Initial Environmental Examination

February 2020

NEP: Urban Water Supply and Sanitation (Sector) Project (UWSSP)

Liwang Urban Water Supply and Sanitation Project
Rolpa, Rolpa District

Prepared by the
Ministry of Water Supply (MoWS)
for the
Asian Development Bank (ADB)

ABBREVIATIONS

ADB	Asian Development Bank
DCC	District Coordination Committee
DED	Detailed Engineering Design
DRTAC	Design Review and Technical Audit Consultant
DSC	Design and Supervision Consultant
DSMC	Design, Supervision and Management Consultant
DWSSM	Department of Water Supply and Sewerage Management
EARF	Environmental Assessment and Review Framework
EIA	Environment Impact Assessment
EMP	Environment Management Plan
EMR	Environmental Monitoring Report
EPA	Environment Protection Act
EPR	Environment Protection Rules
ESA	Environmental Safeguard Assistant
ESE	Environmental Safeguard Expert
GoN	Government of Nepal
GRM	Grievance Redress Mechanism
HDPE	High Density Polyethylene
HHs	Households
IBAT	Integrated Biodiversity Assessment Tool
ICG	Implementation Core Group
IEE	Initial Environmental Examination
LPCD	Liter Per Capita Per Day
MoFE	Ministry of Forests and Environment
MoWS	Ministry of Water Supply
NDWQS	National Drinking Water Quality Standard
NGO	Non-Governmental Organization
NPR	Nepalese Rupees
PMO	Project Management Office
PPTA	Project Preparation Technical Assistance
PPM	Parts Per Million
REA	Rapid environmental assessment
ROW	Right of way
RPMO	Regional Project Management Office
SDG	Sustainable Development Goal
SEMP	Site-specific environmental management plan
SPS	Safeguard Policy Statement
TDF	Town Development Fund
ToR	Terms of Reference
TPO	Town Project Office
UWSSP	Urban Water Supply and Sanitation Sector Project
USD	United States Dollar
VDC	Village Development Committee
WHO	World Health Organization

WSSDO	Water Supply and Sanitation Divisional Office
WTP	Water Treatment Plant
WUA	Water Users Association
WUSC	Water Users and Sanitation Committee

WEIGHTS AND MEASURES

C	Celsius/centigrade
dBA	decibel audible
ha	hectare/s
km	kilometer/s
kph	kilometer/s per hour
m	meter/s
kph	kilometer/s per hour
m^3	cubic meter/s
masl	meter/s above sea level
mg/l	milligram/s per liter
mm	millimeter/s

NOTES

This Initial Environmental Examination is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff and may be preliminary in nature. The IEE and its environmental management plan will be updated during project implementation, if needed.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

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EXECUTIVE SUMMARY

The Urban Water Supply and Sanitation Sector Project (UWSSSP) will support the Government of Nepal's 15-year Development Plan for Small Towns. The project will improve water supply and sanitation service delivery in small-scale urban and semi-urban centers across Nepal.

The proposed subproject will facilitate wards 1, 2 & 4 of Rolpa Municipality. The subproject area is the district headquarters of Rolpa district located at 28°18′ North Latitude and 82°38′ East Longitude. The altitude of the subproject area varies from 1300 m to 1500 m above the sea level in the mid hill region.

The water supply system has been designed for a base year population of 6,466 for the year 2019. The system has been designed to tap surface water source from an intake and using different water sources for a total design year population of 10,819 in 2039.

Law of Nepal, and ADB Policy, both require that the environmental implications of individual developments are taken into account in the planning and decision making process. The statutory requirement of the Government of Nepal, that has to be adhered to for the proposed project, is the Environment Protection Act, 1997 and Environment Protection Rules, 1997 (and amendments). The present IEE study fulfils the requirements pertaining to Rule 3 of EPR 1997.

Subproject Selection. The selection of Liwang Urban Water Supply and Sanitation Subproject complies with the subproject selection criteria discussed in the project administration manual (PAM) and environmental assessment and review framework (EARF) developed for the project. Consistent with the EARF, compliance of Liwang Urban Water Supply and Sanitation Subproject with these criteria has been confirmed prior to the conduct of initial environmental examination.

Categorization. Liwang subproject is classified as Category B for Environment per ADB SPS, 2009 as no significant impacts is envisioned. This initial environmental examination (IEE) report has been prepared based on final detailed design and following requirements of ADB SPS and Government of Nepal laws, rules and regulations. In particular, the subproject is included in Schedule 1 of the Government of Nepal Environment Protection Rules (EPR), 1997, and an IEE is required. The IEE has been undertaken to assess the environmental impacts of the subproject, and provide mitigation and monitoring measures that will ensure no significant environmental impacts occur as a result of the subproject.

Subproject Scope. The subproject is formulated under UWSSSP to improve water supply and sanitation service delivery in ward numbers 1, 2 & 4 of Rolpa Municipality, Rolpa. Investments under this subproject include intakes, storage tanks, valve chambers, transmission mains with distribution lines, and household connections, and other allied components.

Implementation Arrangements. The Ministry of Water Supply is the executing agency. The Department of Water Supply and Sewerage Management (DWSSM) is the implementing agency. Implementing activities will be overseen by a separate Project Management Office (PMO) which is established in DWSSM head office in Kathmandu and two Regional Project Management Offices (RPMOs) in the eastern and western region. A team of technical, administrative, and financial officials including safeguard specialists will be provided at the PMO to implement, manage and monitor project implementation activities. The RPMO will be staffed by qualified and experienced officers and will be responsible for the day-to-day activities of project implementation in the field, and will be under the direct administrative control of the PMO. Consultant teams are responsible for subproject planning and management and assuring technical quality of design and construction; designing the infrastructure and supervising construction; and safeguards preparation.

Components of the project. The subproject comprises of two major components; Water supply and Sanitation. Rimkhola, Mulpani, Sattale & Mulkhola will be used as water sources. The system also consists of water treatment facilities and ground reservoirs from where water will be distributed through distribution pipelines. The second component is sanitation services. Under this component, promotion of household toilets for ultra poor families, and construction of a public toilet has been proposed.

Description of the Environment. The project area is the district headquarters of Rolpa district located at 28°18′ North Latitude and 82°38′ East Longitude. The altitude of the project area varies from 1300 m to 1500 m above the sea level in the mid hill region. The geology of the area shows that the area consists of shallow marine sediments, phyllite, sandstone with quartzite and calcareous sandstone. It has stromatolitic limestone and black slates. The project sites have relatively stable landforms. The subproject components will be located in public land or land owned by the WUSC and the pipe laying works will be along the ROW of the roads. There are no protected areas, or wetlands in or near the project area.

Liwang is a rapidly urbanizing town and the commercial activities are increasing. The household average monthly income of the service area is estimated as Rs. 22,478 (Survey, 2016). In-migration rate and increase of rental population has resulted to high population growth. The existing water supply system has been unable to serve growing population. The present water supply situation is not satisfactory. Only 16.38 percent of the households are satisfied with the quality of drinking water supplied. Regarding the health and sanitation condition, most of the households have toilet facility. The town has been declared Open Defecation Free zone in Jestha 2072 BS. The project area has core market and settlement area. There is one public toilet in the project area.

Environmental impacts, and Environmental Management Plan. No remarkable significant adverse environmental impacts have been predicted and the anticipated negative impacts are of local in nature and low in magnitude. The main activities that may cause environmental concerns are construction activities such as intake works, reservoir and treatment plant construction, and laying of transmission mains and distribution lines. Concerns like degradation of land surface and unsettling of street surfaces due to excavation and trenches are there.

The mitigation measures are precautionary types such as proper and timely back filling of the excavated trenches and avoiding cutting of vegetation. The main issues related to the sanitation component are during the operational phase such as nuisance due to increased sewer sludge. The mitigation measures are related to the periodic maintenance, cleaning and safe disposal of sludge. The land required for major structures have been acquired by the user committee and no households or community have been displaced or resettled. Temporary impacts on ambient air, water and noise levels are expected. Occupational health and safety remains a concern in the work fronts. An environmental management plan (EMP) is included as part of this IEE, which includes i) mitigation measures for environmental impacts during implementation, ii) an environmental monitoring program, and the responsible entities for mitigating, monitoring, and reporting, iii) public consultation and information disclosure, and iv) a grievance redress mechanism. A number of impacts and their significance have already been reduced by amending the designs. The EMP and cost of EMP implementation will be included in civil works bidding and contract documents. Indicative cost for EMP implementation is NRs 1,200,000.

A detailed monitoring schedule has been designed specifying the regular and periodic monitoring activities during the project construction and operation phase. Before the operation of the project, PMO will develop detailed work plan for implementing mitigation measures and monitoring plans based on Environmental Management Plan which will be incorporated into the construction and operation contracts.

There are many beneficial impacts of the project. The major ones are; (i) Improved Access of safe water for all the households of the project area, (ii) Employment increase along with skill enhancement of the local people, and (iii) Improvement in quality of life of the people of the project area.

Grievance Redress Mechanism. A Grievance Redress Committee (GRC) will be formed at Municipality level. The GRC members will comprise of (1) RPMO social development officer, (2) representatives of affected persons, (3) DSMC's safeguards specialist (social/environment as relevant), (4) a representative of recognized CBO/local organization working in the project area, and (5) contractor's representative. Any person with a grievance related to the project works can contact the Project to file a complaint. The WUSC will document the complaint within 24 hours of receipt of complaint in the field. Grievance addressing process and timelines for different levels of interventions required are detailed under the mechanism. Despite the project GRM, an aggrieved person shall have access to the country's legal system at any stage, and accessing the country's legal system can run parallel to accessing the GRM.

Information Disclosure, Consultation and Public Participation

Local communities were informed and consulted during the field study period. A 15 days' public notice was published in the national daily newspaper (Annapurna Post, 18th May, 2018) seeking written opinions from concerned local bodies, schools, health posts and related local organizations and concerned people. A copy of the public notice was also affixed in the notice boards of the above mentioned organizations in the project area and a deed of enquiry (*muchulka*) was collected. A public consultation was conducted and opinions, concerns and suggestions of the local stakeholders were gathered through a consultation process. A recommendation letter was obtained from municipality regarding the conduction of IEE study and implementation of the project.

Conclusion and Recommendation

The project will bring overall improvement in quality of life of the people of the project area. However, considering the nature of the project; environmental situations of the area and based on the detailed field survey and consultation with the relevant stakeholders, it can be concluded that the project benefits outweigh the risks and these potential risks can be overcome through the proposed mitigation measures and its monitoring. The impacts are mostly local in nature and can be easily mitigated with low cost mitigation measures. Hence IEE is sufficient for the project, and classification of the subproject as Category "B" for environment is confirmed. No further special study or detailed Environmental Impact Assessment (EIA) is needed to be undertaken.

I. INTRODUCTION

A. Background

1. The Urban Water Supply and Sanitation (Sector) Project (UWSSP) will support the Government of Nepal (the government) in providing better access to water supply and sanitation (WSS) in selected municipalities (project municipalities)[1] in Nepal. The Asian Development Bank (ADB) has supported the government in providing improved WSS services through three earlier projects.[2] Drawing on experience and lessons, this project will fund physical investments in WSS infrastructure in project municipalities and non-physical investments strengthening institutional and community capacity, service delivery, and advanced preparation of future investments.[3]

2. The Ministry of Water Supply (MOWS) is responsible for planning, implementation, regulation, and monitoring of WSS. The Department of Water Supply and Sewerage (DWSS) under the MOWS supports the provision of WSS facilities in municipalities where large utilities do not exist, and these are operated by municipalities or water users' associations (WUAs). The DWSS assists municipalities and WUAs in preparation of investment plans, project design, and establishing sustainable service delivery. The Local Governance Operation Act (2017), established municipalities as autonomous government institution with responsibility for WSS services.[4] However, shortage of investment funds, skilled personnel, and inadequate operation and maintenance (O&M) budgets, hinder municipalities from providing adequate, cost-effective services. While municipalities' capacity is being built, the government and residents have been receptive to an established decentralized, participatory, and cost-sharing service provision model through Water Users' Steering Committees (WUSCs).[5] Development support for municipal WSS is mainly being channeled through budget allocation as grants to DWSS and loans through to the Town Development Fund (TDF)[6] with contributions from municipalities and beneficiaries. The TDF is also supporting WUSCs in institutional and financial management including the introduction of tariffs.

3. UWSSP is being implemented over a five-year period (2018 to 2023) and supported through ADB financing using a sector lending approach. In continuation of ongoing third small towns WSS sector project,[7] MOWS is the executing agency and Department of Water Supply and Sewerage (DWSS) as the implementing agency. The project management office (PMO) established under ongoing ADB Loan 3157-NEP: Third Small Towns Water Supply and Sanitation Sector Project is also responsible for the overall management, implementation and monitoring of UWSSP. There are Regional PMOs (RPMOs) to manage day-to-day project implementation at the subproject/municipality levels. After construction including a one-year

[1] Interventions will be in preselected urban areas of municipalities, previous to Nepal's federalization referred to as small towns, defined as (i) population of 5,000 to 40,000; (ii) located on a road linked to the strategic road network; (iii) has perennial road access, grid power, telecommunication, and potential for growth; (iv) has an average population density of 10 persons per hectare; and (v) has jurisdiction of one administrative boundary.

[2] ADB. 2000. *Report and Recommendation of the President to the Board of Directors: Small Towns Water Supply and Sanitation Sector Project*. Manila; ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Second Small Towns Water Supply and Sanitation Sector Project*. Manila; and ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Third Small Towns Water Supply and Sanitation Sector Project*. Manila.

[3] Project preparation was supported by loan consultants under the ongoing *Third Small Towns Water Supply and Sanitation Sector Project*.

[4] Government of Nepal. 2017. *Local Governance Operation Act*. Kathmandu.

[5] The WUSCs, formed under the Nepal Water Resource Act (1992), are the elected executive bodies of the WUAs. WUSCs are required to have women (at least 33%) and marginalized ethnic groups representatives, and for a woman to occupy at least one of the key posts (Chair, Vice Chair, Secretary, or Treasurer).

[6] The TDF is a government-owned entity established under the Town Development Fund Act, 1997. Loans from the government to municipalities or WUSCs are generally on lend through the TDF.

[7] ADB Loan 3157-NEP: Third Small Towns Water Supply and Sanitation Sector Project.

O&M period by the contractor, subprojects will be operated by the municipality itself or a user association such as the Water Users Associations (WUAs).[8]

4. Overall, UWSSP will have the following impact: quality of life for urban population, including the poor and marginalized, through provision of improved sustainable water supply and sanitation services.[9]UWSSP will have the following outcome: inclusive and sustainable access to water supply and sanitation services in project municipalities improved.[10] UWSSP will have two outputs:

(i) Water supply and sanitation infrastructure in project municipalities improved; and
(ii) Institutional and community capacities strengthened.

5. The municipality is served by existing sources. However, the system does not sufficiently meet the needs of the people, regarding both quantity and quality. The water sample has been collected from the proposed water source and analyzed. The results of the test have shown that chemical and microbial quality of water meets National Drinking Water Quality Standards (NDWQS).

B. Subproject Selection Based on Environmental Assessment and Review Framework

6. An EARF has been developed to provide guidance on subproject selection, screening and categorization, information disclosure and consultation, assessment, planning, institutional arrangement, and processes to be followed in the formulation and implementation of subprojects during project implementation. The subproject has been screened to ensure that it complied with all the subproject selection criteria provided in the EARF. No subproject will be funded by ADB unless it complies with all these selection criteria. **Table I-1** below shows the status of compliance with the selection criteria.

Table I-1: Status of Compliance with the Subproject Selection Criteria in the EARF

	Subproject Selection Criteria in EARF	**Status of Compliance (Complied / Not Complied / Not Applicable**	**Remarks (Provide basis of compliance)**
General Criteria			
1.	Not located in ecologically sensitive areas.[11]	Complied.	Section V para. 91 IBAT in Annex 4 REA Checklist in Annex 1 No Mitigation Measures Scenario Checklist in Annex 1
2.	Does not directly affect environmentally protected areas, core zones of biosphere reserves, highly valued cultural property.	Complied.	Section V para. 90 IBAT in Annex 4 REA Checklist in Annex 1

[8] WUAs are registered entities with the district water resources committee as users' associations under the Water Resources Act (1992). Water Users and Sanitation Committees (WUSCs) are the elected executive bodies of the WUAs.

[9] Government of Nepal. 2009. *Urban Water Supply and Sanitation Policy*. Kathmandu

[10] The design and monitoring framework is in Appendix 1.

[11] Wildlife/bird sanctuaries, national parks, tiger reserves, elephant reserves, conservation reserves, core zone of biosphere reserves, centrally protected monuments or critical habitat (as defined in ADB Safeguard Policy Statement or SPS)

Subproject Selection Criteria in EARF		Status of Compliance (Complied / Not Complied / Not Applicable	Remarks (Provide basis of compliance)
			No Mitigation Measures Scenario Checklist in Annex 1
3.	Does not cause damage/destruction, removal, alteration or defacement of adjacent or nearby structures/monuments and sites of international, national and local significance.[12]	Complied.	Table II-2 mentions no PCR will be affected. Photos in Annex 12
4.	Does not include and/or involve any activities listed in ADB's Prohibited Investment Activities List (Appendix 5 of ADB SPS).	Complied.	Screening has been carried out
5.	Provides replacement ratio of 1:25 for any tree cutting. (Complying with the national requirements)	Complied.	This has been mentioned in EMP
Specific Criteria for Sources			
6.	Necessary agreement and approval for raw water extraction have been obtained in accordance with relevant laws and regulations.	Complied.	The WUSC has obtained permission (Annex 10)
7.	Water source can sustain the quantity needed to meet demand during the planned service period even during climate change-induced drought events without adversely affecting other beneficial uses of the resource and downstream users.	Complied.	Tapping yield is taken based on safe yield of the existing dry season flow.
8.	Detailed investigations (e.g. hydrogeological surveys, bore tests, etc.) have been carried out to confirm adequate and sustainable yield is available from the proposed source for supply of minimum 100 lpcd.	Complied.	The design is based on 100 lpcd for household connections
9.	Tube well sites and/or surface water intake locations are designed to be fenced or have security provided to them.	Complied.	Protection has been included in detail design
10.	Any intake source is located at least 30m upstream of any sanitation facilities.[13]	Complied	Source selection in sites around 50 m away from any sanitation facilities
11.	Water quality test of the proposed source/s has/have been carried out and confirmed to comply with National Drinking Water Quality Guidelines on Arsenic.[14]	Complied	Annex 8
Specific Criteria for Water Treatment Plant			
12.	No water treatment plant (WTP) will be established in floodplains.	Complied	The WTPs sites proposed are safe
13.	Proposed location of any WTP is at least 50 m away from any premises used by people (house, shops) to avoid noise impact.	Complied	The WTP units are located in consultation with the WUSC as well

[12] Subprojects with component activities near (within 50 m from) such sites shall have prior coordination with the Department of Archaeology

[13] Where this cannot be maintained, the design and implementation will ensure that (i) septic tanks will be sealed to make them water tight and emptied as per the design requirements; (ii) appropriate borehole case and screen are installed; and (iii) a test pit is established, and water quality monitoring is conducted regularly (at least once every quarter)

[14] Water source with arsenic levels above the national standards will not be selected. If small traces of arsenic (below the national standards) have been detected, testing for arsenic will be conducted once a month for the duration of 3 months. Arsenic test results will be submitted to ADB for review before the water source is developed for drinking purposes.

Subproject Selection Criteria in EARF		Status of Compliance (Complied / Not Complied / Not Applicable	Remarks (Provide basis of compliance)
14.	Proposed location of any WTP will be fenced or have security provided to them.	Complied	The WTP area will be fenced
15.	Operate and maintain any WTP in accordance with national requirements and internationally accepted standards to meet national water quality standards or, in their absence, World Health Organization (WHO) Guidelines for Drinking Water Quality.	Complied.	Section II of the IEE discusses compliance with national and internationally accepted standards, whichever is more stringent.
16.	Operate and maintain any WTP in accordance with a sludge management plan.	Complied	This has been mentioned in EMP (Operation Phase)
17.	Operate and maintain any WTP in accordance with an operation and maintenance manual, which includes proper storage and use of chemicals.	Complied	This has been mentioned in EMP (Operation Phase)
Specific Criteria for Network Pipes and Other Structures			
18.	Will not involve use or installation of asbestos cement pipes	Complied	No such use
19.	All pipes are designed to be constructed underground.	Complied	The provision is include in Design document
20.	Infrastructure, such as OHT, GLSR, etc. is located considering high flood level in floodplains.	Complied	No such concern
21.	Includes road access to WTP, pumping stations, and reservoirs/tanks for operations and maintenance activities.	Complied	There is already access to these sites
Specific Criteria for Public Toilets			
22.	Located in, or adjacent to, a frequently used public area on the WUA or municipality land with no or minimum involuntary resettlement/ social impacts	Complied	This has been proposed in municipality owned land
23.	If the municipality doesn't have adequate capacity, the WUA has agreed to manage the public toilet on behalf of the municipality until the municipality has adequate capacity.	Complied	Agreed between WUSC and the Municipality office
24.	Septic tanks will be designed as per national standards and codes to allow for maximum retention of septage (minimum 3 years) and water sealing.	Complied	This has been detailed in design report
25.	Toilets will be established at least 30m downstream of the drinking water source, and not in floodplains or flood prone areas. Where this cannot be maintained, the design and implementation will ensure that (i) septic tanks of the toilets will be sealed to make them water tight and emptied as per the design requirements; (ii) appropriate borehole case and screen are installed; and (iii) a test pit is established, and water quality monitoring is conducted regularly (at least once every quarter).	Complied	These aspects have been considered during detailed design
26.	An O&M plan is developed providing details on the frequency and responsibility for collection and disposal of septage at approved site, and commitment to provide minimum operational staff and operate the facilities sustainably is given by WUAs or municipalities.	Complied	An O&M plan will be finalized after the construction works have been completed; Water Safety Plan will also be prepared at

Subproject Selection Criteria in EARF		Status of Compliance (Complied / Not Complied / Not Applicable	Remarks (Provide basis of compliance)
			the same time
27.	Hygiene promotion campaign and educational program is developed to promote open defecation free (ODF) in the towns, and WUA or municipality commits to implementing it.	Complied	The total sanitation promotion has been inbuilt in this project

C. Basis and Extent of IEE Study

7. The Government of Nepal has prepared a 15-year development plan to implement the water supply and sanitation programs in emerging towns or small towns in order to improve the health and the quality of life of the people living in the project towns by constructing and extending water supply system, drainage and sanitation facilities and providing health and hygiene education programs in the towns. The project follows the community managed demand responsive approach where the community will be involved from the very planning phase to the implementation phase for the operation and maintenance of the subprojects soon after it is completed. The project, 'Urban Water Supply and Sanitation Sector Project, UWSSSP' is the outcome of that effort. The "Asian Development Bank" (ADB) has been providing financial assistance to implement the project in both the phases. The "Department of Water Supply and Sewerage Management" (DWSSM) is the implementing agency whereas the "Ministry of Water Supply" (MoWS) is the executing agency.

8. Both the Nepali law and ADB policy require that the environmental implications of individual developments are taken into account in the planning and decision-making process and that action is taken to reduce the impacts to acceptable levels. This is done through the environmental assessment process, which has become an integral part of lending operations and project development and implementation worldwide. This IEE report is prepared meeting GoN and ADB requirements following the IEE template of EPA/EPR 1997 of GoN.The IEE report primarily: (i) provides information on the sub-project and its environmental requirements; (ii) provides the necessary baseline conditions of the physical, ecological, physical cultural and socio-economic environments and/or resources in and surrounding the sub-project's area of influence; (ii) identifies and assesses potential impacts arising from the implementation of the sub-project on its environments and/or resources; (iii) recommends measures to avoid, mitigate, and compensate the adverse impacts; (iv) presents information on stakeholder consultations and participation during subproject preparation (v) recommends a mechanism to address grievances on the environmental performance of the sub-project; and (vi) provides an environmental management plan.

D. Objectives and Scope of the Environmental Study

9. The main objective of the IEE is to fulfill the requirements of both ADB Safeguard Policy Statement (SPS), 2009 and Government of Nepal Environment Protection Rules, 1997 (and its amendments), particularly pertaining to Rule 3, Annex H of Schedule 1. It aims to help decision makers to make informed decision about project. The specific objectives of the IEE study are as follows:

(i) To identify, predict and evaluate the potential beneficial and adverse impacts of the project on the physical, biological and socio-economical resources in the project area;

(ii) To suggest enhancement measures to augment the benefits of the project, & to propose mitigation measures to avoid, minimize/compensate adverse impacts of the project;
(iii) To prepare appropriate Environmental Management Plan (EMP), and
(iv) To inform public about the proposed project and its impact on their livelihood.

10. Scope of the IEE focuses on the adverse environmental impacts and its mitigation measures relating to the location, design, construction and operation of all the subproject activities. This IEE report is based on the final detailed engineering design report of the subproject.

E. Relevancy of the Project

11. The proposed water supply and sanitation subproject needs to be studied from the environmental point of view as per EPA 1997 and EPR 1997, 2054 BS (and its amendments). The Proposed water supply and Sanitation Subproject is intended to serve drinking water to complete area of ward numbers 1, 2 and 4of Rolpa Municipality (previously Liwang municipality) of Rolpa district. The proposed subproject shall be run from surface water sources to benefit a design population of 10,819 (design year 2039).

12. As the proposed subproject falls within the definitions provided in the EPR 1997(and amendments) Schedule 1 (H) for drinking water projects; an IEE is sufficient. Table I-2 compares the status of the subproject point by point against the conditions defined by Environment Protection Rules 1997 (and its amendments) for which a drinking water will require IEE;

Table I-2: Criteria for Requirement of IEE for Drinking Water Supply Projects as per Schedule 1; Clause H of Environment Protection Rules 1997 and its amendments

Sub-clause	Condition described in the Regulations	IEE Required as per the Regulation Annex 1 H	Conditions in the Subproject
10	Supply of water to a population of	5,000 to 50,000	The design population is 10,819 in 2039

II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

F. Nepal's Environmental Policy Framework

13. Most of the national policies and laws of the Government of Nepal (GoN) are in favor of environmentally sound economic development and growth. Following are the summaries of the relevant policies, acts and regulations and guidelines that have been reviewed during the preparation of the IEE report.

1. The Constitution of Nepal (2072)

14. The Constitution of Nepal defines the right to live in clean environment as one of the fundamental rights of its citizens (Article 16). It prescribes for the State to give priority to the protection of the environment and prevention of its further damage due to physical development activities (Clause 5 of Article 35). Proceeding from, and conformable to, the Constitution, the Government of Nepal has passed a series of environmental laws, policies and implementing regulations and standards. Among these, the basic legislation that provide the framework within which environmental assessment is carried out in A.

2. National Policy on Rural Drinking Water Supply and Sanitation, 2004

15. The policy provides guidance on water and sanitation service provision in rural areas using community led participatory approaches. While partially relevant to the urban context, particularly around the integration of inputs and local capacity building, it generally fails to address the complex operational challenges to be faced by municipal authorities in implementing and managing urban services.

3. National Urban Policy (2007) Policy

16. The policy gives importance to environment conservation while carrying out urban development works and natural resource use; thus, supporting the required environmental conservation and protection in donor-assisted development projects.

4. National Urban Water Supply and Sanitation Sector Policy, 2009

17. The policy is formulated to provide the overall policy support and guidance towards achieving equity in service delivery by ensuring that the financially marginalized households within the system areas are mainstreamed as valid customers of service through design and implementation of financial incentives where so required. It aims to ensure that the roles and responsibilities of central and local government bodies, external development partners, private sector including NGOs and user groups are clearly defined in scheme implementation and regulation and performance management in accordance with national decentralization policy.

G. Government of Nepal Environmental Legal Framework

18. Environment Protection Act (EPA), 1997, which requires a proponent to undertake IEE or environmental impact assessment (EIA) of the proposed subproject and have the IEE or EIA report approved by the concerned sector agency or Ministry of Science, Technology and Environment, respectively, prior to implementation. The EPA: (i) sets out the review and approval process of IEE and EIA reports, that involve informing and consulting stakeholders; (ii) stipulates that no one is to create pollution that would cause significant adverse impacts on the environment or harm to public life and health, or to generate pollution beyond the prescribed

standards; (iii) specifies for the Ministry in charge of environment (currently the MoFE) to conduct inspection of approved projects to ensure that pollution prevention, control or mitigation is carried out according to the approved IEE or EIA report; (iv) provides for the protection of objects and places of national heritage and places with rare plants, wildlife and biological diversity; and (v) states that any person/party affected by pollution or adverse environmental impact caused by anybody may apply to the prescribed authority for compensation to be recovered from the polluter/pollution generator.

19. Environment Protection Rules (EPR), 1997, and its amendments in 1999 and 2007, define the implementing rule and regulations of the IEE/EIA process, elaborating the provisions in the EPA. The preparation, review and approval of IEE and EIA reports are dealt with in Rules 3 to 7 and 10 to 14. Schedules 1 and 2 list down the projects of activities that are required IEE and EIA, respectively, as amended in 2007.

20. Status of securing MOWS−approved IEE. PMO is currently in the process of obtaining MOWS-approved IEE in compliance with the EPR. PMO will ensure that approval from MOWS will be obtained prior to the award of any contract under the subproject. A copy of the approval document from MOWS will be attached in the first semi-annual environmental monitoring report to ADB.

21. All other statutory clearances such as no objection certificates, forest clearances, site location clearances, permits to construct, permits to operate, and/or road cutting permits as required will be obtained by the PMO and/or RPMO. No civil works will commence until and unless required statutory clearances are obtained.

22. Other environmental acts, rules, plans, policies, guidelines that are relevant to the sub-project are presented in Table II-1:

Table II-1: Other Relevant Environmental Act, Rules, Plan, Policies & Guidelines of Nepal

Policy/Law/Guideline	Year	Relevant Provisions	Remarks
Water Resources Act	1992	A comprehensive law on the development, use and conservation of water resources in Nepal, it aims to minimize damage to water bodies by requiring the conduct of EIA & preparation of EIA Report before granting license to use water resources for any purpose.	Per amendment to the EPR, the subproject requires an IEE (instead of EIA) as its nature and extent fall within Schedule 1 of the EPR. Schedule 1 enumerates all types of subprojects that would require IEE only. The license to use water resource for this subproject has been obtained, and a copy attached as Annex 10.
		Proponents shall make sure that the beneficial use of water resources does not cause damage to other water uses/users (Article 4).	
		Article 17 requires proponents to apply for any necessary land acquisition accordingly;	Sites for main structures have been acquired accordingly. Any unidentified site will be acquired accordingly. These are discussed in full in the RP.
		Article 18 requires the compliance to quality standards in making use of water resources. Article 19 prohibits the pollution of water resources. Under the Act are two regulations for drinking water purposes: (i) Water Resources Regulation, 1993, setting out the implementation procedures for the Act; and (ii) the Drinking Water Regulation, 1998, which specifies compliance with the drinking water quality standards and control of water pollution (or sanitation) as it affects drinking water.	The EMP provides measures to comply with the relevant environmental quality standards and national drinking water quality standards.
Forest Act	1993	The Act prohibits the extraction of boulders,	Based on preliminary

Policy/Law/Guideline	Year	Relevant Provisions	Remarks
		rocks, pebbles, sand or soil from national forests, defined as all forests, excluding private forests, whether marked or unmarked with forest boundary, to include waste or uncultivated lands, or unregistered lands surrounded by the forest or situated near adjacent forests as well as paths, streams rivers, lakes, riverine lands within the forest.	assessment and site visits, no forest trees covered by the Forest Act will be cut. For any unanticipated cutting of trees covered under the Act, a forest clearance will be obtained by PMO/RPMO
Child Labor Prohibition and Regulation Act	2001	The section 3 of the act prohibits a child from engaging in work, sub clause 1 of the clause 3 states "Nobody shall engage in work a child who has not completed fourteen years of age as a labor and sub clause 2 states "Nobody shall engage a child in a risk full occupation or work set forth in the Schedule".	The bidding document provides condition that contractors shall comply with applicable labor laws and core labor standards of Nepal on prohibition of child labor, equal pay for equal work of equal value regardless of gender, ethnicity or caste, elimination of forced labor and disseminate information on sexually transmitted diseases including HIV/AIDS to employees and local communities.
Labor Act & Labour Rules	2017 2018	The Act emphasizes OHS Policy; Safety & Health Committee; OHS arrangements including child care center; workplace safety; environment of work place; and specific Labour Audit	The bidding document includes condition that the contractor shall adopt all safety measures for the safety of its workers and other personnel and shall also adhere to environmental and aesthetic issues identified during construction works.

Policy/Law/Guideline	Year	Relevant Provisions	Remarks
Solid Waste Management Act	2011	Article 4 provides that the management of hazardous, medical, chemical or industrial waste rests upon the generators of such wastes. Management should be as prescribed in the Act. Article 5 provides that individuals and entities have the duty to reduce the amount of solid waste generated while carrying out work or business.	It also stipulates to make arrangements such as removal of waste accumulated during production process and prevention of dust, fume, vapor and other waste materials, which adversely affect the health of workers. EMP prescribes eco-friendly management of solid and hazardous wastes.
Drinking Water Rules	1998	The Rules: (i) gives the procedure for the settlement of dispute on use of water sources; (ii) requires water supplier to maintain the quality of water as prescribed in the Water Resources Act; (iii) prohibits water supplier to construct structures and conduct activities that would pollute the water source and cause significant adverse effect on the environment.	Monitoring of the quality of supplied water is prescribed in eth EMP following the NDWQS Directives. GoN has approved the Subproject's IEE Report.
Local Government Operations Act	2017	The Local Government Operation Act, 2017 empowers the local authority for the conservation of local natural resources and implementation of environmental conservation activities along with prime responsibility of conducting development projects which includes water supply, sanitation and awareness activities.	Provides basis for Local Government to monitor the environmental performance of the subproject. EMP provides the responsibilities of LGs in EMP implementation.
National Environmental Policy and Action Plan (NEPAP)	1993	Of its five objectives, most relevant to the Subproject are to: (i) mitigate adverse environmental impacts; and (ii) safeguard national & cultural heritage & preserve biodiversity, within & outside protected areas.	Subproject will not impact on physical cultural heritage & biodiversity. EMP provides measures to mitigate impacts.
National Water Supply and Sanitation Policy	1998	The Policy requires the: (i) monitoring of water quality supplied by completed WSS projects; and (ii) evaluation of their benefits in improving	Monitoring of the quality of supplied water is prescribed in the EMP following the

Policy/Law/Guideline	Year	Relevant Provisions	Remarks
		health (e.g., reducing water-borne diseases) and in relieving the sufferings of women and other disadvantaged groups in carrying out their responsibilities over water collection and maintenance of sanitation and hygiene.	NDWQS Directives.
National Urban Policy	2007	Policy gives importance to environment conservation while carrying out urban development works and natural resource use; thus, supporting the required environmental conservation and protection in donor-assisted development projects.	ADB IEE is conducted to ensure environmental conservation and protection.
National Urban Water Supply and Sanitation Sector Policy	2008	The Policy requires the IEE or EIA of proposed WSS projects in accordance with the EPA/EPR to: (i) incorporate consultations with key stakeholders, including end-point users; & (ii) specify measures to mitigate environmental impacts prior to, during construction & operation, as well as corrective measures.	GoN IEE has been approved. This ADB IEE will be submitted to ADB for review and approval.
Updated 15-Yr Development Plan for Small Towns Water Supply and Sanitation Sector	2009	The Plan defines the population threshold of "small towns" to be in the range of 5,000 to 40,000. Reference to Schedules 1 and 2 of the EPR, as amended in 2007, places water supply projects in small towns under Schedule 1 or within the threshold of water supply projects requiring only an IEE. The Plan emphasizes monitoring and evaluation as an important component of a project to determine the overall impact of a project.	EMP prescribes environmental effects and performance monitoring.
Implementation Directives for the National Drinking Water Quality Standards	2005	It sets out the water sampling, testing, analysis, monitoring and surveillance procedures to certify that the quality of supplied drinking water conforms to the National drinking Water Quality Standards.	Monitoring of the quality of supplied water is prescribed in eth EMP following the NDWQS Directives.
Guidelines for	2071	This procedure simplifies the previously needed	

Policy/Law/Guideline	Year	Relevant Provisions	Remarks
removel of trees from government land		procedure of getting approval from cabinet for	
National EIA Guidelines	1993	Chapter 3 of this guideline requires that an Initial Environmental Examination report must be prepared for those projects which may cause significant impact on environment, whose impact may be known easily and for which mitigation measures may be revealed easily, as mentioned in Schedule-1.	EMP prescribes environmental impact and mitigation measures and their performance monitoring.

H. International Environmental Agreements

23. Table II-2 below lists the relevant international environmental agreements that Nepal is party to, and their relevance to various subprojects under UWSSP.

Table II-2: International Environmental Agreements Relevant to the Subproject

International Environmental Agreement	Year*	Relevant Provisions	Remarks
World Heritage Convention	1978	Parties to ensure the protection and conservation of the cultural and natural heritage situated on territory of, and primarily belonging to, the State	The subproject will help the Government of Nepal comply with this agreement. The subproject has been selected ensuring that it will not negatively impact cultural and natural heritage at the subproject sites.
Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention)	1987	Parties to conserve and wisely use wetlands (i.e., maintaining their ecological character) as a contribution towards achieving sustainable development locally and throughout the world	The subproject will help the Government of Nepal comply with this agreement. The subproject components are not located in wetlands and other protected areas of the country.
Convention on Biodiversity	1992	Parties to require the environmental assessment of projects that are likely to have significant adverse effects on biological diversity with a view of avoiding or minimizing such effects	The subproject will help the Government of Nepal comply with this agreement. The subproject will not impact biodiversity in the country.
UN Framework Convention on Climate Change	1992	Parties to take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects.	The subproject will help the Government of Nepal comply with this agreement. The subproject will ensure implementation of its EMP as measure to minimize the causes of climate change.
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	1996	Parties to, among others, minimize the amount and toxicity of hazardous waste generated, manage the hazardous and other wastes they generate in an environmentally sound manner and as close as possible to the source of generation.	The subproject will help the Government of Nepal comply with this agreement. The subproject will ensure implementation of its EMP as measure to avoid or minimize the generation and disposal of hazardous wastes.

* (Year) - Year last amended

24. The subproject will continuously support Nepal's commitment to these international agreements. Eventually, the subproject will help the country fulfill its commitment to the 6th goal of United Nations Sustainable Development Goals, which is to ensure access of all to clean water and sanitation.

I. Environmental Assessment Requirements

25. The Subproject is subject to the environmental safeguard requirements of both the ADB and the Government of Nepal.

J. Environmental Assessment Requirements of the ADB

26. All projects funded by the ADB must comply with the Safeguard Policy Statement (SPS) 2009 to ensure that these are environmentally sound, designed to operate in compliance with applicable regulatory requirements, and not to cause significant environmental, health, or safety impacts. The policy promotes international good practice as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines.[1]

27. Table II-3 summarizes the environmental safeguard requirements applicable to the subproject per ADB SPS.

Table II-3: SPS 2009 Safeguard Requirements

SPS 2009 - Safeguard Requirements	Remarks
Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment (EA) so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks.	REA has been undertaken, indicating that the Subproject is **NOT**: (i) environmentally critical; and (ii) adjacent to or within environmentally sensitive/critical area. The extent of adverse impacts is expected to be local, site-specific, confined within main and secondary influence areas. Significant adverse impacts during construction will be temporary & local. Hence can be mitigated without difficulty. Hence, IEE is sufficient.
Conduct EA to identify potential direct, indirect, cumulative, & induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential transboundary global impacts, including climate change.	IEE has been undertaken to meet this requirement. (Impacts are discussed in Section VI). No transboundary & global impacts, including climate change.
Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and document the	Analysis of alternatives is presented in Section VII.

[1] New Version of the "World Bank Group Environmental, Health, and Safety Guidelines", April 30, 2007, Washington, USA. http://www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuiidelines

SPS 2009 - Safeguard Requirements	Remarks
rationale for selecting the particular alternative proposed. Also consider the no project alternative.	
Avoid, and where avoidance is not possible, minimize, mitigate, &/or offset adverse impacts and enhance positive impacts by means of environmental planning & management. Prepare an EMP that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators.	An EMP has been prepared to address this requirement. Section VIII
Carry out meaningful consultation with affected people & facilitate their informed participation. Ensure women's participation. Involve stakeholders, including affected people & concerned NGOs, early in the project preparation process & ensure that their views & concerns are made known to & understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to EA. Establish a GRM to receive & facilitate resolution of affected people's concerns & grievances on project's environmental performance.	Key informant and random interviews have been conducted. A grievance redress mechanism for the resolution of valid project-related social and environmental issues/concerns is presented in Section VIII.
Disclose a draft EA (including the EMP) in a timely manner, before project appraisal, in an accessible place & in a form & language(s) understandable to affected people & other stakeholders. Disclose the final EA, & its updates if any, to affected people & other stakeholders.	The draft IEE will be disclosed on ADB's website prior to Project appraisal. After the GoN has approved the IEE Report, approved IEE will be made available at the offices of the PMO, ICG and WUSC.
Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.	EMP implementation, reporting and disclosure of monitoring reports are included in this IEE report.
Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the overall benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources.	The sub-project does not encroach into areas of critical habitats. No trees will need to be cut. The major project structures and transmission main and distribution networks are proposed on public land and existing public road RoWs as far as possible. Therefore, no settlements are expected to be adversely affected due to acquisition of small size of public vacant lands at different sites. The public land can be used after getting consent from Municipality.
Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized	This requirement is also applicable to the sub-project in the aspect of pollution management, and waste management, e.g., effluent from

SPS 2009 - Safeguard Requirements	Remarks
standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phase-outs. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.	septic tanks and generated sludge and slurry disposal from water supply and sanitation structures. The sub-project will ensure that the contractor's measures and practices are in line with internationally accepted standards
Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.	EMP provides measures to mitigate health and safety hazards during construction and operation phases.
Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.	The Subproject will not affect any physical cultural resource. The EMP recommends the measures to mitigate any such adverse impacts, and also in case of chance find.

28. During the design, construction, and operation of the subproject the PMO and RPMO West shall apply pollution prevention and control technologies and practices consistent with international good practices, as reflected in internationally recognized standards. When the Government of Nepal regulations differ from these levels and measures, PMO shall achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific subproject circumstances, PMO will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

K. IEE Approval Process of Nepal

29. The Environment Protection Rules (EPR) defines for the preparation, review, and approval of the IEE report. The process applicable to the sub-project is summarized in Table II-4 below. The key environmental quality standards applied in relevant to this IEE are listed in Table II-5 and their details featured as Annex 2-A.

Table II-4: The GoN IEE Report Preparation, Review, Approval and Implementation Process

Steps in the Process	Remarks
Proponent refers to EPR Schedules 1 & 2 for the required environmental assessment (IEE or EIA) to carry out.	Sub-project requires an IEE.
If proposed project requires an IEE, Proponent prepares an IEE schedule of work/ToR using the format prescribed in Schedule 3 of the EPR and submit this to the CSA for approval.	ToR of the sub-project has been submitted.
Proponent carries out IEE according to the approved work schedule/ToR and prepares an IEE Report following the format prescribed in EPR Schedule 5 and incorporating stakeholders' feedback applying the consultation procedure specified in the EPR.	Sub-project carried out the IEE and prepared the IEE Report accordingly.
Proponent submits 15 copies of the IEE Report along with the project proposal and recommendation of the concerned VDC or Municipality to the CSA.	Sub-project submitted documents accordingly for review and approval.
CSA conducts review and grants approval of IEE Report.	
➢ If review reveals project implementation to have no substantial adverse impact on the environment, CSA grants approval within 21 days from receipt of report.	This is in process of approval
➢ If review reveals the necessity to carry out an EIA, Proponent conducts an EIA following the prescribed EIA process.	Since ToR for IEE has been approved by MoWS, no EIA is required as per EPR, 1997
Proponent implements approved IEE Report and any terms and conditions given with the approval.	Sub-project has not started implementation.
CSA monitors and evaluates impact of project implementation. When necessary, issue directives to the Proponent to institute environmental protection measures.	Sub-project has not started implementation.
MoWS conducts environmental audit after two years of project commissioning/operation.	Sub-project has not started implementation.

CSA Concerned Sector Agency
EPR Environment Protection Rules, 2054 (1997), with amendments in 1999 and 2007
MWSS Ministry of Water Supply

E. RELEVANT STANDARDS

Table II-5: Relevant Environmental Quality Standards

Particular	National Standard	International Standard
Ambient air quality	National Ambient Air Quality Standards, for Nepal, 2003	WHO Air Quality Guidelines, Global Update, 2005
Noise	National Noise Standard Guidelines, 2012	WHO Guideline Values on Noise Level
Drinking water quality	National Drinking Water Quality Standards, 2006	WHO Guidelines for Drinking-water Quality, Fourth Edition, 2011

* For surface and ground water quality monitoring, the National Drinking Water Quality Standard shall be applied since these resources are used for drinking.

III. APPROACH AND METHODOLOGIES

30. The present Initial Environmental Examination report has been prepared based on the Terms of Reference (ToR) approved by the Ministry of Water Supply, Government of Nepal on 9th May 2018. The study has followed the provisions outlined in the Environment Protection Act, 1997 and Environment Protection Rules, 1997 and Safeguard Policy Statement, 2009 of the Asian Development Bank (ADB). The major activities undertaken during the preparation of IEE are outlined below;

1. Literature Review

31. Existing secondary data relevant to the proposed subproject was collected from various published and unpublished sources from different governmental and non-governmental organizations. All related maps, aerial photographs; newspaper articles were gathered and studied. The engineering report of the subproject and other relevant documents were thoroughly reviewed. Policies, legislations and guidelines relevant to the subproject were also referred. Specifically, water supply, sanitation, urban aspects and biodiversity aspects were considered.

32. The desk study also involved the preparation of questionnaires/checklists/matrices for detailed field study to collect primary data in order to specify the area that would be covered by the assessment, the geographical boundary of the influence area was delineated on the topographical map. Depending upon the nature and extent of the expected impact area, the Zone of Influence (ZoI) was categorized into Core Area (CA) and Surrounding Area (SA).

2. Field Work

33. Detailed field investigations were carried out to collect baseline information on the physical, biological, socio-economic and cultural environment of the subproject area. The local communities and key persons were consulted to understand the social, biological and physical nature of the area. Walk-through survey was conducted in the subproject area. Checklists, forms and questionnaires were used to collect the primary information. Followings are the studies covered;

Physical Assessment

34. Existing physical attributes of the subproject area were studied from topographical maps and site observation, complemented by secondary sources of information from reports and interviews. Information on the location, topography, land use, geology, and soil hydrology were collected during field work and from the reports obtained from different institutions. Field observation checklists were also used for study of the physical environment.

Biological Assessment

35. The ecological attributes of the area was gathered during the field survey. Information on vegetation pattern and forest area were screened and collected where relevant. Identification of wild flora and fauna, rare and endangered species was carried out during field observation and

questionnaire surveys. The scientific names of the flora and fauna were later recorded. Checklists and key informant questionnaires were also used for the study of biological environment.

Socioeconomic Assessment

36. Socio-economic and cultural environment of the project area such as population, caste, ethnicity, community structures, distribution of income and sources of livelihood, and expected water users were obtained through various secondary and primary sources of data. These included literature review, questionnaire surveys, and consultations with key persons covering wide range of stakeholders. Questionnaires were used for socio-economic and cultural aspects of the environment. Beneficiary groups and local authorities were also consulted for details on local socio-economy.

3. Stakeholder Consultations and Information Dissemination

37. Public consultation and information dissemination process was carried out to inform the local people and concerned agencies about the project and to obtain their concerns, issues and suggestions. The methods adopted for conducting public consultations included holding meetings with district officials, concerned departments, institutions and NGOs; key-informant consultations, and meetings with community members within the project area.

38. A 15 days public notice was published (18th May 2018, Arthik Abhiyan) in a national daily newspaper seeking written opinions from Municipality office/ward offices, DCCs, schools, local health centers and related local organizations as well as concerned people. A copy of the Public Notice was also posted in the notice board of Municipality office and other public areas in the project area and the deed of inquiry was collected. Public consultation was conducted on 4th June 2019, and a recommendation letter was received from the municipality regarding conduction of IEE and implementation of the project. The final IEE report, after incorporating the comments from the concerned department and ADB, will be made available in their respective websites and will be made available to anyone interested upon request.

4. Data Processing, Impact Prediction, Identification and Evaluation

39. The information obtained from the desk study and field works were processed in a standard format to maintain consistency. The data were tabulated and maps were interpreted. The impacts were then evaluated. The mitigations and monitoring measures were then proposed based on the impacts identified during the study.

40. The impacts are evaluated based on their impact levels, coverage of area and duration of the impacts. The evaluation will be used to emphasize the need to address the concerns. Magnitude, geographical extent and duration of impacts are defined below:

41. **Magnitude**: This can be low-L (minor), medium-M (moderate), and high-H (major), depending on the scale or severity of change.

42. Geographical extent: If the action is confined to the project area, it is referred as site specific (Ss), if it occurs outside area but close to project area, the extent of impact is local (Lc), if it occurs far away from the project, it is referred as regional (R).

43. Duration: It can be short term (St - i.e. less than 3 years), medium term (Mt - i.e. 3-20 years), and long term (Lt - i.e. more than 20 years).

44. For the Impact evaluation the matrix method with numerical ranking is used for the quantitative ranking of the predicted impacts. The numerical scale mentioned in the National EIA Guidelines 1993 has been adopted for this project. The numerical scale is as:

Magnitude		**Extent**		**Duration**	
High	60	Regional	60	Long Term	20
Moderate	20	Local	20	Medium Term	10
Minor	10	Site Specific	10	Short Term	05

5. Preparation of IEE Report

45. Upon meeting the GoN and ADB requirements for conducting IEE, an IEE report is prepared in a format prescribed in Environment Protection Rules 1997. The format for EPR 1997 is followed but the requirements of ADB are complied while preparing the report in GoN format.

6. Team Members for IEE Study

46. The following experts were mobilized to complete the IEE study of Liwang Water Supply & Sanitation Project (Table III-1).

Table III-1: Study Team for IEE Study of the Subproject

SN	Name of Expert	Designation	Expertise field
1	Mr. Mohan Karkee	Project Team Leader	Construction Supervision
2	Yogesh Shakya	Environmental Specialist IEE Team Leader	Environmental Management (IEE Team Leader)
3	Sheela Sharma	Assistant Environmental Specialist	Environment
4	Deependra Pokharel/Giri Bahadur Sunar	Social Safeguards Specialist	Socio-economist
5	Manoj Kumar Sharma	Engineer	Contract Management
6	Elina Pudasainee	Support Staff	

IV. DESCRIPTION OF THE PROJECT

A. Type, Category, Size and Magnitude of the Project

47. The proposed subproject is a mixed use of gravity and groundwater based pumping system, treatment plant, ground reservoirs and an elevated reservoir with a distribution system. The service area is wards 1, 2 & 4 of Rolpa Municipality. It falls in category B of ADB environmental categorization.

48. As the total design water demand is 22.09 lps the system will use gravity sources during the wet season (from June to November) and by pumping during the dry season. The water supply system has been designed for a base year population of 6,466 for the year 2019. The system has been designed to tap surface water source from an intake and using different water sources for a total design year population of 10,819 in 2039. Eight numbers of water storage reservoir tanks have been proposed at different locations considering in mind the elevation difference of the service area. The reservoirs with capacity of 15 cum, 30 cum, 40 cum, 120 cum, 20 cum, 140 cum, 100 cum and 80 cum with total of 545 cum storage capacity of reservoirs are designed for the collection and storage of water.

B. The Sub-Project

49. Liwang Urban Water Supply and Sanitation Project is a basic infrastructure development project with motive of gender strengthening in the long run. The project has been conceptualized as surface water based water supply system integrated with sanitation improvement in the project area. The water supply component of the subproject contains following construction components;

Table IV-1: Subproject Components Based on Bidding Documents

Components		Nos.	Description (Volume / Capacity / Footprint Area / Length)
1.	Intake structures	4 nos.	22.09 lps in total
			Mulkhola 8.31 lps; Sattale 6.67 lps
			Mulpani 4.03 lps; Rimkhola 3.08 lps
2.	Service Reservoirs (OHT/ RVT, Valve Chambers, surface valve box, etc.)	8 nos. (7 new, 1 existing)	545 cu. m. (ranging from 15 to 140 m^3)
	Treatment facility subcomponents:		
3.	Pressure Filters	4 nos.	1.7 m - 2.0 m diameter
4.	Disinfection Units	4 nos.	Mixing tank - 1000L Dosing tank - 250 L
5.	Water Quality Testing Laboratory	1 no.	24 sq. m.
6.	Distribution Network.	1 network	48.120 km.
7.	Transmission Mains.	1 network	10.071 km.
8.	Pumps (including related accessories, electrical panels, generators, etc.)	9 nos. (9 standby)	Capacity of 3 kw to 11 kw
9.	Fire Hydrants	10 nos.	For base year
10.	House Connections.	1060	For base year

11.	11 KV transmission lines	1 network	4 k.m.
12.	Electrical Transformers	4 nos.	3 of 50 KVA; 1 of 25 KVA
13.	Office Building	1 no.	170 sq. m.
14.	Guard House	3 no.	30 sq. m. each
15.	Generator House	4 no.	15 x 4 sq. m.
16.	Standby Electrical Generator	4 Nos.	1 no. 40 kVA; 3 nos. 62.5 kVA
17.	Public Toilets	1 no.	42 sq. m.

1. Salient Features of the Project

50. The salient features of Liwang Urban Water Supply and Sanitation Project have been tabulated in the table below;

Table IV-2: Salient Features of the Project

<table>
<tr><th>SN</th><th>Items</th><th>Description</th></tr>
<tr><td>1</td><td>Name of the Project</td><td>Urban Water Supply & Sanitation Sector Project,</td></tr>
<tr><td></td><td></td><td>Liwang Urban Water Supply and Sanitation Project, Liwang - Rolpa</td></tr>
<tr><td>2</td><td>Type</td><td>Pumping and Gravity type using spring water as source</td></tr>
<tr><td>3</td><td>Study Level</td><td>Detailed Engineering Design Report</td></tr>
<tr><td>4</td><td>Location Area</td><td></td></tr>
<tr><td></td><td>Province / District</td><td>Province 5 / Rolpa</td></tr>
<tr><td></td><td>Municipality</td><td>Rolpa Municipality (Previously Liwang)</td></tr>
<tr><td></td><td>Wards</td><td>Wards 1, 2 & 4 (Previous wards 5, 6, 7, 8)</td></tr>
<tr><td>5</td><td>Available Facilities</td><td></td></tr>
<tr><td></td><td>Road</td><td>Rapti Highway (connected to East-west highway in Bhaluwang)</td></tr>
<tr><td></td><td>Nearest Airport</td><td>Wadachour, Rolpa</td></tr>
<tr><td></td><td>Existing Water Supply System</td><td>Partially covered by piped water supply system, springs are used.</td></tr>
<tr><td></td><td>Electricity, communication</td><td>Available</td></tr>
<tr><td></td><td>Health Services</td><td>Available</td></tr>
<tr><td></td><td>Banking Facilities</td><td>Available</td></tr>
<tr><td>6</td><td>Source Characteristics</td><td></td></tr>
<tr><td></td><td>Source Name and Type</td><td>Spring Sources: Mulkhola, Mulpani, Sattale, Rim khola</td></tr>
<tr><td></td><td>Source Location</td><td>Wards # 1, 2 &4</td></tr>
<tr><td></td><td>Proposed Tapping yield (lps)</td><td>
<table>
<tr><th>SN</th><th>Sources</th><th>Tapping (lps)</th></tr>
<tr><td>1</td><td>Mulkhola</td><td>8.31</td></tr>
<tr><td>2</td><td>Mulpani</td><td>4.03</td></tr>
<tr><td>3</td><td>Sattale</td><td>6.67</td></tr>
<tr><td>4</td><td>Rimkhola</td><td>3.08</td></tr>
<tr><td colspan="2">Total</td><td>22.09</td></tr>
</table>
</td></tr>
<tr><td>7</td><td>Project Components</td><td></td></tr>
<tr><td></td><td>Intake structures</td><td></td></tr>
<tr><td></td><td></td><td>Multiple distribution system is adopted, 8 distribution</td></tr>
</table>

SN	Items	Description
	Storage Reservoirs	reservoirs ranging from 15 Cum to 140 Cum (Total capacity is 545 Cum)
	Valve Chamber (Nos.)	Type 1 (1500x900x1000): 16 #
		Type 2 (900 x900x1000): 198 #
	Community Stand Posts	Nil
	Designed Household connection Household Connection (Nos.)	1,931 1,060 (during construction phase)
	Total Length of pipe (Km)	Transmission: 10.071 km Distribution Networks: 48.120 km
	Treatment Facility	Pressure Filter and Disinfection
	Pressure Filters	4
	Disinfection Units	4
	Water Quality Testing Laboratory	1 no.
	Distribution Network.	48.120 km
	Transmission Mains.	10.071 km
	Pumps (including related accessories, electrical panels, generators, etc.)	9 nos. (9 standby); Capacity ranging from 3 kw to 11 kw
	Fire hydrants	10 numbers
	11 KV transmission lines	4 km.
	Electrical Transformers	4 (3 of 50 kVA, and 1 of 25 kVA)
	Office Building	1 no. with footprint of 170 sq. m.
	Guard House	3 nos. with footprint of 30 sq. m. each
	Generator House	4 nos. with footprint of 20 sq. m.
	Standby Electrical Generator	4 Nos. (1 no. 40 kVA, 3 nos. 62.5 kVA)
	Public Toilet	1 no.; 42 sq. m.
8	**Social Status**	
	Survey Year Population (2016)	5,809 (permanent), 181 (floating) [Total 5,990]
	Base Year Population (2019)	6,271 (permanent), 195 (floating) [Total 6,466]
	Design Year Population (2039)	10,487 (permanent), 332(floating) [Total 10,819]
	Household Numbers (2016, 2039)	1,060 in 2016, and 1931 in 2039
	Average Family Sizes	5.48
	Adopted Growth Rate	3.0 (high), 2.50 (medium), 2.20(low medium)
9	**Total Water Demand**	
	Base Year 2019	Total 1,116.73(m^3/day) [12.9 lps]
	Design year 2039	Total 1902.28(m^3/day) [22.0 lps]
10	**Total Cost of the Project (NRs.)**	**350.4056 million** with 15% contingencies & 13%VAT
	Water Supply Sector	NRs. 343.5383 million
	Sanitation Sector	NRs. 6.8673 million
11	**Per capita Investment (for water supply sector)**	**Base Year** : NRs. 53,129.05 **Design Year** : NRs. 31,753.24

2. Subproject sub-systems and its components

51. Liwang Urban Water Supply and Sanitation Sector Project has 8 sub-systems and these sub-systems are described below; Based on the topography, settlements and existing structures decentralized distribution systems has been adopted and are described below:

52. **Purano Bamruk**: This sub-system is proposed to serve part of the area situated in ward 1 and is able to cater 42 households and 230 populations with 3 rental population. Gravity surface sources (Mulkhola) will be used to feed an existing 15 cum reservoir through which water will be distributed.

53. **Bamruk-Baddhichour**: this sub-system is proposed to serve part of the area situated in ward 1 and is able to cater 83 households and 455 populations with 24 rental population. Gravity surface sources (Mulkhola) will be used to feed an existing 40 cum reservoir through which water will be distributed.

54. **Mewang-Diubuje**: this sub-system is proposed to serve part of the area situated in ward 4 and is able to cater 34 households and 186 populations with 15 rental population. Gravity surface sources (Mulkhola) will be used to feed an existing 10 cum reservoir through which water will be distributed.

55. **Tudhikhel Solabang**: This sub-system is proposed to serve part of the area situated in ward 4 and is able to cater 218 households and 1195 populations with 16 rental population. Gravity surface sources (Sattale) will be used to feed an existing 140 cum reservoir through which water will be distributed.

56. **Sikshya**: this sub-system is proposed to serve part of the area situated in ward 4 and is able to cater 50 households and 274 Populations with 12 rental population. Pumping surface sources (Sattale) will be used to feed an existing 30 cum reservoir through which water will be distributed.

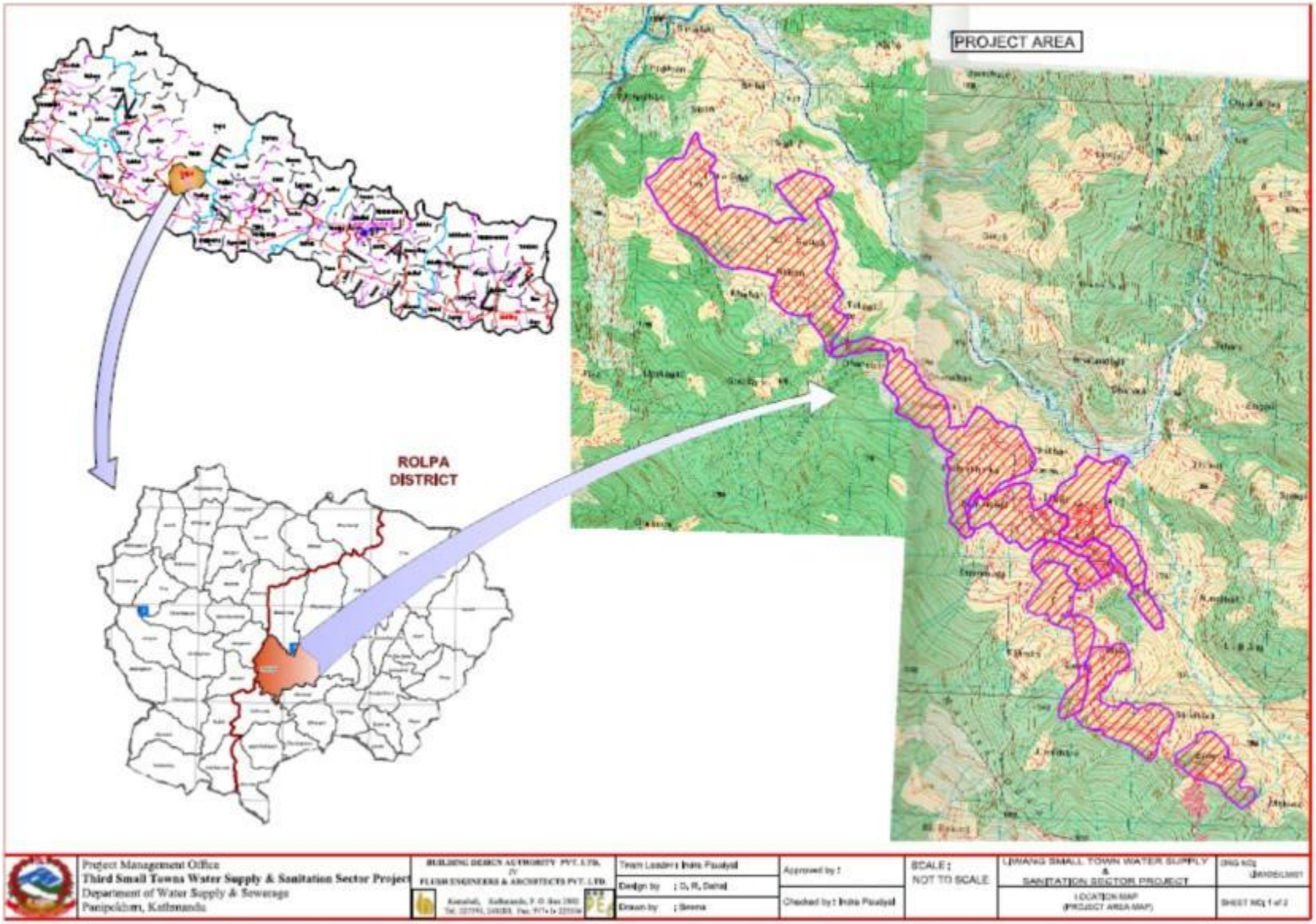


Figure IV-1: Location Map of the Project Area

57. **Shivalaya-Bichbazar**: this sub-system is proposed to serve part of the area situated in ward 4 and is able to cater 263 households and 1441 populations with 48 rental population. Pumping surface sources (Sattale) will be used to feed an existing 170 cum reservoir through which water will be distributed.

58. **Kavre Kharka**: this sub-system is proposed to serve part of the area situated in ward 2 and is able to cater 201 households and 1102 populations with 27 rental population. Gravity surface sources (Mulpani) will be used to feed an existing 120 cum reservoir through which water will be distributed.

59. **Seewang- Reuga**: this sub-system is proposed to serve part of the area situated in ward 2 and is able to cater 169 households and 926 populations with 36 rental population. Gravity surface sources (Rimkhola) will be used to feed an existing 100 cum reservoir through which water will be distributed.

3. Water Source

60. Liwang area has numerous spring sources ranging from 5 lps of discharges to larger ones. Some of them are;

a. Sattale Source (Spring source) dry season discharge 13.6 lps ,
b. Mulpani Source (Spring source) dry season discharge 14.6 lps,
c. MulkholaSource (Spring source) dry season discharge 9.3 lps,
d. Rimkhola Source (Spring source) dry season discharge 5.3 lps.

4. Water Quality Assessment

61. Certified laboratory was used to conduct chemical, bacteriological and physical tests of the proposed surface water. Samples from various available sources were tested in March 2018 for conducting laboratory analysis to test for other physical and chemical parameters with respect to the National Drinking Water Quality Standard (NDWQS) guidelines for potable drinking water (Annex 8). The following table exhibits the finding with respect to the NDWQS;

Table IV-3: Water Quality Assessment

SN	Parameters	Mulkhola Source	Sattale Source	Mulpani Source	Rim Khola Source	NDWQS, Nepal
1	pH at 20°C	7.8	8.1	7.8	7.8	6.5 - 8.5
2	Electrical Conductivity (µmhos/cm)	297	303	286	273	1500
3	Turbidity (NTU)	1	6	5	<1	5 (10)
4	Color (Chromacity Unit)	<0.05	<0.05	<0.05	<0.05	5 (15)
5	Taste	Unobjectionable				-

SN	Parameters	Mulkhola Source	Sattale Source	Mulpani Source	Rim Khola Source	NDWQS, Nepal
6	Odor	Unobjectionable				-
7	Total Dissolved Solids	192	138	198	186	-
8	Total Hardness as CaCO3, (mg/l)	190	200	184	176	500
9	Carbonate Hardness as CaCo3	190	200	184	176	-
10	Total Alkalinity as CaCO3, (mg/l)	220	230	215	205	-
11	Bicarbonate Alkalinity(mg/L)	220	230	215	205	-
12	Chloride, (mg/l)	<0.5	<0.5	<0.5	<0.5	250
13	Ammonia, (mg/l)	N.D.(<0.05)	0.06	<0.05	0.17	1.5
14	Nitrate, (mg/l)	1.48	0.96	0.37	0.74	50
15	Aluminium (mg/L)	<0.01	<0.01	<0.01	<0.01	-
16	Fluoride	<0.05	<0.01	<0.05	<0.05	-
17	Sulphate	<1	<1	<1	<1	-
18	Calcium, (mg/l)	39.28	41.68	39.28	37.67	200
19	Arsenic	N.D.(<0.01)	N.D.(<0.01)	N.D.(<0.01)	N.D.(<0.01)	-
20	Mercury	N.D.(0.0005)	N.D.(<0.0005)	N.D.(0.0005)	N.D.(0.0005)	-
21	Iron	N.D.(<0.05)	0.27	0.21	N.D.(<0.05)	-
22	Manganese, (mg/l)	N.D.(<0.02)	N.D.(<0.02)	N.D.(<0.02)	N.D.(<0.02)	0.3
23	Cadmium	N.D.(<0.003)	N.D.(<0.003)	N.D.(<0.003)	N.D.(<0.003)	-
24	Lead	N.D.(<0.01)	N.D.(<0.01)	N.D.(<0.01)	N.D.(<0.01)	-
25	Copper	<0.01	<0.01	<0.01	<0.01	-
26	Chromium	N.D.(<0.01)	N.D.(<0.01)	N.D.(<0.01)	N.D.(<0.01)	-
27	Zinc	0.02	0.02	0.02	0.03	-
28	*E.coli* count (MPN Index/ 100 mL)	Nil	Nil	>1100	Nil	-

Source: Laboratory Analysis Report, 2018

62. Sample tests of the sources indicate most of the parameters comply with the NDWQS value. This is to be noted water samples were collected in the month of February 2018 (dry season).

5. Treatment Process

63. The water treatment process has been selected based on the raw water quality. The proposed treatment process aims to remove the high concentrations of turbidity present in the raw water. It also kills pathogenic organisms present in raw water and ensures the presence of residual chlorine to kill the pathogenic organisms during the conveyance of treated water in pipelines. The treatment process consists of pressure filters and disinfection with associated accessories likes chemical dosing, valves and pipes. The schematic diagrams of the proposed treatment plant are shown in the figures below;

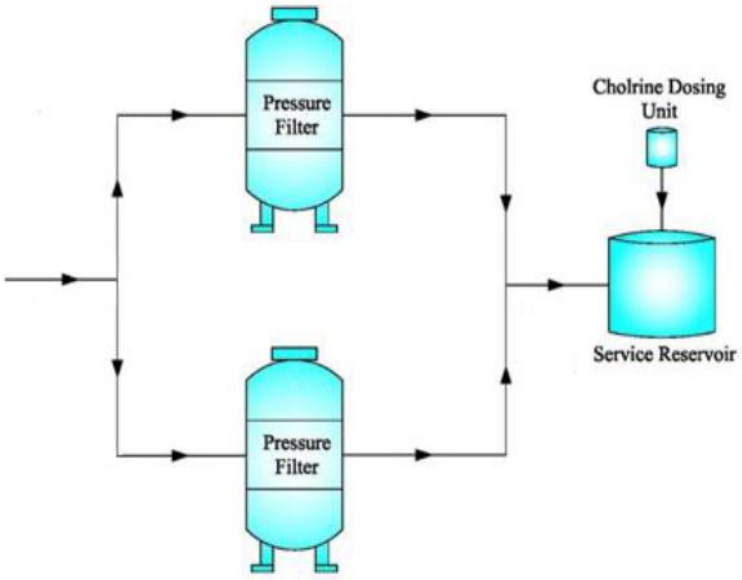


Figure 0-1: Schematic Diagram of Treatment Process

Pressure Filters

64. Pressure filters made of mild steel is proposed to remove turbidity and precipitated iron. The pressure filters are to be packed with sand and gravel as per the design specifications. The under drainage system and back wash system should also be installed in the pressure filters. The pressure filter is expected to bring down the turbidity of water as per the NDWQS. Large number of Coliforms is also expected to be removed in the pressure filter due to biological action.

Disinfection

65. Although pressure filter removes coliforms to certain extent, the effluent of the pressure filter might still contain coliforms which might be harmful to human health. These coliforms are killed by disinfection process and make the water safe. The disinfection is proposed by the addition of bleaching powder in the reservoir. Bleaching powder is to be dosed from chlorine dosing tank through a doser. The chlorine dose of 1 mg/l is proposed.

6. Transmission Mains

66. Transmission mains of 9,584 m have been estimated to convey water from the source to the distribution reservoirs of all the schemes. GI pipes are proposed for pumping schemes. Transmission pipes for all the gravity schemes are proposed to have HDP (PE) pipes. Following table describes the length and sizes of the transmission mains required.

Table IV-4: Transmission Main

SN	Description	Length (m)	
1	Mul Khola Source	4,008	
2	Sattale Source	2,612	
3	Mulpani Source	1,235	
4	Rim Khola Source	2,216	
	Total	**10,071**	

7. Ground Reservoir

67. The total storage requirement for the system at the end of the design period i.e. 2039 is 545 m^3 which will be met by additional ground reservoirs. Most of the existing reservoirs are made of ferrocement and thus will not be used. Few which are in good condition and needs minor repair are proposed to use. The reservoirs will be constructed of RCC and have been designed as ground based. The following table summarizes the requirement of reservoir tanks sub-system wise;

Table IV-5: Requirement of Reservoir

SN	Distribution System	Reservoir Size		
		Existing Capacity (Cum)	Provided capacity (Cum)	Remarks
1	Purano Bamruk	20	15	Ferro-cement (Replace)
2	Bamruk-Badichaur-Mewang	10	30	Ferro-cement (Replace)
3	Mewang-Duibuje	40	40	Masonry Wall (Reuse)
4	Tudikhel-Solowang	40	120	Ferrocement (Replace)
5	Shikshya	NA	20	
6	Sibalaya-Bichbazaar	20	140	Ferro-cement
7	Kavrakharka-Thalawang-Thaliwang	20	100	Ferro-cement (Replace)
8	Siwang-Reeuga	15	80	Replace
Total			**545**	

8. Electrical Facilities

68. Settlements viz Siwalay, Sikshya etc are located in higher altitude than the available sources and thus needs pumping. Table below explains the pumping head and discharge required;

Table IV-6: Settlements Requiring Pumping

	Settlements	Sources	Gross Pumping head (m)	Pumping discharge (lps)	Pump (KW)	Transformer (KVA)	Stabilizer (KVA)	Standby-electric generator (DG set KVA)
1	Purano Bamruk; Bamruk-Badichour, Mewang;Mewang-Deubuje	Mulkhola	180	3.31	10	50	50	50
2	Siwalaya-Bichbazaar; Sikshya	Sattale	65	6.67	11	50	50	50
3	Kavra Kharka-Thalawang-Thaliwang;	Mulpani	112	4.03	8	50	50	50
4	Siwang-Reuga	Rimkhola	132	3.08	8	50	50	50

69. Thus submersible pumps, including control panel, 50 KVA transformers are proposed. Voltage Stabilizer is also proposed to take care of fluctuation. Standby power backup generators are also proposed.

9. Distribution Network

70. The distribution system comprises of a pipe network, which consists of mainly loops and branches in very few places. This network has been analyzed using EPANET 2, a design analytical software tool. Distribution pipes are laid on both sides of the metalled and major roads. Single line pipes are proposed in earthen and other roads. HDPE pipes have been predominantly used. Pipe class and size lesser than 6 kgf and 50 mm has not been proposed. Existing pipes will not be used as these are leaking. The total distribution pipe length of the proposed system is about 46.968 km.

Table IV-7: Distribution Pipelines

SN	Description	Quantity (m)
1	Purano Bamruk	2,222
2	Bamruk-Badichaur-Mewang	4,215
3	Mewang-Duibuje	2,871
4	Tudikhel-Solowang	7,905
5	Shikshya	3,517
6	Sibalaya-Bichbazaar	7,623
7	Kavrakharka-Thalawang-Thaliwang	10,258
8	Siwang-Reeuga	9,509
Total		48,120

10. House Connection

71. The system has been designed predominantly as house to house connections and has been analyzed for a design capacity for a total of 1,914 house connections. However, initially during the construction phase, only 1,060 house connections are provided to satisfy the needs for the base year population.

11. Appurtenances

72. These will primarily comprise of valve chambers or connector boxes to house in flow control valves for controlling flow in the pipeline and to the community taps etc. Altogether 214 valve chambers are expected in the system. Other appurtenances as air valves, scour valves, fire hydrants will be provided at suitable locations. Some road crossing has been initially provided. This will also facilitate for less road cuttings during the operational phase.

12. Guard House

73. Three guard houses are proposed considering the difficulties of terrain and elongated nature of service area.

13. Office Building/Laboratory Room

74. One office building, of 2.5 floors, consists of manager's room, cash counters and also a laboratory for water quality monitoring.

14. O &M Equipment and Tools

75. The following equipment has been also considered in the project so that project works during the construction period and for operational activities are effectively carried out;

- Leakage detecting equipment - 1 set
- Electro-fusion machine for joining the HDPE pipes including portable
- Water quality testing laboratory equipment - 1 set
- Other tools and plants like: electric pipe cutters, pipe wrenches etc.

C. Magnitude of Operation of the Project

76. The water supply system has been designed for a base year population of 6,466 for the year 2019. The system has been designed to tap surface water source from an intake and using different water sources for a total design year population of 10,819 in 2039.

77. Six number of water reservoir tanks have been proposed at different locations considering in mind the elevation difference of the service area. The capacity of water reservoir tans ranging from 15 Cum to140 Cum are proposed for the collection and storage of water.

D. Proposed Schedule for Implementation

78. The exact schedule for implementation of the project will be known after the work has been assigned to the contractor. For the feasibility study, detailed engineering design study and construction, three years period has been assigned. Therefore, the base year for the project has been assumed as the year 2019 and considering design period as 20 year the design year has been taken as the year 2039.

79. The main task associated with the project will be as follows:

(i) Detailed Engineering Design & Preparation of its report
(ii) Preparation of Working Drawings
(iii) Preparation of Quantity and Cost Estimates
(iv) Carrying out of Economic and Financial Analysis and level of Water Tariff
(v) Preparation of Socio Technical Profile
(vi) Environmental Study of the Sub Project Area
(vii) Preparation of Tender Documents
(viii) Awarding of Contract
(ix) Construction
(x) Operation and Maintenance

80. The project has been designed with the principle of active community participation from the design stage itself. The implementation strategy of the project is based on the community management approach, which includes encouraging the financial responsibility towards the improved facility. Therefore, user participation at the outset of the planning and design exercise is an essential requirement. The community has to contribute 50% of the total construction cost. Out of which 5% has to be deposited before implementation of the project as upfront cash. Another 35% - 45% to be contributed taking the loan from TDF. The loan should be recovered within the time frame of 15 years with 5 years of grace period, along with the interest of 5% per annum through their affordable water tariffs. Tariff raised by the service has to support towards maintenance of the supply system of the water supply system. DWSSM is acting as the initiator/coordinator for the purpose.

E. Project Requirements

5. Materials required for the project

81. The required materials have been divided into two categories; (1) Local materials and locally manufactured products, and (2) Imported manufacture products. The materials as aggregates, sand, stone, timber, bricks are considered to be local materials and locally manufactured products are considered as GI pipes and fittings, HDPE (PE) Pipes and fittings, cement and reinforcement bars. The materials as DI pipes and fittings, water meters, electrical equipment including generators, mechanical equipment, and all kinds of valves are considered as imported manufactured products.

6. Human Resources

82. The proposed Liwang Urban Water Supply and Sanitation Project entails both skilled and unskilled laborers for its construction and operation in the proposed site. The numbers of skilled and unskilled labours required per day are not yet decided. However, the labourer's estimation was made on the basis of rate analysis and as far as possible they will be hired from the local market and its adjoining area. The wage rate of skilled labour is considered non-distortive and hence no shadow wage rate is assumed and considered nominal. Cost of unskilled labour is estimated at a shadow wage rate of 0.7 (i.e. 70 percent of the wage rate of unskilled labour estimated for the Project).

V. DESCRIPTION OF THE ENVIRONMENT

A. Physical Environment

1. Location

83. The project area is located in the south-western midhill portion of the country. The location of the project area is 28°18′ North 82°38′ East. The project town is surrounded by Gajul and Mishri settlements in the East, Jankot and Kotgad in the West, Dhawang and Homa in the West and Jedwang in the South. All-weather road is connected to the town from Bhaluwang, a small business centre located at East-West Highway.

2. Topography, Geology and Climate

84. The project area has an elevated landform with scattered settlements. The hilly topography is of significant altitudinal variations. Although the elevation is towards south-west, the landforms are separated by ridges and surface water flows of small size. Terraced land, elevated land and forest covered slopes are major land features.

85. Geologically the rocks exposed of Liwang are of Precambrian to lower Paleozoic consists of shallow sediments, phyllite, sandstone with quartzite and calcareous sandstone. It has stromatolitic limestone and black slates.

86. The project area has sub-tropical climate. The annual average temperature is 18°C. The average annual rainfall is 1580 mm. Almost 80% of rainfall occurs during monsoon (June to September). The altitude of the project area varies from 1,300 m - 1,500 m above mean sea level.

B. Biological Environment

1. Flora in the Project Areas

87. The dominant forest and fodder species reported in the project area are *Pinus roxburghii* (Salla), *Dalbergia sissoo* (Sisam), *Alnus nepalensis* (Uttis), *Schima wallichii* (Chilaune), *Thysolaena maxima* (Amliso), *Ficus semicordata* (Khaniu), mulberry (Morus sps), malagiri (*Cinnamomum glaucescens*), kuiralo (*Bauhinia variegate*) and *Sepium insegne* (Khiro). The project site is rich in different species of *Dendrobiumand Coelogyne* orchid including other aromatic plants like rose (*Rosaceae sps*), mint (*Mentha piperita*), timoor (*Zanthoxylum piperitum*), dalchini (*Cinnamum verum*).

2. NTFPs in the Project Areas

88. The main NTFP species found in the project area are Timur (*Zanthoxylum armatum*), dalchini (*Cinnamum verum*), Allo (*Girardinia diversifolia*), Bamboo (*Bambusa vulgaris*) are the major NTFPs of the project area.

3. Fauna of in the Project Areas

89. *Vulpes sp.* (Fox), *Macaca mulatta* (Monkey), *Felis chaus* (Jungle Cat), *Ratufa sp.* (Squirrel), rato kharayo (*Lepus sps*) are the common wildlife found in the surrounding forest along the road alignment. Dhukur (*Columbidae sps*), Jureli (*Pycnonotus barbatus*), Kaliz Pheasant (*Lophura leucomelanos*), titra (*Perdix perdix*), *Corvus splendens* (Crow), *Passer domesticus* (Sparrow), *Columba livia* (Pigeon) are the birds found in the project area. Fish species found in water bodies along the road alignment are Asala (*Schizothorax plagiostomus*), Katle (*Catla catla*), Hile and Buduna (*Trout sps*).

90. To ensure if there is any occurrence of ecologically sensitive species, IBAT information has been assessed as a source of reference. Since the subproject is of small scale and its Indirect Impact Zone (IIZ) is only 200m, only the species suggested under 1 km periphery of the core project coordinate have been considered (Annex 4). The locals were consulted on the occurrence of these species.

4. Protected Area

91. There are no protected areas in the Project area and its close vicinity.

C. Socio economic and Cultural Environment

1. Demography

92. The project area covers ward number 1, 2 and 4 of Rolpa Municipality of Rolpa district. The service area accommodates a total population of 5809. Major settlements/toles of the service area are Reugha, Mulpani, Simalbang, Sibang, Thalibang, Kabhrekharka, Pipalchautara, Khanepani tole, Bich Bazar Tole in ward number 2; Loktantrik Chowk, Jilla Bikas Tole, Solabang, Bich Bazaar, Balmandir Tole, Shivalaya Tole, Kadya Tole, Kami Tole, Kalimati Tole in ward number 4 and Nebang, Bamruk, Dharapani in ward number 1.

Table: V-1 Household and Population in project areas

SN	Sub-systems	Household	Population
1	Purano Bamruk	42	230
2	Bamruk-Baddhichour	83	455
3	Mewang- Diubuje	34	186
4	Tudhikhel Solabang	218	1195
5	Sikshya	50	274
6	Shivalaya-Bichbazar	263	1441
7	Kavre Kharka	201	1102
8	Seewang- Reuga	169	926
Total		1060	5809

Source: Socio-economic Survey, January 2016

93. There are total 1060 households in the area with an average household size of 5.04. Male population is slightly higher (50.32 %) than the female population (49.68 %).

2. Caste / Ethnicity

94. The proposed project service area comprises multi caste / ethnic groups. Each caste and ethnicity is characterized by its own customs, traditions, culture and nature of occupation with which they are associated. Brahmin and Chhetri comprising 45.89 percent of total population are the most prevailing group in the service area. Janajati are the next major group with 30.75 percent, followed by Dalit which constitutes about 14.33 percent.

3. Occupation

95. Although, the economy of the area is gradually shifting from rural agricultural economy to business and service based, majority of the households are still dependent on agriculture. As the data shows, a high of 47 percent of the households have agriculture as occupation. Service is another main occupation of 21 percent households, followed by business (14%). As in the other parts of Nepal remittance has been playing important role in local economy of the service area, which is the main source of income of less than 1 percent households and secondary source of income of many other households. The ward-wise households by occupation are resented in Table below

Table V-2: Distribution of households by occupation

SN	Occupation	Ward Number			Total
		2	4	1	
1	Agriculture	366	90	127	583
2	Business	38	123	15	176
3	Services	105	116	40	261
4	Foreign Employment	3	2	3	8
5	Wages	49	20	39	108
6	Small industry	11	15	57	83
7	Others	2	17	1	20
Total		**574**	**383**	**282**	**1239**

Source: Field Survey, January 2016

4. Household's Monthly Income Level

96. Economic condition of the families in service area seems satisfactory in terms of their monthly income level. The distribution of households by income range is shown in table below, which indicates that 50.3 percent of them have income range NRs. 20,001-50,000 per month. Likewise, 38.7 percent of households fall under the income range NRs. 8,001-20,000 categories. As the data shows 8.9 percent of households have highest income level (more than NRs.50,000/month), whereas less than 1 percent of the households have lowest income level i.e. less than NRs. 5,000 per month. Finding of socio-economic census survey (2016) depicts that the household average monthly income is NRs. 22,478.

5. Existing water supply condition

97. The existing water supply scheme covers wards 1, 2 and 4 of Rolpa Municipality which supplies water through nearly 390 private and community taps. The present water supply and

sanitation situation is not satisfactory. The town project areas have piped water system to serve some households and the remaining of the community depends upon springs and streams. The quality of water delivered through the existing system in the project area is not satisfactory. Adequate treatment facilities are not provided.

98. Due to high in-migration ratio and increase of rented population, WUSC is unable to serve enough water supplies. The level of services in terms of quality, quantity, coverage is quite insufficient.

99. In terms of water quality 16.38 percent of the respondents feel the quality of supplied water is good, where as that of 75.87 percent feel satisfactory or tolerable (Table V-3). Nearly 8 percent of the respondents responded that the water quality of supplied water by existing systems is unsatisfactory.

Table V-3: Satisfaction in terms of Water Quality

SN	Water Quality	Ward Number			Total	Percent
		2	4	1		
1	Good	67	131	5	203	16.38
2	Satisfactory	445	227	268	940	75.87
3	Unsatisfactory	62	25	9	96	7.75
Total		**574**	**383**	**282**	**1239**	**100**

Source: Socio-economic Survey, January 2016

6. Existing Sanitation Condition

100. Rolpa Municipality was declared as Open Defecation Free (ODF) in Jestha 2072 B.S when it was still Liwang Municipality. In general the overall sanitation condition of the project area was observed satisfactory. Most of the households in the market area have permanent type of private latrine and others have temporary type of private latrine. It was reported that all the schools have toilets; and there is one public toilet in the entire municipality.

101. Lined drain was observed in this municipality. However, it was limited to core market areas. No waterlogged area is found as sufficient natural slope exists. Although, proper management of solid waste by the different agencies has not been developed till now, municipality has been providing municipal solid waste collection services. This service in limited to some wards only. Rest of all other wards manage solid waste either by dumping in the backyard or by providing organic waste to pig farms.

7. Existing Health Situation

102. There is a District Hospital located at Liwang Bazaar. The District Hospital has 25 beds and providing basic health care facilities. Most of the people visit District Hospital for general health treatment. However local people visit Narayangad or even Kathmandu for treatment of complicated health problems. Two dental clinics are providing dental care services and 6 numbers of medical shops are also available in this area.

103. Most of people are found aware in health and hygiene. People are aware about hand washing before touching and eating food, and after defecation.

8. Physical and Cultural Heritage

104. Liwang is famous for historical/cultural and archaeological sites such as Bhama Odar (cave); Gari lake, Jaulipokhari; Bibang Daha; Chaturbhuj Panchayan; Baraha Khetra Badachaur; Devi and Khadga Temple, Durga Bhawani, Durga Temple; Gajulkot; Jaljala, Jankot Jhankristhan; Kalika Devi, Khungrikot, Kot Maula; Pateswari Temple; Shivalaya mandir; and Kothi vhee.

D. Major Environmental Problems of Project Areas

105. Some of the major environmental problems prevalent to Liwang town are as follows:

9. Air Quality

106. There are no industries in the project area. Air pollution is caused by fugitive dust from vehicles movements particularly over unpaved roads and grounds, and some constructions activities. The roadway linking to the project area are not black topped, as a result area around the roadways are polluted by dust and smoke emitted by the vehicle that runs on the roadways. Gas emissions come from household cooking, open burning, and moving vehicles. Emissions from these sources are scattered/ spread apart both in terms of locations and timing. From field observation, the ambient air quality of the area is considered to be under normal and acceptable levels.

10. Acoustic Environment

107. The sources of noise in the project area are the construction activities and vehicle movement. The anthropogenic noise is confined in few clustered settlements and in marketplaces and only in the daytime. At nighttime, noise is generated with the arrivals and departures of buses at the bus park. From field observation, noise level in Liwang town is within the national and international permissible standards at daytime and nighttime.

11. Water Quality

108. Water quality of the existing sources located in the project sites was found to comply with the NDWQS. It is advised to treat the water in order to prevent adverse effect in the public health. The hilly terrain generally has possibility of increase in turbidity occasionally. Hence, the water treatment system consisting of pressure filter and disinfection is recommended to comply with the requirements of the NDWQS for drinking water.

12. Solid Waste Management

109. While discussing with the officials of rural municipality they have requested for a tractor with trailer for prompt service. Similarly, few hand carts (wheel barrows) and collection bins (115 liters capacity) are proposed. Besides training program shall be conducted regarding the solid

waste management to concerned rural municipality officials, users and WUSC members and other members of Tole Lane Organizations. These software programs will help to reduce, reuse and recycle the waste from the households.

13. Wastewater Management

110. Liwang does not have a sewerage system. The current practice of human excreta management and disposal is on-site sanitation consisting of individual household or institutional septic tanks often without a proper effluent disposal system. The septic sludge is often discharged, though illegally, into surface water. The existing practice is unhygienic and unaesthetic for the population.

111. Thus, a trailer mounted suction tank with a capacity of 4,000 liter is proposed. A sludge drying bed constructed from masonry structure with sand and gravel packing is proposed. Gravel packing will enhance to percolate moisture and dry sludge faster.

14. Sanitation Services

112. Some of the households have prepared pit latrines with bamboo, shrubs cover. The wall of pits is not found properly protected. Similarly, toilets as such were also found made temporarily e.g. from bamboo, wooden post etc. Thus, training program in association with LB will be carried out for the proper construction of local material e.g., cement plaster in bamboo woven to make wall, strengthening pit wall by locally available stone, use of RCC rings and cover and its molding methods etc. Accordingly, awareness campaign is also carried out regarding public sanitation and health.

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

113. The potential impacts of the proposed Liwang Urban Water Supply and Sanitation Project are physical, biological and socio-cultural in nature. They can occur at various phases of the project such as pre-construction, construction, and operation & maintenance phases. The magnitude of the impacts can be low, moderate, or high depending upon its severity, and can be temporary or long term, reversible or irreversible, local or wide-ranged. The impacts need not necessarily be limited to negative ones but can be positive as well.

A. Beneficial Impacts and Augmentation Measures

1. Construction Phase

114. **Employment Generation and Increase in Income**. A major direct beneficial impact of the water supply and sanitation project during construction stage is the creation of employment opportunity to the local community. Liwang is economically vibrant town with growing market opportunities. Around 6,000 person-days of skilled workforce and 39,000 person-days of semi-skilled/unskilled workforce will be employed directly by the project. The amount of money that is earned by the wages or salary will directly enhance various economic activities and enterprise development with multiple effects. In order to augment the impact, the local people, particularly poor; dalits, ethnic minority and women, will be given priority for employment and job trainings.

115. **Skills Enhancement**. Although many people in the project area are found unskilled at present, the construction of the water supply system and the distribution network is likely to enhance their skills in plumbing, fittings and other construction works. Furthermore, the project will also give on-job practical trainings to the workers which will enhance their technical skills. The skill and knowledge acquired from the project during construction will enhance employment opportunities of local people who can earn livelihoods from similar projects in the future. Workers, especially workers involved in pipe laying, will be given on-the-job training on plumbing bathroom fittings and other construction activities in order to augment the impact.

116. **Enterprise Development and Business Promotion**. During the construction period, different types of commercial activities will come into operation in order to cater the demand and requirement of workers. As money-flow begins, they will regularly demand different food items, beverages and other items of daily needs. To meet these demands, small shops and restaurants around the vicinity of the construction sites are likely to open. Various farm based enterprises including wide range of agricultural and livestock products will also gain momentum as a result of increased demand by laborers during the construction period. This will increase local trade and business in and around the project area.

2. Operation and Maintenance Phase

117. **Improvement in health and saving of time**. After the water supply and sanitation project is complete, the people living within the project area will benefit from the supply of sufficient quantity and good quality of water, and also from improved sanitary conditions. Women and girls will be directly benefited as they have to spend less time in fetching water and thus have more time for study, regular household works and income generating activities.

Table VI-1: Saving in time in terms of economic values

SN	Time savings per household per year (working days)	Shadow price fo labour per day (Rs)	Economic Value: Benefit/year (Rs)
1	101	350	35,442

118. With the assumption that the shadow price of labour per days is Rs 350, the total saving per household per year would be Rs 35,442.

119. The impact will be augmented through regular maintenance of the water supply and sanitation system by the users' group (WUSC).

120. **Development of market center**. The availability of good supply of drinking water will accelerate the rate of development of Liwang as a leading market centre. In order to promote the development of market centre, municipality shall ensure planned growth with required infrastructure facilities for healthy and hygienic environment in the market areas and regular operation & maintenance of the water supply and sanitation system.

121. **Appreciation of Land Value**. One of the major benefits of the project is that along with the availability of reliable and safe drinking water and sanitation services, the increase in economic activities will instigate increase inland price. Liwang has fertile land and has irrigation facilities too. The availability of good drinking water could be one of the reasons for some many to invest in business sector in the project area. Upon completion of the present project, migration from nearby hills is also expected. In order to promote land development in the area, the local people will be aware that high value lands are acceptable to the banks and microfinance institutions to provide loans for them to start their own economic/social ventures.

122. **Women Empowerment**. Women will largely benefit from this project, as they are the ones who spend a great deal of time in fetching water. With the operation of the water supply scheme, their time will be saved. As there will be adequate supply of safe drinking water, there will be marked reduction in the occurrence of infectious disease and water borne diseases in the project area. This wills save more time of women which else-wise they would be spending in taking care of the ill ones in family. This will provide them more time to spend in economic and social activities, thus leading to empowerment. In order to augment the impact, the water supply system will be regularly maintained so that it operates smoothly, and awareness programmes will be given to the local people regarding health and hygiene with focus on gender.

123. **Quality of Life Values**. The project is expected to increase the existing quality of life values due to improvement in personal, household and community hygiene practices and health situations. The project will provide opportunities for jobs, will bring more investments and opportunities in the area, will provide good quality water, improved sanitation etc. Betterment in women's daily lifestyle through reduced water drudgery and improved health status of family will also be a positive aspect of this project implementation.

B. Adverse Impact and Mitigation Measures

1. Pre-construction Phase

124. The pre-construction works involves field survey and investigation, development of design & detailed drawings, carrying out cost estimate etc. This also includes discussion with WUSC and revision of design if necessary. WUSC already has acquired land required for the construction of structures. As the works involve review of design, estimate, discussions with concerned stakeholders and bidding processes, and no construction activities involved; there will be no adverse impacts.

125. The pre-construction works involves field survey and investigation, development of design & detailed drawings, carrying out cost estimate etc. This also includes discussion with WUSC and revision of design if necessary.

126. WUSC already has acquired land required for the construction of structures. As the works involve review of design, estimate, discussions with concerned stakeholders and bidding processes and no construction activities involved; there will be no adverse impacts.

127. The Rapid Environmental Assessment (REA) Checklists for water supply and sanitation were used to identify potential impacts/issues/concerns of the sub project as per preliminary design (Annex 1). The REA identified the issues and concerns that should be considered during design, impacts that should be mitigated during construction and impacts that should be mitigated or enhanced during operation.

128. Relating to design, the salient concerns would be the inadequate consideration/ incorporation of the REA-identified impacts/issues/concerns that should be considered during design as listed in Table VI-2 and the following:

- Existing users of the groundwater resource in the vicinity or upstream;
- Social considerations of nearby population and service providers and their opinions;
- Sustainable source/s for construction aggregate materials.

Table VI-2: REA-identified Impacts/Issues/Concerns and Mitigation Measures Taken during Project Preparation and IEE

REA identified Impacts/Issues/Concerns	Measures taken during FS/DED and IEE to mitigate impacts/issues/concerns
Issues & concerns that should be considered during design	During the detailed engineering design stage, water samples from existing intake sites were tested. Tests revealed iron content and coliform as beyond standard limits. This information has guided design of water treatment. However, verification on the yield through bore hole tests need to be carried out and confirmed before award of contract.
Unsatisfactory raw water quality	
Delivery of unsafe water to the	Design proposes basic treatment using lime dosing,

REA identified Impacts/Issues/Concerns	Measures taken during FS/DED and IEE to mitigate impacts/issues/concerns
distribution system	pressure filter and disinfection using $Ca(ClO)_2$ and provisions for lab unit and kits. This IEE proposes “hands on” training by a licensed & accredited laboratory for the first few years of operation under the Water Safety Plan included in the sub project design & continuing training there-after.
- Inadequate protection of intake structures	Intake has adequate land for perimeter fencing to keep animals away from grazing nearby. Appropriate intake structures to be located at least 30m upstream from sanitation facilities. Where this cannot be maintained; (i) septic tanks will need to be sealed (watertight) and emptied as per the design requirements; (ii) intakes to be protected appropriately and installation of a screen; and (iii) a test pit should be established and water quality monitoring should be conducted regularly (at least once very quarter). Disinfection of the intake should be conducted prior to commissioning and after repairs.
Health hazards arising from inadequate design of facilities for receiving, storing and handling of Cl & other chemicals	Design has included a “housed” dosing unit.
Delivery of water to distribution system, which is corrosive due to inadequate attention of feeding of corrective chemicals	Design has proposed DI, and HDPE pipes.
Contamination of drinking water source and other environmental receptors from household and public toilets	The design of toilets includes septic tanks that are designed as per national standards and codes to allow for maximum retention of septage. This includes ensuring septic tanks are sealed and watertight. Toilets will be established at least 30m down-stream of the drinking water source.
Risk to public and environmental health due to inappropriate siting and design of septage disposal pit.	The septage disposal pit (similar to sludge drying bed technology) is to be designed and constructed in accordance to international best practice and acceptable standards (e.g. USEPA standards etc).This includes;(i) locating disposal pits at least 300 m away from the nearest dwelling ,and 30m down-stream of the drinking water source; (ii) pits are to be only established in relatively flat land with no more than 8% slope; and(iii) site selected for establishment of pits should not be where food crops are grown.

2. Construction Phase

(i) Physical Environment

129. **Erosion and land surface disturbance**. Excavation and digging of trenches during construction may lead to erosion and caving thereby causing soil erosion, silt runoff, and unsettling of street surfaces. Rock blasting may be required for access during intake construction. There is possible landslide area along the slopes from where the transmission line is to be laid. In addition to this, in the working sites, haphazard disposal of the excavated earth can disturb and damage the road surface. The activity as such will be a nuisance and

discomfort to the road users and inhabitants. Accordingly water stagnation in the construction area especially during the rainy season may occur

130. **Topsoil conservation**. Though there is very little intervention on the forest or agricultural land, at some places laying of pipelines may need short term interventions. Since formation of topsoil is very long natural process, efforts will be made to safeguard the topsoil.

131. **Damage to the Existing Facilities**. During the construction time, while excavating the earth, existing water supply distribution pipelines and electricity poles may get damaged or may relocation in few places particularly in the bazaar area in spite of being careful.

132. **Air and noise pollution**. The construction activity will comprise of construction of intakes, treatment units, generator houses and office building. Laying of transmission and distribution pipes, construction of storage reservoirs, transport and installation of pumps are other works to be carried out. Though there will be limited use of heavy equipments, plying of vehicles (use of power horns), use of generators and use of construction equipments will increase the emissions in the ambient air, and will also elevate noise nuisance. There will be some regular activities such as transportation and loading/unloading of construction materials. These impacts will be more concerning near core settlement areas, market areas and school areas.

133. **Impact on water bodies**. There will be some impacts on water bodies located within the project area during the construction phase. Haphazard disposal of solid waste in the vicinity of water bodies, natural transportation of sediment and excavated materials to the water bodies, and leakage/disposal of oil & grease from construction equipment are some of the activities, which may occur and thus degrade the water quality.

134. The earthworks for intake, RVT and other structures will cause turbidity in water up to a certain extent. However the quantity is expected to be limited with respect to the discharge of water in the rivers. Thus, very minimal impact will be there for short period of time.

135. **Waste Management and Disposal**. Generation of waste from campsites and temporary work-centers are likely to affect environment of the project area. Solid waste, chemical waste and other sanitary waste will increase during the construction phase. There will be small amount of spoil from excavation works, and trenches. Waste generated from decommissioning of the temporary facilities, mainly workforce campsites, may cause degradation of land, loss of aesthetic values, and pollution of the local water resources.

(ii) Biological Environment

136. The project area has built up area along with agricultural land and forests. Only scattered plants of local species and fruit plants are available within the project activity area and thus minor impacts are anticipated only during the construction period. Most of the pipelines

pass along the roadside and only a few numbers of plants and bushes have to be cleared up within the transmission pipe line stretches. Some of the impacts that are likely to occur are described below;

137. **Loss of vegetation cover**. The loss of vegetation cover and species diversity due to earthwork primarily in the direct impact area of the intake and reservoir sites will be minimized as it is located on open grass land. During the construction, there will be only a loss of herbs and shrubs cover. Some of the topsoil and vegetation may also be lost during pipe laying works. No pipeline passes through the forest area. The project components require a very small area of land for implementation and environmental impacts on the vegetation and natural eco-system do not seem to be significant.

138. **Impact on Fauna**. The project area has nearby forests where local species of wildlives are present. Population dynamics of resident and migratory birds and reptiles at the project site may be affected during the construction period due to various construction activities. But these effects will be of temporary in nature. The condition will be normal after construction is over.

139. **Impact on aquatic life**. Some of the construction activities for intake and its protection works are proposed at the bank of the local streams. These construction activities will physically disturb the water quality for a certain period of time and may cause adverse impact on aquatic life, especially fish population. But these effects will be temporary in nature.

(iii) Socio-economic Environment

140. **Disturbance to community activities**. Construction activities, particularly construction works on roads will cause disturbances to the community activities like daily mobility, festival celebrations and conducting of social events. The free movement of vehicular traffic and pedestrians will be affected. Noise produced due to the operation of machines may disturb these events in project sites and its neighborhood during construction periods. In order to minimize the disturbance to the community activities, a detailed

141. **Social Dispute and Dissatisfaction**. There will be influx of outside workforce and any misunderstanding or any misconduct can cause problems with the local community. There is a possibility of social dispute in the community due to irresponsible behaviour of the workers such as gambling and drinking. On the other side, due to over-use of outside workers, the local population may not get adequate employment benefits from the project causing dissatisfaction and conflicts in the area.

142. **Crop Loss**. During construction of access road, there may be damages to some of the locals' agricultural land. At sites of Mewang, Badichaur, Thaliwang, Reeuga Upallo Gaun and Kavrekharka there will be pipelines laid through agricultural land. Around 3.5 ropanis of land may be temporarily affected and this will need crop compensation if the disturbance is during cultivation period of the land.

143. **Occupational health and safety (OHS)**. Life and health of workers, particularly of those involved in concreting, trench cutting, formwork and rebar fixing is of prime concern. Workers involved in mechanical works and all other works are also exposed to some level of health and safety risks.

3. Operation & Maintenance Phase

144. **Chemical hazard**. Exposure and ingestion of Bleaching Powder is harmful and the workers will have to deal with it during the operation of the system. Ingestions, inhalations, application to body parts, especially to the eyes, nose and mouths are of extreme health hazard to the workers handling bleaching powder.

145. **Impact on water bodies and aquatic life**. Haphazard disposal of effluents and sludge from the treatment plant will not only be a nuisance to the public but also will affect the aquatic life by eventually finding its way to nearby water bodies. The effluent produced from the periodic backwashing of the filter plant, if discharged directly to the river course may cause harm to the water bodies and aquatic life especially during the dry season when the flow will be less.

146. **Health Risk due to probable supply of untreated or polluted water**. Improper treatment of water decreases the quality of water. Health of the beneficiaries may be affected if water treatment system becomes non-functional. This may cause water borne diseases and parasite diseases if proper precautions are not taken throughout the operation of the water supply system. Leakage in pipes and malfunctioning of treatment units may also lead to such conditions.

C. Evaluation of the Impacts

147. The impacts are evaluated based on their impact levels, coverage of area and duration of the impacts. The evaluations are used to emphasize the need to address the concerns. Magnitude, geographical extent and duration of impacts are quantified, and the following table summarizes the evaluations of the impacts;

Table VI-3: Evaluation of Environmental/Social Impacts

Impacts	Nature	Magnitude	Extent	Duration	Total score and significance
Beneficial Impacts					
Construction stage					
Employment Opportunity and Increase of Income	Direct	M (20)	Lc (20)	St (5)	Significant (45)
Enhancement of Skills	Direct	M (20)	Lc (20)	Mt (10)	Significant (50)
Enterprise Development and Business Promotion	Direct	M (20)	Lc (20)	Mt (10)	Significant (50)
Operation Stage					
Improvement in health status	Direct	M (20)	Lc (20)	Lt (20)	Significant (60)
Development of Market Center	Indirect	M (20)	Lc (20)	Lt (20)	Significant (60)
Appreciation of land value	Indirect	M (20)	Lc (20)	Lt (20)	Significant (60)
Women Empowerment	Direct	M (20)	Lc (20)	Lt (20)	Significant (60)
Quality of Life Values	Indirect	M (20)	Lc (20)	Lt (20)	Significant (60)
Adverse Impacts					
Construction stage					
Physical Environment					
Possibility of landslide, land degradation	Direct	M (20)	Ss (10)	Lt (20)	Significant (50)
Damage to existing facilities	Direct	L (10)	Ss (10)	St (5)	Insignificant (25)
Air Pollution	Direct	L (10)	Lc (20)	St (5)	Insignificant (35)
Water Pollution	Direct	L (10)	Lc (20)	Mt (10)	Insignificant (40)
Noise nuisance	Direct	L (10)	Ss (10)	St (5)	Insignificant (25)
Waste issues	Direct	M (20)	Lc (20)	Mt (10)	Significant (50)

Impacts	Nature	Magnitude	Extent	Duration	Total score and significance
Biological Environment					
Loss of vegetation cover	Direct	M (20)	Ss (10)	Mt (10)	Insignificant (40)
Impacts on fauna	Direct	L (10)	Lc (20)	Mt (10)	Insignificant (40)
Impacts on aquatic lives	Direct	L (10)	Lc (20)	Mt (10)	Insignificant (40)
Socio-economic Environment					
Disturbance to community activities	Direct	M (20)	Ss (10)	St (5)	Insignificant (35)
Crop loss	Direct	M (20)	Ss (10)	St (5)	Insignificant (35)
Social dispute and dissatisfaction	Indirect	M (20)	Ss (10)	St (5)	Insignificant (35)
Occupational health and safety	Direct	H (60)	Ss (10)	Mt (10)	Insignificant (80)
Operation & Maintenance Stage					
Chemical health-risk	Direct	M (20)	Lc (20)	Lt (20)	Significant (60)
Impact on water bodies and aquatic life	Direct	L (10)	Lc (20)	Mt (10)	Insignificant (40)
Health Risk due to probable supply of untreated or polluted water	Direct	H (60)	Lc (20)	St (5)	Significant (85)

VII. ANALYSIS OF ALTERNATIVES

A. With- and Without Project Alternatives

148. The town is facing increased demand of water supply and if not met, it will be one of the major problems for the Rolpa municipality. The overall sanitary condition of the project area is reasonably satisfactory. But there is still room of improvement in sanitation sector as well. Doing nothing about these challenges would be allowing the subproject municipality to further develop as “under-serviced”, put the health of its residents and the general public at more risks, and worsen its living environment. This would impede: (i) further social and economic development project municipality and (ii) Nepal’s delivery of its commitment to SDG 6th to increase the proportion of population with sustainable access to safe drinking water and basic sanitation.

149. In overall, ‘with project alternative’ will bring about enhanced public health and living environment that will contribute to improved quality of life in the municipality. Improved water supply and sanitation will create an enabling environment for local economic development and improved social services that communities within the sphere of influence of the municipality will benefit from; thus, contributing to the overall local economic development of the district, and Province 5.

B. With project location alternatives

150. The project area is a major junction and booming market place connected to East-West highway at Bhalubang. Thus investment here in long term basic urban facility is very strategic. With the project, 1060 households in the municipality will have immediate and convenient access to reliable as well as adequate safe and potable water supply, and easy access to sanitation at public place so that it helps to improve health and sanitation status. As a result, good hygiene and sanitation practices will be promoted; there will be reduced health and safety risks.

C. Alternatives Relative to Planning and Design

151. The proposed project is a small scale intervention. The major components of water supply system as detailed in the feasibility study are: intake constructions and improvements (Mulkhola, Sattale, Mulpani and Rimkhola) as sources; treatment facilities with sedimentation unit, slow sand filter and disinfection unit; 7 new reservoirs and use of existing one with total 525 Cum capacity of reservoirs; distribution mains, system appurtenances, guard house, office building and compound fencing.

152. The feasibility study report considered for 20 sub-system. It was well discussed with all the stakeholders to reduce the numbers of subsystems and coverage area. Now, only 8 sub-systems have been agreed and designed accordingly. On the other hand, major water sources like Mulpani, Mulkhola were not considered in the feasibility report. Now after discussion with water users committee, major water sources like Mulpani, Mulkhola are also considered in this detailed design report.

153. The project is a combination of gravity flow, and pumping. The project area bears elevation difference of more than 300m. Tundikhel and Solowang area are located in lower elevation than the sources and thus can be run from gravity system. Most of the settlements are located are located in higher elevation and required pumping. Thus considering the topography, landuse, settlement pattern 8 separate distribution schemes are proposed.

154. The service area established as per pre-feasibility report consisted part of wards 2, 3, 4, 5 and 8 of former Liwang Municipality. After the feasibility study report the WRDSMC again discussed with the WUSC team and community people. The service area was redefined leaving some remote settlements as they are being served under Fund Board projects. Now the new serice area has been defined as wards 1, 2 and 4 of Rolpa municipality. Regarding the feasibility of distribution system, since the settlements are scattered and across the ridges, separate sub-systems with treatment plant and distributions systems have been proposed.

155. It was assessed that the proposed water supply system with adequate treatment units will have very small negative impact on the environment. However, there will be substantial improvement in personal hygiene thereby increasing the quality of life and community health. The WUSC has finalized the required site of land for RVT, treatment plant and other structures.

156. Initially, the treatment units with sedimentation, roughing filter and slowsand filters were proposed. The required land and the field conditions were assessed time and again. Finally, the conventional treatment units have been replaced with pressure filter due to limited land available at the site. Apart from this, the project will not have any resettlement or relocation issue. Hence no further alternatives need to be assessed.

VIII. ENVIRONMENTAL MANAGEMENT PLAN

157. The purpose of the Environmental Management Plan (EMP) is to ensure that the activities are undertaken in a responsible, non-detrimental manner with the objectives of: (i) providing a proactive, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on-site; (ii) guiding and controlling the implementation of findings and recommendations of the environmental assignment conducted for the project; (iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the project; and (iv) ensuring that safety recommendations are complied with.

158. A copy of the EMP will be kept on work sites at all times. This EMP will be included in the bid documents and will be further reviewed and updated during implementation. The EMP will be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

A. Institutional Arrangement

159. The Ministry of Water Supply (MOWS) is the Executing Agency, working through the Department Water Supply and Sewerage Management (DWSSM), which has established a Project Management Office (PMO) for the project1 headed by a Project Director. The DWSS has also established a Regional PMO (RPMO) office at Nepalgunj.

160. The PMO is responsible for overall project planning, management, implementation, monitoring and reporting for the project. The PMO is also responsible for screening the proposed subprojects in accordance with the subproject selection criteria for the project,[2] assisting the municipalities in conducting feasibility studies,[3] reporting to and being point of liaison with ADB on the project; quality control of detailed design and construction supervision; procurement of civil works contractors; support for capacity building; and overseeing safeguard compliance. The PMO will liaise with WUSCs or municipalities to sign the management agreement prior to the award of contract for each subproject. The PMO has engaged all consultants under the project.

161. The RPMOs has been established using the existing infrastructure in Nepalgunj, Banke, for the western region, and (PMO (Kathmandu) acts as RPMO for central region projects. The RPMOs report to the PMO and supported and monitored by PMO to implement the projects in the field and manage contractors and consultants. The Western RPMO manages the detailed design and construction supervision with support from DSMC that PMO would engage (DSMCs for eastern, western, and central region each). Each of the DSMCs will be based at the respective RPMO. For each subproject, a dedicated implementation core group will be

[1] DWSS will continue the existing PMO established and operational for the Third Small Towns Water Supply and Sanitation Sector project.

[2] Subproject selection criteria (covering all aspects of a proposed subproject other than the specific subproject selection criteria for environment as discussed in this EARF) is attached as Appendix 1 of the PAM.

[3] TDF will assist the municipalities in conducting financial appraisal of the subprojects and advice DWSS on its outcomes prior to the start of detailed design process.

established in the field, at each WUA's office,[4] headed by a qualified engineer from the RPMO to conduct day-to-day project management, planning and construction supervision. The TDF will coordinate with RPMO, WUSCs and municipalities at least on monthly basis.

162. The WUSC, on behalf of the WUA[5] or the municipality[6] will be responsible for operation and maintenance (O&M) of the water supply and sanitation facilities constructed, operating under a management agreement with DWSS. WUSCs consist of nine executive members,7 at least three of whom are women. The project will fund the WUA's minimum prescribed staffing and other resource requirement, as outlined in the management agreement with DWSS for sustainable operations of the system during the project period. For the subprojects yet to be selected and where WUA does not exist initially, or when the municipality doesn't have the capacity and chooses to delegate the operation to user's representatives, an interim user committee (IUC) will be first established in the feasibility stage by representing potential consumers. The IUC will work with the RPMO and DSMC in undertaking a feasibility study, confirm the technical proposals and the boundaries of the service areas. WUAs will be developed from IUCs at the detailed design stage.

[4] The implementation core group, as a minimum, comprises of (i) an Engineer, a Social mobilizer, and an EMP monitor, RPMO; (ii) an Administration Staff, a Finance Staff, and an Engineer or Junior Engineer, WUSC.

[5] WUAs are registered with the district water resources committee as a user association under the Water Resources Act (1992).

[6] As the project is a demand based open access project, the WUAs or the municipalities can apply for funding a proposed subproject that meets the subproject selection criteria.

[7] WUSCs will be formulated by ensuring proportional representation of gender, caste and ethnic groups. It shall include at least 33% representation of women.

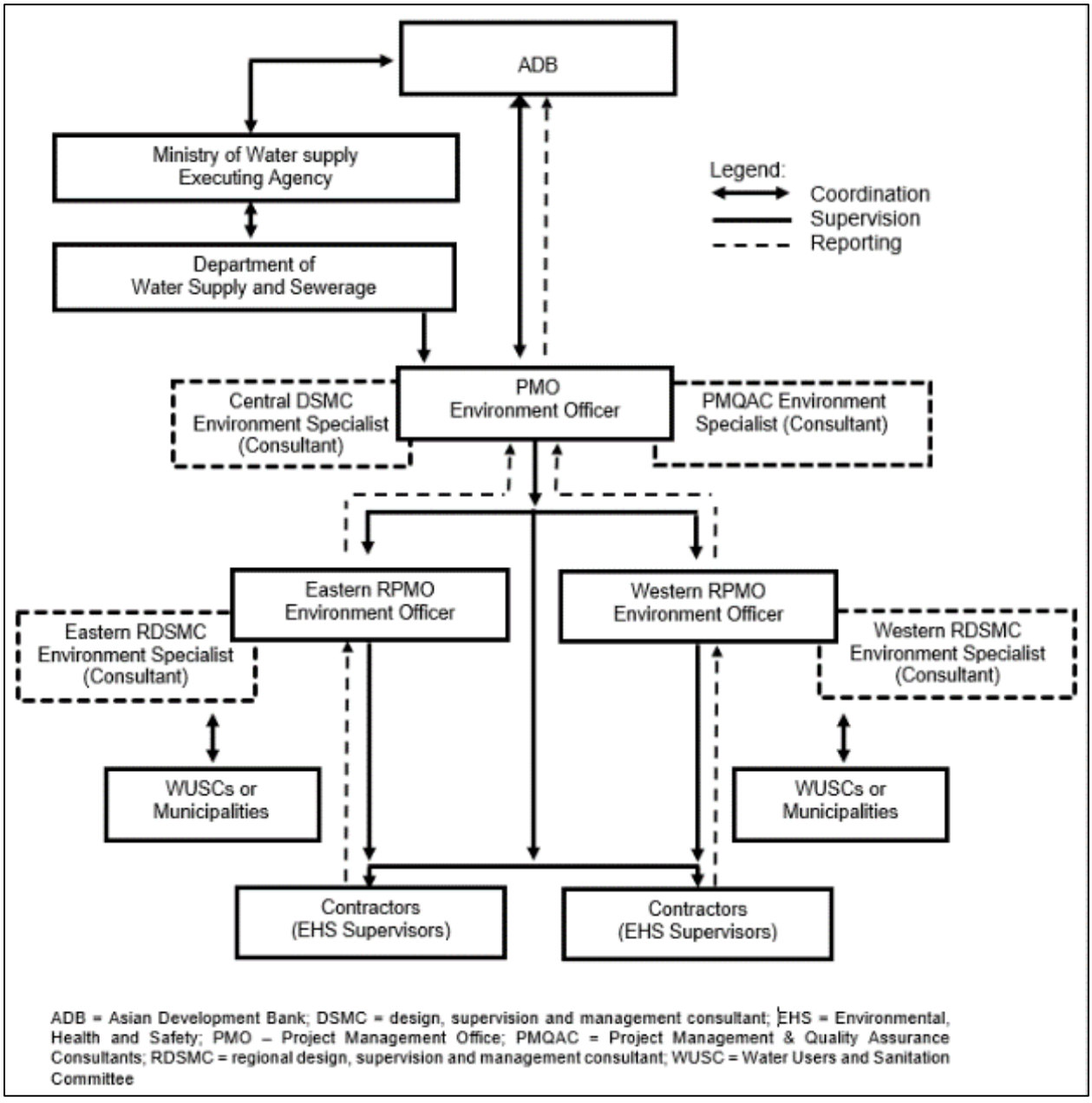


Figure VIII-1: Safeguard Implementation Arrangement

163. **Project Management Office**. A project officer (Environment) has been engaged in PMO to ensure implementation of environmental safeguards. He/she will be provided with necessary consultant support, and capacity development and training. The responsibilities of the Environment Officer are:

(i) review and confirm existing IEEs and EMPs are updated based on detailed designs, that new IEEs/EMPs prepared by DSMCs comply to exclusion criteria and project selection guidelines as stipulated in the EARF and government rules; and recommend for approval to PMO;
(ii) approve subproject environmental category;
(iii) ensure that EMPs are included in bidding documents and civil works contracts;
(iv) provide oversight on environmental management aspects of subprojects and ensure EMPs are implemented by RPMOs and contractors;
(v) establish a system to monitor environmental safeguards of the project including monitoring the indicators set out in the monitoring plan of the EMP;
(vi) facilitate and confirm overall compliance with all Government rules and regulations regarding site and environmental clearances as well as any other environmental requirements as relevant;
(vii) supervise and provide guidance to the RPMOs to properly carry out the environmental monitoring and assessments as per the EARF;
(viii) review, monitor and evaluate effectiveness with which the EMPs are implemented, and recommend necessary corrective actions to be taken;
(ix) consolidate monthly environmental monitoring reports from RPMOs and submit semi-annual monitoring reports to ADB;
(x) ensure timely disclosure of final IEEs/EMPs in project locations and in a form accessible to the public;
(xi) assist with ongoing meaningful consultation and assist in setting up of GRM in respect of environment concerns;
(xii) address any grievances brought about through the Grievance Redress Mechanism (GRM) in a timely manner as per the IEEs;
(xiii) undertake regular review of safeguards-related loan covenants, and the compliance during program implementation; and
(xiv) organize periodic capacity building and training programs on safeguards for project stakeholders, PMO, RPMOs, and WUAs.

164. **Regional Project Management Offices**. The environmental officer assigned by DWSS to the RPMOs will receive support from (i) the PMO environmental officer, (ii) environmental specialist from PMQAC; and (iii) the environmental specialist and EMP monitors of the regional DSMCs to carry out the following:

(i) prepare new IEEs and EMPs in accordance with the EARF and government rules;
(ii) include EMPs in bidding documents and civil works contracts;
(iii) comply with all government rules and regulations;
(iv) take necessary action for obtaining rights of way;
(v) oversee implementation of EMPs including environmental monitoring by contractors;
(vi) take corrective actions when necessary to ensure no environmental impacts;
(vii) submit monthly environmental monitoring reports to PMO;

(viii) assist with ongoing meaningful consultation and assist in setting up of GRM in respect of environment concerns; and
(ix) address any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs.

165. **Project Management and Quality Assurance Consultant**. The Project Management and Quality Assurance Consultants (PMQAC) will provide support to the PMO in the following areas. The detailed TORs are in the PAM:

(i) ensure that the quality of the designs and construction of all water supply and sanitation components implemented under the project are to the required standards; and
(ii) assist the PMO with the overall planning, implementation and monitoring of the project during all stages of implementation including adherence to all environmental and social safeguards' requirements.

166. **Regional Design, Supervision and Management Consultants**. The RDSMCs will provide support to the RPMOs in the following areas. The detailed TORs are in the PAM:

(i) prepare quality feasibility studies, detailed engineering designs, safeguards documents and bid documents
(ii) provide effective construction supervision and contract management of all water supply and sanitation components implemented under the project in its region
(iii) assist the RPMOs with the overall planning, implementation and monitoring of each subproject during all stages of implementation including adherence to all environmental and social safeguards requirements
(iv) work closely with the Water User and Sanitation Committees (WUSCs), respective project municipalities and communities to ensure that the citizens are aware of project benefits and their responsibilities
(v) ensure that poor and vulnerable groups will benefit equally from the project.

167. **Civil Works Contracts and Contractors**. The contractor will be required to designate an Environment, Health and Safety (EHS) supervisor to ensure implementation of EMP during civil works. Contractors are to carry out all environmental mitigation and monitoring measures outlined in their contract. The contractor will be required to submit to RPMO, for review and approval, a site-specific environmental management plan (SEMP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per SEMP; and (iv) budget for SEMP implementation. No works can commence prior to approval of SEMP. The contractor will be required to undertake day to day monitoring and report to the respective RPMO and DSMC.

168. A copy of the EMP or approved SEMP will be kept on site during the construction period at all times. Non-compliance with, or any deviation from, the conditions set out in the EMP or SEMP constitutes a failure in compliance and will require corrective actions. The EARF and IEEs specify responsibilities in EMP implementation during design, construction and O&M phases.

169. The PMO and RPMOs will ensure that bidding and contract documents include specific provisions requiring contractors to comply with: (i) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; and (c) elimination of forced labor; and with (ii) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the project sites.

170. **Capacity Building**. The design review and technical audit consultant (DRTAC) safeguards experts (environmental and social) will be responsible for training the; (i) PMO's safeguards officers (environmental and social); (ii) RPMOs' engineers and social development officers. Training modules will need to cover safeguards awareness and management following both ADB and government requirements as specified below:

(i) Introduction to environment and environmental consideration in water supply and wastewater projects;
(ii) Review of IEEs and integration into the detailed project design;
(iii) Improved coordination within nodal departments; and
(iv) Monitoring and reporting system. The contractors will be required to conduct environmental awareness and orientation of workers before deployment to work sites.

171. **Water Users' and Sanitation Committee**. WUSC is the eventual operators of the completed projects. The key tasks and responsibilities of WUSCs are, but not limited to:

Before Construction.
(i) Facilitate public consultation and participation, information dissemination and social preparation.
(ii) Provide available data to DSMC-ESS during IEE
(iii) Assist in securing tree-cutting permits and/or registration of water source.
(iv) Participate in training programs.

During Construction.
(i) Assist in the observance of the grievance redress mechanism.
(ii) Actively participate in the monitoring of Contractor's compliance with the IEE and its EMP and the conditions set out with Government's approval of the IEE Reports.
(iii) Facilitate public consultations, as necessary.

During Operation.
(i) Implement the Environmental Management Plan and Water Safety Plan.
(ii) If applicable, actively work with the engaged licensed and accredited laboratory in water quality monitoring.
(iii) Prepare the environmental monitoring report as per IEE.
(iv) Ensure observance of the grievance redresses mechanism.

172. **Licensed and Accredited Laboratory.** It is recommended that a licensed and accredited laboratory be engaged to conduct water quality monitoring in the first few years of

operation and to train WUSC. The laboratory will ensure that while carrying out the water quality monitoring as prescribed in the National Drinking Water Quality Standard and its Directives, 'hands-on' training is provided to WUSC.

B. Environmental Management Plan

173. An Environmental Management Plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels.

174. The EMP will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between PMO, RPMO, PIUs, consultants and contractors. The EMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (i) provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (ii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iii) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensure that safety recommendations are complied with. The EMP includes a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries.

175. The contractor will be required to (i) carry out all of the mitigation and monitoring measures set forth in the approved EMP; and (ii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this IEE, EMP and site-specific EMP (SEMP). The contractor shall allocate budget for compliance with these IEE, EMP and SEMP measures, requirements and actions. The contractor will be required to submit to PIU, for review and approval, a SEMP including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; and (iii) monitoring program as per EMP. No works can commence prior to approval of SEMP.

Table VIII-1: Environmental Management Plan Matrix

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
1. Prior to Construction Activities					
Consents, permits, clearances, no objection certificate (NOC), etc.	Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and /or stoppage of works.	- Obtain all of the necessary consents, permits, clearance, NOCs, etc. prior to start of civil works. - Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc.	PMO, RPMO,& DSMC	Incorporated in final design and communicated to contractors.	Prior to award of contract
Existing utilities	Disruption of services	- Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction. - Require contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. - Require contractors to prepare spoils management plan (see Annex 2-D for outline).	DSMC, RPMO	List of affected utilities and operators; Bid document to include requirement for a contingency plan for service interruptions (for example provision of water if disruption is more than 24 hours)	During detailed design phase
Drinking water supply	Extraction of unsatisfactory raw water quality	- During the detailed engineering design stage, test water samples from existing surface sources to be conducted - Design to include basic treatment using lime dosing, pressure filter and disinfection using $Ca(ClO)_2$ and provisions for lab unit and kits.	PMO, RPMO& DSMC	Incorporated in final design and communicated to contractors	Prior to award of contract
Sanitation (Public Toilet)	Contamination of groundwater due to seepage of wastewater from the public toilet. Contamination of surface water due to effluent or runoff from the public toilet. Nuisance to community due to odor.	- Ensure design includes (i) appropriate lining of septic tanks to avoid seepage of wastewater; (ii) appropriate number of treatment chambers; and (iii) provision of water supply to ensure efficient maintenance of the toilet during operation phase.	PMO, RPMO & DSMC	Incorporated in final design and communicated to contractors	Prior to award of contract
Stockpile areas, Storage areas, Disposal areas,	Disruption to traffic flow and sensitive receptors	- Determine locations prior to award of contracts	DSMC, RPMO	List of selected sites for stockpile areas, storage areas, disposal	During detailed design phase

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
and workers camp (if needed)				areas, and workers camp (if needed). Written consent of landowner/s (not lessee/s) for reuse of excess spoils to agricultural land	
Waste generation	Generation of solid waste, wastewater and other construction waste may cause pollution from work sites and workers camp (if any is established)	- Mechanism of safe disposal will be developed in the subproject site before the actual commencement of work, including provision of waste bins. - Prohibition of unwanted littering and discharge of waste. - Proper management of solid waste will be done using lined pits for waste disposal.	Contractor	Contractor records. visual inspection	During detailed design phase
EMP Implementation Training	If no training is done, there is a possibility of the EMP not implemented efficiently and accurately, leading to unfavorable impacts to environment, workers and community.	- Project manager and contractors to undergo training on EMP implementation, including standard operating procedures (SOP) and occupational health and safety (OHS) for construction works. - Timely implementation of the EMP. - Development and execution of measures for any unanticipated environmental impacts.	PMO, RPMO and DSMC. Contractor's Environmental Supervisor	Record of completion (Safeguards Compliance Orientation or Training)	During detailed design phase prior to mobilization of workers to site.
2. During Construction Activities					
A. Physical Characteristics					
Topography, landforms, geology and soils and/or river morphology and hydrology	Surface cutting and excavation works may cause erosions and impact on the local hydrology.	- Soil erosion will be minimized by taking precautionary measures such as:(i) reuse of excavated soil, (ii)immediate and proper backfilling of the trenches, and (iii) the excavated soil temporarily stored properly against erosion by using barriers or silt traps.	Contractor	Records of sources of materials and records of potential areas of soil erosion; Sites of reservoir construction, treatment plant construction, transmission mains and distribution pipelines.	Daily (or as often as necessary especially during monsoon or rains) by contractor. Monthly visual inspection by RPMO and DSMC-ESE.
Community facilities	Damage to existing facilities like drains, compound walls and pavements.	- Existing infrastructure (such as water distribution pipes, etc.) shall be relocated before construction starts at the subproject sites. - Prior permission shall be obtained from respective local authority for use of water	Contractor	List of any public or private infrastructure disturbed by the subproject works Minutes of meetings	As per need, or field-inspection if any such case is foreseen.

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		for construction. Use of water for construction works shall not disturb local water users. - If construction work is expected to disrupt, users of community shall be informed 7 days in advance and again 1 day prior to start of construction. - Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.		with the locals or affected persons.	
Water bodies and water quality	Pollution of water bodies, contamination of water sources due to waste disposal, transport of sediments from worksites and/or construction camps (if any)	- All earthworks must be conducted during dry season to maximum extent possible to avoid the difficult working conditions that prevail during monsoon season such as problems from runoff. - Location for stock yards for construction materials shall be identified at least 300m away from water courses. Place for storage of fuels and lubricants will be away from any drainage leading to water bodies - Take all precautions to prevent entering of wastewater into streams, watercourses, or irrigation system. Install temporary silt traps or sediment basins along the drainage leading to the water bodies. - While working across or close to any water body, the flow of water must not be obstructed. Ensure no construction materials like earth, stone, or appendage are disposed of in a manner that may block the flow of water of any watercourse	Contractor	Areas for stockpiles and sites of storage of fuels and lubricants and waste materials; Number of physical measures (like silt traps installed). Visual inspection. Water quality sampling, if practical and reasonable.	Visual inspection by RPMO and DSMC-ESS on weekly basis Weekly field monitoring Water quality monitoring, if practical and reasonable.
Ambient air	Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants (such as carbon, monoxide, sulphur oxides, particulate matter, nitrous oxides, and hydrocarbons) which will affect people who live and work near the sites.	- Water sprinkling at dry exposed surfaces and stockpiles of aggregates at least twice daily, or as necessary. - If re-surfacing of excavated portion of roads cannot be done immediately, spread of crushed gravel over backfilled surfaces - Require trucks delivering aggregates and cement to have tarpaulin cover and maintain a minimum of 2” free board - Limit speed of construction vehicles in access roads to maximum of 30kph. - Ensure use of equipment and fuel complying with applicable emission standards.	Contractor	Location of stockpiles. Number of complaints from sensitive receptors. Heavy equipment and machinery with air pollution control devices. Certification that vehicles are compliant with air quality	Daily monitoring (when there are ongoing works) by contractor. Monthly visual inspection by RPMO& DSMC-ESS. Air quality monitoring, if practical and reasonable.

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
				standards.	
Acoustic environment	Construction activities will be on settlements along and near schools, and areas with small-scale businesses. Temporary increase in noise level and vibrations may be caused by excavation equipment, and the transportation of equipment materials, and people.	- Plan activities in consultation with local administration so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance. - Restrict noisy activities to daytime. - Minimize drop heights when loading and unloading coarse aggregates. - Horns should not be used unless it is necessary or unavoidable - Utilize modern vehicles and machinery with the requisite adaptations to limit noise and exhaust emissions, and ensure that these are maintained to manufactures' specifications at all times. - All vehicles and equipment used in construction shall be fitted with exhaust silencers. Use silent type generators (if required) - If it is not practicable to reduce noise levels to or below noise exposure limits, the contractor must post warning signs in the noise hazard areas. Identify any building at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity. Complete work in these areas quickly.	Contractor	Results of monitoring noise levels (Maintain maximum sound levels not exceeding 70 decibels when measured at a distance of 10m or more from the construction sites) Number of complaints from sensitive receptors	Daily monitoring (when there are ongoing works) by contractor. Monthly inspection by RPMO& DSMC-ESS. Noise level measurement, on as needed basis and/or if practical and reasonable.
Waste disposal	Pollution of water and land resources, and cases of vector borne diseases due to haphazard waste disposal	- Waste minimization and waste segregation will be prioritized - Practices of composting will be promoted - Containment of hazardous waste will be carried out	Contractor	On-site situation in campsites (if any), work sites and their vicinities	Monthly monitoring by RPMO& DSMC-ESS
B. Biological Characteristics					
Vegetation	Loss of vegetation cover during construction works and laying of the pipelines 5 sall trees, 5 utis trees and 7 kadam trees are likely to be felled for construction works	- Greenery promotion around the construction sites and road alignments where possible - Greenery promotion sites are proposed at Thulo Sisahniya and Pipari sites - Tree felling will be avoided, and if any such cases occur, prior approval from the local bodies will be received and compensatory plantation @ 1:25 will be carried out	Contractor	Area of greenery that has been cleared Number of trees cut (only if unavoidable) Complaints or grievances by the locals	Monthly monitoring by RPMO& DSMC-ESS

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		- Species of local economic significance and values will be planted			
Impacts on Fauna	Disturbances to local and migratory birds, reptiles and mammals	- No heavy vehicles will be made available to run on the road that may disturb the wildlife of the area - Horn prohibited sign will be placed in nearby wildlife inhabited area - Prohibit workforce from any wood logging, hunting - Designating stockpiling areas - Providing alternative fuel to workers for cooking.	Contractor	Vehicles running nearby wildlife inhabited area will be monitored Number of complaints from sensitive receptors on disturbance of poaching fishing, etc.	Monthly visual inspection by RPMO& DSMC-ESS
Aquatic system	Disposal of waste on or nearby water bodies, sediment transport and leakage/disposal of hazardous waste may harm the aquatic lives in the rivers/steams of subproject area	- Washing of vehicles on rivers will be restricted - Disposal of waste of any kind on water bodies will be strictly prohibited - Fishing in rivers will be prohibited for workforce	Contractor	Local stream will be monitored; Any grievances from locals regarding disposal of waste onto water bodies will be referred	Monthly visual inspection by RPMO& DSMC-ESS
C. Socioeconomic Characteristics					
Community activities	The construction related activities that generate dust, noise and impede access will disturb the local residents	- To minimize disturbances, construction work will be conducted at earliest possible. - Disturbances to local activities are foreseen at service areas in the core area/market centers - The local residents will be consulted and informed about the work schedule and possible disturbances in advance. - Temporary diversions and signboards will be provided for the pedestrians.	Construction contractor	Time schedule of construction work; Information related to construction activity to local residents Number of temporary diversions sign, signboards etc.	Daily (or whenever there are construction activities) by contractor Monthly visual inspection by RPMO& DSMC-ESS
Social harmony	Poor sanitation practices by workforce may cause pollution of surrounding environment. Social problems may arise due to bad behavior of the workforce such as gambling, alcoholism and disrespect to local people and culture	- Include in workers training adherence to proper housekeeping practices at worksites. - Local people should be given priority to work (recommended that more than 60% local workers whenever available) in the subproject which helps to minimize the chances of cultural discrepancy and conflict due to increased labor from outside.	Construction contractor	Daily entry-sheet of the workforce in the campsites Number of local people versus outside workers in the subproject area will be regularly monitored	Monthly inspection at campsites (if any) by RPMO& DSMC-ESS.

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
Occupational Health & Safety	During the construction work, the laborers involved in the construction activities may be exposed to different level of health risks and are prone to accidents	- Mandatory use of safety measures (PPEs) such as mask, helmet, hand gloves and rubber boots, etc. - The laborers will be insured for their health and safety. - Provide safe drinking water for labours - First aid box will be kept at a proper and easily accessible place. - Prohibit child labour in all construction activities.	Construction contractor	Availability of personal protective equipment, First-aid facilities, Medical insurance coverage for workers, Housekeeping and condition of sleeping and sanitation facilities at campsite (if any), Roster of workers	Daily (or when there is a construction activity) by contractor. Monthly visual and document inspection by RPMO and DSMC-ESS
Community Health & Safety	Overall, communities will be exposed to cross-cutting threats from construction's impacts on air and water quality, ambient noise level; Chances of accidents, Communicable and transmittable diseases may potentially be brought into the community by construction workers	- Contractor's will maintain adequate space and adequate lighting, temporary fence, barriers and signage at worksites; - Children will be prohibited from active construction sites - Proper fencing of stockpile areas - Awareness programs on communicable diseases and hygiene practices will be carried out - Disseminate the GRM to communities and affected stakeholders during consultations - Sensitive localities in terms of risk of this impact are school areas, market areas, and temple areas	Construction contractor	Number of permanent signs, barricades and flagmen on worksites as per Traffic Management Plan (Annex 2-D); Number of complaints from sensitive receptors; Number of walkways, signs, and metal sheets placed at subproject location	Daily by contractor. Monthly visual inspection by RPMO& DSMC-ESS
D. Historical, Cultural, and Archaeological Characteristics					
Physical and cultural heritage	Although the subproject area holds no visible above-ground PCRs, potential archaeological relics could be discovered underground and could be damaged due to construction activities.	- If by chance any such findings are spotted or suspected, the contractor will immediately stop work to allow further investigation, in coordination with Department of Archaeology.	Contractor	Records of chance finds	Daily (when there are excavation activities) by contractor. Monthly visual inspection by RPMO and DSMC-ESS.
During Operation and Maintenance Phase					
Exposure to chemicals	Excessive exposure to chlorine, hypochlorous acid, and hypochlorite ion generally results in irritation of the esophagus, a burning sensation in the mouth and throat, and spontaneous vomiting	- All disinfection chemicals require proper storage and handling practices - Provide safe storage for chemicals - Ensure that the person is hired, with knowledge of chlorine use for disinfection process during operation - Ensure use of PPE while using chemicals - Use of chlorine guideline as per WHO (Annex 8)	Contractor during DLP; WUSC or operator after DLP	Visual inspection	Daily (or as needed) by the operator.

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
Water bodies	Water pollution due to effluent produced from the periodic backwashing of the filter plant, if discharged directly to the river course may cause harm to the water bodies and aquatic life especially during the dry season when flow will be less.	- A settling tank is proposed for decanting of the slurry from the effluent during backwash	Contractor during DLP; WUSC or operator after DLP	Visual inspection Effluent sampling	For first year, DSMC After that WSUC daily inspection or as needed. Effluent sampling by the operator, only when necessary or practical.
Drinking water supply system	Delivery of unsafe water due to source contamination, leakage in pipes	- The operations and maintenance plan and training for staff will cover; (i) competent/cautions handling and storage of calcium Hypochlorite and qualified persons to implement/oversee disinfection and treatment; (ii) providing safe storage for chemicals; (iii) ensure capacity of WUSC to implement quick response to hazardous substance/waste spills; (iv) implement SPS-complaint EMP and a WSP; and (v) monitor water quality.	Contractor during DLP; WUSC or operator after DLP	Visual inspection Water Quality reports WTP records in the logbook	Daily or as needed visual inspection by the operator. Quarterly or as needed water quality testing by the operator.

C. Environmental Monitoring Program

176. Environmental monitoring will be done during construction at three levels:

(i) Monitoring development of project performance indicators by the PMO-ESS;
(ii) Monitoring implementation of mitigation measures by the Contractor; and
(iii) Overall regulatory monitoring of environmental issues by the PMO.

177. In addition to regular monitoring onsite (at town level) by the ICG and DSMC-ESS on the EMP implementation of the mitigation measures, monitoring of key environmental parameters is proposed. Table VIII-2 presents the indicative environmental monitoring plan for the subproject which includes relevant environmental parameters, with a description of the sampling stations, frequency of monitoring, applicable standards, and responsible agencies. This will be updated during detailed design to ensure EMP and monitoring program is commensurate to the impacts of the subproject.

Table VIII-2: Environmental Pollution Monitoring Program

	Field	Stage	Parameters	• Location	Frequency	Standards	Responsibility
1.	Air quality	• Prior to construction to establish baseline • Construction phase	PM_{10} SO2 (only if potential source is due to subproject) NOx (only if potential source is due to subproject)	• Work site locations • Along water transmission main 1-km interval from PTWs • Construction campsite locations	• 24-hour monitoring once in a season (except monsoons) for the construction period	• National Ambient Air Quality Standards, 2003	Contractor
2.	Noise and vibration levels	• Prior to construction to establish baseline • Construction phase	Equivalent day and nighttime noise levels	• PTWs location • Along water transmission main 1-km interval from PTWs • Construction campsite locations	• Once in a season (except monsoons) for the construction period	• National Noise Standard Guidelines, 2012	Contractor
3.	Water quality	• Prior to construction to establish baseline • Construction phase	TSS, pH, BOD, fecal coliform, DO	• Adjacent to construction sites (to be identified by the (DRTAC or DSMC)	• Twice a year (pre-monsoon and post-monsoon) for the entire period of construction	• National Drinking Water Quality Standards, 2005	Contractor

D. Institutional Capacity Development Program

178. Considering the limited capability of the Project's key players in environmental management, technical assistance from environmental specialists and capacity development during loan implementation will be needed. Capacity development will consist of hands-on training

in implementing the responsibilities in EMP (as well as in EARF) implementation, complemented with a short-term series of lectures/seminars on relevant topics.

179. WUSC does not have the capacity to monitor the quality of supplied water as prescribed in the NDWQS and its Directives. Although monitoring kits and laboratory rooms will be provided, this would not guarantee WUSC can handle monitoring appropriately. DWSSM has five regional laboratories; however, some are not functioning fully due to lack of human resources. Considering that public health is a critical concern associated with water supply, it is recommended that a licensed and accredited laboratory be engaged to conduct water quality monitoring for at least the first 2-3 years of operation with WUSC actively participating to develop its capacity. Water quality monitoring should be carried out in such a way that WUSC will be "learning by doing". After the engagement period, there should be continuing periodic training of new persons to ensure that the capacity of WUSC is sustained. The cost for monitoring during operation is based on the assumption that a licensed laboratory will be engaged for both the monitoring requirements and to train WUSC. A Water Safety Plan is included in subproject design and will oblige the operator to carry out water quality monitoring accordingly. There will be sufficient fund to include training by the licensed and accredited lab, while monitoring water quality.

180. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work site. Contractor needs to prepare a Site-specific EMP (S-EMP) document before starting its construction work, and an EHS focal person should be appointed by the contractor. As of now (this IEE document reviewed in February 2020), the contractor has already assigned an EHS focal person. The proposed training project along with the frequency of sessions is presented in Table VIII-3. The Environmental Safeguard specialist & EMP Field Monitoring Staffs are responsible for organizing different training program for Environmental Management.

Table VIII-3: Training Program for Environmental Management

Items	**Pre-construction/prior to construction**	**Construction**	
Training Title	Orientation workshop	Orientation program/ workshop for contractors and supervisory staff	Experiences and best practices sharing
Purpose	To make the participants aware of the environmental safeguard requirements of ADB and GON and how the project will meet these requirements	To build the capacity of the staffs for effective implementation of the designed EMPs aimed at meeting the environmental safeguard compliance of ADB and GON	To share the experiences and best practices aimed at learning lessons and improving implementation of EMP
Contents	**Module 1: Orientation** • ADB Safeguards Policy Statement • Government of Nepal Environmental Laws and Regulations **Module 2: Environmental Assessment Process** • ADB environmental process, identification of impacts and mitigation measures, formulation of an environmental management plan (EMP), implementation, and monitoring requirements • Review of environmental assessment report to comply with	• Roles and responsibilities of officials/contractors/consultants towards protection of the environment • Environmental issues during construction • Implementation of EMP • Monitoring of EMP implementation • Reporting requirements	Experiences on EMP implementation – issues and challenges Best practices followed

Items	Pre-construction/prior to construction	Construction	
	ADB requirements • Incorporation of EMP into the project design and contracts		
Duration	1 day	1 day	1 day on a regular period to be determined by PMO, ICGs, and (provide if DRTAC or DSMC)
Participants	Executing and implementing agencies, PMO, and PMO staff (technical and environmental) involved in the project implementation	PMO ICGs Contractors	PMO ICGs Contractors

E. Staffing Requirement and Budget

181. Costs required for implementing the EMP will cover the following activities:
(i) Updating IEE, preparing and submitting reports and public consultation and disclosure;
(ii) Application for environmental clearances; and
(iii) Implementation of EMP, environmental monitoring program and long-term surveys.

182. Environmental monitoring during construction will also be straightforward and will involve periodic site observations and interviews with workers and others, plus checks of reports and other documents. This will be conducted by PMO-ESS assisted by the PMO environmental safeguard officer. Therefore, no separate budget is required for the PMO-ESS. The cost of mitigation measures and surveys during construction stage will be incorporated into the contractor's costs, which will be binding on him for implementation. The surveys will be conducted by the contractors.

183. The indicative costs of EMP implementation are shown in Table VIII-4;

Table VIII-4: Indicative Cost of EMP Implementation and Its Monitoring

	Particulars	Stages	Unit	Qty.	Rate (NRs)	Cost (NRs)	Cost covered by
A.	**Mitigation Measures**						
1	Protection works and rehabilitation works	Construction				5,50,000	Contractor's contract
2	Greenery promotion/plantation	Construction				1,00,000	
3	Compensation and reinstatement	Construction				2,25,000	
B.	**Monitoring Measures**						
1	Water Quality	Pre-construction/ - Construction	Sample	10	8,000	80,000	Contractor's contract
2	Air Quality Monitoring	Pre-construction/ - Construction	Sample	5 x 2	10,000	100,000	Contractor's contract
3	Noise level Monitoring	Pre-construction/ - Construction	Sample	L/S		20,000	Contractor's contract
C	**Capacity Building**						
	(i) Orientation workshop for	Immediately				300,000	PMC cost

	Particulars	Stages	Unit	Qty.	Rate	Cost	Cost
	officials involved in the project implementation on ADB Safeguards Policy Statement, Government of Nepal environmental laws and regulations, and environmental assessment process;	upon engagement of the PMO-ESS DSMC) prior to award of civil works contracts					
	(ii) induction course to contractors, preparing the EMP implementation and environmental monitoring requirements related to mitigation measures; and taking immediate action to remedy unexpected adverse impacts or ineffective found during the course of implementation; and mitigation measures	After the first training, and within 6 months of start of project contract				800,000	Covered under PMC or DSMC contract
	(iii)lessons learned information sharing	Prior to start of Phase 2 and upon completion of the project				200,000	
E. Administrative Costs							
1	Legislation, permits, and agreements	Permit for excavation, tree-cutting permits, etc	Lump sum				PMO coordination and correspondence
		Environmental clearances as per EPA 1997 and EPR, IEE presentation at review committee related expenses	Lump sum	1		500,000	DSMC cost
F. Other Costs							
1	Public consultations and information Disclosure	During pre-construction and construction phase, including public awareness campaign through media	As per requirement		Lump sum	25,000	Contractor's contract
2	GRM implementation	Costs involved in resolving complaints (meetings, consultations, communication and reporting/ information dissemination)	Lump sum			75,000	PMO cost
3	Any unanticipated impact due to project Implementation	Mitigation of any unanticipated		Lump sum	Contractor's	As per insurance	Civil works contract–

	Particulars	Stages	Unit	Qty.	Rate	Cost	Cost
		impact arising during construction phase			liability	requirement	contractor's insurance defect liability period
4	Social Safeguard and GESI activities	Costs involved in resolving complaints (meetings, consultations, communication, and reporting/ Informing	As per requirement	Lump sum		25,000	Civil works contract
5	Awareness Activities					50,000	Civil works contract
6	Internal Monitoring; Notices and meetings					25,000	Civil works contract
7	**Expert Monitoring Costs**						
	Environmental Specialist			1 MM	100,000	100,000	
	Sociologist			1 MM	75,000	75,000	
	Support staff			2 MM	25,000	50,000	
	Cost of monitoring visit by MoWS/DWSSM					200,000	
	Transportation and logistics					175,000	
Total						**3,800,000**	

IX. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. Information Disclosure, Consultations and Participations

i. **Public Consultation**.

184. In order to ensure public involvement, the following procedures were followed during the IEE report preparation:

i. A 15 days public notice was published in the national daily newspaper seeking written opinions from concerned municipality and related local organizations and concerned people.
ii. A copy of the public notice was also affixed in the notice boards of the above mentioned organizations in the project area and a deed of enquiry (*muchulka*) was collected.
iii. The IEE team discussed with the local communities and related stakeholders like municipality, WSSDO *etc* during the field survey to collect their concerns and suggestions.
iv. A meeting was held in Liwang regarding the project. DSMC members explained about the project and the probable environmental impacts.
v. The minutes of meeting regarding the same is attached in Annex 5.
vi. Consultation will be a continuing process throughout activity implementation and in environmental monitoring activities. Additional consultations will include key informant interviews and random interviews with affected persons/households

TableIX-1: List of People and Institutions Consulted

SN	Name	Organization/Address
1	Liladhar Acharya	Chairperson, WUSC
2	Nanda Kumar Acharya	Vice Chairperson, WUSC
3	Tulasa Acharya	Treasurer, WUSC
4	Mahesh Neupjane	Secretary, WUSC
5	Dilmani Bhandari	Member, WUSC
6	Tanka Acharya	Member, WUSC
7	Lal Bahadur Kuwar	Member, WUSC
8	Gita Acharya	Member, WUSC
9	Lalmani Kunwar	Staff, WSS
10	Titha Acharya	Beneficiary, ward 4
11	Binsari Rokka	Beneficiary, ward 1
12	Mul Bahadur Rokka Magar	Beneficiary, ward 1
13	Giri Bhandari	Beneficiary, ward 8
14	Resma Tamang	Beneficiary, ward 8
15	Krishna Khatri	Beneficiary, ward 5
16	Baini Tamang	Beneficiary, ward 3
17	Ram Tamang	Beneficiary, ward 3

185. During the IEE preparation, consultations were undertaken (Annex 5). The following table summarizes the public consultations;

Table IX-2: List of Public Consultations and their Summary

SN	Meeting	Date	Location	Outcomes
1	Field/community consultation	2nd June 2018	Ward 2; Women's Group office	The participants discussed on irrigation use of water. And while discussing about drinking water, their focus was on provision of quality/potable drinking water
2	Field/Community consultation	4th June 2018	Bamruk, Ward 1, Liwang Mewang Community Forest User Group	The participants agreed that there are no major environmental implications of the project implementation
3	IEE public consultation	4th June 2018	Community meeting space, Ward 2, Liwang	The participants showed concern on water quality, irrigation use of water, and on timely implementation of the project to serve with adequate potable water

ii. Other Issues Raised and Suggestions

- ✓ Timely implementation of project so that the environmental impacts do not get more aggravated,
- ✓ Minimal loss of vegetation, and suggested for greenery promotion,
- ✓ Construction Equipments should be of standard level, impacts on environment should be minimal and any impacts on the environment should be mitigated by the contractor.

iii. Information Disclosure

186. The draft IEE will be kept at the information centre of Rolpa Municipality, Rolpa for public disclosure. Information will also be disseminated through person to person contacts and interviews and group discussions. Available institutions at the local level will also be informed through notices pasted on notice boards of the concerned ward offices, schools, health posts and public places. The approved IEE report will be accessible to interested parties and general public through websites *www.stwsssp.gov.np*. Following offices will get the IEE report:

- ✓ Rolpa Municipality, Rolpa District, Rapti zone
- ✓ WUSC - Liwang, Rolpa
- ✓ Ministry of Water Supply, Kathmandu

For the benefit of the community, the summary of the IEE will be translated in the local language and made available at locations specified.

B. Grievance Redress Mechanism

187. A project-specific GRM will be established to receive, evaluate and facilitate resolution of affected persons' concerns, complaints, and grievances related to social, environmental and other concerns on the project. The GRM will aim to provide a time-bound and transparent mechanism to resolve such concerns. Grievances may be channeled through letters, emails, text messages (sms), verbal narration, grievance boxes and registers. Suggested template for grievance redress form is in Annex 2-B.

188. A common GRM will be in place for social, environmental or any other grievances related to the subproject. The GRM will provide an accessible forum for receiving and facilitating resolution of affected persons' grievances related to the project. Project will publish the sample

grievance registration form on its website, and publish it in local language and/or indigenous people dialect, at the hoarding board of each of the participating WUA or municipalities' office. Every grievance shall be registered with careful documentation of process adopted for each of the grievance handled, as explained below. The environmental and social safeguards officer (ESO/SSO) at the PMO will have the overall responsibility for timely grievance redress on environmental and social safeguards issues. The Social Safeguards Officer at the RPMO will be the focal person for facilitating the grievance redress at the local level.

189. A municipal-level public awareness campaign will be conducted on a regular basis as per the communication strategy of the project to ensure awareness on the project and its GRM. The social and environmental safeguards experts of the project management and quality assurance consultant (PMQAC) and regional design, supervision and management consultants (RDSMCs) will support the WUA or municipalities in conducting municipality-wide awareness campaigns, which will ensure that all stakeholders including poor and vulnerable are aware of the GRM and project's entitlements.

190. A grievance redress committee (GRC) will be formed at the Municipality level, comprising the Mayor as Chairperson of GRC, and Regional Project Manager RPMO as Secretary. The GRC members will comprise of (1) WUSC Secretary; (2) RPMO Engineer; (3) RPMO social /environmental (as relevant) officer, (4) representative of affected persons, (5) RDSMC's safeguards specialist (social/environment as relevant), (6) a representative of reputable and relevant CBO/SHG/organization working in the subproject area as invitee,23 and (7) contractor's representative. The secretary of the GRC will be responsible for convening timely meetings and maintaining minutes of meetings. The concerned social safeguards expert of RDSMC will support the RPMO safeguard's officer and Project Manager of RPMO to ensure that grievances, including those of the poor and vulnerable are addressed. All GRCs shall have at least two women committee members. Along with representatives of the affected persons, civil society and eminent citizens can be invited as observers in GRC meetings.

191. The functions of the local GRC are as follows: (i) provide support to affected persons on problems arising from environmental or social disruption; asset acquisition (if necessary); and eligibility for entitlements, compensation and assistance; (ii) record grievances of affected persons, categorize and prioritize them and provide solutions within 15 days of receipt of complaint by WUA or local bodies; and (iii) ensure feedback to the aggrieved parties about developments regarding their grievances and decisions of the GRC. The GRM procedure is depicted in Figure 5, and is outlined below in detail, with each step having time-bound schedules and responsible persons to address grievances and indicating appropriate persons whose advice is to be sought at each stage, as required. If affected persons are not satisfied with the response they can elevate it to the next level:

(i) **First Level of GRM** (WUA level): The first-level, which is also the most accessible and immediate venue for quick resolution of grievances will be the contractors, RDSMC field engineers and RPMO supervision personnel, who will immediately inform the WUA. Any person with a grievance related to the project works can contact UWSSSP to file a complaint. The municipal-level field office of the RPMO, in WUA's building, will document the complaint within 24 hours of receipt of complaint in the field, and WUA or local bodies will immediatelyaddressandresolvetheissueatfield-levelwiththecontractor, supervision personnel of RPMO and RDSMC field engineers within 5 days of receipt of a complaint/grievance. The assigned RDSMC's Social Mobilizer will be responsible to fully document:(i)name of the person,(ii)date of complaint received,(iii) nature of complaint, (iv) location and (v) how the complaint was resolved as well as to provide feedback to the complainant. If the complaint remains unresolved at the local level within 5 days, the WUA will forward the complaint to the municipality level GRM.

[23] If the complaints are related with IP/Dalits/other vulnerable groups, specific NGO/CBO that actively involved in development of these communities shall be involved.

(ii) **Second Level of GRM** (Municipality level): The complainant will be notified by the WUA that the grievance is forwarded to the Municipality-level GRC. The Municipality-level GRC will be called for a meeting, called and chaired by the Mayor. The GRC will recommend corrective measures at the field level and assign clear responsibilities for implementing its decision within 10 days of receipt of complaint by WUA. If the grievance remains unresolved within 10 days of receipt of complaint by WUA, the matter will be referred to the third level. The RPMO Engineer will be responsible for processing and placing all papers before the GRC, recording decisions, issuing minutes of the meetings, providing feedback to complainants and taking follow-up actions so that formal orders are issued and decisions are carried out.

(iii) **Third Level of GRM** (PMO Level)**:** Any unresolved or major issues at Municipality level will be referred to the PMO for final solution. A representative of the Nepal Foundation for Indigenous Nationalities (NEFIN) will be invited to attend any meetings related to resolution of Indigenous Peoples grievances. Decision has to be made within 15 days of receipt of complaint from the Municipality-level GRC. The Project Director will sign off on all grievances received by the PMO. The concerned Deputy Project Director (DPD) and environmental and social safeguards officers (ESO and SSO) of PMO will be involved with support from the PMQAC's social/environment safeguards experts. The SSO will be responsible to convey the final decision to the complainant.

192. All paperwork (details of grievances) needs to be completed by the WUA member secretary assisted by RDSMC and circulated to the WUA Chairperson and members. At Municipality level, the RPMO Engineer will be responsible for circulation of grievances to the Regional Project Manager, DWSSM, Mayor and other GRC members, prior to the scheduled meetings. The RPMO's Engineer will be responsible for follow-through of all escalated grievances. All decisions taken by the GRC will be communicated to the affected persons by the RPMO's SSO.

193. Despite the project GRM, an aggrieved person shall have access to the country's legal system at any stage and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

194. In the event that the established GRM is not in a position to resolve the issue, the affected person also can use ADB's Accountability Mechanism through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB headquarters or the ADB Nepal Resident Mission. The complaint can be submitted in any of the official languages of ADB's developing member countries (DMCs). The ADB's Accountability Mechanism information will be included in UWSSSP Information Datasheet (PID), to be published in web and distributed to the affected communities, as part of the project GRM.

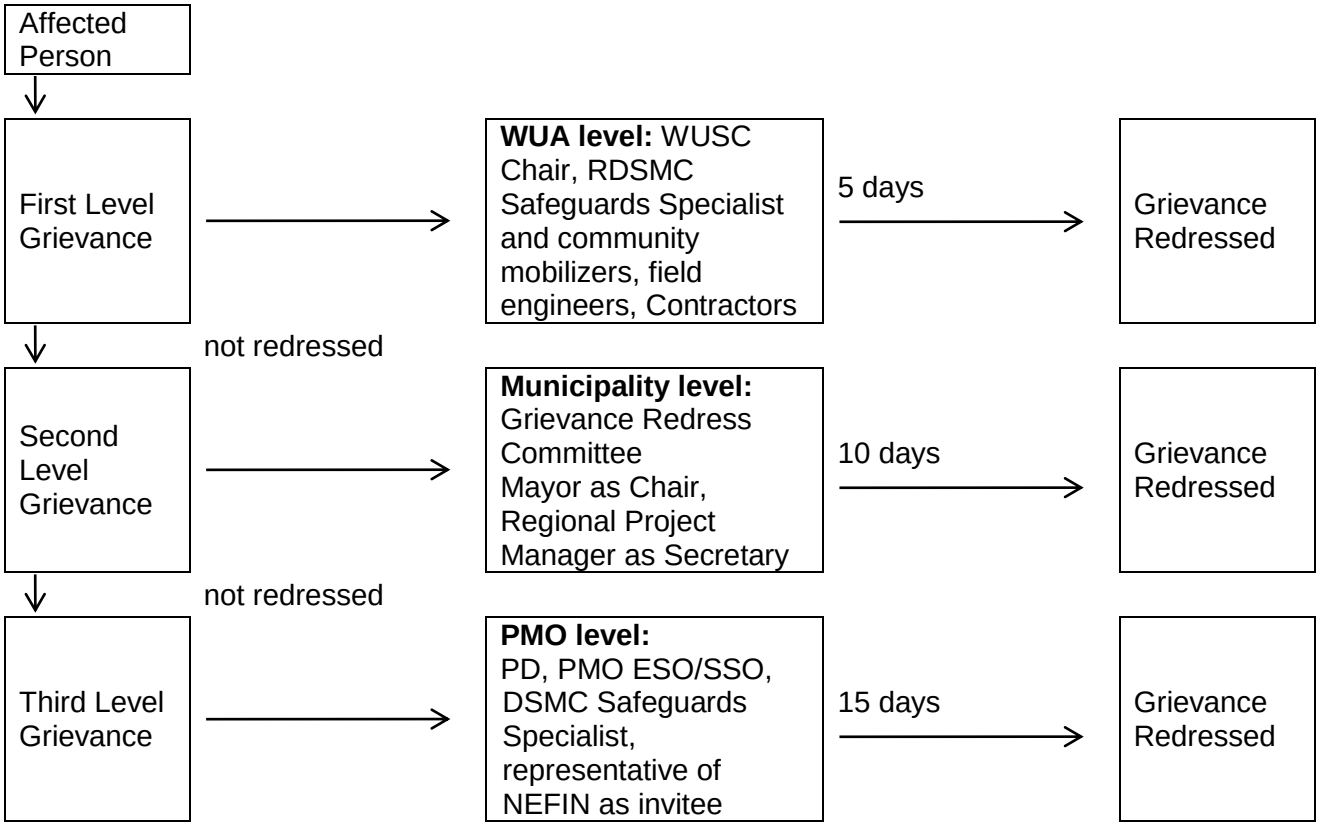


Figure IX-1: Grievance Redress Mechanisms

DSMC = design, supervision and management consultant; ESO=environmental safeguards officer; NEFIN = Nepal Federation of Indigenous Nationalities; PD = project director; PMO = project management office; RDSMC = regional design, supervision and management consultant; SSO = social safeguards officer; WUA = water users' association; WUSC = water users' and sanitation committee.

195. **Record Keeping and Disclosure**. Records at the municipal-level will be kept by the concerned WUA or local bodies member secretary, assisted by RDSMC, of all grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions and the date of the incident and final outcome. The number of grievances recorded and resolved, and the outcomes will be displayed/disclosed in the PMO office, WUA, and on the web, as well as reported in the safeguards monitoring reports submitted to ADB on a semi-annual basis. For any grievance escalated to RPMO/ Municipality level, the RPMO's Engineer assigned as GRM focal person will be responsible for record-keeping, calling of GRC meetings and timely sharing of information with WUA or municipalities. For grievances escalated to PMO and above, the PMO's SSO will be responsible for maintenance of records, sending copies to RPMO and WUA for timely sharing of information with the person filing complaint.

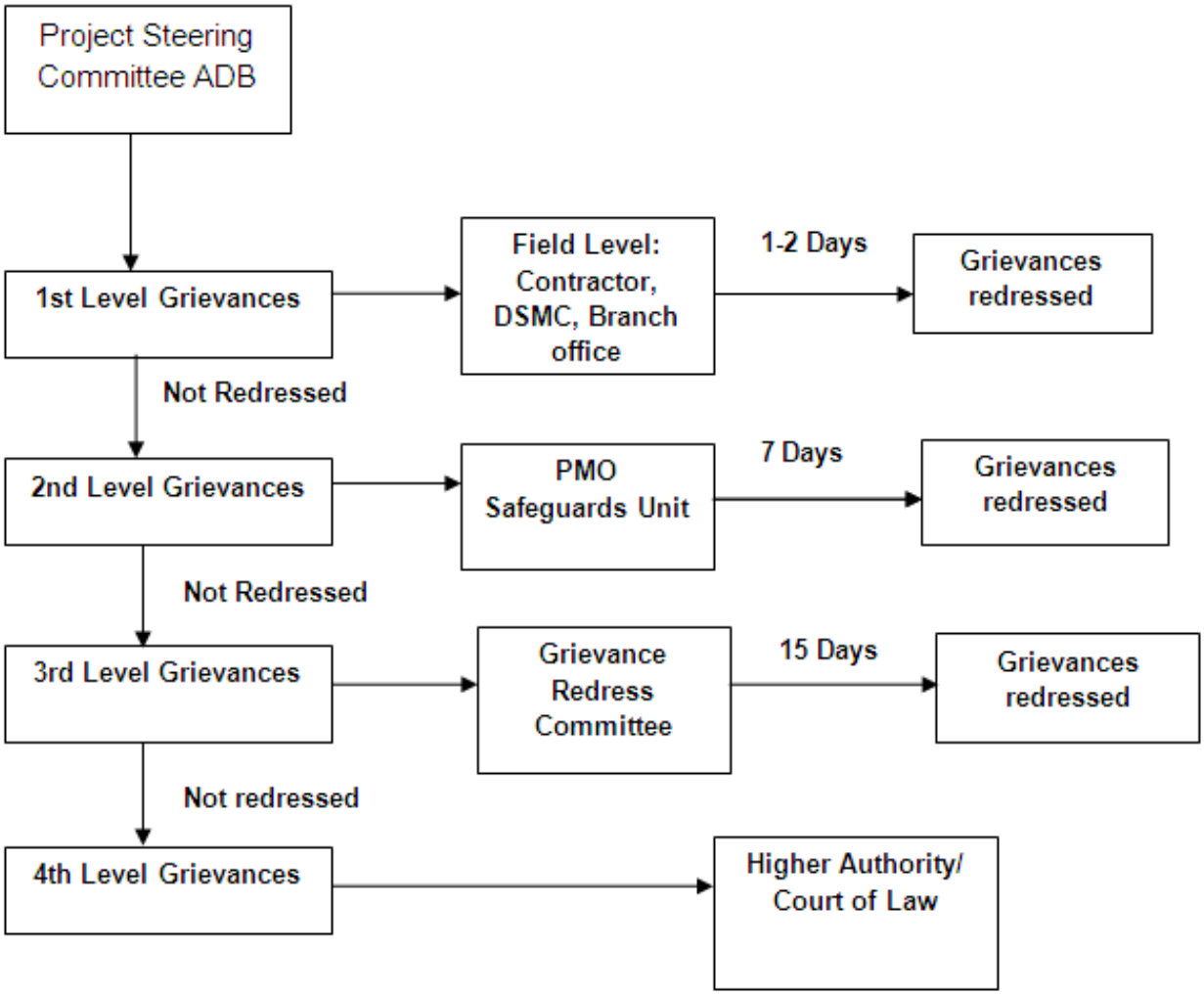
196. Periodic Review and Documentation of Lessons Learned. The PMO's SSO will periodically review the functioning of the GRM at municipality or WUA level and field level and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances. Indicators pertaining to grievance redress (no. of grievances received,

no. redressed/resolved to be reported by Member Secretary, WUA to RPMO SDO, and by RPMO to PMO SSO) in monthly and quarterly progress reports.

197. Costs. All costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) at local (field/ward/municipal) level will be borne by the concerned focal organizations at each level: WUA at local level, and municipality at municipal level; and PMO at central level. Cost estimates for grievance redress are included in resettlement cost estimates.

Table IX-2: Suggested Format for Record Keeping of Grievances

S. No.	Date of receipt of grievance	Name and contact details of complainant	Description of complaint	Nature of complaint	Decisions taken	Response given to complainant and date	Whether closed


Project Steering Committee ADB
1st Level Grievances
Field Level: Contractor, DSMC, Branch office
1-2 Days
Grievances redressed
Not Redressed
2nd Level Grievances
PMO Safeguards Unit
7 Days
Grievances redressed
Not Redressed
3rd Level Grievances
Grievance Redress Committee
15 Days
Grievances redressed
Not redressed
4th Level Grievances
Higher Authority/ Court of Law

X. MONITORING AND REPORTING

198. RPMO will monitor and measure the progress of EMP implementation. The monitoring activities will relate to the subproject's impacts that are identified in IEE. PMO, ICGs will compare the works completed and deviations from the original scope. They will also undertake site inspections and review documents to verify that the project complies with the EMP.

199. RPMO will submit monthly monitoring and implementation reports to PMO, who will take follow-up actions, if necessary. PMO will submit semi-annual monitoring reports to ADB. Project budgets will reflect the costs of monitoring and reporting requirements. For projects likely to have significant adverse environmental impacts during operation, reporting will continue on an annual basis. Monitoring reports will be posted in a location accessible to the public.

200. For projects likely to have significant adverse environmental impacts, the PMO will retain external experts to verify its monitoring information. PMO-ESS will document monitoring results, identify the necessary corrective actions, reflect them in a corrective action plan, and for each quarter, will study the compliance with the action plan developed in the previous quarter. Compliance with loan covenants will be screened by the PMO-ESO, with support from PMO-ESS.

201. ADB will review the project performance against MOWS's commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system. ADB will monitor projects on an ongoing basis until a project completion report is issued. ADB will carry out the following monitoring actions to supervise project implementation:

(i) conduct periodic visits to projects with adverse environmental or social impacts;
(ii) conduct supervision and review by ADB's safeguard specialists/officers or consultants for projects with significant adverse social or environmental impacts;
(iii) review the periodic monitoring reports submitted by EAS to ensure that adverse impacts and risks are mitigated, as planned and as agreed with ADB;
(iv) work with EAS to rectify to the extent possible any failures to comply with their safeguard commitments, as covenanted in the legal agreements, and exercise remedies to re-establish compliance; and
(v) prepare a project completion report that assesses whether the objective and desired outcomes of the safeguard plans have been achieved, taking into account the baseline conditions and the results of monitoring.

202. ADB's monitoring and supervision activities are carried out on an on-going basis until a Project Completion Report (PCR) is issued. ADB issues a PCR within 1-2 years after the project is physically completed and in operation.

203. The contractor will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. The contractor needs to conduct regular monitoring of environmental status, compliance and standards in its working sites and campsites. This needs to be included in monthly reporting to the PMO Consultant in the format prescribed by the PMO Consultant. The Contractor shall facilitate for field visits in any and all monitoring activities planned by the PMO consultants, PMO / RPMO personnel and the ADB.

XI. CONCLUSION AND RECOMMENDATIONS

204. IEE study shows that the proposed project is not an environmentally critical intervention. The IEE indicates that;

205. The project area does not lie within or is not situated adjacent to environmentally sensitive areas. However disturbances to biological resources must be limited to possible extent.

206. Degree of negative impacts is expected to be local, confined within the 'areas of influence'. Cutting and excavation works, cutting, etc are some of the prime concerns. Slope instability and spoil disposal are also among the foreseen challenges to the local environment. With mitigation measures in place, the potential adverse impacts during construction phase would be site-specific and short term, and can be mitigated through appropriate measures.

207. The adverse impacts are foreseen to be of temporary and short-term nature which would be manifested only during peak construction time. These will not be sufficient to threaten or weaken the surrounding resources. Preparation and implementation of an EMP that would mitigate the impacts and would lower their significance to acceptable levels. Simple mitigation measures, basically integral to socially and environmentally responsible construction practices, are commonly used at construction sites and are known to the contractors. The designed mitigation measures are affordable and easy to implement on time.

208. During operation phase, accidental chance of delivery of unsafe water is a major concern. This can be mitigated with good operation and maintenance, prompt action on leaks, and complying with the required quality monitoring of supplied water as per national standards.

209. The proposed project will have following beneficial results: (i) improved access to reliable supply of safe drinking water; (ii) promotion of good hygiene and sanitation practices; and (iii) enhanced public health and improved quality of life.

210. In light of the above findings, the classification of the Liwang *Urban Water Supply and Sanitation Project* as Category B for environment is confirmed and no further special study or EIA needs to be undertaken to comply with the Safeguard Policy Statement (2009) of ADB and EPR (1997) of the Government of Nepal.

LITERATURE REVIEWED

Environment Protection Act, Government of Nepal, 1997

Environment Protection Rules, Government of Nepal, 1997 (and amendments)

Final Feasibility Study of Liwang Small Town Water Supply and Sanitation Project

Detailed Engineering Design Report of Liwang Project, 2018

Environmental Assessment and Review Framework, Third Small Towns Water Supply and Sanitation Sector Project, 2014, Asian Development Bank

Safeguard Policy Statement, June 2009, Asian Development Bank

The Updated Fifteen-Year Development Plan for Small Towns' Water Supply and Sanitation Sector, 2009

ANNEXES

ANNEX 1: REA CHECKLIST

ANNEX 2-A: RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST FOR LIWANG PROJECT AND PRELIMINARY CLIMATE RISK SCREENING

Instructions

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: NEP: Urban Water Supply and Sanitation Sector Project

Subproject: Liwang Urban Water Supply and Sanitation Project

Screening Questions	Yes	No	Remarks
A. Project Siting **Is the project area**			
Densely populated?		√	The population density is 19.57 (per hectare)
Heavy with development activities?		√	
Adjacent to or within any environmentally sensitive areas?			
Cultural heritage site		√	
Protected Area		√	
Wetland		√	
Mangrove		√	
Estuarine		√	
Buffer zone of protected area		√	
Special area for protecting biodiversity		√	
Bay		√	

Screening Questions	Yes	No	Remarks
B. Potential Environmental Impacts Will the Project cause…			
pollution of raw water supply from upstream wastewater discharge from communities, industries, agriculture, and soil erosion runoff?		√	
impairment of historical/cultural monuments/areas and loss/damage to these sites?		√	
hazard of land subsidence caused by excessive ground water pumping?			
social conflicts arising from displacement of communities ?		√	
conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		√	
unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?	√		Complete water treatment is proposed. EMP recommends water quality monitoring as prescribed in the NDWQS & its directives.
delivery of unsafe water to distribution system?	√		Design proposes monitoring kits, a lab room. EMP recommends continuing training of WUSC in water quality monitoring, as prescribed in the NDWQS Directives. WSP team will also monitor the system.
inadequate protection of intake works or wells, leading to pollution of water supply?	√		Design proposes protection for intake, as well as perimeter fencing of the entire land area of the intake & associated facilities.
over pumping of ground water, leading to salinization and ground subsidence?		√	
excessive algal growth in storage reservoir?		√	The design incorporates closed reservoirs
increase in production of sewage beyond capabilities of community facilities?		√	Most of the communities have septic tanks leading to soak pits. EMP provides mitigation measures.
inadequate disposal of sludge from water treatment plants?		√	Minimal sludge expected. EMP provides mitigation measures for sedimentation and safe disposal of the effluent.
inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?		√	

Screening Questions	Yes	No	Remarks
Impairments associated with transmission lines and access roads?	√		Loss of shrub cover and damage to standing crops, loss of topsoil are some concerns that are planned for mitigated and compensation
health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.	√		$Ca(ClO)_2$, commonly used in basic water treatment, will be used. Chlorine use guidelines will be followed. Separate storing space will be allocated, and standard operating procedures will be followed.
health and safety hazards to workers from handling and management of chlorine used for disinfection, other contaminants, and biological and physical hazards during project construction and operation?	√		Operators/workers will be well trained, cautioned and protective equipment will be provided to them Cleaning and disinfection will be scheduled with proper responsibility to specific person/s
dislocation or involuntary resettlement of people?		√	
disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	
noise and dust from construction activities?	√		EMP provides mitigation measures.
increased road traffic due to interference of construction activities?	√		EMP provides mitigation measures.
continuing soil erosion/silt runoff from construction operations?		√	Only short term activities are required
delivery of unsafe water due to poor O&M treatment processes (especially MoWS accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?	√		EMP incorporates monitoring of distributed water according to the Directives for the NDWQS. Residual chlorine of 0.5mg/L will be maintained at all times, and this will be regularly monitored
delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?		√	HDPE and DI pipes are proposed
accidental leakage of chlorine gas?		√	
excessive abstraction of water affecting downstream water users?		√	Safe yield has been maintained
competing uses of water?		√	
increased sewage flow due to increased water supply	√		Most of the communities have septic tanks leading to soak pits.
increased volume of sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant		√	Coordination with municipality team for its integrated urban planning and development approach

Screening Questions	Yes	No	Remarks
large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	Water supply will be used under permission from local authority and under coordination with the locals. Separate toilets (temporary and permanent, if required) will be constructed for the workforce
social conflicts if workers from other regions or countries are hired?	√		Expected as low concern. Priority will be given to local workers.
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?	√		Signboards, sharing of working schedules, proper fencing of stockpile areas and campsites will be conducted
Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		√	Small structures are proposed. However, concerns of land instability and structural strengths will be well addressed Signboards will be placed to exclude general puhlic from active construction sites and sensitive areas of the project

Preliminary Climate Risk Screening Checklist for Sample Sub Project Towns

Screening Questions		Score	Remarks
Location and design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides	0	Investments in the sample sub project will not likely be affected by climate change and extreme weather events due to the siting of project. For example all pipes will be constructed below ground no investments will be sited in flood plains etc.
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g. sea-level, peak river flow, reliable water level, peak wind speed etc.)	0	Not likely.
Materials and maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days,	0	

	exposure to wind and humidity, and hydro metrological parameters) affect the selection of project inputs over the life of project outputs (i.e. construction materials)		
Performance of Project Outputs	Would climate/weather conditions and related extreme events likely to affect the performance throughout their design life time?	0	Climate conditions will unlikely affect water quantity and quality of water supply system. The water supply schemes will be designed to meet the current and future demand. Further water supply system will be operated and maintained efficiently to reduce system losses. Water safety plans will be implemented to ensure water supplied is safe and potable at all times.

Options for answers and corresponding scores are given below.

Response	**Score**
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned as medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): Low Other comments: None

NO MITIGATION SCENARIO (SCOPING CHECKLIST) of Liwang UWSS Project

Checklist 1: Scoping Checklist Part 1 - Questions on Project Characteristics

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1. Will construction, operation or decommissioning of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in water bodies, etc)?				
1.1	Permanent or temporary change in land use, land cover or topography including increases in intensity of land use?	Yes	Slight changes in existing land cover status thus adding some built-up units in the existing open land	Not significant because the proposed land is currently unused, and the area is of small scale
1.2	Clearance of existing land, vegetation and buildings?	Yes	Existing land cover could be converted into built up area	Not significant
1.3	Creation of new land uses?	No		
1.4	Pre-construction investigations e.g. boreholes, soil testing?			
1.5	Construction works?	Yes	Surface water bodies; agricultural land could be polluted/disturbed due to haphazard disposal of spoil and waste during construction phase	Not significant because scale of work is small
1.6	Demolition works?	No		
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	Chance of disposal of waste from temporary campsite thus polluting the local surface water bodies.	Not significant because scale of work is small
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations?	Yes	Disturbance to local socio-economic activities during construction phase	Not significant because scale of work is small
1.9	Underground works including mining or tunnelling?	No		
1.10	Reclamation works?	No		
1.11	Dredging?	No		
1.12	Coastal structures eg seawalls, piers?	No		
1.13	Offshore structures?	No		
1.14	Production and manufacturing processes?	No		
1.15	Facilities for storage of goods or materials?	Yes	Stockpile site is needed. This may disturb community safety, especially for children	The site selected for stockpile is not a prime public space.
1.16	Facilities for treatment or disposal of solid wastes or liquid effluents?	Yes	Small compost pits in campsites; Septic tank for Public toilet; Soak pit for sludge trap. These may pollute the surface water bodies	Not significant as these are in-house units, not community scale units.
1.17	Facilities for long term housing of operational workers?	Yes	WUSC building, guard house	Not significant as the land required is small
1.18	New road, rail or sea traffic	No		

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	during construction or operation?			
1.19	New road, rail, air, waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	No		
1.20	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No		
1.21	New or diverted transmission lines or pipelines?	Yes	Community safety if the trenches are not timely back-filled	Not significant as pipelines are small sized
1.22	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No		
1.23	Stream crossings?	No		
1.24	Abstraction or transfers of water from ground or surface waters?	Yes	Surface water sources will be used by making intake structures	No, as the design has considered safe yield
1.25	Changes in water bodies or the land surface affecting drainage or run-off?	No		
1.26	Transport of personnel or materials for construction, operation or decommissioning?	Yes	Local construction materials need to be transported from within the project district	Not significant as the transportation needed is intermittent
1.27	Long term dismantling or decommissioning or restoration works?	No		
1.28	Ongoing activity during decommissioning which could have an impact on the environment?	No		
1.29	Influx of people to an area in either temporarily or permanently?	Yes	Temporary influx of workforce may cause disturbance to local social activities, harmony	Not significant as they will be coming for short time for specific works only
1.30	Introduction of alien species?	No		
1.31	Loss of native species or genetic diversity?	No		
1.32	Any other actions?	No		
2. Will construction or operation of the Project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?				
2.1	Land especially undeveloped or agricultural land?	Yes	Undeveloped land will be used	Not significant as the unused small land parcels are selected

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
2.2	Water?	Yes	Surface water sources are used	Safe yield has been considered
2.3	Minerals?	No		
2.4	Aggregates?	Yes	These will be used from authorized local suppliers	
2.5	Forests and timber?	No		
2.6	Energy including electricity and fuels?	Yes	Electricity, Petrol, diesel, and LPG gas will be used. However these are not locally produced energy sources	
2.7	Any other resources?	No		
3. Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?				
3.1	Will the project involve use of substances or materials which are hazardous or toxic to human health or the environment (flora, fauna, water supplies)?	No		
3.2	Will the project result in changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)?	Yes	The surroundings of the worker's camp may be affected as they may not have access to safe supply of water and good sanitation practice.	Not significant as the campsites proposed are not within core settlements
3.3	Will the project affect the welfare of people e.g. by changing living conditions?	No		
3.4	Are there especially vulnerable groups of people who could be affected by the project e.g. hospital patients, the elderly?	No		
3.5	Any other causes?	No		
4. Will the Project produce solid wastes during construction or operation or decommissioning?				
4.1	Spoil, overburden or mine wastes?	Yes	Degradation of surface land and pollution of surface water sources	Not significant as scale of works is small
4.2	Municipal waste (household and or commercial wastes)?	Yes	Waste from campsite will increase municipal waste	Not significant as it is short term and small scale
4.3	Hazardous or toxic wastes (including radioactive wastes)?	No		
4.4	Other industrial process wastes?	No		
4.5	Surplus product?	No		
4.6	Sewage sludge or other sludge from effluent treatment?	Yes	Normal sludge from backwash of water treatment plants	Not significant as it will contain sediments which are not toxic
4.7	Construction or demolition wastes?	Yes	Small volume of construction waste during construction	Not significant as these are not

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
			phase, and some waste during decommissioning will be generated	hazardous
4.8	Redundant machinery or equipment?	No		
4.9	Contaminated soils or other material?	No		
4.10	Agricultural wastes?	No		
4.11	Any other solid wastes?	No		
5. Will the Project release pollutants or any hazardous, toxic or noxious substances to air?				
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources?	Yes	Ambient air pollution is a concern	Not significant as GoN standard vehicles and fuel are in use in general
5.2	Emissions from production processes?	No		
5.3	Emissions from materials handling including storage or transport?	Yes	During construction phase, dust generation by the unloading of materials like cement, aggregates, metal bars, etc. During operation phase, spills or leaks from stored chemicals or gases (e.g. chlorine gas) for use in the water treatment and cleaning processes.	Not significant as the scale of works is not large; and these are only site specific activities of short term nature
5.4	Emissions from construction activities including plant and equipment?	Yes	Dust generation due to earthworks and other construction activities.	Not significant as these are short term
5.5	Dust or odours from handling of materials including construction materials, sewage and waste?	Yes	During construction phase, air pollution due to dust generation during unloading of construction materials like aggregates, cements, metal bars, etc. During operation phase, air pollution due to leaks from mishandling of chemicals used in the water treatment (e.g. coagulants, chlorine).	Not significant as the scale of works is not large; and these are only site specific activities of short term nature
5.6	Emissions from incineration of waste?	No		
5.7	Emissions from burning of waste in open air (eg slash material, construction debris)?	No		
5.8	Emissions from any other sources?	No		
6. Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?				
6.1	From operation of equipment eg engines,	Yes	Noise and vibration (limited) may cause community	Not significant as the scale of work

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	ventilation plant, crushers?		nuisance	is small, site specific and short term
6.2	From industrial or similar processes?	No		
6.3	From construction or demolition?	Yes	Noise may cause community nuisance	Not significant as the scale of work is small, site specific and short term
6.4	From blasting or piling?	No		
6.5	From construction or operational traffic?	Yes	Construction traffic will cause disturbance to community activities	Not significant as local roads are wide, and the activities are short term
6.6	From lighting or cooling systems?	No		
6.7	From sources of electromagnetic radiation (consider effects on nearby sensitive equipment as well as people)?	No		
6.8	From any other sources?	No		
7. Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into sewers, surface waters, groundwater, coastal waters or the sea?				
7.1	From handling, storage, use or spillage of hazardous or toxic materials?	No		
7.2	From discharge of sewage or other effluents (whether treated or untreated) to water or the land?	Yes	During operation, the backwash of treatment units will discharge sludge and grey water that pose risk of pollution of land and surface water	Not significant as this is done only periodically
7.3	By deposition of pollutants emitted to air, onto the land or into water?	No	The land nearby the workers camp may be polluted by the daily activities of the workers residing there temporarily.	Not significant as campsite is of small size
7.4	From any other sources?	No		
7.5	Is there a risk of long term build-up of pollutants in the environment from these sources?	No		
8. Will there be any risk of accidents during construction or operation of the Project which could affect human health or the environment?				
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous or toxic substances?	No		
8.2	From events beyond the limits of normal environmental protection	No		

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	e.g. failure of pollution control systems?			
8.3	From any other causes?	No		
8.4	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslip, etc)?	No		
9. Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?				
9.1	Changes in population size, age, structure, social groups etc?	Yes	There is chance of in migration due to this project that will affect the existing community, cultural identity, economic conditions etc.	No, the ethnicity of project area is of heterogeneous type.
9.2	By resettlement of people or demolition of homes or communities or community facilities e.g. schools, hospitals, social facilities?	No		
9.3	Through in-migration of new residents or creation of new communities?	Yes	People from the neighbouring remote areas may migrate to this project town to achieve improved living standards and this may bring change in demography as the population of the project area may be increased.	Not significant as the project area is a small section of the inner Terai belt with similar socio-economy
9.4	By placing increased demands on local facilities or services eg housing, education, health?	No		
9.5	By creating jobs during construction or operation or causing the loss of jobs with effects on unemployment and the economy?	Yes	Requirement of labour for the construction works prioritize the local people hence, providing employment opportunities to the local people.	Yes, because the skills they learnt during their employment period can be utilized in the future in other similar kind of works.
9.6	Any other causes?			
Question - Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality?				
9.1	Will the project lead to pressure for consequential development which could have significant impact on the environment e.g. more housing, new roads, new supporting industries or utilities, etc?	No		
9.2	Will the project lead to	No		

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	development of supporting facilities, ancillary development or development stimulated by the project which could have impact on the environment e.g. supporting infrastructure (roads, power supply, waste or waste water treatment, etc) housing development extractive industries supply industries other?			
9.3	Will the project lead to after-use of the site which could have an impact on the environment?	No		
9.4	Will the project set a precedent for later developments?	Yes	This is a positive impact. The safe access to water supply and sanitation by this project may create opportunities for other development works	Yes, because it will be the important factor for the sustainable development of the town
9.5	Will the project have cumulative effects due to proximity to other existing or planned projects with similar effects?	No		

Checklist 2: Scoping Checklist Part 2 - Characteristics of the Project Environment (Environmental Sensitivity)

Question - Are there features of the local environment on or around the Project location which could be affected by the Project? • Areas which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the project? • Other areas which are important or sensitive for reasons of their ecology e.g. • Wetlands, • Watercourses or other water bodies, • the coastal zone, • mountains, • forests or woodlands • Areas used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, overwintering, migration, which could be affected by the project? • Inland, coastal, marine or underground waters? • Areas or features of high landscape or scenic value? • Routes or facilities used by the public for access to recreation or other facilities? • Transport routes which are susceptible to congestion or which cause environmental problems? • Areas or features of historic or cultural importance?	Yes, the part of project area lying along the main road may be susceptible to traffic congestion during distribution pipeline laying works that may provide discomfort to the passer-by and also may disrupt the access to the roadside shops and houses.
Question - Is the Project in a location where it is likely to be highly visible to many people?	Yes. The project area is proposed to serve the core market area of Rolpa Municipality which includes the main market area due to which it will be highly visible to many people.
Question - Is the Project located in a previously undeveloped area where there will be loss of greenfield land?	No; but some structures like reservoir tank will be in undeveloped open land currently not is any use
Question - Are there existing land uses on or around the Project location which could be affected by the Project? For example: • Homes, gardens, other private property, • Industry, • Commerce, • Recreation, • public open space, • community facilities, • agriculture, • forestry, • tourism, • mining or quarrying	No
Question - Are there any plans for future land uses on or around the location which could be affected by the Project?	No
Question - Are there any areas on or around the location which are densely populated or built-up, which could be affected by the Project?	No
Question - Are there any areas on or around the location which are occupied by sensitive land uses which could be affected by the	No

Project? • hospitals, • schools, • places of worship, • community facilities	
Question - Are there any areas on or around the location which contain important, high quality or scarce resources which could be affected by the Project? For example: • groundwater resources, • surface waters, • forestry, • agriculture, • fisheries, • tourism, • minerals.	No
Question - Are there any areas on or around the location of the Project which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?	No
Question - Is the Project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?	No
Question - Is the Project likely to affect the physical condition of any environmental media? • The atmospheric environment including microclimate and local and larger scale climatic conditions? • Water – e.g. quantities, flows or levels of rivers, lakes, groundwater. Estuaries, coastal waters or the sea? • Soils – e.g. quantities, depths, humidity, stability or erodibility of soils? • Geological and ground conditions?	No
Question - Are releases from the Project likely to have effects on the <u>quality</u> of any environmental media? • Local air quality? • Global air quality including climate change and ozone depletion • Water quality – rivers, lakes, groundwater. Estuaries, coastal waters or the sea? • Nutrient status and eutrophication of waters? • Acidification of soils or waters? • Soils • Noise? • Temperature, light or electromagnetic radiation including electrical interference? • Productivity of natural or agricultural systems?	Yes The construction activities may shortly affect local ambient air quality especially during dry season. Noise nuisance in close proximity to construction sites is potential It due to movement of vehicles for transporting materials
Question - Is the Project likely to affect the availability or scarcity of any resources either locally or globally? • Fossil fuels?	No

• Water? • Minerals and aggregates? • Timber? • Other non-renewable resources? • Infrastructure capacity in the locality - water, sewerage, power generation and transmission, telecommunications, waste disposal roads, rail?	
Question - Is the Project likely to affect human or community health or welfare? • The quality or toxicity of air, water, foodstuffs and other products consumed by humans? • Morbidity or mortality of individuals, communities or populations by exposure to pollution? • Occurrence or distribution of disease vectors including insects? • Vulnerability of individuals, communities or populations to disease? • Individuals' sense of personal security? • Community cohesion and identity? • Cultural identity and associations? • Minority rights? • Housing conditions? • Employment and quality of employment? • Economic conditions? • Social institutions?	Yes, Ambient air quality deterioration, noise levels and exposure to risks from stockpiles/trenches have potentiality to affect Community health & safety aspects during the construction phase This project may also result in the occurrence of communicable diseases due to temporary settlement of workers

Checklist 3: Significance of Impacts

Questions to be Considered	
1. Will there be a large change in environmental conditions?	No
2. Will new features be out-of-scale with the existing environment?	No
3. Will the effect be unusual in the area or particularly complex?	No
4. Will the effect extend over a large area?	No
5. Will there be any potential for trans boundary impact?	No
6. Will many people be affected?	No
7. Will many receptors of other types (fauna and flora, businesses, facilities) be affected?	No
8. Will valuable or scarce features or resources be affected?	No
9. Is there a risk that environmental standards will be breached?	No
10. Is there a risk that protected sites, areas, features will be affected?	No
11. Is there a high probability of the effect occurring?	No
12. Will the effect continue for a long time?	
13. Will the effect be permanent rather than temporary?	No
14. Will the impact be continuous rather than intermittent?	No
15. If it is intermittent will it be frequent rather than rare?	No
16. Will the impact be irreversible?	No
17. Will it be difficult to avoid, or reduce or repair or compensate for the effect?	No

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Date:	19th June 2019

ANNEX 2: Environmental Standards, Sample Forms, Formats and Reporting Template

ANNEX 2-B: RELEVANT ENVIRONMENTAL QUALITY STANDARDS

B.1 Ambient Air Quality Standards

Parameter	Averaging Period	Nepal's Ambient Air Quality Standard ($\mu g/m^3$) *	WHO Air Quality Guidelines ($\mu g/m^3$) **	
			Global Update 2005	Second Edition ^ 2000
TSP	Annual	-	-	-
	24-hour	230	-	-
PM_{10}	Annual	-	20	-
	24-hour	120	50	-
$PM_{2.5}$	1-year	-	10	-
	24-hour	-	25	-
SO_2	Annual	50	-	
	24-hour	70	20	-
	10-minute	-	500	-
NO_2	1-year	40	40	-
	24-hour	80	-	-
	1-hour	-	200	-
CO	8-hour	10,000	-	10,000
	15-minute	100,000	-	100,000
Pb	1-year	0.5	-	0.5
Benzene	1-year	20	-	-

* National Ambient Air Quality Standards for Nepal, 2003. Obtained from Environment Statistics of Nepal 2011, Government of Nepal, National Planning Commission Secretariat, Central Bureau of Statistics, Kathmandu, Nepal.

** Environmental, Health and Safety General Guidelines, 2007. International Finance Corporation, World Bank Group.

^ Air Quality Guidelines for Europe, Second Edition, 2000. WHO Regional Office for Europe, Copenhagen.

Parameter that either has no national standard value for 24-hour observation or with WHO guideline value for 24-hour observation as more stringent than that specified in the national standards.

B.2 Noise Level Standards

Receptor / Source	National Noise Standard Guidelines, 2012 (dB)		WHO Guideline Values for Noise Levels Measured Out of Doors * (One Hour L_{Aeq} in dBA)	
	Day	Night	07:00 - 22:00	22:00 - 07:00
Industrial area	75	70	70	70
Commercial area	65	55		
Rural residential area	45	40	55	45
Urban residential area	55	50		
Mixed residential area	63	55		
Quiet area	50	40	-	-
Water pump	65		-	
Diesel generator	90		-	

* Guidelines for Community Noise, WHO, 1999.

Source: Environmental, Health and Safety General Guidelines, 2007. International Finance Corporation, World Bank Group.

B.3 National Drinking Water Quality Standards, 2006

Group	National Drinking Water Quality Standards, 2006			WHO Guidelines for Drinking-water Quality, 4th Edition, 2011*
	Parameter	Unit	Max. Concentration Limits	
Physical	Turbidity	NTU	5 (10) **	-
	pH		6.5 - 8.5	none
	Color	TCU	5 (15)	none
	Taste & Odor		Would not be objectionable	-
	TDS	mg/l	1000	-
	Electrical Conductivity	µc/cm	1500	-
	Iron	mg/l	0.3 (3)	-
	Manganese	mg/l	0.2	-
	Arsenic	mg/l	0.05	0.01
	Cadmium	mg/l	0.003	0.003
	Chromium	mg/l	0.05	0.05
	Cyanide	mg/l	0.07	none
	Fluoride	mg/l	0.5 - 1.5 ^	1.5
	Lead	mg/l	0.01	0.01
	Ammonia	mg/l	1.5	none established
Chemical	Chloride	mg/l	250	none established
	Sulphate	mg/l	250	none
	Nitrate	mg/l	50	50
	Copper	mg/l	1	2
	Total Hardness	mg/l	500	-
	Calcium	mg/l	200	-
	Zinc	mg/l	3	none established
	Mercury	mg/l	0.001	0.006
	Aluminum	mg/l	0.2	none established
	Residual Chlorine	mg/l	0.1 - 0.2	5 ^^
Micro Germs	E-coli	MPN/100ml	0	must not be detectable in any 100 ml sample
	Total Coliform	MPN/100ml	0 in 95% of samples taken	

* Health-based guideline values

** Figures in parenthesis are upper range of the standards recommended.

^ These standards indicate the maximum and minimum limits.

^^ From WHO (2003) Chlorine in Drinking-water, which states that this value is conservative.

Parameter with WHO guideline value as more stringent than natilonal standard value.

National Drinking Water Quality Standards was obtained from the Environment Statistics of Nepal 2011, Government of Nepal, National Planning Commission Secretariat, Central Bureau of Statistics, Kathmandu, Nepal.

ANNEX C: SAMPLE GRIEVANCE REDRESS FORM

(To be available in Nepalese and English)

The _____ Project welcomes complaints, suggestions, queries and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enables us to get in touch with you for clarification and feedback. Should you choose to include your personal details but want that information remain confidential, please inform us by writing/typing* (CONFIDENTIAL)* above your name. Thank you.

Date	Place of registration			
Contact Information/personal details				
Name	Gender	*Male *Female	Age	
Home Address				
Place				
Phone No.				
E-mail				
Complaint/Suggestion/Comment/Question Please provide the details (who, what, where and how) of your grievance below: If includes as attachment/note/letter, please tick here:				
How do you want us to reach you for feedback or update on your comment/grievance?				

FOR OFFICIAL USE ONLY

Registered by: (Names of official registering grievance)	
Mode of communication: Note/Letter E-mail Verbal/Telephonic	
Reviewed by: (Names/positions of official(s) reviewing grievance)	
Action Taken:	
Whether Action Taken Disclosed:	Yes No
Means of Disclosure:	

ANNEX D: SAMPLE TRAFFIC MANAGEMENT PLAN
SAMPLE: TRAFFIC MANAGEMENT PLAN (TMP)

A. Principles

One of the prime objectives of this TMP is to ensure the safety of all the road users along the work zone, and to address the following issues:

- the safety of pedestrians, bicyclists, and motorists travelling through the construction zone;
- protection of work crews from hazards associated with moving traffic;
- mitigation of the adverse impact on road capacity and delays to the road users;
- maintenance of access to adjoining properties
- Avoid hazards in addressing issues that may delay the project.

B. Operating Policies for TMP

The following principles will help promote safe and efficient movement for all road users (motorists, bicyclists, and pedestrians, including persons with disabilities) through and around work zones while reasonably protecting workers and equipment.

- Make traffic safety and temporary traffic control an integral and high-priority element of every project from planning through design, construction, and maintenance.
- Inhibit traffic movement as little as possible.
- Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they approach and travel through the temporary traffic control zone.
- Inspect traffic control elements routinely, both day and night, and make modifications when necessary.
- Pay increased attention to roadside safety in the vicinity of temporary traffic control zones.
- Train all persons that select, place, and maintain temporary traffic control devices.
- Keep the public well informed.
- Make appropriate accommodation for abutting property owners, residents, businesses, emergency services, railroads, commercial vehicles, and transit operations.

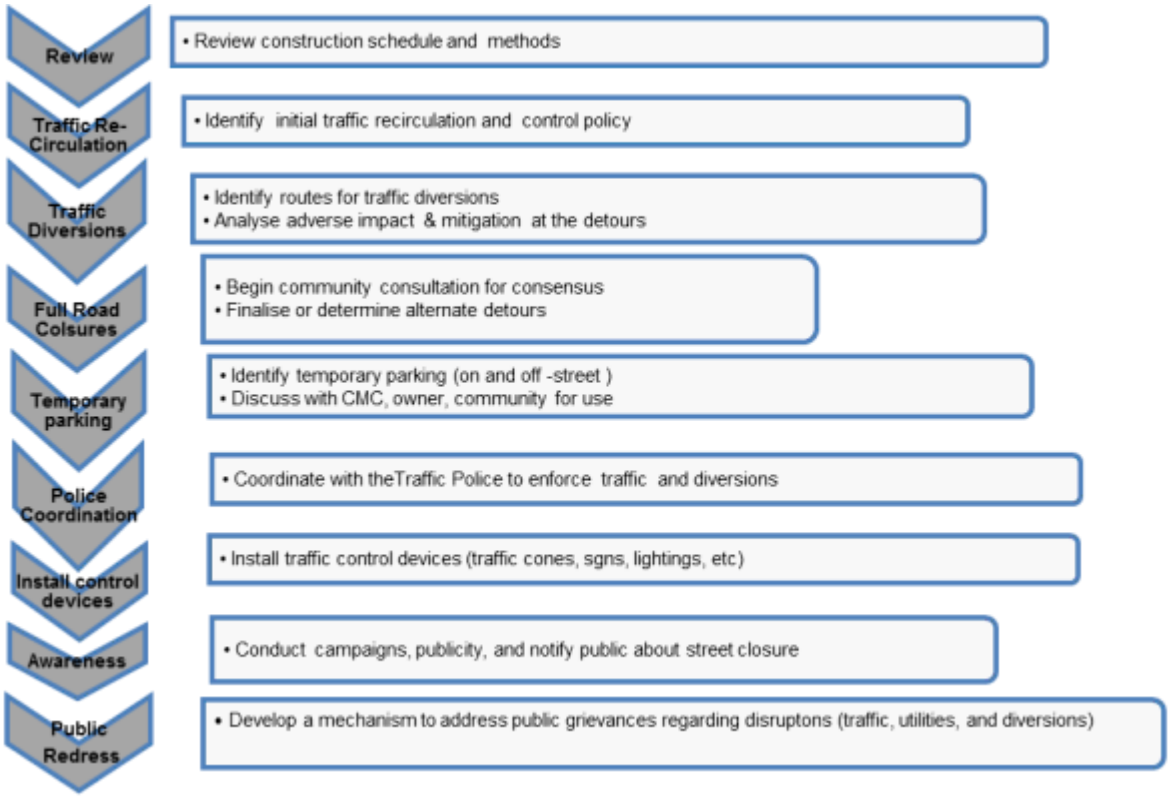
C. Analyze the impact due to street closure

Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

- approval from the ICG, local administration to use the local streets as detours;
- consultation with businesses, community members, traffic police, PWD, etc, regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
- determining of the maximum number of days allowed for road closure, and incorporation of such provisions into the contract documents;
- determining if additional traffic control or temporary improvements are needed along the detour route;
- considering how access will be provided to the worksite;
- contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and
- developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

If full road-closure of certain streets within the area is not feasible due to inadequate capacity of the Detour Street or public opposition, the full closure can be restricted to weekends with the construction commencing on Saturday night and ending on Monday morning prior to the morning peak period.

Figure A: Policy Steps for the TMP



D. Public awareness and notifications

As per discussions in the previous sections, there will be travel delays during the constructions, as is the case with most construction projects, albeit on a reduced scale if utilities and traffic management are properly coordinated. There are additional grounds for travel delays in the area, as most of the streets lack sufficient capacity to accommodate additional traffic from diverted traffic as a result of street closures to accommodate the works.

The awareness campaign and the prior notification for the public will be a continuous activity which the project will carry out to compensate for the above delays and minimize public claims as result of these problems. These activities will take place sufficiently in advance of the time when the roadblocks or traffic diversions take place at the particular streets. The reason for this is to allow sufficient time for the public and residents to understand the changes to their travel plans. The project will notify the public about the roadblocks and traffic diversion through public notices, ward level meetings and city level meeting with the elected representatives.

The ICG will also conduct an awareness campaign to educate the public about the following issues:

- traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);

- defensive driving behavior along the work zones; and
- reduced speeds enforced at the work zones and traffic diversions.

It may be necessary to conduct the awareness programs/campaigns on road safety during construction.

The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centers. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the ICG, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

- Explain why the brochure was prepared, along with a brief description of the project;
- Advise the public to expect the unexpected;
- Educate the public about the various traffic control devices and safety measures adopted at the work zones;
- Educate the public about the safe road user behavior to emulate at the work zones;
- Tell the public how to stay informed or where to inquire about road safety issues at the work zones (name, telephone, mobile number of the contact person; and
- Indicate the office hours of relevant offices.

E. Vehicle Maintenance and Safety

A vehicle maintenance and safety program shall be implemented by the construction contractor. The contractor should ensure that all the vehicles are in proper running condition and it comply with roadworthy and meet certification standards of GoN. All vehicles to be used at STWSSP shall be in perfect condition meeting pollution standards of GoN. The vehicle operator requires a pre state of shift checklist. Additional safety precautions will include the requirement for:

- Driver will follow the special code of conduct and road safety rules of Government of Nepal.
- Drivers to ensure that all loads are covered and secured drivers to ensure operation equipment can’t leak materials hauled
- Vehicles will be cleaned and maintained in designed places.

F. Install traffic control devices at the work zones and traffic diversion routes

The purpose of installing traffic control devices at the work zones is to delineate these areas to warn, inform, and direct the road users about a hazard ahead, and to protect them as well as the workers. As proper delineation is a key to achieve the above objective, it is important to install good traffic signs at the work zones. The following traffic control devices are used in work zones:

- Signs
- Pavement Markings
- Channelizing Devices
- Arrow Panels
- Warning Lights

Procedures for installing traffic control devices at any work zone vary, depending on road configuration, location of the work, construction activity, duration, traffic speed and volume, and pedestrian traffic. Work will take place along major roads, and the minor internal roads. As such, the traffic volume and road geometry vary. The main roads carry considerable traffic; internal roads in the new city areas are wide but in old city roads very narrow and carry considerable traffic. However, regardless of where the construction takes place, all the work zones should be cordoned off, and traffic shifted away at least with traffic cones, barricades, and temporary signs (temporary “STOP” and “GO”).

The work zone should take into consideration the space required for a buffer zone between the workers and the traffic (lateral and longitudinal) and the transition space required for delineation, as applicable. For the works, a 30 cm clearance between the traffic and the temporary STOP and GO signs should be provided. In addition, at least 60 cm is necessary to install the temporary traffic signs and cones.

Traffic police should regulate traffic away from the work zone and enforce the traffic diversion result from full street closure in certain areas during construction. Flaggers/ personnel should be equipped with reflective jackets at all times and have traffic control batons (preferably the LED type) for regulating the traffic during night time.

In addition to the delineation devices, all the construction workers should wear fluorescent safety vests and helmets in order to be visible to the motorists at all times. There should be provision for lighting beacons and illumination for night constructions.

The ICG and contractor will coordinate with the local administration and traffic police regarding the traffic signs, detour, and any other matters related to traffic. The contractor will prepare the traffic management plan in detail and submit it along with the EMP for the final approval.

ANNEX E: SPOIL MANAGEMENT PLAN
Spoil Management Plan (SMP)

Purpose and application: SMP is to describe how STWSSP will manage the spoil generated and reuse related to design and construction works. This is an integral part of EMP. The objective of SMP is to reuse of spoil from works in accordance with the spoil management hierarchy outlined in this document.

Objectives of SMP: The objectives of SMP are:

- To minimize spoil generation where possible
- Maximize beneficial reuse of spoil from construction works in accordance with spoil management hierarchy
- Mange onsite spoil handling to minimize environmental impacts on resident and other receivers
- Minimize any further site contamination of land, water, soil
- Manage the transportation of spoil with consideration of traffic impacts and transport related emissions

Structure of SMP:
Section 1: Introduction of SMP
Section 2: Legal and other requirements
Section 3: Roles and responsibilities
Section 4: Identification and assessment of spoil aspects and impacts
Section 5: Spoil volumes, characteristics and minimization
Section 6: Spoil reuses opportunities, identification and assessment
Section 7: On site spoil management approach
Section 8: Spoil transportation methodology
Section 9: Monitoring, Reporting, Review, and Improvements

Aspects and Potential Impacts
The key aspects of potential impacts in relation to SMP are listed in table below

Aspects	Potential Impacts
Air Quality	Potential for high winds generating airborne dust from the stock piles
Sedimentation	Potential for sediment laden site runoff from spoil stockpiles and potential for spillage of spoil from truck on roads
Surface and Groundwater	Contamination of water (surface and ground water)
Noise	Associated with spoil handling and haulage and storage
Traffic	Impacts associated with spoil haulage
Land Use	Potential for spoil to be transported to a receivable site that doesn't have permission for storage/disposal
Design specifications	Limitations on opportunities to minimize spoil generation
Sustainability	Limited sites for storage, reuse opportunities

Spoil volumes, Characteristics and Minimization

Spoil volume calculations: Estimate the volumes of spoils produced from each of the construction sites.

Characterization of spoil: Based on the type of spoil; characterization is done (sand stone, MoWS mix materials, reusable materials

Adopt Spoil Reduce, Reuse Opportunities
An overview of the assessment methodology to be used is mentioned below.

- Consideration of likely spoil characteristics
- Identification of possible reuse sites
- Screening of possible reuse opportunities

Identification of possible safe disposal sites for spoil: Those spoils which can't be reuse shall be properly disposed in designated areas, such disposal areas should be identified in project locations. Such disposal areas should be safe from environmental aspects and there should be any legal and resettlement related issues. Such areas need to be identified and prior cliental approval should be obtained to use it as spoil disposal area. The local administration must be consulted and if required permission should be obtained from them.

Storage and stock piling

Transportation and haulage route

Based on the above, the contractor will prepare a SMP as an integral part of EMP and submit it to the DSMC for their review and approval.

SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

- Summary of follow up time-bound actions to be taken within a set timeframe.

Appendixes

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection Report
- Others

ANNEX F: SAMPLE SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT TEMPLATE

This template must be included as an appendix in the EIA/IEE that will be prepared for the project. It can be adapted to the specific project as necessary.

INTRODUCTION

- Overall project description and objectives
- Description of sub-projects
- Environmental category of the sub-projects
- Details of site personnel and/or consultants responsible for environmental monitoring
- Overall project and sub-project progress and status

No.	Sub-Project Name	Status of Sub-Project				List of Works	Progress of Works
		Design	Pre-Construction	Construction	Operational		
		☐	☐	☐	☐		
		☐	☐	☐	☐		
		☐	☐	☐	☐		

COMPLIANCE STATUS WITH NATIONAL/STATE/LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS

No.	Sub-Project Name	Statutory Environmental Requirements	Status of Compliance	Action Required

COMPLIANCE STATUS WITH ENVIRONMENTAL LOAN COVENANTS

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

COMPLIANCE STATUS WITH THE ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

- Provide the monitoring results as per the parameters outlined in the EMP. Append supporting documents where applicable, including Environmental Site Inspection Reports.
- There should be Reporting on the following items which can be incorporated in the checklist of routine Environmental Site Inspection Report followed with a summary in the semi-annual Report send to ADB. Visual assessment and review of relevant site documentation during routine site inspection needs to note and record the following:
- What are the dust suppression techniques followed for site and if any dust was noted to escape the site boundaries;
- Adequacy of type of erosion and sediment control measures installed on site, condition of erosion and sediment control measures including if these were intact following heavy rain;
- Are their designated areas for concrete works, and refueling;
- Are their spill kits on site and if there are site procedure for handling emergencies;
- Is there any chemical stored on site and what is the storage condition?
- Is there any dewatering activities if yes, where is the water being discharged;
- How are the stockpiles being managed;

- How is solid and liquid waste being handled on site;
- Review of the complaint management system;
- Checking if there are any activities being under taken out of working hours and how that is being managed.

Summary Monitoring Table

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

Overall Compliance with CEMP/EMP

No.	Sub-Project Name	EMP/CEMP Part of Contract Documents (Y/N)	CEMP/EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed & Additional Measures Required

APPROACH AND METHODOLOGY FOR ENVIRONMENTAL MONITORING OF THE PROJECT

Brief description on the approach and methodology used for environmental monitoring of each sub-project

MONITORING OF ENVIRONMENTAL IMPACTS ON PROJECT SURROUNDINGS (AMBIENT AIR, WATER QUALITY AND NOISE LEVELS)

- Brief discussion on the basis for monitoring
- Indicate type and location of environmental parameters to be monitored
- Indicate the method of monitoring and equipment to be used
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM10 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity (µS/cm)	BOD (mg/L)	TSS (mg/L	TN (mg/L)	TP (mg/L)

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity (µS/cm)	BOD (mg/L)	TSS (mg/L	TN (mg/L)	TP (mg/L)

Noise Level Results

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Government Standard)	
			Day Time	Night Time

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Government Standard)	
			Day Time	Night Time

ANNEX G: SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT
Project Name
Contract Number

NAME: _____ DATE:
TITLE: _____ DMA:
LOCATION: _____ GROUP:

WEATHER CONDITION:
_____

INITIAL SITE CONDITION:
_____

CONCLUDING SITE CONDITION:

Satisfactory _____ Unsatisfactory_____ Incident_____ Resolved _____ Unresolved _____

INCIDENT:
Nature of incident:
_____

Intervention Steps:
_____

Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

Emissions	Waste Minimization
Air Quality	Reuse and Recycling
Noise pollution	Dust and Litter Control
Hazardous Substances	Trees and Vegetation

Site Restored to Original Condition Yes No

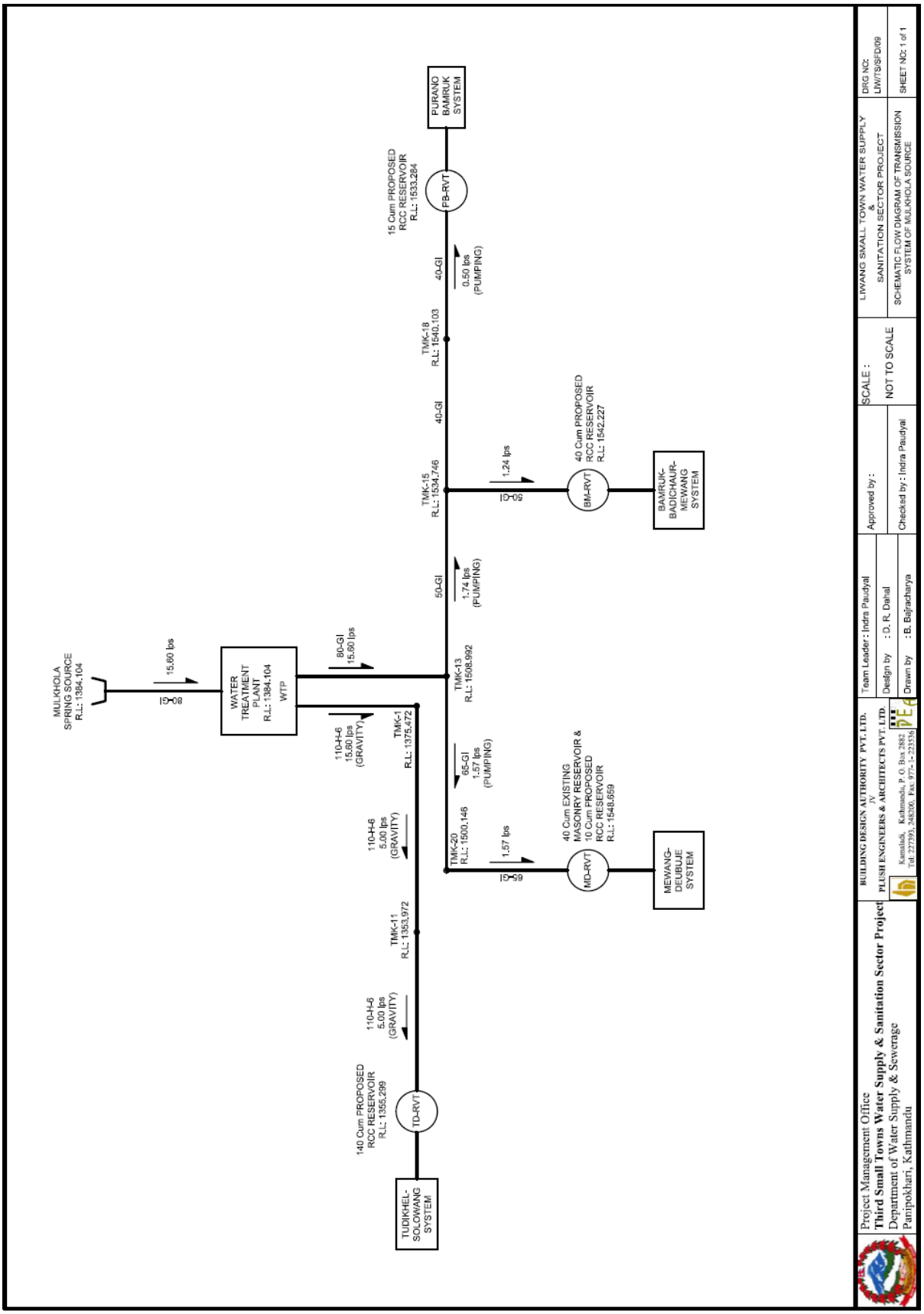
Signature
_____

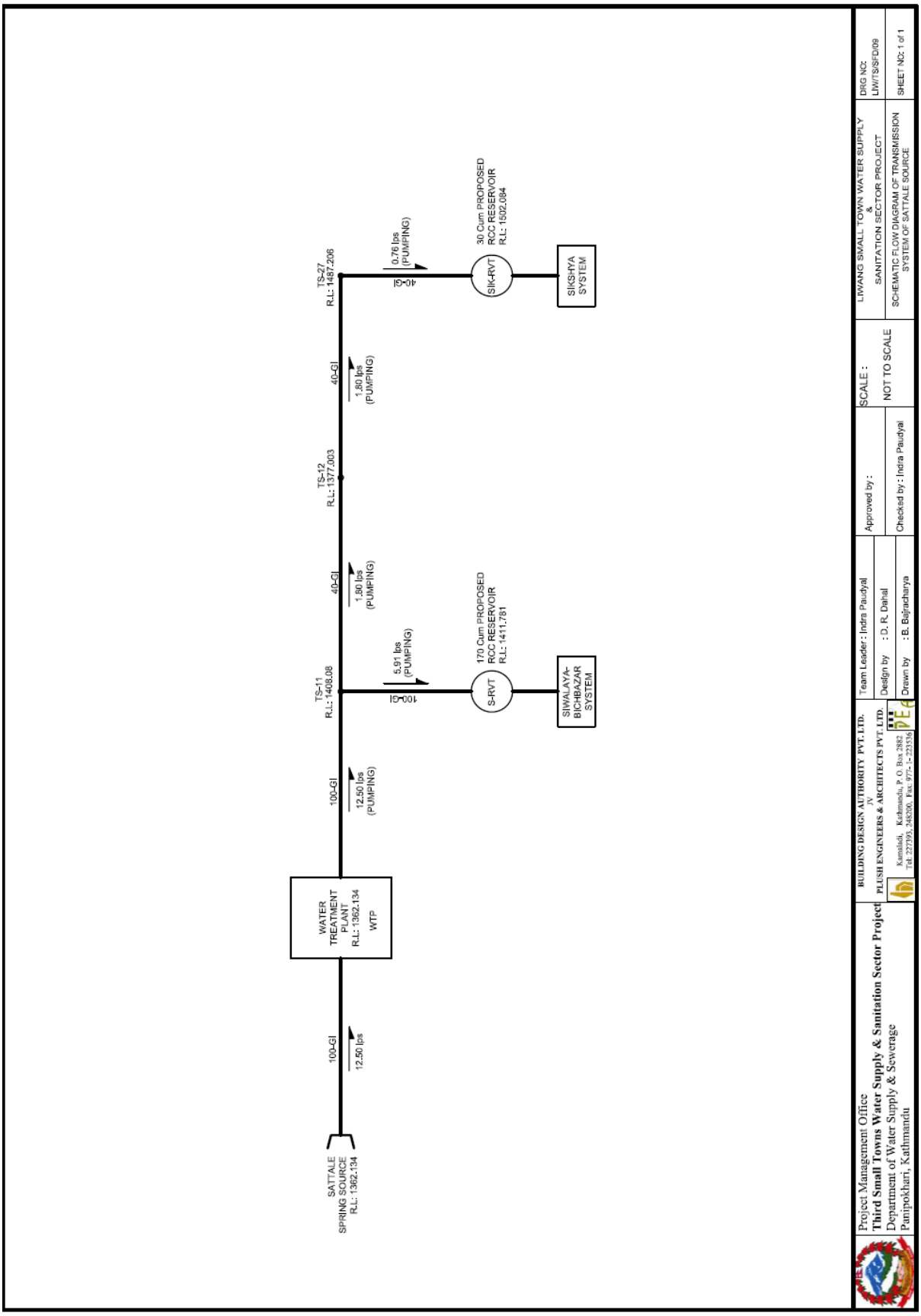
Sign off

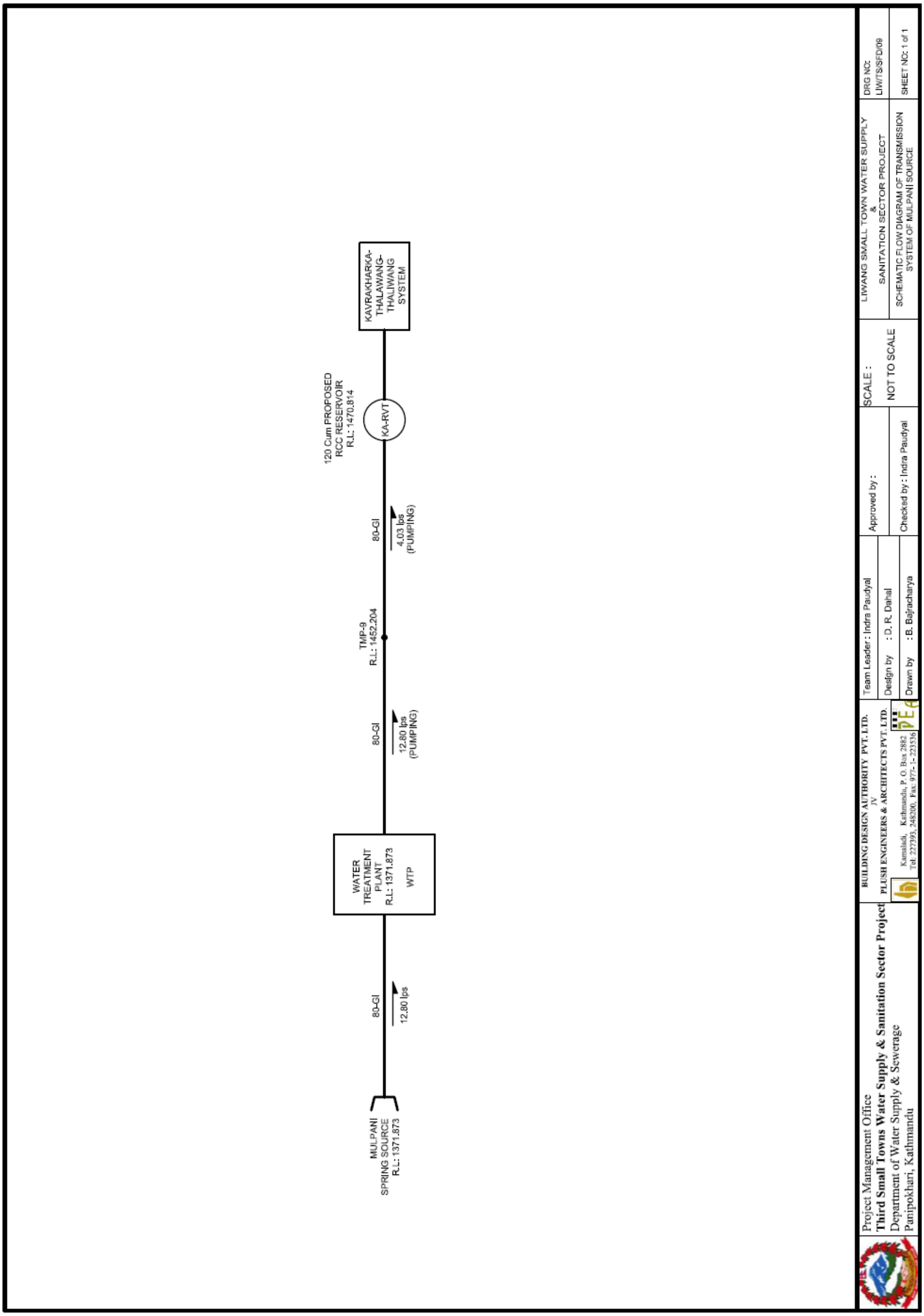
_____ _____
Name **Name**

Position **Position**

ANNEX 3: PROJECT SCHEMATIC LAYOUTS


MULKHOLA SPRING SOURCE R.L: 1384.104
80-GI
15.60 lps
WATER TREATMENT PLANT R.L: 1384.104 WTP
80-GI 15.60 lps
110-H-6 15.60 lps (GRAVITY)
TMK-1 R.L: 1375.472
TMK-13 R.L: 1508.992
50-GI
1.74 lps (PUMPING)
65-GI 1.57 lps (PUMPING)
TMK-20 R.L: 1500.146
110-H-6 5.00 lps (GRAVITY)
TMK-11 R.L: 1353.972
110-H-6 5.00 lps (GRAVITY)
140 Cum PROPOSED RCC RESERVOIR R.L: 1355.299
TD-RVT
TUDIKHEL-SOLOWANG SYSTEM
65-GI 1.57 lps
40 Cum EXISTING MASONRY RESERVOIR & 10 Cum PROPOSED RCC RESERVOIR R.L: 1548.559
MD-RVT
MEWANG-DEUBUJE SYSTEM
TMK-15 R.L: 1534.746
50-GI 1.24 lps
40 Cum PROPOSED RCC RESERVOIR R.L: 1542.227
BM-RVT
BAMRUK-BADICHAUR-MEWANG SYSTEM
TMK-18 R.L: 1540.103
40-GI
0.50 lps (PUMPING)
15 Cum PROPOSED RCC RESERVOIR R.L: 1533.284
FB-RVT
PURANO BAMRUK SYSTEM
Project Management Office
Third Small Towns Water Supply & Sanitation Sector Project
Department of Water Supply & Sewerage
Panipokhari, Kathmandu
BUILDING DESIGN AUTHORITY PVT. LTD. JV
PLUSH ENGINEERS & ARCHITECTS PVT. LTD.
Kamaladi, Kathmandu, P. O. Box 2982, Tel: 227393, 248200, Fax: 977-1-223136
Team Leader : Indra Paudyal
Design by : D. R. Dahal
Drawn by : B. Bajracharya
Approved by :
Checked by : Indra Paudyal
SCALE : NOT TO SCALE
LIWANG SMALL TOWN WATER SUPPLY & SANITATION SECTOR PROJECT
SCHEMATIC FLOW DIAGRAM OF TRANSMISSION SYSTEM OF MULKHOLA SOURCE
DRG NO: LIW/TS/SFD/09
SHEET NO: 1 of 1


SATTALE SPRING SOURCE R.L: 1362.134
100-GI
12.50 lps
WATER TREATMENT PLANT R.L: 1362.134 WTP
100-GI
12.50 lps (PUMPING)
TS-11 R.L: 1408.08
100-GI
5.91 lps (PUMPING)
S-RVT
170 Cum PROPOSED RCC RESERVOIR R.L: 1411.781
SIWALAYA-BICHBAZAR SYSTEM
40-GI
1.80 lps (PUMPING)
TS-12 R.L: 1377.003
40-GI
1.80 lps (PUMPING)
TS-27 R.L: 1487.206
40-GI
0.76 lps (PUMPING)
SIK-RVT
30 Cum PROPOSED RCC RESERVOIR R.L: 1502.084
SIKSHYA SYSTEM
Project Management Office
Third Small Towns Water Supply & Sanitation Sector Project
Department of Water Supply & Sewerage
Panipokhari, Kathmandu
BUILDING DESIGN AUTHORITY PVT. LTD.
JV
PLUSH ENGINEERS & ARCHITECTS PVT. LTD.
Kamalok, Kathmandu, P. O. Box 2882,
Tel: 227393, 246306, Fax: 977-1-225156
Team Leader : Indra Paudyal
Design by : D. R. Dahal
Drawn by : B. Bajracharya
Approved by :
Checked by : Indra Paudyal
SCALE :
NOT TO SCALE
LIWANG SMALL TOWN WATER SUPPLY & SANITATION SECTOR PROJECT
SCHEMATIC FLOW DIAGRAM OF TRANSMISSION SYSTEM OF SATTALE SOURCE
DRG NO: LIW/TS/SFD/09
SHEET NO: 1 of 1


MULPANI SPRING SOURCE R.L: 1371.873
80-GI
12.80 lps
WATER TREATMENT PLANT R.L: 1371.873
WTP
80-GI
12.80 lps (PUMPING)
TMP-9 R.L: 1452.204
80-GI
4.03 lps (PUMPING)
120 Cum PROPOSED RCC RESERVOIR R.L: 1470.814
KA-RVT
KAVRAKHARKA-THALAWANG-THALIWANG SYSTEM
Project Management Office
Third Small Towns Water Supply & Sanitation Sector Project
Department of Water Supply & Sewerage
Panipokhari, Kathmandu
BUILDING DESIGN AUTHORITY PVT. LTD.
JV
PLUSH ENGINEERS & ARCHITECTS PVT. LTD.
Kamaladi, Kathmandu, P. O. Box 2882
Tel: 227393, 248200, Fax: 977-1-223536
Team Leader : Indra Paudyal
Design by : D. R. Dahal
Drawn by : B. Bajracharya
Approved by :
Checked by : Indra Paudyal
SCALE :
NOT TO SCALE
LIWANG SMALL TOWN WATER SUPPLY & SANITATION SECTOR PROJECT
SCHEMATIC FLOW DIAGRAM OF TRANSMISSION SYSTEM OF MULPANI SOURCE
DRG NO: LIW/TS/SFD/09
SHEET NO: 1 of 1

RIM KHOLA
SPRING SOURCE
R.L: 1336.855
65-GI
6.80 lps
WATER
TREATMENT
PLANT
R.L: 1336.855
WTP
65-GI
6.80 lps
(PUMPING)
TRK-12
R.L: 1391.251
65-GI
3.08 lps
(PUMPING)
S-RVT
100 Cum PROPOSED
RCC RESERVOIR
R.L: 1416.551
SIWANG-
REEUGA
SYSTEM
Project Management Office
Third Small Towns Water Supply & Sanitation Sector Project
Department of Water Supply & Sewerage
Panipokhari, Kathmandu
BUILDING DESIGN AUTHORITY PVT. LTD.
JV
PLUSH ENGINEERS & ARCHITECTS PVT. LTD.
Kamaladi, Kathmandu, P. O. Box 2882
Tel: 227393, 248200, Fax: 977- 1- 233156
Team Leader : Indra Paudyal
Design by : D. R. Dahal
Drawn by : B. Bajracharya
Approved by :
Checked by : Indra Paudyal
SCALE :
NOT TO SCALE
LIWANG SMALL TOWN WATER SUPPLY
&
SANITATION SECTOR PROJECT
SCHEMATIC FLOW DIAGRAM OF TRANSMISSION
SYSTEM OF RIM KHOLA SOURCE
DRG NO:
LIW/TS/SFD/09
SHEET NO: 1 of 1

ANNEX 4:
IBAT INFORMATION ON BIODIVERSITY SENSITIVITY IN PROXIMITY OF PROJECT AREA

ibat | FOR BUSINESS

Protected Areas and Key Biodiversity Areas

The following sites are found within the selected buffer distances:

Features within 1 km

There are no features within 1 km.

Features within 5 km

There are no features within 5 km.

Features within 10 km

There are no features within 10 km.

ANNEX 5: PUBLIC CONSULTATIONS AND NOTIFICATIONS

4th June, 2018

रवर्कवाड० सिवाड० स्वास्थ्य आमा समूह
Ward – 2

आज मिति २०७५/.०२/२१गतेका दिन ..लिवाड..... साना सहरी खानेपानी तथा सरसफाई आयोजनाको मिति २०७५/२/४ मा प्रारम्भिक वातावरणीय परिक्षण (IEE) का लागि तेस्रो सानासहरी खानेपानी तथा सरसफाई क्षेत्रगत आयोजनाको आयोजना व्यवस्थापन कार्यालयद्वारा प्रकाशित सार्वजनिक सूचनाका आधारमा सरोकारवालाहरु सित निम्न विषयहरुमा जानकारी दिई छलफल तथा अन्तरकिया संचालन गरियो:

१. खानेपानी आयोजनाको बारेमा /location को बारेमा
२. प्रारम्भिक वातवरणीय परिक्षणको बारेमा र यसको आवश्यकता साथै महत्वको बारेमा
३. खानेपानी लागू हुँदाका फाइदाको विश्लेषण
४. वातावरण व्यवस्थापन योजना; यस अन्तर्गतका कम्पोनेन्टहरु, बजेट विनियोजन र रोजगारीको अवसर बारे छलफल

क.सं.	नाम/संस्था	ठेगाना	दस्तखत
१	मिना घर्ति	लिवाङ २ रेछउघा	मिना
२	श्याम कुमारी घर्ति	,, ,,	श्याम कुमारी
३	अनुसा पुन		अनुसा
४	सिर्जना घर्ति	,, ,,	सिर्जना
५	पुर्णिमा घर्ति	,, ,,	~~सिर्जना~~ पुर्णिमा
६	सुनिता घर्ति	,, ,,	सुनिता
७	संगिता घर्ति कुढा	,, ,,	संगिता
८	पार्वति घर्ति	,, ,,	पार्वती
९	विमला घर्ति	,, ,,	मित्रला
१०	मुना पुन	,, ,,	मुना
११	मनीका घर्ति	,, ,,	मनिका
१२	सविना घर्ति	,, ,,	सवि
१३	कमला घर्ति मगर	,, ,,	
१४	गिता घर्ति मगर	,, ,,	गिता
१५	रानु घर्ति मगर	,, ,,	रानु

क्र.स	नाम ~~[illegible]~~ संस्था	ठेगाना लिवाङ-नं. पा. २ देखाउने	दस्तखत
१६	लाल कुमारी पुन		लाल कुमारी
१७	प्रेम कुमारी छेत्री मगर	" "	
१८	~~मिना [illegible]~~	" "	
१९	प्रमिला घर्ति मगर	" "	
२०	जमुना घर्ति मगर	" "	
२१	लक्ष्मी पुन मगर	" "	
२२	[illegible] छेत्री मगर	" "	
२३	दुर्गा कुमारी घर्ति	" "	
२४	ममता छेत्री मगर	" "	
२५	प्रमिला छेत्री मगर	" "	
२६	काजि खड्का	" "	
२७	रति घर्ति	" "	
२८	संगिता थापा		
२९	विद्या घर्ति	" "	
३०	मनकुमारी घर्ति	" "	
३	[illegible] घर्ति मगर	" "	

छलफलका विषय तथा सम्बन्धित सुझावहरुः

१. यस आयोजनाका विभिन्न कार्यहरु, ती कार्यहरु संचालन हुने स्थानहरु र ती कार्यहरुको प्रकितीका बारेमा सरोकारवालाहरुलाई जानकारी दिईयो ।

२. आयोजनाबाट प्राप्त हुने फाईदाहरु (सफा सुरक्षित खानेपानी, स्वास्थ्य अवस्थामा सुधार, पानी संकलनमा लाग्ने समय बच्ने, स्थानीय रोजगार, आदी) का बारेमा एवम् आयोजनाको तयारी तथा निर्माण सम्बन्धी कार्यहरु बाट विभिन्न समयमा स्थानीय वातावरणका भौतिक, जैविक तथा आर्थिक-सामाजिक पक्षहरुमा पर्न सक्ने नकारात्मक असरहरुकाबारे पनि जानकारी दिई छलफल गरियो ।

३. निर्माण कार्य संचालनगर्दा हुन सक्ने भूक्षय, हरियालीमा आउन सक्ने ह्रास, खोलानालामा हुन सक्ने प्रदुषण, कामदारको सुरक्षा, सम्भावित वातावरणीय प्रदुषण जस्ता विषयमा जानकारी तथा छलफल भयो ।

४. स्थानीय सरोकारवालाहरु ले उल्लेख गरेका विषयहरु /सरोकारवालाहरु बाट प्राप्त सुझावहरुः

खानेपानी लिवाइमा अत्यावश्यक रहेकोले शुद्ध र सुरक्षित खानेपानीका लागि सबै सहमत रहेको जानकारी;

श्रमदान दिन नपर्ने र यस रोजगारीको अवसर मिलने हुँदा सरोकारवालाहरु खुशी

सकेसम्म यो आयोजना दिईं लागू हुन पाए हुन्थ्यो किनभने पानी पुगेको छैन; सुरक्षित छैन

यदि सिंचाइको लागि पानीको अभाव हुँदैन; शुद्ध र सुरक्षित पानी आउने हो भने यो योजना दिईं लागू हुनुपर्छ ।

2nd June, 2018

Local beneficiaries (Women)

आज मिति २०७५/०२/१५ गतेका दिन लिवाङ..... साना सहरी खानेपानी तथा सरसफाई आयोजनाको मिति २०७५/२/४ मा प्रारम्भिक वातावरणीय परिक्षण (IEE) का लागि तेम्रो सानासहरी खानेपानी तथा सरसफाई क्षेत्रगत आयोजनाको आयोजना व्यवस्थापन कार्यालयद्वारा प्रकाशित सार्वजनिक सूचनाका आधारमा सरोकारवालाहरु सित निम्न विषयहरुमा जानकारी दिई छलफल तथा अन्तरक्रिया संचालन गरियोः

Women group

१. वातावरणीय प्रभाव मूल्याङ्कनका बारेमा / IEE बारे
२. पूर्वाधारहरुको निर्माणका बेला हुनसक्ने र आइपर्ने वातावरणीय ह्रासका विषयमा
३. आयोजनाको लागू सँगै लिवाङमा स्थानीयहरुले प्राप्त गर्न सक्ने सुरक्षित पानी र सर कोदोरमैला व्यवस्थापन सम्बन्धि सुविधाहरुका विषयमा
४. वातावरण व्यवस्थापन योजना (EMP) का सम्बन्धमा
५. र विस्तृतरुपमा सानासहरी खानेपानी तथा सरसफाई आयोजनाका बारेमा ; स्रोत, sub-system, etc.

Women group
2nd June, 2018

क्र.सं.	नाम/संस्था	ठेगाना	दस्तखत
१.	बालासरी डंगी	रोल्पा न. ४	
२.	पार्वती के.सी	" " "	पार्वती
३.	कौसला घर्ती	" " २	कौसीला
४	अस्तुरा घर्ती	" " २	अस्तुरा
५	दिपा पुन मगर	" " २	
६	शामिला वली	" " २	
७	मौली डंगी	" " २	मौली
८	रूपा डंगी	" " २	रूपा
९	बोलु अर्ज	" " २	
१०	पिङ्माली सेन	" " २	पि.मा.सेन
११	गौरी के.सी	" " २	गौरी
१२	प्रतिक्षा सर्मा	" " २	प्रतिक्षा
१३	रिना के.सी	" " ४	रिना
१४	विनिता पुन मगर	" " ४	
१५	लिपा घर्ती	" " ४	

2nd June, 2018

Women group

छलफलका विषय तथा सम्बन्धित सुझावहरु:

१. यस आयोजनाका विभिन्न कार्यहरु, ती कार्यहरु संचालन हुने स्थानहरु र ती कार्यहरुको प्रकितीका बारेमा सरोकारवालाहरुलाई जानकारी दिईयो ।

२. आयोजनाबाट प्राप्त हुने फाईदाहरु (सफा सुरक्षित खानेपानी, स्वास्थ्य अवस्थामा सुधार, पानी संकलनमा लाग्ने समय बच्ने, स्थानीय रोजगार, आदी) का बारेमा एवम् आयोजनाको तयारी तथा निर्माण सम्बन्धी कार्यहरु बाट विभिन्न समयमा स्थानीय वातावरणका भौतिक, जैविक तथा आर्थिक-सामाजिक पक्षहरुमा पर्न सक्ने नकारात्मक असरहरुकाबारे पनि जानकारी दिई छलफल गरियो ।

३. निर्माण कार्य संचालनगर्दा हुन सक्ने भूक्षय, हरियालीमा आउन सक्ने ह्रास, खोलानालामा हुन सक्ने प्रदुषण, कामदारको सुरक्षा, सम्भावित वातावरणीय प्रदुषण जस्ता विषयमा जानकारी तथा छलफल भयो ।

४. स्थानीय सरोकारवालाहरु ले उल्लेख गरेका विषयहरु /सरोकारवालाहरु बाट प्राप्त सुझावहरु:

– स्रोतको सबै पानी अथवा मूल नै सुक्ने जारि यस आयोजनाले स्रोतको पानी प्रयोग नगर्ने हो भने सिंचाईमा असर पर्दैन भने पाईयो;

– स्थानीयहरुको मुख्य सरोकारको विषय भनेकै सुरक्षित र दीर्घकालिन खानेपानी प्राप्त गर्ने रहेको देखियो;

– हाल पनि शुद्ध र सुरक्षित पानीको अभावका साथै अनियमित खानेपानीको उपलब्धताले गर्दा स्थानीयहरुले यस आयोजनाप्रति धेरै चासो देखियो

– यस आयोजना लागू हुँदा स्थानीय तहबाट लाग्ने लागत खर्चको सदि उपयोग होस भने सुझाव

– यसका लागि guard house दीर्घकालिन रुपमा नै व्यवस्था गर्ने सुझाव

– शुद्ध पानीको अभाव; धारावाट गाड्यौला, झ्याउरा आदि आउने हुँदा शुद्धिकरण गर्ने कार्य हुने कुरामा महिला समुह अत्यन्त खुशी

– जति सक्यो छिटो यस आयोजना लागू गर्न पहल गरिदिन महिला समुहको आग्रह

– पानीको अभाव हुँदा गुनासो /आग्रह गर्न खानेपानी अफिसमा सम्पर्क गर्न खोज्दा खर्च हुने मोवाइल खर्चबाट बच्न र झन्झटबा छिटो छरकारा पाउन आतुर

Mewang Forest User Committee
Bamruk, ward 1
Liwang

आज मिति २०७५/०२/२१ गतेका दिन लिवाङ..... साना सहरी खानेपानी तथा सरसफाई आयोजनाको मिति २०७५/२/४ मा प्रारम्भिक वातावरणीय परिक्षण (IEE) का लागि तेस्रो सानासहरी खानेपानी तथा सरसफाई क्षेत्रगत आयोजनाको आयोजना व्यवस्थापन कार्यालयद्वारा प्रकाशित सार्वजनिक सूचनाका आधारमा सरोकारवालाहरु सित निम्न विषयहरुमा जानकारी दिई छलफल तथा अन्तरकिया संचालन गरियो:

१. खानेपानी आयोजना ; कम्पोनेन्ट Eको बारेमा
२. IEE को विषयमा ; यसको महत्व र आवश्यकताको बारेमा
३. IEE को लागि आवश्यक पर्ने वनस्पतिको जानकारी
४. खानेपानी लागू हुँदा फाइदा र बेफाइदाको विश्लेषण
५. EMP को बारेमा छलफल

Liwang Forest User Committee
Bamruk, ward 1

क्र.सं.	नाम/संस्था	ठेगाना	दस्तखत
१	लाल बहादुर कुकर	लिवाङ नपा. १	
२	नौरबज पोखरेल	लिवाङ रोल्पा न.पा. १	
३	शिव राज पोखरेल	लिवाङ रोल्पा न.पा. १	
४	कमला कवर	लिवाङ रोल्पा न.पा. १	
५	हर्ण ब. कवर	लिवाङ रोल्पा न.पा. १	
६	केदराज कवर	लिवाङ रोल्पा नपा. १	
७	गायत्री कवर	लिवाङ रोल्पा न.पा. १	
८	रुपा मल्ला	लिवाङ रोल्पा न.पा १	
९	निर्मला कवर	लिवाङ रोल्पा न पा १	
१०	विमला कवर	लिवाङ रोल्पा न पा. १	
११	सरदा मल्ला	लिवाङ रोल्पा न पा. १	

छलफलका विषय तथा सम्बन्धित सुझावहरु:

१. यस आयोजनाका विभिन्न कार्यहरु, ती कार्यहरु संचालन हुने स्थानहरु र ती कार्यहरुको प्रकितीका बारेमा सरोकारवालाहरुलाई जानकारी दिईयो ।

२. आयोजनाबाट प्राप्त हुने फाईदाहरु (सफा सुरक्षित खानेपानी, स्वास्थ्य अवस्थामा सुधार, पानी संकलनमा लाग्ने समय बच्ने, स्थानीय रोजगार, आदी) का बारेमा एवम् आयोजनाको तयारी तथा निर्माण सम्बन्धी कार्यहरु बाट विभिन्न समयमा स्थानीय वातावरणका भौतिक, जैविक तथा आर्थिक-सामाजिक पक्षहरुमा पर्न सक्ने नकारात्मक असरहरुकाबारे पनि जानकारी दिई छलफल गरियो ।

३. निर्माण कार्य संचालनगर्दा हुन सक्ने भूक्षय, हरियालीमा आउन सक्ने ह्रास, खोलानालामा हुन सक्ने प्रदुषण, कामदारको सुरक्षा, सम्भावित वातावरणीय प्रदुषण जस्ता विषयमा जानकारी तथा छलफल भयो ।

४. स्थानीय सरोकारवालाहरु ले उल्लेख गरेका विषयहरु /सरोकारवालाहरु बाट प्राप्त सुझावहरु:

यस आयोजना दिर्घ लागू गराउन पारु रुकदमै राम्रो हुने थियो

पानी ट्यांकी र मुहान माथि रहेका वस्तीमा पनि पानी पुगोस् । Lift-up गर्नुपर्ने हु भने पनि पुर्याइयोस

वातावरणमा यस्तो राम्रो आयोजनाले रुखारी जर्दैन वरु सबैलाई सुविस्था दिन्छ भन्ने सुझाव

यस आयोजनाको नाकारात्मक असर छैन वरु दिर्घ संचालन गर्न पारु राम्रो

यसको राम्रो पक्ष भनेको सफा-सुरक्षित पानी त्यो पनि अलिक व्यवस्थित (metre) रुपमा रहेको हुनाले यस आयोजनाको अति आवश्यकता रहेको जिकिर

UNOFFICIAL TRANSLATION (S.No.1)

With reference to public notice regarding IEE published on 05-18-2018, a meeting was held on 06-04-2018. Following decision were made among the participants in the meeting.

Attendance

S.N.	Name	Address
1.	Mina Gharti	Liwang Municipality 2, Reuga
2	Shyam Kumari Gharti	Liwang Municipality 2, Reuga
3.	Srijana Gharti	Liwang Municipality 2, Reuga
4.	Purnama Gharti	Liwang Municipality 2, Reuga
5.	Anusha Pun	Liwang Municipality 2, Reuga
6.	Sunita Gharti	Liwang Municipality 2, Reuga
7.	Sangita Buda	Liwang Municipality 2, Reuga
8.	Parbati Gharti	Liwang Municipality 2, Reuga
9.	Bimala Gharti	Liwang Municipality 2, Reuga
10.	Muna Pun	Liwang Municipality 2, Reuga
11.	Manika Gharti	Liwang Municipality 2, Reuga
12.	Sabina Gharti	Liwang Municipality 2, Reuga
13.	Kamala Gahrti Magar	Liwang Municipality 2, Reuga
14.	Gita Gharti Magar	Liwang Municipality 2, Reuga
15.	Gyanu Gharti Magar	Liwang Municipality 2, Reuga
16.	Lal Kumari Pun	Liwang Municipality 2, Reuga
17.	Prem Kumari Buda Magar	Liwang Municipality 2, Reuga
18.	Prajita Gharti Magar	Liwang Municipality 2, Reuga
19.	Jaumati Gharti Magar	Liwang Municipality 2, Reuga
20.	Laxmi Pun Magar	Liwang Municipality 2, Reuga
21.	Shanti Buda Magar	Liwang Municipality 2, Reuga
22.	Durga Kumari Gharti	Liwang Municipality 2, Reuga
23.	Prem Buda Magar	Liwang Municipality 2, Reuga
24.	Pramila Buda Magar	Liwang Municipality 2, Reuga
25.	Kaji Khadka	Liwang Municipality 2, Reuga
26.	Ravi Gharti	Liwang Municipality 2, Reuga
27.	Sangita Thapa	Liwang Municipality 2, Reuga
28.	Nisha Gharti	Liwang Municipality 2, Reuga
29.	Mankumari Gharti	Liwang Municipality 2, Reuga
30.	Tarjan Gharti Magar	Liwang Municipality 2, Reuga

Agenda and Discussions

Agenda: Public consultation and interaction for Initial Environment Examainiation (IEE).

Discussion topics

- Discussed about water supply project and its location
- Initial Environment Examination (IEE) and its importance.
- Benefits after the implementation of water supply project.
- Envrionment Management Plan (EMP) and its components, budgeting and job opportunity.

Decision/Suggestion

- The meeting unanimously discussed and informed about project activities, project nature and its running areas to the concerned authorities.
- It discussed and informed about the project benefit in terms of providing clean and safe water, health improvement, local job opportunity and time reduction for fetching water. Also, it informed about the potential physical, biological, socio-economical impact that may result at any course of time during construction stage.
- The participants in meeting shows higly concerned about the potential land degradation, water/stream pollution, impacts on greenary, wokers safety and overall enviroment impacts which may arise during commencement of construction work/activities.
- Realising the importance of drinking water in Liwang they all commonly agreed about the proposed clean and safe water supply project.
- The concern people attended meeting seemed happy about the project because it will create job opportunity.
- The participants showed concerns about the timely implementaion of this project because the existing water supply which they are consuming is neither clean, safe nor adequate.
- Provided that there is no problem in water for irrigation, they were expecting about the timely implementation of this proposed project so as to get better access to potable water.

UNOFFICIAL TRANSLATION (S.No.2)

With reference to public notice regarding IEE published on 05-18-2018, a meeting was held on 06-02-2018. Following decision were made among the participants in the meeting.

Attendance

S.N.	Name	Address
1.	Balasari Dangi	Rolpa Municipality 4
2	Parbati K.C.	Rolpa Municipality 4
3.	Kaushala Gharti	Rolpa Municipality 2
4.	Astura Gharti	Rolpa Municipality 2
5.	Dipa Pun Magar	Rolpa Municipality 2
6.	Sharmila Bali	Rolpa Municipality 2
7.	Nauli Dangi	Rolpa Municipality 2
8.	Rupa Dangi	Rolpa Municipality 2
9.	Basu Shrestha	Rolpa Municipality 2
10.	Pingmali Sen	Rolpa Municipality 2
11.	Gauri K.C.	Rolpa Municipality 2
12.	Pratikshya Sharma	Rolpa Municipality 2
13.	Meena K.C.	Rolpa Municipality 4
14.	Binita Pun Magar	Rolpa Municipality 4
15.	Siya Chhetri	Rolpa Municipality 4
16.	Dilmaya Acharya	Rolpa Municipality 4
17.	Uma Acharya	Rolpa Municipality 4
18.	Dhan Prasad Sharma	Rolpa Municipality 2

Members of womens' groups from wards 2 and 4 were also invited.

Agenda and Discussions

Agenda: Public consultation and interaction for Initial Environment Examainiation (IEE).

Discussion topics
- Evaluation of Environment Impacts.
- About potential Environment impacts at preliminary stage
- Safe drinking water and waste management practices which they obatined along with the implementation of proposed project.
- In relation to Environment Management Plan (EMP).
- Discussed detailly about the third Small Town Water Supply and Sanitation Project, its sources and subsystem.

Decision/Suggestion
- The meeting unanimously discussed and informed about project activities, project nature and its running areas to the concerned authorities.
- It discussed and informed about the project benefit in terms of providing clean and safe water, health improvement, local job opportunity and time reduction for fetching water. Also, it informed about the potential physical, biological, socio-economical impact that may result at any course of time during construction stage.
- The participants in meeting shows higly concerned about the potential land degradation, water/stream pollution, impacts on greenary, wokers safety and overall enviroment impacts which may arise during commencement of construction work/activities.

According to local concern authorities following suggestions were made which are noted as belows:-

- If project don't use all water from water sources till it dries, then it can be assured that it will not pose impact on irrigation.
- The main concerned of local conceren authority were to obtained safe and clean drinking water for long run.
- Lack of clean, safe and the problem of irregular supply of drinking water from existing source has helped to increase participant's interest towards this proposed project.
- They suggested for proper utilization of collected money which they earn from local users group during the implemenation of this project.
- They have instructed to set up guard house for long term use.
- Women groups seems very happy with the treatment system/process the project contain because the existing water suppy is inadequate and contain contaminations.
- Women group pledged for the timely implementation of this project.

UNOFFICIAL TRANSLATION (S.No.3)

With reference to public notice regarding IEE published on 05-18-2018, a meeting was held on 06-04-2018. Following decision were made among the participants in the meeting held at Bamruk, ward number 1 of Liwang.

Attendance

S.N.	Name	Address
1.	Lal Bahdur Kunwar	Liwang Rolpa Municipality 1
2	Nokhraj Pokhrel	Liwang Rolpa Municipality 1
3.	Shivaraj Pokhrel	Liwang Rolpa Municipality 1
4.	Kamala Kunwar	Liwang Rolpa Municipality 1
5.	Purna Bahadur Kunwar	Liwang Rolpa Municipality 1
6.	Bedraj Kunwar	Liwang Rolpa Municipality 1
7.	Gayetri Kunwar	Liwang Rolpa Municipality 1
8.	Rupa Mahara	Liwang Rolpa Municipality 1
9.	Nirmala Kunwar	Liwang Rolpa Municipality 1
10.	Bimala Kunwar	Liwang Rolpa Municipality 1
11.	Sharda Mahara	Liwang Rolpa Municipality 1

The representatives of Mewang CFUG were invited among the participants.

Agenda and Discussions

Agenda: Public consultation and interaction for Initial Environment Examainiation (IEE).

- Water supply project and its components.
- Initial Environment Examinaion (IEE) and its importance and necessity.
- Information regarding vegetation
- Discussed about the advantage and disadvantage that may result during the implementation of the project.
- About Environment Management Plan (EMP).

Discussions and suggestions

- In the meeting, it was informed about project activities, project nature and its running areas to the concerned authorities.
- It discussed and informed about the project benefit in terms of providing clean and safe water, health improvement, local job opportunity and time reduction for fetching water. Also, it informed about the potential physical, biological, socio-economical impact that may result at any course of time during construction stage.
- The participants in meeting were informed about the potential land degradation, water/stream pollution, impacts on greenary, wokers safety and overall enviroment impacts which may arise during commencement of construction work/activities.

The participants of the meeting raised the following concerns and provided their suggestion as per;

- Participants were highly concerned about the timely implementation of project.
- The participants desired that the project should serve the households which are situated above water tank and source as well, and hence need to consider lifting technology also if needed.
- The participants pointed that such project don't pose any negative impacts to the environment, and instead it will provide facilities to all.
- This project is very important for Liwang due to its provision of safe and clean drinking water including the metered distribution system.

NOTIFICATION OF GRC

ITECO-UNEC JV
Western Region Design Supervision
And Management Consultant
UWSSP/C-03/WROSMC

मिति:२०७६।१०।२८

श्री वडा अध्यक्ष ज्यू,
वडा नम्बर ..... रोल्पा नगरपालीका रोल्पा

विषय:, गूनासो सूनूवाई तथा समस्या समाधान सम्वन्धमा ।

उपरोक्त सम्वन्धमा यस "रोल्पा शहरी खानेपानी तथा सरसफाई आयोजनाको" काम भैराखेको हूदा आयोजना क्षेत्रभित्र गूनासो तथा समस्या पर्न आयमा गूनासो निराकरण समिति गठन गरिएको छ । वडा भित्र गूनासो वा समस्या भएमा गूनासो नियूनिकरण मा यस समितिलाई जानकारी गरी सहयोग गरीदिनू हून अनूरोध गर्दछौ ।

गूनासो समिति:

प्रथम तह .

१.लिलाधर आचार्य खा.पा.उ.स.स. अध्यक्ष "अध्यक्ष"
२.गौरीप्रसाद शर्मा सामाजिक शूरक्षाविद "सदस्य"
३.कृष्ण वहादूर ऐर परामर्श दाता "सदस्य"
४.सृजना खड्का सामाजीक परिचालक "सदस्य"
५.सोविक श्रेष्ठ प्रोजेक्टर म्यानेजर निर्माण व्यवसाई "सदस्य"

स्थानिय तह

१.पूर्ण के.सि. प्रमूख रोल्पा न.पा. "अध्यक्ष"
२.पूर्ण प्रसाद उपाध्याय क्षेत्रिय आ. प्रमूख "सदस्य सचिव"
३. गैरीप्रसाद शर्मा सामाजिक शूरक्षाविध "सदस्य"
४. कृष्ण वहादूर ऐर परामर्श दाता "सदस्य"
५. माधव भट्टराई क्षेत्रिय आयोजना इन्जीनीयर "सदस्य"
६. हरीप्रसाद आचार्य खा.पा.उ.स.सचिव (सदस्य सचिव)
७. सोविक श्रेष्ठ प्रोजेक्ट इन्जि .नि.व्य. "सदस्य"

रोल्पा नगरपालिका २ नं. वडा कार्यालय २०७३

.....
ITECO-UNEC (JV)

Western ...pervision
And ... Consultant
UWSSP/C-03/WROSMC

UNOFFICIAL TRANSLATION (S.NO.4)

Date: 11th February 2020

To,
The Chariperson,
Ward ……., Rolpa Municipality.

Subject: Regarding Grievance and its addressing

Regarding the subject, it is informed that a Grievance Redress Committee (GRC) has been formed for Liwang Urban Water Supply and Sanitation Project so as to address the grievances and problems that may arise during the project implementation. If there is any grievance in project's ward level, we request you to forward it to the committee as per.

Grievance Redress Committee
1st Level

S.N.	Name	Designation	Designation/Status on GRC
1	Mr. Liladhar Acharya	WUSC Chairman	Chairperson GRC
2.	Mr. Gauri Prasad Sharma	Social Safeguard Specialist - DRSMC	Member
3.	Mr. Krishna Bahadur Aiyer	CSE, WR-DSMC	Member
4.	Ms. Shrijana Khadka	Social Mobilizer, WR-DSMC	Member
5.	Mr. Shobhik Shrestha	Project Manager, Contractor	Member

2nd Level GRC

S.N.	Name	Designation	Designation/Status on GRC
1	Mr. Purna KC	Mayor, Rolpa Municipality	Chairperson GRC
2.	Mr. Purna Prasad Upadhyaya	Regional Project Manager-RPMO	Member, Secretary
3	Mr. Gauri Prasad Sharma	Social Safeguard Specialist-DRSMC	Member
.4	Mr. Krishna Bahadur Aiyer	CSE, WR-DSMC	Member
5.	Mr. Madhav Bhattarai	ICG Engineer - RPMO	Member
6.	Mr. Tul Bahadur Khadaka	Secretary-WUSC	Member Secretary
7.	Mr. Shobhik Shrestha	Project Manager, Contractor	Member

……..
ITECO-UNEC (JV)
WR-DSMC
(Signed and Stamped)

RECEIVED, SIGNED AND STAMPED BY:
Ward Office representatives of Ward 1, Ward 2, and Ward 4

ANNEX 6: SURVEY QUESTIONNAIRE

Household Survey

१. परिचय

१.१ अन्तर्वार्ता दिने व्यक्तिको नाम ठेगाना:

(क) जिल्ला: (ख) गा.वि.स:

(ग) टोल रस्थान: (घ) वार्ड नं.:

१.२ पारिवारिक विवरण

(क) घरमुलिको नाम: श्रीमान् र श्रीमती .....

(ख) जाती: (ग) उमेर: (घ) लिङ्ग: □ पुरुष महिला □

(ङ) वैवाहिक स्थिति: (च) धर्म: (छ) व्यवसाय (घरमुलीको):

(ज) बसेको वर्ष: (झ) शिक्षा :

(ञ) कुल परिवार संख्या .....

उमेर समुह	पुरुष	पेशा	महिला	पेशा	जम्मा
०-५ बर्ष					
६-१० बर्ष					
११-१५ बर्ष					
१६-४५ बर्ष					
४५-६० बर्ष					
६० भन्दा माथि					
जम्मा					

१.३ विद्यालय जाने उमेरका बाल बालिका (६-१५ बर्ष)

जम्मा	**विद्यालय गएका**		**विद्यालय नगएका**	
	पुरुष	**महिला**	**पुरुष**	**महिला**

२. साक्षरता : (तपाईको परिवारमा)

	लेखपढ गर्न सक्ने	एस.एल.सी. उत्तिर्ण	स्नातक	स्नातकोत्तर	जम्मा
महिला					
पुरुष					
जम्मा					

३. कृषि (भु-उपयोग)

३.१ तपाई वा परिवार सदस्यको नाममा गा.वि.स.**र** वडा भित्र जग्गा छ रु

छ □ छैन □

३.२ यदि छ भने कति छ ? रोपनीमा भन्नुहोस :

क.स.	स्वामित्व	खेत	बारी	खरवारी	वन	कैफियत
१	आफ्नै					
२	सगोलको					
३	कमाई आएको					

क्र.स.	स्वामित्व	खेत	बारी	खरवारी	वन	कैफियत
४	कमाउन दिएको					
५	जम्मा					

३.३ गा.वि.स. वा वडा बाहिर कुन ठाउँमा जग्गा छ रु

क्रस.	ठाउँको नाम	जग्गा				कैफियत
		खेत	वारी	खरवारी	वन	

३.४ तपाईको जग्गा आयोजना भित्र पर्छ रु ९एभिबकभ ःभलतष्यल तजभ अफउयलभलत या उचयवभअत धजभचभ ज्ज ाबाकि०

घर

- □ लम्बाई (फिटमा)
- □ चौडाई (फिटमा)
- □ छाना
- □तल्ला
- □ कोष

खेत

- □ पाखो बारी
- □ जंगल
- □ अन्य
- □ अन्दाजी मूल्य (चलनचल्तीमा) नेरु.

(क) आयोजना क्षेत्र भित्र तपाईको कतिवटा घर र गोठ छन् ।

घर ☐ गोठ ☐

क्र.सं.	किसिम	क्षेत्रफल
घर १		
घर २		
घर ३		

(१) कच्ची-खरले छाएको (२) पक्की (ढुङ्गा, ईटाको पर्खाल र ढलान भिगटी वा टिनको छानो)

	संख्या	क्षेत्रफल
गोठ		
अन्य (खुलाउने)		

३.५ (क) तपाईको आयोजना क्षेत्र भित्र पर्ने जमिनमा कुन कुन फसल लगाउनु हुन्छ रु

क्रसं.	खाद्यान्न वाली	वाली लगाएको क्षेत्रफल	उत्पादन परिणाम
१. खाद्यान्न बाली			
	धन		
	गहु		
	मकै		
	कोदो		
	दाल गेडागुडी		
	अन्य		
२. नगदे वाली			
	आलु		

	तोरी		
	तरकारी		
	अन्य		

(ख) उक्त जग्गामा लगाएको फलफूल र अन्य बोट विरुवाको विवरण दिनुहोस रु

कंसं.	बोटविरुवा	विरुवा संख्या		जम्मा
		फल लाएको	फल नलाएको	
१	फलफूल			
२	कागती			
३	सुन्तला			
५	आँप			
६	मेवा			
७	अम्बा			
८	लिच्ची			
९	कटहर			
१०	केरा			
११	आरु			
१२	नास्पाती			
१३	आरुवखडा			
१४	अन्य			
१५	डाले घाँस			
१६	पाखुरी			
१७	काभ्रो			
१८	वडहर			
१९	खनायो			
२०	टाकी			
२१	गिदरी			
२२	अन्य			
२३	इन्धनको लागि प्रयोग गर्ने बोट विरुवा			
२४	काठमा प्रयोग हुने बोटविरुवा			
२५	वाँस निगालो			

३.६ के तपाईको जग्गामा भएको गत बर्षको उत्पादनले तपाईको परिवारलाई खान पर्याप्त भयो रु

भयो ☐ भएन ☐

३.७ यदि अप्रर्याप्त भयो भने कति महिनाको लागि पुगेन रु महिना

(क) तिन महिना (ख) छ महिना

(ग) नौ महिना (घ) बाह्र महिना

३.८ आफ्नो उत्पादित खाद्यान्न अप्रर्याप्त भएको बेला आफ्नो परिवारलाई कसरी खुवाउनु हुन्छ ?

क. ऋण गरेर ख. नोकरीबाट भएको आम्दानीबाट

ग. व्यापारीको आम्दानीबाट घ. भारी बोकेर भएको आम्दानीबाट

ड. दैनिक मजदुरबाट भएको च. अन्य .....

३.९ पशुपालन सम्वन्धी :

तपाईको घरमा कति /कस्ता पशु पक्षीहरु पाल्नु भएको छ रु

क.सं.	पशुपंक्षी	संख्या
१	गाई	

क.सं.	पशुपंक्षी	संख्या
२	गोरु	
३	भैसी	
४	बाछा	
५	बाछि	
६	पाडा	
७	पाडि	
८	राँगो	
९	घोडा	
१०	बाखा	
११	बोका	
१२	खसी	
१३	पाठा/पाठी	
१४	सुँगुर/बंगुर	
१५	हाँस	
१६	कुखुरा	
१८	अन्य (खुलाउने)	

४. **घर परिवारको वार्षिक औषत आम्दानी :**

श्रोत	वार्षिक आम्दानी (रु.)	श्रोत	वार्षिक आम्दानी (रु.)
कृषिबाट		अन्यश्रोतहरु	
खाद्यान्न		नोकरी, सेवा	
नगदेवाली		ज्याला मजदुरी र भरीया	
फलफुल		निवृतिभरण	
जम्मा (१)		व्यापार	
पशुपालनबाट		घरेलु उद्योग	
दुग्ध उत्पादन		पेशागत सेवा	
अण्डा कुखुरा हाँस बिक्री		माछा बिक्री	
बाछा/बाछी/गोरु /बिक्रि		अन्य	
भैसि /राँगो बिक्रि		जम्मा (३)	
बोका/खसी/भेडा/बाखा बिक्रि			
सुगंर/बंगुर बिक्रि			
कुखुरा/हाँस विक्रि			
जम्मा (२)			
जम्मा आय (१२३):			

५. **घर परिवारको वार्षिक औषत खर्च :**

विवरण	जम्मा रकम (रु.)	विवरण	जम्मा रकम (रु.)
चामल		ीचया	
द्याल		दाउरा	
मकै		बिजुली	
तरकारी		मट्टितेल	
दुघ/दही		औषधि	
माछा/मासु		शिक्षा	
तेल/ध्यू		कपडा	
मर-मसला		चाडपर्व	
नुन		अन्य	
चिनी			
		जम्मा खर्च	

६.पानीको आपूर्ति

(क) तपाईले यस खोलाको पानी उपयोग गर्नु हुन्छ कि हुदैन रु
गर्छु □ गर्दिन □

(ख) यदि खोलाको पानी प्रयोग गर्नु हुन्छ भने कुन प्रयोजनको लागि प्रयोग गर्नुहुन्छ रु
सिंचाई □ नुहाउने, कपडा धुने □
पिउने □ अन्य □

७.स्वास्थ्य सम्बन्धिः

(क) तपाईको परिवारमा कुनै सदस्य विगत वर्षमा विरामी भएका थिए रु

थिए□ थिएनन् □

(ख)यदि थिए भने निम्न विवरण दिनुहोस् रु

कसं	नाता	पुरुष	महिला	उमेर	रोग
१					
२					
३					
४					

(रोगको प्रकारः- दिसापखाला, आउं, टाइफाईड, हैजा, मलेरिया, टीवी, जन्डीस, छाला सम्बन्धी, निमोनिया, दम, रक्तचाप, एड्स र यौन रोग, अन्य)

(ग) विरामी पर्दा सर्वप्रथम कहाँ जानुहुन्छ .....

(घ) त्यहाँ निको नभए कहाँ जानुहुन्छ रुकमश उल्लेख गर्नुहोस ।

कं.सं	जाने ठाउँ	रहेको स्थान	दूरी (कि.मी.)
१	अस्पताल		
२	हेल्थपोस्ट		
३	हेल्थ सेन्टर		
४	आयुर्वेदिक औषधालय		
५	निजि क्लिनिकरऔषधी पसल		
६	धामी झाक्री		
७	अन्य		

८. महिलाको अवस्थाः

(क) श्रमको वर्गिकरण

कं.सं	कामको विवरण	हिस्सा प्रतिशतमा	
		पुरुष	महिला
१	खनजोत		
२	मल राख्ने		
३	जमिन तयारी		
५	रोप्ने		
६	गोडमेल		
७	सिंचाई		
८	काट्ने		
९	बोक्ने र थन्काउने		
१०	अन्न प्रसोधन (कुटाई पिसाई)		
११	घाँस दाउरा		
१२	गोठालो		
१३	मेलापात		
१४	खाना पकाउने		
१५	पानी पधेरो		
१६	बच्चाबच्ची र बुढाबुढी हेरविचार		

(ख) सम्पत्तिमा अधिकार

कं.सं	कामको विवरण	हिस्सा प्रतिशतमा	
		पुरुष	महिला
१	घर		
२	जग्गा		
३	पशु		
५	गरगहना		
६	उद्योग धन्दा		
७	अन्य		

(ग) निर्णय प्रक्रियामा अधिकार

कं.सं	कामको विवरण	हिस्सा प्रतिशतमा	
		पुरुष	महिला
१	वाली रोज्ने		
२	पशु खरीदविक्री		
३	गरगहना खरीदविक्री		
५	अन्न खरीदविक्री		
६	फलफूल खरीदविक्री		
७	पशुजन्य पदार्थ खरीदविक्री		
८	काठ दाउरा खरीदविक्री		
९	विहावारी		
१०	परिवार नियोजन		
११	छोराछोरी पढाई लेखाई		
१२	अन्य		

९. मुआब्जा सम्बन्धीः

(क) तपाईको घर **र** जग्गाको मुआब्जा के मा चाहनु हुन्छ

नगद □ जग्गाको सट्टा जग्गा □ अन्य □

(ख) यदि तपाईले मुआब्जा नगदमा पाउनु भयो भने उक्त मुआब्जा रकम के मा प्रयोग गर्नु हुन्छ

जग्गा किन्ने □ घर वनाउने □ ऋण तिर्ने □
व्यापार गर्ने □ अन्य □

१०. प्रस्ताव कार्यान्वयन गर्दा के कस्तो प्रभाव पर्न सक्दछ सो सम्बन्धी राय सुझाव छ
सकारात्मकः नकारात्मकः

Household Survey

1= Introduction

1=1 Name and Address of Respondent

-1_ District -2_ V.D.C.

-3_ Tole -4_ Ward No.

1.2 Family Description/Details

-1_ House owner Name Husband or Wife==========

-2_ Cast: -3_ Age -4_ Sex ☐ Male Female ☐

-5_ Marital Status -6_ Religion -7_ Business-House owner

-8_ Year of Stay -9_ Education

-10_ Total Family Number **========**

Age group	Male	Occupation	Female	Occupation	Total
0-5 Year					
6–10 Year					
11-15 Year					
16-45 Year					
45-60 Year					
Above 60					
Total					

1.3 Children going to School -6-15 years_

Total	Going School		Not going School	
	Male	**Female**	**Male**	**Female**

2= LiterateM (on your house_

	Read & write	S.L.C. Passed	Bachelor	Master	Total
Female					
Male					
Total					

3= Agricultural land

3.1 Is there your or other family members land within a premises of V.D.C./Ward?
Yes ☐ No ☐

3=2 If yes? How much (in Ropani)?

S.N.	Ownership	Farm	Orchard	Grassland	Forest	Remarks
1	Own					
2	Sharing land					
3	Land is earned					
4	Land given to earn					
5	Total					

3.3 Is there any land out to V.D.C./Ward area?

S.N.	Name of Place	Land				Remarks
		Farm	Orchard	Grassland	Forest	

3.4 Is your land within a project area? (Please mention the component of project where HH falls)

House
☐ Length (ft._
☐ Breadth -ft_
☐ Roof
☐ Storey
☐ Corner

Farm
☐ Slope farm
☐ Forest
☐ Other
☐ Estimate cost (Present market rate) =

-A_ How many houses and shed are there within a Project area?

House ☐ Shed ☐

S.N.	Types	Area
House1		
House2		
House3		

-1_ Roof with raw straw (2) Concrete (Stone, Bricks wall and roof with zinc sheet)

	Number	Area
Shed		
Others-write_		

3.5 -A_ What type of crops you cultivate on your land that lies within project area?

S.N.	Food Crops	Cultivated Land Area	Production rate
1= Food Crops			
	Paddy		
	Wheat		
	Maize		
	Millet		
	Pulse/grain or cereal		
	Others		
2= Cash Crops			
	Potato		
	Mustard		
	Vegetables		
	Others		

-B_ Give details of fruits and crops you planted on your land within project area?

	plants	Number of plants		Total
		Plant having fruit	Not having fruit	
1	Fruits			
2	Lemon			
3	Orange			
4	Mango			
5	Papaya			
6	Guava			
7	Litchi			
8	Jackfruit			
9	Banana			
10	Peach			
11	Pear			
12	Aarubukhada (Plum)			
13	Others			
14	Stylo grass			
15	Pakhauri (Ficus glaberrima)			
16	Kavro			
17	Badhar (Monkey fruit)			
18	Khanayo (Ficus camia)			
19	Tanki (Bauhinia purpurea)			

	plants	Number of plants		Total
		Plant having fruit	Not having fruit	
20	Gidri			
21	Other			
22	Plant use for fuel			
23	Plant use for timber			
24	Bamboo			

3.6 Is previous year production sufficient to you and your family?

Yes ☐ No ☐

3.7 If inadequate then for how many more month is it insufficient?

-a_ 3 Month -b_ 6 Month

-c_ 9 Month (d) 12 Month

3.8 How you manage food for your family when your production is insufficient?

a= Debt b=Job/service income

c= Business income d=Potter

e= Daily labor wages f= Other

==========

3=9 Livestock farming

How many and what types of livestock you are rearing in your house?

S.N.	Livestock	Number
1	Cow	
2	Ox	
3	Buffalo	
4	Male calf	
5	Female calf	
6	Young male buffalo	
7	Young female buffalo	
8	Male Buffalo	
9	Horse	
10	Goat	
11	Male goat	
12	Castrated goat (Khasi)	
13	Kid goats	
14	Pig	
15	Duck	
16	Hen	
17	Others-write)	

4=Annual income of Household

Source	Annual Income-rs._	Sources	Annual Income-rs_
Agriculture		Other sources	

Food crops		Job/service	
Cash crops		Daily wages labor/potter	
Fruits		Pension	
Total -1_		Business	
Livestock		Home enterprise	
Milk Production		Occupational services	
Egg Hen duck selling		Fish selling	
Selling of male and female calf/Ox		Others	
Male &Female Buffalo/selling ÷		Total-3_	
Sheep/Goat/ Male goat/ Castrated goat/selling			
Pig selling			
Hen/Duck selling			
Total -2_			
	Total income -123_		

5=Annual expenses of Household

Particular	Total amount -rs_	Particular	Total amount -rs_
Rice		Tea	
Pulse		Wood/timber collection	
Maize		Electricity	
Vegetables		Kerosene	
Milk/curd		Medicine	
Fish/Meat		Education	
Oil/ghee		Clothing	
Masala		Festival/ celebration	
Salt		Others	
Sugar			
		Total expenses	

6=Utilization of water

-A_ Do you use the water of this river or not?

Yes ☐ No ☐

-B_ If you use the river water then for what purpose do you utilize it?

Irrigation ☐ Bathing and clothes ☐

Drinking ☐ Others ☐

7= Health related

-A_ Any family members were sick on last year?

Yes ☐ No ☐

-B) If it was then give detail of it

S.N.	Relation	Male	Female	Age	Disease
1					
2					
3					
4					

-Types of disease – Diarrhea, Dysentery+, Typhoid, Cholera, Malaria, Tuberculosis, Jaundice, Skin disease, Pneumonia, Asthma Pressure, Aids and sexual disease, Other_

-C_ Where you first visit when you are sick
==========

-D_ If there is no improvement on your heath by first checkup then where you will go next?

S.N.	Place for health checkup	Location	Distance-k.m._
1	Hospital		
2	Health post		
3	Health care center		
4	Ayurveda hospital		
5	Private clinic/Pharmacy		
6	Witch doctors		
7	Other		

8= Female Condition/Situation

-A_ Categorization of Labor

S.N.	Work description	Part of work (%)	
		Male	Female
1	Ploughing		
2	Manuring		
3	Land preparation		
4	Cultivation		
5	Digging		
6	Irrigation		
7	Cutting		
8	Carrying & Harvesting		
9	Food proceeding – thrashing/grinding_		
10	Grass/wood collection		

S.N.	Work description	Part of work (%)	
		Male	Female
11	Shepard		
12	Melapaat		
13	Cooking food		
14	Water collection/fetching		
15	Child and old care		

-B_ Right to property

S.N.	Work description	Part (in %)	
		Male	Female
1	House		
2	Land		
3	Animal		
4	Jewelry		
5	Enterprise/Industry		
6	Others		

-C_ Right to decision

S.N.	Work Description	Part in %	
		Male	Female
1	Crop choice		
2	Buying and selling of animal		
3	Buying and selling of jewelry		
4	Buying and selling of food		
5	Buying and selling of fruits		
6	Buying and selling of livestock		
7	Buying and selling of timber		
8	Marriage program		
9	Family planning		
10	Children Education		
11	Other		

9. Compensation related

-A_ Need compensation of your house and land in the form of?

Cash ☐ Land in terms of land ☐ other ☐

-B_ If your receive compensation in the form of cash then where you will utilize it?

Buy land ☐ Built a house ☐ Clear debt ☐

Start business ☐ other ☐

10= what will be the influence of implementation of propose? Give your suggestion/opinion

Positive Negative

ANNEX 7: CHLORINE USE GUIDELINES

CHLORINE GUIDELINE VALUE

In humans and animals exposed to chlorine in drinking-water, specific adverse treatment related effects have not been observed.

Chlorine in drinking water is safe for consumption .The small amount of chlorine typically used to disinfect water does not pose risks to human health. The World Health Organization (WHO) has established a guideline value of 5 mg/L for chlorine in drinking water, meaning that such concentrations are considered acceptable for lifelong human consumption. Furthermore, WHO concludes that this value is "conservative," as no adverse effects from chlorine in drinking water were observed in studies reviewed by WHO.

Guideline values for chlorine WHO Guidelines for drinking water quality (2004)

Chlorine	**below 5 milligrams per liter (mg/L)***

*For effective disinfection, there should be a residual concentration of free chlorine of 0.5 mg/L after at least 30 min contact time at pH<8.0

Chlorination does not harm aquatic environments

Chlorinated drinking water is unlikely to be harmful when discharged into aquatic environments. An extensive risk assessment conducted under European Union guidelines examined potential harm from various processes to make drinking water using sodium hypochlorite. This assessment found no significant environmental risks from chlorine or byproducts formed during drinking water chlorination. The DBPs formed in drinking water depend on the nature and quantity of organic matter present as well as on the disinfectant and other treatments used. In drinking water the principal byproducts are trihalomethanes (THMs; mainly chloroform) and halo-acetic acids (HAAs), with smaller amounts of other byproducts. Direct 'whole effluent' experiments representing various uses, including drinking water, have shown that no significant amounts of persistent and potentially bio-accumulative substances are formed. Toxicity tests on these mixtures demonstrated that the presence of DBPs did not increase the toxicity.

A major concern from the past was the formation of some highly-chlorinated, high-hazard molecules, such as dioxins, resulting from chlorine used in paper pulp bleaching. However, dioxins were only formed from 'active chlorine' under specific conditions: acid pH and in the presence of certain phenols such as those abundant in the lignin component of wood. There is no significant formation of dioxins or other high-hazard molecules at neutral or alkaline pH. All current uses of 'active chlorine' for microbial control and cleaning take place at alkaline or neutral pH.

ANNEX 8: WATER QUALITY TEST REPORTS

Nepal Environmental & Scientific Services (P) Ltd.
G.P.O. Box: 7301, Thapathali, Kathmandu, Nepal
Phone : +977-1-4244989, 4241001, Fax No.: +977-1-4226028, Email: ness@mos.com.np
http:\\www.nesspltd.com

NESS/Lab, M-03/R1.1

QS Test Report / Certificate

NS Accreditation No. Pra. 01/053-54

Entry No. : NCL - 358(W) (4) - 02 - 2018
Sample : Water (Mul Khola Spring Source)
Client : BDA PEA JV
Sampled By : WUSC Liwang, Rolpa
Project : Third Small Town Water Supply and Sanitation Project

Date Received : 26 - 02 - 2018
Date Completed : 15 - 03 - 2018
Location : Rolpa

S. N.	Parameters	Test Methods	Observed Values
1.	pH at 20°C	Electromeric, 4500 - H^+ B,: APHA	7.8
2.	Electrical Conductivity, (µS/cm)	Conductivity Meter, 2510 B, APHA	297
3.	Turbidity, (NTU)	Nephelometric, 2130 B, APHA	1
4.	Color, (Chromacity Unit)	Spectrophotometric, 2120 C, APHA	<0.05
5.	Taste	Physical, 2160 B/C, APHA	Unobjectionable
6.	Odor	Warm up, JIS - K 010210.1	Unobjectionable
7.	Total Dissolved Solids, (mg/L)	Oven Drying Method, 180°C, 2540 C, APHA	192
8.	Total Hardness as $CaCO_3$, (mg/L)	EDTA Titrimetric, 2340 C, APHA	190
9.	Carbonate Hardness, (mg/L)	Calculation	190
10.	Total Alkalinity as $CaCO_3$, (mg/L)	Titrimetric, 2320 B, APHA	220
11.	Bicarbonate Alkalinity, (mg/L)		220
12.	Chloride, (mg/L)	Argentometric Titration, 4500 - Cl^- B, APHA	<0.5
13.	Ammonia, (mg/L)	Direct Nesslerization, 4500 - NH_3 C APHA	N. D. (<0.05)
14.	Nitrate, (mg/L)	UV Spectrophotometric Screening, 4500 - NO_3^- B, APHA	1.48
15.	Aluminium, (mg/L)	Erichrome Cyanine R, 3500 - Al A: APHA	<0.01
16.	Fluoride, (mg/L)	SPANDS, 4500 – F^- D, APHA	<0.05
17.	Sulphate, (mg/L)	Gravimetric Method with Ignition of Residue, 4500 – SO_4^{2-} C, APHA	<1
18.	Calcium, (mg/L)	EDTA Titrimetric, 3500 - Ca B & 3500 - Mg B APHA	39.28
19.	Arsenic, (mg/L)	SDDC, 3500 - As, C: APHA	N. D. (<0.01)
20.	Mercury, (mg/L)	Cold Vapor AAS, 3112 B: APHA	N. D. (<0.0005)
21.	Iron, (mg/L)	Direct Air - Acetylene AAS, 3111 B, APHA	N. D. (<0.05)
22.	Manganese, (mg/L)		N. D. (<0.02)
23.	Cadmium, (mg/L)		N. D. (<0.003)
24.	Lead, (mg/L)		N. D. (<0.01)
25.	Copper, (mg/L)		<0.01
26.	Chromium, (mg/L)		N. D. (<0.01)
27.	Zinc, (mg/L)		0.02
28.	*E. coli* Count, (MPN Index /100 mL)	Multiple Tube Fermentation, 9221 E, APHA	Nil

N. D.: Not Detected

Note:
AAS: Atomic Absorption Spectrophotometer; UV: Ultraviolet; EDTA: Ethylenediaminetetraacetic acid; MPN: Most Probable Number;NTU: Nephelometric turbidity unit; NEDA: N-1-Naphthylethylenediamine dihydrochloride; APHA: American Public Health Association.

(Analyzed By) (Checked By) (Authorized Signature)

Note:
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2. The result of parameters refers only to the tested samples. Endorsement of products is neither inferred nor implied.
3. Liability of our institute is limited to the invoiced test parameters & amount only.
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NESS/Lab, M-03/R1.1

QS Test Report / Certificate

NS Accreditation No. Pra. 01/053-54

Entry No. : NCL - 358(W) (4) - 02 - 2018
Sample : Water (Sattle Spring Source)
Client : BDA PEA JV
Sampled By : WUSC Liwang, Rolpa
Project : Third Small Town Water Supply and Sanitation Project

Date Received : 26 - 02 - 2018
Date Completed : 15 - 03 - 2018
Location : Rolpa

S. N.	Parameters	Test Methods	Observed Values
1.	pH at 20°C	Electromeric, 4500 - H^+ B,: APHA	8.1
2.	Electrical Conductivity, (µS/cm)	Conductivity Meter, 2510 B, APHA	303
3.	Turbidity, (NTU)	Nephelometric, 2130 B, APHA	6
4.	Color, (Chromacity Unit)	Spectrophotometric, 2120 C, APHA	N. D. (<0.05)
5.	Taste	Physical, 2160 B/C, APHA	Unobjectionable
6.	Odor	Warm up, JIS - K 010210.1	Unobjectionable
7.	Total Dissolved Solids, (mg/L)	Oven Drying Method, 180°C, 2540 C, APHA	138
8.	Total Hardness as $CaCO_3$, (mg/L)	EDTA Titrimetric, 2340 C, APHA	200
9.	Carbonate Hardness, (mg/L)	Calculation	200
10.	Total Alkalinity as $CaCO_3$, (mg/L)	Titrimetric, 2320 B, APHA	230
11.	Bicarbonate Alkalinity, (mg/L)		230
12.	Chloride, (mg/L)	Argentometric Titration, 4500 - Cl^- B, APHA	<0.5
13.	Ammonia, (mg/L)	Direct Nesslerization, 4500 - NH_3 C APHA	0.06
14.	Nitrate, (mg/L)	UV Spectrophotometric Screening, 4500 - NO_3^- B, APHA	0.96
15.	Aluminium, (mg/L)	Erichrome Cyanine R, 3500 - Al A: APHA	<0.01
16.	Fluoride, (mg/L)	SPANDS, 4500 – F^- D, APHA	<0.05
17.	Sulphate, (mg/L)	Gravimetric Method with Ignition of Residue, 4500 – SO_4^{2-} C, APHA	<1
18.	Calcium, (mg/L)	EDTA Titrimetric, 3500 - Ca B & 3500 - Mg B APHA	41.68
19.	Arsenic, (mg/L)	SDDC, 3500 - As, C: APHA	N. D. (<0.01)
20.	Mercury, (mg/L)	Cold Vapor AAS, 3112 B: APHA	N. D. (<0.0005)
21.	Iron, (mg/L)	Direct Air - Acetylene AAS, 3111 B, APHA	0.27
22.	Manganese, (mg/L)		N. D. (<0.02)
23.	Cadmium, (mg/L)		N. D. (<0.003)
24.	Lead, (mg/L)		N. D. (<0.01)
25.	Copper, (mg/L)		<0.01
26.	Chromium, (mg/L)		N. D. (<0.01)
27.	Zinc, (mg/L)		0.02
28.	*E. coli* Count, (MPN Index /100 mL)	Multiple Tube Fermentation, 9221 E, APHA	Nil

N. D.: Not Detected

Note:
AAS: Atomic Absorption Spectrophotometer; UV: Ultraviolet; EDTA: Ethyelenediaminetetraacetic acid; MPN: Most Probable Number;NTU: Nephelometric turbidity unit; NEDA: N-1-Naphthyleethylenediamine dihydrochloride; APHA: American Public Health Association.

(Analyzed By) **(Checked By)** **(Authorized Signature)**

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QS Test Report / Certificate

NS Accreditation No. Pra. 01/053-54

Entry No. : NCL - 358(W) (4) - 02 - 2018 Date Received : 26 - 02 - 2018
Sample : Water (Mulpani Spring Source) Date Completed : 15 - 03 - 2018
Client : BDA PEA JV Location : Rolpa
Sampled By : WUSC Liwang, Rolpa
Project : Third Small Town Water Supply and Sanitation Project

S. N.	Parameters	Test Methods	Observed Values
1.	pH at 20°C	Electromeric, 4500 - H^+ B.: APHA	7.8
2.	Electrical Conductivity, (µS/cm)	Conductivity Meter, 2510 B, APHA	286
3.	Turbidity, (NTU)	Nephelometric, 2130 B, APHA	5
4.	Color, (Chromacity Unit)	Spectrophotometric, 2120 C, APHA	0.03
5.	Taste	Physical, 2160 B/C, APHA	Unobjectionable
6.	Odor	Warm up, JIS - K 010210.1	Unobjectionable
7.	Total Dissolved Solids, (mg/L)	Oven Drying Method, 180°C, 2540 C, APHA	198
8.	Total Hardness as $CaCO_3$, (mg/L)	EDTA Titrimetric, 2340 C, APHA	184
9.	Carbonate Hardness, (mg/L)	Calculation	184
10.	Total Alkalinity as $CaCO_3$, (mg/L)	Titrimetric, 2320 B, APHA	215
11.	Bicarbonate Alkalinity, (mg/L)		215
12.	Chloride, (mg/L)	Argentometric Titration, 4500 - Cl^- B, APHA	<0.5
13.	Ammonia, (mg/L)	Direct Nesslerization, 4500 - NH_3 C APHA	<0.05
14.	Nitrate, (mg/L)	UV Spectrophotometric Screening, 4500 - NO_3^- B, APHA	0.37
15.	Aluminium, (mg/L)	Erichrome Cyanine R, 3500 - Al A: APHA	<0.01
16.	Fluoride, (mg/L)	SPANDS, 4500 – F^- D, APHA	<0.05
17.	Sulphate, (mg/L)	Gravimetric Method with Ignition of Residue, 4500 – SO_4^{2-} C, APHA	<1
18.	Calcium, (mg/L)	EDTA Titrimetric, 3500 - Ca B & 3500 - Mg B APHA	39.28
19.	Arsenic, (mg/L)	SDDC, 3500 - As, C: APHA	N. D. (<0.01)
20.	Mercury, (mg/L)	Cold Vapor AAS, 3112 B: APHA	N. D. (<0.0005)
21.	Iron, (mg/L)	Direct Air - Acetylene AAS, 3111 B, APHA	0.21
22.	Manganese, (mg/L)		N. D. (<0.02)
23.	Cadmium, (mg/L)		N. D. (<0.003)
24.	Lead, (mg/L)		N. D. (<0.01)
25.	Copper, (mg/L)		<0.01
26.	Chromium, (mg/L)		N. D. (<0.01)
27.	Zinc, (mg/L)		0.02
28.	*E. coli* Count, (MPN Index /100 mL)	Multiple Tube Fermentation, 9221 E, APHA	>1100

N. D.: Not Detected

Note:
AAS: Atomic Absorption Spectrophotometer; UV: Ultraviolet; EDTA: Ethylenediaminetetraacetic acid; MPN: Most Probable Number;NTU: Nephelometric turbidity unit; NEDA: N-1-Naphthylethylenediamine dihydrochloride; APHA: American Public Health Association.

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QS Test Report / Certificate

NS Accreditation No. Pra. 01/053-54

Entry No. : NCL - 358(W) (4) - 02 - 2018
Sample : Water (Rim Khola Spring Source)
Client : BDA PEA JV
Sampled By : WUSC Liwang, Rolpa
Project : Third Small Town Water Supply and Sanitation Project

Date Received : 26 - 02 - 2018
Date Completed : 15 - 03 - 2018
Location : Rolpa

S. N.	Parameters	Test Methods	Observed Values
1.	pH at 20°C	Electromeric, 4500 - H^+ B.: APHA	7.8
2.	Electrical Conductivity, (µS/cm)	Conductivity Meter, 2510 B, APHA	273
3.	Turbidity, (NTU)	Nephelometric, 2130 B, APHA	<1
4.	Color, (Chromacity Unit)	Spectrophotometric, 2120 C, APHA	N. D. (<0.05)
5.	Taste	Physical, 2160 B/C, APHA	Unobjectionable
6.	Odor	Warm up, JIS - K 010210.1	Unobjectionable
7.	Total Dissolved Solids, (mg/L)	Oven Drying Method, 180°C, 2540 C, APHA	186
8.	Total Hardness as $CaCO_3$, (mg/L)	EDTA Titrimetric, 2340 C, APHA	176
9.	Carbonate Hardness, (mg/L)	Calculation	176
10.	Total Alkalinity as $CaCO_3$, (mg/L)	Titrimetric, 2320 B, APHA	205
11.	Bicarbonate Alkalinity, (mg/L)		205
12.	Chloride, (mg/L)	Argentometric Titration, 4500 - Cl^- B, APHA	<0.5
13.	Ammonia, (mg/L)	Direct Nesslerization, 4500 - NH_3 C APHA	0.17
14.	Nitrate, (mg/L)	UV Spectrophotometric Screening, 4500 - NO_3^- B, APHA	0.74
15.	Aluminium, (mg/L)	Erichrome Cyanine R, 3500 - Al A: APHA	<0.01
16.	Fluoride, (mg/L)	SPANDS, 4500 – F^- D, APHA	<0.05
17.	Sulphate, (mg/L)	Gravimetric Method with Ignition of Residue, 4500 – SO_4^{2-} C, APHA	<1
18.	Calcium, (mg/L)	EDTA Titrimetric, 3500 - Ca B & 3500 - Mg B APHA	37.67
19.	Arsenic, (mg/L)	SDDC, 3500 - As, C: APHA	N. D. (<0.01)
20.	Mercury, (mg/L)	Cold Vapor AAS, 3112 B: APHA	N. D. (<0.0005)
21.	Iron, (mg/L)	Direct Air - Acetylene AAS, 3111 B, APHA	N. D. (<0.05)
22	Manganese, (mg/L)		N. D. (<0.02)
23.	Cadmium, (mg/L)		N. D. (<0.003)
24.	Lead, (mg/L)		N. D. (<0.01)
25.	Copper, (mg/L)		<0.01
26.	Chromium, (mg/L)		N. D. (<0.01)
27.	Zinc, (mg/L)		0.03
28.	*E. coli* Count, (MPN Index /100 mL)	Multiple Tube Fermentation, 9221 E, APHA	Nil

N. D.: Not Detected

Note:
AAS: Atomic Absorption Spectrophotometer; UV: Ultraviolet; EDTA: Ethylenediaminetetraacetic acid; MPN: Most Probable Number;NTU: Nephelometric turbidity unit; NEDA: N-1-Naphthylethylenediamine dihydrochloride; APHA: American Public Health Association.

(Analyzed By) (Checked By) (Authorized Signature)

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ANNEX 9: CHECKLISTS

Checklist for Physical Environment

A. Topography/Physiography

1. Study of Topographic maps/ other available maps and identify the ground topographic characteristics of land covered by the proposed project
2. Verify the topographic characteristics of the land in the field
3. Soil Type

B. Climate and Meteorology

1. Study of published data of regarding temperature, rainfall, humidity, wind speed and direction, solar radiation
2. If possible classify the climatic zone and its verification
3. Visit the meteorological office of the district and get latest information

C. Air Quality

1. Collect any data on air quality of the area from previous literature
2. Investigate on the air polluting activities of the area (traffic, biomass burning, industries, other anthropogenic activities

D. Erosion and land Stability

1. Identification of erosion prone area along the road alignment
2. Investigate the erosion features and potentials of the local streams and gullies

E. Land Use

1. Investigate on the land use of the Project Blocks from the topo-maps, and other available land use maps
2. Investigate the land use affected by the project structures and subsidiary facilities
3. Investigate on the land use potentials of the area

CHECKLIST OF PLANT RESOURCES

Date:

S.No.	Name of plants	Uses			Others
		Fuel-wood	Fodder	Medicine	

Note:……
……
……
……
……...

CHECKLIST OF WILDLIFE ANIMALS

Date:

S.N.	Wild Animals	Remarks

Note:……
……
……
……
……..

CHECKLIST OF (Birds)

Date:

S.No.	Birds	Remarks

Note:……
……
……
……

Checklist for Socio-economic Environment

A. Consultative Meeting in affected VDCs

Focus Group Discussion, Rapid Rural Appraisal or Participatory Rural Appraisal method shall be applied to gather the community concern regarding the development of the Project

Process:

1. **The IEE team will present the development of the project focusing on:**
   a. Location of the project to the communities
   b. Explain the subsidiary facilities required for the construction of the project
   c. Explain how the local people will be affected during construction and in operation period
      - Land and property acquisition of permanent project occupied areas
      - Obstruction of irrigation canals, foot trails, suspension bridge etc. during construction
      - Construction related risks
      - Vehicular movement and related risks
      - Job and employment opportunities
      - Influx of outside people and social and cultural risks
      - Improvement of access and related benefits to education, health, and economy

   .
2. **Discussions on the proposal with the locals – Question and Answer**

3. **Seek following information from the locals**

About Project:

   a. Willingness to cooperate in the land acquisition process and willingness to give land and property for the for project
   b. Willingness to give land on compensation for permanent area occupied
   c. Envisaged mode of compensation for the land and property
      - Cash compensation
      - Land to land
      - Some other methods (if any)
   d. Approximate current value of land in the VDC in the project sites
   e. Availability of labour for construction from the VDC, approximate number of labour force available for such works
   f. What type of arrangement needed for obstructed infrastructures during construction
   g. Willingness to give land for temporary use
   h. Mode of compensation to the temporarily occupied land and conditions

About People

   i. Demographic Feature of the project area along with male and female population
   j. The major ethnic groups in the close proximity of the project sites and their demography along with male and female population
   k. Relationship between the ethnic groups
   l. Any cultural difference between the ethnic groups
   m. Economic status of people (In general, by ethnicity)
   n. Major Health problems of the area (Frequently observed disease, among child, old, young, women)

o. Education status of people (In general, by ethnicity)
p. Health status of people (In general and by ethnicity)
q. Occupational status of people (in general, by ethnicity)
r. Any in migration and out migration in the last five years and reasons for migration

About Agriculture

s. What is the current season wise intercropping practice in the area
t. What is the production per unit of the land for each crops
u. What are the fertilisers used currently by the farmers and what is the approximate quantity of use in a year by an average farmer household
v. Do you use pesticide? Name the types of pesticide used and quantity used by a farmer household.
w. Food security and food sufficiency (is the local production sufficient to feed area people, if not sufficient the mode of coping)
x. What potential exists for vegetable and horticulture or other agro-based economic opportunity

About Community User group:

Community Forest within project affected area

- Name
- Area VDC wards
- No of User Households VDC wise break
- No of Male Households
- No of Female Households
- Year of establishment:

Community Forest outside Project area (details same as above)

Any other community User groups (Details same as community forests

About Infrastructures

Any infrastructure (foot trail, suspension bridge, existing water supply line, water springs, irrigation they think will be affected by the project

About culture and historical places

Name the temples in the VDC and what is their religious significance
Is any of the temple lies close to the project sites
What are key festivals of the VDC people and the observation day of festival (how many people visit the site)
Is there a site of historical and touristic significance in the area

About development

Name the primary schools in the VDC – students and teachers number
Name the Middle schools in the VDC – students and teachers number
Name the Secondary schools in the VDC– students and teachers number
Name the higher secondary schools in the VDC – students and teachers
Name the health posts in the VDC – number of health workers
Telephone numbers in the VDC
Name the post office in the VDC
Name the industries in the VDC – number of workers
Water supply system and coverage (mode of water fetching for household use)
Energy Use and types of energy use

- for cooking (average consumption per household)
- for lighting (average consumption per household)

Tourism & Market Development Opportunities:

Tourism development opportunities (reasons)
Market development Opportunities (reasons)

About Development Needs

What are the first five development needs of the VDC
What is expected by the people from the project (at the minimum)

About Gender

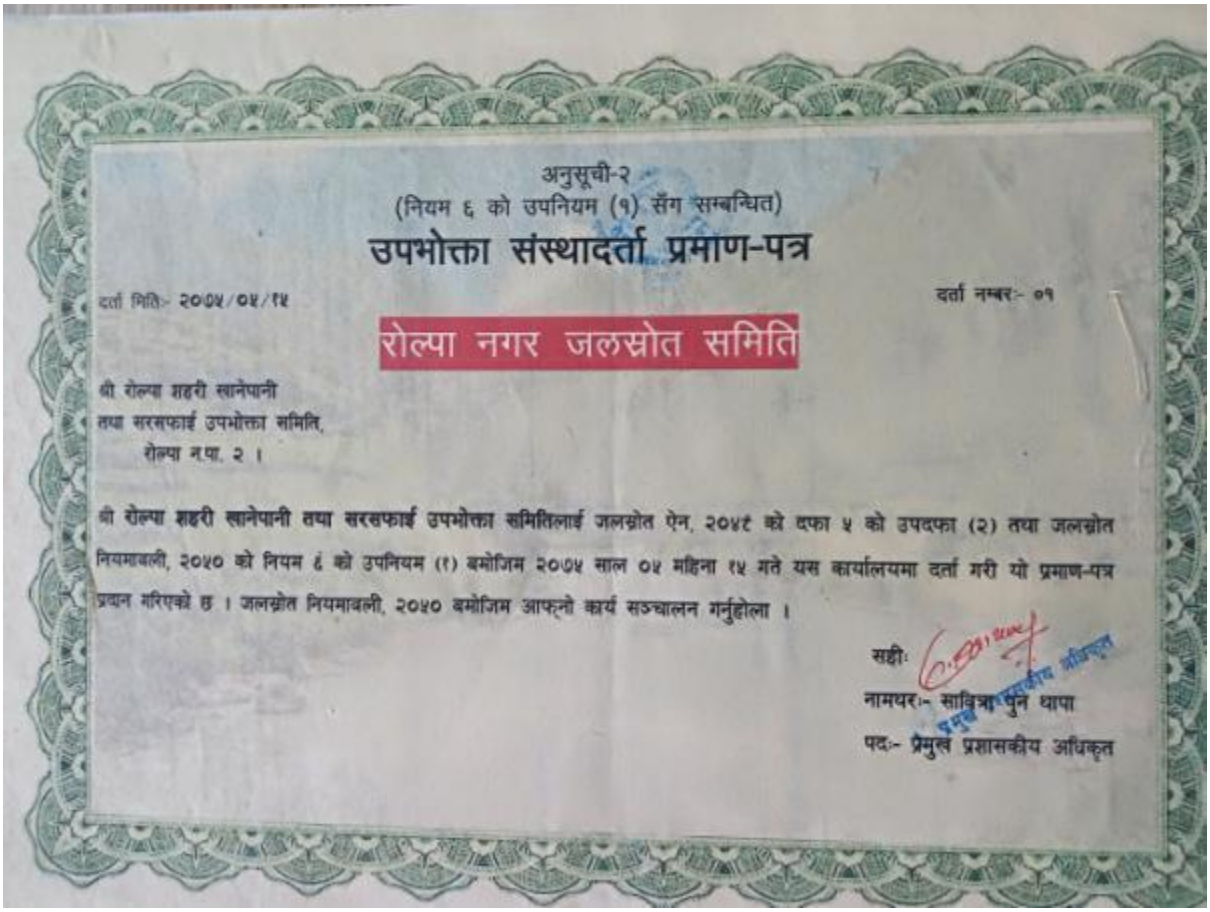
Educational status of women compared to man counterpart and reason
Social status of women

- in household decision making
- in household works
- in land and property
- livestock
- in social organisation

How the status of women could be upgrade

ANNEX 10: CONSENT LETTERS

REGISTRATION



अनुसूची-२
(नियम ६ को उपनियम (१) सँग सम्बन्धित)

उपभोक्ता संस्थादर्ता प्रमाण-पत्र

दर्ता मिति:- २०७५/०५/१५ दर्ता नम्बर:- ०१

रोल्पा नगर जलस्रोत समिति

श्री रोल्पा शहरी खानेपानी
तथा सरसफाई उपभोक्ता समिति,
रोल्पा न.पा. २ ।

श्री रोल्पा शहरी खानेपानी तथा सरसफाई उपभोक्ता समितिलाई जलस्रोत ऐन, २०४९ को दफा ५ को उपदफा (२) तथा जलस्रोत नियमावली, २०५० को नियम ६ को उपनियम (१) बमोजिम २०७५ साल ०५ महिना १५ गते यस कार्यालयमा दर्ता गरी यो प्रमाण-पत्र प्रदान गरिएको छ । जलस्रोत नियमावली, २०५० बमोजिम आफ्नो कार्य सञ्चालन गर्नुहोला ।

सही:
नामथर:- सावित्रा पुन थापा
पद:- प्रमुख प्रशासकीय अधिकृत

UNOFFICIAL TRANSLATION (S.No. 1)

Annex - 2
(Pertaining to Sub-Rule 1 of Rule 6)

Registration Date: 31st August 2018 Entry No.: 01

Rolpa Municipal Water Resource Committee

M/S Rolpa Water Supply and Sanitation Project
Ward 2, Rolpa Municipality.

In accordance to Clause 5, Sub-Cluase 2 of Water Resource Act (2049 BS) and as per Rule 6, Sub-Rule 1 of Water Resource Regulations 2050 BS, the WSUC has been registered on date 31st August 2018. The WUSC is required to perform as per the Water Resource Regulations 2050 BS.

Ms Sabitra Pun Thapa
Chief Administrative Office

(Signed and Stamped)

PERMISSION GIVEN

रोल्पा नगरपालिका
Rolpa Municipality
नगर कार्यपालिकाको कार्यालय
Office of the Municipal Executive
लिबाङ, रोल्पा
Libang, Rolpa
५ नं. प्रदेश, नेपाल
5 No.Province, Nepal

प.सं./FY:- २०७५/०७६
च.नं. /Ref No:- ९९४५

मिति/Date:- २०७६/०१/१९

विषय :- सहमति दिईएको सम्बन्धमा।

श्री अध्यक्ष ज्यु
रोल्पा शहरी खानेपानी उपभोक्ता तथा सरसफाइ समिति
रोल्पा नगरपालिका लिवाङ रोल्पा

प्रस्तुत विषयमा रोल्पा नगरकार्यपालिकाको मिति २०७६/०१/०५ को १४औ बैठकबाट भएको निर्णय बमोजिम तेस्रो साना शहरी खानेपानी आयोजना अन्तरगत रोल्पा शहरी खानेपानीका लागि तपसिल बमोजिमका मुहान अन्तरगत बन्ने तपसिल बमोजिमका संरचनाहरु तपसिल बमोजिमका क्षेत्रमा पर्ने हुँदा तेस्रो साना शहरी खानेपानी आयोजनाका लागि आवश्यक पर्ने जग्गा उल्लेखित प्रयोजनका लागी सो उपभोक्ता समितले आफ्नो व्यवस्था नगर्दा सम्म कानुन अनुसार अन्य सरकारी निकायको अनुमति लिनु पर्ने भए लिएर उल्लेखित संरचना निर्माण गर्न सहमति दिएको व्यहोरा अनुरोध छ।

तपसिल

क्र. सं.	मुहान/ स्थानको नाम	बन्ने संरचनाहरु	जग्गाको क्षेत्रफल	जग्गाको किसिम
१	मुलखोला मुहान अन्तरगत	इन्टेक, गार्डहाउस WTP , सम्पवेल	६०० वर्ग मिटर	सार्वजनिक जग्गा वडा नं. १
		टुडिखेल सोलोवाङ सिस्टम (RVT)	५७० वर्गमिटर	सार्वजनिक जग्गा वडा नं. ४
२	रिमखोला मुहान अन्तरगत	इन्टेक, गार्डहाउस WTP , सम्पवेल	३०५ वर्गमिटर	सार्वजनिक जग्गा वडा नं. २
		सिवाङ रेउघा सिस्टम (RVT)	४१० वर्गमिटर	सार्वजनिक जग्गा वडा नं. २
३	मुलपानी मुहान अन्तरगत	इन्टेक, गार्डहाउस WTP, सम्पवेल	४१० वर्गमिटर	सार्वजनिक जग्गा वडा नं. २
		काभ्रेखर्क थलिवाङ सिस्टम (RVT)	५०५ वर्गमिटर	
४	सातले मुहान अन्तरगत	इन्टेक, गार्डहाउस WTP, सम्पवेल	५७० वर्गमिटर	सार्वजनिक जग्गा वडा नं. २
		शिक्षा सिस्टम	३६५ वर्मिटर	सार्वजनिक जग्गा वडा नं. ४
५	सन स्टार टोल	WUSC कार्यालय भवन	५१५ वर्गमिटर	रोल्पा न.पा.को जग्गा वडा नं. ४

पूर्ण के.सी.
नगरप्रमुख
नगर प्रमुख

Toll Free No. +977-166-086-44555 ☎Ph. +977-086-440071, ☎ Ph. +977-086440372
http:-rolpamun.gov.np, E-mail- rolpanagarpalika@gmail.com

Unofficial Translation (S.No. 2)

Rolpa Municipality
Office of the Municipality Executive
Liwang, Rolpa
Province No: 5, Nepal

FY:-2075/076 Date: - May 2, 2019
Ref No: 1646

Sub: Regarding Permission

The Chairperson,
Liwang_Rolpa Sahari Khanepani Upabhoktta Tatha Sarsafai Sammittee
Rolpa Nagarpalika, Liwang Rolpa

As per the 14th municipality meeting on April 18, 2019, a decision was made to grant permission to construct water supply source related structures under following water sources for the Rolpa Sahari Khanepani Upabhoktta Tatha Sarsafai Sammittee. Liwang Water Supply and Sanitation Project is given permission to use following land and requested to coordinate legally with other government offices, if any land related permission is needed.

Particulars

S. No.	Water Sources/Place Name	Structures	Land Area	Type of land
1.	Under Mulkhola Water Source	Intake, Guard House, WTP, Sump well	600 Sqm.	Public Place, Ward No: 1
		Tudikhel Solobang System(RVT)	570 Sqm.	Public Place, Ward No: 4
2.	Under Rimkhola Water Source	Intake, Guard House, WTP, Sump well	305 Sqm.	Public Place, Ward No: 2
		Siwang Reeuga System (RVT)	410 Sqm.	Public Place, Ward No: 2
3.	Under Mulpani Water Source	Intake, Guard House, WTP, Sump well	410 Sqm.	Public Place, Ward No: 2
		Kavrekharka Thalibang System (RVT)	505 Sqm.	Public Place, Ward No: 2
4.	Under Sattale Water Source	Intake, Guard House, WTP, Sump well	470 Sqm.	Public Place, Ward No: 2
		Sikhya System (RVT)	365 Sqm.	Public Place, Ward No: 4
5.	San Star Tole	WUSC Office Building	515 Sqm.	Public Place, Ward No: 4

……..
Purna K.C.
Mayor
(Stamped and Signed)

ANNEX 11: APPROVAL OF IEE FROM MOWS

Letter of approval of IEE from MoWS

नेपाल सरकार

खानेपानी मन्त्रालय

सिंहदरबार,
काठमाडौं, नेपाल ।

VISIT Nepal Year 2020

पत्र संख्या:- ०६६।०६६
चलानी नं.:- ४९१

मिति २०७६।०९।१६

श्री सहरी खानेपानी तथा सरसफाइ (क्षेत्रगत) आयोजना,
पानीपोखरी, काठमाडौं ।

विषय : प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन स्वीकृती सम्बन्धमा ।

प्रस्तुत विषयमा तहां विभाग मार्फत स्वीकृतिका लागि यस मन्त्रालयमा प्राप्त भएको सहरी खानेपानी तथा सरसफाइ (क्षेत्रगत) आयोजना, प्रस्तावक रहेको तपसील बमोजिम आयोजनाहरुको परिमार्जित प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन नेपाल सरकार (सचिवस्तर) को मिति २०७६।०९।१६ को निर्णयानुसार स्वीकृत भएको व्यहोरा निर्देशानुसार अनुरोध छ ।

आयोजनाहरु :

१ लिवाङ्ग सहरी खानेपानी तथा सरसफाइ आयोजना, रोल्पा
२ सिद्धनाथ बैजनाथ सहरी खानेपानी तथा सरसफाइ आयोजना, कञ्चनपुर
३ प्रगतिनगर सहरी खानेपानी तथा सरसफाइ आयोजना, दाङ्ग

(मधुसुधन खनाल)
इन्जिनियर

बोधार्थ :
श्री खानेपानी तथा ढल व्यवस्थापन विभाग,
पानीपोखरी, काठमाडौं ।
संलग्न :
स्वीकृत प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन २ प्रति ।

"नतिजामुखी प्रशासन:समृद्धि र सुशासन"

Unofficial translation

Government of Nepal
Ministry of Water Supply Singh Durbar
Kathmandu, Nepal
Tel: 4211693; Fax: 977-1-4211433

Letter No.: 076/077
Serial No.:291

Date: 01-01-2020

To,
Urban Water Supply and Sanitation (Sector) Project
Panipokhari, Kathmandu

Subject: Regarding the Approval of Initial Environmental Examination (IEE) Report

Like to inform as per decision made on the related subject, the revised IEE report of the following listed project submitted by the Department to this Ministry for approval of had been approved on 01-01-2020 by secretarially level decision of Government of Nepal.

Projects:

1. **Liwang, Urban Water Supply and Sanitation Project (Rolpa)**
2. **Siddhanath Baijnath, Urban Water Supply and Sanitation Project (Rolpa)**
3. **Pragatinagar, Urban Water Supply and Sanitation Project (Rolpa)**

_____
Madhusudan Khanal
Engineer
(Signed and Stamped)

cc:
Department of Water Supply and Sewage Management
Panipokhari, Kathmandu
.
Attached:
Approved Initial Environmental Examination (IEE) Report: 2 Copy

ANNEX 12: PHOTOGRAPHS

Photo 1: Stakeholder consultation

Photo 2: Consultative meeting in a beneficiarycommunity

Photo 3: Key Respondant interview

Photo 4: Meeting with WUSG on socio-economic aspects

Photo 5: Proposed Mewang Deubuje RVT under Mulkhola

Photo 6: Proposed WUSC Building site

Photo 7: Proposed Mulpani Source for Intake, Guard house and WTP

Photo 8: Distribution Network Area, Ward 2; Rolpa Municipality

SAUW IEE Review - Information Log

Instructions: Provide information based on IEE submitted by Project Management Office (PMO). This IEE log sheet will serve as record of the review findings, comments, and/or further actions required during implementation. A copy of the IEE log sheet should be (i) provided to PMO for their record and guidance on actions during implementation; (ii) attached in the cleared IEE to be disclosed; (iii) used as reference for review of updated/final IEE and (iv) inputted in the SARD Safeguards Compliance Tracking System.

Project:	**Nepal: Urban Water Supply and Sanitation Project (UWSSP): Liwang (Rolpa District) Urban Water Supply and Sanitation Subproject**		
Loan No.:	3711	**Package No.:**	**W06**

Components:

	Components	Nos.	Description (Volume / Capacity / Footprint Area / Length)
1.	Intake structures	4 nos.	22.09 lps in total
			Mulkhola 8.31 lps; Sattale 6.67 lps
			Mulpani 4.03 lps; Rimkhola 3.08 lps
2.	Service Reservoirs (OHT/ RVT, Valve Chambers, surface valve box, etc.)	8 nos. (7 new, 1 existing)	545 cu. m. (ranging from 15 to 140 m^3)
	Treatment facility subcomponents:		
3.	Pressure Filters	4 nos.	1.7 m - 2.0 m diameter
4.	Disinfection Units	4 nos.	Mixing tank - 1000L Dosing tank - 250 L
5.	Water Quality Testing Laboratory	1 no.	24 sq. m.
6.	Distribution Network.	1 network	48.120 km.
7.	Transmission Mains.	1 network	10.071 km.
8.	Pumps (including related accessories, electrical panels, generators, etc.)	9 nos. (9 standby)	Capacity of 3 kw to 11 kw
9.	Fire Hydrants	10 nos.	For base year
10.	House Connections.	1060	For base year
11.	11 KV transmission lines	1 network	4 k.m.
12.	Electrical Transformers	4 nos.	3 of 50 KVA; 1 of 25 KVA
13.	Office Building	1 no.	170 sq. m.
14.	Guard House	3 no.	30 sq. m. each
15.	Generator House	4 no.	15 x 4 sq. m.
16.	Standby Electrical Generator	4 Nos.	1 no. 40 kVA; 3 nos. 62.5 kVA
17.	Public Toilets	1 no.	42 sq. m.

Contract Type:	Civil Works
Date of IEE:	June 2019

Draft IEE?	Updated/Revised IEE?	Others
		The IEE is the final IEE and components are based on final detailed design.

	Activity	Status		Detailed Comments and Further Actions Required
1.	Environmental assessment has been satisfactorily conducted based on ADB REA Checklist and scoping checklist.[24]	**Yes**: X	**No**:	
2.	Environmental assessment based on latest project components and design	**Yes**: X	**No**:	
3.	Statutory Requirements[25]		Forest Clearance	To be obtained by PMO/RPMO if needed. No civil works will commence unless forest clearance, if required, is obtained. PMO to report status in the SEMR.
			No Objection Certificate	To be obtained by PMO/RPMO if needed. No civil works will commence unless NOC, if required, is obtained. PMO to report status in the SEMR.
			Site Location Clearance	To be obtained by PMO/RPMO if needed. No civil works will commence unless site location clearance, if required, is obtained. PMO to report status in the SEMR.
			Environmental Compliance Certificate	PMO is currently in the process of obtaining MOWS-approved IEE. Accordingly, application is under review by MOWS. PMO to attach copy

[24] ADB Rapid Environmental Assessment Checklist for screening and categorization. Scoping Checklist ("No Mitigation Scenario" Checklist) for scope of IEE, identification of impacts and development of environmental management plan.
[25] If applicable, include date accomplished or obtained.

	Activity	Status					Detailed Comments and Further Actions Required
							of approval document in the next SEMR.
			Permit to Construct (or equivalent)				To be obtained by PMO/RPMO if needed. No civil works will commence unless permit to construct (or equivalent), if required, is obtained. PMO to report status in the SEMR.
			Permit to Operate (or equivalent)				To be obtained by PMO/RPMO if needed. No civil works will commence unless permit to operate (or equivalent), if required, is obtained. PMO to report status in the SEMR.
			Others				
5.	Policy, legal, and administrative framework	**Adequate**		**Not Adequate**			Section II discusses the policy, legal and administrative framework of the subproject.
		X					
		Included discussions and requirements of the:					
		Yes	National regulation/law on EIA				
		Yes	Environmental agency				
		Yes	Relevant international environmental agreements				
		Yes	Environmental standards (IFC's EHS Guidelines)				
6.	Anticipated environmental impacts and mitigation measures	**assessed impacts and risks:**		**mitigation measures included:**			
				Yes	**No**	**n/a**	
			Biodiversity conservation			X	Endangered species and habitats not present in subproject area. An IBAT was ran and no features was found.
			Pollution prevention and abatement	X			

	Activity	Status					Detailed Comments and Further Actions Required
			Health and safety	X			
			Physical cultural resources	X			
			Cumulative impacts			X	
			Transboundary impacts			X	
7.	Impacts from Associated Facilities[26]	**Addressed**	**Not Addressed**	**Not applicable**			
				X			
8.	Analysis of Alternatives	**Yes**		**No**			An analysis of alternatives is provided, but this is not required.
		X					
9.	EMP budget included	**Yes**		**No**			Section VIII (Table VIII-4) provides indicative budget of NPR 3,800,000 for EMP implementation.
		X					
10.	EMP implementation integrated in FAM/PAM and bid documents	**Yes**		**No**			(i) Included in PAM during loan processing. Included in Section 8 of bid documents. (ii) Section VIII includes discussion on the inclusion of the EMP in the bid and contract documents. PMO and the RPMO will have the responsibility to ensure compliance with this requirement.
		X					
11.	Consultation and Participation	**Yes**		**No**			(i) Section IX discusses the conduct of initial consultation. (ii) Annex 5 shows a minutes of consultative meeting, with translation in the English language.
		X					

[26] ADB SPS (Appendix 1 para 6) defines associated facilities as not funded as part of the project (funding may be provided separately by the borrower/client or by third parties), and whose viability and existence depend exclusively on the project and whose goods or services are essential for successful operation of the project.

	Activity	Status		Detailed Comments and Further Actions Required
12.	Grievance Redress Mechanism	**Yes**	**No**	
		X		
		Description of GRM.		Section IX discusses the GRM.
		GRC members identified.		Section IX discusses the GRC membership.
		GRM established and notified?		GRM is established. PMO to confirm in the first SEMR that (i) GRM is notified and GRC members have the capacity to address project-related grievances/complaints, and (ii) contractors are given instructions and orientation on GRM.
13.	Disclosure	To be complied	Endorsement to disclose on ADB website	To be complied after endorsement from PMO is received by ADB.
		To be complied	Disclosed on project website	To be complied by PMO once clearance of the IEE is received from ADB.
		To be complied	Relevant information available to stakeholders and affected people in language and form they understand.	To be complied by PMO once clearance of the IEE is received from ADB.
14.	Mobilized PMO Environment Specialist	**Yes**	**No**	This is also confirmed in the SEMR for January – June 2019.
		X		
15.	Mobilized RPMO Environment Specialist	**Yes**	**No**	This is also confirmed in the SEMR for January – June 2019.
		X		
16.	Mobilized PMQAC / DRTAC Environment Specialists	**Yes**	**No**	This is also confirmed in the SEMR for January – June 2019.
		X		
17.	Mobilized DSMC/RDMSC Environment Specialists	**Yes**	**No**	This is also confirmed in the SEMR for January – June 2019.
		X		
18.	Confirm bid and contract documents	**Yes**	**No**	
		X		Section VIII explains

	Activity	Status		Detailed Comments and Further Actions Required
	and/or EMP include requirement for the contractor to appoint EHS supervisor and/or nodal person for environment safeguards			this role and responsibility of the contractor.
19.	If contract awarded already, confirm contractor's appointment of EHS supervisor and/or nodal person for environmental safeguards	**Yes**	**No**	
		X		Section VIII explains this role and responsibility of the contractor.
20.	Awareness training on compliance to safeguard requirements	**Yes**	**No**	Section VIII discusses the institutional capacity development program, schedule, and topics for the subproject, which DRTAC-ESS will supervise for the entire UWSSP.
		X		
21.	Monitoring and Reporting	**Yes**	**No**	
		X		Section X clarifies the monitoring and reporting roles of stakeholders.
22.	**Others/Remarks**	The IEE report already provides compliance matrix on the specific requirements in the EARF. Accordingly, all subproject selection criteria in EARF has been complied with.		
	Prepared by: *(name, designation and date)*	Miguel B. Diangan, Jr. Safeguards Specialist (Consultant), SAUW 24 October 2019		
	Noted and Checked By: *(name, designation and date)*	Ninette Pajarillaga Environment Specialist, SAUW 24 October 2019		
	Documents/References:	1. Final IEE of Liwang Subproject 2. EARF of UWSSP.		