Initial Environmental Examination

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NEP: Urban Water Supply and Sanitation (Sector) Project

Package No. W10 (Pragatinagar Urban Water Supply and Sanitation Project Pragatinagar, Dang District)

Prepared by Ministry of Water Supply, Government of Nepal for the Asian Development Bank.

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

Pragatinagar Urban Water Supply and Sanitation Project

Pragatinagar, Dang 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
DTW	Design Tube Well
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
UWSSSP	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
m^3	cubic meter/s
amsl	above mean 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 subproject 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.

Pragatinagar Urban Water Supply and Sanitation Project is located in Rapti Rural Municipality of Dang district in Province 5 of Nepal. The location of the subproject area is $27^0$51'54" North Latitude and $82^0$39'14" East Longitude. The is formed by merging Sisahaniya VDC, Lalmatiya VDC and wards 1 and 2 of Hansipur VDC. It surrounded by Arghakhanchi district in the East, Bangachuli Rural Municipality in the North, Lamahi Municipality in the West and Gadhawa Rural Municipality in the South.

The service area of the proposed subproject covers ward numbers 5, 7 & 8 of Rapti Rural Municipality. The existing water supply scheme covers parts of the municipality core, which supplies water through around 2,406 house connections. However, coverage is less than 50 % of the total population of the proposed subproject area. The distribution system is very unsystematic as water is supplied 24 hours a day except during dry season. In dry season of months, water is supplied 2 hours in the morning and 2 hours in the evening.

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. Regarding the perception of beneficiaries toward water quality, 12.8 percent of the respondents replied the quality of supplied water is unsatisfactory. In general, the overall sanitation condition of the subproject area was observed satisfactory. Most of the households in the market area have permanent type of private latrine and few of them have temporary type of private latrine. It was reported that all the colleges/schools, hospital and government offices have toilets. The overall basic sanitation situation of the subproject area is satisfactory.

Although, the economy of the area is gradually shifting from rural agricultural economy to trade/ business and service based, majority of the households are still dependent on agriculture. As the socio-economic data shows, nearly 49.4 percent of the households have agriculture as main occupation in service area followed by 30 percent in service and 15 percent in wage work.

Subproject Selection. The selection of Pragatinagar 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 Pragatinagar Urban Water Supply and Sanitation Subproject with these criteria has been confirmed prior to the conduct of initial environmental examination.

Categorization: Pragatinagar 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 Environmental 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 5, 7 & 8 of Pragatinagar, Dang. Investments under this subproject include intakes, storage tanks, valve chambers, transmission mains with distribution lines, 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.

Description of the Environment: The subproject components are located in Pragatinagar, Rapti Rural Municipality. The subproject components will be located in WUSC sites, public road right-of-way (ROW). There are no protected areas, wetlands, mangroves, or estuaries in or near the subproject locations.

Environment Management Plan: 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 1,500,000.

Locations and siting of the proposed infrastructure were considered to further reduce impacts. The concepts considered in design of subproject are: i) demand for new piped water supply; ii) maximum population coverage mostly in residential areas and areas of high growth rate; iii) avoidance of water-use conflicts, iv) locating pipelines within ROWs to reduce acquisition of land; v) locating pipelines at least 10 meters away from latrines, septic tanks and main drains to avoid contamination; vi) locating sources at least 30 m upstream from sanitation facilities, vii) locating household and public latrines and septic tanks at least 30 meters downstream from the nearest drinking water source; viii) piloting controlled disposal of septage in accordance to WHO standards to reduce the likelihood of uncontrolled disposal as currently practiced; ix) ensuring all planning and design interventions and decisions are made in consultation with local communities and reflecting inputs from public consultation and disclosure for site selection.

During the construction phase, impacts mainly arise from the need to dispose of moderate quantities of waste soil; and from the disturbance of residents, businesses, and traffic. These are common impacts of construction in urban areas, and there are well developed methods for their mitigation. These are common temporary impacts of construction and will be minimized by using best construction methods. Traffic management will be necessary during pipe laying on busy roads.

During operation, the delivery of unsafe water is a crucial concern that can be mitigated with good operation and maintenance, prompt action on leaks and quality monitoring of supplied water. The operation and maintenance will be carried out timely during this phase.

The Mitigation measures have been proposed for adverse environmental impacts. The IEE will suggest mitigation of adverse impacts during construction phase and operation phases.

To ensure that the recommended mitigation and monitoring actions are duly implemented, monitored, assessed, evaluated and disseminated to the stakeholders for feedback and

improvement, the Project's Environmental Management Office will be established and manned by the qualified environmental experts, whose sole responsibility will be to monitor the implementation of the environmental mitigation measures and direct project supervising engineers through project management office for needed action and coordination.

Consultation, Disclosure, and Grievance Redress Mechanism: Public consultations were done in the preparation of the subproject and IEE. On-going consultations will be carried throughout the subproject implementation period. A grievance redress mechanism is described to ensure any public grievances are addressed quickly.

Monitoring and Reporting: The PMO, RPMO and DSMC will be responsible for environmental monitoring. The RPMO with support from DSMC will submit monthly monitoring reports to PMO. The PMO will consolidate the monthly reports and will send semi-annual monitoring reports to ADB. ADB will post the environmental monitoring reports in its website.

Conclusions and Recommendations: Pragatinagar Urban Water Supply and Sanitation Project will bring a series of benefits to the local people. However, there are some risks in the commencement of the subproject on time and sustainability of the subproject which requires to be identified and measures taken to mitigate them. But the analysis shows that subproject benefits outweigh the risks and these potential risks can be overcome through proper planning, coordination and management. Therefore, the proposed subproject is unlikely to cause significant adverse impacts. Based on the findings of IEE, there are no significant adverse impacts and the classification of the subproject as Category B for environment is confirmed. No further special study or detailed Environmental Impact Assessment (EIA) needs to be undertaken.

I. INTRODUCTION

A. Background

1. The Urban Water Supply and Sanitation (Sector) Project (UWSSSP) 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 Management (DWSSM) 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 DWSSM 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 DWSSM 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. UWSSSP 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 Management (DWSSM) 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

[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.

and monitoring of UWSSSP. There are Regional PMOs (RPMOs) to manage day-to-day project implementation at the subproject/municipality levels. After construction including a one-year 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, UWSSSP 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] UWSSSP will have the following outcome: inclusive and sustainable access to water supply and sanitation services in project municipalities improved.[10] UWSSSP 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 ground water sources close to proposed water source sites, 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. 101 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. 102 IBAT in Annex 4 REA Checklist in

[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)
			Annex 1 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 11
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	This is deep-boring source hence will not have downstream water user issue
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 technical 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 sites are not in the flood plains
13.	Proposed location of any WTP is at least 50 m away from any premises used by people (house,	Complied	Additionally, the WTP Units are

[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)
	shops) to avoid noise impact.		compact units
14.	Proposed location of any WTP will be fenced or have security provided to them.	Complied	???
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	These considerations have been made
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 Rural 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 in detailed design
26.	An O&M plan is developed providing details on the	Complied	An O&M plan will be

Subproject Selection Criteria in EARF		Status of Compliance (Complied / Not Complied / Not Applicable	Remarks (Provide basis of compliance)
	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.		finalized after the construction works have been completed; Water Safety Plan will also be prepared at 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 subproject

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 subproject 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 Environmental 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 subproject on the physical, biological and socio-economical resources in the subproject area;
(ii) To suggest enhancement measures to augment the benefits of the subproject, & 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 subproject 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 5, 7 and 8 of Rapti Rural Municipality of Dang district. The proposed subproject shall be run from underground water sources to benefit a design population of 11, 418 (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 Schedule 1; Clause H	Conditions in the Subproject
10	Supply of water to a population of	5,000 to 50,000	The design population is 33,719 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 defines that each person shall have the right to live in a healthy and clean environment (Clause 1 of Article 30). The victim of environmental pollution and degradation shall have the right to be compensated by the pollutant as provided for by law (Clause 2 of Article 30). 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. Proceeding from, and conformable to, the Constitution, the Government of Nepal has passed a series of environmental laws, policies and implementing regulations and standards.

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), 2054 B.S. (1997 A.D), requires a proponent to undertake IEE or EIA of the proposed subproject and have the IEE or EIA report approved by the concerned sector agency or ministry of 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 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, 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 require IEE and EIA, respectively.

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

Act/ Rule Policy/ Law/Guideline	Year	Relevant Provisions	Remarks
Labor Act	2048 B.S. (1992 A.D.)	The Act emphasizes on occupational health and safety of workers and stipulates provision of necessary safety gears and adopting necessary precautionary measures against potentially hazardous machine/equipment in the workplace. 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.	The bidding document (Section 6, para 4.1.2) 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 the construction works.
Water Resources Act	2049 B.S. (1992 A.D.)	A comprehensive law on the development, use and conservation of water resources in Nepal, it aims to minimize damage to water bodies by requiring 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. Unidentified sites for some of the subproject components will be acquired accordingly. These are discussed in full in the Resettlement Plan.
		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,	The EMP provides measures to comply with the relevant environmental quality standards

Act/ Rule Policy/ Law/Guideline	Year	Relevant Provisions	Remarks
		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.	and national drinking water quality standards.
Forest Act	2049 B.S. (1993 A.D.)	The Act prohibits the extraction of boulders, 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.	Based on preliminary 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. As per IEE study, tree cutting is not required EMP stipulates no illegal quarrying of natural aggregate materials.
National Environmental Policy and Action Plan (NEPAP)	2049 B.S. (1993 A.D.)	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.
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 subprojects. EMP provides the responsibilities of LGs in EMP implementation.
Child Labor Prohibition and Regulation Act	2056 B.S. (2001 A.D.)	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 section 4 states “Child not to be engaged in work against his will by temptation or fear or pressure or by any other means”.	The bidding document (Section 6, para. 4.1.2) 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,

Act/ Rule Policy/ Law/Guideline	Year	Relevant Provisions	Remarks
			elimination of forced labor and disseminate information on sexually transmitted diseases including HIV/AIDS to employees and local communities.
Implementation Directives for the National Drinking Water Quality Standards	2062 B.S. (2005 A.D.)	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.
Updated 15-Yr Development Plan for Small Towns Water Supply and Sanitation Sector	2067 B.S. (2009 A.D.)	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.
Solid Waste Management Act	2068 B.S. (2011 A.D.)	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.	EMP prescribes eco-friendly management of solid and hazardous wastes.

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 UWSSSP.

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.[15]

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 rationale for selecting the particular alternative proposed. Also consider the no project alternative.	Analysis of alternatives is presented in Section VII.
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 IX
Carry out meaningful consultation with affected people	Key informant and random interviews have been

[15] 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
& 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.	conducted. A grievance redress mechanism for the resolution of valid subproject-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 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.	This requirement is also applicable to the sub-project in the aspect of pollution management, and waste management, e.g., effluent from 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	The Subproject will not affect any physical

SPS 2009 - Safeguard Requirements	Remarks
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.	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 concerned RPMO 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

L. Relevant Environmental Quality 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
Emission standard for diesel generator discharge to ambient Air	Emission standard for diesel generator	EPR-15, 1997
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. In order to meet the objectives of the IEE study a systematic and integrated methodology was followed in accordance with the legal requirements of GoN. The IEE study was conducted as per provisions of the Environment Protection Rules (1997) following the provision of Rules 5, 7, 10 & 11 in compliance with the schedule 1, 3 & 5. The basic methodology as per EPR includes review of literature for preparation of IEE, ToR preparation and approval from the concerned ministry, followed by a 15-days public notification & collection of suggestions from the subproject stakeholders and collection of information related to physical, biological socio-economic & cultural environment (Rule 5 of EPR) using various applicable survey tools. The principal steps undertaken in the IEE methodology to accomplish the assignment are briefly discussed below.

A. Literature review

31. Available primary and secondary literature in the form of reports and maps; topographic maps, land use maps, aerial photographs, cadastral survey maps etc were collected and reviewed. Feasibility studies of the subproject conducted at various times were the key documents collected and reviewed to determine the nature and scope of activities of the subproject that influences the environmental conditions of the proposal area. Similarly, published and unpublished reports pertaining to environmental standards, acts, regulations etc were collected and reviewed. Published and unpublished literatures of the subproject area pertaining to biological, social, chemical, physical, and cultural environments were collected from various sources and reviewed to get information on the coverage of the studies and fulfill the data gaps.

B. Field Study

32. Field studies were conducted in subproject site areas in an extensive manner by a multidisciplinary team, which comprised of an environmentalist, biologist, socio-economist, and civil engineer. During the visits, baseline information on physical and cultural, chemical, biological, and social conditions of the subproject direct and indirect impact areas was collected using checklists (Annex 9). The paragraphs below present briefly the various approaches and methodological tools used during the field exploration;

Study of Physical Environment

33. An extensive Physical Environment survey was carried out by delineating the subproject impact area to collect the baseline information on physical environment. Topographic and geomorphic features were observed and documented. Physical features such as topography, climate & meteorology, air quality, erosion and land stability & land use pattern were observed and recorded. Similarly, data on rainfall and other meteorological conditions were collected.

Study of Biological Environment

34. The vegetation survey was carried out by walkover survey throughout the subproject direct impact areas. Type of vegetation and forest were identified based on the species composition. Biodiversity values of the indirect impact area were estimated as low, moderate, and high applying standard tools. Ethno-botanical information was obtained. The protected vegetation (rare, endangered, indigenous etc.) of the influence area as per IUCN Red Book, CITES Appendices, and GoN list species were enumerated based on consultation with the local people in the direct impact areas of the subproject.

35. Wildlife biodiversity in the indirect impact areas was studied in the field interacting with local people (for habitat continuity) methods to identify linkages between wildlife habitats and proposal activities. The indicator wildlife and threatened or endangered species (as per IUCN Red Book, CITES Appendices, and GoN list) in the area were discussed with the local communities.

Study of Socio-Economic and Cultural Environment

36. Household survey with questionnaires was conducted by interviewing to obtain information on socio-economic and cultural environment like demography, ethnicity, education, health, and sanitation, drinking water condition of the subproject area, irrigation facility, local traditions, religion, land holding pattern, income and expenditure and to acquire their perception towards proposed subproject, etc. The survey covered 100% of the total HHs whereas only 10% of the total HHs was survived in detail for socio-economic study.

37. Consultations were held to interact with local people and stakeholders in order to collect information on migratory pattern of local people, settlements, agriculture, information on subproject affected families (PAFs, families whose land or property falls under subprojects area), land transaction and to obtain suggestions and comments from all relevant stakeholders through. Direct observation (walkover survey) was done to collect information on the cultural sites, and public institutions such as temples, cremation grounds, and festival sites, historical and archaeological sites, school, and health post within the direct subproject affected areas. Consultation with village elites and key person interviews were conducted to assess the current situation of these facilities and the general water/sanitation status of the communities of the subproject area.

C. Stakeholder Consultations

38. Stakeholder consultations were conducted by WRDSMC during July - August 2018. The positive response and interactive presence of local stakeholders made the public consultation more fruitful. Section VII discusses the details.

D. Data Processing and Impact Identification, Prediction & Evaluation Methods

39. The environmental impacts, both beneficial and adverse, were elaborately identified, predicted and evaluated to the extent possible, for both construction and operational stages. Each impact identified, predicted and evaluated by using standard methods and techniques on physical, biological, socio-economic and cultural aspects. The impacts were studied in terms of their nature, magnitude, extent and duration. National EIA Guidelines 1993 was used for the reference for the impact identification, prediction and evaluation. Magnitudes of the impacts are classified into High (H), Medium (M) and Low (L), and extent of the impacts classified in terms of Site Specific (SS), Local (L), and Regional (R). Similarly, the duration of impacts is classified into Short Term, Medium term and Long term.

5. Scoring of Impacts

40. Nature of Impact: D = Direct; IN = Indirect; Magnitude, H = High (60); M = Medium/Moderate (20) ; and L = Low (10), Extent, R = Regional (60), L = Local (20); and S = Site-specific (10), Duration, LT = Long-term (20), MT = Medium-term (10); and ST = Short-term (5) ,The points/scoring are taken from the National EIA Guidelines, 1993. Significance of Impact rated if total score: More than 75: Very Significant, 45-75: Significant, Less than 45: Insignificant.

E. Preparation of IEE report

41. 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.

F. Team Members for IEE Study

42. The following experts were mobilized to complete the IEE study of Pragatinagar 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	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 and Need of the Sub-Project

43. The proposed "Pragatinagar Urban Water Supply & Sanitation Project" is a ground water-based water supply system project covering wards 5, 7 & 8 of Rapti Rural Municipality. The subproject comprises of two major components – water supply and sanitation.

44. The water supply part comprises of a ground (pumping) scheme. Intakes and 3 new reservoirs have been proposed: 2 overhead tanks and a ground tank for storage of water. All source type mentioned above is ground water.

45. The present water supply and sanitation situation is satisfactory. Though, Dhaberi schemes serves through 17 public taps and Singe scheme serves through 14 public taps, yet no private tap connection in households existed. These public taps cover only 5 percent households of the total beneficiary households of the service area. Groundwater is extensively used in Pragatinagar town for irrigation and drinking purpose. The existing water consumption scenario indicates that on average 46 and 43 liter per capita per day of water being consumed in rainy and dry season respectively. Furthermore, about 77.9 percent beneficiaries feel the quality of supplied water to be satisfactory or moderate and only 9.3 percent of them feel highly satisfactory.

46. 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. The current demand is partially fulfilled by existing water supply systems with supply of water for 2 hours in the morning and 2 hours in the evening during dry season for 4 months in a year and 24 hours supply for rest of months. In order to serve large amount of service areas of Pragatinagar town, it will be required to formulate new schemes with higher source yields to meet the demand.

B. The Sub-Project

47. The Pragatinagar Urban Water Supply and Sanitation Sub-project have been designed as piped based water supply system that will provide sufficient quantity and good quality of water to the residents of Pragatinagar town. The water supply component of the subproject consists of following construction components;

Table IV-1-A: Subproject Components Based on Bidding Documents

	Components	Nos.	Description (Volume / Capacity / Footprint Area / Length)
1.	New Tube wells	4	100 to 150 m depth
2.	Service Reservoirs (OHT/ RVT, Valve Chambers and surface valve box, etc.)	3 nos.	850 cu. m.
	Treatment facility subcomponents:		
3.	Aerators	4 nos.	1.5 m - 1.8 m diameter
4.	Pressure Filters	8 nos.	1.7 m - 2.0 m diameter
5.	Disinfection Units	4 nos.	Mixing tank - 1000L Dosing tank - 250 L
6.	Water Quality Testing Laboratory	1 no.	24 sq. m.
7.	Distribution Network.	1 network	66.093 km.
8.	Transmission Mains.	1 network	2.474 km.

9.	Pumps (including related accessories, electrical panels, generators, etc.)	4 nos. (4 standby)	30 kw
10.	Fire Hydrants	8 nos.	For base year
11.	House Connections.	2,406	For base year
12.	11 KV transmission lines	1 network	1.6 km
13.	Electrical Transformers	2 nos.	1 of 100 KVA 1 of 200 KVA
14.	Office Building	1 no.	255 sq. m.
15.	Guard House	2 nos.	35 sq. m. each
16.	Generator House	2 no.	30 sq. m. each
17.	Standby Electrical Generator	2 nos.	1 of 125 KVA 1 of 250 KVA
18.	Public Toilets	1 no.	41 sq. m.

48. Only one public toilet was observed in Pragatinagar near Shankar Secondary School, Pipari. The subproject will include sanitation component with the construction of one public toilet. The WUSC will take responsibility of operation of the public toilet in coordination with the municipality if municipality requires it so.

1. Salient Features of the Project

49. The salient features of the subproject are given in table below;

Table IV-1-B: Salient Features of the Project

SN	Items	Description
1	**Name of the Project**	Urban Water Supply and Sanitation (Sector) Project, Pragatinagar, Dang
2	**Type**	Ground (Pumping) scheme
3	**Study Level**	Detailed Engineering Design Report
4	**Location Area**	
	Province	Number 5
	Zone	Rapti
	District	Dang
	VDC/Municipality	Rapti Rural Municipality
	Wards	Parts of Ward No. 5, 7 and 8
5	**Available Facilities**	
	Road	East West Highway
	Nearest Airport	Nepalgunj (nearly 150 Km)
	Existing Water Supply System	Partially covered by piped water supply system; Spring sources are used
	Electricity	Available
	Communication	Available
	Health Services	Available
	Banking Facilities	Available
	Ghorahi- Pragatinagar distance	36 km
6	**Source Characteristics**	
	Source Name	Deep Tube Well
	Source Type	Groundwater
	Source Location	Kalapani in Ward # 5 and Pipari in Ward # 8, Rapti Rural Municipality

SN	Items	Description
	Proposed Tapping yield (lps)	Kalapani DTW :16.57 lps (Pumping) Pipari DTW :3 x 14,95 lps (Pumping)
7	**Project Components**	
	New Tube wells	4
	Service Reservoirs (OHT/ RVT)	RCC Overhead Tank 200 Cum : 1 # (Proposed) RCC Overhead Tank 450 Cum : 1 # (Proposed) RCC Ground Tank 200 Cum : 1 # (Proposed) Total 850 Cum
	Valve Chambers and surface valve box, etc.	Type I (1500x900x1000) : 7 #
		Type 2 (900 x900x1000) : 119 #
		Pipe Valves (125mm dia) : 40 #
	Treatment facility subcomponents:	
	Aerators	4
	Pressure Filters	8
	Disinfection Units	4
	Water Quality Lab	1 no. (1 Room)
	Distribution Network.	66.093 km
	Transmission Mains.	2.474 km
	Pumps (including related accessories, electrical panels, generators, etc.)	4 Nos.; (and 4 standby)
	Fire Hydrants	8 nos.
	House Connections.	2,406 for base year
	11 KV transmission lines	1.6 km.
	Electrical Transformers	2 nos. (1 of 100 KVA, and 1 of 200 KVA)
	Office Building	1 no. with footprint of 255 sq. m.
	Guard House	2 nos. with footprint of 35 sq. m. each
	Generator House	2 nos. with footprint of 30 sq. m. each
	Standby Electrical Generator	1 of 125 KVA; 1 of 250 KVA
	Public Toilets	1 no. (41 sq. m.)
8	**Social Status**	
	Survey Year Population (2017)	11,908 (permanent), 135 (floating); [Total 12,043]
	Base Year Population (2019)	13,037 (permanent), 145 (floating); [Total 13,182]
	Design Year Population (2039)	33,394 (permanent), 325 (floating); [Total 33,719]
	Adopted Annual Growth Rate %	4.79 (Average)
	Household Numbers (2017)	2,156
	Average Family Sizes	5.52
9	**Total Water Demand**	
	Base year 2019 (m^3/day)	**Total 1,396.25**
	Design year 2039 (m^3/day)	**Total 3,978.46**
10	**Total Cost of the Project (NRs.)**	**415.471million** with 15% contingencies & 13%VAT
	Water Supply Sector	NRs. 408.522 million
	Sanitation Sector	NRs. 6.949 million
11	**Per capita Investment (for water supply sector)**	**Base Year** : NRs. 31,518.07 **Design Year** : NRs. 12,321.57

2. Subproject Sub-Systems and its Components

50. Pragatinagar Urban Water Supply and Sanitation Project is a piped water supply system using ground water as sources. Thus, considering the topography, landuse, settlement pattern and use of existing facilities; two (2) water supply sub-systems based on decentralized distribution system are proposed and are briefly described below;

51. **Kalapani System:** This is a pumping system. This system is proposed to serve northern part of Dolai River in Kohalwa-Jutpani, Kalapani, Singe, Paharwaha and Lathuwa areas of wards 5 and 8 of Rapti Rural Municipality. This system is designed to cater 9,442 permanent and 69 rented (total 9,511) population. The groundwater will be extracted through a tube well as water source. The water is pumped from tube well to the 200 Cum overhead RCC reservoir. The water from the overhead reservoir is supplied to the service areas through gravity.

52. **Pipari System:** This is a pumping system. This system is proposed to serve southern part of Dolai River in Bijauri, Baraki-Sisaniya, Jitpur. Pipara, Pipari, Pragatinagar and Kamal Road areas of wards 5, 7 and 8 of Rapti Rural Municipality. This system is designed to cater 23,952 permanent and 256 rented (total 24,208) population. The groundwater will be extracted through a tube well as water source. The water is pumped from tube well to the 170 Cum ground RCC reservoir. The water from the ground reservoir is pumped to the 450 Cum overhead RCC reservoir so that sufficient head is available at the consumers' area. The water from the overhead reservoir is supplied to the service areas through gravity.

53. The subsystem-wise population and its projects are provided in the table below;

Table IV-2: Subsystem-wise Population Projection

Distribution System	Survey Year (2017)			Base Year (2019)			Design Year (2039)		Total
	Population			Population			Population		
	Own House	Floating	Total	Own House	Floating	Total	Own House	Floating	
Kalapani	4214	34	4248	4526	36	4562	9442	69	9511
Pipari	7694	101	7795	8511	109	8620	23952	256	24208
Total	**11908**	**135**	**12043**	**13037**	**145**	**13182**	**33394**	**325**	**33719**

3. Water Source

54. The existing and proposed water sources in the subproject area are enumerated below. Only the proposed DTW sources in Kalapani and Pipari will be utilized under the subproject.

(i) Kalapani which serves ward 5; DTW: 16.57 lps (proposed)
(ii) Pipari which serves ward 8; DTW: 3×14.95 lps (proposed)

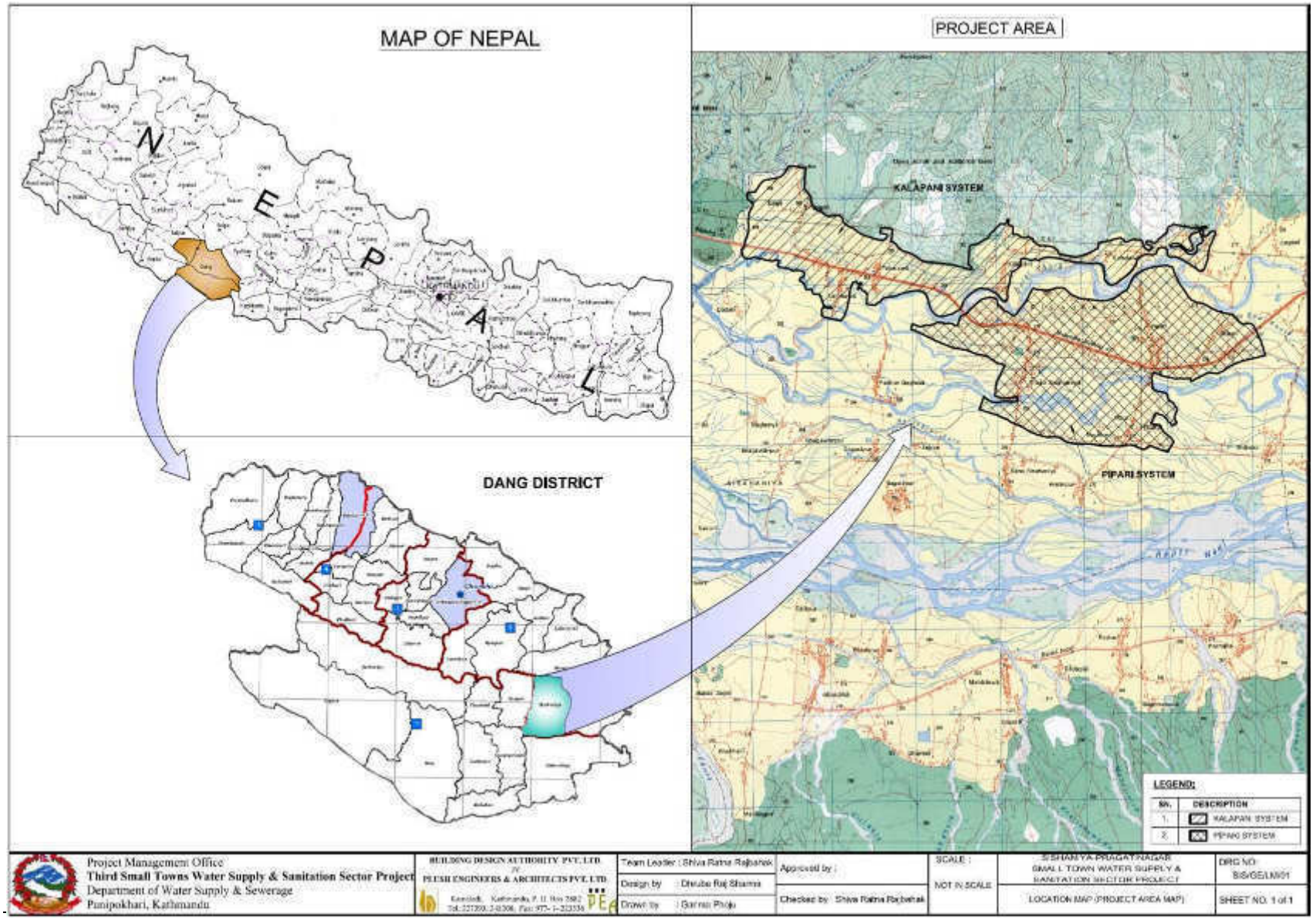


Figure IV-1: Location Map of the Project Area

55. Dolai River which flows through the subproject area form north-east to south-west (with discharge of 75 lps as measured in August 2015) could be one of the water sources for the proposed system. Although this river is perennial, the flow in the river decreases considerably during dry season will be able to meet the demand of the service areas. Besides, the quality of water deteriorates considerably during rainy season thus by requiring extensive water treatment.

4. Water Quality Assessment

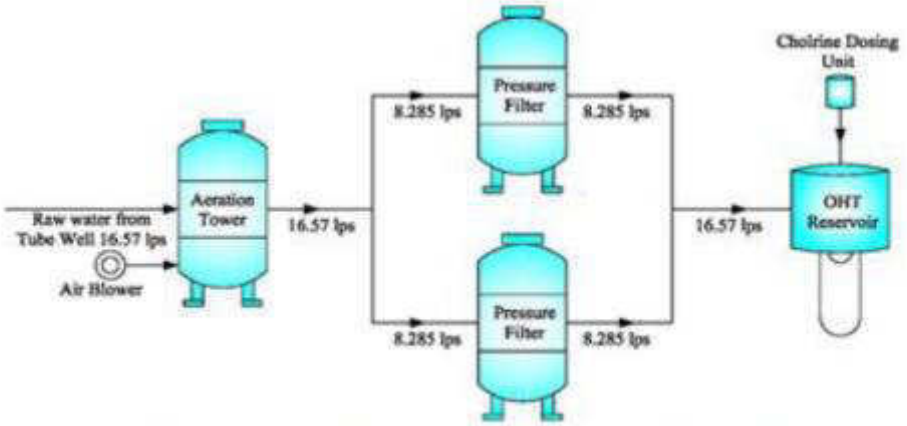
56. The Nepal Environmental and Scientific Services (NESS) Laboratory was used to conduct chemical, bacteriological and physical tests of the proposed surface water. Samples from underground source from existing tubewell in Sisahniya were collected on September 2017 and February 2018 for conducting laboratory analysis to test for other physical and chemical parameters with respect to the Nepal Drinking Water Quality Standard (NDWQS) guidelines for potable drinking water. The following table exhibits the finding with respect to the NDWQS.

Table IV-3: Water Quality Assessment

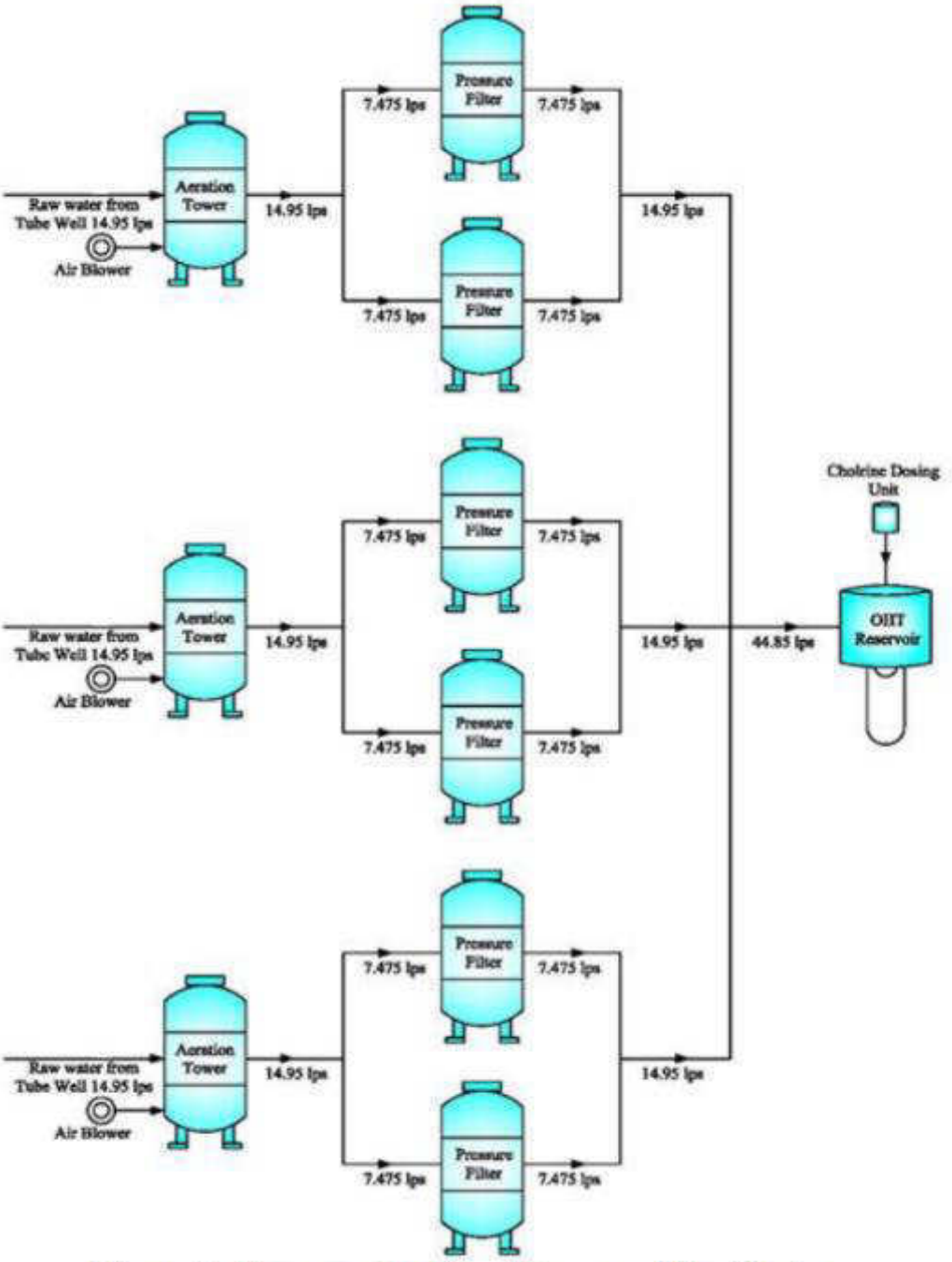
SN	Parameters	Units	Test methods	Observed Values		NDWQS, Nepal
				Sept 2017	Feb 2018	
1	pH at 27°C		Electromeric, 4500 – H^+ B, : APHA	7.1	7.8	6.5 – 8.5
2	Electrical Conductivity	µS/cm	Conductivity Meter, 2510 B, APHA	510	357	1500
3	Turbidity	NTU	Nephelometric, 2130 B, APHA	<1	2	5
4	Total Hardness as $CaCO_3$	mg/l	EDTA Titrimetric, 2340 C, APHA	271	212	500
5	Total Alkalinity as $CaCO_3$	mg/l	Titrimetric, 2320 B,APHA	295	223	-
6	Chloride	mg/l	Argentometric Titration, 4500 – Cl^- B, APHA	2.98	4.93	250
7	Ammonia	mg/l	Direct Nesslerization, 4500 – NH_3C APHA	0.17	0.05	1.5
8	Nitrate	mg/l	UV Spectrophotometric Screening, 4500 –No_3 B, APHA	4.58	4.93	50
9	Nitrate	mg/l	NEDA, Colorimetric, 4500 – NO_2^- B, APHA	<0.02	0.05	-
10	Calcium	mg/l	EDTA Titrimetric, 3500 –Ca B &3500 –Mg B APHA	85.77	60.92	200
11	Magnesium	mg/l		14.10	14.58	-
12	Arsenic	mg/l	SDDC, 3500 - As, C: APHA	N.D. (<0.01)	N.D. (<0.01)	0.05
13	Iron	mg/l	Direct Air – Acetylene AAS, 3111 B, APHA	0.07	N.D. (<0.05)	0.3
14	Manganese	mg/l		N.D. (<0.02)	N.D. (<0.02)	0.2

5. Treatment Process

57. The water treatment process has been selected based on the raw water quality. The proposed treatment process aims to remove the high concentrations of iron and 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 lime dosing, aeration towers, pressure filters and disinfection with associated accessories likes air blowers/compressors, valves and pipes. The schematic diagrams of the proposed treatment plant are shown in the figures below;



Schematic Diagram of Treatment Process – Kalapani System



Schematic Diagram of Treatment Process – Pipari System

Figure IV-2: Schematic Diagram of Treatment Process

58. The treatment process consists of various steps of treatments which are described below.

59. **Aeration Tower.** Aeration tower made of mild steel is proposed to precipitate out dissolved iron. The tower is packed with pall rings. The raw water is applied at the top of aeration tower flowing downward while air is blown from the bottom of the aeration tower flowing in upward direction. The intermixing of air and water will increase the dissolved oxygen in water required to precipitate out dissolved iron and manganese. Air blower/compressor is proposed to supply the air. The air to water ratio of 1 is to be maintained for effective precipitation of iron and manganese. The excessive air is released through air valves provided at the top of the tower.

60. **Pressure Filters.** Pressure filters made of mild steel is proposed to remove 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.

61. **Disinfection.** 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

62. The transmission main conveys the water from the tube well to overhead service reservoirs. Since the water is conveyed by pumping it is also known as pumping main. Pipe sizes are so selected that velocity of water within the pipes remain within the range of 0.5 m/s to 1.5 m/s. DI pipes are proposed to use in both the systems. The water is pumped from the tube well with sufficient head so that the water passes through the water treatment plant and delivers it into the ground reservoir/sump well. The water is then pumped again from ground reservoir/sump well to overhead reservoir. The total transmission main pipe length of the proposed systems is 2.474 km. Thrust blocks are also provided to restrain the pumping mains in both the systems.

Table IV-4: Transmission/ Pumping Main

SN	Systems	Length of Pipes (m)
1	Kalapani	705
2	Pipari	1769
Total		2474

7. Service Reservoirs

63. The service reservoir is required to store the water to meet the hourly fluctuation of consumers' water demand. This allows the peak flow in the distribution network. The total storage requirement for the system at the end of design period i.e. 2039 is calculated as 850 Cum. Existing reservoirs made of ferrocement are very small in capacity and have not been utilized in the proposed system.

64. The reservoirs will be constructed of RCC and is designed as overhead tank as the terrain suggests. However, a ground-based reservoir of 200 Cum capacity has provided prior to the overhead reservoir in Pipari system so that the capacity of the overhead reservoir can be optimized. The following table summarizes the requirement of reservoir tanks for the various systems.

Table IV-5: Requirement of Reservoir

SN	Systems	Reservoir Size (Cum)	Type	Remarks
1	Kalapani	200	RCC – OHT	Proposed
2	Pipari	450	RCC – OHT	Proposed
		200	RCC – Ground	Proposed
Total		850		

8. Distribution Network

65. The distribution system comprises of pipe network, which consists of mainly loops and branch. The water is supplied from the service reservoir to the consumers by the distribution pipe network. This network is analyzed using EPANET 2, a design analytical software tool. Distribution pipes are laid both sides of the all metalled and major roads. Single line pipes are proposed in earthen and other roads. HDPE pipes are predominantly used. Pipe of class and size lesser than 6 kgf and 50 mm is not proposed. Existing pipes will not be used as these are leaking and found substandard (class of 4 kgf). The length of the distribution network pipes proposed for various systems is shown in the table below. The total distribution pipe length of the proposed systems is 66.093 km.

Table IV-6: Distribution Pipe Network

SN	Systems	Length of Pipes (m)
1	Kalapani	29637
2	Pipari	36456
Total		**66093**

66. Type of pump selected is submersible motor pump which will be installed in a mild steel housing pipe of appropriate diameter. The pump housing pipe itself will be fixed in the tube well. Pump shall be operated semi automatically. Provisions for the protection of pump motor against over loading, dry running and single phasing will be made by selecting appropriate motor and control panel.

67. One pump for normal use and one for standby with full capacity pumping rate may be installed in each station. Following power ratings are calculated in pumping stations.

Table IV-7: Power Rating of Pumps

SN	Descriptions	Unit	Kalapani System		Pipari System	
			DTW to Sump Well	Sump Well to OHT	DTW to GR	GR to OHT
1	Discharge	Lps	17.67	17.67	52.84	52.84
2	Number of operating pumps	No.	1	1	2	1
3	Number of standby pumps	No.	1	1	1	1

SN	Descriptions	Unit	Kalapani System		Pipari System	
			DTW to Sump Well	Sump Well to OHT	DTW to GR	GR to OHT
4	Idle power of pump	KW	20.797	5.721	32.311	14.535
5	Efficiency of pump	%	60	60	60	60
6	Actual power of pump	KW	34.662	9.535	53.852	24.225
7	Factor of safety	%	12	12	12	12
8	Designed power of pump	KW	38.821	10.679	60.314	27.132
9	Designed power of pump, say	KW	40	12	60	30

68. Pumping hours of deep tube wells have been calculated and presented in the table below:

Table IV-8: Pumping Hours of Tube Wells

SN	Description	Year					
		2017	2019	2024	2029	2034	2039
Kalapani System							
1	Water demand (m^3/d)	435.4	468	578.5	719.61	915	1144.6
2	Pumping rate @ 17.67 lps (m^3/hr)	63.61	63.61	63.61	63.61	63.61	63.61
3	Pumping hours in a day	6.8	7.4	9.1	11.3	14.4	18
Pipari System							
4	Water demand (m^3/d)	853.5	952.3	1293.8	1772.5	2481.3	3423.3
5	Pumping rate @ 52.84 lps (m^3/hr)	190.2	190.2	190.22	190.22	190.22	190.22
6	Pumping hours in a day	4.5	5	6.8	9.3	13	18

9. Electrical Facilities

69. Power for the operation of pumps shall be obtained from nearby 11 KVA line locating about 1500 m away from the boring station for Kalapani system. In case of Pipari system, the power is proposed to be tapped from nearby 11 KVA line locating about 50 m away from the boring station for both proposed tube wells of this system. The total 11 KV power distribution lines required is about 1600 m.

70. Power required for lighting facilities and other uses are also considered. Two 11/0.4 KVA step down transformers of 100 to 200 KVA capacities are proposed to cater the need of the proposed subproject. As the voltage of the electricity line of Nepal Electricity Authority is found fluctuating, stabilizers have also been proposed. Similarly, standby diesel generators are also proposed to be used in case of electricity power failure and load shedding .A three -phase power line shall connect the control panel, which will distribute power to different power load points. Following table summarizes the proposed electrical equipment.

Table IV-9: Transformers and Generator Set

SN	System	Power of Pump (KW)		Building and Peripheral Lighting	Total Power		Transformer	Stabilizer	DG Set
		DTW - SW/GR	SW/GR – OHT	(KW)	(KW)	(KVA)	(KVA)	(KVA)	(KVA)
1	Kalapani	40	12	3	55	68.75	100	100	125
2	Pipari	60	30	3	93	116.25	200	200	250

10. House Connections

71. The system has been designed, predominantly as house to house connections. The system has been analyzed for a design capacity of providing a total of 6981 house connections at the end of design period. However, initially during construction phase, only 2406 house connections are provided to satisfy the need for the base year population**.**

11. Appurtenances

72. These will primarily comprise of valve chambers in flow control valves for controlling flow in the pipeline. Altogether 125 valve chambers and 25 pipe valve boxes 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. Generator/Operator Room

73. Two permanent generator operator houses to accommodate the generators shall be constructed. In case of failure of power supply, the generator shall be used to supply power to the pumps to deliver water. A permanent area to accommodate the pump / plant operator will be provided in this generator house. Accordingly, a guard room is proposed.

13. Office Building/ Laboratory Room

74. There is no office building in the existing system. Thus, new one is proposed to accommodate the required facilities Laboratory room, counters, managers room cannot be accommodated in the present office building. The new will consists of manager's room, cash counters, meeting hall etc. Lab room, store will be placed in the office building.

14. Guard House

75. There is no guard house in the existing systems. Two guard houses are proposed in the Pragatinagar Urban Project, one each for Kalapani System and Pipari system. These guard houses are to be located at the reservoir sites. The guard house is one storey building with a guard room, toilet and bathroom.

15. O&M Equipment and Tools

76. An assessment was done for the needed items. The UWSSSP has also some guidelines on it. Besides the following equipment have been also considered in the subproject so that project works during construction period and for operational activities are effectively carried out.

(i) Leakage detecting equipment- 1 set
(ii) Submersible sludge pump- 1 no
(iii) Electro-fusion machine for joining the HDPE pipes including portable Generator - 1 set
(iv) Water quality testing laboratory equipment - 1 set
(v) Other Tools and Plants like electric pipe cutters, pipe wrenches etc.

C. Magnitude of Operation of the Project

77. The water supply system has been designed for a base year population of 13,427 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 38,834 in 2039.

78. Three number of water reservoir tanks have been proposed at different locations considering in mind the elevation difference of the service area. The capacity of 200Cum & 450Cum overhead tank and 250Cum capacity of ground tank with total 900Cum storage capacity of reservoirs are proposed for the collection and storage of water.

D. Proposed Schedule for Implementation

79. The exact schedule for implementation of the subproject 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 subproject has been assumed as the year 2019 and considering design period as 20 year the design year has been taken as the year 2039.

80. The main task associated with the subproject 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

81. The subproject 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 subproject 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

1. Materials required for the project

82. 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.

2. Human Resources

83. The proposed Pragatinagar 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

84. Pragatinagar town sub-project lies in Rapti Rural Municipality in Dang district of Rapti Zone in province number 5. The subproject town is wards 5, 7 and 8 of Rapti Rural Municipality. Rapti Rural Municipality is formed by merging Sisahaniya VDC, Lalmatiya VDC and wards 1 and 2 of Hansipur VDC. It surrounded by Arghakhanchi district in the East, Bangachuli Rural Municipality in the North, Lamahi Municipality in the West and Gadhawa Rural Municipality in the South. Pragatinagar is one of the emerging towns of Dang district, located at East-West Highway at around 6 kilometers east of Lamahi. Pragatinagar town is located in east of Deukhuri valley in the Terai region bordering India. The location of the subproject area is $27^0$51'54" North Latitude and $82^0$39'14" East Longitude. Pragatinagar town is located about 36km away from Ghorahi, the headquarters of Dang District.

2. Climate, Topography and Geology

85. Pragatinagar town located in Rapti Rural Municipality of Dang district has fervent hot and temperate type of climate. The temperature rises to about 33.9°C in summer while in winter it drops to about 5.4°C. About eighty percent of the total annual rainfall occurs during the monsoon season (June to September).

86. The subproject is located in relatively flat Terai plain. The altitude of the town varies from 210 to 300m above the sea level. Since the topography of the area is almost flat, the large portion of land faces flooding problem during rainy season.

87. Geologically it is situated in the foothill of mid-hill range. The underlain formation of the area consists of cobbles, gravels and sand with pockets of clay. The area is rich in groundwater potential. The shallow as well as deep aquifers are being extracted for drinking and irrigation purposes.

B. Biological Environment

1. Flora in the Project Areas

88. Flora of the subproject area consist of *Calotropis gigantean*, *Woodfordia fruticosa*, *Euphorbia hirta*, *Mimosa rubicaulis*, Adhatoda vasica (*Justicia adhatoda*), *Thespesia lampas*, *Buddleia paniculata*, *Colebrookea oppositifolia*, etc. and herbaceous species like *Eragrostis cyanosuroides*, *Cyperus rotundus*, *Eulaliopsis binnata*, *Achyranthes bidentata*, *Cissampelos pareira*, *Phoenix humilis*, etc. and seedlings of woody species. Invasive species found in the area were *Lantana camara*, *Ipomoea fistulosa*, etc.

2. NTFPs in the Project Areas

89. Non-timber forest products (NTFPs) are defined as any kind of product derived from forest species other than timber and fuelwood. The main NTFP species found in the subproject area are: *Shorea robusta, Dalbergia sisso, Acacia catech, Bamboo species*, etc. Other species are Rice-bean Vigna umbellate, Bombax ceiba, harro (*Termnalia chebula*), barro (*Terminalia*

bellirica), amala (*Emblica officinalis*), kurilo (*Asparagus racemosus*), sikakai (*Acacia concinna*), pipala (*Piper longum*) and sarpagandha (*Rauwolfia serpentine*). Harro (*Termnalia chebula*) and Barro (*Terminalia bellirica*) are endangered species.

3. Fauna of in the Project Areas

90. Crane, White-rumped vultures, *Panther tigris*, *Varanus bengalensis*, Vulture, *Macaca mulatta* (Monkey), *Felis chaus* (Jungle Cat) are the wild animals reported in the proposed road area. Similarly, birds are *Lophura lencomelana* (kalij pheasant), Lophophorus (Danphe*), Columba livia* (Pigion), etc. White-rumped vultures are the endangered species.

91. 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

92. In close periphery of the subproject area, there is no declared protected area.

C. Socio economic and Cultural Environment

1. Demography

93. While carrying out the household survey, the local leaders and beneficiary community provided great assistance to identify the exact service area to be considered in the proposed subproject. During household's survey done by the consultants the households within service area were accounted as 2,156 and permanent population 11,908. The ward numbers and the cluster settlements are presented in table below.

Table V-1: Service Area, HH and population (Survey year, 2017)

Town	Ward No.	HHs	Population		
			Permanent	Rented	Total
Pragatinagar, Rapti Rural Municipality	5	862	4702	103	4805
	7	326	1883	2	1885
	8	968	5323	30	5353
	Total	2156	11908	135	12043

Source: Socio-economic Survey, August 2017

94. Among the total permanent population (11,908) in the service area, 6,038 are male and 5,870 are female. Male population is slightly higher (50.7%) than the female population (49.3%).

Table V-2: Male/female population and Average HH size (Survey year 2017)

Town	Ward No.	HHs	Population			Average HH Size
			Male	Female	Total	
Pragatinagar, Rapti Rural Municipality	5	862	2349	2353	4702	5.5
	7	326	954	929	1883	5.8
	8	968	2735	2588	5323	5.5
	Total	2156	6038	5870	11908	5.5

Source: Socio-economic Survey, August 2017

2. Caste / Ethnicity

95. The proposed subproject 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. Janjati comprises 75.0 percent of total families, Brahmin/Chhetri are the next major group with 19.2 percent, followed by Dalit which constitutes about 4.6 percent.

Table V-3: Caste / Ethnicity

Ethnicity	Rapti Rural Municipality			Total	Percentage
	Ward No.				
	5	7	8		
Brahmin/Chhettri	192	59	163	414	19.2
Janjati	629	253	734	1616	75.0
Dalit	36	10	54	100	4.6
Other	5	4	17	26	1.2
Total	**862**	**326**	**968**	**2156**	**100.0**

Source: Socio-economic Survey, August 2017

3. Educational Status

96. Pragatinagar has 10 educational institutions including schools and colleges. About 92.3 percent people on the subproject area (ward 5, 7 & 8) of Pragatinagar are literate.

Table V-4: Population Distribution by Education Level

Educational Status	Ward No.6		Ward No.7		Ward No.8		Total	
	Pop.	%					Pop.	%
Illiterate	17	6.2	13	13.0	23	7.4	53	7.7
Literate	29	10.6	20	20.0	48	15.4	97	14.2
Primary	51	18.6	22	22.0	64	20.6	137	20.0
Secondary	73	26.6	17	17.0	73	23.5	163	23.8
SLC	47	17.2	3	3.0	57	18.3	107	15.6
IA or equivalent	27	9.9	11	11.0	22	7.1	60	8.8
BA or equivalent	4	1.5	5	5.0	1	0.3	11	1.6
MA or equivalent	1	0.4	3	3.0	1	0.3	5	0.7
Above Master	2	0.7	0	0.0	0	0.0	2	0.3
Total	**249**	100.0	**94**	100.00	**289**	100.00	**633**	100.0

Household Sample Survey, August 2017

4. Occupation

97. Although, the economy of the area is gradually shifting from rural agricultural economy to trade/ business and service based, majority of the households are still dependent on agriculture. As the socio-economic data shows, nearly 49.4 percent of the households have agriculture as

main occupation in service area followed by 30 percent in service and 15 percent in page work. The percent of household by occupation is illustrated in the table below.

Table V-5: Occupation of Households of the Project Area

SN	Occupation	Rapti Rural Municipality			Total	Percent
		Ward Number				
		5	7	8		
1	Agriculture	359	183	522	1064	49.4
2	Business	116	24	74	214	9.9
3	Services	134	21	244	399	18.5
4	Industry	1	1	1	3	0.1
5	Foreign Employment	72	21	47	140	6.5
6	Wages	165	76	76	317	14.7
7	Others	4	0	1	5	0.2
8	Do Nothing	11	0	3	14	0.6
	Total	**862**	**326**	**968**	**2156**	**100**

5. Household's Monthly Income Level

98. Economic condition of the families in service area is satisfactory in terms of their monthly income level. The distribution of households by income range is shown in Table V-6, which indicates that 51.3 percent of them have income range NRs. 2001-50000 per month. Likewise, 26.1 percent of households fall under the income range NRs. 7501-20000 categories. As the data shows 20.8 percent of households have highest income level (more than NRs.50,000 per month), whereas 0.2 percent of the households have lowest income level i.e. less than NRs. 5,000 per month.

Table V-6: Monthly Average Income Range

SN	Income Range (NRs.)	Ward No.			Total	%
		5	7	8		
1	<5000	3		1	4	**0.2**
2	5000-7500	34	1		35	1.6
3	7501-20000	326	13	224	563	26.1
4	20001-50000	398	13	695	1106	51.3
5	>50000	101	299	48	448	20.8
Total		**862**	**326**	**968**	**2156**	**100**

Source: Socio-economic Survey, August 2017

99. Finding of socio-economic census survey depicts that the household average monthly income is NRs. 40,193.88.

6. Existing water supply condition

100. Existing water supply system cover 17 public taps in Kolwaha and Jutpani in ward no. 8 and 14 public taps in Singhe village in ward no. 8. No private taps were seen during the observation. Water is supplied 24 hours a day except during dry season. In dry season of months, water is supplied 2 hours in the morning and 2 hours in the evening.

101. 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.

102. Regarding the perception of beneficiaries toward water quality 77.9 percent of the respondents feel the quality of supplied water is satisfactory or moderate and only 9.3 percent of them feel highly satisfactory, whereas 12.8 percent of the respondents said the water quality is unsatisfactory.

Table V-7: Satisfaction in terms of Water Quality

SN	Water Quality	Ward No			Total	Percent
		5	7	8		
1	Good (high Satisfactory)	9	14	177	200	9.3
2	Satisfactory	821	248	611	1680	77.9
3	Unsatisfactory	32	64	180	276	12.8
Total		**862**	**326**	**968**	**2156**	**100.0**

Source: Socio-economic Survey, August 2017

7. Existing Sanitation Condition

103. In general, the overall sanitation condition of the subproject 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 colleges / schools, hospital and government offices have toilets.

104. Lined drain is observed in limited part of the core bazaar area. No waterlogged area is found as sufficient natural slope exists. The proper management of solid waste by the different agencies has not been developed till now in this town. People were found to manage solid waste in the pits prepared in the backyard of their house.

105. Regarding the drainage facility, 97.2 percent of the respondents reported that they do not have access to drainage, whereas nearly 2.8 percent of them have access to it. The sewerage system has not been developed in the service area so far.

Table V-8: Drainage and Sewerage Facility

Facility Type	Drainage	Ward No			Total	Percent
		5	7	8		
Drainage and Sewerage	Yes	46	4	10	60	2.8
	No	816	322	958	2096	97.2
	Total	**862**	**326**	**968**	**2156**	**100**

Source: Socio-economic Survey, 2017

8. Access to Household Latrine

106. The access of household to toilet facility is shown in table below, which reveals that 95.7 percent (2064 out of 2156) of the households have household toilet.

Table V-9: Household Latrine

Toilet	Ward No.			Total	Percent
	5	7	8		
Yes	849	293	922	2064	95.7
No	13	33	46	92	4.3
Total	**862**	**326**	**968**	**2156**	**100.0**

Source: Socio-economic Survey, August 2017

107. Among the households with access to household latrine, 78.8 percent of them have ventilated type of latrine, 13.1 percent have water seal type and 6.8 percent have pit latrine as shown in table below.

Table V-10: Type of Household Latrine

SN	Toilet Type	Ward No.			Total	
		5	7	8	No.	Percent
1	Pit Latrine	62	23	56	141	6.8
2	Ventilated Pit	663	242	721	1626	78.8
3	Water Seal	112	27	131	270	13.1
4	Cistern Flush	12	1	14	27	1.3
Total		**849**	**293**	**922**	**2064**	**100**

Source: Socio-economic Survey, August 2017

9. Existing Health Situation

108. Ghorahi-based Rapti Sub-Regional Hospital of Dang district is set to be upgraded to a teaching hospital in line with the government policy to have one such hospital in Mid-West Region. Most people visit district hospital, apart from these, there is two Health Hut Offices in the subproject area providing health facilities to the resident. Most people are found aware in health and hygiene. People are aware about hand washing before touching and eating food, and after defecation etc.

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

10. Waterborne Diseases in the Project Area

110. Available data from District Hospital Dang shows that water borne diseases are occurred in the subproject area. Waterborne diseases can have a significant impact on the local economy. People who are infected by a waterborne disease are usually confronted with financial burden. This is especially the case in poor households.

111. Total 503 numbers of water born/related diseases infected persons were found treated by District Hospital last year. Out of the total incidents, 164 incidents were diarrheas, 99 incidents were reported as typhoid, 58 and 53 were suffered from worm and dysentery respectively. Likewise, 45 water related cholera and 33 skin diseases were also reported in the subproject area. District Hospital has recorded waterborne-related disease data in last year 2073/74 as illustrated in the figure following.

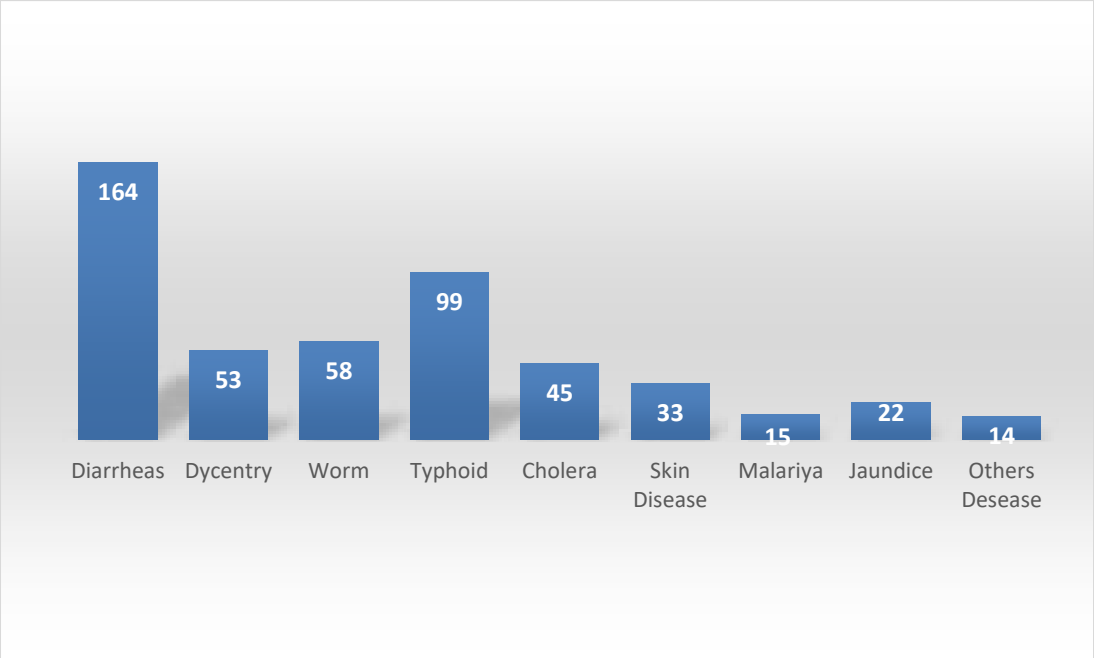


Figure V-1: Data on Waterborne Diseases in 2073/74

11. Existing Institutions

112. Ghorahi is the districts headquarter of Dang district. District level government offices and other institutions have been established in the service area. There are total 6 government offices including office of Gau Palika (Rural Municipality). Besides these, a significant number of government and private institutions / organizations are in the town. Among them 11 are financial institutions, 10 educational institutions i.e. college / schools, 8 health intuitions (hospital / health centre) and 1 I/NGOs (International/Non Governmental Organizations). The details of the institutions in the service area are presented in table following;

Table V-11: Institutions in the service Area

S.N.	Type of Institution	Sub-type	Number	No. of Staff/student
1	Government Office	Shishniya Police bid, Shree Shankar Bank Karyalaya, Gau Palika Office etc.	6	36
2	Financial	Bank	3	54
		Cooperative / Insurance	8	
3	Education	Government / Public College / School	4	4015

S.N.	Type of Institution	Sub-type	Number	No. of Staff/student
		Private/ Boarding school/hostel	6	
4	Health	Health Post	2	7
		Private Clinic / Medical Store	5	
5	I/NGO	International / National level Organization	1	9
6	Small Cottage Industries		9	
7	Hotel / Lodges		2	9
Total			**46**	**4140**

Source: Socio-economic Survey, 2017

12. Willingness to Pay

113. **Willingness to Pay 5 percent Cash Contribution.** As the social census survey data shows, more than 99.2 percent of the beneficiary's HHs would willingly to pay 5% up-front cash contribution if they have been assured that the new water supply system would function and operate with proven water quality without interruptions.

Table V-12: Willingness to pay 5% Cash Contribution

SN	Willingness to 5% Cash Contribution	Ward No.			Total	Percent
		5	7	8		
1	Yes	851	324	963	2138	99.2
2	No	7		2	9	0.4
3	Can't	4	2	3	9	0.4
Total		**862**	**326**	**968**	**2156**	**100**

Source: Socio-economic Survey, August 2017

114. **Willingness to pay Monthly Water Tariff** .All households were asked how much they could pay as monthly water tariff. Out of the total households interviewed 49.81 percent of households were found eager to pay monthly water tariff range NRs. 201-500, followed by 47.63 percent of household willing to pay more than NRs. 100-200 monthly as water tariff.

Table V-13: Willingness to pay Monthly Water Tariff

SN	Water Tariff	Ward No.			Total	Percent
		5	7	8		
1	NRs. 100-200	292	126	612	1027	47.63
2	NRs. 201-500	543	185	346	1074	49.81
3	>NRs. 500	27	18	10	55	2.55
Total		**862**	**326**	**968**	**2156**	**100.00**

Source: Socio-economic Survey, August 2017

D. Major Environmental Problems of Project Areas

115. Some of the major environmental problems prevalent to Pragatinagar town are as follows:

1. Air Quality

116. There are no large industries in the subproject 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 subproject 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.

2. Acoustic Environment

117. The sources of noise in the subproject 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 Pragatinagar town is within the national and international permissible standards at daytime and nighttime.

3. Water Quality

118. Water quality of the existing tube well located in the subproject site was found to comply with the NDWQS. Besides, the quality of water in the proposed tube well may not show exactly the same results as the existing tube well. It is thus advisable to treat the water in order to prevent adverse effect in the public health. The ground of Terai generally shows the increase in iron and turbidity occasionally. Hence, the water treatment system consisting of aeration, filtration and disinfection is recommended to comply with the requirements of the NDWQS for drinking water.

4. Solid Waste Management

119. 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.

5. Wastewater Management

120. Pragatinagar 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.

121. 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.

6. Sanitation Services

122. 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

123. The potential impacts of the proposed Pragatinagar Urban Water Supply and Sanitation Project are physical, biological, and socio-cultural in nature. They can occur at various phases of the subproject such as design, preconstruction, construction and operation and maintenance phases. The magnitude of the impacts can be small, moderate, or high depending upon its severity, and can be temporary or long term, reversible or irreversible, local or wide. The impacts need not necessary be limited to negative ones but can be positive as well. The objective of Environment Management is to attempt to augment positive impacts and to minimize negative impacts by sustainable mitigation measures.

A. Beneficial Impacts and Augmentation Measures

1. Construction Phase

124. **Employment Generation and Increase in Income**. One of the major direct beneficial impacts of the water supply and sanitation subproject during construction stage is the creation of employment opportunity to the local community. As such for this work a total of 6,000 man-days of skilled labors and 40,000 man-days of unskilled labors person days are required. This will increase local income level, and this will therefore increase economic activities and enterprise development with multiplier effect. In order to augment the impact, the local people particularly poor; dalits, ethnic minority and women will be given priority for employment and on-the-job trainings.

125. **Skills Enhancement**. Although many people in the subproject 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 subproject will also give on job practical training to the workers which will enhance their technical skills. The skill and knowledge acquired from the subproject during construction will enhance employment opportunities of local people who can earn livelihoods from similar subprojects in the future.

126. Workers especially pipe laying persons will be given on-the-job training on plumbing bathroom fittings, and other construction activities in order to augment the impact.

127. **Enterprise Development and Business Promotion**. Most of the service areas of Pragatinagar town have mixed urban and semi-urban characteristics. During 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 daily needs. To meet these demands, small shops and restaurants around the vicinity of the construction sites are likely to open. At present, Bhalubang, Sishaniya, and Lahamai are the marketplace for selling green vegetables. Similarly, people earn 20,000 to 45,000 Rs. Yearly from milk production. Along with the implementation of the project, these avenues will also gain local market, and as economic status of locals will be improved, it will help in further expansion of these agro-businesses. This will increase local trade and business in the belt.

2. Operation and Maintenance Phase

128. **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 water and improved sanitary conditions. Women and girl child will be directly benefited as they have to spend less time in fetching water and thus have more time for study, other household and income generating activities. The time savings of households is taken as time in collecting households' daily water requirements. It si estimated that every household will safe in average of 70 working days of time value after the service from the project has started. Table below shows the annual economic value to time saved based on shadow labour price;

Table VI-1: Economic Benefits from Time Saved in Collecting Water

Time Savings per Household per year (Working Days)	Shadow price of labor per day (Rs)	Economic Value: Benefit/year (Rs)
70	350	24379

Source: Socio-economic Survey 2017

129. This shows that in average, a household of service area will save time worth NRs 24,379 per year with the reduced time for water fetching after the implementation of the project. The impact will be augmented through regular maintenance of the water supply and sanitation system by the users' group (WUSC).

130. **Development of market center**. The availability of good supply of drinking water will accelerate the rate of development of Pragatinagar as a leading market centre. The project area already has 3 banks, 8 micro-finance institutions, 5 private clinics, and some governmental & educational institutions. The implementation of this subproject will attract more of investments. The local agricultural products, human skill and new economic avenues will be promoted in the local markets.

131. **Appreciation of Land Value**. One of the benefits of the subproject is that land price will increase due to the availability of reliable safe drinking water and sanitation system. The unavailability of good drinking water could be one of the reasons for some persons to opt for conducting their business in the subproject area. Upon completion of the present subproject, migration from nearby hills is 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.

132. **Women Empowerment**. Women will largely benefit from this subproject, as they are the ones who spend a great deal of time in fetching water. With the operation of the water supply scheme, time will be saved. As contaminated water can lead to diseases the women of the family also have to spend a good deal of their time to care for the sick family members. With the improvement of water supply, there will be marked reduction in the occurrence of infectious disease in the area. This will provide more time to spend on other economic and social activities leading to empowerment. In order to augment the impact, the water supply system will be

regularly maintained so that it operates smoothly and health and awareness programmes will be given to the local people.

133. **Quality of Life Values**. The subproject is not expected to adversely affect any cultural or recreational resources but will increase the existing quality of life values due to improvement in personal, household and community hygiene practices and health. It is estimated that the delivery of clean drinking water through the sub-projects will reduce health expenditures by 25%. The subproject will help to enhance the quality of life of people in many ways, like by providing opportunities for jobs, providing good quality water, and improved sanitation & hygiene practices.

B. Adverse Impact and Mitigation Measures

1. Pre-construction Phase

134. 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.

135. 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.

136. 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.

137. 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 deep tube well were tested. Tests revealed iron content and coliform as beyond standard limits. This information has guided design of water treatment and depth of well. 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 distribution system	Design proposes basic treatment using lime dosing, 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

REA identified Impacts/Issues/Concerns	Measures taken during FS/DED and IEE to mitigate impacts/issues/concerns
	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 well has adequate land for perimeter fencing to keep animals away from grazing nearby. Appropriate casing of tube wells including the installation of screens. Intake well 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) tube wells to be cased 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 tube well 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

138. **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. Topsoil may be lost, and this needs special care during construction period. Haphazard disposal of the excavated earth can disturb the local land surfaces. These activities will cause nuisance and discomfort to the locals. Forest area of Kalapani village, Pipari site, Kohalwa-Jutpani area, Baraki-Sisaniya area and Kamal road are some of the places where these disturbances can occur.

139. **Underground water quality and state of water table**. Due to the continual extraction of ground water, there will be fluctuation in ground water level. As the water is proposed to be extracted from the depth of about 120m, below the impervious strata, there shall be insignificant effect to the existing shallow tube wells which are generally at the level of 10 to 15m.

140. **Damage to the Existing Facilities**. During the construction time, while excavating the earth, existing water supply distribution pipelines and telecommunication cable may get damaged in few places particularly in the bazaar area in spite of great care. A repair team will be on standby for the repair of water supply pipeline for immediate repairs. Such damages are likely at Kohalwa-Jutpani area, Baraki-Sisaniya area and Kamal road of the subproject service area.

141. **Air and noise pollution**. The construction activity will comprise of construction of deep tube wells and laying of transmission and distribution pipes, construction of storage reservoirs, construction of office building along with generator & guard houses, and transport & installation of pumps. Most of the works do not involve heavy machines except in constructing deep tube well which will produce some extent of noise for a certain period of time. There will be some activities such as transportation, loading/unloading of construction materials viz. sand and aggregates, stockpiling of construction waste and construction materials and earthworks. These will cause effect into air quality due to dust generation and vehicular emission as well as noise pollution. Use of power horns and movement of heavy vehicles can cause a serious disturbance to the community, educational institutes, hospitals/health posts and residences etc.

142. **Impact on water bodies**. There will be some impacts on water bodies located within the subproject area during the construction phase. Possible activities, which may influence the water quality, are listed below.

(i) Washing of vehicles, and other washing activities directly on local surface water bodies,
(ii) Sediment and excavated materials may be transported to the water bodies due to rain,
(iii) Leakage and disposal of oil and grease from construction equipment

143. The excavation work for digging of well will cause turbidity in water up to a certain extent. However, the quantity is limited and very minimal impact will be there for short period of time.

144. **Waste Management and Disposal**. Haphazard disposal of solid waste from workers' campsites in the vicinity of water bodies and at open spaces could be a concern. Chances of open defecation by outside workers will also be a concern to local environment. Construction waste from campsites and construction sites are also sometimes disturbing the local environment.

(ii) Biological Environment

145. The service area falls in a built-up area with agricultural land without any forests. Only scattered plants of local species and fruit plants are available within the service area and thus minor impacts are anticipated only during the construction period. The source of water of

Kalapani system is located in the forest. Thus, some vegetation cover loss will be there. However, site has been selected to avoid any tree cutting. 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. The impacts to human settlement including villages, cattle sheds and farmlands will be very low.

146. The potential environmental impacts of the subproject on local flora and fauna during construction and post construction phases will be low as it involves no tree felling along the distribution line, minimum loss of grazing land, and no loss of agriculture lands. Some of the impacts that may likely to occur are described below.

147. **Loss of vegetation cover**. The loss of vegetation cover and species diversity due to earthwork primarily in the direct impact area of the treatment plants and deep tube well sites include felling of 5 Salla (*Pinus roxburghii*) trees, 5 utis (*Alnus nepalensis*) trees, 7 Kadam (*Anthocephalus chinensis*) tress and some other trees. Loss of trees will be minimized as the sites will be selected keeping in priority to avoid any tree felling. The source of water of Kalapani system is located in the forest area of ward number 5 of Rapti Rural Municipality. Thus, some vegetation cover loss will be there. Some of the topsoil and vegetation may also be lost during pipe laying works. No pipeline passes through the forest area.

148. IBAT information has been assessed. 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 subproject 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.

149. **Impact on Fauna**. The subproject site is within the built-up area except for some sites like the deep tube well sites. Population dynamics of resident and migratory birds and reptiles at some project sites 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. The workers should not be allowed to hunt birds.

150. **Impact on aquatic life**. Some of the construction activities and protection works are proposed at the bank of the river. Dolai river, which flows through the subproject area form North to South, and Bhulke Khola and Gopi Khola river are the surface water sources that face risk of pollution due to subproject activities. The construction activities will physically disturb the water quality for a certain period of time and may cause adverse impact on aquatic life. But these effects will be temporary in nature and local in scale.

(iii) Socio-economic Environment

151. **Disturbance to community activities**. Construction activities, particularly construction works on roads will cause disturbances to the community activities, festivals and social events. The free movement of vehicular traffic and pedestrians will be affected. Noise produced due to the operation of machines may disturb the neighbourhood in construction areas.

152. In order to minimize the disturbance to the community activities, a detailed Traffic Management Plan will be developed by Contractor during the early stage of construction phase for areas along the construction works to minimize traffic flow interference from construction activities. Advance local public notifications of construction activities, schedules, routings, and

affected areas including road closures will be made. Signage in Nepali and English languages will be erected. The residents will be consulted and informed about the disturbances in advance.

153. **Social Dispute and Dissatisfaction.** There is a possibility of influx of outside workforce and with them money from the construction work and unwanted communities can cause problems with the local community. The local population may not get employment benefits from the subproject causing dissatisfaction and conflicts in the area. There is a possibility of social dispute in the community due to irresponsible behaviour of the workers such as gambling and drinking.

154. An employment policy will be prepared so that the local people may not be deprived of employment opportunities. Local people and women above the age of 16 will be given preference for employment. Wages will be settled based on DWEC (District Wage Evaluation Committee) with the list of employees.

155. **Occupational health and safety (OHS)**. Life and health of workers particularly of those involved in concreting, trench cutting, formwork and rebar fixing in the overhead tank is of prime concern. To mitigate or minimize the hazards adequate safety instructions should be provided to the contractor and monitored by the subproject.

(i) Health and hygiene in the camp site (against unsafe working conditions, accidents, transmission of communicable diseases etc.) will be given top priority.
(ii) Regular health checkups, proper sanitation and hygiene, health care will be provided. Awareness programs concerning human trafficking and the possibility of spread of STDs and HIV/AIDS will be conducted during focus group discussions.
(iii) Personal protection equipment (PPE) e.g. safety helmets, safety belt, boots, gloves will be provided to all construction workers.
(iv) The loss of life or any type of injuries will be compensated and insurance to the workers will be provided. First aid kits, standby vehicle, and fire extinguishers will be provided in camp sites.
(v) To avoid risks from accidents on site due to the movement of the public and workers, health and safety measures of the contract will also prohibit entry at construction sites to the public and the area will be barricaded, and warning signs will be placed.

3. Operation & Maintenance Phase

156. **Chemical hazard**. Chlorine and Bleaching Powder are toxic, 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 mouth are of extreme hazard to the workers handling chlorine and bleaching powder. The storage procedures, in-plant handling and dosages of chlorine (bleaching powder) will be addressed. Procedures and guidelines will be developed for its handling and first aid measures will be introduced for emergencies. Training on the handling and on dosage of the chemicals will be given to the staff.

157. **Impact on water bodies and aquatic life**. 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. Dolai river, Bhulke Khola and Gopi Khola river may be susceptible to such impacts.

158. As the backwash water mainly contains suspended solids. A small pond of 20,000 litre capacity will be constructed for decantation and will be drained of to the river/ stream course. To avoid the impact to aquatic life, the effluent and sludge should be disposed of only in designated areas and regular monitoring of the river or stream water quality should be done.

159. **Resettlement, relocation and compensation issue.** The major structures are to be constructed on land belonging to WUSC. Similarly, the distribution system network follows within the public property line. Therefore, resettlement or relocation is not required.

C. Evaluation of the Impacts

160. The combined score less than 45 is termed as insignificant impact; 45-75 is termed as Significant and beyond 75 is termed as very significant impact. Following table summarizes the evaluations of the impacts.

Table VI-3: Evaluation of the Environmental 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)
Skill Enhancement	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 and saving of time	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					

Impacts	**Nature**	**Magnitude**	**Extent**	**Duration**	**Total score and significance**
Physical Environment					
Erosion and land surface disturbance	Direct	M (20)	Ss (10)	Lt (20)	Significant (50)
Underground water quality and state of water table	Direct	M (20)	Ss (10)	Lt (20)	Significant (50)
Damage to existing facilities	Direct	L (10)	Ss (10)	St (5)	Insignificant (25)
Air Pollution and Noise nuisance	Direct	L (10)	Lc (20)	St (5)	Insignificant (35)
Impacts of water bodies	Direct	L (10)	Lc (20)	Mt (10)	Insignificant (40)
Waste disposal	Direct	M (20)	Lc (20)	Mt (10)	Significant (50)
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)
Social dispute and dissatisfaction	Indirect	M (20)	Ss (10)	St (5)	Insignificant (35)
Occupational health and safety	Direct	H (60)	Ss (10)	Mt (10)	Significant (80)
Community health and safety	Direct	H (60)	Ss (10)	Mt (10)	Significant (80)
Resettlement, relocation and compensation issues	Direct	L (10)	Lc (20)	St (5)	Insignificant (35)
Operation & Maintenance Stage					
Risk of exposure to chemicals	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)
Risk of supply of contaminated water	Direct	H (60)	Lc (20)	St (5)	Significant (85)

VII. ANALYSIS OF ALTERNATIVES

A. With- and Without-Subproject Alternatives

161. The subproject area is a major junction and booming marketplace. It lies in close connection to the East-West Highway. Though the trend of urbanization is increasing, the town is facing increased problems to water supply. The overall sanitary condition of the subproject area is reasonably satisfactory, but still improvements are required.

162. Doing nothing about these challenges would be allowing the subproject rural municipality to further develop as "under-serviced" area, 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 of subproject rural 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. Hence, do-nothing or without-project alternative is not chosen.

163. The 'with subproject' alternative will contribute to the realization of the Updated 15-Yr Development Plan for Small Towns Water Supply and Sanitation Sector and to the delivery of Nepal's commitment to SDG 6th.

B. With subproject's location alternatives

164. The subproject area is a very needy area in terms of safe water needs. Strategically, the investment in water and sanitation in this belt will improve the overall socio-economic aspects of the Province as it serves as a market junction to the surrounding rural municipalities and it is located around 6 kilometers from Lamahi, and about 36km away from Ghorahi, the headquarters of Dang District.

165. The subproject components are selected at technically safe site where there is no social dispute as well. Minimization of loss of vegetation cover is also considered. Avoiding tree clearance and damage to cultivated land has also been considered in site selection.

166. Since the settlements in Pragatinagar are separated by Dolai river into North-western and South-eastern settlements, 2 separate District Management Areas (DMAs) are established. This is based on the principle of managing a large water network into a number of areas, typically of between 500 and 3000 connections, each established area having a defined and permanent geographical and/or hydraulic boundary. With other possibilities as well, the proposed sub-systems will be an easy-to-operate and cost-effective option for the scattered location of the settlements.

C. Alternatives Related to technology, materials and implementation procedure

167. Regarding the source and its technology of water extraction, the proposed deep tube well as source is more sustainable. The subproject area has Dolai River which flows through form North to South of the subproject area. It has discharge of 75 lps (as measured in August 2017). Though this perennial river could have been one of the water sources for the proposed system, the flow in the river decreases considerably during dry season and it will be able to meet the demand of the service areas. Besides, the quality of water deteriorates considerably

during rainy season thus requiring extensive water treatment. Hence, deep tube wells will be relatively more reliable and sustainable source technology.

168. The proposed system is a small-scale subproject. Since the yield of the proposed deep tubewells is reliable, it is expected that the water supply will be smooth. The major component of a ground water-based water supply system consists typically of boreholes with pumps, treatment unit, reservoirs and distribution system. It was assessed that the proposed water supply system with adequate treatment 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. All water supply components will be constructed on the land owned by WUSC.

169. The work involved is labor intensive and minimum use of mechanical equipment is involved. Most of the construction work will be done manually, avoiding heavy equipment which will produce minimum environmental impacts. Trained human resources will be employed.

170. The working procedures proposed are participatory one and the beneficiaries will be actively participating in all the phases of the subproject. Except from some mechanical equipment for drilling of boreholes, most of the raw materials used will be local in nature. Similarly, as far as possible, local people will be employed for the subproject so that the chances of conflict are minimal.

VIII. ENVIRONMENTAL MANAGEMENT PLAN

171. 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 subproject; (iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensuring that safety recommendations are complied with.

172. 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

173. The Ministry of Water Supply (MOWS) will be the Executing Agency, working through the Department Water Supply and Sewerage Management (DWSSM), which will establish a Project Management Office (PMO) for the project[1] headed by a Project Director. The DWSSM will also establish two Regional PMOs (RPMOs).

174. The PMO will be responsible for overall project planning, management, implementation, monitoring and reporting for the project. The PMO will also be responsible for screening the proposed subprojects in accordance with the subproject selection criteria for the project, assisting the municipalities in conducting feasibility studies, 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 will also engage all consultants under the project.

175. The RPMOs will be established using the existing infrastructure in (i) Itahari, Sunsari, for the eastern region, (ii) in Nepalgunj, Banke, for the western region, and (iii) PMO (Kathmandu) will act as RPMO for central region projects. The RPMOs will report to the PMO and be supported and monitored by PMO to implement the projects in the field and manage contractors and consultants. The RPMOs will manage 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 established in the field, at each WUA's office,[2] headed by a qualified engineer from the RPMO to conduct day-to-day project management, planning and construction supervision. The TDF will coordinate with RPMOs, WUSCs and municipalities at least on monthly basis.

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

[2] 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.

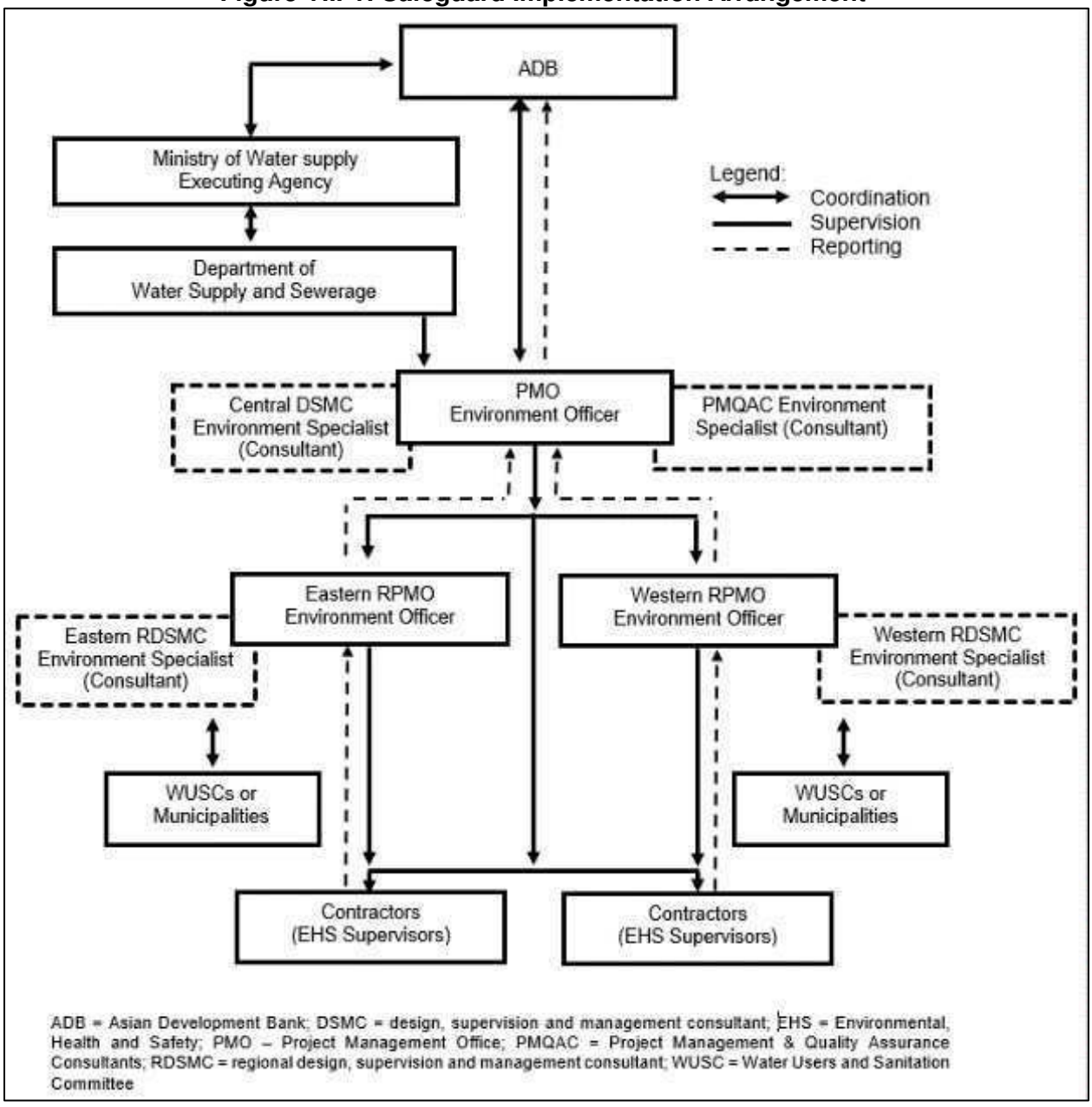
176. The WUSC, on behalf of the WUA[3] or the municipality[4] will be responsible for operation and maintenance (O&M) of the water supply and sanitation facilities constructed, operating under a management agreement with DWSSM. WUSCs consist of nine executive members,[5] at least three of whom are women. The subproject will fund the WUA's minimum prescribed staffing and other resource requirement, as outlined in the management agreement with DWSSM 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.

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

[4] 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.

[5] 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



ADB = Asian Development Bank; DSMC = design, supervision and management consultant; EHS = Environmental, Health and Safety; PMO – Project Management Office; PMQAC = Project Management & Quality Assurance Consultants; RDSMC = regional design, supervision and management consultant; WUSC = Water Users and Sanitation Committee

177. **Project Management Office.** A project officer (Environment) will be 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.

178. **Regional Project Management Offices.** The environmental officer assigned by DWSSM 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.

179. **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.

180. **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.

181. **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.

182. 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.

183. 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 subproject sites.

184. **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.

185. **Water Users' and Sanitation Committees.** WUSCs are 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.

186. **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

187. An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels.

188. 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.

189. 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-2: 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 tube wells located near proposed tube wells. - 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, and workers	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 areas, and workers	During detailed design phase

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
camp (if needed)				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 for construction. Use of water for	Contractor	List of any public or private infrastructure disturbed by the subproject works Minutes of meetings with the locals or	As per need, or field-inspection if any such case is foreseen.

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		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.		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 standards.	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
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 - Species of local economic significance and values will be planted	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
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 (Dolai river, Bhulke Khola and Gopi Khola) and river (Rapti River) 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 of Paharawa, Lathhawa, Kalabani, Thulo Sisahaniya, Pipara, Bijauri and Nayabasti - 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 Paharawa, Lathhawa, Kalabani, Thulo Sisahaniya, Pipara, Bijauri, and Nayabasti	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	- 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	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
	spontaneous vomiting	(Annex 8)			
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

190. 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.

191. 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-3 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-3: 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

192. 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.

193. 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.

194. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work site. The proposed training project along with the frequency of sessions is presented in Table VIII-4. The Environmental Safeguard specialist & EMP Field Monitoring Staffs are responsible for organizing different training program for Environmental Management.

Table VIII-4: 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 ADB requirements • Incorporation of EMP into the project design and contracts	• 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
Duration	1 day	1 day	1 day on a

Items	Pre-construction/prior to construction	Construction	
			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

195. 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.

196. 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.

197. 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.

198. The operation phase for mitigation measures are good operating practices to mitigate the environmental impacts of this phase & the responsibility remains to WUSC. All monitoring during the operation and maintenance phase will be conducted by WUSC. The Water Safety Plan, included in each subproject design, will allocate NPR 500,000 annually for operation and maintenance particularly water quality monitoring. If a licensed laboratory will be engaged for the first 2-3 years of operation for training purposes, the cost can be accommodated under the Water Safety Plan. Cost of awareness program & WSP during contract period is NPR 190,000.00. The indicative costs of EMP implementation, safeguards and its monitoring are shown in Tables VIII-5 (by source of funds).

Table VIII-5: Indicative Cost of EMP Implementation and Its Monitoring

	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Cost covered by
A	**Mitigation Measures**						
1	Protection and reinstatement works					350,000	Civil works contract
2	Greenary management/ Promotion	Construction phase				250,000	Civil works contract
3	Compensation costs	Construction phase				250,000	Civil works contract

	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Cost covered by
B	**Monitoring Measures**						
1.	Air quality monitoring	- Pre-construction - Construction	Per location	5	30,000	150,000	Civil works contract
2.	Noise levels monitoring	- Pre-construction - Construction	Per location			50,000	Civil works contract
3.	Water Quality Test	Pre-construction - Construction	Per Location	12	5000	60,000	Civil works contract
C	**Capacity Building**						
1.	(i) Orientation workshop for officials involved in the project implementation on ADB Safeguards Policy Statement, GoN environmental laws and regulations, and environmental assessment process; (ii) induction course contractors, preparing them on EMP implementation and environmental monitoring requirements (iii) lessons learned information sharing	Module 1 – immediately upon engagement of the (provide if DRTAC or DSMC) environmental specialists Module 2 – prior to award of civil works contracts (twice a year for 4 years) Module 3 - Upon completion of the project	lump sum	1 8 1	Module 1 – 300,000 Module 2 – 100,000 Module 3 – 200,000	300,000 800,000 200,000	Covered under DRTAC or DSMC contract
D	**Administrative Costs**						
1.	Legislation, permits, and agreements	Permit for excavation, tree-cutting permits, etc	As per requirement	NA	NA	NA	NA (Coordination and communication)
		IEE preparation and MoWS presentation in	Lump sum	1	500,000	500,000	DSMC contract
E	**Other Costs**						
1.	Public consultations and information disclosure	Information disclosure and consultations including public awareness campaign, preparation for WSP	As per requirement	Lump sum		190,000	Civil works contract – contractor's defect liability period
2.	GRM implementation	Meetings, consultations, communication, and information dissemination		Lump-sum		200,000	PMO cost
3.	Any unanticipated impact due to project implementation	Mitigation of any unanticipated impact arising		Lump sum	Contractor's liability	As per insurance requirement	Civil works contract – contractor's defect liability

	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Cost covered by
							period
F	**Expert Monitoring Costs**						
	Environmental Specialist			1 MM	100,000	100,000	PMO cost
	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					75,000	
TOTAL						**3,800,000**	

199. The EMP will be included in civil work bidding and contract documents. The cost of NRs 1,500,000 will be included in the contract document to ensure implementation of EMP works.

IX. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. Information Disclosure, Consultations and Participations

200. Stakeholder consultations and local participation was an essential process in subproject preparation and IEE study. The process in engaging stakeholders and affected people involved key informant interviews, on-site discussions with WUSC, and random field interviews of stakeholders. Table IX-1 lists the persons consulted during the IEE Study.

Table IX-1: Lists of People and Institutions Consulted

SN	Name	Organization/Address
1	Mr Shantaram Sharma	President, Pragatinagar WUSC
2	Mrs. Bhima Acharya	Vice President, Pragatinagar WUSC
3	Mr Ohmnath Banjade	Secretary, Pragatinagar WUSC
4	Mr. Arjun Adhikari	Treasurer, Pragatinagar WUSC
5	Mr Bharat Prasad Pandey	Member, Pragatinagar WUSC
6	Mr Tuladhwoj Malla	Member, Pragatinagar WUSC
7	Mr. Thagendra Pariyar	Member, Pragatinagar WUSC)
8	Mrs Pratima Acharya	Member, Pragatinagar WUSC)
9	Mrs Nirmala Chaudhary	Member, Pragatinagar WUSC)
10	Mr Numa Nanda Subedi	Chairperson, Rapti Rural Municipality
11	Mr Lalit K Thapa	Chief Admin. Officer, Rapti Rural Mucnicipality
12	Mr Resham R Adhikari	Finace Section, Rapti Rural Municipality
13	Mr Damodar Pokharel	Secretary, Rapti Rural Municipality
14	Hemanta Chhetri	Assistant, Bhalubang Ddhyog Banijya Sangh
15	Mr Purna Bahadur Budhathoki	Chair, Sishaniya Udhyog Banijya Sangh

201. During the IEE preparation, consultations were undertaken. A formal public consultation was conducted on 22nd March 2019 in compliance with GoN's EPR requirements (Annex 5). Chosing of safe construction campsites and safety concerns in the proposed subproject sites during construction were raised as among the concerns during the public consultation.

202. Stakeholder consultations will continue throughout the implementation of the subprojects and operation. All stakeholders must be invited and encouraged to participate in community consultations. To facilitate the engagement of stakeholders, the PMO and ICG will maintain good communication and collaboration with WUSC and the Rural Municipality. PMO, ICG, Contractors and/or WUSC will be open to the public to contact on matters concerning the progress of the subprojects, adverse impacts, mitigation measures and environmental monitoring and grievances. Future stakeholder consultations will be as follows:

(i) During the construction stage, if there would be a major change in design/alignment/location, the PMO and ICG will hold at least one public consultation meeting early on in the construction period to solicit perceived impacts, issues, concerns and recommendations from affected communities;

(ii) Prior to construction, the PMO and ICG will conduct an intensive information, education and communication (IEC) campaign to ensure sufficient level of awareness/information among the affected communities regarding the

upcoming construction, its anticipated impacts, the grievance redress mechanism, contact details and location of the PMO and ICG, and status of compliance with the Government's environmental safeguard requirements, among others, are attained/provided. Billboards about the subproject, implementation schedule and contact details of the executing agency, PMO-ES, ICG-ESA and Contractors will have been set up at strategic locations within the subprojects' main areas of influence. The grievance redress procedure and details will have been posted at the offices of the ICG, WUSC and Rural Municipality;

(iii) During construction, regular random interviews will be conducted by the ICG-ESA every month to monitor environmental concerns of subproject communities;

(iv) During operation, periodic random interviews will be conducted by the ICG and WUSC to monitor the environmental concerns of subproject communities;

(v) The public consultations and information disclosure will be continuous throughout the project cycle. Women participation from beneficiary community will be insured. PMO and ICG will be responsible for designing and implementing such aspects on the ground.

203. The GoN-approved IEE Report (in English), will be available at the offices of the PMO, ICG and WUSC for the perusal of interested parties. Copies may be made available upon formal request. The IEE and environmental monitoring reports will be disclosed in the ADB's and UWSSSP website.

B. Grievance Redress Mechanism

204. 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 channelled through letters, emails, text messages (SMS), verbal narration, grievance boxes and registers. Suggested template for grievance redress form is in Annex 2-B.

205. 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.

206. 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.

207. 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,[21] 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.

208. 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 immediately address and resolve the issue at field-level with the contractor, 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.

(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

[21] 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.

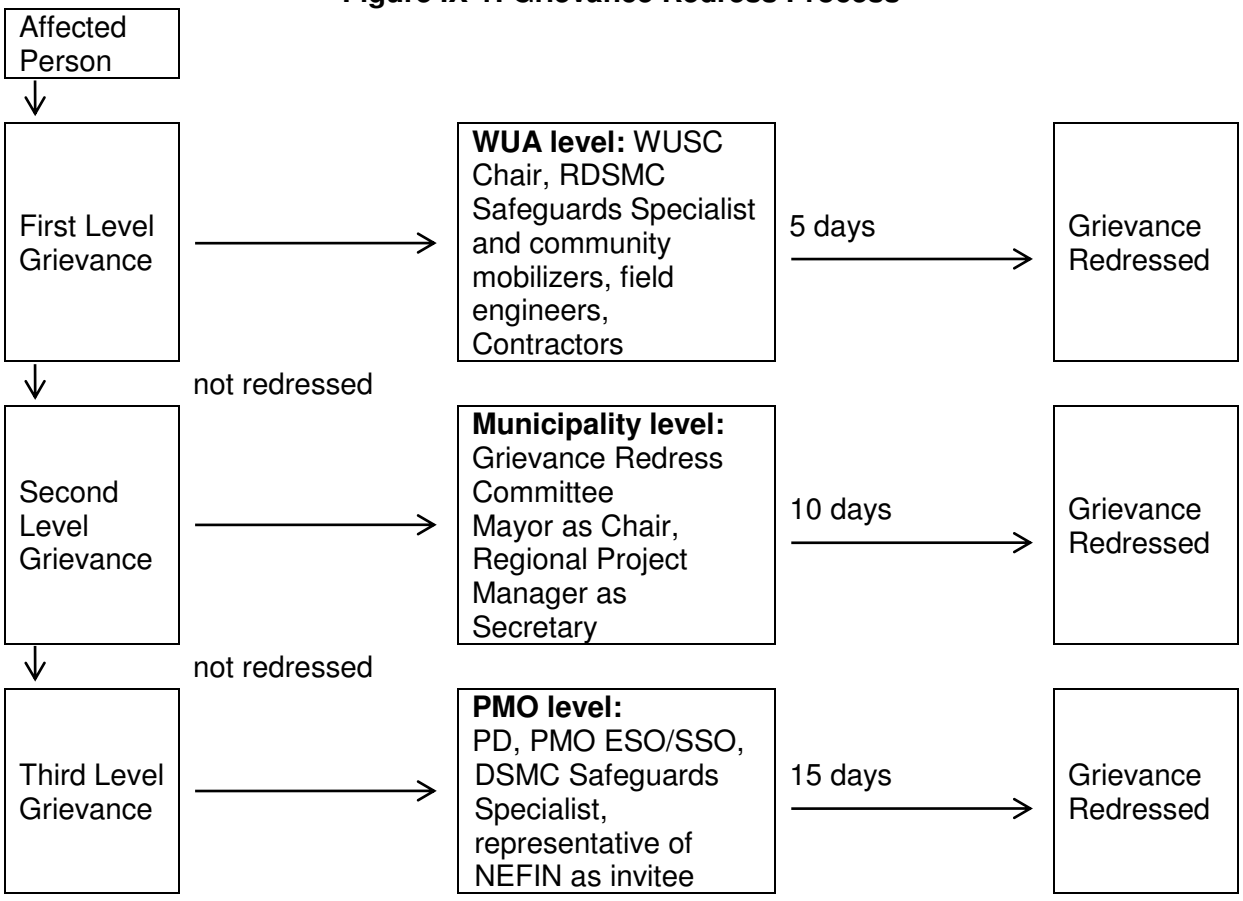
complaint from the Municipality-level GRC. The Project Director will sign off on all grievances received by the PMO. The concerned Deputy Project Director (DPD) and environmental and social safeguards officers (ESO and SSO) of PMO will be involved with support from the PMQAC's social/environment safeguards experts. The SSO will be responsible to convey the final decision to the complainant.

209. 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.

210. 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.

211. 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 Process



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.

212. **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.

213. **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.

214. **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

X. MONITORING AND REPORTING

215. 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.

216. 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.

217. 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.

218. 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.

219. 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.

220. 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

221. The water supply and sanitation subproject proposed under UWSSSP in Pragatinagar Town is not an environmentally critical intervention. The IEE further concludes that;

(i) The subproject is not within or adjacent to any environmentally sensitive area and hence it is unlikely to cause any significant adverse impacts of flora and fauna;
(ii) Since it is a development intervention, there will be some impacts on the local environment. However, the extent of impacts is expected to be local, confined within the subprojects' main areas of influence, and for short period of time, and can be mitigated through appropriate measures; and
(iii) Controlled activities during construction of reservoirs and building, well managed activity plan for deep tube wells and treatments plants, and proper management of construction campsites, if any, and stockpile areas are seen as major areas to focus with respect to environmental safeguards.

222. It is recommended that;

(i) Mitigation measures, basically integral to socially and environmentally responsible construction practices, are commonly to be applied at construction sites. Mitigation measures would not be difficult to be implemented but timely implementation and its monitoring is required.
(ii) There needs to be proper coordination with the local communities like Paharawa, Lathhawa, Kalapani, Thulo Sisahaniya, Pipara, Bijauri and Nayabasti to minimize disturbances to local activities and damage to public or private properties during laying of pipelines and other construction works
(iii) During operation, the potential delivery of unsafe water can be mitigated with good operation and maintenance, prompt action on leaks, and complying with the required quality monitoring of supplied water as prescribed in the National Drinking Water Quality Standards Directives.

223. The proposed subproject will bring about: (i) the benefits of access to reliable supply of safe and potable water; (ii) promotion of good hygiene and sanitation practices and reduced health and safety risks as positive impacts; and (iii) enhanced community health, improved quality of life and safe communities as outcomes. This subproject will have positive development impact not only in the project area, but also in this belt of Province 5.

224. Finally, based on the above findings, the classification of Pragatinagar Water Supply and Sanitation Project as Category B is confirmed. IEE is sufficient for the subproject, and no further special study or EIA needs to be undertaken for safeguarding the environmental aspects of the subproject implementation.

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ANNEXES

ANNEX 1: REA CHECKLIST

ANNEX 1:

RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST FOR PRAGATINAGAR PROJECT AND PRELIMINARY CLIMATE RISK SCREENING CHECKLIST

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 (RSES) 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: Pragatinagar Urban Water Supply and Sanitation Project

Screening Questions	Yes	No	Remarks
A. Project Siting **Is the project area**			
Densely populated?		√	The population density is 17.55 per ha.
Heavy with development activities?		√	The distribution pipeline will partially go through RoW of road in the municipal settlements with moderate population density.
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		√	
B. Potential Environmental Impacts Will the Project cause…			

Screening Questions	Yes	No	Remarks
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?			Ensure sustainable pumping (if pumping option is selected)
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)?	√ (Risk of Chance case)		Basic water treatment is proposed under the Subproject. EMP recommends water quality monitoring as prescribed in the NDWQS & its Directives.
delivery of unsafe water to distribution system?	√ (Risk of Chance case)		Design proposes monitoring kits, a lab room. EMP recommends continuing training of WUSC in water quality monitoring, as prescribed in the NDWQS Directives.
inadequate protection of intake works or wells, leading to pollution of water supply?		√	
over pumping of ground water, leading to salinization and ground subsidence?		√	High cost involved in pumping will constrain over pumping. EMP recommends monitoring pumping & maintaining record to control pumping to design limit.
excessive algal growth in storage reservoir?		√	EMP provides mitigation measures.
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.
inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?		√	
Impairments associated with transmission lines and access roads?	√		Power transmission lines crossing the proposed water transmission & distribution lines will not be affected. EMP provides measures to mitigate impacts on power supply poles in the bazaar that are immediately adjacent to, or onto, road carriageways.
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. EMP provides measures to mitigate health and safety impacts from improper handling, potential accidents &/or human error in dosing.

Screening Questions	Yes	No	Remarks
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?		√	$Ca(ClO)_2$, commonly used in basic water treatment, will be used. EMP provides measures to mitigate health and safety impacts from improper handling, potential accidents &/or human error in dosing.
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?		√	
delivery of unsafe water due to poor O&M treatment processes (especially MWSS 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.
delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?	√		Concern for corrosion of G.I. pipes caused by the chlorine content in treated water is low. EMP provides mitigation measures.
accidental leakage of chlorine gas?		√	
excessive abstraction of water affecting downstream water users?		√	
competing uses of water?		√	
increased sewage flow due to increased water supply	√		Most of the communities have septic tanks leading to soak pits. EMP provides mitigation measures.
increased volume of sullage (wastewater from cooking and washing) and sludge from wastewater treatment plant	√		There is no wastewater collection & treatment system. EMP provides mitigation measures.
large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	
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?	√		EMP provides mitigation measures.
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?	√		EMP provides mitigation measures.

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, 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)	0	
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 Pragatinagar 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 waterbodies, 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

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?
1.18	New road, rail or sea traffic during construction or operation?	No		
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	Deep underground water sources will be used through deep boring	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

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?
				selected
2.2	Water?	Yes	Deep underground water sources are used	
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	Yes	Small volume of construction	Not significant as

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?
	wastes?		waste during construction phase, and some waste during decommissioning will be generated	these are not 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	Yes	Noise and vibration (limited)	Not significant as

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?
	equipment eg engines, ventilation plant, crushers?		may cause community nuisance	the scale of work 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	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?
	environmental protection 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		

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?
9.2	Will the project lead to 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?	No		
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 waterbodies, • 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 Rapti Rural Municipality which includes the main market area due to which it will be highlyvisible 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

Prepared by:	Yogesh Shakya
Designation and Office	Environmental Specialist, BDA/PEA JV
Date:	18th June 2019

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

ANNEX 2-A: RELEVANT ENVIRONMENTAL QUALITY STANDARDS

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.

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.

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 2-B:
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 C:
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.

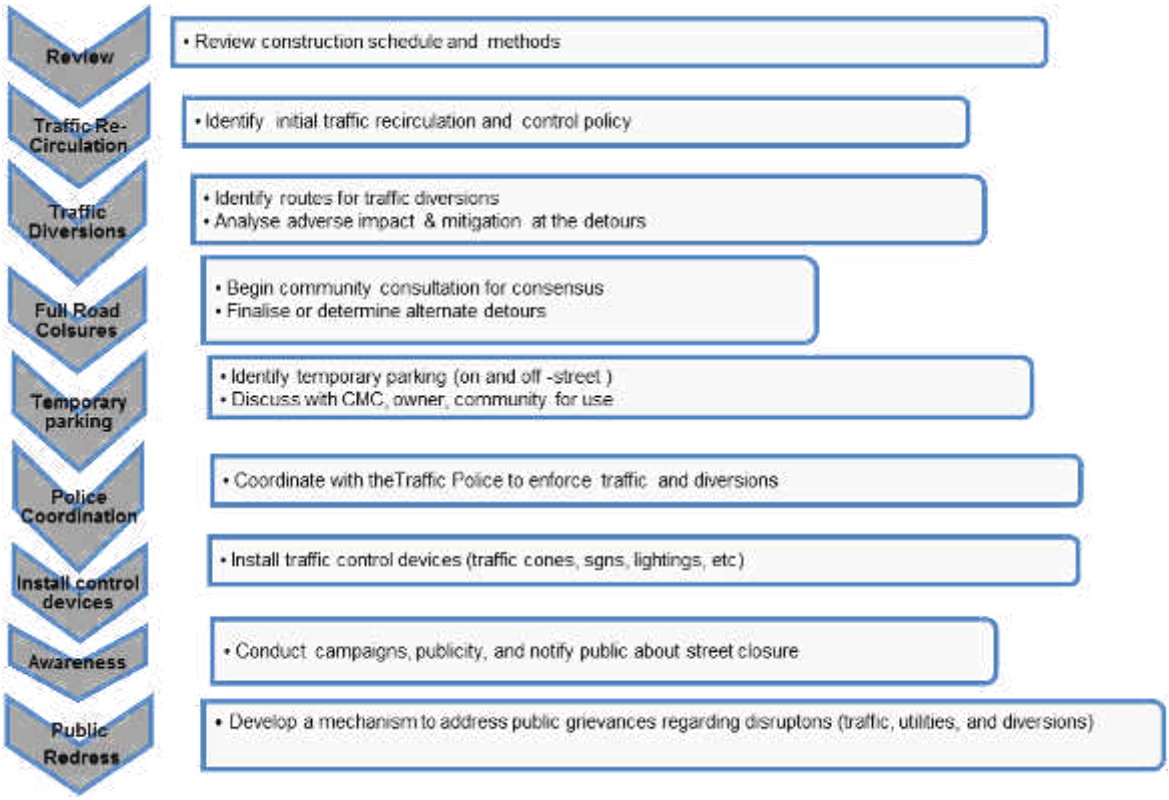
- Make traffic safety and temporary traffic control an integral and high-priority element of every project from planning through design, construction, and maintenance.
- Inhibit traffic movement as little as possible.
- Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they 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.



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 D:
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, MWSS 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 E:
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 Quality 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 F:
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**

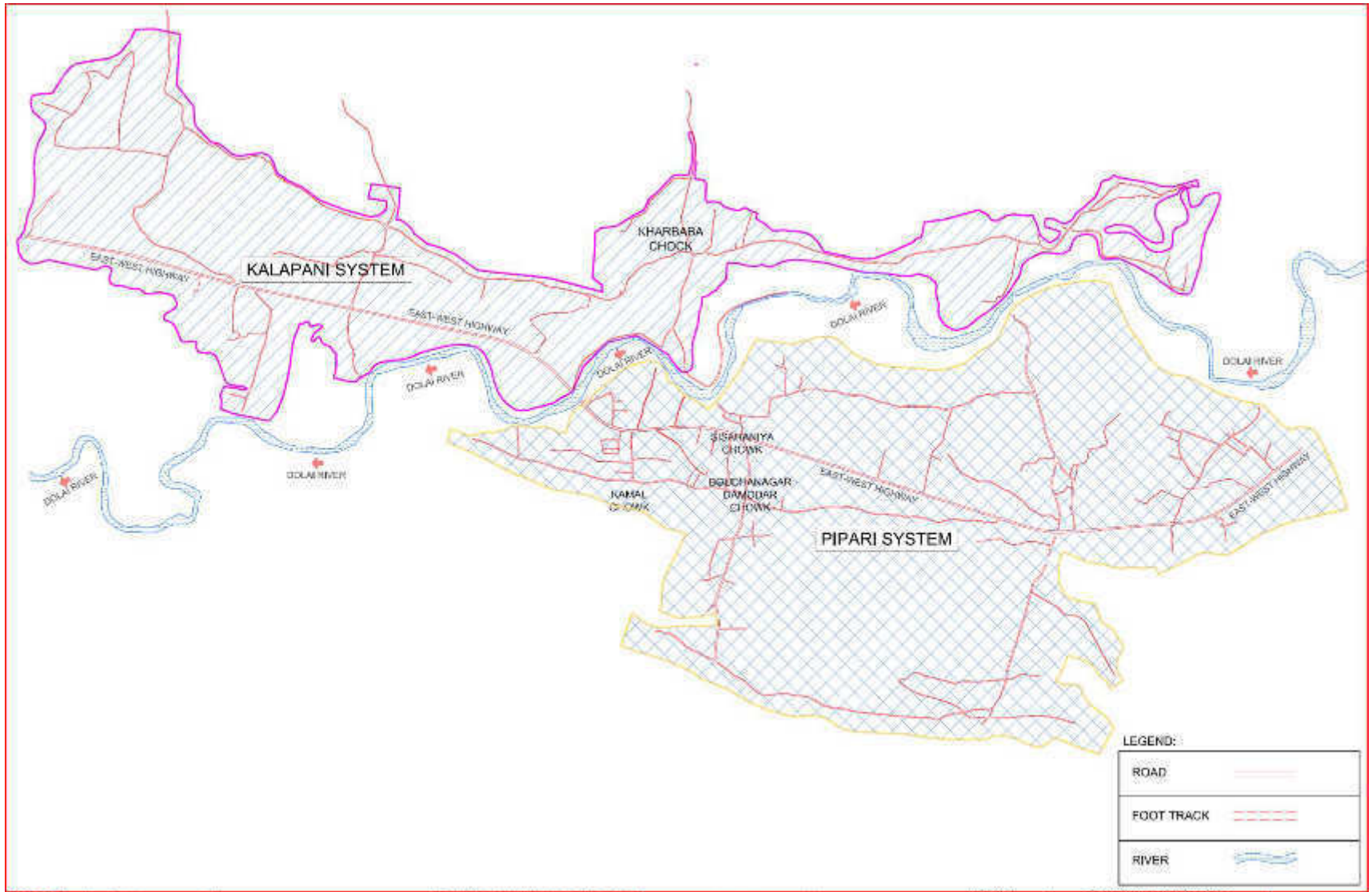
Position **Position**

ANNEX 2-G: REFERENCE FOR PLANTATION COST BREAKDOWN (INDICATIVE)

SN	Activities	Unit	Description	Qty	Area (ha.)	Rate, NRs	Total	Remarks
I	**Purchase of saplings**							
	Species A	Saplings		1000		15	15,000.00	
	Species B			1000		25	25,000.00	
II	**Pitting**							
	Pitting area for Species A	sq m	Spacing of 2.5mx2.5m	1000	0.625			Size: 45cm depth X 45cm diameter
	Pitting area for Species B	sq m	Spacing of 5mx5m	1000	2.5			
	Labour cost							
	Species A	Person/ha	25.6 per ha	16		500	8,000.00	
	Species B	Person/ha	6.4 per ha	16		500	8,000.00	
III	**Transportation**							
	Vehicle cost	Trip		2		10,000	20,000.00	
	Cost of unloading and manual carrying to site		100 saplings/ labour/d up to 3 km	2000		500	10,000.00	
IV	**Clearing plantation site**							
	Species A	Person/ha	4 persons/ha.		0.625	500	1,250.00	
	Species B	Person/ha	4 persons/ha.		2.5	500	5,000.00	
V	**Plantation**							
	Species A	Person/ha	9.6 persons/ha	6		500	3,000.00	
	Species B	Person/ha	2.4 persons/ha	6		500	3,000.00	
	Total						**98,250.00**	
	Overhead cost (@15%)						14,737.50	
	Grand Total						**112,987.50**	
VI	**After care (Cutting, prunning, ….)**	MM	Care taker	6	1	5000	**30000**	
							42,987.50	

Note: If plantation is not possible in a single site, it can be carried out in multiple sites. E.g. Community Forest/s near by, Public Parks, road sides, office premise, or any other potential sites

ANNEX 3:
PROJECT SERVICE AREA



Project Management Office **Third Small Towns Water Supply & Sanitation Sector Project** Department of Water Supply & Sewerage Panipokhari, Kathmandu	BUILDING DESIGN AUTHORITY PVT. LTD. In PLINTH ENGINEERS & ARCHITECTS PVT. LTD.	Team Leader : Shiva Ratna Rajbahak Design by : Dhruba Raj Sharma Drawn by : Garima Phuju	Approved by : Checked by : Shiva Ratna Rajbahak	SCALE : 1:16000	SISHANIYA PRAJAPATINAGAR SMALL TOWN WATER SUPPLY & SANITATION SECTOR PROJECT DISTRIBUTION SYSTEM DIVISION MAP	DRG NO: SISDIS/DSN/05 SHEET NO: 1 of 1

ANNEX 4:
IBAT information on Biodiversity Sensitivity in Proximity of Project Area

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

Priority Sites for Biodiversity		
Key Biodiversity Area	Dang Deukhuri foothill forests and west Rapti wetlands CR/EN, VU, other	150,000 ha

Features within 10 km

There are no additional features within 10 km.

ANNEX 5:
STAKEHOLDER CONSULTATIONS

Public Consultation

आज मिति २०६४ साल चैत्र ८ गते यस भगतिनगर तेस्रो साना सहरी खानेपानी तथा सरसफाई आयोजना को बैठक संस्थाका अध्यक्ष श्री शान्तराज शर्मा को अध्यक्षतामा बसि निम्नानुसार को उपस्थिती मा तपसिल बमोजिमका निर्णय हरु गरियो ।

उपस्थिती

१. अध्यक्ष श्री शान्तराज शर्मा
२. उपाध्यक्ष श्री भिमा आचार्य
३. सचिव श्री ओम नाथ बराल
४. कोषाध्यक्ष श्री अर्जुन कु. अधिकारी
५. सदस्य श्री भरत प्रसाद पाण्डे
६. " श्री कुलध्वज मल्ल
७. " श्री विरबहादुर चौधरी
८. " श्री नारायण प्रसाद "
९. " श्री उपेन्द्र परियार
१०. " श्री प्रतिमा आचार्य
११. " श्री निर्मला चौधरी
१२. " श्री शिवध्वज मल्ल
१३. " श्री मिनराज भट्टराई
१४. " श्री नोखुराम चौधरी
१५. " श्री चुडामणि पोखेल
१६. " श्री दलिलाल चौधरी
१७. " श्री देव प्रसाद "
१८. " श्री देविराम शर्मा
१९. " श्री सुन्दर साही
२०. " श्री राम बहादुर शाही
२१. " श्री तुलसी प्रसाद गौतम
२२. " श्री पुरन प्रसाद चौधरी
२३. " श्री श्यामा रावल
२४. " श्री विष्णु रावत
२५. " श्री प्रकाश पौडेल
२६. " श्री सोभाराम आचार्य
२७. " श्री राम प्रसाद चौधरी
२८. " श्री पूर्ण के.सी.

३०. सदस्य श्री गोविन्द कुवर क्षेत्री

आमन्त्रित

३१. रा.गा.पा. अध्यक्ष श्री नुमानन्द दुवेदी
३२. " उपाध्यक्ष श्री जगदम्बा कु. चौधरी
३३. " वडा अध्यक्ष श्री गोवर्धन रावत
३४. " " " श्री विद्या सरण चौधरी
३५. " " श्री गोर्ख बहादुर शाही
३६. " " सदस्य श्री भानु चौधरी
३७. B.O.A/P.E.A.J.V. श्री योगेश साक्य
३८. सदस्य श्री रोहन प्रसाद चौधरी
३९. " श्री पुरन प्रसाद "
४०. " श्री लहान " "
४१. " श्री जगनारायण "
४२. " श्री तिलबहादुर थापा
४३. " श्री मधु प्रसाद दुवेदी
४४. " श्री भगवता अधिकारी
४५ श्री सर्वोदय मा.वि. सिसहनियाँ हेमराज अधिकारी (शिक्षक प्रतिनिधि)
४६. संस्था सदस्य श्री गणेश कुमार चौधरी
४७. श्री शंकर मा.वि. विभी/श्री ~~ओमकिन प्रसाद~~ राम कुमार "
४८ श्री हरि प्रसाद ग्यावाली
४९. श्री इन्दिरा पोखरेल
५०. श्री संगीता वेल्वासे
५१. संस्था सदस्य श्री तारा घिमिरे
५२ श्री कमला शर्मा
५३. श्री सर्वेश्वर अधिकारी
५४. श्री चन्द्र कला "
५५. श्री सान्ता दुवेदी
५६. श्री रीता के.सी.

प्रस्ताव

१- प्रारम्भीक वातावरणिय परिक्षण (IEE) सम्बन्धी सार्वजनिक अन्तरक्रिया कार्यक्रम सम्बन्धमा :-

निर्णय

प्रस्ताव नं. १ माथि छलफल गर्दा यस म्याग्दिकार तेस्रो साना सहरी - खानेपानी तथा सरसफाई आयोजना को मिति २०७५ सालमा उगते प्रकाशित प्रारम्भीक वातावरणिय परिक्षण (I.E.E) को सुचना अनुसार यस गा.पा. वडा नं. ५ को सभाकक्ष मा यस आयोजनाको कार्यान्वयन बाट वातावरणमा पर्न सक्ने असरहरु र सम्भाव्य न्युनिकरण रोकथामका उपाए हरु बारे विस्तारमा व्यापक सार्वजनिक छलफल गरियो। जसमा निम्नानुसार बुंदाहरु छन् ।

१- यस आयोजना का संरचना र स्थानहरुबारे विस्तृत रुपमा छलफल भयो।

२- यस आयोजना को निर्माण कार्य गर्दा वातावरणका भौतिक, नैतिक, सामाजिक आर्थिक पक्षहरुमा पर्न सक्ने असरहरु बारे जानकारी र छलफल भयो।

३- निर्माणको क्रममा शिव मंदिर वडा नं. ८ परिसर नजिकमा २५ मिटर देखि ४५ मिटर सम्म wall बनाउनु पर्ने सुझाव प्राप्त भयो।

४- शिवालयमा वडा नं. ८ कमसेकम डिस्टर्ब हुने गरि जालो तार बार गरि सुरक्षित तवरले काम गर्नु पर्ने सुझाव प्राप्त भयो।

५- निर्माण कार्यका लागि construction camp पिपरी चोक को वन कार्यालय को परिसर नजिकको जग्गा प्रयोग गर्न सक्ने सुझाव प्राप्त भयो।

६- आयोजना को अवधारणा का बारेमा गाउपालिका का अध्यक्ष र पूर्व टोल टोलमा जन समुदाय संग समन्वय गरि काम गर्न पर्ने सुझाव प्राप्त भयो।

[signatures]

UNOFFICIAL TRANSLATION

Date: 2075-12-08

Following decesion were made among the participants in the meeting held on 2075-Chaitra 8 (22nd March 2019), chaired by Mr. Shantaraj Sharma, Chairperson of Pragatinagar Urban Water Supply and Sanitation Project.

Presence

1. Mr. Shanta Raj Sharma , Chairperson
2. Mr. Bhima Acharaya ,Vice-Chairperson
3. Mr. Om Nath ,Secretary
4. Mr. Arjun Kumar Adhikari,Tresuror
5. Mr. Bharat Prasad Pandey, Member
6. Mr. Tulawaj Malla , Member
7. Mr. Bir Bahadur Chaudary ,Member
8. Mr. Naryan Prasad Chaudary, Member
9. Mr. Durga Prasad , Member
10. Mr. Thagendra Pariyar, Member
11. Ms. Partima Chaudary ,Member
12. Ms. Nirmala Chaudary , Member
13. Mr. Shivdhoj Malla ,Member
14. Mr. Jibraj Bhattarai, Member
15. Mr. Jokhuram Chaudary, Member
16. Mr. Churamani Pokharel, Member
17. Mr. Chabilal Chaudary ,Member
18. Mr. Dev Prasad Chaudary, Member
19. Mr. Deviram Sharma, Member
20. Mr. Sundar Sahi, Member
21. Mr. Ram Bahadur Shai, Member
22. Mr. Tulsi Prasad Gautam, Member
23. Mr. Puran Prasad Chaudary, Member
24. Mr. Shyam Raut, Member
25. Mr. Bishnu Raut, Member
26. Mr. Prakash Paudel, Member
27. Mr. Shovakhar Acharya, Member
28. Mr. Ram Prasad Chaudary, Member
29. Mr. Purna K.C. Member
30. Mr. Govinda Kunwar Chhetri, Member

Invitees

31. Mr. Numanand Subedi, Chairperson, Rapti Rural Municipality
32. Mr. Jagdamba Kumar Chaudary, Vice chairperson, Rapti Rural Municipality
33. Mr. Gobardhan Raut, Ward Chairperson, Rapti Rural Municipality
34. Mr. Bidhyasharan Chaudary, Ward Chairperson, Rapti Rural Municipality
35. Mr. Gokarna Bahadur Sharma, Ward Chariperson, Rapti Rural Municipality
36. Mr. Bhanu Chaudary, Member, Rapti Rural Municipality

37. Mr. Gokarna Bahadur Rana- ward chairperson-8
38. Mr. Yogesh Shakya, B.D.A/P.E.A. JV
39. Mr. Rohan Prasad Chaudary, Member
40. Mr. Puran Prasad Chaudary, Member
41. Mr. Lahan Prasad Chaudary, Member
42. Mr. Jagnaryan Chaudary, Member
43. Mr. Til Bahadur Thapa, Member
44. Mr. Madhu Prasad Subedi, Member
45. Ms. Bhagwata Adhikari, Member
46. Mr. Hemraj Subedi, Sarbodhaya Higher Secondary School, Sisahania
47. Mr. Ganesh Kumar Chaudary, Member of Organization
48. Mr. Omin Prasad Chaudary, Shankar Higher Secondary School, Pipara

Agenda and Decisions:

Agenda:

- Public consultation and interaction for Initial Environment Examainiation (IEE) of the project

Decision:

The meeting discussed about the potential envrionemental impacts that may arise during the implementation of project works and and ways to find out the measures to mitigate those impacts as follows;

1. The participants on meeting show concern about the possbile and potential bilogical, physical, social and economic impact to environmnet that may result during construcion work and ways to find out the measures to mitigate those impacts.
2. Meeting discussed detailly about the project location and infrastructures.
3. It was suggested to build 25 m up to 45 m wall near to Shiva temple premeises, ward no. 8.
4. It was also discussed that the works should be executed considering safety and without distrubing the near-by school in ward no. 8 Shivalaya, and demanded to fence the construction area with metal wire and work in safe mannaer while carrying our project work.
5. The participants pointed to use the avilable land nearby forest office premesis of Pipari Chwok to set up the construction/labor camp.
6. The Chairperson of Rapti Rural Municipality suggested to forge coordination with public community while conducting relevant construction works.

ANNEX 6:
SURVEY QUESTIONNAIRE

!= kl/ro

!=! cGtjf{tf lbg] AolQmsf] gfd 7]ufgfM

-s_ lhNnfM -v_ uf=lj=;M

-u_ 6f]n /:yfgM -3_ jf8{ g+=M

!=@ kfl/jfl/s ljj/0f

-s_ 3/d'lnsf] gfdM >Ldfg\ / >LdtL

==========

==========

-v_ hftLM -u_ pd]/M -3_ lnËM □ k'?if dlxnf □

-ª_ j}jflxs l:yltM -r_ wd{M -5_ Joj;fo -3/d'nLsf]_M

-h_ a;]sf] jif{M -em_ lzIff **M**

-`_ s'n kl/jf/ ;+Vof **========**

pd]/ ;d'x	**k'?if**	**k]zf**	**dlxnf**	**k]zf**	**hDdf**
)–% aif{					
^–!) aif{					
!!–!% aif{					
!^–$% aif{					
$%–^) aif{					
^) eGbf dfly					
hDdf					

!=# ljBfno hfg] pd]/sf afn aflnsf -^–!% aif{_

hDdf	**ljBfno uPsf**		**ljBfno guPsf**	
	k'?if	**dlxnf**	**k'?if**	**dlxnf**

@= ;flf/tf M -tkfO{sf] kl/jf/df_

	n]vk9 ug{ ;Sg]	P;=Pn=;L= plQ0f{	:gfts	:gftsf]Q/	hDdf
dlxnf					
k'?if					
hDdf					

#= s[lif -e'–pkof]u_

#=! tkfO{ jf kl/jf/ ;b:osf] gfddf uf=lj=;=**/** j8f leq hUuf 5 ?

5 □ 5}g □

#=@ olb 5 eg] slt 5 < /f]kgLdf eGg'xf]; M

s|=+;=	:jfldTj	v]t	af/L	v/jf/L	jg	s}lkmot
!	cfkm\g}					
@	;uf]nsf]					
#	sdfO{ cfPsf]					
$	sdfpg lbPsf]					
%	hDdf					

#=# uf=lj=;= jf j8f aflx/ s'g 7fpFdf hUuf 5 ?

s|;=	7fpFsf] gfd	hUuf				s}lkmot
		v]t	jf/L	v/jf/L	jg	

#=$ tkfO{sf] hUuf cfof]hgf leq k5{ ? (Please mention the component of project where HH falls)

3/	v]t
□ nDafO{ -lkm6df_	□ kfvf] af/L
□ rf}8fO{ -lkm6df_	□ h+un
□ 5fgf	□ cGo
□ tNnf	
□ sf]if	□ cGbfhL d"No -rngrNtLdf_

g]?=

-s_ cfof]hgf If]q leq tkfO{sf] sltj6f 3/ / uf]7 5g\ .

3/ ☐ uf]7 ☐

s|=;+=	lsl;d	lf]qkmn
3/ !		
3/ @		
3/ #		

-!_ sRrL–v/n] 5fPsf] -@_ kSsL -9'Ëf, O{6fsf] kvf{n / 9nfg lemu6L jf l6gsf] 5fgf] _

	;+Vof	lf]qkmn
uf]7		
cGo -v'nfpg]_		

#=% -s_ tkfO{sf] cfof]hgf lf]q leq kg{] hldgdf s'g s'g km;n nufpg' x'G5 ?

s|+;+=	vfBfGg jfnL	jfnL nufPsf] lf]qkmn	pTkfbg kl/0ffd
!= vfBfGg afnL			
	wfg		
	ux'		
	ds}		
	sf]bf]		
	bfn u]8fu'8L		
	cGo		
@= gub] jfnL			
	cfn'		
	tf]/L		
	t/sf/L		
	cGo		

-v_ pQm hUufdf nufPsf] kmnkm"n / cGo af]6 lj?jfsf] ljj/0f lbg'xf]; ?

s|+;+=	af]6lj?jf	lj?jf ;+Vof		hDdf
		kmn nfPsf]	kmn gnfPsf]	
!	kmnkm"n			
@	sfutL			
#	;'Gtnf			

s|+;+=	af]6lj?jf	lj?jf ;+Vof		hDdf
		kmn nfPsf]	kmn gnfPsf]	
%	cfFk			
^	d]jf			
&	cDaf			
*	lnRrL			
(	s6x/			
!)	s]/f			
!!	cf?			
!@	gf:kftL			
!#	cf?jv8f			
!$	cGo			
!%	8fn] 3fF;			
!^	kfv'/L			
!&	sfe|f]			
!*	j8x/			
!(	vgfof]			
@)	6fsL			
@!	lub/L			
@@	cGo			
@#	OGwgsf] nflu k|of]u ug]{ af]6 lj?jf			
@$	sf7df k|of]u x'g] af]6lj?jf			
@%	jfF; lgufnf]			

#=^ s] tkfO{sf] hUufdf ePsf] ut aif{sf] pTkfbgn] tkfO{sf] kl/jf/nfO{ vfg kof{Kt eof] ?

eof] ☐ ePg ☐

#=& olb ck\|of{Kt eof] eg] slt dlxgfsf] nflu k'u]g ? dlxgf

-s_ ltg dlxgf -v_ 5 dlxgf

-u_ gf} dlxgf -3_ afx\| dlxgf

#=* cfˆgf] pTkflbt vfBfGg ck|of{Kt ePsf] a]nf cfˆgf] kl/jf/nfO{ s;/L v'jfpg' x'G5 <

s= C0f u/]/ v= gf]s/Laf6 ePsf] cfDbfgLaf6
u= Jofkf/Lsf] cfDbfgLaf6 3= ef/L af]s]/ ePsf] cfDbfgLaf6
8= b}lgs dhb'/af6 ePsf] r= cGo
==========

#=(kz'kfng ;DaGwL M
tkfO{sf] 3/df slt ÷s:tf kz' kIfLx? kfNg' ePsf] 5 ?

s|=;+=	kz'k+IfL	;+Vof
!	ufO{	
@	uf]?	
#	e};L	
$	af5f	
%	afl5	
^	kf8f	
&	kfl8	
*	/fFuf]	
(	3f]8f	
!)	afv|f	
!!	af]sf	
!@	v;L	
!#	kf7f÷kf7L	
!$	;'Fu'/÷a+u'/	
!%	xfF;	
!^	s'v'/f	
!*	cGo -v'nfpg]_	

$= 3/ kl/jf/sf] jflif{s cf}ift cfDbfgL M

>f]t	Jfflif{s cfDbfgL -?=_	>f]t	jflif{s cfDbfgL -?=_
s[lifaf6		cGo >f]tx?	

vfBfGg		gf]s/L, ;]jf	
gub]jfnL		Hofnf dhb'/L / e/Lof	
kmnkm'n		lgj[lte/0f	
hDdf -!_		Jofkf/	
kz'kfngaf6		3/]n' pBf]u	
b'Uw pTkfbg		k]zfut ;]jf	
c08f s'v'/f xfF; lasL|		df5f lasL|	
af5f÷af5L÷uf]? ÷lals|		cGo	
e}l; ÷/fFuf] lals|		hDdf -#_	
af]sf÷v;L÷e]8f÷afv|f lals|			
;'u+/÷a+u'/ lals|			
s'v'/f÷xfF; ljls|			
hDdf -@_			
hDdf cfo -!+@+#_M			

%= 3/ kl/jf/sf] jflif{s cf}ift vr{ M

ljj/0f	hDdf /sd -?=_	ljj/0f	hDdf /sd -?=_
Rf.dn		Lrof	
Bfn		bfp/f	
ds}		lah'nL	
t/sf/L		dl§t]n	
b'3÷bxL		cf}iflw	
df5f÷df;'		lzIff	
t]n÷Wo"		sk8f	
d/–d;nf		rf8kj{	
g'g		cGo	
lrgL			
		hDdf vr{	

^=kfgLsf] cfk"lt{

-s_ tkfO{n] o; vf]nfsf] kfgL pkof]u ug'{ x'G5 ls x'b}g ?

u5'{ □ ulb{g □

-v_ olb vf]nfsf] kfgL k|of]u ug'{ x'G5 eg] s'g k|of]hgsf] nflu k|of]u ug'{x'G5 ?

l;+rfO{ □ g'xfpg], sk8f w'g] □

lkpg] □ cGo □

&=:jf:Yo ;DalGwM

-s_ tkfO{sf] kl/jf/df s'g} ;b:o ljut jif{df lj/fdL ePsf lyP ?

lyP □ lyPgg\ □

-v_olb lyP eg] lgDg ljj/0f lbg'xf];\ ?

s|;+	gftf	k'?if	dlxnf	pd]/	/f]u
!					
@					
#					
$					

-/f]usf] k|sf/M– lb;fkvfnf, cfp+, 6fOkmfO{8, x}hf, dn]l/of, 6LjL, hG8L;, 5fnf ;DaGwL, lgdf]lgof, bd, /Strfk, P8\; / of}g /f]u, cGo_

-u_ lj/fdL kbf{ ;j{k|yd sxfF hfg'x'G5

==========

-3_ ToxfF lgsf] geP sxfF hfg'x'G5 ? s|dz pNn]v ug'{xf]; .

s|+=;+	hfg] 7fpF	/x]sf] :yfg	b"/L -ls=dL=_
!	c:ktfn		
@	x]Nykf]:6		
#	x]Ny ;]G6/		

$	cfo'a]{lbs cf}ifwfno		
%	lglh lSnlgs/cf}ifwL k;n		
^	wfdL emfs|L		
&	cGo		

***= dlxnfsf] cj:yfM**

-s_ >dsf] jlu{s/0f

s|+=;+	**sfdsf] ljj/0f**	**lx:;f k|ltztdf**	
		k'?if	**dlxnf**
!	vghf]t		
@	dn /fVg]		
#	hldg tof/L		
%	/f]Kg]		
^	uf]8d]n		
&	l;+rfO{		
*****	sf6\g]		
(	af]Sg] / yGsfpg]		
!)	cGg k|;f]wg -s'6fO{ lk;fO{_		
!!	3fF; bfp/f		
!@	uf]7fnf]		
!#	d]nfkft		
!$	vfgf ksfpg]		
!%	kfgL kw]/f]		
!^	aRrfaRrL / a'9fa'9L x]/ljrf/		

-v_ ;DklQdf clwsf/

s|+=;+	**sfdsf] ljj/0f**	**lx:;f k|ltztdf**	
		k'?if	**dlxnf**

s|+=;+	sfdsf] ljj/0f	lx:;f k|ltztdf	
		k'?if	dlxnf
!	3/		
@	hUuf		
#	kz'		
%	u/uxgf		
^	pBf]u wGbf		
&	cGo		

-u_ lg0f{o k|ls|ofdf clwsf/

s|+=;+	sfdsf] ljj/0f	lx:;f k|ltztdf	
		k'?if	dlxnf
!	jfnL /f]Hg]		
@	kz' v/Lbljs|L		
#	u/uxgf v/Lbljs|L		
%	cGg v/Lbljs|L		
^	kmnkm"n v/Lbljs|L		
&	kz'hGo kbfy{ v/Lbljs|L		
*	sf7 bfp/f v/Lbljs|L		
(	ljxfjf/L		
!)	kl/jf/ lgof]hg		
!!	5f]/f5f]/L k9fO{ n]vfO{		
!@	cGo		

(= d'cfAhf ;DaGwLM

-s_ tkfO{sf] 3/ **/** hUufsf] d'cfAhf s] df rfxg' x'G5

gub □ hUufsf] ;§f hUuf □ cGo □

-v_ olb tkfO{n] d'cfAhf gubdf kfpg' eof] eg] pQm d'cfAhf /sd s] df k|of]u ug'{ x'G5

hUuf lsGg] □ 3/ jgfpg] □ C0f ltg]{ □

Aofkf/ ug]{ □ cGo □

!)= k|:tfj sfof{Gjog ubf{ s] s:tf] k|efj kg{ ;Sb5 ;f] ;DaGwL /fo ;'emfj 5

;sf/fTdsM gsf/fTdsM

Household Survey

1= Introduction

1=1 Name and Address of RespondentM

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

-3_ Tole -4_ Ward No.

1.2 Family Description/Details

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

-2_ Cast: -3_ AgeM -4_ SexM ☐ Male Female ☐

-5_ Marital StatusM -6_ ReligionM -7_ Business-House owner

-8_ Year of StayM -9_ Education **M**

-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	af/L	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	jf/L	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 M

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 M

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_M			

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 M– 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		

S.N.	Work description	Part of work (%)	
		Male	Female
9	Food proceeding – thrashing/grinding_		
10	Grass/wood collection		
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

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

QS Test Report / Certificate

NS Accreditation No. Pra. 01/053-54

Entry No. : NCL - 71(W) (1) - 09 - 2017
Sample : Boring Water
Client : BDA PEA JV
Sampled By : Client

Date Received : 03 - 09 - 2017
Date Completed : 06 - 09 - 2017
Sampling Date : 31 - 08- 2017
Location : Sishaniya-Pragatinagar, Dang

S. N.	Parameters	Test Methods	Observed Values	NDWQS, Nepal
1.	pH at 23°C	Electromeric, 4500 - H^+ B, APHA	7.1	6.5 - 8.5
2.	Electrical Conductivity, (µS/cm)	Conductivity Meter, 2510 B, APHA	510	1500
3.	Turbidity, (NTU)	Nephelometric, 2130 B, APHA	<1	5
4.	Total Hardness as $CaCO_3$, (mg/L)	EDTA Titrimetric, 2340 C, APHA	272	500
5.	Total Alkalinity as $CaCO_3$, (mg/L)	Titrimetric, 2320 B, APHA	295	-
6.	Chloride, (mg/L)	Argentometric Titration, 4500 - Cl^- B, APHA	2.98	250
7.	Ammonia, (mg/L)	Direct Nesslerization, 4500 - NH_3 C APHA	0.17	1.5
8.	Nitrate, (mg/L)	UV Spectrophotometric Screening, 4500 - NO_3^- B, APHA	4.58	50
9.	Nitrite, (mg/L)	NEDA, Colorimetric, 4500 - NO_2^- B, APHA	<0.02	-
10.	Calcium, (mg/L)	EDTA Titrimetric, 3500 - Ca B & 3500 - Mg B APHA	85.77	200
11.	Magnesium, (mg/L)		14.10	-
12.	Arsenic, (mg/L)	SDDC, 3500 - As, C. APHA	N. D. (<0.01)	0.05
13.	Iron, (mg/L)	Direct Air - Acetylene AAS, 3111 B, APHA	0.07	0.3
14.	Manganese, (mg/L)		N. D. (<0.02)	0.2

N. D.: Not Detected

Note:
NDWQS: National Drinking Water Quality Standard - 2063; AAS: Atomic Absorption Spectrophotometer; UV: Ultraviolet; EDTA: Ethyelenediaminetetraacetic acid; NTU: Nephelometric turbidity unit; NEDA: N-1-Naphthyleethylenediamine dihydrochloride; APHA: American Public Health Association.

Remarks: All observed values complied the prescribed NDWQS for drinking water.

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

Note:
1. This report/certificate is in reference to Laboratory Quality Control Manual, QS (012), section OPT.
2. The result listed refer only to the tested samples & applicable parameters. Endorsement of products is neither inferred nor implied.
3. Liability of our institute is limited to the invoiced test parameters & amount only.
4. Samples will be destroyed after one month from the date of issue of test certificate unless otherwise specified.
5. This report is not to be reproduced wholly / partially & cannot be used as an evidence in the Court of Law & should not be used in any advertizing media without our permission in writing.
6. The clients are requested to take back their hazardous samples along with the report/certificate

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.nessptd.com

NESS/Lab, M-03/R1.1

QS Test Report / Certificate

NS Accreditation No. Pra. 01/053-54

Entry No. : NCL - 362(W) (1) - 02 - 2018
Date Received : 28 - 02 - 2018
Sample : Ground Water
Date Completed : 15 - 03 - 2018
Client : BDA PEA JV
Sampled By : Client
Project : Pragatinagar Third Small Town Water Supply Project
Location : Latmatiya, Masuriya

S. N.	Parameters	Test Methods	Observed Values	NDWQS, Nepal
1.	pH at 20°C	Electromeric, 4500 - H^+ B, APHA	7.8	6.5 - 8.5
2.	Electrical Conductivity, (µS/cm)	Conductivity Meter, 2510 B, APHA	357	1500
3.	Turbidity, (NTU)	Nephelometric, 2130 B, APHA	2	5
4.	Color, (Chromacity Unit)	Spectrophotometric, 2120 C, APHA	N. D. (<0.05)	5
5.	Total Hardness as $CaCO_3$, (mg/L)	EDTA Titrimetric, 2340 C, APHA	212	500
6.	Total Alkalinity as $CaCO_3$, (mg/L)	Titrimetric, 2320 B, APHA	223	-
7.	Bicarbonate Alkalinity, (mg/L)		223	-
8.	Chloride, (mg/L)	Argentometric Titration, 4500 - Cl^- B, APHA	4.93	250
9.	Ammonia, (mg/L)	Direct Nesslerization, 4500 - NH_3 C APHA	0.05	1.5
10.	Nitrate, (mg/L)	UV Spectrophotometric Screening, 4500 - NO_3^- B, APHA	6.57	50
11.	Nitrite, (mg/L)	NEDA, Colorimetric, 4500 - NO_2^- B, APHA	N. D. (<0.02)	-
12	Fluoride, (mg/L)	SPANDS, 4500 – F D, APHA	<0.05	0.5-1.5
13.	Sulphate, (mg/L)	Gravimetric Method with Ignition of Residue, 4500 – SO_4^{2-} C, APHA	<1	250
14.	Calcium, (mg/L)	EDTA Titrimetric, 3500 - Ca B & 3500 - Mg B APHA	60.92	200
15.	Magnesium, (mg/L)		14.58	-
16.	Arsenic, (mg/L)	SDDC, 3500 - As, C: APHA	N. D. (<0.01)	0.05
17.	Iron, (mg/L)	Direct Air - Acetylene AAS, 3111 B, APHA	N. D. (<0.05)	0.3
18.	Manganese, (mg/L)		N. D. (<0.02)	0.2

N. D.: Not Detected

Note:
NDWQS: National Drinking Water Quality Standard - 2063; AAS: Atomic Absorption Spectrophotometer; UV: Ultraviolet; EDTA: Ethyelenediaminetetraacetic acid; NTU: Nephelometric turbidity unit; NEDA: N-1-Naphthyleethylenediamine dihydrochloride; APHA: American Public Health Association.

Remarks: All observed values complied the prescribed NDWQS for drinking water.

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

Note:
1. This report/certificate is in reference to Laboratory Quality Control Manual, QS (017).
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.
4. Samples will be destroyed after three months from the date of issue of test certificate unless otherwise specified.
5. This report is not to be reproduced wholly / partially & cannot be used as an evidence in the Court of Law & should not be used in any advertizing media without our permission in writing.
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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:

SN	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:

SN	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 focussing 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:

y. 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:
z. 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 and what is their religious significance
Is any of the temple lies close to the project sites
What are key festivals of the 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, middle and higher/secondary schools – students and teachers number
ents and teachers
Name the health posts – number of health workers
Telephone numbers, Name of the post office, name of the industries
Water supply system and coverage (mode of water fetching for households)
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)

ANNEX 10:
CONSENT LETTERS FROM LOCAL STAKEHOLDERS

अनुसूची -२

(नियम ६ को उपनियम (१) संग सम्बन्धित)

जिल्ला जलस्रोत समिति, दाङ

उपभोक्ता संस्था दर्ता प्रमाण-पत्र

दर्ता नं: २९३
दर्ता मिति : 2065/8/96

मिति : 2065/8/96

नेपाल सरकार जिल्ला जलस्रोत समिति दाङ

श्री प्रगतीनगर तेस्रो साना शहरी खानेपानी तथा सरसफाई आयोजना,
राप्ती गा.पा. ५, प्रगतीनगर दाङ ।

जलस्रोत ऐन, २०४९ को दफा ५ को उपदफा (२) तथा जलस्रोत नियमावली २०५० को नियम ६ को उपनियम (१) बमोजिम सर्वोदय मा.वि. सिसहनियाको कि.नं. ५ क २२१ को दक्षिण पश्चिम, शंकर मा.वि. पिपरीको कि.नं. १३८४ र राप्ती गा.पा. ८ पिपरी स्थित शिवमन्दिरले भोगचलन गरेको कि.नं. ४क १३८५ को दक्षिण तर्फको जमीनमा डिप बोरीङ गरी प्राप्त जलस्रोत उपयोग गर्ने गरी जिल्ला जलस्रोत समिति दाङको मिति २०७५।२।१६ को निर्णयानुसार संस्था दर्ता गरी प्रमाणपत्र प्रदान गरिएको छ । प्रचलित कानून र स्वीकृत विधान बमोजिम आफ्नो कार्य संचालन गर्नुहुन ।

सही :

नाम, थर : श्री कृष्ण प्रसाद गौतम
पद : सदस्य -सचिव
सदस्य सचिव

REGISTRATION UNDER DISTRICT WATER RESOURCE COMMITTEE

UNOFFICIAL TRANSLATION

District Water Resource Committee, Dang

Registration Certificate of User Committee

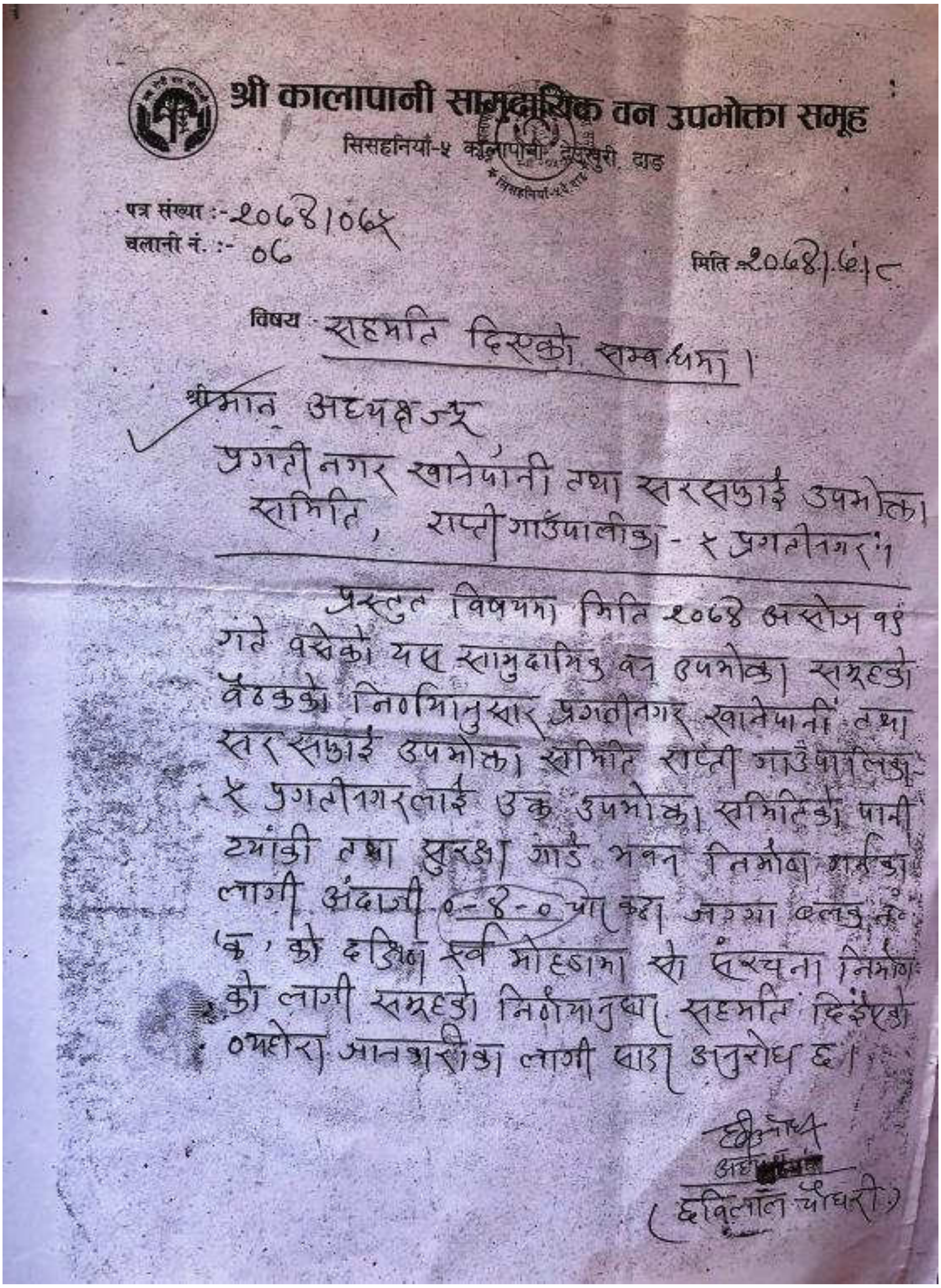
Entry no.: 219
Entry date: 31 May 2018 Date: 31 May 2018

M/S Pragatinagar Water Supply and Sanitation Project
Ward 5, Rapti Rural Municipality, Dang.

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 right to use of water resources from deep boring water sources (South west Plot of Plot No. 5-Ka-221 of Sarbodaya Sec. School of Sisahniya; Plot No. 1384 of Shankar Secondary School of Pipari; Southern plot of Plot No. 4-Ka-1385 of land of Shiva Mandir area) has been awarded as per the committee's decision of date 31st May 2018.

Mr Krishna Prasad Gautam
Member-Secretary

(SIGNED AND STAMPED)



श्री कालापानी सामुदायिक वन उपभोक्ता समूह
सिसहनियाँ-५ कालापानी, देउखुरी, दाङ

पत्र संख्या :- २०६८।०६९
चलानी नं. :- ०६

मिति २०६८।६।१८

विषय : सहमति दिइएको सम्बन्धमा।

श्रीमान् अध्यक्षज्यू
प्रगतीनगर खानेपानी तथा सरसफाई उपभोक्ता समिति, राप्ती गाउँपालीका - ५ प्रगतीनगर।

प्रस्तुत विषयमा मिति २०६८ असोज १६ गते बसेको यस सामुदायिक वन उपभोक्ता समूहको बैठकको निर्णयानुसार प्रगतीनगर खानेपानी तथा सरसफाई उपभोक्ता समिति राप्ती गाउँपालिका-५ प्रगतीनगरलाई उक्त उपभोक्ता समितिको पानी ट्यांकी तथा सुरक्षा गार्ड भवन निर्माण गर्नका लागी अंदाजी ०-४-० को जग्गा ब्लक नं 'क' को दक्षिण पूर्व मोहडामा सो संरचना निर्माण को लागी समूहको निर्णयानुसार सहमति दिइएको व्यहोरा जानकारीका लागी यसै अनुरोध छ।

अध्यक्ष
(छविलाल चौधरी)

Consent Letter from Kalapani Samudayik Ban for use of its 4 Katha land

UNOFFICIAL TRANSLATION

Shree Kalapani Samudayik Ban Upabhokta Samuha
Sishaniya-5 Kalapani Deukhuri Dang

Letter no: 2074/075
Dispatch No:-07 Date: 2074/07/08 (2017-10-25)

Sub: Consent Provided

Mr. Chiarperson
Pragatinagar Drinking Water and Sanitation User Committee, Rapti Rural Municipality-5
Pragatinagar

Regarding the above mentioned subject matter, according to the decision of meeting of Forest User Group held on 2074 Ashoj, 19 (2017-November-05), it is informed that permission has been given for use of about 0-4-0 (Four Kattha land- block no "Ka" of north-east side) to Drinking Water and Sanitation User Committee Rapti Rural Municipality-5 Pragatinagar to build Reservoir Tank and Guard house.

Chairperson
Chabilal Chaudhari

(SIGNED AND STAMPED)

वि.द.नं. _____

का.यो.द.नं. _____

श्री शंकर सामुदायिक बन उपभोक्ता समूह

राप्ती ना.पा.-८ पिपरी, देउखुरी, दाङ

पत्र संख्या :- ०६४/०६५

चलानी नं. :- ४९

मिति ०६४/६/२५

विषय :- निर्णय प्रतिलिपी पठाएको सम्बन्धमा

श्री मान अध्यक्ष ज्यू,

प्रगति नगर तेस्रो साना शहरी खाने पानी तथा सरसफाई आयोजना प्रगति नगर सिलहानथा

उपरोक्त सम्बन्धमा नेपाल सरकार केन्द्रीय खाने पानी आयोजना पानी पोखरी काठमाडौं बाट संचालन हुने तेस्रो साना शहरी खाने पानी तथा सरसफाई आयोजनाले यस शंकर सा. व. भवन पूर्व तर्फ सर्वे समेत गरेको जग्गा ०-१-० क्षेत्रफल टपुस संस्था लाई भोगाधिकार दिने निर्णय भएकोले यसै पत्र साथ सोको प्रतिलिपी समेत राखि पठाइएको व्यहोरा अनुरोध छ।

धन्यवाद।

सचिव

UNOFFICIAL TRANSLATION

SHREE SANKAR COMMUNITY FOREST USER GROUP
RAPTI RURAL MUNICIPALITY-8 PIPARI, DEUKHURI, DANG

Letter no: - 074-075
Outgoing reference no: 09 Date: 074-6-25 (2017-10-11)

Subject: Regarding the copies of decision.

Mr. Chairperson,
Pragatinagar Third Small Town Water Supply and Sanitation Project, Pragatinagar Sishniya
As mentioned, consensus has been made to provide the parcel no; 0-1-0 area of land located at east of Sankar Community Building which has been already survey for the project of Government of Nepal, Central Drinking water Project, Panipokhari. The copies of decisions are attached herewith.

Tara Ghimire
Secretary
(SIGNED AND STAMPED)

ANNEX 11:
PHOTOGRAPHS

Photo 1: Public Consultation to discuss environmental concerns

Photo 2: Feedback from the local representatives in Public Consultation

Photo 3: Tube Well Boring and Reservoir Sites of Kalapani System

Photo 4: Proposed site for reservoir and treatment unit in WN 8

Photo 5: Reservoir of Existing Singhe System

Photo 6: Existing shallow tubewell in project area

Photo 7: Track through which Transmission Mains of Kalapani System

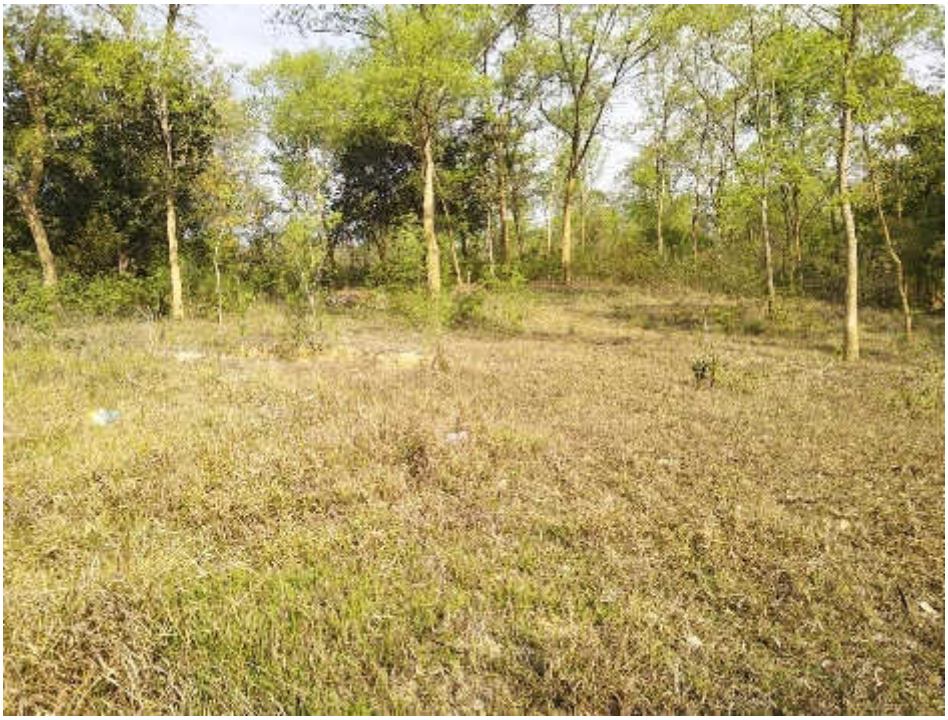


Photo 8: Site for proposed reservoir tank and guard house; Kalapani

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): Pragatinagar (Dang District) Water Supply and Sanitation Subproject**		
Loan No.:	3711	**Package No.:**	**W10**

Components:

	Components	**Nos.**	**Description (Volume / Capacity / Footprint Area / Length)**
1.	New Tube wells	4	100 to 150 m depth
2.	Service Reservoirs (OHT/ RVT, Valve Chambers and surface valve box, etc.)	3 nos.	850 cu. m.
	Treatment facility subcomponents:		
3.	Aerators	4 nos.	1.5 m - 1.8 m diameter
4.	Pressure Filters	8 nos.	1.7 m - 2.0 m diameter
5.	Disinfection Units	4 nos.	Mixing tank - 1000L Dosing tank - 250 L
6.	Water Quality Testing Laboratory	1 no.	24 sq. m.
7.	Distribution Network.	1 network	66.093 km.
8.	Transmission Mains.	1 network	2.474 km.
9.	Pumps (including related accessories, electrical panels, generators, etc.)	4 nos. (4 standby)	30 kw
10.	Fire Hydrants	8 nos.	For base year
11.	House Connections.	2,406	For base year
12.	11 KV transmission lines	1 network	1.6 km
13.	Electrical Transformers	2 nos.	1 of 100 KVA 1 of 200 KVA
14.	Office Building	1 no.	255 sq. m.
15.	Guard House	2 nos.	35 sq. m. each
16.	Generator House	2 no.	30 sq. m. each
17.	Standby Electrical Generator	2 nos.	1 of 125 KVA 1 of 250 KVA
18.	Public Toilets	1 no.	41 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.[1]	**Yes**	**No**	
		X		
2.	Environmental assessment based on latest project components and design	**Yes**	**No**	
		X		
3.	Statutory Requirements[2]		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. PMO to attach copy of approval document in the 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	

[1] 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. [2] If applicable, include date accomplished or obtained.

		Yes	Environmental standards (IFC's EHS Guidelines)	
6.	Anticipated environmental impacts and mitigation measures	**assessed impacts and risks:**	**mitigation measures included:**	

	Activity	**Status**				**Detailed Comments and Further Actions Required**
				Yes	**No**	**n/a**	
			Biodiversity conservation			X	
			Pollution prevention and abatement	X			
			Health and safety	X			
			Physical cultural resources	X			
			Cumulative impacts			X	
			Transboundary impacts			X	
7.	Impacts from Associated Facilities[2]	**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 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				
12.		**Yes**		**No**		

[2] 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.

	Grievance Redress Mechanism	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.

	Activity	**Status**		**Detailed Comments and Further Actions Required**
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**	PMO to include in the first SEMR the status of appointment PMO Environmental Officer.
		???		
15.	Mobilized RPMO Environment Specialist	**Yes**	**No**	PMO to include in the first SEMR the status of appointment RPMO Environmental Officer.
		???		
16.	Mobilized PMQAC / DRTAC Environment Specialists	**Yes**	**No**	PMO to include in the first SEMR the status of appointment PMQAC / DRTAC Environment Specialists.
		???		
17.	Mobilized DSMC/RDMSC Environment Specialists	**Yes**	**No**	PMO to include in the first SEMR the status of appointment DSMC/RDSMC Environment Specialists.
		???		
18.	Confirm bid and contract documents and/or EMP include requirement for the contractor to appoint EHS supervisor and/or nodal person for environment safeguards	**Yes**	**No**	
		X		Section VIII explains 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 DRTACESS 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**			
	Prepared by: *(name, designation and date)*	Miguel B. Diangan, Jr. Safeguards Specialist (Consultant), SAUW 20 August 2019		
	Noted and Checked By: *(name, designation and date)*	Ninette Pajarillaga Environment Specialist, SAUW 20 August 2019		
	Activity	**Status**		**Detailed Comments and Further Actions Required**
	Documents/References:	1. Final IEE of Pratinagar Subproject 2. EARF of UWSSP.		