise disturbance to the surrounding locality.
- Trucks/dumpers shall be covered by tarpaulin sheets during offsite transportation.
- The construction site shall be provided with a temporary tin sheet barrier all around to isolate it from the surroundings.
- Construction equipment with idling control technologies shall be used.
- Regular maintenance of the equipment shall be carried out; and
- The workers exposed to high noise generating equipment shall be provided with earplugs and earmuffs.

1.2.6.2. Explosives

- The explosives storage building shall be a dry, well-ventilated facility. The building shall be constructed using materials resistant to firearms, fire, and atmospheric phenomena. It shall also have a metal door with a safety lock, lightning protection, warning signs and strict surveillance.
- The explosive storage building shall be located away from other buildings and high traffic roads.
- Only qualified and authorized personnel shall handle explosives.
- Explosives and detonators shall be of good quality and suitable for the blasting operation.
- Explosives with past expiration dates shall not be used.
- Explosives and detonators must be packed in closed boxes. The explosives damaged by handling or transportation shall not be used and shall be disposed of in accordance with established procedures and any national regulations.
- The boxes of explosives and blasting caps must be visibly labelled with signs indicating their contents and instructions on how to dispose and handle them.
- For the transportation, storage, processing, packaging on site, blasting and the disposal of the blasting material, the procedure shall be in accordance with the Nepalese regulations on blasting.

1.2.6.3. Hazardous and Chemical Substances

The Contractor shall provide a method statement detailing the hazardous substances/material that are to be used during construction, as well as the storage, handling, and disposal procedures for each substance / material and emergency procedures in the event of misuse or spillage that might have impact on the environment. In general terms, the following activities shall be carried out:

- All hazardous material/substances (e.g. petrochemicals, oils, paints, solvents, etc.) shall be stored on site only under controlled conditions and with appropriate secondary containment.
- All hazardous material/substances shall be stored in a secured, appointed area that is fenced and has restricted entry.
- All storage shall take place using suitable containers as prescribed by the manufacturers or regulatory authority.
- Hazard signs indicating the nature of the stored materials (Material Safety Data Sheets [MSDSs]) shall be displayed on the storage facility or containment structure.
- Areas for the storage of fuel or lubricants and any maintenance workshop shall be fenced and have a compacted/impervious floor to prevent the escape of accidental spillage of fuel and or lubricants from the site.
- Surface water drainage from fenced areas shall be discharged through purpose designed and constructed oil traps.
- Empty fuel or oil drums shall not be stored on site.
- Fuel shall be stored in a steel tank supplied and maintained by the fuel suppliers. The tank shall be located in a secure, demarcated area. It can also be stored in overhead tanks of 5,000 litres maximum on flat ground at least 50 metres from a waterway.
- Dikes to capture 100 percent of fuel must be placed around fuel storage area
- Herbicides shall be appropriately packaged, labelled, handled, stored, disposed of, and applied according to national standards.
- During servicing/repair of equipment or vehicles, a suitable drip tray shall be used to prevent oil/grease spills onto the soil, especially in case of emergency repairs.
- Leaking equipment shall be repaired immediately or be removed from the site to facilitate repair.

1.2.6.4. Cement, Concrete Batching, and Surfacing Materials

- Concrete mixing shall take place on impermeable surfaces such as geomembrane or metal platforms only and not directly on ground.
- In case of spillage of the concrete mix, the area shall be cleaned immediately. The waste shall be collected and deposited in approved sites assigned to it by the EST. It is prohibited to place these mixtures in water courses, cultivated land, parks, protected areas, etc.

- All runoff water from the batching plant areas shall be strictly controlled, and cement-contaminated water shall be collected, stored and disposed of at a site approved by the EST.
- Unused cement bags shall be stored in a weather-proof area where it will not be impacted by rain. Used (empty) cement bags shall be collected and stored in weatherproof containers to prevent windblown cement dust and water contamination. The bags shall not be used for any other purpose and shall be disposed of on a regular basis via the solid waste management system.
- All excess concrete shall be removed from site on completion of concrete works and disposed of as approved by the EST. Washing of the excess concrete into the ground is not allowed. All excess aggregate shall also be removed from site.
- Overspray of bitumen products outside of the road surface and onto roadside vegetation shall be prevented using appropriate methods.
- When heating of bitumen products, the Contractor shall take appropriate fire control measures.
- Stone chip/gravel excess shall not be left on road/paved area verges. This shall be swept/ raked into piles and removed to an approved disposal site.
- Water quality from runoff from any fresh bitumen surfaces shall be monitored by EST and remedial actions taken where required.
- The Batching Plant shall be set up at a location downwind away from any residential set up at a sufficient distance.
- The Plant shall be set up away from any drain inlet and a perimeter bund shall be erected all around the batching plant. The drainage from the bund shall be subjected to a sump which will be cleaned on periodic basis to minimise potential surface runoff from stockpiles.
- The Plant shall be enclosed with temporary barriers (3 metres high) to minimise spread of emissions of noise and dust particles.
- Unloading from cement delivery trucks shall be done on pallets, which shall be covered with tarpaulin sheets during non-working periods.
- The plant shall be operated under supervision and periodical monitoring of dust levels and noise shall be conducted at the periphery of the construction site twice on weekly basis.
- The area surrounding the temporary concrete batching plant shall be swept on daily basis.

1.2.7. Noise and Vibration Management Plan

To minimise noise within the construction site, the Contractor shall:

- Maintain all construction-related traffic and on-site vehicles at or below 15 to 20 km/hr on streets within 200 metres of the site.
- To the extent possible, maintain noise levels associated with all machinery and equipment at or below 90 decibels.

- In noise-sensitive areas (including residential neighbourhoods, hospitals, rest homes, schools, etc.), stricter measures shall be implemented to prevent undesirable noise levels, as per the regulatory requirements in Nepal.
- Proper measures to minimise disruptions from vibration or noise coming from construction activities shall be applied.
- A transportation schedule shall be developed for the construction materials to minimise the adverse impact on residents as well as the traffic on the existing roads.
- The transportation vehicles shall be required to slow down and be banned from horning when passing through sensitive areas.
- Maintain the construction equipment in its best operating conditions and lowest noise levels possible.
- Temporary noise barriers shall be used to minimise the noise caused by the construction equipment.
- Workers shall be provided with ear plugs around highly noisy machines such as piling, explosion, mixing, etc., for noise control and workers protection.
- The construction team shall be equipped with portable detecting devices to monitor the noise level at the sensitive receptors.
- Materials leaving the construction site shall be transported during non-peak hours to minimise traffic noise due to the increase in traffic volume.
- Properly designed silencers, mufflers, acoustically dampened panels and acoustic sheds or shields, etc. shall be used. Mufflers and other noise control devices shall be repaired or replaced if defective. Electric-powered equipment shall be used when applicable instead of diesel-powered or pneumatic-powered equipment.
- Equipment known to emit a strong noise in one direction, shall when possible, be oriented to direct noise away from noise sensitive receivers.
- Machines and equipment that may be in intermittent use shall be shut down between work periods or throttled down to a minimum.
- Equipment such as cranes, earth moving equipment, and heavy vehicles shall be routed in such a way that there is minimum disturbance to receptors along the route.
- Inherently quiet equipment shall be used (as far as reasonably practicable); the equipment shall be regularly maintained to ensure noise levels are maintained at design level.
- Loud, sudden noises shall be avoided wherever possible. Fixed noise sources shall be located more than 50 metres away from the site fencing.
- Integral noise shielding (including provision of tin sheets as noise barrier) shall be used where practicable and fixed noise sources shall be acoustically treated, for example, with silencers, acoustic louvers and enclosures. All diesel generators shall be installed in

conformance with the statutory requirement of acoustic enclosure to achieve the required norm of 75 A-weighted decibels.

- Rubber paddings/ noise isolators at equipment/machinery shall be used for construction.

1.2.7.1. Night-time Construction Noise Management

Although in general, night-time construction shall be banned near sensitive receptors, some construction may still occur for technical and other reasons. If occurred near local communities, night-time construction noise would result in particularly significant impacts to residents and other sensitive receptors. Hence, besides the above mitigation measures, the following special measures shall be taken during the construction phase to ensure minimum emission of night-time noise:

- People living within potentially impacted areas shall be notified ahead of time of the length and noise intensity of the proposed night-time construction.
- Residents shall be informed on:
  - Why the night construction is necessary; and
  - Mitigation measures that are going to be implemented to obtain their understanding.
- These residents shall be allowed to express their concerns, difficulties, and suggestions for noise control prior to the commencement of night-time construction. These concerns shall be addressed and suggestions adopted where appropriate.
- Concrete batching plants, power generators, and other stationary equipment shall be carefully placed as far away from local communities to reduce noise impacts from these machines. Wherever possible, municipal power supply shall be utilized in construction, including night-time construction, as diesel generators are extremely noisy and avoiding their use is the best mitigation possible.
- Equipment with lower noise levels shall be used for concrete pouring operations, which may require 24 hours non-stop operation.
- Temporary noise barriers at the appropriate places shall be erected to reduce the noise impacts at night.
- If necessary, the Contractor shall arrange temporary accommodations away from the impacted area for the extremely vulnerable people such as persons with illness and the elderly.
- Notification boards shall be erected at all construction sites providing information about the Project, as well as contact information about the site managers, environmental staff, telephone numbers and other contact information so that any affected people can have the channel to voice their concerns and suggestions.
- Supervision personnel shall be assigned to the construction sites during the period of night-time construction to ensure that the above measures are taken and to respond to any un-anticipated impacts by implementing any necessary mitigation measures.

1.2.8. Occupational Health and Safety Management Plan

The Contractor shall prepare and enforce an Occupational Health and Safety (OHS) Management Plan to address matters regarding the health and wellbeing of construction workers, Project staff and nearby communities. The Contractor shall include in his proposal the outline of the OHS Management Plan.

The SEO will issue a certificate of compliance to the Contractor prior to the initiation of Construction. The Contractor shall:

- Carry out health screening and fitness test of all workers at the time of recruitment. This health screening shall be undertaken in keeping with the work profiles of the workers. The fitness test shall screen for communicable diseases and any health risks which may create issues in undertaking the task assigned. In addition to this, regular annual health check-ups shall be undertaken of all workers.
- Implement a vaccination program for all workers, including, but not limited, to vaccination against hepatitis A and B, tetanus, polio, rabies, etc.
- Provide appropriate information and education to the workforce on basic personal hygiene, prevention of diseases, including respiratory diseases, vector-borne diseases such as malaria and dengue, water and food borne diseases such as diarrhoea, tuberculosis, etc.
- Implement a program for workers and local communities for the prevention, detection, screening, and diagnosis of sexually transmitted diseases, especially with regard to HIV/AIDS. The program shall also include information on alcohol abuse and human trafficking.
- The HIV/AIDS program shall include awareness campaigns at the construction sites and in the communities, developing peer educators and community, monitoring combined with the prevention of human trafficking, awareness on safe migration, and community monitoring.
- Distribute educational materials to all workers including brochures, and leaflets which provide information of tuberculosis, HIV/AIDs symptoms and counselling and treatment services.
- Establish a health post or a hospital or promotion of medical clinics and dispensaries in Haku area, in particular where population densities are likely to increase.
- Provide basic first-aid services to the workers as well as emergency facilities for emergencies for work-related accidents, including medical equipment suitable for the personnel, type of operation, an ambulance or motorized vehicle, and the degree of treatment likely to be required prior to transportation to a hospital or health care centre.
- Ensure that medical staff, first-aid facilities, sick bay, and ambulance service are available at all times and that suitable arrangements are made at the labour camp and work sites, for all necessary welfare and hygiene requirements and for the prevention of epidemics.
- Send details of any accident to the EST as soon as practicable after its occurrence.

- Maintain records and reports concerning health, safety and welfare of persons, and damage to property, as the EST may reasonably require.
- Include a Pest Management Program for the construction areas, including construction work camp areas, in the OHS Management Plan. The use of pesticides shall follow procedures acceptable to the government of Nepal.
- If applicable, to reduce the risk of workers contracting malaria, the following measures shall be followed:
  - Educate workers about problems and preventive measures;
  - Use protective clothing;
  - Apply repellents to clothing;
  - Minimise containers full of water;
  - Ensure correct maintenance of water and water treatment plants to prevent the breeding of mosquitoes;
  - Keep storm water drains and borrow pits free of vegetation; and
  - Use insecticides as a last control method and only after studies indicate the primary location of mosquitoes.

During construction, there will be a potential for workers to damage the community forest and waterways adjacent to camps and work areas. The Contractor shall prepare an Environmental Awareness Training Plan to ensure that all construction workers and relevant personnel are familiar with the environmental requirements of the Project. The Plan shall include:

- The Contractor shall distribute to all construction workers and relevant personnel:
  - The Contractor's Environmental Plans;
  - The Environmental and Social Specifications contained in this document; and
  - Copies of relevant environmental laws, standards and regulation of Nepal.
- The Contractor shall provide environmental training to employees according to their level of environmental responsibility.
- All employees shall be required to comply with environmental protection procedures, and training records shall be prepared showing that they attended the training sessions detailed in the Plan.
- The Plan shall educate all construction workers and relevant personnel on the following issues but not limited to them:
  - The Worker Code of Conduct;
  - The prohibitions if any;
  - Traffic regulation;

- Illegal logging and collection of non-timber forestry products;
- Non-disturbance of communities;
- Hunting and fishing restrictions;
- Waste management;
- Erosion and sediment control;
- Health and safety issues;
- Establishment of penalties for those who violate the rules; and
- Any other environmental and social aspect relevant to this Project.

- The Contractor shall present to ESMC and SEO for approval the proposed methods for conducting the training program, which shall include formal training sessions, posters, data in newsletters, signs in construction and camp areas, and 'tool box' meetings.
- The Contractor shall provide periodical training as deemed necessary.
- The Contractor shall keep records of attention and issues covered and provide such records when required by ESMC or SEO.

1.2.9. Site Security and Safety Management Plan

1.2.9.1. Site Safety

The Contractor's responsibilities include the protection of every person and nearby property from construction accidents. The Contractor shall be responsible for the following:

- The Contractor shall comply with relevant national and local safety requirements and any other measures necessary to avoid accidents.
- The Contractor shall conduct safety training for construction workers prior to start working.
- The safety training shall be accompanied by regular refresher trainings and daily tool box talks on safety issues.
- The Contractor shall provide construction workers with sufficient personal protective equipment and clothing such as goggles, gloves, respirators, dust masks, hard hats, earmuffs, steel toed boots, etc., and enforce their use.
- During heavy rains, accidents, or emergencies of any kind, all work shall be suspended.
- Electrical and mechanical equipment shall be braced to withstand seismic events during the construction.
- Sawing, cutting, grinding, sanding, chipping, or chiselling shall be conducted with proper guards and anchoring as applicable.
- The Contractor shall establish safe sight distance in both construction areas and construction camp sites.

- The speed of vehicles moving within the construction site shall be limited to 15-20 km/hr;
- Signs shall be erected around the construction areas to facilitate traffic movement, provide directions to various components of the works, and provide safety advice and warning.
- MSDSs for each chemical present on the worksite shall be maintained.
- The Contractor shall ensure that all workers read all MSDSs explaining the risks to them and their partners, especially when pregnant or planning to start a family. The Contractor shall encourage workers to share the information with their physicians, when relevant.
- The Contractor shall ensure that the removal of asbestos-containing materials or other toxic substances shall be performed and disposed-off by trained workers.
- Seminars on safety issues for local inhabitants, particularly school students shall be organised, to include prevention of road accidents, drowning, and electric shock.
- Warning signs and fence high-risk areas signs such as deep excavations, or blasting areas shall be erected to control public access.
- The Contractor shall ensure to provide lighting at night in roads near constructions sites, if these routes are used regularly by locals.

1.2.9.2. Working in Watercourses

When crossing or working near watercourses the following measures shall be taken into consideration:

- As far as reasonably possible, the Contractor shall work in watercourses shall take place outside of the expected rainy season. Sufficient time shall be allowed for construction processes to be effected before the rains start.
- Steep slopes (>25 percent) leading to watercourses shall be hand-cleared.
- Temporary embankments shall be built to protect riverbanks and ponds from erosion.
- Fallen trees, debris, or soil inadvertently deposited within the high water mark of any watercourse shall be removed to reduce damage to any aquatic habitat.
- Drip trays shall be used for all pumps, generators, etc. to prevent water contamination as a result of fuel spills or leaks.
- In the event of a spill, the Contractor shall take prompt action to clear polluted areas and prevent spreading of the pollutants.
- The Contractor shall be liable to arrange for professional service providers to clear affected areas, if required.
- Any work requiring the fording of watercourses by machinery and vehicles shall be undertaken at slow speed and with clean vehicles (no leaks, etc.) and along a single track.
- The Contractor shall select appropriate equipment and vehicle crossing methods. Such methods shall be approved by EST.

- The Contractor shall use existing stream and river crossings as much as possible if the crossings can stand the weight of machinery and equipment.
- The Contractor shall build temporary stream crossings such as fords, culverts, polyvinyl chloride and high-density polyethylene pipe bundles, and portable or on-site constructed bridges when existing crossings cannot be used.
- Temporary crossings shall be required to provide safe, erosion-free access across a stream for construction equipment. Properly designed, installed, and maintained temporary stream crossings can greatly reduce costs and help meet concerns of regulating agencies.
- When vehicle crossing is no longer required, the Contractor shall remove stream crossing structures, restore and stabilize stream beads, banks and other disturbed areas, if required.

1.2.9.3. Working in the Proximity of Community Springs/Water Sources

A number of springs have been identified along the tunnel alignment as reported in the Supplementary ESIA report. These springs are used by local communities for drinking water, irrigation and as water supply for livestock and wildlife. The following measures shall be taken into consideration by the Contractor to minimise potential impacts on these water sources:

- Identification and flagging of the location of these springs.
- Ensuring that minimum earth works and any other disturbance in the area around the springs is carried out and sedimentation is avoided.
- Monitoring and documentation of water yield before, during and after construction to detect impacts.
- Advance notification and coordinate with the respective communities if any impact or temporal access restriction to the springs is expected.
- Implementation of a grievance mechanism that allows communities to express their concerns/claims in relation to the local water supplies.
- Provision of water supplies to villages/communities if water supply is affected due to Project-related activities.

1.2.10. Rehabilitation and Landscaping Management Plan

1.2.10.1. Site Restoration

Remedial actions which cannot be effectively carried out during construction shall be carried out on completion of the works (and before issuance of the acceptance of completion of works). Various activities to be carried out for site restoration are:

- Following the completion of the Project, access roads may be turned back to the local government and if desired, used as rural roads or wood land roads. If local governments elect not to use these access roads, the land can be used for farming or plantation purposes.

- At the completion of the construction work, all construction camp facilities shall be dismantled and removed from the site and the whole site shall be restored to a similar condition to that prior to the commencement of the works, or to a condition agreed to with the land owner.
- Construction campsite shall be vegetated and trees cut replaced with saplings of similar tree species.
- All affected areas shall be landscaped and any necessary remedial works shall be undertaken without delay, including vegetation and reforestation.
- To make the land fertile, compaction, grading, construction of drainage channels and spreading topsoil over terrains shall be carried out upon completion of the Project.
- Water courses shall be cleared of debris and drains and culverts checked for clear flow paths.
- All sites shall be cleaned of debris and all excess materials properly disposed as approved by EST.
- No foreign material generated/ deposited during construction shall remain on site.
- Oil and fuel contaminated soil shall be removed and transported and buried in government approved waste disposal areas.
- Soak pits and septic tanks shall be covered and effectively sealed off.
- Restoration of cleared areas, such as borrow pits no longer in use, disposal areas, construction roads, construction camp areas, stockpiles areas, working platforms and any areas temporarily occupied during construction of the Project works shall be restored using landscaping, adequate drainage and vegetation. Restored dumping sites can then further be used for farming.
- Land used for agricultural activities (especially the additional land being taken on lease), prior to use for construction activities, shall be, as much as possible, restored to a state to allow the same agricultural activity to continue.
- Watercourses, which have been temporarily diverted by the construction activities, shall be restored to their former flow paths after commencement of construction.
- Any damaged to occupied drainage, irrigation and other agricultural infrastructure shall be restored to its previous condition as much as possible.

1.2.10.2. Access Roads

To reduce the environmental impact caused by the construction of new access roads, the Contractor shall put into place the following measures:

- All new access roads shall be approved by ESMC and EST. A road engineer shall corroborate that the proposed access road is properly designed.
- The Contractor shall present a 1:5000 scale map of the road.

- The design of the new access roads shall follow the landform and avoid alignments that require large volumes of excavation and clearance of vegetation.
- The new access road shall include a drainage ditch, and all unstable slopes shall include retaining walls or other appropriate structures to control erosion and landslides.
- Where the soil texture on the slopes to be filled is too loose to resist erosive forces of storm water, a dam of 0.5 metre width by 0.2 metre height is suggested to be constructed along the edge of the roadbed to retain storm water from running down through the soils on side slopes. In addition, a temporary drainage ditch shall be constructed along the roadbed at an interval of 50 metre to divert the excessive storm water.
- A sedimentation basin shall be provided where necessary downstream of the drainage ditch in order to remove solids in the run-off before it reaches any watercourse.
- The Contractor shall carry out stabilization and appropriate bio-engineering activities such as grass and tree plantation along the entire route.
- New access roads shall avoid areas of high scenic value and protected and sensitive areas.
- Access roads shall avoid agricultural areas wherever reasonable and practical.
- The Contractor shall avoid road construction on unstable slopes and shall improve existing low-standard roads, which shall be used for the movement of construction equipment and vehicles. Community roads also used for this purpose shall be properly maintained, restored, rehabilitated or upgraded, including strengthening of the road surface and drainage system.
- Night construction activities near sensitive receptors such as residential areas, hospitals, rest homes, etc. shall be prohibited.
- The Contractor shall set all necessary warning signs, and speed bumps near sensitive receptors to reduce speed and increase traffic safety.
- For unpaved access roads, the Contractor shall spray water as needed during the dry season to reduce fugitive dust.
- If temporary bridges are needed, their design shall be reviewed by a licensed engineer and approved by ESMC and EST. These bridges can be constructed from locally available materials or the Contractor can use pre-fabricated bridges if available. All temporary bridges shall be removed after the completion of construction;
- Roads should be designed with the necessary width and slope to allow the transit of equipment and machinery in both directions without causing any delay.
- In access roads adjacent to communities, the Contractor shall inform local communities of traffic patterns and usage and provide awareness materials to schools to inform children about traffic safety.
- Once the construction of the Project is finished, all access roads shall be:
  - Given to local governments/communities;

- Decommissioned and the area restored for use in agriculture or grassing, or re-stored to its pre-construction condition; or
- Used for maintenance of the components of the Project.

1.2.10.3. Clearing, Revegetation, and Restoration Management Plan

In general, the Clearing, Revegetation and Restoration Management Plan shall include:

- Areas proposed for clearing shall be approved by ESMC and EST. Only those areas shall be cleared that are in accordance with the Plan.
- The Contractor shall identify vegetation to be preserved during the planning process and shall delineate with temporary fencing. Preserving vegetation helps to stabilize the soil, prevent erosion, protect water quality and has visual and aesthetic benefits.
- Initially, the Contractor shall perform the removal of existing vegetation to allow access for construction machinery and establish a safe workplace for employees.
- Trees and plants located in the Project area and access roads shall be marked to indicate whether they should be kept, transplanted or removed. Large or significant trees and plants with ecological value (for example, those that serve as nesting or rest areas for birds) or that have commercial value, should be preserved wherever possible.
- Transplantation of existing trees affected by the Project works shall be carried out prior to the commencement of construction.
- The Contractor shall take into account soil stability, protection of wildlife, and natural vegetation and the prevention of sedimentation of watercourses when determining the method and time to carry out the clearing.
- The removal of vegetation shall be avoided, as far as possible, in steep terrains, erosion, and landslide prone areas and ecologically sensitive sites.
- When clearing within 30 metres of permanent streams and 15 metres of intermittent streams, the Contractor shall use hand cutting or winching to remove timber.
- The Contractor shall use “brush rakes” on bulldozers to minimise disturbance of ground cover and to save as much vegetation as possible.
- The vegetation shall be removed in stages to retain topsoil as long as possible to prevent large areas from being eroded by wind and rain.
- At the reservoir, fallen vegetation shall be left in place over the cleared areas for as long as possible before flooding, so as to minimise sediment run-off.
- During excavations, it shall be ensured that damage to the root systems is avoided. Mitigation measures are also required to prevent damage to trunks and branches of trees.
- The plants and vegetation that can be used later in the process of revegetation and restoration and threatened or endangered flora identified in the areas to be cleared shall be conserved in temporary nurseries. The location of the nurseries shall be approved by EST.

- All remaining non-indigenous vegetation shall not be burned but disposed of at an EST approved landfill site.
- Successful land reclamation and re-cultivation of temporary used land are highly dependent on preservation of topsoil. Therefore, the Contractor shall remove topsoil from all areas where it shall be impacted by the construction activities, including temporary activities such as storage and stockpiling, etc.
- Stripped topsoil shall be stockpiled in locations approved by EST for later use in revegetation and reclamation, and shall be adequately protected from wind and water erosion and toxic materials.
- The Contractor shall provide a plan for timber salvage indicating the type of timber to be salvaged, methods of storage, transportation and use of timber.
- In community forests, trees shall be cut and deposited in accordance with the agreement with the affected owners.
- Trees shall be replaced in accordance with Ministry of Forest standards (2:1 ratio)
- All trees and plants deemed to have economic value to individuals or communities (for example, medicinal plants) shall be adequately compensated, according to the entitlements identified in the Land Acquisition and Livelihood Restoration Plan (LALRP) for the Project.
- Local people shall be encouraged to make use of removed vegetation such as to use as garden composts.
- The application of chemicals for vegetation clearing shall be completely avoided.
- Herbicides use in the Project shall be shown to be effective against the target vegetation species, have minimum effect on the natural environment, and be demonstrated to be safe for inhabitants and domestic animals in the treated areas, as well for personnel applying them.
- The use of chemicals and herbicides, if any, shall be approved by EST and comply with the Nepalese rules and regulation.
- The Contractor shall replace at her/his own cost the vegetation that was damaged or destroyed outside the areas approved for clearing.

1.2.10.4. Landscape, and Visual Impacts

The construction activities of the Project shall be executed in phases, particularly in those locations where severe or high landscape and visual impacts are expected.

- Construction shall be programmed in sequence so that the scale of earth moving activities and area of exposed surface can be minimised.
- Revegetation shall start at the earliest opportunity and appropriate local species of vegetation shall be used.
- Topsoil stripped from the work areas shall be used for landscaping works.

- Appropriate grass or other erosion control material (such as jute) shall be planted on high embankment slopes to recover vegetable cover and protect from erosion.
- The requirement of compensatory planting shall be included in the design and Project contract. A Master Landscaping Plan and requirements of ecological monitoring or survey during different stages of the Project shall be prepared during the design stage, which shall be implemented during construction and maintained during operation. These planning and monitoring requirements shall be integrated into the overall Reforestation Plan.
- The Contractor shall use mulch, blankets, and mats, along with native grass seeds, in situations when disturbed soil is difficult to stabilise, such as bare or exposed soil, steep slopes, (generally steeper than 1:3), slopes where the erosion potential is high, disturbed areas where plants are slow to develop, channels with flows exceeding 1 metre per second, stockpiles, and slopes adjacent to water bodies and other sensitive resources.
- Spoil heaps and excavated slopes shall be re-profiled to stable batters, and shall be vegetated to prevent erosion.
- At the highly sensitive scenic zones, the construction shall be scheduled where possible at the low tourist seasons. The construction trucks shall operate at night when possible and shall be maintained and covered when shipping bulk materials.
- The construction sites shall be surrounded with opaque fence or treelines if located at the scenic zones to avoid direct visual sights of the construction sites. Temporary fences shall be of a recessive visual appearance in both colour and form.
- Spoil disposal sites, quarries and borrow sites shall avoid environmentally sensitive areas such as nature reserves, scenic spots, forests, water source protection areas, agricultural land, etc.
- Existing roads shall be used as access road if possible to minimise the need for development of new access roads which leads to damage to the existing land form and/or greens.

1.2.11. Spill Prevention and Response Management Plan

Environmental emergency procedures relate primarily to the event of accidental leaks, spills, emissions and other unforeseen impacts or issues. By definition, the nature of such emergencies cannot be known. Therefore, the Contractor shall respond on a case-by-case basis to such emergencies and shall initiate event-specific measures in terms of notifications and reactions.

1.2.11.1. Accidental Leak/Spill of Fuel/Chemicals/Waste

In the event that accidental leakage or spillage of diesel/chemicals/chemical wastes takes place, standard response procedures shall be followed immediately by the Contractor such as:

- The person who identified the leakage/spillage shall immediately check if anyone is injured and then inform the SEO and EST.
- The Contractor shall ensure that all injured persons, if any, are treated and assess the nature of the substance that has spilled/leaked.

- Whenever the accidents/incidents generate serious environmental pollution or potential risks resulting in serious environmental pollution problems (e.g. spillage/leakage of toxic or chemicals, large scale spillage/leakage, or spillage/leakage into the nearby water bodies which are used for irrigation / portable water), the SEO shall immediately inform the EST.
- In such cases, the Contractor shall take immediate action to prevent the spillage/leakage and divert the spilled/leaked liquid to a nearby non-sensitive area.
- The Contractor shall arrange maintenance staff with appropriate protective clothing to clean up the chemicals/chemical waste. This may be achieved through covering the area with sawdust (if the quantity of spillage/leakage is small), or sand bags (if the quantity is large); and/or using a shovel to remove the topsoil (if the spillage/leakage occurs on bare ground).
- Contract Environmental Health and Safety team shall identify the possible accidental leak/spill of fuel/chemicals/waste as per the type, nature of materials to be handled at site and detailed procedure for spill prevention and management to be prepared and awareness training on the same to be imparted to all responsible personal;
- Spilled chemicals must not be flushed to local surface drainage systems. Instead, government approved clean-up and disposal procedures shall be carried out.
- Depending on the nature and extent of the chemical spill, evacuation of the activity at the site may be considered. The Contractor/SEO has the authority to make the final decision.
- The Contractor shall prepare a report with root cause analysis for the spill or incident, remedial action taken, consequences/damage from the spill, and proposed corrective actions. The incident report shall be submitted to the EST for review and shall be maintained in the records.
- Workers shall receive training on environmental emergency procedures, so that they are fully aware of the various possible emergency situations in construction activities and the relevant emergency response procedures, as well as the danger and potential damages caused by the emergency to the environment and the people.

1.2.12. Spoil Management and Disposal

The Contractor shall follow the following for spoil disposal:

- Spoil disposal sites should not be located where they can cause future slides, interfere with agricultural land or any other properties, impact endangered/rare flora or sensitive areas, or cause soil from the dump to be washed into any watercourse. Garland drains need to be dug within and around the spoil disposal site.
- Spoil disposal sites shall not be located near residential areas, in unstable lands, on flood plains, and shall not affect drainage and irrigation ditches.
- Spoil disposal sites shall be constructed in locations that are not susceptible to water erosion and be designed and constructed to be stable during and subsequent to construction.

- The Contractor shall include provisions for incorporating the most appropriate stabilization techniques for each disposal site and determine the selected spoil disposal sites do not cause unwanted surface drainage.
- If the disposal site is located near a river or water course, a retaining wall and/or interception ditch or settling ponds shall be built prior to the initiation of the construction activities to prevent the deposits from being washed away by the monsoon waters. The surface runoff shall be retained and settled first before allowed discharge into the receiving water.
- The Contractor shall use excavated materials for filling purposes in the powerhouse site and remaining quantity for filling access road and regulating poundage to minimise the spoil dumps requirement.
- Spoil and excavated material generated from Project footprint shall be utilized for the following construction purposes: (1) Suitable rocks from the excavations can be used as aggregate; (2) road construction; (3) backfilling of quarries and borrow pits, and for land reclamation.
- The construction of disposal sites and transportation of spoils at night is strictly prohibited near residential areas. The sites shall be watered for dust suppression during their operation.
- The disposal sites shall be fully rehabilitated as soon as the disposal operation is completed. The rehabilitation shall include a complete cover of the site with native soil and fully landscaped/vegetated. The stability of the sites shall be inspected and measures such as retaining walls shall be constructed as needed.
- Disposal sites close to patches of natural vegetation shall be limited in size to avoid cutting vegetation and disturbing any existing wildlife.
- Access roads, if needed, to the disposal areas shall be handled in the same manner as the construction of new access roads.

1.2.13. Traffic Management Plan

The Contractor shall:

- Make sure construction vehicles comply with speed limits.
- Use only selected routes to the Project site, appropriately sized vehicles suitable to the class of roads in the area, and restrict loads to prevent damage to local roads and bridges used for transportation purposes as agreed upon with the ESMC.
- Maintain adequate traffic control measures throughout the duration of the construction activities. Such measures shall be subject to prior approval of the EST.
- Clearly mark pedestrian-safe access routes.
- Promote and distribute traffic safety information to local residents.
- If school children are in the vicinity, include traffic safety personnel to direct traffic during school hours.

- Ensure traffic safety at intersections, especially near sensitive areas (schools, markets, hospitals, and historical, cultural and religious places).
- Maintain a supply for traffic signs (including paint, easel, sign material, etc.), road marking, and guard rails to maintain pedestrian safety during construction.
- Use signs and flagmen for traffic control.
- Be held responsible for any damage caused to local roads and bridges due to the transportation of excessive loads, and be required to repair such damage to the approval of the ESMC.

1.2.14. Waste Management Plan

During the construction stage, the Contractor shall prepare a Waste Management Plan before commencement of Project work. The Plan shall include the following Sub-Plans:

1.2.14.1. Solid Waste

Disposal of Construction Debris

The Contractor shall carry out the following activities:

- The disposal of construction debris shall be carried out only at sites previously identified and approved by EST.
- Debris generated due to the dismantling of existing structures shall be suitably reused, to the extent feasible, in the proposed construction program (e.g. as fill materials for embankments).

- Trash and debris shall not be buried within fill or backfill areas.
- All arrangements for transportation during construction including provision, maintenance, dismantling and clearing debris, where necessary, shall be considered incidental to the work and should be planned and implemented by the Contractor as approved and directed by the ESMC and the EST.
- Once the work is completed, all construction -generated debris shall be removed from the site.

Domestic Solid Waste

The Contractor shall carry out the following activities:

- The Contractor shall submit a method statement detailing a solid waste control system (storage, provision of bins, site clean-up schedule, bin clean-out schedule, etc.) to the ESMC and the EST for approval.
- The Contractor shall ensure that all facilities are maintained in a neat and tidy condition and the site shall be kept free of litter.

- Measures shall be taken to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse. At all places of work, the Contractor shall provide litter bins, containers, and refuse collection facilities for later disposal.
- Solid waste may be temporarily stored on site in a designated area approved by the EST. The storage area shall have a cover to avoid direct contact with surface runoff, and be fenced off to prevent wind-blown litter. Waste storage containers shall be covered, tip-proof, weatherproof, and scavenger proof.
- The Contractor shall identify and demarcate disposal areas clearly indicating the specific materials that can be deposited in each waste container.
- Waste containers shall be strategically placed in visible locations easily identified and marked. For example, recycle, organic waste, unusable waste, hazardous waste, paper, glass, etc.
- Recyclable materials (e.g. wooden plates for trench works, steel, scaffolding material, site holding, packaging material, paper, empty cement bags and containers, glass, wood, junk), shall be collected and separated on-site from other waste. Collected recyclable material shall be re-used or sold to a waste collector for recycling.
- The Contractors shall be required to separate construction waste from domestic waste. Where possible, the construction waste shall be recycled for landfilling. If possible, the domestic waste shall be transported off site-at least once a week for disposal in covered containers or trucks, by an environmental sanitary authority or by a licensed waste collector.
- In remote locations where collection of waste is not practical, the Contractors shall be required to bury the solid waste in the designated landfill areas approved by the EST. Organic waste and kitchen wastes shall be disposed into soak pits.
- Burning solid waste in open air conditions shall be strictly prohibited.
- Random disposal of solid waste in within and outside the Project areas shall be strictly prohibited.
- Employees shall be educated on segregation of waste with demarcated bins for recyclables and perishables placed in common areas.

Hazardous and Chemical Waste

The Contractor shall carry out the following activities:

- All hazardous and chemical waste (including bitumen, disposable lubricating oil, mineral oil, organic solvent, acid and alkali, oil paint, etc.) shall be properly stored, handled and disposed of in accordance with the environmental standard, regulation and management policies of Nepal, and the producers of the chemicals.
- Only authorized personnel shall handle hazardous and chemical waste.
- The Contractor shall inform all employees of the emergency measures to be taken in case of spills or accidents due to improper use of these substances.

- Hazardous waste shall be stored separately from other waste and warning signs shall be posted around the site.
- The Contractor shall provide disposal certificates to the EST.
- The removal of asbestos-containing materials or other toxic substances shall be performed and disposed of by trained workers.
- Used oil and grease shall be removed from site and sold to an approved used oil recycling company.
- Under no circumstances shall the spoiling of tar or bituminous products, or any other chemical or hazardous waste be allowed on the site, over embankments, in borrow pits or any burying, water bodies, agricultural land, or sensitive areas.
- Hazardous wastes shall be kept in isolated place away from active working zone.
- Ensure proper covered shed is provided with impervious floor for storage of used oil and any other identified hazardous wastes to avoid any soil contamination;
- Unused or rejected tar or bituminous products shall be returned to the supplier's production plant.
- Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery shall be collected in holding tanks and sent back to the supplier or removed from site by a specialist oil recycling company for disposal at an approved hazardous waste site.
- Transportation of hazardous waste off the site shall be done in cooperation with an approved and authorized partner. All this material shall be regularly collected, stored and transported to disposal or reuse in accordance to the regulations of Nepal.

1.2.15. Wastewater Management Plan

The Contractor shall be responsible for compliance with the relevant Nepalese legislation relevant to wastewater discharges, including tunnel process water, into watercourses. Contractor shall ensure the following processes are implemented for wastewater management:

- Sewers shall be designed and installed by the Contractor in accordance with the national design code of Nepal.
- The Contractor shall submit a method statement to the EST detailing how wastewater will be collected from all wastewater generating areas, as well as storage and disposal methods. If the Contractor intends to carry out any on-site wastewater treatment, this should also be included.
- Groundwater intercepted from tunnelling area shall be collected through sump and treated prior to discharge to the river or tributaries;
- Wastewater from mixing stations, concrete batching plants, crushing plants, warehouses, material washing, and tunnel construction shall be collected into settling tanks, treated, and disposed according to national rules and regulations.

- Runoff from fuel depots/workshops/machinery washing areas, concrete batching plants, mixing station, and similar areas shall be collected into a settling basin and disposed of at a site approved by the EST.
- Domestic sewage from site office and chemical toilets for construction workers shall either be collected by a licensed waste collector or treated by on-site treatment facilities. Discharge of treated wastewater must comply with the discharge limit according to Nepalese wastewater discharge standards.
- Wastewater shall not be discharged into water bodies without treatment.
- Water usage shall be optimised by creating awareness among the labour force through construction supervisors;

1.2.15.1. Site Drainage System

The Site Drainage System Plan shall contain details regarding the following:

- A review of the preliminary site drainage design prepared during the detailed design.
- An update of the preliminary design based on the actual construction program and the site specific conditions (e.g. the geographical conditions, location of slopes and the nature of construction work).
- A detailed implementation program, approved by ESMC and EST, of the proposed drainage system shall need to be maintained.
- Detailed design including drawings, location maps, and specifications of drainage collection channels, pumping systems, temporary water pipes, and wastewater treatment facilities shall need to be prepared.
- Proposed discharge locations and treatment standards.
- As part of the design of the site drainage system, surface runoff within the construction site shall be diverted in order to avoid flushing away soil material. The runoff water shall be treated by device such as sediment trap before discharge.
- Storm water and wastewater systems shall be separated. The rainwater shall be collected through a ditch and discharge into any adjacent body of water. The maximum flow velocity for a rainwater ditch shall be determined in accordance with flood prevention measures.

1.2.16. Water Quality Management Plan

The Contractor shall be fully responsible for any contamination to the existing water quality within the Project site. The Contractor shall ensure that the following mitigation measures are implemented:

- Contractor shall ensure that the effluents released from the operations of the crusher and other sources will be settled into a sedimentation tank, before being released into water sources.

- An appropriate drainage system shall be established in and around the spoil and muck disposal area to ensure that it does not impact the water quality.
- Liquid waste discharged from the labour camp shall be treated as per the standards set in the regulations of Nepal.
- Washing, bathing, urination, and toilet facilities shall be provided at the worker camps to ensure there is no open urination or defecation in open areas and water bodies by the workers.
- The Contractor shall establish a solid waste management system to ensure proper collection, segregation, and disposal of solid waste so that there is no contaminated surface run off from the waste.
- Liquid waste generated on site such as lubricants, paints, cleaning chemical, and other aqueous oil-based materials, shall be collected separately, stored in a suitable storage tank (i.e. on a concrete platform with secondary containment), and disposed of in a government approved facility.
- Semi-liquid waste generated from the batching plant shall be settled in a sedimentation tank before realised into a water source.
- The Contractor shall ensure that there is no haphazard disposal of waste on site.
- Sufficient and suitable toilet facilities for workers shall be maintained for proper standards of hygiene.
- Bund shall be provided around excavated soil or loose construction material to prevent runoff to nearly water bodies.
- Storage area shall be kept away from the water course to prevent any washes away.
- All the debris resulting from construction activities shall be removed from the site on regular basis to prevent their runoff.

1.2.17. Rock Cuttings Management Plan

The post-earthquake revised Project design involves significant tunnelling, the rock cuttings from which have not been tested to see if they are potentially acid generating. A Rock Cuttings Management Plan will be prepared by the contractor to manage the risk of acid rock drainage. The Contractor shall ensure that the following mitigation measures are implemented:

- During the tunnelling process, the Contractor shall perform a visual geological/geotechnical evaluation of the rock type for a preliminary determination of its acid generating potential.
- Sample collection should be done from the interior of every tunnel (for example, every 500 meters) during excavation, and from every area where there is a significant change in rock type, and sent to an accredited laboratory for analysis.

- The Contractor should test the pH of the seepage water on a regular basis, and have a contingency plan in order to contain and treat the water if it exceeds the discharge standards set forth in the MP.
- Material disposal (source and final disposal location) shall be monitored and documented daily.
- Material shall be disposed off based on the visual inspection; however, all material's disposal locations shall be recorded until lab results have been obtained and the geologists initial assessment verified.
- The Contractor shall establish a cuttings disposal plan so that materials with acid drainage potential are not disposed of in areas for inert materials.
- Material with potential acid drainage shall be disposed of in areas where they are not exposed to conditions where they can generate acid leachate and where leachate can be collected and treated/disposed off appropriately.

1.2.18. Worker Accommodations Management Plan

1.2.18.1. Site Selection

The number and exact location of worker camps is being re-evaluated after the 2015 earthquake and future susceptibility to landslides due to earthquake induced or heavy rain induced landslides.

The Contractor shall plan, design and build workers' camps and work sites to meet the following requirements:

- The Contractor shall submit for approval the designs and location of the proposed camps and work sites including details of all buildings, facilities, materials used, the construction methodology and work schedule, at least two months before the start of the construction works.
- The sites for the labour camps shall be identified keeping in mind the risk of landslides. For this purpose, the geological survey results of the Technical Team of Ministry of Federal Affairs and Local Development shall be taken into account.
- The permits and approvals shall be obtained in accordance with relevant local laws and regulations, applicable standards and environmental requirements in order to meet legal obligations for the construction of the camps and work facilities of Nepal.
- Camps, work sites, and access roads shall be located so as to avoid clearing as many major trees and vegetation as possible from the areas and to avoid important aquatic habitats. These areas shall be located to allow effective natural drainage.
- Offices and workers' camps shall be located at least 50 metres from watercourses and operated so that no pollutants enter watercourses, either overland or through groundwater seepage, especially during the rainy season. This can be achieved by recycling lubricants and

building a ditch or canal around the area with an oil separator or settling pond/oil trap at the outlet of the ditch.

- Offices and workers' camps be located at least 100 metres from residential areas and shall never be located near schools or hospitals.
- Offices and workers camps shall not be located in environmentally sensitive areas such as nature reserves, forests, water source protection areas, agricultural land, etc.
- Effective sediment and erosion control measures shall be implemented during construction of the camps and work sites in accordance with the environmental requirements of the Project especially near watercourses.
- Drainage systems, wastewater treatment and solid waste disposal shall be carried out according to Nepal national laws and regulations and the Waste Management Plan.

1.2.18.2. Facilities

- The Contractor shall provide suitable, safe, and comfortable facilities for the labour force.
- The facilities shall include dormitories, rest areas, lavatory facilities, and canteens adequate for the numbers of workers in the camps.
- The Contractor shall present the design of the facilities, to ESMC for approval and shall be in general conformance with the IFC Guidance Note on Worker Accommodations (IFC 2009).
- The Contractor shall provide adequate and suitable facilities for washing clothes and utensils for the use of contract labour employed therein.
- The Contractor shall provide recreational facilities to the workforce. Such facilities shall help reduce potential conflict and impact on the local population as the incentive to go outside the camp shall be reduced.
- Adequate power, heating, air conditioning and telecom system shall also be provided.
- The Contractor shall provide nutritious meals that shall take into account ethnical and cultural differences of the workforce.

1.2.18.3. Potable Water

- It shall be the Contractor's responsibility to carry out all the works necessary for the provision of a water supply system. A gravity flow water supply system can be constructed using water sources from the upper ridges. In any case, the water supply system shall be approved by ESMC.
- The Contractor shall verify the availability of water in the area to determine the scope of the works to be done.
- The Contractor shall supply water to the camps without impacting the water supply of neighbouring towns and villages.
- Water at sources shall be tested and treated as necessary.

- The Contractor shall provide potable water for food preparation, drinking, and bathing in all labour camps, administrative offices, medical facilities, canteens, etc. Potable water shall comply with the Nepal national standards for human consumption.
- Public taps shall be installed at appropriate locations
- The drinking water system shall be cleaned and maintained on a regular basis by the Contractor.

1.2.18.4. Sanitary Facilities

- Separate and adequate toilet and bathing facilities shall be provided for the use of male and female workers. Notices shall be displayed outside each block of latrines and urinals, in the language understood by the majority of the workers stating "For Men Only" or "For Women Only" as the case may be.
- Toilet and bathing facilities shall be provided with adequate supply of running water, soap, toilet paper, and drainage.
- Such facilities shall be conveniently accessible and shall be kept in a clean and hygienic condition on a regular basis. Latrines shall also be constructed in areas that are likely to be visited frequently by the construction workers.
- The Contractor shall provide portable toilets in all construction sites in the following scale: one latrine for maximum 15 women and one latrine for maximum 15 men.
- A dry system of sewage disposal, such as ventilated improved pit latrine, shall be appropriate for the Project area. It is easy to construct and does not require a flushing system. The latrines shall be located at a distance of at least 10 metres away from residential areas and at least 50 metres away from water sources.
- If septic tank systems are used for any residential labour camps, the seepage pits shall be located at a safe distance from water sources to avoid contaminating them. Wastewater shall not be disposed into water bodies without treatment.
- The wastewater treatment plants shall be designed, installed, operated and maintained in accordance with the regulations and specifications of Nepal.

1.2.18.5. Medical Facilities

The Contractor shall establish a medical centre located at the main construction camp for the diagnosis and treatment of communicable diseases, simple medical complaints, and the handling of medical emergencies and accidents, prior to transportation to the hospital. The medical centre shall have:

- A 7 to 10 bed health facility fully equipped to provide emergency medical care to stabilize emergency patients before they can be referred to district or provincial hospital.
- Essential medical equipment for the centre to provide emergency care.
- Short term care of patients requiring hospitalization.

- Isolation room (one bed) for any infectious disease patient (in epidemic situations, district and provincial facilities shall have to be used).
- An ambulance or an appropriate motor vehicle to transport patients to the nearest health care centre or hospital.
- One medical officer, one trained nurse of senior level, two medical auxiliaries, and one laboratory technician (who may be also responsible for monitoring water quality in construction camp areas).

In addition, the Contractor shall ensure the following:

- The smaller construction camps shall have first aid posts staffed by either a trained nurse or a locally trained personnel, as required.
- All biomedical waste from the medical centre and the first aid posts shall be packed in containers designated for that purpose and discarded according to the rules and regulations established for the disposal of medical waste.
- All the facilities shall be provided with first aid kits that are regularly checked for medicine expiry, etc.

1.2.18.6. Maintenance of Camp Facilities

The Contractor shall implement the following measures to ensure that the construction camp and its facilities shall be organized and maintained to acceptable and appropriate standards:

- Meals and drinks shall be provided in the areas designated for this purpose (canteens) and during the established schedule. Cooking or preparation of food shall be prohibited in accommodation quarters.
- Designated rest times and recreational hours shall be established.
- Appropriate areas shall be designated for smoking. NO SMOKING signs shall be placed in areas where smoking is prohibited, for example, in the dormitories and medical facilities.
- The dormitories, medical and health facilities as well as canteens, kitchens, administrative offices, and other facilities shall be kept clean and free of debris, solid wastes and contaminants.
- The latrines and urinals shall be adequately lighted and shall be maintained in a clean sanitary condition at all times.
- Reserve water shall be kept in drums or barrels in or near the latrines and urinals.
- The Contractor shall establish a grievance redressal mechanism to receive and respond to complaints from the construction camp residents regarding the maintenance of facilities and services provided (food, medical care, recreation, etc.). This mechanism shall be in compliance to the principles identified in the GRM for the Project

1.2.18.7. Security

Some security measures shall be put into place to ensure the safe and secure running of the camp and its residents. Some of these security measures include:

- Adequate, day-time night-time lighting shall be provided.
- The construction site shall be properly fenced and guarded to restrict access to public. The perimeter security fence shall be at least 1.8 metres in height and constructed from appropriate materials. The type of fence and the materials used must be approved by ESMC.
- Access to the camp shall be limited to the residing workforce, construction camp employees, and those visiting personnel on business purposes.
- Visitors and relatives of the camp residents must obtain written permission to enter the camp. This permit shall be approved by the construction camp manager.
- Guided tours shall be arranged whenever required to inform people about construction activities of the Project to avoid local people from gathering and crowding near the construction sites.
- Camps shall have emergency equipment such as first-aid kits, flashlights, firefighting equipment, portable fire extinguishers, audible warning devices such as a siren, water rescue equipment, emergency vehicle and phone on site at all times, with workers well informed about the proper use of such equipment.

1.2.19. Stockpiles, Quarries, and Borrow Pits Management Plan

The Contractor shall prepare an overall Stockpiles, Quarries and Borrow Pits Management Plan for the total work. Operation of a new borrowing area, on land, in a river, or in an existing area, shall be subject to prior approval by ESMC and the operation shall cease if so instructed by the EST. Stockpiles, Quarries and borrow pits shall be prohibited where they might interfere with the natural or designed drainage patterns. River locations shall be prohibited if they might undermine or damage the river banks, or carry too much fine material downstream. Rock or gravel taken from a river shall be limited to the depth equal to one-tenth of the width of the river at any one location, and not disrupt the river flow, or damage or undermine the river banks. The Plan shall include:

- A map showing the extent of the area to be developed.
- A method statement defining the proposed working methods shall be developed and approved by EST/ESMC.
- The proposed access and haulage routes between the borrow pits and the destination for the extracted materials shall be developed and approved by EST/ESMC.
- A justification for the quantities of materials to be extracted, an estimation of the waste material to be generated and disposal details for such waste materials.
- Details of the drainage system (ditches, culverts, etc.) to be submitted to EST.
- Details of the measures taken to minimise the borrow pit areas and their visual impact on the surrounding area.
- Details of the measures to be taken for the long-term rehabilitation of the borrow pit areas to avoid situations that could constitute a threat to health and safety and cause environmental pollution.

In general terms, the Contractor shall:

- Identify and demarcate locations for stockpiles and borrow pits, ensuring that they are 50 metres away from critical areas such as steep slopes, erosion-prone soils, and areas that drain directly into sensitive water bodies.
- Not locate borrow pits also close to roads.
- Locate stockpiles, quarries and borrow pits in non-productive land to the maximum extent possible and as approved by EST.
- Locate stockpiles, quarries, and borrow pits so as to avoid sensitive areas such as nature reserves, scenic spots, forest parks, water source protection areas, woodlands, or grasslands, etc.
- Locate stockpiles, quarries, and borrow pits in non-productive land to the maximum extent possible, and avoid agricultural land
- Limit extraction of material to approved quantity and demarcated borrow pits area.

- Stockpile topsoil when first opening the borrow pit. After all usable borrow has been removed, the previously stockpiled topsoil shall be spread back over the borrow area and graded to a smooth, uniform surface, sloped to drain. On steep slopes, benches or terraces shall be used to help control erosion.
- Stabilize and revegetate excess overburden. Wherever appropriate, organic debris and overburden shall be spread over the disturbed site to promote revegetation. Natural vegetation is preferred to the extent practicable.
- Keep existing drainage channels in areas affected by the operation free of overburden. These shall be cleaned regularly.
- Ensure that all borrow pits used are left in a trim and tidy condition with stable side slopes, re-establishment of vegetation, restoration of natural water courses, and avoidance of flooding of the excavated areas wherever possible so no stagnant water bodies are created which could breed mosquitoes.
- When the borrow pits or the local depressions created by the construction activities cannot be refilled or reasonably drained, consult with the local community to determine their preference for reuse such as fish farming or other community purposes.
- Reinstate areas affected by stockpiling to the satisfaction of EST.

1.2.20. Maintenance Management Plan

1.2.20.1. Maintenance of Site during Construction

The Contractor shall carry out the following activities:

- Establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for debris.
- Collect construction, demolition, clearing, grubbing debris, and other trash weekly for disposal off–site. No on-site burning shall be permitted.
- Maintain silt fence and other temporary erosion and sediment controls in working order throughout the Project.
- Remove and properly dispose of excess sediment behind silt fences and Bio Rolls of when sediments reach one-third the height of the structure.
- Maintain construction entrances/exits daily.
- Remove all remaining temporary and accumulated silt fences 30 days after site has undergone final stabilization.
- In the event any debris or silt from the sites is deposited on adjacent land, immediately remove debris or silt and restore the affected area to its original state to the satisfaction of the EST.

1.2.20.2. Maintenance of Equipment during Construction Phase

To ensure the maintenance of equipment during construction, the Contractor shall:

- Identify and demarcate equipment maintenance areas (50 metres from rivers, streams, lakes, or wetlands). Fuel storage shall be located in proper areas approved by EST.
- Ensure that all instruments, machines, and construction equipment meet quality standards before they are put into use.
- Maintain the equipment and machinery used for earthmoving activities s in very good operating conditions, and periodically revises them for controlling emissions and avoiding possible mechanicals faults during operation that could lead to oil, lubricant, or fuel leaks.
- Ensure that all equipment maintenance activities, including oil changes, are conducted within demarcated maintenance areas.
- Never dispose spent oils on the ground, in water courses, drainage canals or in sewer systems.
- Dispose of all spills and collected petroleum products in accordance with standard environmental procedures/guidelines. Fuel storage and refilling areas shall be located at least 50 metres from all cross-drainage structures and important water bodies or as directed by the EST.
- Maintain and wash vehicles and other transport equipment only at sites having impermeable protective layers and collection system for oils, lubricants, detergents, solvents. The use of solvents and detergents shall be avoided to a minimum.

2. OPERATION ESMMP

2.1. KEY HIGHLIGHTS OF OPERATION PHASE MITIGATION MEASURES

This section describes the requirements for Operational Phase ESMMP. Table 2.1-1 lists the Management Plans required for this phase, which should be prepared by NWEDC or its facility operator. This operational phase ESMMP shall be implemented in addition to, and in keeping with, the other management plans prepared for the Project and the requirements of the applicable reference framework.

Table 2.1-1: Operation Phase ESMMP

S.N	Resource area	Mitigation /Safeguard Measures	Responsibility	Timing
1	Land and soil	Routes for movement of Operations and Maintenance (O&M) vehicles shall be in designated areas to avoid soil compaction in other areas.	NWEDC/O&M contractor	Regularly during operation phase
		Ensure hazardous waste (used oil, transformer oil, and oil soaked cloths) is properly labelled, stored onsite at a location provided with impervious surface, shed and secondary containment system, and ultimately transported offsite to an approved disposal facility.	NWEDC/O&M contractor	Regularly during operation phase
		Lubricants, oils, grease, chemical shall be stored at designated area with impervious surface and a secondary containment system.	NWEDC/O&M contractor	Regularly during operation phase
		Solid waste generate from the powerhouse, dam, and accommodations areas shall be collected through proper collection system and stored at designated locations.	NWEDC/O&M contractor	Regularly during operation phase
		Maintenance of vehicles, machineries and equipment's shall be carried out only at designated area.	NWEDC/O&M contractor	Regularly during operation phase
		Random disposal of waste shall not be allowed.	NWEDC/O&M contractor	Regularly during operation phase
		Appropriate training shall be conducted for all workers responsible for handling hazardous waste.	NWEDC/O&M contractor	Quarterly/half yearly
		Sludge generated from a wastewater treatment plant shall be used in garden and landscaping.	NWEDC/O&M contractor	Regularly during operation phase
2	Water resources and quality	Regular inspection for identification of water leakages and preventing waste of water from water supply tankers.	NWEDC/O&M contractor	Regularly during operation phase
		Recycle/reuse water to the extent possible.	NWEDC/O&M contractor	Regularly during operation phase
		No treated /raw sewage shall be discharged to any waterbodies.	NWEDC/O&M contractor	Regularly during operation phase
		Spill Prevention and Response Plan shall be implemented for immediate cleaning of spills and leakages.	NWEDC/O&M contractor	Regularly during operation phase
		Manpower engaged during O&M phase onsite shall be sensitised about water conservation and encouraged for optimal use of water.	NWEDC/O&M contractor	Quarterly/half yearly
		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.	NWEDC/O&M contractor	Quarterly/half yearly
		Provision of appropriate drainage shall be implemented along all access roads, quarry site, soil stockpiles and other construction sites.	NWEDC/O&M contractor	Regularly during operation phase
		Wastewater treatment plant shall be provided for treatment and disposal of wastewater generated from accommodations and office and PH area.	NWEDC/O&M contractor	At the beginning of the operations phase

S.N	Resource area	Mitigation /Safeguard Measures	Responsibility	Timing
		Efficient operation of wastewater treatment plant shall be ensured.	NWEDC/O&M contractor	Regularly during operation phase
		Regular monitoring of treated wastewater quality.	NWEDC/O&M contractor	Regularly during operation phase
		Provision of oil and grease trap at vehicle, machinery and equipment maintenance area and regular upkeep and removal.	NWEDC/O&M contractor	Monthly
		Monitor success of tree planting to compensation for Project tree clearing.	NWEDC/O&M contractor	Monthly
3	Reservoir water quality	Regular monitoring of reservoir water quality.	NWEDC/O&M contractor	Monthly
		Removal of dead vegetation or debris on regular basis.	NWEDC/O&M contractor	During monsoon /snow melt
4	Hydrology	Installation of flow measuring gauges (meter with recording provisions) both electronic and manual measurement basis to measure E flow.	NWEDC/O&M contractor	Regularly during operation phase
		Controlled flushing of sediment from reservoir and desanders.	NWEDC/O&M contractor	As needed
5	Air Emission	Vehicles used in O&M Phase shall be regularly maintained and idling time reduced to minimise emissions.	NWEDC/O&M contractor	Regularly during operation phase
		Vehicle emitting significant black smoke in their exhausts shall be serviced/ replaced.	NWEDC/O&M contractor	As and when required
		Regular maintenance of vehicles shall be undertaken.	NWEDC/O&M contractor	As per the manufacturer guideline
6	Noise	Restriction on unnecessary honking.	NWEDC/O&M contractor	Regularly during operation phase
		Use of Personal Protective Equipment (PPE) by all the employees to minimise adverse impact of occupational noise generation.	NWEDC/O&M contractor	Regularly during operation phase
		Use of rubber padding underneath high noise and vibration generating machines.	NWEDC/O&M contractor	Regularly during operation phase
		Employees working within powerhouse shall be provided with earplugs and other required PPE.	NWEDC/O&M contractor	Regularly during operation phase
7	Occupational Health and Safety	Alternating work schedule to avoid continuous exposure of workers to higher noise levels.	NWEDC/O&M contractor	Regularly during operation phase
		Appropriate PPEs and fall protection equipment shall be used by all employees in keeping with their work profile.	NWEDC/O&M contractor	Regularly during operation phase
		Cranes and other lifting equipment shall be operated by trained and authorised persons.	NWEDC/O&M contractor	Regularly during operation phase
		Training to the workers on climbing techniques, and rescue of fall-arrested workers.	NWEDC/O&M contractor	Regularly during operation phase

S.N	Resource area	Mitigation /Safeguard Measures	Responsibility	Timing
		Use of appropriate tool bag for raising or lowing tools to workers on elevated structures.	NWEDC/O&M contractor	Regularly during operation phase
		Lifting devices, including equipment, slings, ropes, chains, and straps, shall be inspected, certified, and labelled to confirm their weight capacities.	NWEDC/O&M contractor	Regularly during operation phase
		Drinking water to the workers at residential accommodations and other facilities shall be supplied after maintaining drinking water quality norms (Nepal drinking water quality standard and WHO drinking water quality standards).	NWEDC/O&M contractor	Regularly during operation phase
		Adequate sanitary facilities shall be provided to prevent any health ailments and to meet the emergency needs.	NWEDC/O&M contractor	Regularly during operation phase
		Induction training for new employees shall be conducted prior to starting the work at site.	NWEDC/O&M contractor	At the time of Joining
		Tunnel and other underground area shall be properly illuminated.	NWEDC/O&M contractor	Regularly during operation phase
		Provision of all the PPE's such as safety boots, helmets, goggles, illumination jacket, ear muffs (plugs) etc. shall be made available to the employees and regular check shall be undertaken to ensure their use.	NWEDC/O&M contractor	Regularly during operation phase
		Details of health and safety related incidence shall be recorded and maintained.	NWEDC/O&M contractor	Regularly during operation phase
		Lock out and Tag out procedure shall be developed and permit system shall be adopted.	NWEDC/O&M contractor	Regularly during operation phase
		Sufficient number of employees shall be provided with first aid training to respond emergency	NWEDC/O&M contractor	At the beginning and thereafter annually
		Periodic review and update of Emergency Response Plan (ERP).	NWEDC/O&M contractor	annually
		Proper marking shall be made for identification of locations of flammable storages.	NWEDC/O&M contractor	Regularly during operation phase

S.N	Resource area	Mitigation /Safeguard Measures	Responsibility	Timing
8	Natural Disasters and Other Emergencies	During operation phase, potential risks will be mainly related to accidental fire from leaks of flammable material from tanks, valves, maintenance activities by working at height, and movement of traffic. Ensure adequate Fire Fighting system is established onsite prior to commissioning of the Project as per the Fire Fighting Plan covering the following aspects: • Fire Prevention Measure and Systems • Signage • Fire Detection and alarm System • Fire Fighting System and devices • Annually, update Emergency Response Plan (and ensure organization available for its implementation. • The ERP covers following responses to: • Flash floods or inundation • Earthquake • Landslide • Spill/leak/fire of fuel or toxic gas • Electrical Emergency • Medical emergency • Bomb threats • Road accidents • Responsibilities of Emergency Response Co-ordination Team members shall be provided in the ERP	NWEDC/O&M contractor	Half yearly/annually
		Implementation of emergency response plan in case of flash flood, cloud burst etc.	NWEDC/O&M contractor	Monsoon season/snow melt
		Warning system on water level fluctuation shall be installed at major locations/communities downstream of the proposed dam site.	NWEDC/O&M contractor	At the beginning of the operations phase with regular monitoring and physical verification of the functioning of the system
9	Aquatic Resources	Implement the environmental flow (Eflow) Management Plan	NWEDC/O&M contractor	Regularly through the operation phase through Installation of flow measuring gauges (meter with recording provisions) both electronic and manual measurement basis to measure E flow.

S.N	Resource area	Mitigation /Safeguard Measures	Responsibility	Timing
10	Terrestrial Resources	• Transmission lines. • Regular checking of the vacuums or holes in the towers to avoid nesting by the birds. • Monthly monitoring of bird carcasses electrocuted and records of any threatened or migratory species maintained. Any spurt in mortality shall need consideration of design modifications to reduce mortality.	NEWDC/O&M contractor	Once a week during breeding season for nesting in vacuums or holes. Monthly monitoring for electrocution of threatened species
		• Signage and speed humps shall be used in areas where wildlife crossing is likely. • Training of vehicle drivers regarding the driving risks through biodiversity sensitive areas and along remote roads. • Any spurt of in mortality shall require review of location of signage and training efficacy of drivers.	NEWDC/O&M contractor	All incidences of road kills to be recorded routinely
		• Awareness raising among site management staff and O&M contractors to desist from extracting or exploiting floral and faunal resources within construction areas or LNP. Access will not be permitted in the LNP and this needs to be communicated to workers and staff. • Include terms in contracts with O&M contractors indicating that exploitation of biodiversity resources will result in penal action.	NEWDC/O&M contractor	Awareness raising to be carried out once in 6 months and for all new staff who join the Project
11	Labour	Ensure adequate labour accommodation in keeping with the requirements of the applicable reference framework.	NWEDC/O&M contractor	Regularly during operation phase
		Provide adequate training to the workers in the Project, especially in terms of interaction with the local community.	NWEDC/O&M contractor	Regularly during operation phase
		Implement a code of conduct for the workers in the Project.	NWEDC/O&M contractor	At the beginning
		Ensure access to a grievance redressal mechanism for the workers.	NWEDC/O&M contractor	Regularly during operation phase
12	Stakeholder Engagement	Ensure access to a grievance redressal mechanism for the local community.	NWEDC	Regularly during operation phase
		Ensure adequate and timely disclosure of information to the local community in terms of Project activities and available opportunities, in keeping with Stakeholder Engagement Plan formulated for the Project.	NWEDC	Regularly during operation phase
13	Grievance Mechanism	In order to manage and address any complaints, queries or issues raised by the community, the Project team will need to maintain and implement the Grievance Redress Mechanism. The same will need to be communicated to the nearby settlements.	Project proponent	During operation phase

S.N	Resource area	Mitigation /Safeguard Measures	Responsibility	Timing
14	Future Land Procurement	Avoid culturally and religiously significant sites for the locals.	NWEDC	At the time of land identification
		In case of any additional land requirement, undertake land procurement in keeping with the principles identified in the Land Acquisition and Livelihood Restoration Plan.	NWEDC	At the time of land procurement
		In case of any additional land requirement, ensure proper documentation of consultation with impacted communities for future land requirements and agree on an acceptable option in terms of managing impacted sites.	NWEDC	At the time of land procurement
		Implement a Chance Finds Protocol that is widely socialized and understood by the Project contractors.	NWEDC/O&M contractor	Regularly during operation phase
		Ensure access to a grievance redressal mechanism for the local community	NWEDC	At the time of land procurement
15	Traffic	Contractors shall ensure that the transport of labour and material of maintenance is planned so that it does not increase traffic on the existing roads.	Contractor	Regularly during operation phase
		Signs and warning signs shall be placed properly.	Contractor	Regularly during operation phase
		Use appropriate safe and decent transportation mode to transport workers to Project sites, during the operation phase. Labourers shall be provided with transportation in vehicles equipped with canopy (closed vehicles) and seating facility.	Contractor	Regularly during operation phase
		The contractor shall undertake to increase the level of public awareness prior to commencement of the plant operation to advise all road users of the impending construction work, the time taken for such work, and the road conditions likely to be encountered.	Contractor	Regularly during operation phase
16	Community Health and Safety	Contractor will ensure to display warning signs in the areas where there is high risk due to electric works etc.	Contractor	Regularly during operation phase
		Security personnel will be posted around the site to ensure that there are no unauthorised personnel within the Project site.	Contractor	Regularly during operation phase
		Any trainings, workshop, skill development and vocational program as proposed in the Nepal employment and Skill Training plan shall be implemented.	Project proponent and Contractor	During operation phase

3. GENERAL ESMMP

3.1. BIODIVERSITY MANAGEMENT PLAN

3.1.1. Purpose

Where biodiversity values of importance to conservation are associated with a project site or its AoI, the preparation of a Biodiversity Management Plan (BMP) provides a useful means to facilitate implementation of a project's mitigation and management strategy. The development of a BMP might be required under a company's own biodiversity policy, or International Finance Institutions (IFI or "Lenders") might request a BMP to help document compliance with Lender standards. Other parties, such as government agencies, conservation organizations or Affected Communities, might also be interested in the development of a BMP to address a specific topic of concern.

This BMP has been prepared to support the corporate commitments of the Nepal Water and Energy Development Company (NWEDC) for conserving aquatic and terrestrial biodiversity in the Trishuli River Basin.

3.1.2. IFC Performance Standard 6

IFC applies the Performance Standards (PS) to manage social and environmental risks and impacts and to enhance development opportunities in its private sector financing. IFC PS 6, Biodiversity Conservation and Sustainable Management of Living Natural Resources, aims at protecting and conserving biodiversity, the variety of life in all its forms, including genetic, species, and ecosystem diversity and its ability to change and evolve. This PS addresses how projects will avoid or mitigate threats to biodiversity arising from their construction and operations as well as incorporate sustainable management of renewable natural resources.

IFC PS6 categorizes habitats as follows:

- Modified Habitat: are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition.
- Natural Habitat: are areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition.
- Critical Habitat: are areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes.

3.1.2.1. Objectives of The BMP and Compliance to IFC PS6.

In accordance to PS 6, Projects affecting areas of Natural Habitat, the client will not significantly convert or degrade Natural Habitats, unless all of the following are demonstrated:

- No other viable alternatives within the region exist for development of the project on Modified Habitat;
- Consultation has established the views of stakeholders, including Affected Communities, with respect to the extent of conversion and degradation; and
- Any conversion or degradation is mitigated according to the mitigation hierarchy

Furthermore in areas of Natural Habitat, mitigation measures will be designed to achieve no net loss of biodiversity where feasible. Appropriate actions include:

- Avoiding impacts on biodiversity through the identification and protection of set-asides
- Implementing measures to minimize habitat fragmentation, such as biological corridors;
- Restoring habitats during operations and/or after operations; and
- Implementing biodiversity offsets

The BMP initially classifies all habitats into modified, natural or critical by assessing the prevailing state of habitat modification by human use and presence of threatened, endemic or migratory species. For Modified Habitat, the BMP discusses minimization of impacts. For Natural Habitat, the BMP assesses whether any project alternatives are possible and whether stakeholders have been adequately consulted. It subsequently discusses how the mitigation hierarchy has been used to minimize impacts or compensate residual impacts through biodiversity offsets. The Project does not directly affect Critical Habitat, but the BMP describes measures to avoid or minimize indirect impacts on Critical Habitat.

3.1.3. Impacts on Terrestrial Habitat and its Mitigation

3.1.3.1. Terrestrial Habitats Classification

The Project will directly impact approximately 108 hectares (ha) of land as summarized in Table 3.1.

Table 3.1-1: Project Effects on Land Cover and IFC Habitat Classifications

Land Cover[a]	Area (ha)[a]	Natural Habitat	Modified Habitat	Critical Habitat
Forest	80.9	2.6	78.3	0
Cultivated Land	20.6	0	20.6	0
Cliff	0.8	0	0.8	0
River Banks (bagar)	5.5	0	5.5	0
Total	107.8	2.6	105.2	0

The Project will directly impact biodiversity by the loss of vegetation and habitat and injuring wildlife; and indirectly by increased human activity (i.e. influx of workers, noise, vehicular

traffic, potential for illegal hunting and plant collection) and the loss of habitat connectivity. The transmission line will pose electrocution threats to bird species.

Potential Impacts to Natural Habitat

Project construction and operation will directly impact approximately 2.6 ha of Natural Habitat, as defined in the International Finance Corporation's Performance Standards. This small area is located on the east bank of the Trishuli River near the proposed dam/headworks and is part of Langtang National Park (LNP).

The small impact to Natural Habitat associated with the Project cannot be avoided or further minimized because of engineering constraints. In accordance with IFC PSs, NWEDC is required to mitigate this residual impact to achieve no net loss. NWEDC will achieve no net loss by working with the LNP to identify a suitable area of cleared/degraded land and reforest it using a 1:2 ratio. Species used will maintain parity with the impacted area. Additionally, NWEDC will enhance riparian vegetation by developing a Riparian Vegetation Restoration Program which describes existing conditions, restoration design, and monitoring and maintenance activities.

Potential Impacts on Modified Habitat

The Project will impact approximately 105.2 ha of Modified Habitat, as defined by the IFC PSs. Modified terrestrial habitats on the west bank of the Trishuli River, where most of the Project components will be built, consist mostly of forest under management by local communities (78.6 ha) and agricultural or marginal lands. The forests are highly intervened and degraded by human activity (e.g. extraction of forests products, cattle grazing). Much of this land will only be temporarily disturbed, and NWEDC will stabilize and revegetate approximately 76 ha with only approximately 31 ha permanently converted to Project facilities and the reservoir.

Potential Impacts to Critical Habitat

According to the IFC Performance Standard 6, Critical Habitat is defined as "areas with high biodiversity value, including (1) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of significance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes (*Error! Reference source not found.*). We assess the potential presence of Critical Habitat below.

Species Criteria

There are no IUCN Critically Endangered, Endangered, or endemic flora or fauna species within the Project AoI, so no Critical Habitat is identified based on IUCN listed species. There are, however, some fauna species that are endangered or endemic in Nepal, which are evaluated below.

- Isisbill – is classified as Endangered in Nepal and is thereby assessed under Criteria 1 Tier 2 e. The species is widely distributed in Southern Central Asia and numbers in the

Modified Habitat of the project's AoI are not nationally or regionally significant. The Critical Habitat criteria are therefore not triggered.

- Assamese monkey *(Macaca assamese)* - is endemic to Nepal and relegated to a single population there. The Nepal population of the species is threatened due to its restricted distribution of less than 2,200 square kilometres extent of occurrence and 914 square kilometres areas of occupancy and continuing decline in area, extent and quality of habitat, the number of locations and in the number of mature individuals. Given its restricted extent of occurrence, threats on its population and habitat, and small numbers in fragmented patches, the Nepal population of this macaque is categorized as Endangered (Boonratana et al. 2008). The species will be affected by habitat loss within the Modified Habitat. However macaque species are highly adaptable and will either move to areas (if competition from other neighbouring troops is limited) or adapt within the cleared area which will be human dominated in the future. Given the wide range of the species in South and Southeast Asia, and that the numbers in the Modified Habitat in the Project's AoI are not nationally or regionally significant, Criteria 1 Tier 2 e is not triggered.
- Asiatic black bear (*Ursus thibetanus*) - is classified as EN in Nepal and is thereby assessed under Criteria 1 Tier 2 e. The species is widely distributed in South and Southeast Asia and numbers in the Modified Habitat of the project's AoI are not nationally or regionally significant. The Asiatic black bear is unlikely to be found in the Modified Habitats which are to be cleared, preferring the more forested and remote areas in the LNP. This criterion is therefore not triggered.
- Smooth coated otter (*Lutrogale perspicillata*) – is classified as EN in Nepal, but is largely confined to protected areas in the Terai. This aquatic species prefers slower moving rivers with deeper pools and is more likely in downstream areas. It is unlikely to be present in the project area (Jnawali et al. 2011) in any significant numbers and Criteria 1 Tier 2 e is not triggered.

Protected Areas Criteria

LNP is an IUCN Category II protected area (Bhugu et al. 2007) and is recognized as an Important Bird and Biodiversity Area (Birdlife 2013). It is not a World Heritage Site or a Biosphere Reserve. IFC PS6 states that internationally and/or nationally recognized areas of high biodiversity value will likely qualify as Critical Habitat; examples include the following:

- Areas that meet the criteria of the IUCN's Protected Area Management Categories Ia, Ib and II, although areas that meet criteria for Management Categories III-VI may also qualify depending on the biodiversity values inherent to those sites.
- The majority of Key Biodiversity Areas (KBAs), which encompass inter alia Ramsar Sites, Important Bird Areas (IBA), Important Plant Areas (IPA), and Alliance for Zero Extinction Sites (AZE).

Therefore, the LNP is considered Critical Habitat. The LNP, however, is divided into a "core area" and a "buffer zone," which is technically outside the park, but within the park boundary. Much of the buffer zone is developed with roads, villages, and farmland. In fact, more than 80,000 people were estimated to live within the park in 2012 (Langtang National Park and Buffer Zone Management Plan 2012). The buffer zone lands need to be assessed on a case-by-case basis as to whether they would qualify as Critical Habitat.

The Project will disturb approximately 6.77 ha of land within the LNP boundary—2.61 ha for construction of the dam and 4.16 ha for the construction of the new worker camp (2.8 ha owned by the government and 1.36 ha privately owned). The new worker camp needs to be relocated from the previously approved Mailung School site for safety reasons in the aftermath of the 2015 earthquake.

Both sites (i.e. the entire 6.77 ha) are designated buffer-zone land along the edge of, but still within, the LNP boundary (Langtang National Park and Buffer Zone Management Plan 2012). The LNP Management Plan recognizes the potential for development of hydroelectric projects near the LNP, specifically mentioning the Upper Trishuli Project, and encourages use of alternative energy as a buffer zone objective.

The 2.61-ha site required for the dam is forested and identified above as Natural Habitat. This site, however, is designed buffer-zone land, which is isolated from the remainder of the LNP by steep cliffs. It does not provide habitat of significant importance to Critically Endangered or Endangered, endemic, restricted range, or restricted-range species; does not support globally significant concentrations of migratory or congregatory species; is not a highly threatened or unique ecosystem; and is not associated with any key evolutionary processes. Therefore, we do not consider this site to be Critical Habitat.

Although within the LNP, the 4.16-ha site required for the worker camp is designated buffer zone land, is also disturbed and not forested, and is isolated from the remainder of LNP by the Betrawoti-Mailung-Syabrubesi Road. As with the 2.61-ha parcel, this site also does not meet any of the applicable criteria, so is not considered Critical Habitat.

Although these sites are not considered Critical Habitat and the Project will not directly impact any Critical Habitat, there is the potential for the Project to indirectly impact core areas of the LNP, which are considered Critical Habitat. This is less of a risk for the 2.61-ha site because the camp for the dam construction workers is on the west bank, with the Trishuli River and the extremely steep slopes on the east bank serving as a barrier limiting access to the LNP core areas.

The 4.16-ha site near the powerhouse, however, poses a greater risk because it will be used as the worker camp, and is located on the east bank of the river with roads providing easy access to the LNP's core areas. The introduction of this workforce in close proximity of Critical Habitat presents several risks, including illegal hunting/poaching and the collection/trade of natural or wildlife products.

NWEDC has agreed to adopt the following measures to minimise indirect Project impact on LNP, Critical Habitat, as well as impacts to Community Forests:

Table 3.1-2: BMP Mitigation Measures

Mitigation Measures	Responsibility
Ensure compliance with all applicable NWEDC commitments and the Biodiversity Management Plans are included in the EPC contracts	NWEDC
Demarcate in the field the approved limits of clearing to ensure no additional Natural Habitat or Community Forest is disturbed.	EPC
Install fencing around the dam site to prevent unauthorized worker access to LNG forest.	EPC
Collect and store topsoil for use in restoration.	EPC
Adopt a Worker Code of Conduct that prohibits unauthorized entrance to LNP or Community Forests; illegal hunting, fishing, and poaching; and the collection/trade of natural or wildlife products. Clearly indicate that these activities could result in the termination of their employment.	EPC
Provide awareness training to construction workers, operations and maintenance (O&M) staff, and site management employees regarding the elements of the Worker Code of Conduct.	EPC
Prohibit use of wildlife meat at the worker camps.	EPC
Provide staff to monitor/patrol activities in the LNG buffer zone at the dam site and powerhouse worker camp to ensure no illegal activity by construction workers.	EPC
Use signage and speed humps in areas where wildlife crossing is likely.	EPC
Train vehicle drivers regarding the driving risks through biodiversity sensitive areas and along remote roads.	EPC
Stabilize and rehabilitate/reforest temporarily disturbed areas, especially community forest. In accordance with the Nepal Ministry of Forest requirements, NWEDC will compensate for the loss of trees on a 2:1 basis in accordance with its PDA agreement.	EPC
Visually monitor number of trees felled within 1 km of dam, access road and switchyard as well as baseline plots, as part of a Biodiversity Evauation and Monitoring Program (BEMP) to be developed	NWEDC
Provide funding to LNP to recruit additional staff to monitor UT-1 construction activities	NWEDC
In accordance with Nepal Ministry of Forest requirements, as mentioned earlier, 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 permanent acquisition of parklands.	NWEDC
Provide funding to local forest user groups for monitoring and surveillance to protect wildlife	NWEDC
Protect the LNP from further losses of land due to shifting river course and from easy access to the park though dewatered zones during operation	NWEDC/ECP
Limiting disturbance and educating construction workers on steps to prevent damage to the park and/or its wildlife	NWEDC/EPC
Enhance riparian vegetation by developing a Riparian Vegetation Restoration Program which describes existing conditions, restoration design, and monitoring and maintenance activities	NWEDC
Regular ecological monitoring on the fauna, flora and specific habitats within the impact areas.	NWEDC
Raise the transmission poles with suspended insulators in order to reduce the electrocution of bird species or fixing insulated caps made of plastic.	EPC
Require bird-safe strain poles with insulating chains of at least 60 cm length.	EPC
Check for vacuums or holes in the towers to avoid nesting by any of the birds;	EPC
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

Considering the relatively minor impacts on terrestrial biodiversity, and implementation of these mitigation measures, NWEDC should achieve no less loss of terrestrial Natural Habitat at the UT-1 Project, and should not result in any significant impacts to terrestrial habitat.

3.1.4. Aquatic Biodiversity

The Project will affect aquatic habitat and fish differently upstream of the dam, in the diversion reach, and downstream of the powerhouse. This section summarizes the types of impacts that will occur in each of these river segments and proposed mitigation and management measures.

3.1.4.1. Upstream of the Dam

The Project should have negligible impacts on aquatic habitat upstream of the reservoir. No in-water construction will occur upstream of the dam that would modify riverine habitat, with the exception of the temporary coffer dam using to divert water around dam construction. The Project dam will permanently convert riverine habitat to lacustrine (lake) habitat, which results in changes in water depths and velocities, light penetration, physical water quality (e.g. temperature), sediment deposition, and substrate material, all of which modifies the suitability of that habitat for various aquatic species.

In the case of the UT-1 Project, however, the reservoir will only be 2.1 ha in surface area, which effectively limits the impacts on upstream aquatic habitat. Common snow trout, which is one of only two species of fish found upstream of the dam site and by far the most abundant, is known to inhabit lakes (Petr and Swar 2002; Petr 1999), and would be expected to colonize the small UT-1 reservoir.

The existing baseline ecological condition of the Trishuli River upstream of the UT-1 dam is considered “Natural” to “Slightly Modified.” The Downstream Response to Imposed Flow Transformation (DRIFT) Model (S.A.N. Engineering Solutions 2017) results found that the Project would slightly reduce the overall ecological integrity of the Trishuli River upstream of the dam to a “Moderately Modified” condition. This reduction in the integrity rating is largely attributable to the “barrier” effect of the dam on upstream migration of Common snow trout. The magnitude of Project effects on Common snow trout populations upstream of the dam will be largely dependent on the effectiveness of the proposed fishway in facilitating the movement of these fish from their over-wintering areas downstream of the dam to their breeding areas upstream of the dam.

3.1.4.2. At the Dam

The UT-1 dam will interfere with the ability of fish to move upstream or downstream past the dam, which could affect the abundance of Common snow trout and its ability to reach upstream spawning grounds. NWEDC proposes to construct a fish ladder at the UT-1 dam, which would allow Common snow trout and potentially other species to move upstream past the dam.

Fish surveys conducted in 2011, 2014, and 2016 collectively indicate that Common snow trout migrate upstream of the UT-1 dam site in the early Spring (March and April to spawn. Most of these fish remain in the upper portion of the river through the summer, with a large downstream

migration of some adults, but predominantly juvenile fish, from May through September. Some Common snowtrout were found to overwinter above the dam site, but this population is relatively small.

These data demonstrate that different portions of the Project Area provide important habitat for various life stages of the Common snowtrout at different times of the year, and therefore the importance of maintaining connectivity between aquatic habitat upstream and downstream of the dam.

NWEDC has committed to providing fish ladder at the UT-1 dam, and contracted with SWECO, a Norwegian company with extensive fishery experience in Nepal, to develop a conceptual design for fish passage at the UT-1 dam. In this case, the Common snowtrout was selected as the target species because it is the dominant species found in the Project area and its IUCN status as Vulnerable. Based on the Common snowtrout's size and swimming ability, SWECO proposed a fish ladder design with the following features (see Figure 3.2):

- Fish ladder flow of 1 m^3/s;
- An additional attraction flow of 1 m^3/s;
- The remainder of the Eflow will be routed into the entrance pool at the base of the ladder;
- Entrance pool at the base of the ladder equipped with hiding places for fish and water velocities of less than 0.6 metre per second (m/s);
- Approximately 100 steps with an approximate height of 0.3 metre, based on a dam height of approximately 30 metres;
- Water velocity through the vertical slots connecting the various steps with a maximum velocity of 0.7 m/s (slightly higher velocities are allowed in the lowest nine steps;
- Exit from the fish ladder at the top of the weir will be located as far as possible from the powerhouse intake where water velocities are less than 0.3 m/s to minimize the risk of the upstream migrating fish being entrained into the turbines.

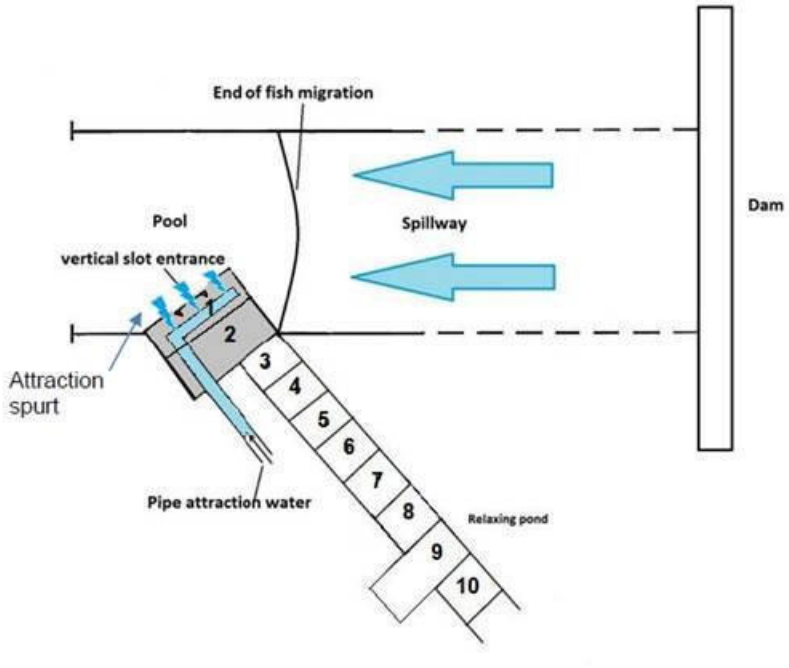


Figure 3.1-1: Fish Ladder Design

SWECO notes that there are some other upstream migration challenges unrelated to the fish ladder itself, and recommends that NWEDC:

- Ensure conditions at the powerhouse tailrace are such that the upstream migrating fish are attracted to the flow from the diversion reach and are not diverted to the powerhouse tailwaters;
- Ensure that the reduced flows in the diversion reach do not create any barriers or obstacles to upstream migration; and
- Ensure the channel in the river section just downstream of the dam leads the fish to the fish ladder entrance.

SWECO also makes several recommendations regarding the management of the fish ladder, including:

- Monitor flow and temperature (preferably on an hourly basis) to have the data needed to optimize fish ladder functionality; and
- Monitor fish movement to detect the beginning of the upstream migration period and ensure proper functioning of the fish ladder entrance.

Facilitating the safe upstream passage of migrating Common snowtrout above the dam is important, but ensuring the safe downstream passage of migrating fish is equally important. Most adult and juvenile Common snowtrout will migrate downstream in late summer and autumn as river temperatures gradually decline. Fish migrating downstream would either be entrained into the powerhouse turbines, with high levels of injury or mortality, or pass with spillage water over

dam falling 15 to 30 metre. SWECO provided the following recommendations regarding downstream fish migration:

- Monitor fish movement to detect the beginning of the downstream migration period and ensure fish are guided away from the powerhouse intake;
- Ensure the main river current in the reservoir directs fish toward the spillway rather than 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 fish ladder design has been peer reviewed by the IFC and ERM and found acceptable. SWECO has provided advice and coordinated with the Project engineers on the fish ladder to ensure its design is technically feasible and economically viable. This fish ladder design has been incorporated into the overall dam design drawings.

Based on NWEDC's commitment to fully implement SWECO's recommendations, and assuming the fish ladder operates effectively, we conclude that impacts to upstream and downstream migrating fish have been appropriately managed consistent with international good practice.

As indicated by SWECO, additional monitoring is required to ensure the proper operation of the upstream and downstream fishways. NWEDC has committed to contracting an international fish scientist with expertise in Nepal fish to oversee the following actions:

- During Project construction:
    - Develop and oversee implementation of a aquatic biodiversity monitoring plan, including fish, water quality, and sediment, which would be implemented prior to the initiation of construction to provide a solid baseline against which to measure Project effects on fish populations, especially the Common snowtrout, and to help better understand the timing of Common snowtrout upstream and downstream migration, the extent to which Common snowtrout spawns in the Trishuli River mainstem versus tributaries in the Project area, and the relative population of Common snowtrout in the diversion reach;
    - 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.
- During the initiation of Project operations:

- Inspect the diversion reach to ensure no barriers or obstacles exist to upstream migration under Eflow only conditions, and if any are identified, recommend measures to mitigate them;
- 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 Eflow program and determine whether further actions are warranted in accordance with the Environmental Flow Adaptive Management Program.

The intent of this monitoring is to demonstrate no net loss of Common snowtrout in the Project area. It should be noted that there are several other hydropower projects under construction and proposed both upstream and downstream of the Project area. There is potential that decreases in the numbers of migrating Common snowtrout passing through the UT-1 Project area, and the populations of Common snowtrout found in the Project area, could occur, and not be attributable to the UT-1 Project. NWEDC is participating in a Trishuli River Basin Cumulative Impact Assessment funded by IFC, and has committed to participate in a Trishuli Basin Co-Management Platform to facilitate collaborate monitoring and management of cumulative impacts (see Section 7.12 for more details on Cumulative Impacts).

3.1.4.3. Diversion Reach

The Project will divert up to 76 cubic metres per second (m^3/s) of flow from the 10.7-kilometre 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 diversion reach, thereby potentially impacting aquatic habitat and fish. During nearly six months of the year (November through April), this diversion would represent much of the Trishuli River flow.

In Nepal, hydropower projects are required to release 10 percent of the minimum monthly average flow or an alternative environmental flow (Eflow) recommended in the project's EIA, whichever is higher. The purpose of the Eflow is two-fold: 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. As Table 3.2.1 shows, 10 percent of the minimum monthly average flow for the UT-1 Project would equate to a required minimum flow of approximately 3.9 m^3/s (i.e. 10 percent of 38.6 m^3/s, which is the average flow during the river's lowest flow months of February and March at the Project site).

NWEDC has proposed an Eflow that is higher than that required by Nepalese regulations, essentially providing 10 percent of the average monthly flow for each month, rather than the minimum average monthly flow. Actual flow in the diversion reach would typically be higher than this Eflow from May to October (e.g. the spring snowmelt and monsoon period) as river flow would exceed the hydraulic capacity of the Project and excess water would be spilled into the diversion reach. Table 3.2.1 below shows the existing, required minimum, proposed minimum, and the proposed actual diversion-reach flow regimes by month.

Table 3.1-3: 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 river flow regime	43.7	38.6	38.6	49.5	87.5	230.4	487	557.8	370.8	160.4	79.9	54.6
Required minimum diversion reach flow regime	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Proposed minimum diversion reach Eflow regime	4.4	3.9	3.9	5.0	8.8	23.0	48.7	55.8	37.1	16.0	8.0	5.5
Proposed actual average diversion reach flow regime[a]	4.4	3.9	3.9	5.0	11.5	154.4	411.0	481.8	294.8	84.4	8.0	5.5
% of mean monthly flow	10%	10%	10%	10%	13%	67%	84%	86%	80%	53%	10%	10%

Source: Modified from ESSA 2014

[a] Includes flows above the hydraulic capacity of the powerhouse (76 m^3/s) that would be spilled.

The data indicate that some, but relatively few Common snowtrout overwinter in the diversion reach. This is attributed to both the high velocities and cold winter water temperatures found in this reach, which approach the tolerance threshold of Common snowtrout. The Eflow analysis indicates that the relatively few Common snowtrout that may overwinter would likely vacate the diversion reach during the winter primarily because of the low flows (assumed to be 3.9 m^3/s) provided by the Project. There is available habitat downstream below the powerhouse where winter water temperatures remain warmer, so the reduced diversion reach flow is not expected to result in any loss of Common snowtrout or reduction in their population.

The other important purpose of Project Eflow is to provide sufficient flow conditions to enable upstream migrating adult Common snowtrout to navigate through the diversion reach to the proposed fish ladder at the dam. If the Eflow does not provide appropriate water depths and velocities, the Common snowtrout will not be able to reach the fish ladder or its upstream spawning areas. The literature reports a range of minimum depths for the species. The final Eflows assessment for the Project reported a preferred depth for adults of 1 to 3 m (S.A.N. Engineering Solutions 2017) based on one study from the 1970s (Shrestha and Khanna 1976),

but more recent studies indicate a minimum depth of 0.8 m for spawning adult Common snowtrout (Mathur and Kapoor 2015).

Table 3.2.2 compares the estimated flows, based on hydraulic calculations, required to provide average depths of 0.8 to 1.0 m through the diversion reach, assuming a trapezoidal channel and the average Trishuli River gradient through the diversion reach. These calculations likely underestimate actual flow required to achieve these critical water depths as true trapezoidal channels do not typically occur in nature.

Table 3.1-4: Comparison of Minimum Flows Required to Achieve Critical Depths for Common Snowtrout (S. richardsonii) in the Diversion Reach

Depth (m)	Manning Coefficient (n)	Gradient (m/m)	Flow (m^3s)
0.8	0.04-0.08	0.03	3.45-6.90
1.0	0.04-0.08	0.03	5.79-11.57

The Project fishery studies and the scientific literature suggest that most Common snowtrout spawn from March to May in the Project Area, NWEDC's proposed Eflow for these months (3.9 to 11.5 m^3/s, see Table 7.2-1 above) would just provide the minimum depth required in the diversion reach if the 0.8 m critical depth is accepted, but would not provide the minimum depth during March and April if the 1.0 m critical depth is used. In either case, the proposed Eflow during March and April appear to be marginal, which could prevent Common snowtrout from reaching the proposed fish ladder at the dam and access to upstream spawning areas, which in turn could significantly impact reproductive potential, spawning success, and ultimately population levels of Common snowtrout both upstream and downstream of the Project.

There are many uncertainties inherent in this analysis, including the relatively weak scientific basis for establishing the critical flow depth required to support the upstream migration of Common snowtrout, the flow required to achieve this critical flow depth, the timing of the Common snowtrout's spawning, among others. Discussions with NWEDC indicate constraints on their ability to increase Eflows, especially during the critical early migration months, if monitoring indicates water depths are insufficient to allow the Common snowtrout to reach the fish ladder. These constraints include the terms of their Power Purchase Agreement and the economic impact of increasing Eflows, which means decreasing flows available for power generation. NWEDC has agreed to perform an in-depth river connectivity analysis during the 2018 pre-monsoon by collecting additional fish and invertebrate sampling, surveying the cross-section of the diversion reach, and using these data to develop a hydraulic model of the diversion reach to complement the DRIFT model. This analysis will enable a more robust assessment of the adequacy of the proposed Eflow releases to support Common snowtrout's upstream migration.

In addition, NWEDC will implement an Adaptive Management Program based on intensive monitoring during the 5 years of construction and the Project's first few years of operation to confirm whether upstream migrating Common snowtrout are able to reach the UT-1 fish ladder.

The Adaptive Management Program includes the following elements:

- Implement an intensive fish monitoring program during construction and the first few years of operation to ensure most upstream migrating Common snowtrout are able to reach the Project's fish ladder, especially during the early portion of the migration period (i.e. March and April) when the proposed Eflows are relatively low.
- If monitoring indicates that a meaningful percentage of Common snowtrout are not able to reach the fish ladder (i.e. sufficient to achieve the "no net loss" standard in IFC PS 6), then NWEDC will evaluate the potential for channel improvements to effectively increase water depths and guide the fish to the fish ladder.
- If monitoring indicates that, even with channel improvements, a meaningful percentage of Common snowtrout are still unable to reach the fish ladder, then NWEDC either (1) initiate a trap and haul program to capture upstream migrating Common snowtrout and transport and release them upstream of the dam, or (2) establish a hatchery for Common snow trout, possibly in combination with other hydropower developers in the area, and release sufficient numbers of hatchery-bred fish upstream of the dam to maintain fish populations in the Project area.

In addition to these measures, NWEDC and IFC are implementing a "connectivity study," which will include an enhanced hydraulic analysis and DRIFT modelling of the diversion reach to better evaluate Common snowtrout's upstream migration flow requirements, and an eDNA analysis of the Upper Trishuli River Basin to establish a robust baseline regarding fish biodiversity in the river.

Implementation of this Adaptive Management Program, informed by the results of the connectivity study, provides assurance that Project effects on flow will not prevent Common snowtrout from reaching spawning grounds upstream of the UT-1 dam.

3.1.4.4. Downstream of the Powerhouse

Impacts on aquatic habitat and fish downstream of the powerhouse will be relatively minor for the following reasons:

- Flow - The Project will operate in a true run-of-river regime and should have no effect on flow downstream of the UT-1 powerhouse;
- Sediment – The Project is designed to pass, rather than trap, sediments using a desander, which will be periodically flushed out several times a year to maintain a reasonably natural sediment balance along the Trishuli River;
- Physical Water Quality - The Project has a very small impoundment (2.1 ha) with negligible water retention, so the Project is not predicted to have any effect on physical water quality (e.g. water temperature, dissolved oxygen) that could affect downstream fishery habitat; and
- Chemical Water Quality - The Project will provide wastewater treatment for both its construction and operation workforce, ensure proper handling and storage of all hazardous materials, will implement an emergency preparedness and response plan in the

event of any spills of hazardous materials, will manage slope stability and sediment control, and will stabilize and landscape disturbed areas.

The existing baseline ecological status of the Trishuli River downstream of the powerhouse is considered "Slightly Modified" (S.A.N. Engineering Solutions 2017). The DRIFT Model results confirm that the Project would have little effect on the overall ecological integrity of the Trishuli River downstream of the powerhouse, with the predicted ecological integrity remaining as "Slightly Modified," assuming effective fish passage.

Overall, Project operational design and proposed upstream mitigation measures should be adequate to ensure that the Project will not adversely impact fishery habitat downstream of the Project powerhouse.

3.1.4.5. Aquatic Habitat Classification

Based on the physical habitat and water quality conditions documented by Project baseline studies, the aquatic habitat in the Project Area meets the IFC's definition of Natural Habitat (IFC 2012). Although the concentrations of several metals (notably iron, manganese and zinc) as well as oil and grease were elevated during the monsoon period, the physical habitat in the diversion reach currently retains its natural ecological function and supports a viable aquatic community.

The Trishuli River is fragmented by the downstream Devighat and Trishuli hydropower projects, which have affected the ecological continuity of the river, but the prevalence of migratory species such as Common snowtrout in the UT-1 Project area demonstrates that the ecosystem is still functionally intact and capable of supporting migratory species. It should be noted, however, that the Upper Trishuli 3A and 3B hydropower projects are under construction immediately downstream of the UT-1 site, and the Rasuwagadhi

Hydropower Project is under construction upstream of the UT-1 site. An additional risk to the local fishery is the introduction of the exotic species Rainbow trout from fish farms. The Common snowtrout population in the Project area appears robust at this time and the Rainbow trout population has not substantially altered the aquatic community to date.

The Upper Trishuli River does not meet the definition of Critical Habitat because it does not support any Critically Endangered, Endangered Species, endemic, or restricted range species; or any highly threatened or unique ecosystems; nor is associated with any key evolutionary processes. The Upper Trishuli River does support migratory species (e.g. Common snowtrout),

but does not support globally significant concentrations of these species.

3.1.4.6. Achieving No Net Loss of Natural Habitat

Pursuant to the IFC Performance Standards, the goal for Natural Habitat is no net loss. As indicated above, the Project is predicted to impact aquatic habitat upstream of the dam and along the diversion reach, but not downstream of the powerhouse because the Project will operate in a true run-of-river regime. IFC's Performance Standard 6 requires Project's to avoid "significant" conversion of Natural Habitats unless:

- No other viable alternatives within the region exist for development of the project on Modified Habitat;
- Consultation has established the views of stakeholders, including Affected Communities, with respect to the extent of conversion and degradation; and
- Any conversion or degradation is mitigated according to the mitigation hierarchy.

The Project has been designed to take advantage of the generation potential offered by the specific set of hydrologic conditions at the Project site and the entire Upper Trishuli River Basin would be considered Natural Habitat, so there are no other viable alternatives for the Project in Modified Habitat. NWEDC has also engaged with stakeholders and communities within the Project area. The major habitat impacts (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 without fundamentally altering the design and purpose of the Project.

The next step in the mitigation hierarchy is minimization. Although the construction of the dam is an inherent component of the Project's design and an unavoidable impact, NWEDC has minimized Project impacts by:

- Minimizing the size of the Project impoundment (2.1 ha); and
- Operating the Project in a true run-of-river mode.

Mitigation follows minimization in the mitigation hierarchy. Although the Project does not propose any measures to compensate for the loss of riverine habitat that will occur upstream of the dam within the reservoir footprint, Common snow trout is expected to persist in the reservoir, and may expand given the amount of new habitat that will be available within the reservoir and the incrementally warmer water temperature of the reservoir, so the loss of Natural Habitat upstream of the dam is negligible. As indicated above, the Project will not impact Natural Habitat downstream of the powerhouse.

Project impacts on the diversion reach relate to a net reduction in flow that will decrease available habitat for the Common snow trout and other species. As discussed above, even under existing conditions, the diversion reach only supports a small population of Common snow trout. Therefore, the impact of the Project on the value of aquatic habitat in the diversion reach is likely small. The critical issue for the diversion reach is the provision of sufficient flow to enable upstream migrating Common snowtrout to navigate the diversion reach and access the fish ladder.

NWEDC proposes the following measures to mitigate these impacts:

- Diversion Reach Eflow
    - Provide an Eflow sufficient to maintain habitat connectivity and support upstream fish migration through the diversion reach;
    - Implement the Adaptive Management Program described in Section 2.2.7 above to ensure the reduced flows in the diversion reach do not create any barriers or obstacles to upstream fish migration;

  - Adopt a Worker Code of Conduct that prohibits fishing in the Trishuli River. Require the EPC to provide awareness training of this requirement. Clearly indicate that this activity could result in the termination of their employment.

- Upstream Fish Passage
  - Install a fish ladder in accordance with the approved design to enable upstream migration of snow trout;
  - Ensure conditions at the powerhouse tailrace are such that the upstream migrating fish are attracted to the flow from the diversion reach and are not diverted to the powerhouse tailwaters;
  - Ensure the channel in the river section just downstream of the dam leads the fish to the fish ladder entrance.
- Downstream Fish Passage
  - Ensure the main river current in the reservoir directs fish toward the spillway rather than 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.
- Contract with an international fish scientist with expertise in Nepal fish to develop a fish monitoring plan to enhance the understanding of the timing and location of Common snowtrout spawning, design and oversee a fish aquatic monitoring program to demonstrate No Net Loss per IFC's PS6, oversee construction of the fish ladder to ensure it is consistent with the approved design, and inspect flow conditions in the diversion reach during initial operations to ensure no barriers or obstacles exist to upstream migration under Eflow-only conditions;
- Monitor and report on the effectiveness of the fish ladder for upstream fish passage and the effectiveness of downstream fish guidance measures; and
- Actively participate in the Trishuli River Basin Cumulative Impact Assessment and the Trishuli Basin Co-Management Platform to facilitate collaborative monitoring and management of cumulative impacts

NWEDC will also develop and implement a robust and comprehensive Biodiversity Evaluation and Monitoring Program, which will include an integrated water quality, sediment, and fish monitoring program, as well as a terrestrial biodiversity monitoring program.

The combined objective of the Eflow and fish passage will be to support a stable population of Common snowtrout in the Project area by achieving and demonstrating No Net Loss of aquatic biodiversity per IFC's PS6 requirements, so the comparative analysis and trend analysis will be

conducted to identify patterns in year-over-year changes in the Common snowtrout population. The details of the metrics and analysis will be developed and guided by the fish expert to be hired by NWEDC. Particular attention will need to be paid to the changes not only in overall population but also in the life stage composition of the population because changes in the relative abundance of life stages within the population may indicate certain deficiencies in the Eflow or fish passage program. For example, a decrease in the number of juveniles occurring in the dataset that cannot be explained by a corresponding decrease in spawning adults the prior year may indicate that juveniles are experiencing high mortality due to passage through the turbines and that the exclusion devices at the dame need to be adjusted or replaced.

With the implementation of these measures, NWEDC should achieve no less loss of aquatic Natural Habitat at the UT-1 Project.

3.2. STAKEHOLDER ENGAGEMENT/GRIEVANCE REDRESS MECHANISM

To be provided pending NWEDC review of the draft Plan.

3.3. LAND ACQUISITION AND LIVELIHOOD RESTORATION PLAN

Provided as Attachment 1 to this ESMMP.

3.4. INDIGENOUS AND VULNERABLE PEOPLES DEVELOPMENT PLAN

To be provided pending NWEDC review of the draft Plan.

3.5. LABOUR INFLUX MANAGEMENT PLAN

This document presents the Labour Influx Management Plan (LIMP) for the Upper- Trishuli 1 (UT 1) Hydropower project in Nepal. This plan has been prepared in the keeping with the requirements of the applicable reference framework for the project. The following sections provide an understanding of the purpose of the LIMP, the institutional framework put in place for its implementation, the scope of the LIMP, the measures included in the LIMP and the monitoring, reporting and reviewing process for the same.

3.5.1. Purpose

The UT1 project is expected to employ approximately 1090 skilled, semi-skilled and unskilled workers over a 60 month construction period. The skilled workforce will be recruited either directly by NWEDC or by its EPC contractors and the subcontractors hired by EPC Contractors. The semi-skilled and unskilled workforce, will however, be subcontracted, to local Nepali subcontractors or local petty contractors in the Rasuwa district or the nearby districts. Based on the project skill requirement and the present skill level of the local community, it is understood that most of the skilled and semi- skilled workforce will be migrant population from other districts of Nepal and expats.

As part of the ESIA for the project, an assessment was undertaken of the potential environmental and social impacts from labour influx due to the project in the construction phase. In keeping with this impact assessment, certain mitigation measures were identified, and included in the

Construction phase ESMMP for the project. However, in keeping with the socio-economic profile of the local community in the Project Area of Influence (AoI), a need was identified for a detailed Labour Influx Management Plan (LIMP).

This LIMP is thus aimed at putting in place measures and processes, to allow for avoiding, minimizing and mitigating the risks identified due to influx of labour from outside the AoI.

The CSE/OE shall in turn report the status of the LIMP implementation and any key areas of concern to the Project Management Office (PMO) and EHS Head. The PMO and E&S Managers shall in turn be responsible for the overall review and assessment of LIMP in terms of the requirements of the applicable reference framework. The final decision making authority in regards to the provisions of the LIMP shall lie with the PMO, who shall be supported in their decision by the E&S Manager.

3.5.2. Institutional Framework

The implementation of the LIMP thus formulated, shall be undertaken by the NWEDC Environmental and Social Management Cell (ESMC), ESST and the EPC Contractors and sub-contractors for the project.

The EPC contractors and sub-contractors shall be responsible for ensuring the everyday implementation of the LIMP and ensuring that their labourers and workers comply with the same. On the other hand, the CSE/OE for the project (assisted by the site level ESMC representatives) shall be responsible for the overall monitoring and review process of the LIMP implementation and ensuring that the plan is implemented in keeping with the requirements of the applicable reference framework and the principles identified.

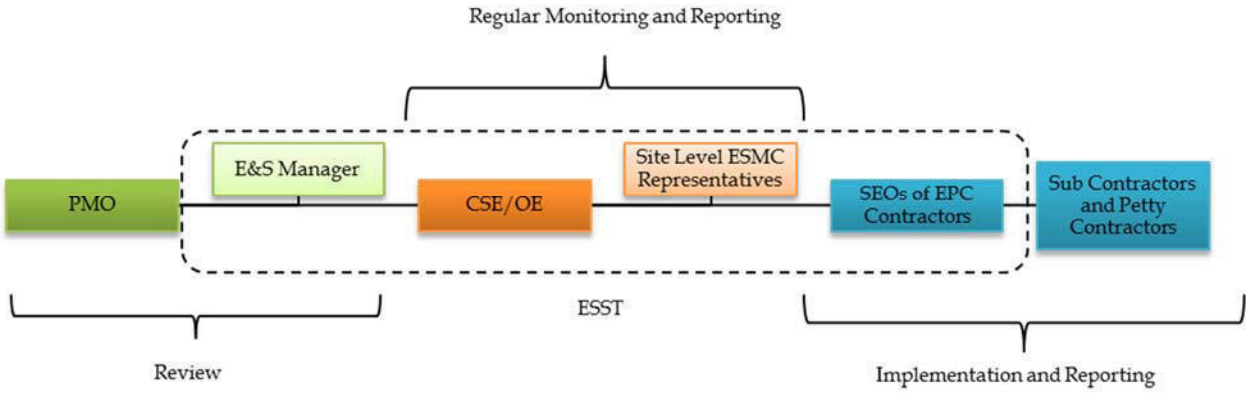


Figure 3.5-1: Institutional Framework for the LIMP Implementation

The CSE/OE shall in turn report the status of the LIMP implementation and any key areas of concern to the PMO and EHS Head. The PMO and E&S Managers shall in turn be responsible for the overall review and assessment of LIMP in terms of the requirements of the applicable reference framework. The final decision making authority in regards to the provisions of the LIMP shall lie with the PMO, who shall be supported in their decision by the E&S Manager.

3.5.3. Scope

The LIMP is applicable for the entire UT-1 project and its associated facilities. This plan has been formulated for the mitigation of social impacts from project induced in-migration into the AoI during the construction phase of the project. This plan has to be read in conjunction with the other management plans such as the Stakeholder Engagement Plan (SEP), Grievance Redressal Mechanism (GRM) and the Construction Phase ESMMP.

3.5.4. Potential Environmental and Social Impacts from Labour Influx

The ESIA for the project identifies the following potential environmental and social impacts due to labour influx during construction phase of the project.

Table 3.5-1: Potential Impacts from Labour Influx

Social Impacts	Environmental Impacts
• Increased competition for the direct and indirect economic opportunities created due to the project and potential resentment amongst the local community • Increased pressure on and competition for infrastructure and services in the AoI • Increased waste and sewage generation and possible community health and safety risks due to inadequate waste disposal • Risk of social unrest and conflict due to increased presence of migrant population in the AoI • Risk of spread of communicable diseases, especially sexually transmitted diseases in the workers and local population • Risk of Change in Community dynamics and potential for community conflict • Additional influx of population seeking economic gains from presence of migrant population (through establishing small businesses and enterprises) • Increased risk of illicit behaviour and crime, especially gender based violence • Increased risk of child labour and school drop outs due to increased opportunities for host community to engage in economic activities • Increased risk of inflation and increase in expenses for the local community due to a general increase in prices in the AoI	• Increased pressure on and competition for natural resources in the AoI • Risk of pollution of water resources in the AoI due to lack of appropriate wastewater discharge • Risk of disturbance to wildlife due to presence of labour camp and movement of labour

It should be noted that, during the discussions with the local community, the representatives did not report any apprehensions or concerns regarding the presence of migrant workers in the area. The community reported to appreciate the presence of migrant workers in the area as they allowed for economic opportunities to be created. The representatives did not report any instances of conflict or violence due to the presence of the migrant workers involved in the access road construction.

- There are no reported existing issues or tension with the migrant workers in the area

- The community see the labourers as a positive presence and did not report an issue with migrant labourers coming into the area
- However, if the locals don't get employment opportunities from the project or general economic opportunities it may lead to resentment
- Furthermore, cultural conflict can arise if labourers do not respect the local traditions of the community
- Workers on infrastructure projects are predominantly young and male. Those who are incoming are single or are separated from their family or spouse, and are outside their habitual sphere of social control. Further, in rural settings, where the presence of law enforcement is often low, the risk of sexual harassment for local women is likely higher, in particular for younger women and girls, but also boys.

3.5.5. Labour Influx Management Measures

In keeping with the impacts identified, the following mitigation measures have been put in place as part of the LIMP.

Table 3.5-2: Labour Influx Management Measures

Potential Impact	Contractor Responsibility	NWEDC responsibility
Overall Impact	• Undertake regular engagement with the workers and sub-contractors through workshops, training sessions and tool box talks to ensure understanding and compliance to the LIMP requirements • Put in place a detailed Code of Conduct, based on the LIMP and ensure its implementation • Undertake regular internal monitoring to ensure compliance to the contract agreement and the overall requirement of the LIMP • Ensure that the workers have all required documentation as follows: employment contract, insurance, routine check-ups, vaccinations, occupational health training, etc.	• Undertake regular and timely engagement with the local community in keeping with the SEP formulated • Undertake timely information disclosure, to ensure the community is aware of the project activities, opportunities in the same and potential adverse impacts from the project • Implement the GRM for the project and ensure the community is aware of the same • Ensure the inclusion of relevant clauses in all sub-contract agreements • Undertake a training of the EPC contractors, sub-contractors and petty contractors to ensure understanding and compliance of the LIMP • Undertake regular monitoring of the compliance of the contractors to the LIMP
Increased competition for the direct and indirect economic opportunities created due to the project and potential resentment amongst the local community	• To the extent possible, recruit local population in keeping with the Employment and Skill Trainings plan for the project; • Undertake timely information disclosure, to ensure the community is aware of the project activities, opportunities in the same and potential adverse impacts from the project.	
Increased pressure on and competition for infrastructure and services in the AoI	• Put in place a detailed Code of Conduct, based on the LIMP and ensure its implementation • Ensure the worker camp has adequate provisions for water, electricity and sanitation facilities • Identify an authorized water supply source for the worker camp and prohibit of use from other community sources;	• Investment in and capacity building of local public service providers • Put in place contingency plans for temporary rise in demand for utilities and public service provision.
Increased waste and sewage generation and possible community health and safety risks due to inadequate waste disposal	• Ensure adequate waste and sanitation facilities in worker camp • Ensure workers' camp and associated facilities are connected to septic tank or other wastewater systems which are appropriate and of sufficient capacity for the number of workers and local conditions.	• Undertake community sensitization campaigns to build awareness about public health impacts from labour influx. • Undertake regular inspections and monitoring of the worker camps and associated facilities in terms of the adequacy of sanitation provisions and their maintenance

Potential Impact	Contractor Responsibility	NWEDC responsibility
Risk of social unrest and conflict due to increased presence of migrant population in the AoI Risk of Change in Community dynamics and potential for community conflict	• Ensure the worker camp has adequate facilities for entertainment and basic provisions to reduce the need for workers to use local community facilities and resources; • Ensure the code of conduct has adequate provisions for the interaction of the labourers with the local community	• Undertake community sensitization campaigns to build awareness about potential impacts from labour influx Undertake regular and timely engagement with the local community in keeping with the SEP formulated • Ensure adequate security provisions across project area, including worker camp and associated facilities
Risk of spread of communicable diseases, especially sexually transmitted diseases in the workers and local population	• Undertake a health and fitness to work assessment of each worker prior to initiation of work; • Ensure all workers have required vaccinations against common and locally prevalent diseases; • Implement HIV/AIDS education program for all workers; • Undertake information campaigns on STDs and transmission of diseases among the workers; • Establish a health centre at the camp and construction sites, which should include – Free testing facilities; – Regular health check-ups; – Database of all the worker health records – Provision of condoms	• Undertake community sensitization campaigns to build awareness about public health impacts from labour influx; • Undertake community sensitization campaigns towards STDs • Ensure access to GRM; • Hold community health camps and check-ups on a regular basis with a focus on the presence and spread of communicable diseases; • Ensure an HIV service provider is available on-site;
Additional influx of population seeking economic gains from presence of migrant population (through establishing small businesses and enterprises)	• Hire workers through recruitment offices and avoid hiring “at the gate” to discourage spontaneous influx of job seekers. • Hire workers in keeping with the employment and skill training plan	• Undertake regular and timely engagement with the local community in keeping with the SEP formulated • Undertake timely information disclosure, to ensure the community is aware of the project activities, opportunities in the same and potential adverse impacts from the project

Potential Impact	Contractor Responsibility	NWEDC responsibility
Increased risk of illicit behaviour and crime, especially gender based violence	• Pay adequate salaries for workers, in keeping with the prevalent wage rates in the country to reduce incentive for theft; • If possible, Pay salaries into workers' bank accounts rather than in cash; however access to banking system need to be looked into. • To the extent possible, recruit local population in keeping with the Employment and Skill Trainings plan for the project • As part of the Code of Conduct, include sanctions (e.g. dismissal) for workers involved in criminal activities; • Introduce substance abuse prevention and management programs and undertake worker sensitization programs on the same • Undertake regular training for workers on required lawful conduct in host community and legal consequences for failure to comply with laws; • Ensure cooperation with law enforcement agencies investigating perpetrators of gender-based violence; • allow for opportunities for workers to regularly return to their families; • Ensure the worker camp has adequate facilities for entertainment and basic provisions to reduce the need for workers to use local community facilities and resources;	• Support and assist local law enforcement agencies investigating perpetrators of gender-based violence; • Monitor the Contractor and worker performance in keeping with the local law requirement in terms of drug abuse and traffic; • Ensure access of local community to the GRM in place
Increased risk of child labour and school drop outs due to increased opportunities for host community to engage in economic activities	• Ensuring that children and minors are not employed directly or indirectly on the project.	• Monitor the contractor performance and ensure compliance to local labour laws, pertaining to child labour
Increased risk of inflation and increase in expenses for the local community due to a general increase in prices in the AoI	• Undertake procurement of law material and goods in keeping with the industrial benefits plan in place	• Ensure compliance to the Industrial benefits plan in place

Potential Impact	Contractor Responsibility	NWEDC responsibility
Increased pressure on and competition for natural resources in the AoI	• Ensure the worker camps and associated facilities have adequate provisions for water conservation and recycling of water, including potential for rainwater harvesting • Ensure workers' camp and associated facilities are connected to septic tank or other wastewater systems to avoid contamination of fresh water sources. • Ensure that only wood from commercial sources is used on the project; • prohibit use of wood for fuel in worker camp; • put in measures to reduce energy demand, noise and light generation in labour camp • Minimise land use change and use of other natural resources to the extent possible due to worker camp and associated facilities • Avoid deforestation and cutting of trees around camp area;	• Ensure inclusion in contract of requirement for rainwater capture, use of non-potable water for construction works, etc. • Cooperation with environmental organizations in the area to seek their advice and allow for early feedback on adverse impacts. • Undertake regular monitoring of impact on natural resources with enforcement of contract or legislative options.
Risk of pollution of water resources in the AoI due to lack of appropriate wastewater discharge	• Ensuring workers' camp and associated facilities are connected to septic tank or other wastewater systems which are appropriate and of sufficient capacity for the number of workers and local conditions.	• Regular inspection to ensure proper functioning of the systems in place
Risk of disturbance to wildlife due to presence of labour camp and movement of labour	• Ensure placement of workers' camp away from environmentally sensitive areas to avoid impacts on the local wildlife; • Ensure routing of new access routes for workers' camp to avoid/minimise environmentally sensitive areas.	• Inclusion in contract of requirements for camp locations.

A major concern during the construction of large hydroelectric projects is the potential negative impacts that might arise from the interaction of outside workers with local communities. For this reason, it is important that the Contractor establish a Code of Conduct that emphasizes the importance of appropriate behaviour, respect for local communities and customs, and compliance with all Nepalese laws and regulations. Each employee/worker shall be informed of the Code of Conduct, once she/he has signed the contract to work for the Project. The Code of Conduct as well as all other ESMMP requirements of the contractor also apply to all subcontractors and should be referenced by the main contractor in all subcontracts. The Code of Conduct should be available to local communities at the Public Information Centres (PIC) established for the Project. The Code of Conduct should address at least the following topics:

- Expectations for workers to carry out their work in a safe manner, and to look after the safety of others.
- Expectations of workers to look after, be aware of, and minimize their impacts on the environment.
- All the workers/labourers shall comply with the laws and regulations of Nepal.
- All illegal substances, abuse of drugs and alcohol, carrying of firearms, as well as pornographic material and gambling shall be prohibited.
- Fighting (physical or verbal), creating nuisances and disturbances in or near communities, disrespecting local customs and traditions shall be prohibited.
- Smoking shall only be allowed in designated areas.
- Workers must follow appropriate standards of dress and personal hygiene while visiting local communities and in the accommodation quarters.
- Workers visiting the local communities must behave in a manner consistent with the Code of Conduct.

The following activities (which must be included in the Code of Conduct) are prohibited on or near the Project site:

- Cutting of trees outside the approved designated areas.
- Hunting, fishing, trapping and trade of wildlife especially endangered species and collection of flora.
- Caging wild animals.
- Purchase of wild animals for food.
- Illegal hunting and poaching of any kind.
- Fishing in any river of water body within the Project area
- Use of unapproved toxic materials such as lead-based paint, asbestos, etc.
- Damage to any property with architectural or historical value.

- Building of unapproved fires.
- Wood collection for cooking or heating and as a fuel for heating during the processing or preparation of any materials forming part of the works.
- Burning waste or vegetation.
- Use of firearms (except authorized personnel).
- Use of alcoholic beverages during working hours.
- Washing machines, vehicles or clothes in rivers, streams or lakes.
- Maintenance of machinery and vehicles outside designated areas.
- Disposal of trash or construction waste outside designated areas.
- Driving vehicles or equipment improperly or under the influence of drugs or alcohol on local roads or in the Project area.
- Working without the proper protective equipment (including helmets and boots).
- Spilling potential contaminants such as petroleum products.
- Defecation or urination outside designated sanitary facilities. The Contractor shall provide portable toilets on all work fronts.
- Any construction worker, office staff, Contractor's employees, the project's employees or any other person related to the project found violating the Code of Conduct, the prohibitions established in these specifications, or the rules, regulations, and procedures implemented at the construction camp shall be subject to disciplinary actions that can vary from a simple reprimand to termination of employment, depending on the severity of the offense.

3.5.6. Monitoring

In order to ensure proper implementation of the LIMP, regular monitoring shall be undertaken by the site level ESMC representatives and the CSE/OE. The monitoring shall be undertaken on a weekly, monthly and annual basis. The key aspects to be covered in the monitoring and the means of monitoring are provided in the table below.

Table 3.5-3: Monitoring Requirements

Type of Monitoring	Frequency	Aspects to be covered
Internal Monitoring by CSE/OE	• Weekly	• Adequacy of provisions in labour camp
	• Monthly	• Compliance to code of conduct • Review of Records required to be maintained by law and as part of the LIMP

Type of Monitoring	Frequency	Aspects to be covered
	• Annually	• Records of GRM and community engagement activities • Compliance to code of conduct • Review of Records required to be maintained by law and as part of the LIMP • Review of records of previous monitoring undertaken at weekly and monthly basis and the status of the action items identified in the same
Internal Monitoring by ESMC Representatives	• Monthly	• Records of GRM and community engagement activities
External Monitoring by Third Party	• Annually	• Records of GRM and community engagement activities • Compliance to code of conduct • Review of Records required to be maintained by law and as part of the LIMP • Review of records of previous monitoring undertaken at weekly and monthly basis and the status of the action items identified in the same

3.5.7. Reporting, Record Keeping, and Auditing

The EPC contractors, sub-contractors shall maintain detailed documents of the implementation of the LIMP. Some of the records to be maintained (but not limited to) are as follows:

- Detailed code of conduct and any action/ sanction against any worker in keeping with the same;
- Records of trainings, programs, workshops and tool box talks held;
- Compliance to the local laws and regulations;
- Records of the workers, age, their health records, vaccination records etc.;
- Records of the health centre and visitation by workers;
- Records of wage payment ; and
- Records required as part of the employment and skill training plan and industrial benefit sharing plan, GRM and any other management plans in place

In addition to this, the CSE/OE shall maintain detailed records of the monitoring activities undertaken and those required as part of the employment and skill training plan and industrial benefit sharing plan, GRM and any other management plans in place.

3.5.8. Adaptive Management System

It should be noted that the LIMP presented above is based on the present understanding and resource requirement available. This resource requirement or the socio-cultural dynamics in the AoI are susceptible to change during the construction phase. In keeping with this, it is important that the LIMP is a live document and is reviewed and revised in a timely manner. This is important to ensure that the LIMP remains relevant throughout the construction phase of the

project. This will also allow for the inclusion of any additional measures in the LIMP, which may be identified as part of the monitoring exercise.

3.5.9. Funding

NWEDC will ensure that the budget formulated for the purpose of the LIMP implementation is sufficient to meet the expenses of the same.

3.6. PLANS REQUIRED BY THE PDA

3.6.1. Introduction

The Upper Trishuli (UT-1) Hydropower project is a 216-MW green field runoff-river hydropower facility to be located in the upper part of the Trishuli watershed, in the Rasuwa District in central Nepal, 80 km northeast of Kathmandu. Once commissioned, the project will account for sizeable portion of Nepal's current installed capacity and will sell power under a long-term power purchase agreement (PPA) with Nepal Electricity Authority ("NEA"), the national utility company.

As a part of the Project Development Agreement (PDA) signed between - Nepal Water & Energy Development Company (hereinafter referred to as "NWEDC"), as well as Government of Nepal (hereinafter referred to as "GoN"), the parties (NWEDC and GoN) are committed to maximize the positive impacts and manage and mitigate the negative outcomes of the project to the extent possible.

The PDA requires the following in terms of Benefit sharing:

- The Local Benefit Sharing Plan, including
  - Local Share for the people from affected Project Area;
  - Rural Electrification
- The Nepal Employment and Skills Training Plan;
- The Nepal Industrial Benefits Plan;

The common discourse however does not segregate these interventions and are usually clubbed together under the umbrella of 'benefit sharing' to capture the whole gamut of benefits which can potentially be shared with the community. These benefits are based on differentiated entitlements, achieved through consultations with the various stakeholders as well as complying with the regulatory requirement of GoN and especially the PDA for the Project.

The detailed plan preparation will be undertaken in due course of time. As a part of the present scope, an annotated outline is being developed for each of the relevant plans. Each of the plans has been segregated into separate chapters; however in some cases some of the requirements have been consolidated into a single plan. The annotated outline will provide a framework for the benefit sharing plan. This will include brief description of the following:

Section 3.6.1	Introduction:	This section provides an understanding of: • Purpose of the benefit sharing plans; • Context of the plan; • The legal framework governing the plan; • Existing benefit sharing mechanisms in Nepal; • Guiding principles to be followed by NWEDC; and • The implementation mechanism to be followed by NWEDC.
Section 3.6.2	Local Benefit Sharing Plan	This includes guidelines & benefit sharing plan mechanism, including: • Benefit Sharing guideline; • Benefit Sharing Program Identified including Rural Electrification; • Reporting and documentation requirements; • Monitoring and review; and • Schedule and budget for implementation.
Section 3.6.3	Employment and Skill Training plan	This includes the employment and skill training plan for the project, which includes the following: • Skill set requirement for the project; • Recruitment Process; • Trainings to be provided; • Monitoring and review process; • Reporting and documentation; • Schedule and budget for implementation.
Section 3.6.4	Industrial Benefit Plan	This section will provide a detailed industrial benefit sharing plan, in keeping with the requirements and guidance of the PDA, which will include: • Resource requirements of the project • Vendor strategy and principles • Procurement plan • Monitoring and review mechanism • Reporting and documentation • Schedule and budget for implementation

3.6.1.1. Purpose of the Plan

The PDA specifically asks for the local benefit sharing to be undertaken by NWEDC through different means as mentioned in Table 3.6.1-1 below.

Table 3.6.1-1: Benefit Sharing Requirements as per PDA

PDA provisions for Benefit Sharing	Relevant Sections of the PDA
Local Share	Section 10.17 of the PDA
The Local Benefit Sharing Plan	Section 11.3.2 (A) Schedule 11 (Local Benefit Sharing Plan- Guidance Note)
The Nepal Employment and Skills Training Plan	Section 11.3.2 (B) Schedule 12 (Nepal Employment and Skills Training Plan- Guidance Note)

PDA provisions for Benefit Sharing	Relevant Sections of the PDA
The Nepal Industrial Benefits Plan	Section 11.3.2 (C) Schedule 13 (Nepal Industrial Benefits Plan- Guidance Note)
Rural Electrification	Section 11.8

The parties also commit that systems and plans will be put into place to ensure that the skill level and level of employment of the local community is maximized. While the Land acquisition & Livelihood Restoration plan (LALRP) will specifically address the management of socio-economic impacts from the displacement (economic and physical) resulting from the project land requirements, the ESMP will address the management of environmental and social impacts from the construction and operation of the project.

The present document provides an annotated outline of the various plans required to be prepared as part of the benefit sharing which Local Benefit Sharing Plan (hereafter referred to as the "LBSP"). These plans will be supported and will be implemented in coordination with the LALRP and other management plans formulated for the project.

The plan will be implemented for all phases of the Project lifecycle and will be limited to the locals situated within the project impacted VDCs and district, with priority being given to those who have been directly impacted by the project due to land procurement. With the current administrative reorganisation, the Gaunpalikas will be used for deciding the area within which these plans will need to be rolled out.

Note: While some of the benefits like rural electrification will be undertaken based on the PDA requirements and also reflects Supreme Court of Nepal judgement in another HEP Project in Nepal. However, for the sharing of the equity shares, NWEDC will need to coordinate with GoN to agree on the area of influence.

Here clarity is required on the manner in which the scope of the plan will change due to the change in the administrative structure. Based on the discussion with the GoN, the scope of the plan will have to be revised. There may also be instances, where specific components of the plan (such as employment opportunities, rural electrification and skill trainings etc.) have different applicability and scope. For instance, the present employment opportunity may be focused on the PAFs and local community members who received training as part of earthquake relief, but skill trainings may be expanded to the entire population in the VDCs. The detailed plan will identify the specific scope of each mechanism identified in the following sections. This section will provide an overview of the scope in terms of the plan itself.

3.6.1.2. Context Setting

Project Overview

The Upper Trishuli (UT-1) Hydropower project is a 216 MW green field runoff-river hydropower facility to be located in the upper part of the Trishuli watershed, in the Rasuwa District in central Nepal, 80 km northeast of Kathmandu. The geographical coordinates of the project are longitude (between 85°12′40″E and 85°18′03″E) and latitude (between

28°04′27.50″N and 28°07′42″N). The details of the project can be referred to in the Detailed Project Report (DPR) of the project. The location of the project is depicted in Figure 3.6.1-1.

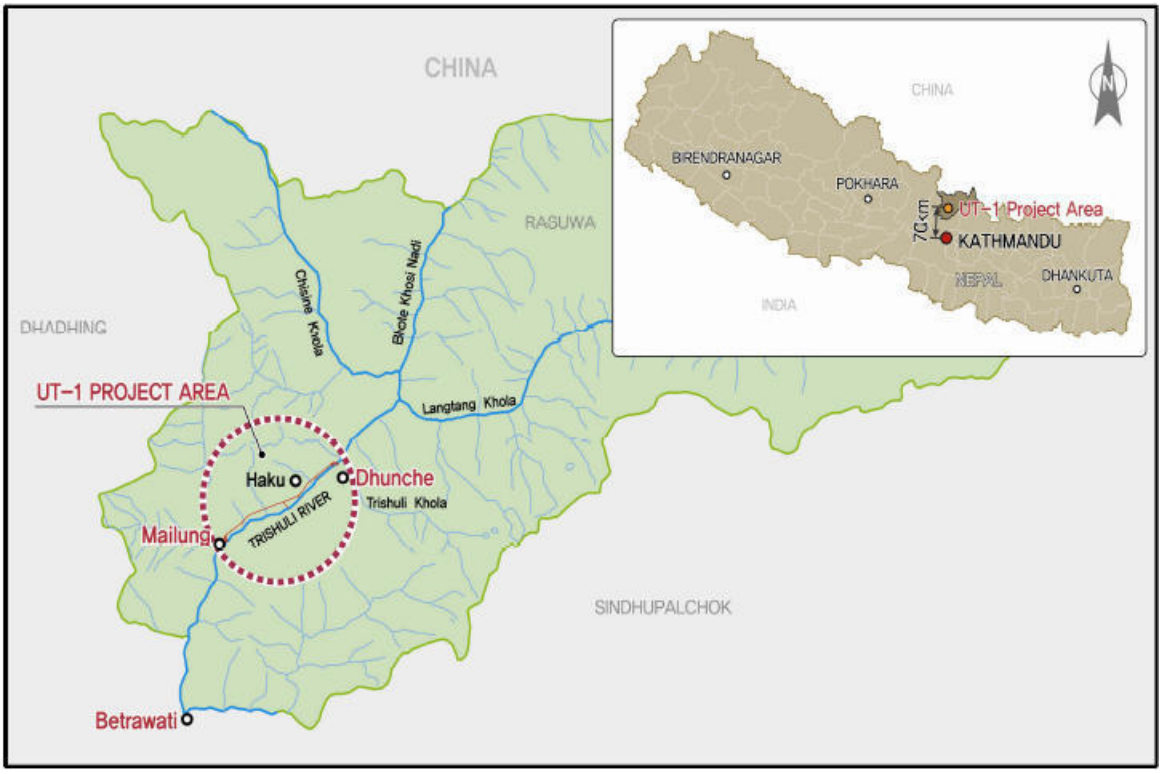


Figure 3.6.1-1: Upper Trishuli 1 Project Location

The intake site is located near the confluence of Bhotekoshi river at Dunche and Haku VDC on the east bank of Trishuli River, about 70 km directly north of Kathmandu. The dam will be located about 275m downstream of the junction with the Bhotekoshi River. The direction of the valley is mostly south-west. The dam site can be viewed on Google Earth at 28-07-36.61N and 85-17-52.42E. Apart from the dam and spillway, all structures are located underground on the east bank of the river. The Pasang-Lhamu highway passes on the left bank of the river, and is the primary access route for the development.

Land Requirement for the Project

A total of 99.79 ha of land was earlier required for the project. Of this amount, 26.15 ha were required on a temporary basis during the construction phase of the project. Post the earthquake, an additional 1.2 ha of land has been identified in Mailung for the new camp site. The following table (Table 3.6.1-2) provides an understanding of the main components of the project and their land requirement.

Table 3.6.1-2: Land Requirement for the Project

Project Component	Land requirement (in ha)	Habitation Impacted
Permanent Land Take	73.64	
Private Land	3.96	• Mailung • Gogone • Tiru
Trust (Guthi) Land	15.53	• Haku Besi • Budget Farm • Thanku • Phoolbari
Community Forest and other Government land like Flood plain	51.54	• Gogone • Tiru • Mailung • Haku Besi • Gosumba • Budget Farm
Langtang National Park[1]	2.61	NA
Temporary Land Take	26.15	
Community Forest and other Government land like Flood plain	25.13	• Gogone • Tiru
Mailung HEP land (5 year lease)	1.02	• Mailung
Total	99.79	

Source: NWEDC 2014

1. An additional 2.8 ha of already disturded/deforested LNP land will be temporarily used for the workercamps; however, returned once construction is completed.

Note: the Government land includes the forest land apart from the community forest land and the flood plain land

However, in keeping with the design changes caused by the 2015 earthquake, NWEDC is in the process of procuring the additional 1.2 ha of land required, and is presently in negotiations with 7 private land owners for the same.

Impact of the Gorkha Earthquake

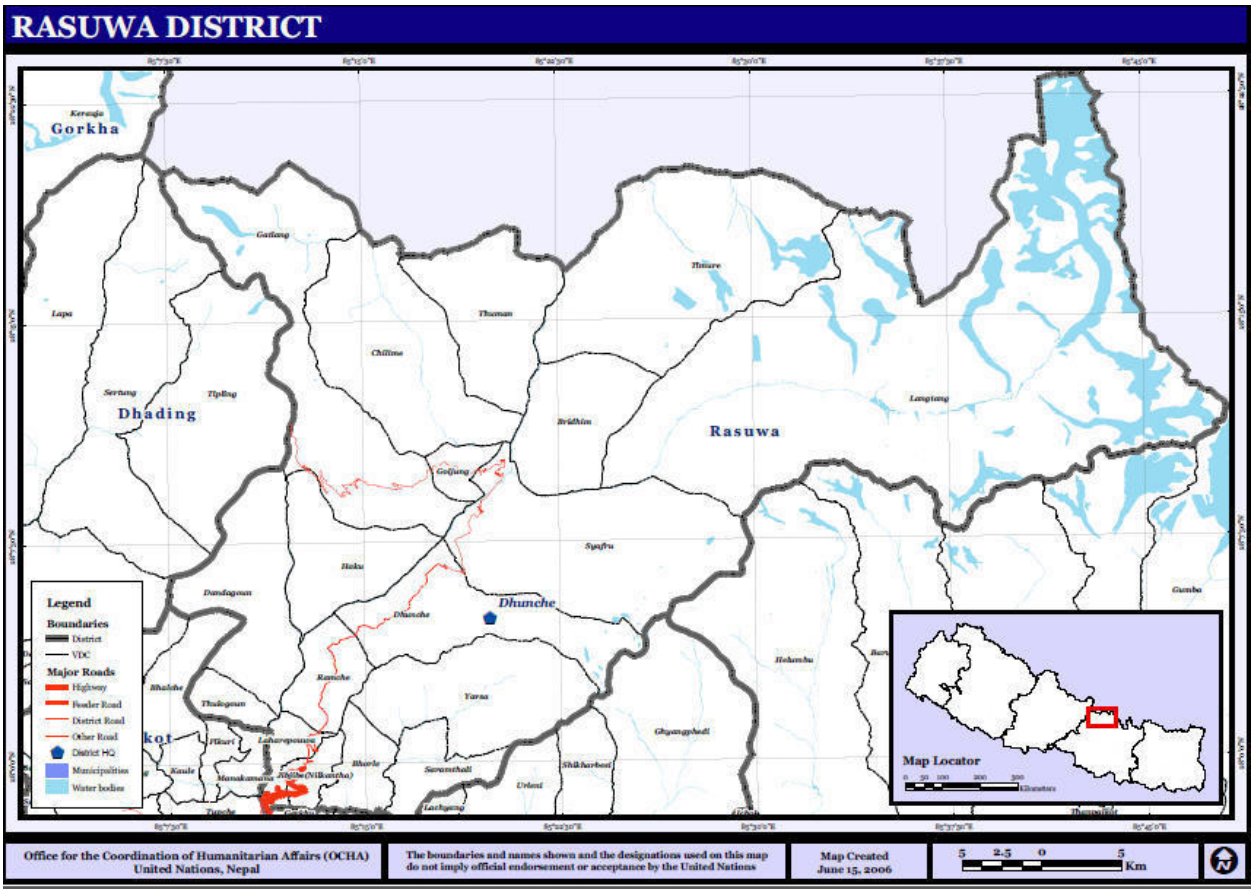
Nepal was struck by 7.8-8.1 magnitude earthquake; the 'Gorkha Earthquake', on 25th April 2015. This earthquake, was the worst natural disaster to strike this country since the 1934 Nepal-Bihar earthquake, and killed nearly 9000 people and injured over 22,000. The epicentre of this earthquake and its aftershocks was located east of the Gorkha District at Barpak, Gorkha; less than 100 kilometres from the UT-1 project site.

The Rasuwa District was one of the worst hit districts from the 2015 Gorkha Earthquake. The earthquake damaged more than 80% of the houses in the project footprint area (3 village development councils- VDCs- accounting for about 500 households) and resulted in more than 200 deaths in the area (43 on the project site) and the access road to the project was totally compromised.

The post-earthquake scenario led to wide spread influx of NGOs in the area and relief support in the form of livelihood and skill related trainings. The present livelihood and skill profile in the area is thus based on the pre-earthquake profile of the community, the impacts of the earthquake led displacement and the relief activities undertaken by NGOs/INGOs in the area.

Rasua District Socioeconomic Profile

The Rasuwa District is located in the north central part of Nepal with a population of 43,300 individuals and 9,778 households and is one of the districts with the lowest population in the country.



Source: United Nations Nepal Information Platform, http://www.un.org.np/attachments/district-map-rasuwa

Figure 3.6.1-2: Rasuwa District Map

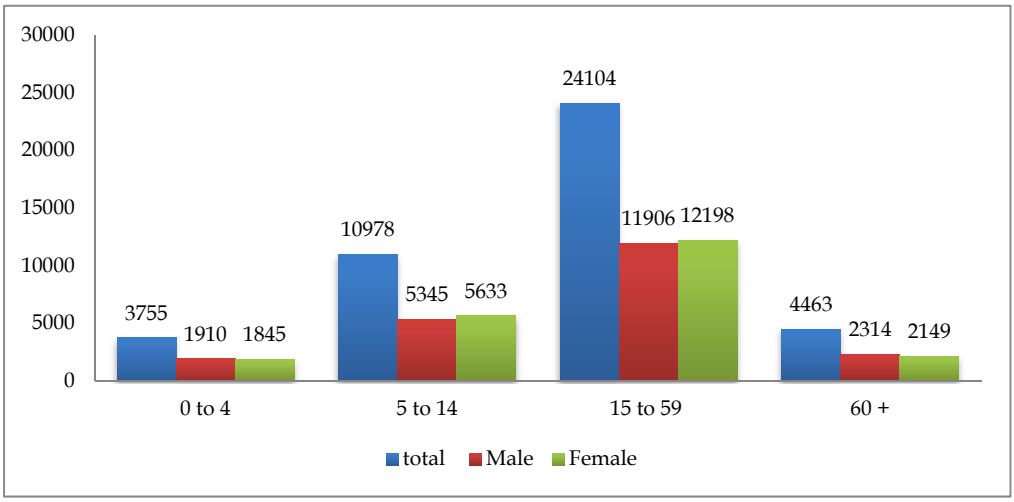
The district has an average household size of 4.43 individuals, and a sex ratio of 1016 females per thousand males, which is higher than but comparable to the national average (1050 females per thousand males). Covering approx. 1,544 sq. km. the district has a population density of 53.6 persons per sq. km as can be seen from the following table.

Table 3.6.1-3: Rasuwa District Demographic Profile

Variables	Value
Total Population	43,300
Total Area (sq. km)	1,544
population density	53.6
Total Households	9,778
Sex Ratio	1016
Average Household Size	4.43

Source: UT-1; Complementary Social Baseline, NESS, July 2014

However, post-earthquake, the district is expected to have undergone a shift in terms of the overall population, average household size and population density. This is primarily understood to be resultant from a portion of the population getting displaced and seeking refuge in VDCs such as Dhunche, Lahare Pahuwa etc. This is expected to have increased in the population and its density in the urban areas and in settlements in the valley. Similarly, the families are also understood to have split up post the earthquake, due to space issues in temporary housing and also to gain maximum benefit from relief support given by NGOs/INGOs.



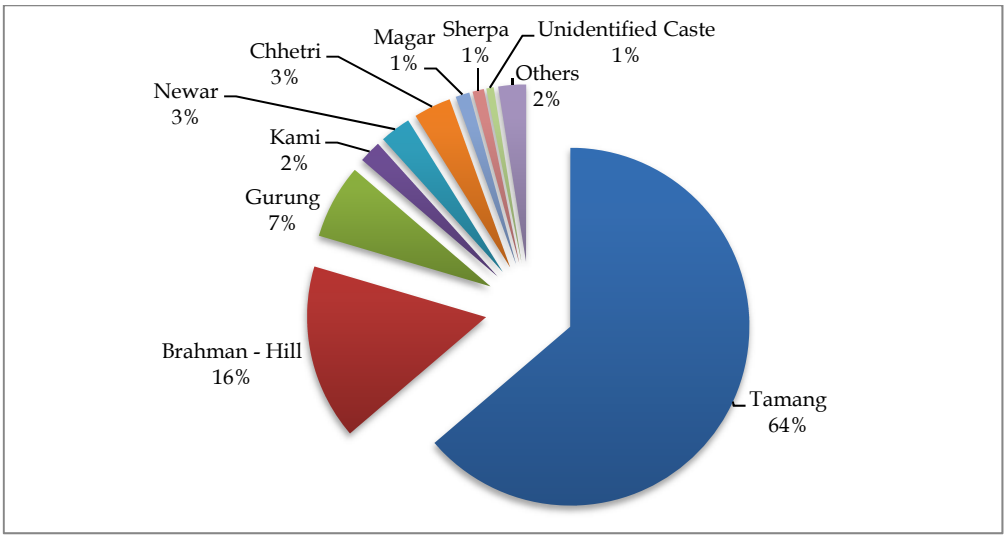
Source: UT-1; Complementary Social Baseline, NESS, July 2014

Figure 3.6.1-3: Classification According to Age Groups

According to the information available, 34% of the district is reported to be in age group of 0-14 years, while the age group between 15 to 59 (the productive age group) represent 56% of the population. The figure above showcases the age classification of the population in the district.

Social Groups

The population in the district is reported to be comprised of 18 ethnic groups, with the Tamang group (an indigenous group) comprising of the majority of the population (63.75%). The other main ethnic groups in the area are Hill Brahman, Gurung, Kami, Newar, Chhetri, Magar and Sherpas amongst others. The following figure provides an understanding of the ethnic composition of the district.



Source: UT-1; Complementary Social Baseline, NESS, July 2014

Figure 3.6.1-4: Ethic Composition of the District

The main religion in the area is Buddhism (69% of the total population), followed by Hinduism (25.4%) and Christianity (4%). The other religions in the area comprise of Islam, Kirat, Prakriti, and Bon. From the discussions with the local community, it is understood that over the last years, there has been an increase in the number of conversions to Christianity. This is primarily reported to be resultant from the high presence of NGOs/ INGOs in the district and an increase in the number of children studying in Catholic boarding schools.

The district is characterised by 9 languages, the most prominent of which is Tamang (60%), followed by Nepali (31.67%). The other languages spoken in the area are Newari, Magar, Gurung, Sherpa, Maithali, Tharu and Tibbetan.

Gender

While the female population constitutes 50.4% of the total population in the district, their access to education, property ownership and participation in social organization and economic activities is lower than in the case of their male counterparts. Compared to the 60.58% male literacy rate, 46.5% of the women are reported to be literate and only 8% of the women have legal ownership of property. However, the life expectancy of women at 54 years is lower but comparable to that of men at 55 years. The following table provides an understanding of the ownership of assets by women.

Table 3.6.1-4: Female Ownership of Assets

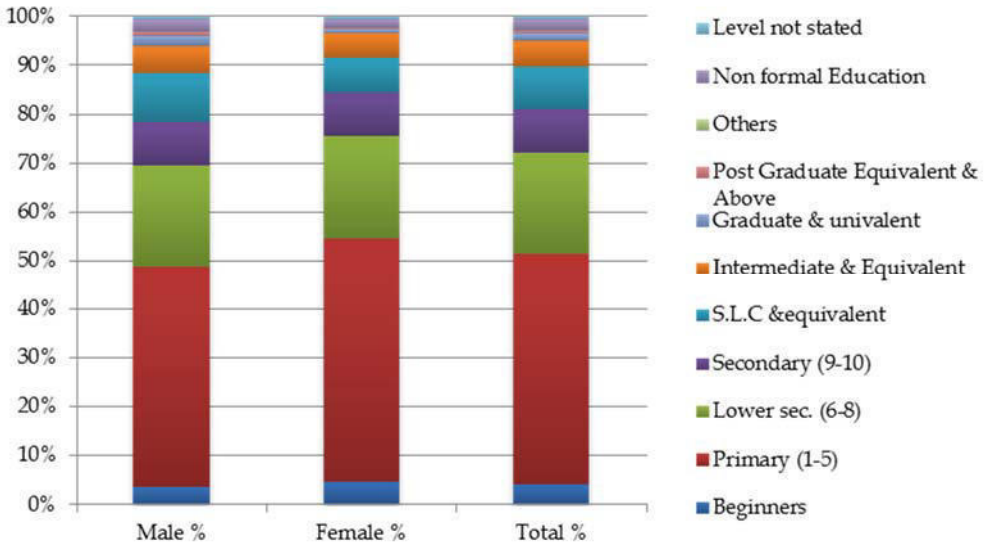
Asset	HHs No.	Percentage
Both House and Land	460	5
Land only	322	3
Neither house nor land	8892	91
Not stated	67	1
Total	9741	100

Source: UT-1; Complementary Social Baseline, NESS, July 2014

While involved in income generating activities such as agriculture and small businesses, women are reported to be mostly involved in household activities including child care, animal husbandry, water fetching, and looking after the welfare of family members.

Education Profile

The district is characterised by a literacy rate of 53.6%, with the male literacy rate being 60.58% and the female literacy rate being 46.5%.



Source: UT-1; Complementary Social Baseline, NESS, July 2014

Figure 3.6.1-5: Educational Profile for the Rasuwa District

Of the literate population, 50% is reported to have education till the primary level while only 16% of the population is reported to have received the School Leaving Certificate and 7.18% has education above the intermediate level.

This literacy profile of the district is undergoing a change in the post-earthquake scenario. This is reported to be resultant from a larger population moving towards urban areas and thus having better access to educational infrastructure.

The district is reported to have 129 educational institutions, of which 123 are managed by the community and 6 are institutional. The primary education institutions comprise of 80% of the total educational institutions.

Health

The district has 18 health care facilities, including 1 hospital at Dhunche. In addition to this, there are 17 health posts and sub-health posts at the VDC level. Apart from this, there are 42 primary health care outreach clinics, 57 Expanded Program on Immunization (EPI) clinics and 24 female and child health volunteers.

The predominant diseases in the district include skin diseases, respiratory problems, diarrhoea, parasitic infections, gastric disorders and eye and ear infections.

Water Supply and Sanitation

In the district, 88% of the households are reported to be supplied with tap/piped water, while the remaining are primarily dependent upon nearby springs and rivers. The sources of the water supply in most of the cases are springs.

While 57% of the district is reported to have some type of toilet (predominantly being flush toilets with septic tanks) in their homestead, facilities of storm water drainage and wet sewage drainage do not exist in the district.

As part of the detailed plan, NWEDC will review and update the socio-economic profile put in place. This update shall be based on the understanding of the changed administrative structure and scope of the plan, in discussion with the GoN. Some of the sources of information which may be used include the following:

- Central Bureau of Statistics/UNFPA, Kathmandu, 2002 Population Census 2001, National Report
- CBS/ICIMOD, Kathmandu, 2003 Mapping Nepal Census Indicators 2001 and Trends
- CBS/ Survey Department 2004, The Population and Socio- Economic Atlas of Nepal
- Central Bureau of Statistics 2012, National Population and Housing Census 2011 (National Report)
- Central Bureau of Statistics 2012, National Population and Housing Census 2011 (Tables from form II)
- Department of Education, 2012-2013, "Flash Report 2067"
- Department of Health Services, Kathmandu, Annual Report 2011
- National Planning Commission / UNDP, Nepal Human Development Report 2014
- Central Bureau of Statistics, Kathmandu, 1013 Nepal In Figures 2013
- CBS/ Survey Department 2004, The Population and Socio- Economic Atlas of Nepal

Context for Developing the Local Benefit Sharing Plan

The benefit sharing plan has thus been formulated in keeping with the above mentioned understanding of benefit sharing, project context, the impacted area and the impact of the Gorkha earthquake on the district and the project area of influence. Some of the specific points to be kept in mind for this benefit sharing plan are provided below:

Earthquake-Related Losses and Internal Displacement of People

- The Project area has been impacted by the 2015 Gorkha earthquake.
- The earthquake of April 2015 caused huge losses to the people residing in Rasuwa district at large; especially in Gogone and Tiru. The local community in the project area suffered impacts pertaining to loss of life and property, loss of livelihood, physical injuries, psychological trauma and damage to agricultural land.
- The earthquake and subsequent landslides resulted in the local community (Haku Besi, Phoolbari, Gogone, Tiru etc.) vacating their villages and seeking refuge in Internally Displaced People's (IDP) camps, such as Naubesi, Satbise, Bogetitar etc.
- The land of Gogone, Tiru and Mailung, is heavily impacted by the earthquake. The path from these locations to these villages has been severely damaged and only a few families have gone back to Tiru or Gogone because of the highly prevalent risk of landslides.
- In case of Haku Besi, Thanku, Phool Bari and other nearby villages, though there was destruction of residential structures, the agricultural land is reported to have suffered minor damages, most of which can be or have been repaired. Thus, the people of these villages have started going back to their original villages, either for short duration or some families permanently.
- Most households are moving back and forth between the native villages and the IDP camps. From most households, at least a few household members return to the native village for cultivation three times in a year, for usually 10-15 days at a time. The families return to the IDP camps during monsoons and winters. However, none of the households from Gogone have not returned due to extensive damage and continued risk of landslides.

Permanent Housing and Livelihood Concerns

- Government has identified resettlement site, but this does not include agriculture land.
- Reconstruction or construction of new house in a safe location is another concern of the HHs living in the IDP. In case of Gogone, Tiru identification of an alternate land is also an issue.
- The people living in the IDP camps have been facing various issues in terms of lack of space for livestock and poultry; unsanitary conditions leading to various diseases affecting people frequently, etc.
- Another issue is safety concerns post-earthquake, due to risk of landslides because of which people are still hesitant to move to their native village locations.
- Majority of the IDP camps are constructed on private land for which the people have to pay rents. There are a considerable number of families which are struggling to meet their basic expenses on account of shrinking savings, erratic employment opportunities and increased expenditure.
- Another issue being faced by the community is the instability and uncertainty associated with the present livelihood options available.

- In the pre-earthquake scenario, the local community was primarily dependent upon agriculture and livestock rearing.
- However, in the post-earthquake scenario, the community has reported a shift towards non-farm based livelihoods. This is understood to be primarily resultant from loss of access to agricultural land, loss of livestock in earthquake, issues with climatic conditions in IDP camps which makes it unsuitable for the high mountain breeds earlier kept by the local community.
- A significant portion of the local community has also started undertaking labour as masons or other construction related activities. however, the opportunities with this are also understood to be reducing due to a general reduction in the construction activities in the district

Alternative Land Identification for Resettlement of IDPs

- A government Geological team visited the project villages and assessed the level of earthquake impact in the affected villages. According to the preliminary information available, the areas of Gogone have been identified as High Risk, and resettlement has been suggested for the same; Tiru has not found mention in the draft report. Haku has been considered safe as per the draft geological study.
- For the villages identified as safe, a housing reconstruction grant has been identified. This grant shall be provided to those households, who have lal purza/ tenancy certificates for the land. These households would then be provided with monetary assistance to rebuild houses in keeping with pre-approved designs
- Of the 820 HHs in Haku VDCs, 803 are understood to have been identified as those who were eligible for receiving the grant
- For the villages identified as high risk, resettlement to an alternative land parcel.
- For this purpose, the government has already identified 72/82 ropani of land in Khalte, Lahare Pahuwa for resettlement of the households. This land is understood to have the capacity of accommodating 200 households.
- The ground levelling activities have been initiated by the NGO, Samaritan Purse and entire construction is expected to be completed in 1.5 years.
- Another 65 ropani has been identified in the Uttar Ganga Gaonpalika. However, no activity has been initiated for the same.

Capacity Building Training by NGOs and Government Agencies Post-Earthquake

- Over the last two years, however, the skill set of the community has evolved, due to the numerous trainings given by the NGOs/INGOs active in the area as part of the relief activities post-earthquake, including skill training for plumbers, electricians, masons, poultry farming, WASH etc.
- A lot of the NGOs (including Lumanti, Manekor, LaCCoS, Parivartan Nepal) have been involved in the district as a whole in different training- some are women specific and others

are general. In some cases need assessment was done but not always. Cottage department also did training in Rasuwa.

- Some people have benefited but some took trainings only for livelihood and for some it was too basic for sustaining livelihoods so need refresher courses.
- There is also a lack of understanding amongst the local communities in terms of the purpose of the trainings and the possibility of future livelihood opportunities from the same.
- There are also reported to be certain people who attended training just for the sake of being engaged and to earn money being paid to attend trainings;
- The project can build on this base and with people. This can be done keeping in mind the constraint, such as access to land – which was a major source of sustenance.

Current Livelihood Status

- One of the most important concerns of people has been the continuous pressure to find enough livelihood sources to help them meet the financial needs of their families, in the present temporary shelter. This has also led to a higher level of diversification of the livelihood dependence of the households;
- The most common sources of livelihoods in the local community presently are labour, stone breaking, Masonry, foreign employment, agriculture and remittance;
- While some households are now returning regularly to the original villages. Some households are also undertaking agriculture on share cropping basis in the vicinity of the IDP camps. However, this is limited to households who can afford the rent/ share in crop. There is also a limitation in the total land available for rent/share cropping
- Activities such as livestock are likely to be restricted in the area due to instability associated with residential status and land availability the company will do this.
- Furthermore, it is understood that the breeds to livestock that were maintained by the communities in the native villages are non-compatible with the climatic conditions of the IDP camps, which are hotter as they are mostly in the plain region.
- There is also reported to be a reduction in the availability of labour work opportunities associated with construction such as Masonry, electricians, plumbers etc. due to a reduction in construction activities in the district.
- The livelihood profile and the present trends, is largely dependent upon the present residence of the population and are likely to change once again, if the population goes back to the original village or changes location of residence.

Livelihood Expectations of the Project-Affected Population

- A number of the local community members, especially younger population, are interested in direct employment, petty contracts and daily wage.
- The preference for direct employment pertains to job profiles such as security, housekeeping, general administration, drivers etc.
- There is reported to be a shift, especially amongst the local population, towards foreign employment, as it is perceived as providing better returns and more stable incomes. Thus, there is an interest in the youth to develop skills which would allow them to pursue livelihood opportunities not just in the country but also abroad.
- However, the skill set required by the project, at least in the initial few years, may not be available in the project area. These skill sets however may be available in urban areas such as Battar, Betrawati etc.

Livelihood Options Likely to be Available from UT-1 Project

- As a result of this, it is possible, that in the first few years, the project may have to recruitment workers from outside the project area and the district. However, it is expected that through the training plan, the skill set available in the AoI will increase and after a certain number of years, the project will be able to recruitment a majority of its workers from the project area itself.
- However, one of the challenges in recruiting for the project is the remoteness of the site, due to which finding appropriate skill sets becomes a challenge
- The employment and skills training plan thus formulated will put in place a recruitment plan which will prioritize the recruitment of the locals from the project area, followed by the Gaonpalikas being touched by the project boundaries and then the district, and if not available in the district, then a Nepali citizenship.

3.6.1.3. Legal and Regulatory Framework

The plan implementation will be ensured to be in compliance with applicable requirements/guidelines which as per PDA should comply with Nepal regulations as well as Performance standards (IFC PS and ADB SPS etc. already referred to in the PDA.

Provisions of the Project Development Agreement (2016)

As per the Project Development Agreement:

- In addition to the budget committed in the EIA, the Company shall throughout the Term, support community development of affected communities through benefit sharing activities;
- The Company will set up a grievance mechanism to resolve grievances at the community level as per the EIA;
- As part of the Company's obligations regarding Disclosure of Information and Consultation, the Company will disclose all Plans in Nepali and English;

- The Company shall submit reports, every six months up to Commercial Operation Date and every 12 months thereafter, to GON describing in detail the activities undertaken under the Plan, the amounts spent on such activities and impact evaluation of such activities.
- Local community development activities aim to improve the standard of living of the affected communities through livelihood enhancements and support to construction and maintenance of physical infrastructure such as roads, trails, pedestrian bridges, water supply and sanitation schemes, communication infrastructures, community infrastructure development, such as schools, health posts, community centers, women's centers, small enterprise development funds etc. These initiatives should be developed in coordination with local governments to avoid duplication of interventions/support and ensure sustainability of efforts.
- The Local Benefit Sharing Plan shall also include a component detailing local community development activities (as committed in GON approved Environment Reports), that includes a detailed breakdown of specific activities, timeline, budget and implementation modalities.
- This does not preclude the Company from committing additional resources for the above and other benefit sharing activities.
- The Company and GON shall as per Section 11.3.2 (Plans) jointly prepare the Local Benefit Sharing Plan to be implemented within 12 months from the Agreement Date in accordance with this Schedule.
- The Company shall, and shall ensure that its Contractors and Representative shall, in connection with the conduct of the Project:
  - maximise the use of Nepali resources and give first consideration and full and fair opportunity to technically and commercially qualified Nepalese citizens and firms provided that in each case, the use of such Nepali resources meet the quality, quantity and availability requirements of the Company and provided further that use of such resources does not have a material and adverse impact on the costs and the timelines for the Project;
  - ensure that its Nepal Industrial Benefits Plan provides for an outreach programme under which the Company engages with Nepali suppliers for Project-related opportunities;
  - comply with the Laws of Nepal including the Labour Act, 2048 and Labour Regulation, 2050;
  - ensure that its Nepal Employment and Skills Training Plan provides for appropriate training of suitable citizens of Nepal for Project-related opportunities;
  - conduct employee training programmes from time to time, including training in each of the skills used in the Project, including management training;
  - comply with the Nepal Employment and Skills Training Plan, Nepal Industrial Benefits Plan and Local Benefit Sharing Plan and ensure that appropriate programmes are designed to assist suitable Nepali citizens, entities, and firms to meet the Project's requirements for goods and services;

- shall (to the extent applicable) submit reports every six (6) months to GON for the first three (3) years of the Construction Period and every twelve (12) months thereafter, describing in detail (A) its employee training programmes, (B) the implementation of such training programmes, (C) the progress made towards meeting the objectives set forth in· this Section 11 .9 (Use of Nepali resources; training and development) the Nepal Employment and Skills Training Plan, Nepal Industrial Benefits Plan and Local Benefit Sharing Plan.

Other Applicable Provisions

Constitution of Nepal (2015 AD)

Nepal is governed according to the Constitution of Nepal, which came into effect on Sept 20, 2015, replacing the Interim Constitution of 2007.

- Policies of the State: The state shall pursue a policy of raising the standards of living of the general public through the development of infrastructures such as education, health, housing and employment of people of all regions by equitably distributing investment of economic investment for the balanced development of the country;
- The state shall pursue a policy of making the women participate to the maximum extent in the task of national development by making special provisions for their education, health and employment
- The state shall pursue a policy of making special provisions of social security for the protection and progress of the single women, orphans, children, the helpless, the aged, the disabled, incapacitated persons and tribes on the verge of extinction
- The State shall pursue a policy of making a special provision, based on positive discrimination, for the minorities, landless people, landless squatters, bonded labours, the disabled, backward regions and communities and victims of conflict, the women, Dalit, indigenous people, Madhesi and Muslims, as well.

Nepal Hydropower Development Policy 2056 BS (2001 AD) Requirements

The Hydropower Development Policy was implemented by the Department of Electricity, Nepal to ensure supply of electricity to rural and urban areas, to enhance hydro-power development and to motivate the national and foreign private sector investments for the development of the hydropower sector in the country.[1]

The policy species requirements for various works to be undertaken for the development of hydropower in the country, from which, the following specifications are relevant to the Project:

- Foreign entrepreneurs shall be encouraged to be affiliated with local organizations as the cost of hydropower decreases if the project is developed through the domestic construction entrepreneurs and consultants;

[1] Hydropower Development Policy, 2001, http://www.doed.gov.np/policy/hydropower_development_policy_2001.pdf

- The person licensed to build or operate a hydropower project shall carry out or cause to be carried out works such that technology is transferred to the Nepalese citizens in the course of performing the works in accordance with the license;
- The person licensed to build or operate a hydropower project shall utilize Nepalese labor, skills, means and resources to the maximum extent possible and, shall also give priority to utilize local labor. 6.8.4 Development of industries producing construction materials and equipment to be used in the power sector shall be encouraged.

Land Acquisition, Resettlement and Rehabilitation Policy for Infrastructure Development Projects 2071 BS (2015 AD)

In September 2015, the Government of Nepal formulated the Land Acquisition, Resettlement and Rehabilitation Policy for Infrastructure Development Projects (2071 BS). The main objective of the policy is to make the process of land acquisition for development projects smooth and scientific. Key features of the policy (relevant to benefit sharing) are as follows:

- Social mobilization income restoration and life skill program: Project affected persons should be given necessary training for development of life skills, income generating schemes, savings and credit schemes so that PAFs can take up self-employment projects at the resettlement zone. Preference should be given to women;
- Vulnerable groups such as Janajati/Adivasi, Dalits, landless, women, especially women-headed households, differently-abled, poverty groups and senior citizens are entitled to special benefit and assistance packages in addition to compensation and resettlement;

International Reference Guidelines Requirements

<u>IFC Performance Standards 2012</u>

IFC applies the Performance Standards[2] to manage social and environmental risks and impacts and to enhance development opportunities in its private sector financing to its member countries eligible for financing. Together, the eight Performance Standards establish standards that the Client is required to meet throughout the life of an investment by IFC or other relevant financial institutions. The key requirements of these standards in terms of community development and benefit sharing are as follows:

- The project must improve, or at least restore the livelihoods and standards of living of displaced persons
- the project will offer displaced communities and persons compensation for loss of assets at full replacement cost and other assistance to help them improve or restore their standards of living or livelihoods
- economically displaced persons whose livelihoods or income levels are adversely affected will also be provided opportunities to improve, or at least restore, their means of income-earning capacity, production levels, and standards of living

[2] http://ifcext.ifc.org/ifcext/sustainability.nsf/Content/PerformanceStandards

- The project may also provide alternative income earning opportunities may be provided, such as credit facilities, training, cash, or employment opportunities.

ADB Safeguard Policy Statement

In July 2009, ADB's Board of Directors approved the new Safety Policy statement (SPS) governing the environmental and social safeguards of ADB's operations[3]. The SPS builds upon ADB's previous safeguard policies on the Environment, Involuntary Resettlement, and Indigenous Peoples, and brings them into one consolidated policy framework with enhanced consistency and coherence, and more comprehensively addresses environmental and social impacts and risks. The SPS also provides a platform for participation by affected people and other stakeholders in the Project design and implementation.

The key requirements of these standards in terms of community development and benefit sharing are as follows:

- The project shall at least restore, the livelihoods of all displaced persons1 in real terms relative to pre-project levels; and improve the standards of living of the displaced poor and other vulnerable groups.
- The project shall aim to provide displaced persons with opportunities to share project benefits in addition to providing compensation and resettlement assistance.
- Project shall attempt to ascertain specific opportunities for engaging affected persons as project beneficiaries and to discuss how to spread such opportunities as widely as possible among affected persons
- The project shall prioritize land-based resettlement strategies for displaced persons whose livelihoods are land-based.
- If land is not the preferred option of the displaced persons, or sufficient land is not available at a reasonable price, non-land-based options built around opportunities for employment or self-employment should be provided in addition to cash compensation for land and other assets lost.
- The project will also provide assistance to displaced persons in the form of credit facilities, training, and employment opportunities so that they can improve, or at least restore, their income-earning capacity, production levels, and standards of living to pre-displacement levels
- The borrower/client will also provide opportunities to displaced persons to derive appropriate development benefits from the project.

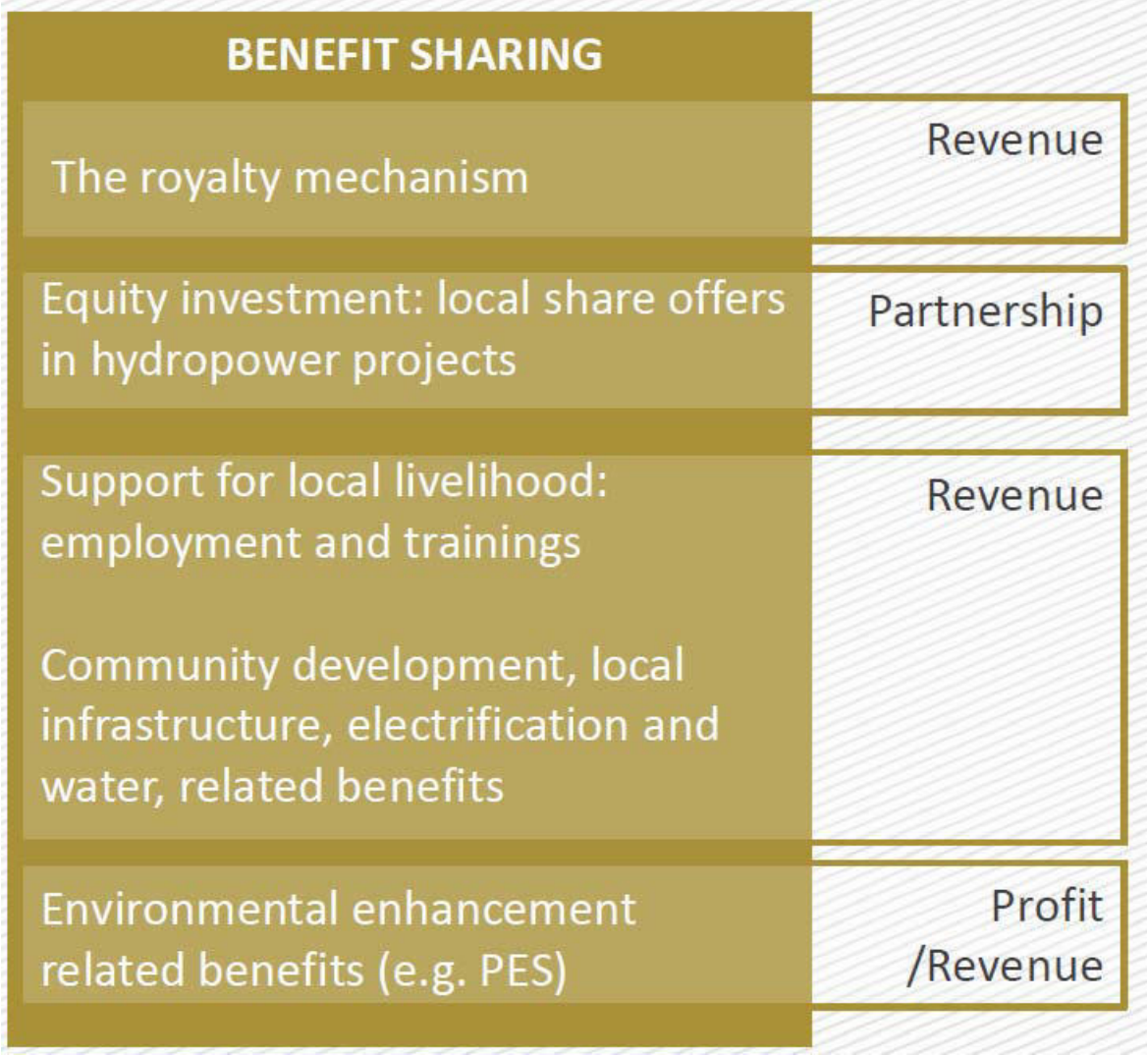
3.6.1.4. Benefit Sharing Mechanism: Practice in other HEP Projects of Nepal

According to the PDA, "Benefit Sharing is the systematic effort of the Company, as well as GON and GON nominated agencies to equitably share benefits of Project with affected communities through benefit sharing mechanisms beyond mandatory mitigation and

[3] http://www.adb.org/sites/default/files/institutional-document/32056/safeguard-policy-statement-june2009.pdf

compensation measures, including but not limited to the enhancement measures detailed in the environmental reports during construction phase, and continued community development activities that benefit the affected communities throughout the concession term".

The benefits typically include monetary and non-monetary initiatives. The following figure provides an understanding of the typical components of a benefit sharing mechanism.



Source: Rai. N & Neupane S. "Sharing benefits" of Hydropower projects: with special reference to the "Shares model". Advancing Sustainable Hydropower Technical Workshop Series. January 23-24 2017

Figure 3.6.1-6: Typical Components of a Benefit Sharing Mechanism

The concept of benefit sharing has been used in many HEP projects in Nepal. While the benefit sharing is used liberally by many, it has also been used liberally in some contexts. The modalities of benefit sharing have definitely evolved over time with communities engaged in continued struggle to get benefits from the Project in their backyard which they consider to be rightfully theirs.

A brief snapshot of how similar HEP Projects in Nepal have implemented benefit sharing in their respective Projects is captured in Table 3.6.1-5.

Table 3.6.1-5: Examples of Benefit Sharing in Nepal

SN	Project name	Royalty	Local project shares	Community development fund	Local livelihoods programme	Electricity support	Water and environment benefits
1	Kulekhani I	Pays	N/A	No	Local jobs, trainings	Infrastructure provided and no load shedding	Drinking, fisheries
2	Kulekhani II	Pays	N/A	No	Local jobs, trainings	Infrastructure provided	Drinking
3	Marsyangdi	Pays	N/A	Yes	Local jobs, trainings	N/A	Drinking, irrigation
4	Aadhi Khola	Pays	N/A	Yes	Local jobs, trainings	BPC grid distribution	Drinking, irrigation
5	Jhimruk	Pays	N/A	Yes	Local jobs, trainings	BPC grid distribution	Drinking, irrigation
6	Khimti	Pays	N/A	Yes	Local jobs, trainings, local union	MHP plant built and local cooperative established	Drinking, irrigation
7	Upper Bhotekoshi	Pays	6% private pending	Yes	Local jobs, trainings	Infrastructure provided	Drinking
8	Kali Gandaki A	Pays	N/A	No	Local jobs, trainings	Connections to some houses	Drinking, irrigation, fisheries
9	Chilime	Pays	10% issued	Yes	Local jobs, trainings	Infrastructure provided	Drinking
10	Middle Marsyangdi	Pays	N/A	No	Local jobs, trainings	Infrastructure provided	Drinking, cultural, environment data
11	Ridi	Pays	10% issued	Yes	Provided	Preferential tariff and no load shedding	Drinking, irrigation
12	Siuri Khola	Pays	10% issued	No	Provided	Infrastructure provided	None
13	Mai	Pays	10% issued	Yes	Provided	Infrastructure provided	Drinking
14	Upper Marsyangdi	N/A	N/A	No	Provided	N/A	Drinking
15	Puwa Khola I	N/A	10% planned	No	Provided	N/A	TBD
16	Kulekhani III	N/A	N/A	No	Provided	N/A	Drinking, attempted environment scheme
17	Rasuwagadhi	N/A	10% planned	No	Provided	Infrastructure provided	Cultural, environment data
18	Upper Tamakoshi	N/A	10% pending	No	Provided	Infrastructure provided	Drinking, environment data

Note: BPC = Butwal Power Company; MHP = micro hydro plant; N/A = not applicable; TBD = to be decided

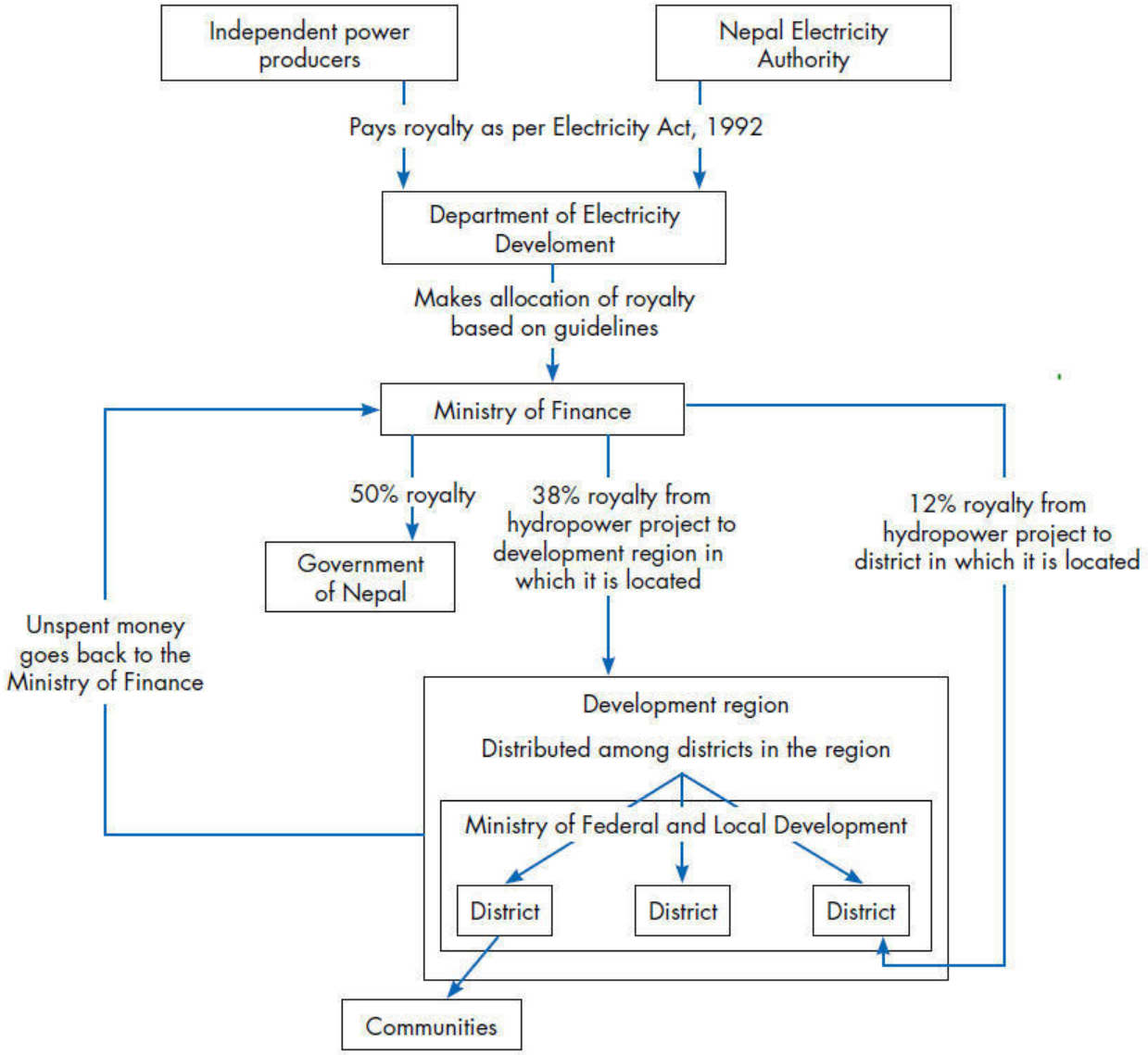
Source: Shrestha, P; Lord, A; Mukherji, A; Shrestha, RK; Yadav, L; Rai, N (2016) Benefit sharing and sustainable hydropower: Lessons from Nepal. ICIMOD Research Report 2016/2. Kathmandu: Nepal

Royalty Sharing

The royalty sharing mechanism is one of the most common types of benefit sharing and usually works on a system of royalty collection by the government from HEP Projects and distribution to local community through local governments.

Typically, the royalty collected is based on the capacity of the hydropower plant and the annual generation of electricity. The annual capacity royalty amount increases ten times after 15 years and the energy royalty increases by five times after 15 years.

The typical process followed for the royalty sharing mechanism is given in the following figure.



Source: Shrestha, P; Lord, A; Mukherji, A; Shrestha, RK; Yadav, L; Rai, N (2016) Benefit sharing and sustainable hydropower: Lessons from Nepal. ICIMOD Research Report 2016/2. Kathmandu: Nepal

Figure 3.6.1-7: Royalty Sharing Process

The table below provides an understanding of some of the projects in which royalties have been collected.

Table 3.6.1-6: Royalties collected by the Government of Nepal from Hydropower Projects in Fiscal Year 2068/69 BS (2012 AD)

SN	Project name	Capacity royalty	Generation royalty	Total
1	Kulekhani I (60 MW)	NPR 60,000,000	NPR 77,136,754	NPR 1,37,136,754
2	Kulekhani II (32 MW)	NPR 32,000,000	NPR 38,531,556	NPR 70,531,556
3	Marsyangdi (69 MW)	NPR 69,000,000	NPR 240,457,529	NPR 309,457,529
4	Aadhi Khola (5.1 MW)	NPR 5,100,000	NPR 14,227,684	NPR 19,327,684
5	Jhimruk (12 MW)	NPR 12,000,000	NPR 34,054,469	NPR 46,054,469
6	Khimti (60 MW)	NPR 6,000,000	NPR 56,293,747	NPR 62,293,747
7	Upper Bhotekoshi (45 MW)	NPR 4,500,000	NPR 35,601,380	NPR 40,101,380
8	Kali Gandaki A (144 MW)	NPR 14,400,000	NPR 92,953,213	NPR 107,353,213
9	Chilime (22.1 MW)	NPR 2,210,000	NPR 17,843,078	NPR 20,053,078
10	Middle Marsyangdi (72 MW)	NPR 7,200,000	NPR 45,906,287	NPR 53,106,287
11	Ridi Khola (2.4 MW)	NPR 240,000	NPR 1,082,686	NPR 1,322,686

Note: Project numbers 1–5 have been in operation for more than 15 years and pay higher royalties as per the Electricity Act, 1992;
USD 1 = NPR 107 as in June 2016
Source: Department of Electricity Development, Government of Nepal

Source: Shrestha, P; Lord, A; Mukherji, A; Shrestha, RK; Yadav, L; Rai, N (2016) Benefit sharing and sustainable hydropower: Lessons from Nepal. ICIMOD Research Report 2016/2. Kathmandu: Nepal

The royalty mechanism is intended to promote development on a district and regional scale by distributing benefits to local government institutions rather than individual beneficiaries. According to the Hydropower Royalty Distribution and Utilization Directive, 2063 BS:

- The district with the hydropower project that receives 12% of royalty has to spend half of that money (that is 50% of the 12%) for environmental restoration work in upstream areas (20%);
- For supporting work in surrounding areas impacted by project's infrastructure like the dam, powerhouse, reservoir, transmission lines, tunnel, etc. (15%);
- For work in downstream dry areas below the dam (15%).
- For the remaining 50% of the 12% royalty and the contribution from the 38% royalty distributed within districts of the development region, DDCs have to give higher priority to electrification, alternate energy, and community electrification in affected areas.

But again, as the local development officers have to deal with multiple needs in a district, they often allocate budgets for purposes other than electricity and beyond the affected areas.

Equity Shares

This form of benefit sharing involves the provisioning of a percentage of equity or shares to the local stakeholders through both the public and private markets. This mechanism is aimed at allowing the local shareholders to get a direct financial claim to the project's projects. Although similar to the royalty mechanism in that the value of financial transfers to project beneficiaries is linked to project performance (in the form of dividends, bonus shares, or increased equity value).

As per the amended Securities Registration and Issuance Regulation 2008, only a hydropower company that is registered as a public limited company, not a private company can float a minimum of 30% of its shares to public, out of which 5% must be for company staff, 10% for locals, and the remainder for the general public.

The following table provides an understanding of some of the projects that have undertaken equity sharing as a mechanism.

Table 3.6.1-7: Share offers by Hydropower Projects

Hydropower project, offering status, and offering year	Allocation of 'local shares'	Share offer details
Chilime (completed 2008–2010)	10% to local affected district and 15% to general public	The general initial public offering (IPO) was completed seven years after the completion of the project, post-profitability. The local share offer was conducted in 2010, following the resolution of a court case in which the percentage of shares allocated to the local population was revised from 5% to 10%. Due to this delay in the local offer, shares were offered at par with the IPO price (@ NPR 100) to 'highly-affected' locals in three VDCs and at a backdated share price premium (@ NPR 323) to affected locals. As a result, the company was able to pay dividends to locals immediately following the offer.
Mai (completed 2013–2014)	10% to local affected district and 20% to general public	The general IPO was completed in 2013 and the local share offer was conducted in 2014, both during the construction phase prior to the completion of the project in 2015. The project initially planned to allocate 40% of local shares to affected VDCs, but due to insufficient local demand the project allocated the remaining local shares to other residents of Ilam District. The general IPO was oversubscribed by 29 times.
Ridi (completed 2013–2014)	10% to local affected VDCs and 39% to general public, plus 50% promoter shares to locals	The construction of the project was completed in 2009. The local share offer to affected VDCs was done in October 2013 and the general IPO was done in February 2014. For both the offers, the IPO price was NPR 100 per share. Out of 300 promoters, about 50% are from local affected VDCs.
Siuri Khola (2015–2016)	10% to locals and 20% to general public	The construction was completed in September 2012. Ngadi Power Group completed the local share offer to affected districts in November 2015 and the general IPO in April 2016.
Upper Bhotekoshi (in progress/agreement reached)	6% private-market shares to locals only	Shares were demanded 14 years into commercial operation as a result of local protests following a landslide in August 2014. Following negotiations, project developers committed to provide 6% of 'private-market' shares to locals (distribution still pending).
Upper Tamakoshi (pending 2016–2017; delayed)	10% to local affected district and 15% to general public	The general IPO and local share offer was initiated in early 2015, after roughly 70% of the construction work had been completed. Concerns about eligibility criteria and uneven allocations to different affected areas led to protests and strikes in Dolakha District. Nepali employees of project contractor Sinohydro also organized a labour strike, demanding that workers be allowed to purchase shares in the project. The construction of the project and the share offer have been delayed due to earthquake-related damage.
Rasuwagadhi (planned 2018)	10% to local affected district and 15% to general public	There are plans to offer local shares before completion of construction.
Puwa Khola 1 (planned)	10% to local affected district	There are plans to offer local shares before completion of construction.
Khimti (demanded)	N/A	Local demands for shares emerged 14 years into commercial operation (partially a reaction to Bhotekoshi and Upper Tamakoshi protests/demands), but the project has not agreed to any share offer.
Upper Marsyangdi (demanded)	N/A	Local demands for shares emerged during the construction phase, but no shares have been issued.
Aadhi Khola and Jhimruk projects (demanded)	N/A	Project developer Butwal Power Company (BPC) is a publicly traded company on the Nepal Stock Exchange and, therefore, has not issued shares for its subsidiary projects in the past (although BPC is currently changing its policy by establishing a new project-specific company for its new undertakings). Local people from Aadhi Khola and Jhimruk have demanded shares.

Source: Shrestha, P; Lord, A; Mukherji, A; Shrestha, RK; Yadav, L; Rai, N (2016) Benefit sharing and sustainable hydropower: Lessons from Nepal. ICIMOD Research Report 2016/2. Kathmandu: Nepal

Note: Although the practice is not mandatory for all projects, shares are still widely offered by many power producers as public companies in order to harness domestic or 'local' capital and to obtain the 'social licence to operate'.

Community Development

One of the oldest and most common types of benefit sharing is in the form of investment in community development or infrastructure development. This generally includes interventions in key areas such as: Health, Education, Agriculture, Road, Water supply, Religious/ cultural sites. These activities are also undertaken as part of the CSR activities by the project. Some of the community development activities undertaken by hydropower projects are depicted in the table below.

Table 3.6.1-8: Community Development Areas and Activities in Hydropower Projects

Priority areas	Representative activities
Health care	Funding management of health care (e.g., Khimti, Upper Bhotekoshi) Construction of health posts (e.g., Kulekhani III, Middle Marsyangdi, Aandhikhola, Upper Marsyangdi, Upper Tamakoshi) Acquisition of ambulances (e.g., Middle Marsyangdi, Chilime, Rasuwaghadi, Puwa Khola I) Organization of health camps (e.g., Mai, Aandhikhola, Middle Marsyangdi)
Education	In-kind and cash support to schools (e.g., Khimti, Aandhikhola, Kaligandaki,Upper Tamakoshi) Maintenance of school buildings (e.g., Aandhikhola, Upper Marsyangdi, Kaligandaki) Construction of new school buildings (e.g., Middle Marsyangdi, Khimti, Mai, Kulekhani II, Upper Bhotekoshi) Provision of school bus (e.g., Kulekhani II) Support for teachers' salaries (e.g., Upper Bhotekoshi, Khimti, Aandhikhola) Merit-based scholarships and awards (e.g., Upper Bhotekoshi, Khimti) Tuition fee waivers (e.g., Khimti) Literacy programmes (e.g., Khimti, Aandhikhola)
Roads	Opening track of road (e.g., Middle Marsyangdi, Jhimruk, Upper Marsyangdi, Puwa Khola I, Siuri)
Cultural sites	Construction of cremation sites (e.g., Kaligandaki, Upper Marsyangdi, Puwa Khola I) Construction/reconstruction of temples (e.g., Andhikhola, Kaligandaki, Upper Bhotekoshi)
Mother's group	Financial support (e.g., Upper Marsyangdi, Andhikhola, Jhimruk) Literacy classes (Khimti)
Drinking water	One house, one tap programme (e.g., Upper Marsyangdi) Construction of water supply lines (e.g., Middle Marsyangdi, Lower Marsyangdi, Upper Marsyangdi, Jhimruk, Ridi, Kaligandaki)
Irrigation	Expansion and improvement of irrigation systems (e.g., Ridi, Aandhikhola, Jhimruk, Khimti) Irrigation canal maintenance (e.g., Ridi, Aandhikhola, Jhimruk) River works and river bank stabilization (Jhimruk)
Other	Support for fisheries development (Kulekhani I, Kali Gandaki A)

Source: Shrestha, P; Lord, A; Mukherji, A; Shrestha, RK; Yadav, L; Rai, N (2016) Benefit sharing and sustainable hydropower: Lessons from Nepal. ICIMOD Research Report 2016/2. Kathmandu: Nepal

Rural Electrification

Another component of the benefit sharing mechanism is the rural electrification process. This may be undertaken based on the following models:

- Provision of free electricity and distribution infrastructure to the local electricity group, which then manages the distribution;
- Preferential tariff rates for those living in the affected VDCs;

- Provision of distribution infrastructure, but the electricity is purchased by rural electricity groups through NEA; and
- Rural electrification through NEA

The following table provides an understanding of the rural electrification process undertaken by some of the hydropower projects in the country.

Table 3.6.1-9: Support for Rural Electrification Provided by Hydropower Projects

SN	Project name	Rural electrification support
1	Kulekhani I	Infrastructure support for electrification; no load shedding
2	Kulekhani II	No load shedding
3	Marsyangdi	Access through regular NEA connection
4	Aadhi Khola	Electricity connection through BPC distribution at subsidized rate
5	Jhimruk	Electricity connection through BPC distribution at NEA rates
6	Khimti	Free electricity (about 1 MW) to rural electricity cooperative through separate micro hydro plan
7	Upper Bhotekoshi	Some infrastructure support for electrification
8	Kali Gandaki A	Electricity connection to Bote community houses
9	Chilime	Infrastructure support for electrification
10	Middle Marsyangdi	Infrastructure support provided through neighbourhood development programme, complementing electrification policy of Lamjung District
11	Ridi Khola	Distributed electricity to 60 households at subsidized rate; no load shedding
12	Siyuri Khola	Infrastructure support for electrification
13	Mai	Infrastructure support for electrification
14	Upper Marsyangdi	N/A
15	Puwa Khola I	N/A
16	Kulekhani III	N/A
17	Rasuwagadhi	Infrastructure support for electrification (proposed)
18	Upper Tamakoshi	Infrastructure support for electrification (proposed)

Source: Shrestha, P; Lord, A; Mukherji, A; Shrestha, RK; Yadav, L; Rai, N (2016) Benefit sharing and sustainable hydropower: Lessons from Nepal. ICIMOD Research Report 2016/2. Kathmandu: Nepal

NWEDC will try and build case studies on the examples presented, based on the information available as part of the detailed plans. The primary purpose of this section will be to provide learnings for previous experiences, and the key take –away from the same. The key learnings may be in the form of activities/initiatives that were successful and those which were not.

Employment and Training

The support for local livelihoods is another form of benefit sharing and pertains to employment (usually contractual) of the local community within the project, or development of additional skills through trainings. Typically, the majority of local hiring is unskilled and casual labour, hired formally or informally through the project contractor(s), while the project developer hires a smaller group of locals as drivers or entry-level office staff.

The following table provides an example of some of the hydropower projects that have undertaken local employment as a benefit sharing mechanism.

Table 3.6.1-10: Local Employment and Priority Hiring Programmes Provided by Hydropower Projects

SN	Project name	Local jobs	Employment during construction	Employment after construction
1	Kulekhani I	Yes	Not known	35 locals NEA recruiting process
2	Kulekhani II	Yes	Not known	Some locals NEA recruiting process
3	Marsyangdi	Yes	Preference to people who lost more than 70% of land	Some locals in contract later NEA recruiting process
4	Aadhi Khola	Yes	Priority to locals	85 locals
5	Jhimruk	Yes	Priority to locals	Priority given to locals by Jhimruk Industrial Development Company (JIDCO) – previously established by the project, but later turned into a non-government organization (NGO)
6	Khimti	Yes	Priority to locals	Priority to affected district
7	Upper Bhotekoshi	Yes	17 displaced people Priority to affected VDC	26 out of 53 are locals Priority to affected VDC
8	Kali Gandaki A	Yes	Priority to local affected people (especially Bote)	7 locals in contract
9	Chilime	Yes	50/60 people from district	12–15 local staff
10	Middle Marsyangdi	Yes	Priority to locals	NEA recruiting process
11	Ridi Khola	Yes	Priority to affected VDC	8 local staff
12	Siuri Khola	Yes	Local contractor for buildings and 8 local workers	6–7 locals
13	Mai	Yes	15–16 locals after training Selected through concerned committee	10–15 locals Priority to affected VDCs for employment
14	Upper Marsyangdi	Yes	About 800 locals from affected district	TBD
15	Puwa Khola I	Yes	20–25 locals Priority displaced people	TBD
16	Kulekhani III	Yes	Priority to displaced people	TBD
17	Rasuwagadhi	Yes	Priority to people from most-affected VDCs	TBD (verbal commitment)
18	Upper Tamakoshi	Yes	Priority to 'local hiring' of people from Dolakha district, stated preference to hire from most-affected VDCs where possible	TBD (verbal commitment)

Note: TBD = to be decided

Source: Shrestha, P; Lord, A; Mukherji, A; Shrestha, RK; Yadav, L; Rai, N (2016) Benefit sharing and sustainable hydropower: Lessons from Nepal. ICIMOD Research Report 2016/2. Kathmandu: Nepal

However, one of the issues is that when the project construction is complete, the daily operations of the hydropower project require much less labour input. Hence, most of the jobs directly created by hydropower development are not durable in the long term. For this reason, the quality and duration of project employment are key variables affecting the distribution of benefits from employment. However, while jobs in hydropower construction are rarely sustainable in this sense, it does allow the local community to develop specific skills which may allow them to find employment elsewhere.

In addition to employment with the project, provisioning of skill trainings has also evolved as a benefit sharing mechanism. These trainings are usually aimed at allowing for the local

community to build and expand their skills to allow them to undertake new entrepreneurship opportunities or for finding employment in the country or abroad. The following table provides an understanding of the types of trainings provided by the various hydropower projects in Nepal.

Table 3.6.1-11: Trainings Provided by Hydropower Projects

SN	Project name	Sample trainings to project-affected people
1	Kulekhani I	Watershed management and soil erosion prevention training for women
2	Kulekhani II	Skill enhancement training on electro-mechanical and 'doko' knitting (for Chepang community)
3	Marsyangdi	House wiring and plumbing training
4	Aadhi Khola	Vegetable farming training
5	Jhimruk	Construction work (welding, plumbing), mobile repair, fruit support programme training
6	Khimti	Skill development and non-formal education programmes
7	Upper Bhotekoshi	Income generating training programme for disabled and backward communities
8	Kali Gandaki A	Fish farming training
9	Chilime	Women's empowerment, cooking, knitting training
10	Middle Marsyangdi	Agriculture training (e.g., in beekeeping and herb identification)
11	Ridi Khola	Converting semi-skilled workers to skilled workers through construction-related training
12	Siuri Khola	None
13	Mai	Construction training to 60 workers (later jobs), knitting training to women
14	Upper Marsyangdi	70 labours trained in construction works (carpentry and bar bending) at Technical Campus
15	Puwa Khola I	Agriculture training
16	Kulekhani III	Driving, computer, stitching, agriculture training
17	Rasuwagadhi	Culinary training
18	Upper Tamakoshi	Electrical and plumbing training, driving, agriculture training

Source: Shrestha, P; Lord, A; Mukherji, A; Shrestha, RK; Yadav, L; Rai, N (2016) Benefit sharing and sustainable hydropower: Lessons from Nepal. ICIMOD Research Report 2016/2. Kathmandu: Nepal

3.6.1.5. Guiding Principles: Benefit Sharing

On the basis of the review of the PDA requirements, and based on understanding from the practices of other HEP Projects in Nepal, NWEDC will develop its own principles finalise in consultation with the GON at the time of formulating the detailed plan.

The Local Benefit Sharing Plan will be based on the following guidelines and principles:

- The Project will ensure compliance to relevant applicable Government of Nepal regulations, IFC Standards and ADB Safeguards Policy Requirements;
- The Project will clearly define and communicate to concerned parties, the areas and populations that qualify for LBS initiatives, with a list of criteria and mechanism for dispute resolution;
- The Project will ensure that the LBS initiatives will include all influenced VDCs and settlements, based on a fair selection process for prioritisation and stage-wise coverage);

- The Project work with credible local institutions and create an enabling environment to promote greater local ownership of initiatives, with the aim of transferring/handing-over operations (where feasible) to ensure both local ownership and long-term sustainability.[4]
- Ownership and user rights will be clearly defined with local participation and involvement of concerned stakeholders for all assets created/enhanced under LBS initiatives;
- The Project will take into consideration all forms of extant ownership and user rights (individual and community) to ensure that these are not involuntarily compromised by the project's initiatives;
- The Project will take into account all the impacts (beyond the 3 VDCs and ensure avoidance or effective management/mitigation);
- The Project will take into account existing schemes and programmes of the Government of Nepal, other plans formulated for the project and schemes and programmes of other multi and bi-lateral lending agencies with the purpose of ensuring complementarities and avoiding conflict or duplication;
- The Project will ensure transparency in disclosing information related to the LBS initiatives (impacts, benefits, eligibility criteria, people's participation, fund-utilisation/expenditure, time-lines etc.), across the project lifecycle;
- With the overall aim of furthering social inclusion, the Project will aim to ensure local participation, (with special care to include marginalised and/or indigenous groups and persons) from the planning stages to implementation and delivery;
- All stages and components of the initiatives will take into account gendered patterns in livelihoods and aim for greater gender equity to ensure practical benefits for women such as necessary safeguards, ensuring access, increased income opportunities and greater financial security;
- Recognising existing social and economic vulnerabilities in the local populations, the Project will build-in additional safeguards to ensure access and up-take of benefits;
- The project-related information dissemination, engagement and disclosure will be through informed consultation and participation (ICP), aiming for the widest coverage and use of the most effective mediums of communication; and
- The implementation of Local Benefit Sharing Plan will be monitored in terms of its impacts, process and outcomes as per agreed and approved indicators and timelines as defined in the Monitoring Plan.

3.6.2. Local Benefit Sharing Plan

As per PDA, "Local Benefit Sharing Plan" is understood to refer to the plan through which the Company agrees to benefit sharing through local community development activities reflected in the EIA, and that which the Company as a good corporate citizen will continue throughout the

[4] ICIMOD.Benefit Sharing and Sustainable Hydropower:Lessons from Nepal(2016).

concession period by channelling some of the benefits generated by the operation of the Project to the affected communities beyond mitigation and compensation measures.

As part of this section, the detailed plan will provide the benefit sharing programs based on the finding of the primary and secondary data of the demographic, socio-economic, and development indicators, as well as status of essential infrastructure in terms of housing, schools, hospitals and road networks. The plan will be developed on the following guidelines (but not limited to these guidelines)

3.6.2.1. Objective of the LBSP

The Local Benefit Sharing plan has been formulated in keeping with the requirements of the PDA signed on 29th December 2016. The primary purpose of the plan is to sustainably benefit local communities affected by hydropower investments.

While the LALRP formulated for the project, is aimed at mitigating the impacts from land procurement for the project, the Local Benefit Sharing Plan (hereinafter referred to as "LBSP"), as per PDA, will be aimed at fulfilling the following objectives:

- Supporting the local development process through direct investments (including local shares, royalty sharing, supply of local rural electrification) as well as collaboration and support of complementary programmes/projects in the area so that communities and other stakeholders benefit from the Upper Trishuli Hydro Power Project;
- Demonstrating good corporate citizenship practices of the NWEDC.

It should be noted that the LBSP shall serve as an umbrella plan, and shall be supported by specific plans including Industrial Benefit Sharing and Employment and Skill training plan formulated for the project.

The plan will be detailed out further by NWEDC in consultation with Government of Nepal (GoN) & GoN nominated agencies.

The objectives of the Plan will be discussed with GoN and any changes in the objectives will be made accordingly.

3.6.2.2. Generic Options under Local Benefit Sharing (Community Development)

In keeping with the EIA requirements and the understanding of benefit sharing in Nepal, the following options have been identified for the LBSP for UT-1.

Table 3.6.2-1: Benefit Sharing Programs

Monetary Benefits	**Non-Monetary Benefits**
Monetary benefit refers to sharing part of the monetary flows generated by the operation of the hydropower projects with local communities. It includes, but is not limited to, the following mechanisms: • Direct payments/royalty and revenue sharing • Preferential electricity rates • Payments for environmental or ecosystem services • Community development fund • Equity sharing	Non- monetary benefits refers to the approaches adopted by the project entity for ensuring that local communities benefit from construction and operation of a hydropower project in non-monetary terms.: • rural electrification, • improved infrastructure, • support for health and education programs, • improved access to fisheries and forests, and • legal title to land.
Note: Based on the understanding of the above mentioned benefits, profile of the target district, the guidelines & the PDA, following activities can be included in the benefit sharing plan.	
1. Sharing	**1. Watershed management**
• Allowing the local population an equity stake (i.e. shares). As mentioned previously, current thinking requires moving beyond mitigation and compensation to work with communities to maximize development benefits and engender more equitable outcomes. • Providing the local government a share in the royalties for the project.	• This includes development of an integrated management plan for the river watershed,
2. Community Development Fund/ Plan	**2. Associated Infrastructure and Public Service Investment**
• Community development funds financed from electricity sales can be established to foster economic development in the project areas, including the project-affected communities. • The sources of the fund can also be from the royalties and taxes paid to the government. • The objectives, structure, and duration can be the result of negotiations between local authorities and the hydropower project companies. • An important component of community development is rural electrification	• The investment can cover • Social and environmental investment such as for schools, health facilities, local infrastructure or watershed protection. • Local people will benefit from these investments if efforts can be made to ensure they are an integral part of the local development plan

The following subsections provide an understanding of the key components of the LBSP.

Based on the programs identified above, during the preparation of the detailed plan, specifics of such mechanism will be put in place, which shall provide details on how each of the initiatives will be rolled out. While finalizing the modalities of such plans NWEDC will;

- Refer to PDA requirements;
- GoN regulatory requirements (including past precedence of Court Judgements in Nepal); and
- Refer to the lenders requirement (already stipulated under PDA).

These plans will provide an understanding of (but not be limited to):

- The specific objectives of each of the mechanisms identified;
- The target groups and population;
- The year wise targets for implementation; and
- The key steps for implementation

A year wise plan of implementation will be put in place for achieving the objectives identified.

These programs will be based on the understanding of the above mentioned benefits, profile of the target district & the guidelines. The section below describe the modalities in brief and suggests the way forward for detailed plans to be prepared to meet PDA requirements.

Royalty to GoN

According to the PDA requirements (Section 11.22.2), the royalty payable shall thus be based on the following figure.

11.22.1 The Company shall pay the following royalties to GON:

From the first Unit Commissioning Date until the fifteenth (15th) anniversary of the Commercial Operation Date	From the earlier of the Energy Start Date or the Commercial Operation Date until the fifteenth (15th) anniversary of the Commercial Operation Date	For the period commencing on the day falling immediately after the fifteenth (15th) anniversary of the Commercial Operation Date and ending on the last day of the Term	
Capacity Royalty Rate (per KW per annum)	Energy Royalty Rate	Capacity Royalty Rate (per KW per annum)	Energy Royalty Rate
NPR 200	2% of the Energy Receipts	NPR 1,500	10% of the Energy Receipts

Source: UT-1 PDA

Figure 3.6.2-1: Royalty Payable to the Government

The capacity royalty chargeable from the project shall be calculated based on the following:

- From and after the first Unit Commissioning Date until the Commercial Operation Date: Capacity Royalty Rate multiplied by the total nameplate capacity (in kW) of the relevant unit(s) of the Power Station that has been commissioned.
- From and after the Commercial Operation Date: Capacity Royalty Rate multiplied by the total nameplate capacity (in kW) of the Power Station.

However, the royalty shall not be payable if:

- If NEA is in default of its payment obligations under the Domestic PPA;

- Any payments received from GON or NEA in the circumstances described in the following PDA sections: Section 6.1 (GON rights and obligations), 12.7 (Staggered Remedies) or 12A.6 (Change in Law) or Local Free Power.

It is further clarified in the PDA that in the event of non-payment of any undisputed amounts due and payable by GON to the Company under this Agreement, the Company shall, at its option, be entitled to set-off such amounts against the Capacity Royalty and/or Energy Royalty payable by the Company hereunder.

Note: In keeping with the requirements of the PDA, the royalty sharing program with the local government shall be identified, in consultation with the GoN.

Equity Shares

In addition to royalty sharing, the project shall make available shares to the local community. These shares shall be available for purchase by any member within the local community at a subsidized rate.

As per PDA,

10.17.1 *"At the option of the Project Affected People, the Company agrees that the Project Affected People:*

(A) Required to be resettled and rehabilitated as a result of the Project; and

(B) Who are natural persons and other natural persons residing permanently in the districts of the Project Area at the date on which the construction activities for the Project commence,

shall, directly or indirectly, be sold or issued up to a maximum of ten per cent (1 0%) of all the Company Shares with the value of each share determined on the basis of the face value of such shares without applying any premium, which shall be exercised and the total value paid in full in the period from the date of Financial Close until the date which is three years after the Financial Close. GON shall work together with the Company to agree on a local share allocation plan and implement such effective mechanisms and processes that is not cumbersome in the ordinary course of business to the Company to give full effect to the transactions envisaged in this Section 10.17.1 (Local share). For the avoidance of doubt, the Company shall not be required to issue any Company Shares to the general public."

Note: In discussion with the GoN, the proportion of equity shares to be made available and the rate shall be identified.

Furthermore, the definition of local community for the purpose of making equity shares available shall be established.

Rural Electrification Plan

Rural electrification is an important component of the benefit sharing mechanism.

As per the PDA,

11 .8.1 *No later than the Financial Close, the Company in consultation with GON shall identify each household (an "Original Household") within the geographical area described in Schedule 12 (Nepal Employment and Skills Training Plan – Guidance Note) (the "**Free Electrification Area**").*

11.8.2 *From and after the Commercial Operation Date, 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 household within the Free Electrification Area as at the Commercial Operation Date to up to 200% of the number of Original Households identified pursuant to Section 11 .8.1 (Rural Electrification) (each an "**Eligible Household**").*

Schedule 11, Rural electrification section additionally mentions that*:*

*From and after the Commercial Operation Date, the Company shall make available for use by **each Eligible Household within a 500 metre radius of the headworks and the Power Station** as at the Commercial Operation Date as identified by the Company and GON (which shall not be more than 200% of the Original Households), twenty (20) kWh of electrical output free of charge each Month during the Term.*

11.8.3 *Prior to Commercial Operation Date, the Company shall build the distribution network to supply such Local Free Power to each Eligible Household within the Free Electrification Area in accordance with Section 11 .8.1 (**Rural Electrification**).*

11.8.4 *GON shall be responsible for the operation and maintenance of such distribution network at its sole cost.*

11.8.5 *GON and the Company shall jointly prepare a plan (the "Rural Electrification Plan"), based on a pre-feasibility study to be carried out by GON and the Company (at the Company's sole cost) to assess the costs and scope of rural electrification in accordance with this Section 11.8 (Rural Electrification). **The Company shall implement the Rural Electrification Plan.***

Note: The final plan to be submitted by NWEDC will need to consider the following:

- In consultations with GoN, identify each household (an "Original Household") within the geographical area described in Schedule 12 (Nepal Employment and Skills Training Plan – Guidance Note); however, Schedule 12 of PDA does not specify such specific Geographical area;

- Schedule 11, somehow defines, each Eligible Household within a 500 metre radius of the headworks and the Power Station;
- NWEDC will also take part in conducting a pre-feasibility study to be carried out by GON and the Company (at the Company's sole cost) to assess the costs and scope of rural electrification.
- Prior to Commercial Operation Date, NWEDC shall build the distribution network.

To sum it up, NWEDC as part of the detailed plan shall provide an understanding of the manner in which the rural electrification requirements of the PDA will be met.

Community Development Plan

The project has undertaken a number of community development and infrastructure development activities in their Area of Influence (AoI) as part of their CSR activities. In addition to this the project was also involved in various relief efforts post-earthquake, an understanding of which is provided in the LALRP. The project is also supporting the rebuilding of two schools in Haku Besi and Dhunche and one health centre.

As per PDA,

Schedule 11

In addition to the budget committed in the EIA,

- *The Company shall throughout the Term, support community development of affected communities through benefit sharing activities.*
- *Local community development activities aim to improve the standard of living of the affected communities through livelihood enhancements and support to construction and maintenance of physical infrastructure such as roads, trails, pedestrian bridges, water supply and sanitation schemes, communication infrastructures, community infrastructure development, such as schools, health posts, community centers, women's centers, small enterprise development funds etc. These initiatives should be developed in coordination with local governments to avoid duplication of interventions/support and ensure sustainability of efforts.*
- *The Local Benefit Sharing Plan shall also include a component detailing local community development activities (as committed in GON approved Environment Reports), that includes a detailed breakdown of specific activities, timeline, budget and implementation modalities.*

EIA Commitment

There are certain community development initiatives which have been included as part of the commitments in the EIA for the project. The same shall be incorporated into the community development plan thus formulated. The EIA commitments of relevance are:

- Local people will be prioritized for employment in project construction works;
- Local people specifically women will be encouraged in agricultural practice through agricultural enhancement programme;

- The project will assist the school of the Haku VDC to provide education to the children of project staff and workers;
- The project will assist the local health institutions;
- The ethnic group 'Tamang' of the project area will be supported to preserve their, tradition, culture, identity as well as their traditional occupation;
- Dalit group will be prioritized in project works as per their skills and capacities with certain percentage reservation for dalit;
- Local people will be provided training on business and trade;
- Local people will be prioritized in training in project related works;
- The project affected VDCs will be supported for rural electrification;
- Local people will be encouraged for tourism enhancement;

Also, the following measures are suggested in the EIA,

- The erosion of river bank will be minimised 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 LNP;
- The project will carried out compensatory plantation of 4797 felled trees at a ratio of 25 seedlings for each lost tree equivalent to 119925 numbers 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 to collect firewood, timber and other forest products from the local community forest of Haku VDC and such act will be termed illegal;

Note: NWEDC will finalise these and ensure that these are developed in coordination with local governments and GoN to avoid duplication of interventions/support and ensure sustainability of efforts. These commitments will be further streamlined with clarity on numbers, schedule and budget for implementation across years.

3.6.2.3. Implementation of LBSP

During the preparation of the detailed plan, an understanding of the overall implementation mechanism for the LBSP, in keeping with the specific programs identified, will be proposed. NWEDC will formulate this implementation mechanism, based on the specific requirements of the programs, the resources available and the requirements of the GoN.

Organization Structure

The NWEDC and GoN, as per section 11.3.2 (of the project development agreement) jointly prepare the Local Benefit Sharing Plan to be implemented within 12 months from the Agreement Date in accordance with this Schedule.

NWEDC will put in place a team with clear cut roles and responsibilities for the implementation of the detailed plan. NWEDC will provide an understanding the team and the manner in which they will be involved in the implementation. Some key things to be kept in mind and questions which will be answered as part of this section are as follows:

- NWEDC's role;
- GoN's role;
- Stakeholders to be engaged in decision making;
- Decision making in relation to LBSP components;
- Possible implementation partner;
- The role of third parties (if any).

This section will provide a brief description about the effectiveness of the institution/implementation agency for planning, management, monitoring and delivery of the plan. This will also include suggestions for workable linkages with other programs/projects (government-run; multi/bi-lateral agency sponsored).

Implementing Partners

For the purpose of implementing specific components of the plans, NWEDC shall/ may associate with external third party experts, as required, who have experience in the field and the geographical area.

As part of this, NWEDC will,

- Identify NGOs/civil society and government department/ agencies who shall be involved in the implementation of the plan thus formulated.
- Some of the key agencies identified include Manekor, Parivartan Nepal, LaCCoS, Cottage Industries department, veterinary department, horticulture department etc.
- The NRA may serve as a consolidation point for all the existing NGOs and agencies in the area.
- NWEDC will build on such networks and allow for opportunities to be created for knowledge transfer.

Interlinkage with other Plans

The benefit sharing plans thus formulated are part of a larger social impact management framework for the project and shall be implemented in coordination with the other management plans such as the following (but not limited to):

- Stakeholder Engagement Plan;
- Livelihood Restoration Plan;
- Labour influx management plan; and
- Grievance Redressal Mechanism.

Schedule for Implementation

This section provides an understanding of the schedule of implementation of the plan thus formulated

As part of the detailed plan, NWEDC will put in place a schedule for implementation of the LBSP, in discussion with GoN. This schedule will provide an itemized timeline for each step of the implementation process.

3.6.2.4. Engagement Strategy

This section will provide the Engagement strategy for the LBS plan. An essential component of the implementation of the benefit sharing plan is the engagement with the local community and other external stakeholders.

The strategy will specifically explain the key needs and sensitivities viz. communities, government, and other stakeholders who will be associated ort linked to implementation of the LBS plan.

Although this will be in line with the overall stakeholder engagement activities of LALRP /ESIA, it will describe how to position LBS actions and address a larger audience (3 VDCs and beyond).

The engagement strategy as a part of the detailed plan will include the following:

- Aim, objectives of LBS;
- Coverage, potential beneficiaries, thematic areas of intervention, entitlements;
- Engagement mechanism,
- Phased approach, timelines and outcomes;
- Disclosure mechanism;
- Grievance management (as per EIA/ESIA/LALRP); &
- Feedback, documentation, communication, multi-media.

3.6.2.5. Monitoring and Review Mechanism

The LBSP will serve as a macro plan that will be constantly reviewed and updated on annual basis, throughout the project lifecycle. Micro plans will be developed, that will comply with the major principles identified, and are ready for implementation during the project activities.

As part of the detailed plan, a monitoring and review mechanism will be put in place, which will include the following:

- Provision for internal and external monitoring
- Frequency of monitoring and review
- The KPIs for internal and external monitoring
- Process of reviewing and updating the LBSP based on the findings of the monitoring reports
- Responsibilities of NWEDC, GoN, implementation partners and any third party involvement for monitoring purposes
- Overlaps and integration with project and other reporting timelines (LALRP etc.); and
- Systems and institutional linkages for feedback and mid-course correction

3.6.2.6. Budget

NWEDC will ensure that adequate budget is allotted for the implementation of the LBSP.

As part of the detailed plan, this section will provide an itemized budget for each step in the implementation of the LBSP

3.6.2.7. Reporting and Documentation Requirements

As per the agreement, NWEDC shall submit reports, every six months up to Commercial Operation Date and every 12 months thereafter, to GON describing in detail the activities undertaken under the Plan, the amounts spent on such activities and impact evaluation of such activities.

The activities undertaken, observations made and mitigation measures implemented, if any, will be reported to the Government of Nepal on an annual basis by the Project team.

As part of the detailed plan, a reporting mechanism will be put in place, in consultation with the GoN, which will provide an understanding of the following:

1. Requirement for internal and external reporting
2. The frequency of reporting
3. Chain of reporting
4. The format- report, presentation, verbal discussion etc.

3.6.3. Employment and Skill Training Plan (ESTP)

This section puts in place the employment and skill training plan (ESTP) for the project. The ESTP shall comprise of following key components, namely:

- Employment opportunities in the project, directly by NWEDC as well as through the contractors and sub-contractors;
- Trainings for skill development of the local labourers, who are employed in the project; and
- Trainings for livelihood development for those who presently do not have the skills required for employment in the project or other hydropower projects in the area.

As per PDA, (Section 11.9) - Use of Nepali resources; training and development:

The Company shall, and shall procure that its Contractors and Representative shall, in connection with the conduct of the Project:

11.9.1 *maximize the use of Nepali resources and give first consideration and full and fair opportunity to technically and commercially qualified Nepalese citizens and firms provided that in each case, the use of such Nepali resources meet the quality, quantity and availability requirements of the Company and provided further that use of such resources does not have a material and adverse impact on the costs and the timelines for the Project;*

11.9.3 *comply with the Laws of Nepal including the Labour Act, 2048 and Labour Regulation, 2050;*

11.9.4 *ensure that its Nepal Employment and Skills Training Plan provides for appropriate training of suitable citizens of Nepal for Project-related opportunities;*

11.9.5 *conduct employee training programmes from time to time, including training in each of the skills used in the Project, including management training;*

11.9.6 *comply with the Nepal Employment and Skills Training Plan, Nepal Industrial Benefits Plan and Local Benefit Sharing Plan and ensure that appropriate programmes are designed to assist suitable Nepali citizens, entities, and firms to meet the Project's requirements for goods and services;*

11.9. 7 *shall (to the extent applicable) submit reports*

- *every six (6) months to GON for the first three (3) years of the Construction Period and*
- *every twelve (12) months thereafter, describing in detail*
  (A) its employee training programmes,
  (B) the implementation of such training programmes,
  (C) the progress made towards meeting the objectives set forth in· this Section 11 .9 (Use of Nepali resources; training and development) the Nepal Employment and Skills Training Plan, Nepal Industrial Benefits Plan and Local Benefit Sharing Plan.

Schedule 12 of the PDA, also mentions the following:

Schedule 12

- *Identify expected labour force (Nepali and Non-Nepali) requirements over the Project life cycle by Year and by skill, both directly by the Company and by each of its expected major Contractors.*
- *identify the expected opportunities for employment and skill development at local levels;*
- *set out the Company's and the major Contractors' planned measures to recruit and train workers over time;*
- *contribute to the development of employable skills and human resources*

The employment and skills training plan will not restrict itself only to the hydro power related training, but will also comprehensively look into vocational training opportunities to provide impetus to the improvement of living standards of locals e.g.

- *The area- specific farm (agriculture, animal husbandry;*
- *small orchards and other farm based allied activities) and non-farm linked training;*
- *productivity improvement (knowledge transfer) and*
- *Self-employment program.*

As far as practicable, the Company shall attempt to transfer the skills of skilled and semi-skilled foreign personnel to Nepalese counterparts during the course of Project implementation.

3.6.3.1. Objective of the Plan

The ESTP has been formulated in keeping with the requirements of the PDA signed on 29th December 2016. The plan has been developed by NWEDC and Government of Nepal (GoN) & GoN nominated agencies. The main objective of the plan is:

- To create opportunities for employment, training and skills enhancement in project related activities, or vocational trainings and other trainings.
- Encourage training and employment of local people in Project related activities, which employment will be commensurate with educational qualifications, relevant skills and experience;
- Hydro development will act as a stimulus to bring long term sustainable benefits to Nepal and its people, and that one of the key benefits is improved skill development and employment of the Hydro Property affected people;

- It is expected that the majority of job requirements can be met by Nepalese, and that the project cycle for hydro projects will enable training to be proceeded sufficiently in advance to enhance employment opportunities for the locals; and
- Comply with the Laws of Nepal including the Labour Act, 2048 and Labour Regulation, 2050.

The objectives of the Plan will be discussed with GoN and any changes in the objectives will be made accordingly.

The detailed plan will be developed, in consultation with the GoN, keeping in context the following:

- Literacy and skill profile of the area;
- The skill training programs being implemented in the area by the NGO/INGO and other agencies;
- Skill requirement for the Project during construction and operations stage;
- Potential employment opportunities- existing and during project construction;
- The One Belt One Road (OBOR)/ Belt and Road Initiative (BRI) and other future developments in the area.

3.6.3.2. Context of Livelihood and Associated Skill Set in Project Area

Preparation of the ESTP will need to be situated in the context of the existing socio economic condition, earthquake induced impacts and the current livelihood practices in the Project area. A summary of the existing livelihood and associated skill profile of the PAFs which could to a great extent reflect the profile of the district (especially the ones affected by the earthquake).

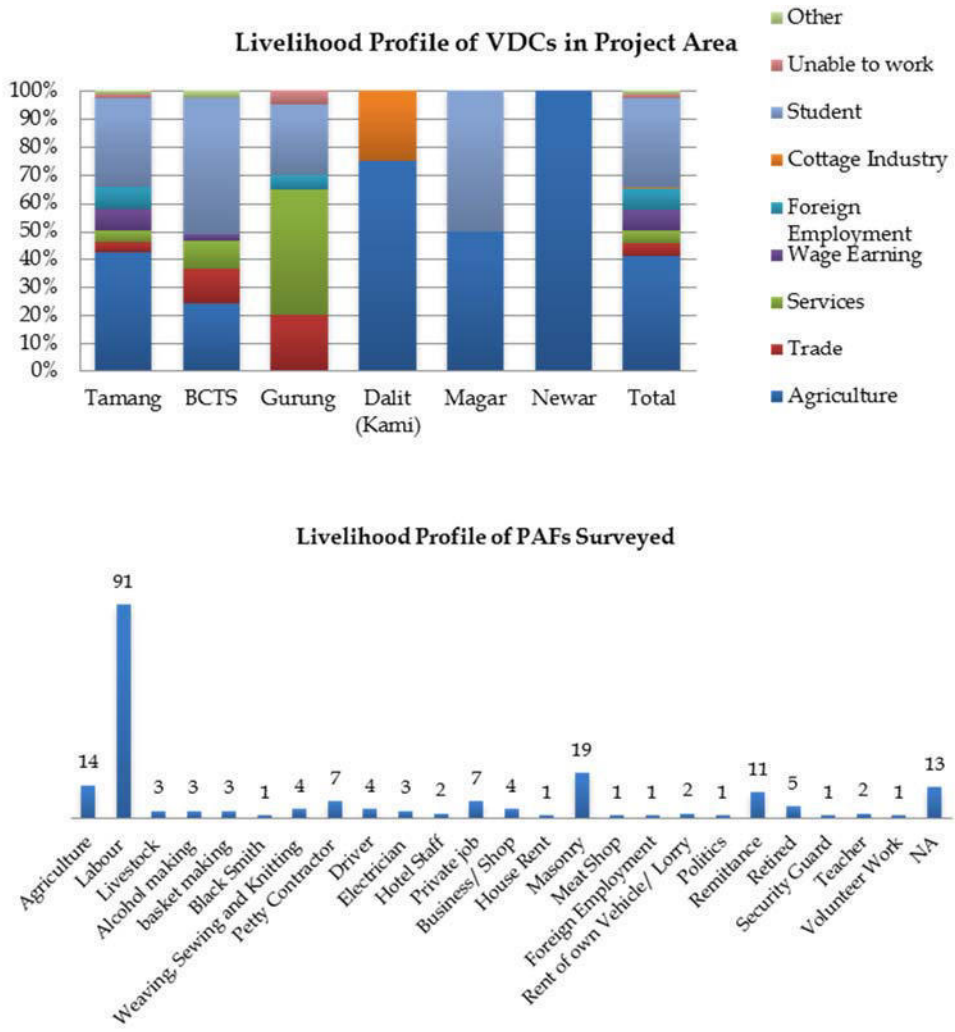
Existing Livelihood Profile and Associates Skill Set of PAFs

Subsistence agriculture has been the mainstay of the economy in the Project area. As can be seen from Figure 3.6.3-1, a significant portion of the population (41.3%) within the economically active age group in the project area reported agriculture as the key source of livelihood. Apart from agriculture, the other sources of income identified are as follows:

- Wage labour (7.3%);
- Foreign employment (7.5%);
- Business (4.9%); and
- Service (4.76%).

As can be seen from the Figure 3.6.3-1, within the project area, the social groups such as Kami, Magar and Newar are reported to have the highest dependence on agriculture. On the other hand, wage earnings and foreign employment is primarily undertaken by the Indigenous groups of Tamang and Gurung. From the discussions with the local community, it is understood that post-earthquake, the dependence on agriculture has reduced, due to loss of access to and damage to

agricultural land; this will however slowly build up once people start going back to their villages and repair their land parcels, some of which are affected beyond any repair, while in other cases they can be worked upon. However, post-earthquake, there has been an increase in the dependence upon wage labour in construction sites and stone breaking.



Source: UT-1 Supplemental ESIA Appendix A, 2014 and LALRP HH Survey 2017 based on the responses given

Figure 3.6.3-1: Livelihood Profile of the Project Area and PAFs

Amongst the PAFs surveyed for the LALRP, the primary source of livelihood is reported to be labour (45% of PAFs) and Masonry (9% of PAFs). This is followed by Agriculture (7% of PAFs) and remittance (5% of PAFs). The remaining sources of income represent less than 5% of the total PAFs. This is a significant shift in the livelihood profile, in comparison to the pre-earthquake scenario, where approximately 50% of the population reported a dependence upon agriculture as a source of income. The decrease can also be seen in terms of complete dependency on agriculture; in most cases, people have been forced to look out for other options.

Post-earthquake, the situation is still uncertain; while the first year after 2015 earthquake, NGOs came out with some sort of support mechanism, this has gradually reduced with help directed on housing, skill building, education, water supply and sanitation. According to the discussions with the PAFs during the LALRP formulation, in the post-earthquake scenario, the livelihood profile of the community is characterised by a larger variation and uncertainty associated with income sources. The survey conducted in April 2017 provides evidence of the livelihood shift in the community. Of the 129 PAFs, 74 reported to having difficulty in finding sources of livelihood. The people were forced to look for livelihood options after the NGO support started diminishing around a year.

The trainings conducted by NGOs provided some skills and cash based support, but the utilisation of trainings after withdrawal of NGO intervention did not take place. Only some people could translate the trainings provided in having gainful employment/ engagement, which is largely in case of occupations like Masonry. Since the period between January 2016 and April 2017 witnessed a lot of activity on reconstruction and rehabilitation front, thus there was a huge requirement of masons, which was fulfilled by these trained people. However, most of the PAFs involved in labour work, reported to be gainfully engaged for approx. 8-15 days in a month. This has also resulted in the PAFs diversifying their livelihood sources, with income from labour work, being supplemented by livestock/ poultry farming, agriculture, weaving, basket making and sale of homemade alcohol.

Furthermore, 28% of the PAFs surveyed during the LALRP, expressed the desire to return to the original settlements. Also, most of the remaining 72% PAFs, reside in IDP camps, on rented private land or government land. Thus, this livelihood profile and the present trends, is largely dependent upon the present residence of the population and are likely to change once again, if the population goes back to the original village or changes location of residence.

Also, while in the pre-earthquake scenario, most women were engaged in agricultural or livestock farming activities, presently a larger number of women are reported to be engaged in income generating activities, primarily stone breaking. This is understood to be resultant from the fact the loss of agricultural land and livestock holding. Women trained on tailoring, weaving and mat making could not continue with the same after withdrawal of NGO support. The people were trained with basic skills of tailoring and handicrafts, which equipped them enough to manage household needs. However, these trainings could not result in income generating activities because of the following reasons:

- Lack of advanced or specialist skills and the general interest in taking things forward without support;
- There was lack of finishing in the goods produced which restricted them being able to adequately sell in the market; and
- Lack of market linkage provided as part of the training.

Another shift in the post-earthquake scenario has been the increased burden on the younger population. This has resulted from the older generations (50 years and above) losing access to agricultural land and livestock holding and to not having any other skill training or physical

fitness to undertake wage labour. While in the pre-earthquake scenario, the elderly population could sustain themselves, by sustenance agriculture or taking care of the family's livestock holding, they are now forced to depend upon the younger generation for support. There are thus situations where the elders of the family are living in a separate household, in the IDP camp or original village, but are dependent completely upon their sons for maintenance and support in terms of provisions, food and medical care.

The following sub sections provide an understanding of the key sources of livelihood amongst the PAFs, namely wage labour, agricultural production, livestock holdings and foreign employment.

Wage-Based Labour

As discussed previously, 7.3% of the population in the project area reported dependence on wage labour as a source of livelihood in the pre-earthquake scenario. However, there is a profound shift in the livelihood profile of the PAFs, from agriculture to wage based livelihoods. 54% of the PAFs reported undertaking wage labour and masonry as the source of livelihood during the LALRP updation survey. This wage labour is primarily daily wage labour and is comprised of both semi-skilled (masonry, plumbing, bag weaving etc.) and unskilled work (stone breaking, labour in shops). The people were trained on construction of houses (both mud and stone) by the NGOs under the "Food for Work" programme.

Stone Breaking

A large number of members from the PAFs have reported to be engaged in stone breaking activities, as a primary or secondary source of income. A large number of unskilled women and aged people (above 50 years) are involved in stone breaking activities, earning an amount ranging from 250-500 NPR per day, being paid on a piece per rate basis. This activity is one of the most prominent sources of income because of its proximity to the IDP camps, especially near Farm Camp and Pradhikaran camp in Dhunche.

Agriculture

In the pre-earthquake scenario, agriculture was reported to be one of the most important sources of livelihood in the community. The main crops grown in the area include paddy, buck wheat, pulses, oil seeds, maize, potato, corn, millets and vegetables. While crops such as paddy and maize are grown primarily for household consumption, crops such as potato and vegetables are grown both for household consumption and for sale in the market. The households owning irrigated land parcels (Khet) are understood to grow multiple crops (two or more) on their land. On the other hand, those households who own unirrigated land (Bari) primarily understood to grow a single crop, with certain households growing vegetables, pulses and potatoes on small scales. Most of the land parcels are reported to be unirrigated, and depending upon monsoons and rainfall for irrigation.

However, post the earthquake, and the damage to agricultural land, there is a marked shift from agriculture to other sources of livelihood. Another reason, for the shift away from agriculture, is the increased proximity of the PAPs to urban areas and consequently non-farm based livelihoods.

As discussed earlier, only 7% of the 129 PAFs surveyed during the LALRP reported a complete dependence on agriculture as a source of livelihood over the last 2 years. Also, these PAFs are reported to be undertaking agriculture solely for the purpose of self-consumption. The present agricultural practices are comprised of agriculture on rented land in the vicinity of the IDP camps and agriculture in Native villages.

Livestock Rearing

The PAFs were understood to have considerable livestock holdings prior to the earthquake, which serves their needs of dairy products, eggs, meat, etc. Of these, the most common livestock holdings were poultry, followed by goats and cattle.

However, the earthquake resulted in deaths/ loss of livestock of the PAFs, leaving the families with no or lesser number of livestock. Furthermore, while most have tried to rebuild their livestock rearing, 75 PAFs (58% of total) report a reduction in the total number of livestock heads owned, while 4 PAFs (3% of total) reported to have same or increased livestock holdings. This is despite training and support being provided to PAFs by NGOs/ INGOs in poultry farming and boar farming as part of relief work post-earthquake.

Some of the reasons for the PAFs not restoring (OR not able to restore) their livestock holdings are as follows:

- Lack of monetary resources for purchasing and maintaining the livestock;
- Lack of space in IDP camps for keeping the livestock heads especially cattle;
- Lack of grazing land, for goats and cattle/bovine especially in Nuabesi, Bogetitar, Satbesi and Battar; and
- Reluctance by PAFs and community to keep larger number of livestock in IDP camps, due to issues such as bad odour and sanitation.

In the present scenario, the livestock holdings comprise of poultry, goats, cattle/bovine, and boars/ pigs. Of the PAFs surveyed, only 2 PAFs reported owning boars. While one household reported owning one boar, the other household reported to owning a pair.

Small Enterprises

It has been understood from the consultations with PAFs from Haku Besi and PhoolBari that a lot have families were having small grocery shops, restaurants, tea shops, etc. in their original villages prior to earthquake.

Some people had also bought land in and around Dhunche and had set up small shops in the newly purchased land or land rented land being used for residence. These shops are reported to have comprised of meat shops, tea shops, grocery shops, etc. In this case, the prior experience of managing an enterprise and savings helped restart business enterprises in the new setting. It has also been observed and understood through consultations that new enterprises are also being set up in Nuabesi and Khalde camp areas, but the people venturing in this area for the first time

require some handholding support in terms of technical knowledge of managing an enterprise in order to run their venture profitably.

Migration to other Countries

It was understood during the survey and the consultations undertaken in May, 2017, that a lot of young population of the community is increasingly getting interested in foreign employment. Consultations suggested that migration to other countries was existent earlier as well, but the number of people opting for and investing in this option is definitely on the rise with more people thinking around these options. Apart from this, many households also reported having family members, who had gone for wage labour to foreign countries for a few years, and had saved money and subsequently returned back to Nepal. The most common country for migration presently is China (kerung and China-Nepal border) for short term, whereas Malaysia and middle-east countries are considered for long term opportunity (3 years). The most common nature of activity for migrant workers is as masons or labourers.

The primary objective of foreign employment is reported to be the savings from the salaries that can be brought to Nepal and put to productive uses like buying land, construction of house, buying assets like trucks, etc.

Trainings Provided by NGOs/Government in Project Area/Rasuwa District

The influx of NGOs began right after the earthquake and the number was at its peak during that period. There have been developmental efforts in areas of provision of supplies, reconstruction, trainings, etc. during the period between May 2015 and May 2016 in the IDP camps; involving the local community in the project area.

The number of NGOs active in Rasuwa district during the first year was reportedly 200 (some of them directly on the ground while others through the local NGO partners) and it reduced to nearly 20-25 in the first quarter of the second year (2017), which also kept decreasing gradually.

The current activities in Rasuwa District are reported to the National Reconstruction Authority (NRA) in quarterly coordination meetings. During the consultations with NRA Project implementation Officer (PIO) in March, 2017, it was mentioned that currently, nearly 18 NGOs and INGOs involved in various interventions which revolve around livelihood, capacity building, house reconstruction, WASH, child care, education etc.

Some of the key NGOs and their area of interest are discussed subsequently. Most of the INGOs and national level prominent NGOs (like Parivartan Nepal), Bilateral and Multilateral agencies are operating in the Rasuwa district through selected local NGO partners who had a long standing presence and resources in the area.

Table 3.6.3-1: Key NGOs in Rasuwa According to Area of Interest

NGO/INGO	Area of Interest
Build Change;	Housing Reconstruction
Lumanti; (with Parivartan Nepal)	Housing Reconstruction and livelihood restoration
Nepal Red Cross;	Housing Reconstruction
Batas Foundation;	Housing Reconstruction
Manekor.	Housing Reconstruction and livelihood restoration
Laccos	Livelihood Restoration

The key NGOs presently active in the IDP camps of Nuabesi and Batar include Manekor, LACCOS and Lumanti. Lumanti has also been undertaking livelihood restoration trainings in the IDP camps, in collaboration with Parivartan Nepal. Consultations with the NGOs suggested that most of these interventions related to livelihood support and training will be over in the period from June to October, 2017 and there is lack of clarity on further fund availability for these kinds of interventions.

In Dhunche area, where the PAFs of Haku Besi and Phool Bari are residing, not much intervention has been undertaken by above mentioned NGOs. The limited number of trainings provided to PAFs has been through Cottage and Small Industries Board.

Mode of Operation of NGOs and Training Provided in IDP Camps

Based on the consultations undertaken with the NGOs such as Manekor, Lumanti and LaCCos, it is understood that the NGOs have identified target areas as women's group, men's group and youth group. The specific skill training for each of the groups was identified keeping in mind the expectations, capacity and practical feasibility of each activity identified for each group.

Consultations undertaken with NGOs and later corroborated with people in the IDP camps suggested that following types of training were provided as enlisted in Table 3.6.3-2.

Table 3.6.3-2: Livelihood Support by Main NGOs in Rasuwa District

Target Group	Manekor	LaCCos	Parivartan Nepal
Men Focused	• Tourism Capacity Building • Sherpa Training • Plumbing training • Electrician Training • First aid Veterinary training	• Training for Tomato farming • Driver training • Electrician training • Mobile repair training • Mechanic training	• Plumbing training • Electrician Training
Women Focused	• Machines for Spice grinders • Tailoring training • Sewing Machines		• Daka making training

Target Group	Manekor	LaCCos	Parivartan Nepal
Men and Women Focused	• Bakery and Cooking Training • Infrastructure support • Water Sanitation and Hygiene training • Seed capital for enterprises • Farming equipment • Ground apple cultivation • Coffee machines for tourist lodges • Boar Farming	• Livelihood Promotion Programme • Local Governance Community Development Programme • Sustainable Action for Food Security and Resilience Programme	• Poultry farming training • Vegetable farming training • Boar farming training • Seed capital for poultry and boar farming • Soap making training
Other support	• Provision of Accommodation and travel for those attending training • Drinking Water provision for impacted villages • Establishment of user committees • Market linkages	• Financial Assistance immediately post-earthquake • Irrigation and water systems • Construction of training centre • Market place for vegetables and other produce • Water Supply to local schools	• Reconstruction Assistance to NRA
Funding Support	• UNDP • DfID • LWF • Save the Children	• USAID	NA

Source: Limited consultations with NGO

The NGOs have undertaken the livelihood trainings in order to train the people in their areas of operation in Rasuwa district on certain skills on basic level, such that it could prove as an entry point of livelihood activities for people, who needed initial thrust to move out of the stalemate developed due to earthquake. The Table 3.6.3-3 provides an understanding of the manner in which Parivartan Nepal provided various trainings for people residing in Nuabesi camp.

Table 3.6.3-3: Details of Training (Earthquake-Affected Families Residing in Naubise Camp)

Training	Number of People per Batch	Duration per batch	Support Provided to beneficiaries through Parivartan Nepal
Poultry Farming	No batch size limitation	7 days	• Accommodation • Meals • Travel Allowance based on the following: – 1 hour of walking: NPR 100 – Bus travel: ticket refund
Vegetable Farming	No batch size limitation	7 days	
Driving	~20	21 days	
Plumbing	~20-25	390 hours/ 65 days	
Masonry	~25	7 days	
Electrician	~20	390 hours/ 65 days	
Daka Making	~20-25	390 hours/ 65 days	

Note: Consultations with PAFs in Nuabesi IDP camp

The NGOs have been very active in areas near Nuabesi, Bogetitar, Satbise and Battar, where one or more people from each PAF have been reported to have attended one or more skill trainings. However, the scenario in Dhunche is remarkably different where skill trainings have not been received by a considerable number of PAFs.

Effectiveness of Training Programmes

The discussions with the local community on the trainings have helped in understanding their takeaways from the training and the challenges in fully utilising the learning which are enlisted below:

- A lot of households in the IDP camps (except Battar and Satbise) have received one or more livelihood trainings;
- The number and range of trainings by NGOs was larger in Nuabesi and Bogetitar areas, as compared to Dhunche;
- Most of the training is on basic skills, which were scaled up and utilised for their benefits by certain people and could not prove helpful for many others; In certain cases the training was useful for the people who had existing skills in that particular area such as masonry;
- Some of the people trained on masonry skills have reported to be trained on construction earthquake resistant houses, which they think is an essential skill in Nepal;
- The people who got trained as carpenters reported that the training has been essential for building a new skill, but the demand of this skill is not in profusion and hence earnings are irregular.
- People having received masonry, plumbing, and electrician trainings have been able to gain some employment in the nearby areas and to a very limited extent in urban centres; however there is not much opportunity in the District itself. Masonry demand was there as a lot of reconstruction work was being undertaken; and
- Women of some families have engaged in small collective vegetable gardens to meet their daily family requirements. The seeds are provided the NGOs and the entire operation is also presently regulated by NGO representatives. However, the independent functionality and success of these groups will be understood, after the NGO support will be withdrawn.

Key Learnings from Training Outcomes Provided by NGOs Post-Earthquake (2015)

It has been understood from the consultations and focus group discussions that not everyone has been able to utilise their trainings in livelihood / income generating opportunities. The reasons for this varied across the trainings, depending upon the skill set in question.

It has been understood from the consultations and focus group discussions that not everyone has been able to utilise their trainings in livelihood / income generating opportunities. The reasons for this varied across the trainings, depending upon the skill set in question. The understanding of some of the general reasons identified for the trainings being unsuccessful is as follows:

- Apparent lack of willingness of individuals to pursue regular employment;

- There are certain people who attended training just for the sake of being engaged and to earn money being paid to attend trainings;
- A large part of the community people don't want females to go out and work in case of less wages;
- People have limited understanding and awareness on scope and possibilities of employment and need elongated period of hand holding;
- People tried initially, though stopped once they did not get desired outcome in terms of financial gains.
- In some PAFs, the people are engaged in foreign employment, which fetches comfortable money which is required for sustenance. The family members of such families are less interested in making an effort even after receiving trainings.

The following table provides an understanding of some of the reasons identified for the specific trainings being unsuccessful or not yielding intended results.

Table 3.6.3-4: Reasons for Skill Training not being Successful

S. No	Type of Training	Reasons for not being successful
1.	Poultry	While some of the PAFs could gainfully utilise their poultry training after withdrawal of NGO support, a large number of people trained on skills to manage poultry could not take it forward successfully because of the following: • Limited space for poultry farm near camps; • Lack of proper understanding of potential diseases and requirement for vaccinations • Availability of resources such as electricity and water supply, which are critical for the proper growth of the chicks;
2.	Tailoring and Handicrafts	The people were trained with basic skills of tailoring and handicrafts, which equipped them enough to manage household needs. However, the reasons it did not result in income generating activities are: • Lack of advanced or specialist skills and the general interest in taking things forward without support; • There was lack of finishing in the goods produced which restricted them being able to adequately sell in the market. • Lack of market linkage provided as part of the training;
3.	Masonry	There is saturation of skills in market. With majority people trained on masonry skills the supply has outgrown demand in the area;
4.	General Issues	• Apparent lack of willingness of individuals to pursue regular employment; • There are certain people who attended training just for the sake of being engaged and to earn money being paid to attend trainings; • A large part of the community people don't want females to go out and work in case of less wages; • People have limited understanding and awareness on scope and possibilities of employment and need elongated period of hand holding; • In some PAFs, the people are engaged in foreign employment, which fetches comfortable money which is required for sustenance.

Key Learnings from NBGOs Working with Groups

The initial assessments undertaken by the NGOs on each target group helped them in identification of behavioural patterns and expectations of each group (enlisted in Table 3.6.3-5.).

Table 3.6.3-5: Characteristics and Expectation of Target Groups

Target Groups	Characteristics
Women's Groups	• The members of which engage in different activities like handicraft, hotels, business enterprise, poultry, etc.; hence there is not much competition; • Expects clear communication and transparency in terms of support provided, timelines of various activities; • Want clarity in the group selection criteria; • Good field agent is critical for successful intervention with this group.
Men's Group (25-40 years)	• They are the main breadwinners of the family and hence tend to turn self-centred when opportunity comes, especially in the given scenario, where the source of income are less; • A considerable proportion of this group is illiterate and hence less aware; • The educated and financially comfortable individuals take responsibility for the group at large and emerge as opinion leaders and decision makers for the group; • This group has an inclination towards working as construction labourers /masons as it is considered as a masculine activity; • The illiterate members of this group are apprehensive of working/ attending trainings in groups, especially with literate folks.
Youth Group (17-25 years)	• Energetic and quick learners; • Clear decision making and thought process; • Involvement in the development and welfare of the community; • Open to working in groups • Interested in conducting adult literacy classes for the community

Note: NWEDC will use this information for preparation of the EST to meet the requirements under PDA.

3.6.3.3. Planning for Employment and Skill Training

Expected Labour Force Requirements over the Project Live Cycle

The following table presents a mapping of the labour/workforce requirement for the project. This shall include Nepali and Non- Nepali workforce requirements for NWEDC as well as its Major Contractors.

Table 3.6.3-6: Labour Requirements

Sr. No.	Category of Manpower	Minimum Educational Qualifications	Technical Skills / Competence Certificate Desired (if any, please specify)	No. of Years of Experience Desired (if any, please specify)	Nos. Required in 2017				Nos. Required in 2018				Nos. Required in 2019				Nos. Required in 2020				Nos. Required in 2021				Nos. Required in 2022			
					1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q
Skilled																												
1.	Driller																											
2.	Blaster																											
3.	Welder																											
4.	Heavy Eq. Operator																											
5.	Plant Operator																											
6.	Foreman																											
7.	Fitter																											
8.	Plumber																											
9.	Carpenter																											
10.	Electrician																											
11.	Technician																											
12.	Supervisor																											
13.	Mason																											
14.	Security Head																											
15.	Others (Please Specify in separate rows)																											
Semi-Skilled																												
16.	Account Helper																											
17.	Stores Helper																											
18.	HR & Admin Helper																											
19.	Cook																											
20.	Asst. Welder																											
21.	Asst. Foreman																											
22.	Wiremen																											
23.	Others (Please Specify in separate rows)																											
Unskilled																												
24.	Office Attendant																											
25.	Survey Helper																											
26.	Quality Helper																											
27.	HSE Helper																											
28.	E&M Helper																											
29.	Geologist Helper																											
30.	Cook Helper																											
31.	Service Boy																											

Sr. No.	Category of Manpower	Minimum Educational Qualifications	Technical Skills / Competence Certificate Desired (if any, please specify)	No. of Years of Experience Desired (if any, please specify)	Nos. Required in 2017				Nos. Required in 2018				Nos. Required in 2019				Nos. Required in 2020				Nos. Required in 2021				Nos. Required in 2022			
					1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q
32.	Cleaning Boy																											
33.	Pantry Helper																											
34.	Helper/Labour																											
35.	Security Guard																											
36.	Others (Please Specify in separate rows)																											

Note:

- Such a mapping exercise shall be undertaken based on discussions with its project team, contractors and sub-contractors to obtain an overview of the required laborers in terms of skill level.
- This will be done for each phase of the Project, and opportunities to include local labor will be identified.

Expected Opportunities for Employment and Skill Development

On the basis of the workforce requirement, NWEDC will identify the expected opportunities for employment and skill development at local levels.

Existing Expectations

One of the main expectations of the local community is that they receive opportunities for livelihoods and income generation from the project;

- This may be in the form of direct or contractual employment.
- Most of the community reported to looking for employment as security guards and housekeeping staff in the project.
- One of the key expectations is do with the driving training which is locally considered to be a better opportunity for employment in the long run; this can be supported with mechanic training as one of the other options.
- In terms of skill development the community's expectations primarily pertain to enhancement of the existing skill level, and allowing a larger proportion of the community to develop skills that are useful for income generation.

NWEDC shall further strengthen the understanding of local community's expectations during the skill mapping exercise.

Existing Skill Mapping

Thus as can be seen from the above discussion, there is an existing skill set in the local community which may be of use for the project. In summary, the following aspects should be kept in mind of the existing skill set in the community:

Table 3.6.3-7: Skill set Overview Pre & Post Earthquake (April 2015)

Timeline	Skillset
Skill set in pre-earthquake scenario:	• In the pre-earthquake scenario, the local community was primarily dependent upon agriculture and livestock farming for livelihood purposes; • The education and literacy levels in the local community were generally low due to a lack of access to infrastructure; • There were a few of the youth in the local community who were engaged in foreign employment, but these were limited to only a few households; • Business, small enterprise, wage labour was limited to a selected segment in the affected villages.

Timeline	Skillset
Skill set in post-earthquake scenario	• A number of NGOs/INGOs entered in the area in the post-earthquake for providing relief support to the local community • As a result of the trainings provided, the overall skill level in the community improved • However, most of the skill level in the community is still basic and preliminary. This is primarily because the trainings provided by NGOs were basic for a short duration and primarily aimed at allowing the community to stabilize their living conditions post-earthquake and cater to the needs in the local area • The overall literacy level is also understood to be improving as the community has increased access to schools and improved infrastructure • The number of young members of the community seeking foreign employment has also increased

Consultations indicate that in general, the young population usually don't continue education after SSC level; no one reported university level in the recent survey for LALRP. The priority for the people is to get such skillet which will allow them to find jobs in Nepal and other countries. Certain skills are more in demand in these countries; for Women- housekeeping, packing etc. while for men it is driving, mechanic, electrical etc.

Note: While doing so NWEDC will look at the existing expectations as well as the existing skill levels in the community. This information can be used to assess the workforce requirements that can be met from the local community and district:

- Without any additional training;
- With some additional training.

This will also take into consideration additional employment generation or business opportunity that will be required to support the Project.

Once the skill training requirement for employing the locals is identified, NWEDC will need to identify the agencies (NGOs/ Government agencies/ Technical agencies/ Universities/ Training institutes etc.) which can help in providing training to the locals.

This will be done based on the following (but should not be limited to):

- Review of the information available with the government, in terms of the following:
  - Number of registered agencies, per resource requirement
  - Details of training and certification programmes available with the government
  - Details of training programs by NGOs/INGOs/Universities and other agencies (if available)
- Consultations with stakeholders, including:
  - Government departments
  - NGOs/Agencies working in the field of entrepreneurship development
  - Representative of contractors/ suppliers and vendors, large; medium and small scale

As part of this process, a mapping will also be done of the existing initiatives for skill enhancement by other stakeholders, such as government agencies and other projects in the district. The Company will then be in a position to assess the skills background of the locals and finalise the trainings required, number of labours to be employed and budget needed.

Other Expected Opportunities in the Area for Employment and Skill Development

The Rasuwa district is expected to have a lot of opportunities for employment and entrepreneurship ventures in the coming years. This is primarily attributed to the development of other hydropower projects being developed in the district as well as the One Border One Road initiative.

Note: As part of this Section, NWEDC will undertake a broad level mapping of the potential employment and skill development opportunities outside the project in the area.

- This may be done through consultations with the government departments and other projects being set up.
- This mapping will in turn allow for the project to identify other opportunities for employment of local community.
- This will also allow for specific skill sets to be identified which may be in demand in the near future for training purposes.

NGOs with previous experience of working with communities on livelihood restoration in the district and elsewhere in Nepal will serve a good resource to identify opportunities outside Project area.

NWEDC and Major Contractors: Measures to Recruit and Train Workers

In keeping with the requirement of manpower thus identified, a detailed plan shall be formulated for each year/phase of the project, to allow maximum locals to be engaged.

The company will develop a plan to be followed for recruitment of the locals during the development of the project. The plan will be at two levels, the macro level (for the entire project lifecycle) and the micro level (an annual plan). The various recruitment methods which will be considered include:

- Direct recruitment of locals;
- Recruitment through local agencies;
- Recruitment with NGOs and other welfare groups.

The process will include the following steps:

- Development of a selection criteria;
- Short-listing of agency/NGO for recruitment;
- Method of approaching the local community;
- Contract terms and conditions, if any;

As far as practicable, the Company shall attempt to transfer the skills of skilled and semi-skilled foreign personnel to Nepalese counterparts during the course of Project implementation. However, the transfer of skill set would depend on the existing skill levels.

Development of Employable Skills and Human Resources

Vocational and Livelihood Training to Locals

The Company will also look into the feasibility of providing livelihood training to the locals to improve the economic conditions of the area. These may include the following types of training or support:

- Vocational training to the locals;
- Assistance to farmers;
- Forest conservation activities;
- Training to women in the area;
- Provision of apprenticeship programs; and
- Improvement of education facilities in the area.

Each of these trainings will be accompanied with a market linkage training, to allow for maximum benefit to be accrued from the training.

The provision of such livelihood trainings will focus on possible training opportunity in:

- The area- specific farm (agriculture, animal husbandry);
- Small orchards and other farm based allied activities) and non-farm linked training;
- Productivity improvement (knowledge transfer); and
- self-employment program

Women consultations suggest that women are interested in such activities and have experience. Consultations with local NGOs like Manekar suggest that in past similar experiments have not succeeded such as agarbatti (incense sticks) making as cost of production was too high and not competitive. Some areas are quite remote and market access is a problem. In another case of improved potato farming intervention, over production and lack of access to market and storage facilities resulted in farmers not making enough profit which further dampened the spirit of the farmers. The Project access road may change this- and provide market connectivity. Too much training for stuff like Shama weaving may overcrowd the market for women who have already been trained. Therefore, new trainings need to be identified based on these learnings.

Any such interventions will need to identify proper market linkage, and will require specific NGOs/ Institutions with past experience. Self-development activities could be piggery, poultry etc. however learning from the intervention made by NGOs post-earthquake will be important to understand the reason for success/ failure of such interventions. Risk appetite of the people especially after the earthquake should be an important consideration.

The One Border One Road initiative market linkage is likely to expose them to other market opportunities which may exist.

Note: Some of the key aspects which will be kept in mind while preparing the plan are as follows:

- For business and entrepreneurship training, preferably individuals or households with a high risk appetite will be identified;
- While formulating a plan for each training, care will be taken to not saturate the market with a particular skill such as Shama making. For this purpose, multiple trainings should be identified, with the total number of individuals trained in each limited to a number which is agreed with the GoN.
- Some training which will be considered include those pertaining to the tourism sector, such as housekeeping and running restaurants, running inns and home stays, Tamang trails etc.
- While identifying any training, focus/ priority will be given to those trainings which will allow for jobs to be found within the country and then in foreign countries.

Training in Course of Employment

Depending on the project phase and activities, the Company will provide the following types of trainings to the local labourers:

- Induction training;
- General H&S training;
- Vocational training to workers and locals;
- Specific on-the-job training;
- Firefighting and mock drill training; and
- Operation and maintenance training.

The company will appoint staff responsible for the implementation of the trainings to the identified locals. Additionally, training materials, schedule and budget will also be developed for each of the training sessions.

The company and GoN will jointly decide the frequency of the trainings and any other additional requirements.

Training Schedule

Training schedule will be developed by NWEDC which will include details regarding the type of training, batch per training, frequency, and staff to be trained.

3.6.3.4. Implementation

This section will provide an understanding of the overall implementation mechanism for the ESTP thus formulated, in keeping with the specific plans put in place.

Note: NWEDC shall formulate this implementation mechanism based on the specific requirements of the plan, the resources available and the requirements of the GoN.

Organisational Structure

The NWEDC and GON, as per section 11.3.2 (of the project development agreement) jointly prepare the ESTP to be implemented within 12 months from the Agreement Date in accordance with Schedule 12 of the PDA.

The implementation of the ESTP thus formulated shall be undertaken by the ESMC of the project.

NWEDC will put in place a team with clear cut roles and responsibilities for the implementation of the detailed plan. This section (and sub sections) will provide an understanding the team and the manner in which they will be involved in the implementation. Some key things to be kept in mind and questions which will be answered as part of this section are as follows:

- NWEDC's role and
- Role of HR personnel
- Role of CSR personnel
- Possible implementation partner
- GoN's role
- The role of third parties (if any)
- Roles and responsibilities for each stakeholder

Implementing Partners

For the purpose of implementing specific trainings identified, NWEDC shall associate with external third party experts, who have experience in the field and the geographical area. Cottage & Small Industries Training department is one of the key departments which has customised training calendar for different skills. It not only conducts training on its own, but also helps NGOs to conduct training, identify resource person, has dedicated infrastructure for conducting training. There are some specific vocational training institutes in Kathmandu which provide vocational training. NWEDC is already in talks with some of them.

For this purpose, NWEDC will also undertake consultations with the CDO and NRA, for an understanding of the organizations active in the area.

As part of this section, NWEDC will identify NGOs/INGOs and government department/ agencies who shall be involved in the implementation of the plan thus formulated. Some of the key agencies identified include Manekor, Parivartan Nepal, Cottage Industries department, veterinary department, horticulture department etc. Company will build on such networks and allow for opportunities to be created for knowledge transfer.

Interlinkage with other Plans

The ESTP thus formulated are part of a larger social impact management framework for the project and shall be implemented in coordination with the other management plans such as the following (but not limited to):

- LBSP
- Stakeholder Engagement Plan
- Livelihood Restoration Plan
- Grievance Redressal Mechanism
- Labour influx management plan

Note: This section will provide a brief description about the effectiveness of the institution/implementation agency for planning, management, monitoring and delivery of the plan.

This will also include suggestions for workable linkages with other programs/projects (government-run; multi/bi-lateral agency sponsored).

Schedule for Implementation

This section provides an understanding of the schedule of implementation of the plan thus formulated.

NWEDC will put in place a schedule for implementation of the ESTP, in discussion with GoN. This schedule will provide an itemized timeline for each step of the implementation process

3.6.3.5. Engagement Strategy

An essential component of the implementation of the ESTP is the engagement with the local community and other external stakeholders.

This section will provide the Engagement strategy for the ESTP. The strategy will be specifically to explain the key needs and sensitivities viz communities, government stakeholders and the EST plan.

Although this will be in line with the overall stakeholder engagement activities of LALRP /ESIA and other plans formulated, it will describe how to position EST actions and address a larger audience (3 VDCs and beyond). The engagement strategy will include the following:

- Aim, objectives of ESTP;
- Coverage, potential beneficiaries and thematic areas;

- Phased approach, timelines and outcomes;
- Grievance management (as per EIA/ESIA/LALRP); &
- Feedback, documentation, communication, multi-media.

3.6.3.6. Monitoring and Review Mechanism

The Employment and Skills Training Plan will serve as a macro plan that will be constantly reviewed and updated on annual basis, throughout the project lifecycle. Micro plans will be developed, that will comply with the major principles identified, and are ready for implementation during the project activities.

- Schedule with milestones and tracking of delays;
- Responsibilities of NWEDC, GoN, implementation partners and any third party involvement for monitoring purposes;
- Provision for internal and external monitoring;
- Frequency of monitoring and review;
- The KPIs for internal and external monitoring;
- Process of reviewing and updating the ESTP based on the findings of the monitoring reports;
- Overlaps and integration with project and other reporting timelines (LALRP etc.); &
- Systems and institutional linkages for feedback and mid-course correction.

3.6.3.7. Budget

NWEDC will ensure that adequate budget is allotted for the implementation of the ESTP.

This section will provide an itemized budget for each step in the implementation of the ESTP.

3.6.3.8. Reporting and Documentation

As per the agreement, NWEDC shall submit annual reports, GON describing in detail the activities undertaken under the Plan, the amounts spent on such activities and impact evaluation of such activities.

Other documents which will be maintained during the plan implemented will include, but not be limited to, the following:

- Meeting minutes during the supply and demand mapping consultations;
- Training records;
- Records of human resources involved in the project and the number of locals employed;
- The number of locals supported with other employment opportunities and trainings; and
- Any complaints or grievances obtained.

Person in charge for maintaining documents will be appointed by the Project team.

As part of the detailed plan, a reporting mechanism will be put in place, in consultation with the GoN, which will provide an understanding of the following:

- Requirement for internal and external reporting;
- Frequency of reporting;
- Format- report, presentation, verbal discussion etc.

Person in charge for maintaining documents will be appointed by the Project team.

3.6.4. Industrial Benefit Sharing Plan

This section will present the Industrial Benefit Sharing Plan (IBSP) developed for the project. This plan will be focused only on the procurement of materials and goods from the locals and shall not specify requirements for any skills and employment training to be imparted. Requirements of the same are detailed in the Skills and Employment Development Plan.

As per PDA, (Section 11.9)- Use of Nepali resources; training and development:

The Company shall, and shall procure that its Contractors and Representative shall, in connection with the conduct of the Project:

11.9.1	*maximise the use of Nepali resources and give first consideration and full and fair opportunity to technically and commercially qualified Nepalese citizens and firms provided that in each case, the use of such Nepali resources meet the quality, quantity and availability requirements of the Company and provided further that use of such resources does not have a material and adverse impact on the costs and the timelines for the Project;*
11.9.2	*ensure that its Nepal Industrial Benefits Plan provides for an outreach programme under which the Company engages with Nepali suppliers for Project-related opportunities;*
11.9.3	*comply with the Laws of Nepal including the Labour Act, 2048 and Labour Regulation, 2050;*
11.9.5	*conduct employee training programmes from time to time, including training in each of the skills used in the Project, including management training;*
11.9.6	*comply with the Nepal Employment and Skills Training Plan, Nepal Industrial Benefits Plan and Local Benefit Sharing Plan and ensure that appropriate programmes are designed to assist suitable Nepali citizens, entities, and firms to meet the Project's requirements for goods and services;*
11.9. 7	*shall (to the extent applicable) submit reports every six (6) months to GON for the first three (3) years of the Construction Period and every twelve (12) months thereafter, describing in detail (A) its employee training programmes, (B) the implementation of such training programmes, (C) the progress made towards meeting the objectives set forth in· this Section 11.9 (Use of Nepali resources; training and development) the Nepal Employment and Skills Training Plan, Nepal Industrial Benefits Plan and Local Benefit Sharing Plan.*

3.6.4.1. Objective of the IBSP

The IBSP has been formulated in keeping with the requirements of the PDA signed on 29th December 2016. The plan has been developed by NWEDC and GoN & GoN nominated agencies. The plan, to be implemented jointly by GoN and the Company has the following objectives:

- Ensure full and fair opportunity of access for Nepal-based suppliers of goods and services to participate in the development of the Project;
- Help in promoting a vibrant, growing, competitive supplier base within Nepal that over the time shall meet higher value-added requirements for goods and services for the Project;
- Encourage initiatives for joint venture and quality improvement measures that shall enhance the ability of Nepal-based suppliers to compete domestically and internationally; and
- Promote safe and healthy working conditions among suppliers of goods and services to the Company and the Project.

The objectives of the Plan will be discussed with GoN and any changes in the objectives will be made accordingly.

3.6.4.2. Resource Requirements for the Project

Since there are immediate service requirements and early construction, preliminary Nepal Industrial Benefits Plans shall consider the availability of engineering, legal, planning, consulting and construction services, while the detailed design phase shall enable more precision on the specific requirements for goods and services and their timing that would enable Nepal-based suppliers to be accommodated.

NWEDC will undertake a mapping of the requirement of resource through the project lifecycle, in terms of the specific resource required and any quality and size specifications (Itemisation and quantification of goods and services required over the Hydro Property life cycle).

The following table provides an example of the output which will be presented. This will be done for each phase of the Project, and opportunities to include local population will be identified.

This information should be broadly shared with potential suppliers well in advance to enable them to compete on a full and fair basis. This information could be just shared capturing the basic/ broad requirement. Detailed information will be shared at later stages when specifics are available.

Table 3.6.4-1: Resource Requirements

Sr. No.	Category of Resource	Quality Specifications	Nos. Required in 2017				Nos. Required in 2018				Nos. Required in 2019				Nos. Required in 2020				Nos. Required in 2021				Nos. Required in 2022			
			1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q
1.	Water																									
2.	Fossil Fuel																									
3.	Cement																									
4.	Gravel																									
5.	Office Stationery																									
6.	Housekeeping supplies																									
7.	Furniture																									
8.	Computers																									
9.	Printers																									
10.	Four Wheelers																									
11.	Bulbs																									
12.	Tube lights																									
13.	Construction equipment																									
14.	Labour and Manpower																									
15.	Others….																									
16.	Others….																									
17.	Others….																									
18.	Others….																									
19.	Others….																									
20.	Others….																									
21.	Others….																									
22.	Others….																									
23.	Others….																									
24.	Others….																									

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Note: The above table provides certain examples of the resources which will be considered and mapped. NWEDC will undertake a detailed mapping exercise, based on discussions with various departments involved in the construction and post-construction activities. This mapping will be undertaken for various stages of the project including:

- Pre-construction and design;
- Early construction;
- Construction;
- Commissioning, (if any specific resource is required);
- Operations; and
- Decommissioning.

3.6.4.3. Vendor Strategy and Procurement Principles

This section will put in place the key principles and policy points which shall guide the process of industrial benefit sharing for the entire life cycle of the project.

Some of the key principles include the following (but shall not be limited to):

- The procurement process shall ensure full and fair opportunity of access for Nepal-based suppliers of goods and services to participate in the development of the Project;
- The procurement process shall be undertaken in a manner so as to encourage initiatives for joint venture and quality improvement measures that shall enhance the ability of Nepal-based suppliers to compete domestically and internationally; and
- While procuring locally, promote safe and healthy working conditions among suppliers of goods and services to the Company and the Project.

Note: NWEDC shall identify all the principles which shall govern the IBP.

3.6.4.4. Procurement Plan

Based on the principles identified, NWEDC will put in place a procurement plan for the project. The procurement plan will be aimed at allowing for the utilization of the existing resources while also enabling the development of new skills and capacities. The key steps in the procurement plan are discussed below.

Mapping of Nepal-Based Suppliers

While there should be some existing information on the suppliers through some government directory or exchange. This mapping shall include the movable and immovable goods resource requirements. The workforce required for the project shall be covered in the ESTP formulated for the project.

This mapping shall provide an understanding of the following:

- The present organizations which have the existing capacity of serving as contractors and suppliers for the project, in terms of manpower, quality control, availability of raw material, resources to meet the timelines, legal compliances etc.;
- The present organizations which may not have the existing capacity, but can be given trainings and hand holding support to allow them to serve as contractors and suppliers for the project;
- The smaller organizations who can serve as subcontractors to the main contractors for the project.

Registration Process

As part of the procurement plan, NWEDC will formulate a registration process for the project. This registration process may be in the form of hard copy forms to be filled out or an online registration process.

The basic information which would be required for registration purposes, such as (but not limited to):

- Registered Name
- Know Your Customers (KYC) Documents
- Resource/ Material(s) to be supplied
- Certifications and registrations required for the material identified;
- Past experiences;
- Contact Information
- Present capacity;

A vendor or supplier may register for multiple products as well.

Note: In case an online registration process is identified, handholding support may be considered for those who are not adequately trained in computers. Alternatively, the project may consider simultaneously providing an offline registration option for such vendors. The information should be provided through mass mediums like local TV channels, local popular newspapers etc.

Timely Disclosure of Information

Early interaction with Nepal-based suppliers, both existing and potential, is strongly encouraged by GON. All Project phases shall be addressed in procurement plans to afford opportunities for Nepal-based suppliers for goods and services.

NWEDC understands that timely information sharing, enough time to respond and ease of access to communication will be some of the key measures that NWEDC to help enhance local supplier prospects of business success.

NWEDC may consider having an online portal system for early notification for vendor opportunities (it should be matched with newspaper notifications too).

- A critical component of the procurement plan will be the timely disclosure of information pertaining to available opportunities.
- As part of this disclosure, the project will provide information pertaining to the timing, quantity and quality of resource requirements for the project. This would then allow for the vendors to bid for the project.
- The disclosure process to be followed is to be in keeping with the principles identified in the Stakeholder Engagement Plan for the project.

Note: This could be supplemented by NWEDC interaction (in the form of workshop) with key domestic suppliers to help them understand the timing, quantity and quality requirements for goods and services.

Vendor Selection Process

Once the registration process is complete, a short list of qualified vendors will be formulated and maintained in a project database. These vendors and suppliers will then be provided with opportunities for providing services for the project.

Note: As part of this section, NWEDC will identify certain basic parameters for the selection of vendors.

Opportunity will also be provided after giving the disqualified vendors an opportunity to improve with clear feedback on opportunity for improvement.

Vendor Proposal Selection

Based on the information disclosure, the short listed vendors will be identified to submit proposals for each resource requirement. These proposals will then be accessed in terms of the project's quality, cost and EHS requirements.

NWEDC will also take extra efforts for proper structuring of procurement packages at a scale to encourage domestic supplier participation, where possible; this is to ensure that local vendors do not lose out on the opportunity because of the sheer scale of the contract package.

For this purpose, the project may consider develop a marking system with each criterion carrying certain weightage.

- If such a system is developed, the local firms will be given an additional bonus score, to promote local industrial skill development.
- The vendor with the highest score overall will be invited for final negotiations or for providing services.
- The procurement packages formulated will also allow for the local vendors to participate.
- The disqualified vendors at this stage will also be given clear feedback on the gaps or the reason for non-selection to ensure better performance during next bidding process. This

mechanism will be aimed at providing constructive feedback to the vendors and assist in improving their performance.

Capacity Building and Support Activities

It is understood, that initially it is possible that few local vendors and suppliers may qualify, due to lack of present capacity. Efforts will be made to support GON initiatives for domestic supplier development activities to enhance upgrading of capabilities and product and services quality and competitiveness.

- In keeping with this, NWEDC will undertake capacity building activities with local vendors. The primary purpose of this capacity building will be to allow for the improvement of local supplier's prospects of business success.
- Efforts will be made at every stage to ensure that local vendors and supplier's capacity are built up.
- NWEDC will also put in efforts at encouraging joint ventures between local and foreign suppliers to enhance knowhow transfer;

The target group for these capacity building activities shall be:

- Small and medium size vendors, who wish to increase their productivity;
- Vendors who at the outset do not qualify, but wish to improve their performance and capacity;

Some of the key areas of focus for capacity building have been identified below. NWEDC will, in consultation with GoN, finalize and put in place a plan for the same.

- Workshop/ Induction Training;
- Job-specific On-site training;
- Cluster Development;
- HSE Training;
- Joint Ventures;
- Bank Linkages;

3.6.4.5. Implementation

Organisation Structure

The NWEDC and GON, as per section 11.3.2 (of the project development agreement) jointly prepare the IBP to be implemented within 12 months from the Agreement Date in accordance with this Schedule

NWEDC will put in place a team with clear cut roles and responsibilities for the implementation of the detailed plan. This section (and sub sections) will provide an understanding the team and

the manner in which they will be involved in the implementation. Some key things to be kept in mind and questions which will be answered as part of this section are as follows:

1. NWEDC's role
2. GoN's role
3. Industrial Benefits Officer
4. Local communication officer

The roles and responsibilities for each stakeholder will be clearly specified.

Industrial Benefits Officer

As a part of the PDA requirements, NWEDC will appoint an Industrial benefits officer, who shall work with domestic suppliers on opportunities to meet mutual needs.

Interlinkage with other Plans

The benefit sharing plans thus formulated are part of a larger social impact management framework for the project and shall be implemented in coordination with the other management plans such as the following (but not limited to):

- LBSP
- ESTP
- Stakeholder Engagement Plan
- Livelihood Restoration Plan
- Grievance Redressal Mechanism
- Labour influx management plan

Note: This section will provide a brief description about the effectiveness of the institution/implementation agency for planning, management, monitoring and delivery of the plan.

This will also include suggestions for workable linkages with other programs/projects (government-run; multi/bi-lateral agency sponsored).

Schedule for Implementation

This section provides an understanding of the schedule of implementation of the plan thus formulated.

NWEDC will put in place a schedule for implementation of the IBP, in discussion with GoN. This schedule will provide an itemized timeline for each step of the implementation process.

3.6.4.6. Engagement Strategy

An essential component of the implementation of the benefit sharing plan is the engagement with the local community and other external stakeholders.

This section will provide the Engagement strategy for the IBP. The strategy will be specifically to explain the key needs and sensitivities viz local vendors government stakeholders and the IBP.

Although this will be in line with the overall stakeholder engagement activities of LALRP /ESIA and other plans formulated, it will describe how to position IBP actions and address a larger audience (district and beyond). The engagement strategy will include the following:

- Aim, objectives of IBP;
- Coverage, potential beneficiaries and thematic areas;
- Phased approach, timelines and outcomes;
- Grievance management (as per EIA/ESIA/LALRP); &
- Feedback, documentation, communication, multi-media.

3.6.4.7. Monitoring and Review Mechanism

The IBP will serve as a macro plan that will be constantly reviewed and updated on annual basis, throughout the project lifecycle. Micro plans will be developed, that will comply with the major principles identified, and are ready for implementation during the project activities

NWEDC will identify a monitoring mechanism in terms of the following:

- Schedule with milestones and tracking of delays;
- Provision for internal and external monitoring;
- Frequency of monitoring and review;
- The KPIs for internal and external monitoring;
- Process of reviewing and updating the IBSP based on the findings of the monitoring reports;
- Responsibilities of NWEDC, GoN, and any third party involvement for monitoring purposes
- Systems and institutional linkages for feedback and mid-course correction

3.6.4.8. Budget

NWEDC will ensure that adequate budget is allotted for the implementation of the IBP.

This section will provide an itemized budget for each step in the implementation of the IBP.

3.6.4.9. Reporting and Documentation

As per the PDA, NWEDC shall submit annual reports to GON describing in detail the activities undertaken under the Plan, the amounts spent on such activities and impact evaluation of such activities. Some of the key aspects which may be included in the reports shall include (but not be limited to):

- The measures put in place to promote local enterprises;
- The number of local vendors registered with the project;

- The resources procured locally;
- The training and capacity building activities undertaken; and ·
- The way forward

As part of the detailed plan, a reporting mechanism will be put in place, in consultation with the GoN, which will provide an understanding of the following:

1. Requirement for internal and external reporting
2. the frequency of reporting
3. chain of reporting
4. the format- report, presentation, verbal discussion etc.

Other documents which will be maintained during the plan implemented will include, (but not be limited to), the following:

- Meeting minutes during the supply and demand mapping consultations;
- Training records;
- Records of human resources involved in the project and the number of locals vendors engaged in the project;
- Purchase register used;
- The number of locals supported with other capacity building and trainings; and
- Any complaints or grievances obtained.

Person in charge for maintaining documents will be appointed by the Project team.

3.7. CUMULATIVE IMPACTS MANAGEMENT PLAN

3.7.1. Purpose

This Cumulative Impacts Management Plan (CIMP) summarises and updates the mitigation and monitoring measures identified in a Cumulative Impact Assessment (CIA) prepared as part of a Supplemental ESIA for the Project in 2014 (Supplemental ESIA 2014). The purpose of a CIMP is to describe the specific requirements, roles, and responsibilities to appropriately implement the mitigation measures to address and manage identified cumulative impacts. According to the CIA, commonly identified cumulative impacts include the following:

- Changes in land use;
- Reduction of water flow along certain river stretches, including tributaries that serve as refuges for the fish during the winter and during monsoon high flows, and where breeding and growth of young fish take place;
- Increase in sediment loads to the watershed and alteration of the sediment dynamics;
- Loss of agricultural land;

- Impacts on livelihoods dependent on altered ecosystem services;
- Aquatic impacts, in particular fish and specially in conjunction with the downstream UT-3 project;
- Interference with migratory routes and/or terrestrial wildlife movement; and
- Loss of aesthetic and/or recreational values.

3.7.2. Institutional Framework

According to Nepalese Environmental Protection Rules, environmental and social management of the Project is the responsibility of the Proponent. This responsibility will fall under the Proponent's PMO both during the construction and operation phase (see Appendix A, ESMS, for a more detailed description).

Roles and responsibilities to implement the Management Plans are defined as follows. A separate ESMC will be established, reporting to the PMO, to address social, environmental, and safety issues. The ESMC will consist of community liaison officers, Environmental Health and Safety Officer, Social Manager, and one Environmental Manager. The Environmental Manager at corporate leads the ESMC. The Project appointed an Environmental Manager to lead the ESMC and to ensure that mitigation and monitoring actions are duly implemented, monitored, assessed, evaluated and disseminated to Project stakeholders for feedback and improvements.

The ESMC (Figure 3.7-1) is responsible for implementing and monitoring environmental and social provisions not included in the Contractor's contract documents and to liaison with the other governmental and nongovernmental organizations. The ESMC will have full-time social, environmental, and Environmental, Health and Safety professionals on staff to directly lead the supervision and management efforts for the social, environmental, and safety aspects of Project preparation and construction. ESMC staff will be based in Kathmandu and at the Project site. It is recommended that two Community Liaison Officers be located in the field in close proximity to affected communities and the Project site. Environmental Officers will also be required to be located near the Project site to be able to monitor ongoing construction activities.

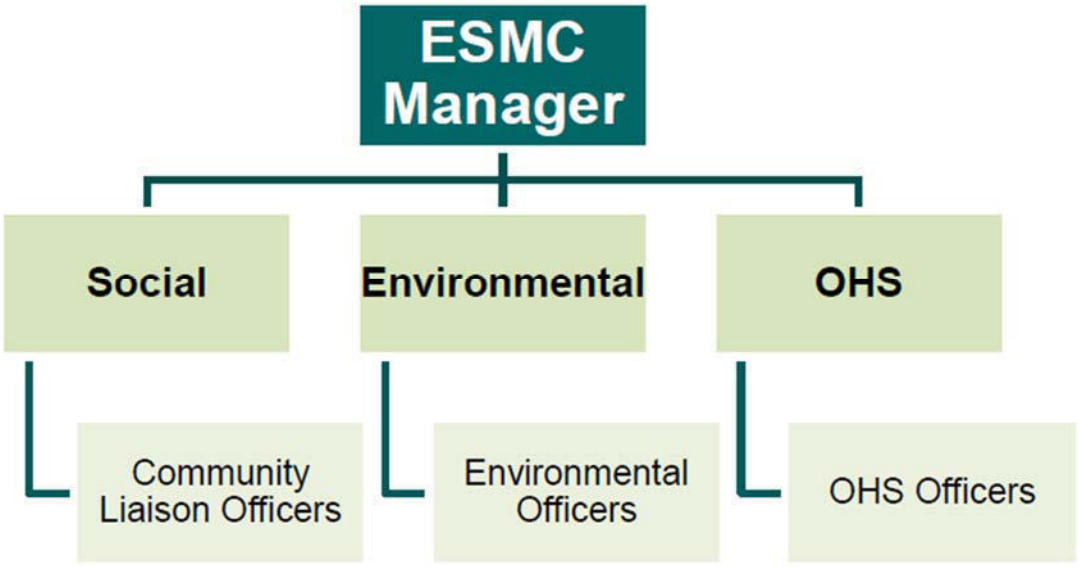

Figure 3.7-1: ESMC Organisational Chart

3.7.3. Scope

3.7.3.1. Project-Level

Effective application of the mitigation hierarchy (avoid, minimise, mitigate, and compensate/offset) to manage individual contributions of cumulative impacts is recommended as best practice. The actions and measures described below should be addressed by hydropower project developers, including NWEDC, to properly manage their contributions to cumulative impacts at a project level:

- Encourage at least all main-stem Trishuli River hydropower projects (including UT-1) to operate in a run-of-river mode to maintain natural hydrology and water quality;
- Include provisions to pass sediments and flush flows seasonally to mimic the natural pattern of sediment transport and deposition;
- Provide downstream ecological flows to maintain downstream ecological functions (e.g. support fish juvenile life stages), ecosystem services, and water uses;
- Manage riparian landscapes surrounding reservoirs and upstream of reservoirs to minimise hypoxia in reservoirs;
- Provide effective upstream and downstream fish passage at dams where migrations naturally occur and provide attraction flows when and where necessary to ensure fish successfully move through the free-flowing reaches;
- Implement long-term monitoring of fish passages to ensure continued functionality for successful fish passage;

- Construct screening and diversion devices where necessary to prevent downstream passage via turbine or spillways;
- Discourage and monitor extent of in-migration, and target local benefit sharing/community investment funds to increase infrastructure and services capacity;
- Coordinate with boating outfitters to maintain flows suitable for recreation use, if any, and potentially provide suitable flows on specific days during the peak recreation period; and
- Provide sufficient flows to maintain water levels for irrigation intakes during the dry season.

3.7.3.2. Regional Level

While the individual actions recommended above minimise an individual development's contribution to cumulative impacts, the overall management of cumulative impacts must be the responsibility of multiple project developers and government and requires a collective approach. If individual actions are not enough to mitigate cumulative impacts, collaborative efforts, usually at regional level, are required (IFC 2013). The strategy of collaborative efforts depends on the complexity of the cumulative effects and can range from information exchange between proponents to multidisciplinary working groups and regional initiatives.

Ideally the CIA should be led or developed by government entities that have direct influence on proponents and other government entities to identify the contributions of each actor and establish the mechanism to manage cumulative impacts. International good practice requires that individual proponents must mitigate the impacts generated by their project and, at least, support and strategies to manage cumulative impacts (IFC 2013).

As there are multiple hydropower projects being developed or planned to be developed by different developers with multiple stakeholders in the Trishuli River Basin, managing the identified cumulative impacts and varied stakeholder expectations is considered complex and would be best carried out through a collaborative regional initiative.

The regional cumulative impacts management initiative could be defined and enacted through a regional working group, which would operate under a Memorandum of Understanding. Stakeholders involved in the discussion and creation of the working group should include government agencies, international organizations, affected communities, project developers and financers of hydropower projects and other sector projects of the Trishuli River Basin.

Through their institutional objectives and contacts, the Depart of Energy Development could have a crucial role in the creation and implementation of the regional working group. The regional working group could use the CIA for the Project as a basis to identify objectives, key issues, responsible parties, and management strategies and actions. Roles and responsibilities of each stakeholder should be clearly defined at the beginning of the planning process to establish and maintain a constructive relationship among involved stakeholders. The regional initiative should be engaging and communicate roles, strategies and actions to other stakeholders and interested parties.

A preliminary list of issues that could be covered by the working group includes:

- Coordinate benefit sharing plans in partnership with the regional government, which would allow for the coordinated planning and implementation of strategic community investments (e.g. water access, road improvements, new hospital, and education improvements);
- Coordinate the location, construction schedules, and mitigation of impacts for associated facilities such as access roads, transmission lines, and substations;
- Standardise practices and synergies of mitigation and monitoring measures such as a collective streamflow monitoring network in lieu of individual field monitoring efforts;
- Implement land use zoning in the region, including means to document existing land use patterns;
- Coordinate between finance institutions in project monitoring and collaborative Environmental and Social Management Systems (ESMS);
- Exchange environmental and social data between stakeholders;
- Report and disclosure information to Affected Communities to better manage local expectations and foster a transparent process; and
- Follow up and update the CIA as other projects are added and commissioned. It is important to note that CIAs are not static analysis.

3.7.4. Monitoring

Table 3.7-1 presents the proposed management and monitoring measures to mitigate cumulative impacts identified in the CIA performed as part of the Supplemental ESIA. The proposed actions are structured around two levels of responsibility:

- Measures that fall within NWEDC control and could be directly implemented by the proponent; and
- Actions that require collaboration and coordination of multiple stakeholders (e.g. Government of Nepal, other hydropower sponsors in the Trishuli basin, etc.)

NWEDC will be required to implement and follow up on the mitigation measures and coordinate as needed with other regional stakeholders (hydropower operators, nongovernmental organizations, government, Community Forest Groups, etc.) to engage in and support regional initiatives.

Table 3.7-1: Management and Monitoring Actions for Cumulative Impacts Mitigation

Selected VECs	Cumulative Impacts (Indicator)	Proposed mitigation and management actions	
		NWEDC	Collaborative/Regional Efforts
Environmental			
Water Resources: Quantity, Quality and Use	Reduction in water availability (creation of flow-reduced segments)	• Create an Environmental Flow Stakeholders Committee • Monitor environmental flows within the diversion reach (as	• Participate in the Trishuli River Co-Management Platform to collaboratively

Selected VECs	Cumulative Impacts (Indicator)	Proposed mitigation and management actions	
		NWEDC	Collaborative/Regional Efforts
		described in the Environmental Flow Management Plan [EFMP])	monitor and manage cumulative impacts within the river basin • Engage and support watershed management initiatives in the Trishuli basin
	Competition with other users (presence of settlements within the concession areas)	• Engage with water user groups and monitor impacts on water supply • Continue water quality monitoring during operations as described in the EFMP • Develop Water Source Protection Programs	• Engage and support watershed management initiatives in the Trishuli basin • Support collaboration and exchange of data with relevant stakeholders (e.g. Langtang Park Authorities, Water District Offices, etc.)
Fish and Aquatic Habitats	Aquatic habitat loss/degradation (creation of flow reduced segments)	• Implement all of the monitoring requirements in the EFMP, including an eDNA analysis of fish in the Trishuli River Basin and enhanced hydraulic analysis of its diversion reach, especially with regards to the *S. richardsonii* • Fish expert to be hired to develop and implement aquatic monitoring program during constructino and operation	Engage in coordinated monitoring efforts and explore joint mitigation options with other hydropower sponsors.
	Aquatic habitat fragmentation (construction of dams and other physical barriers)	• Integrate fish passages as part of the BMP and EFMP • Explore and develop mitigation options suggested for the barrier effect (implement Adaptive Management based on monitoring results)	• Engage and support initiatives aiming to mitigate/restore aquatic connectivity (e.g. coordinated capture and release, multi-stakeholder fish rearing program, etc.) • Ensure downstream projects provide fish passage, especially the downstream UT-3 Project.
Erosion and Sedimentation Processes	Landslides and other risks (presence of high slide potential areas in the concession areas)	• Stabilize and protect slopes • Monitor landslides and other natural risks (i.e. GLOFs) in the Project area	Engage and support soil conservation and erosion reduction initiatives in the Trishuli basin
	Increased surface erosion (density of roads within the concession areas)	• Protect natural vegetation to minimise erosion (e.g. river bank restoration) • Manage sediments and monitor sedimentation • Stabilize and protect slopes	Engage and support soil conservation and erosion reduction initiatives in the Trishuli basin

Selected VECs	Cumulative Impacts (Indicator)	Proposed mitigation and management actions	
		NWEDC	**Collaborative/Regional Efforts**
		• Provide adequate drainage • Retention facilities during construction	
Terrestrial Habitats	Encroachment on protected areas (proximity of concession areas to protected areas)	• Minimise and mitigate impacts on fauna and vegetation as described in the Biodiverisity Management Plan by limiting disturbance and educating construction workers on steps to prevent damage to the park and/or its wildlife • Extend wildlife and biodiversity monitoring in selected locations into the operational phase (as described in the Biodiversity Management Plan) • Enhance riparian vegetation by developing a Riparian Vegetation Restoration Program which describes existing conditions, restoration design, and monitoring and maintenance activities • Protect the Langtang National Park from further losses of land due to shifting river course and from easy access to the park though dewatered zones during operation • Regular ecological monitoring on the fauna, flora and specific habitats within the impact areas.	• Engage and support stakeholders (e.g. Langtang National Park, WWF Nepal) working on biodiversity protection initiatives in the Trishuli watershed. • Explore opportunities for coordinated re-vegetation reforestation actions with other hydropower sponsors (i.e. maximize terrestrial habitats connectivity).
	Pressure on forest habitats (presence of forest habitats within concession areas)		

Selected VECs	Cumulative Impacts (Indicator)	Proposed mitigation and management actions	
		NWEDC	Collaborative/Regional Efforts
Socioeconomic			
Use of Natural Resources	Pressure on forest uses (presence of forest land within concession areas)	• Develop a Community Forestry Support Program that provides guidance on how to undertake construction activities in a community forestry area and how to involve the CFUGs in the process • Monitor impacts on Community Forests (e.g. impacts on productivity and livelihoods) (included in the Land Acquisition and Livelihood Restoration Plan)	Coordinate reforestation and revegetation actions with existing/future initiatives in the watershed.
	Pressure on agricultural land (presence of agricultural land within concession areas)	• Develop Agricultural Enhancement Program • Monitor impacts on livelihoods due to the loss of agricultural land (included in the Land Acquisition and Livelihood Restoration Plan)	Support farmers in the Project area to participate in agriculture enhancement opportunities at the district or watershed level.
Cultural and Religious Sites	Reduction in water availability for rituals (cremation sites within the concession areas)	• Few existing cremation sites are located within the concession area of an existing hydropower project. Further disruption is not expected.	Collaborate with the Government and other stakeholders in cultural related issues.
	Interference with access and use of cultural sites	Coordinate with local communities to minimise disruption of cultural/religious activities, especially significant dates (included in the Construction ESMP)	

3.7.5. Auditing, Reporting, and Record Keeping

3.7.5.1. Audit and Inspection

An audit program detailing the aspects to be audited, the area (relevant department or section), and the frequency of audits will be established. The audits will be based on appropriate protocols prepared by the environmental, social and health functions.

Regular environmental, social, and health audits and random spot checks will be undertaken by selected audit team members throughout all phases of the Project. The audit and inspection frequencies will be defined, and may be increased or decreased according to the findings and degree of confidence in the audit program. Audits will also assess compliance with agreed objectives and targets as well as the effectiveness of the management plans and their implementation.

Audit findings will be reviewed by the applicable management functions and where corrective actions are deemed necessary; the relevant management plans will be updated.

3.7.5.2. Record and Record Keeping

The proposed Project will develop a system of internal reporting that allows for appropriate reporting on the effectiveness of the ESMS. Public reports will also be prepared on a range of issues of interest or concern to local communities.

During the construction phase, contractors are required to take all appropriate measures in the ESMS and related plans and procedures to identify and document incidents of environmental, social and health non-conformance. These records should be produced at no less than weekly frequency, identifying the category of non-conformance, its potential severity, and its frequency to be demonstrated. The resultant records will be addressed in the appropriate management meetings to initiate corrective actions required.

These records are intended to facilitate the purposeful reduction of incidents of non-conformance, leading to a consequential reduction of the root causes of such incidents. All management plans include a monitoring plan detailing parameters that will be monitored. The results from this data will be reviewed and published annually. The report will review performance over the previous year and will set targets for subsequent years.

3.7.6. Adaptive Management System

Project design changes may occur that need to be accommodated by NWEDC and their contractors. Similarly, the institutional framework and roles and responsibilities provided in Section 3.7.2, Institutional Framework, may also change as the Project progresses.

The ESIA management plans require a mechanism to manage change. At times these changes may be material, potentially influencing the original findings of the ESIA, and hence, the basis for its approval. Such a mechanism to manage change, or a change management system, must ensure that changes to the scope of the proposed Project are subjected to a robust assessment process. Any changes to Project scope will be evaluated for their degree of significance, and will be incorporated into the appropriate documentation as follows:

- Minor changes will be reflected in updates to the applicable Management Plans; and
- Substantive changes that might potentially alter the ESIA findings (i.e. those that result in changes to the predicted significance of environmental, socioeconomic and health impacts) will be subject to re-assessment, further stakeholder consultation, supplementary reporting and revision of the Project's Environmental, Social and Health Management Plans. Typically, such substantive changes will be submitted as an addendum to this ESIA.

3.7.7. River Basin Coordination

Although most of the potential cumulative impacts of the UT-1 Project appear manageable, there is the potential for over 40 hydropower projects in the Trishuli River Basin, which collectively pose significant environmental and social risks. Since cumulative impacts typically result from the actions of multiple stakeholders, the responsibility for their management is collective. At times, cumulative impacts can transcend a regional/administrative boundary and, therefore, collaboration in regional strategies may be necessary to prevent, or effectively manage, such

impacts. Where cumulative impacts already exist, management actions by other projects may be needed to prevent unacceptable cumulative impacts. There is a need for a platform or organization that can facilitate multi-stakeholder cooperation and commitment to collaborate in the monitoring and co-management of cumulative impacts in the Trishuli River Basin.

The UT-1 Project is actively participating in the Trishuli Basin CIA, funded by the IFC, and has committed to participating in the Trishuli River Co-Management Platform to collaboratively monitor and manage cumulative impacts within the river basin. The Project is also undertaking additional activities, including an eDNA analysis of fish in the Trishuli River Basin and enhanced hydraulic analysis of its diversion reach to better evaluate common snow trout's upstream migration flow requirements, which it will share with the government and other hydropower developers within the Trishuli Basin.

3.7.8. Funding

Provision for the financing of the implementation of the CIMP (through the financing of the ESMC) has been included in the budget of the NWEDC. This may include periodic meetings between Depart of Energy Development, other project proponents, local stakeholders, and those necessitated by the Adaptive Management System.

3.7.9. References

IFC (International Finance Corporation). 2013. Good Practice Handbook, Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets.

ESSA (ESSA Technologies Ltd.). 2014. Supplemental ESIA Upper Trishuli-1 Hydropower Project, Nepal. Prepared by ESSA Technologies Ltd. for the Nepal Water and Energy Development Company and the International Finance Corporation. December 2014.

3.8. ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING REPORTING PLAN

The following table describes the monitoring and reporting requirements for the Project as discussed through the ESIA and the ESMMP.

Resource/Area	Monitoring Requirement/ Indicator	Frequency	Reporting Requirement	Entity Responsible
Construction Phase				
Air	Dust accumulation: Inspect for and record dust accumulation on roof and vegetation in the surrounding area	Monthly	Monitor, record, and report exceedances	EPC Contractor
Air	Air quality inside the tunnel: PM_{10}, CO, SO_x, and NO_x	Monthly	Report concentrations in excess of parameters in ESIA	EPC Contractor

Resource/Area	Monitoring Requirement/ Indicator	Frequency	Reporting Requirement	Entity Responsible
Air	Install an online real-time gas monitoring system, including analysis equipment, to detect elevated concentrations of hazardous gases (coal gas)	Continuous	Monitor, record, and report the situation of hazardous gas to make sure that the emission has not exceeded the established standards	EPC Contractor
Air	Monitor air quality (TSP/PM_{10}) at Hakubesi-Fulbari, Gogane, and Mailun Villages.	3 times a year	Record and compare with ambient standards in the ESIA.	EPC Contractor
Noise	Noise Level Meter installed at Hakubesi-Fulbari, Gogane, and Mailun Villages.	3 times a year	Record and monitor noise levels.	EPC Contractor
Noise	Maintain noise levels associated with all machinery and equipment at or below 90 decibels.	3 times a year	Record and monitor noise levels.	EPC Contractor
Noise	Construction site noise shall be monitored with portable detecting devices	Continuous	Monitor the noise level at the sensitive receptors	EPC Contractor
Water	Sample three locations for DO, pH, BOD, turbidity, total suspended solids, and hardness: upstream of weir, between weir and power house, and downstream of power house	3 times a year	Record and compare with Standards for Effluents Discharged in the ESIA.	EPC Contractor
Water	DO, pH, BOD, turbidity, total suspended solids, and hardness. Sample immediate points after treatment units of tunnel discharge, discharge from aggregate, crushing plant and batching plant, settling ponds, and sanitary discharge.	Monthly	Report concentrations in excess of parameters listed in the ESIA: Standards for Effluents Discharged into Inland Water from Construction Sites and Camps	EPC Contractor
Water	Water quality from runoff from any fresh bitumen surfaces	As needed	monitored and remedial actions taken where required	EPC Contractor

Resource/Area	Monitoring Requirement/ Indicator	Frequency	Reporting Requirement	Entity Responsible
Water	Water quantity in Community Springs/Water Sources	Before, during and after construction	Monitor water yield to detect impacts and provide alternate water supplies to villages/communities if water supply is affected	EPC Contractor
Water/Soil	Pollution Prevention: open defecation and garbage/solid waste disposal	Daily	Visual monitoring of nearby villages and headwork and powerhouse areas.	EPC Contractor
Water/Soil	Hazardous materials/Waste use as well as the storage, handling, and disposal procedures	Continuously	Records must be kept on site.	EPC Contractor
Water/Soil	Tunnel excavation material disposal (source and final disposal location) shall be monitored and documented	Continously	Records must be kept on site.	EPC Contractor
Soil	Landslide and slope stability – access roads and tunnel	6 times a year	Record and monitor number of incidence of landslides, slope failure and debris flow.	EPC Contractor
Soil	Erosion of soils and deposition in downslopes of the access roads, tunnels, spoil disposal areas, and quarries	6 times a year	Monitor via frequent mapping and site observations	EPC Contractor
Flora	Forest cover – visually monitor number of trees felled within 1 km of dam, access road and switchyard as well as baseline plots	Bi-annually	Record visual observations	Environmental and Social Management Cell
Fauna	Monitor and record information on raiding season (flora raiding by wild herbibores), frequency and sites	Bi-annually	Conduct community consultations and maintain records	Environmental and Social Management Cell
Fauna	Aquatic Ecology - monitored as part of a Biodiversity Evaluation and Monitoring Program	Bi-annually	Conduct Fish sampling and interview local	Environmental and Social Management Cell

Resource/Area	Monitoring Requirement/ Indicator	Frequency	Reporting Requirement	Entity Responsible
	(BEMP) to be developed by a fish expert with metrics to demonstrate No Net Loss of aquatic biodiversity as required by IFC's PS6.		fishermen, maintain records.	
Health and Safety	Sample water supply reservoir and end tap of the Camps.	Monthly	Report concentrations in excess of parameters listed in the ESIA: Drinking Water Quality Standards for Construction Camps and Construction Sites	EPC Contractor
Health and Safety	Monitor structural stability of tunnels	During the construction phase	Record visual observations	EPC Contractor
Health and Safety	Maintain records and reports concerning health, safety and welfare of persons, and damage to property, as the Environmental Supervision Team may reasonably require	Monthly	Records must be kept on site.	EPC Contractor
Health and Safety	Training program numbers	During the construction phase	Keep records of attention and issues covered and provide such records when required by the Environmental and Social Management Cell or the Safety and Environmental Officer	EPC Contractor
Health and Safety	Visually monitor number of houses, construction material, development of cracks and house owner information in Hakubesi-Fulbari	In response to complaints	Document structured through write ups, maps, and photographs.	Environmental and Social Management Cell
Health and Safety	Visually inspect workers camps for adequate water, wastewater, and solid waste facilities	Weekly	Record visual observations	EPC Contractor

Resource/Area	Monitoring Requirement/ Indicator	Frequency	Reporting Requirement	Entity Responsible
Health and Safety	Compliance to code of conduct and Review of Records required to be maintained by law	Monthly	Maintain records	Environmental and Social Management Cell Representatives
Social	Review records of Grievance Redressal Mechanism and community engagement activities, Compliance to code of conduct, and records of weekly and monthly monitoring	Annually	Document any deviations from requirements in the Labor Influx Management Plan, submit annual reports to the GON	External Monitoring by Third Party
Social	Perception of environmental enhancement programs in Hakubesi-Fulbari, Gogane, and Mailun and VDC Offices in Dhunche and Ramche	Bi-annually	Interviews, observation and structured questionnaire survey of selected groups.	Environmental and Social Management Cell
Social	Monitoring compliance with the Employment and Skills Training Plan, the Industrial Benefit Sharing Plan	Annually	Submit annual reports to the GON	NWEDC
Socio-economics	Economic and social status of affected communities (Hakubesi-Fulbari, Gogane, and Mailun)	Once a year	Interviews, observation and structured questionnaire survey of selected groups.	
Socio-economics	Inflation of prices - commodities in Hakubesi-Fulbari, Gogane, and Mailun (cereals, cash crops, kerosene, meat, sugar, salt, spices, soap. Milk, ghee, etc.)	Monthly	Record keeping of prices.	Environmental and Social Management Cell
Socio-economics	Trade and business development – number of hotels, tea stalls, and restaurants.	Three times a year	Direct enumeration and record keeping.	Environmental and Social Management Cell
Operation Phase				
Soil	Landslide and slope stability – access roads and tunnel	Bi-annually for the first 5 years or operation	Record and monitor number of incidence of landslides, slope failure and debris flow.	NWEDC

Resource/Area	Monitoring Requirement/ Indicator	Frequency	Reporting Requirement	Entity Responsible
Soil	Erosion of soils and deposition in downslopes of the access roads, tunnels, spoil disposal areas, and quarries	Bi-annually for the first 5 years or operation	Monitor via frequent mapping and site observations	NWEDC
Water	Sample three locations for DO, pH, BOD, turbidity, total suspended solids, and hardness: upstream of weir, between weir and power house, and downstream of power house	Yearly for 30 years	Record and compare with Standards for Effluents Discharged in the ESIA.	NWEDC
Water	Aquatic habitat loss/degradation (creation of flow reduced segments)	Monitor monthly for 5 years	Engage in coordinated monitoring efforts and explore joint mitigation options with other hydropower sponsors	NWEDC
Water	EFlows releases and river condition: gauging station located at Eflows Site 1 and another at Eflows Site 2	Continuous	Communicate the results of the independent monitoring of EFlows releases and river condition to stakeholders	NWEDC will be responsible for the release of EFlows and record keeping
Drinking Water	Sample water supply reservoir and end tap of the Camps.	Yearly	Report concentrations in excess of parameters listed in the ESIA: Drinking Water Quality Standards	
Noise	Noise level in the powerhouse area	Once after operation	Measure noise level using noise level meter	NWEDC
Flora	Forest cover – visually monitor number of trees felled within 1 km of dam, access road and switchyard as well as baseline plots. Survival of planted tree species and maintenance of floral diversity within offset site	Bi-annually for the first 5 years of operation	Record visual observations	NWEDC

Resource/Area	Monitoring Requirement/ Indicator	Frequency	Reporting Requirement	Entity Responsible
Fauna	Monitor and record information on raiding season (flora raiding by wild herbibores), frequency and sites	Bi-annually for the first 5 years of operation	Conduct community consultations and maintain records	NWEDC
Fauna	Aquatic Ecology - monitored as part of a Biodiversity Evaluation and Monitoring Program (BEMP) to be developed by a fish expert with metrics to demonstrate No Net Loss of aquatic biodiversity as required by IFC's PS6.	in January, March, June, and September at the three EFlow monitoring sites	Conduct Fish sampling and interview fishermen, maintain records.	NWEDC
Fauna	Terrestrical biodiveristy will be monitored at the project site and in LNP as part of a Biodiversity Evauation and Monitoring Program (BEMP) to be developed to demonstrate NNL per IFC's PS6.	Bi-annually for the first 5 years of operation		To be implemented by LNP or NGOs with supervision by NWEDC.
Fauna	Monitor bird carcasses electrocuted and record any threatened or migratory species observed as described in the BEMP	Monthly	Record and monitor number	NWEDC
Socio-economics	Economic and social status of affected communities (Hakubesi-Fulbari, Gogane, and Mailun)	Once after 2 years of operation	Interviews, observation and structured questionnaire survey of selected groups.	NWEDC
Socio-economics	Inflation of prices - commodities in Hakubesi-Fulbari, Gogane, and Mailun (cereals, cash crops, kerosene, meat, sugar, salt, spices, soap. Milk, ghee, etc.)	Three times a year for the first 2 years of operation	Record keeping of prices.	NWEDC
Socio-economics	Trade and business development – number of hotels, tea stalls, and restaurants.	Three times a year	Direct enumeration and record keeping.	NWEDC

Resource/Area	Monitoring Requirement/ Indicator	Frequency	Reporting Requirement	Entity Responsible
Social	Perception of environmental enhancement programs in Hakubesi-Fulbari, Gogane, and Mailun and VDC Offices in Dhunche and Ramche	Bi-annually	Interviews, observation and structured questionnaire survey of selected groups.	NWEDC

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