Initial Environmental Examination

November2020

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

DadhikotUrban Water Supply and Sanitation Project
Suryabinayak, Bhaktapur 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
PMQAC	Project Management and Quality Assurance Consultant
PPTA	Project Preparation Technical Assistance
PPM	Parts Per Million
REA	Rapid environmental assessment
ROW	Right of way
RPMO	Regional Project Management Office
SCADA	Supervisory Control and Data Acquisition
SDG	Sustainable Development Goal
SEMP	Site-specific environmental management plan
SPS	Safeguard Policy Statement
TDF	Town Development Fund
ToR	Terms of Reference
TPO	Town Project Office

UWSSP	Urban Water Supply and Sanitation Sector Project
USD	United States Dollar
VDC	Village Development Committee
WHO	World Health Organization
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.

Table of Contents

LIST OF TABLES

LIST OF ANNEXES

EXECUTIVE SUMMARY

The Urban Water Supply and Sanitation (Sector) Project (UWSSP) 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.

Dadhikot Urban Water Supply and Sanitation Project is located in Suryabinayak Municipality of Bhaktapur district in Bagmati Province of Nepal. The location of the subproject area is 27°38'33"N to 27°40'08" N and Longitude 85°21'39" E to 85°28'35" E Longitude. The municipality is bordered by Bhaktapur Municipality, Changunarayan Municipality and Madhyapur Thimi Municipality on the north direction, Mahalaxmi Municipality on South-West direction, Panauti Municipality on South-East direction and Banepa Municipality on East direction. The Project area of Dadhikot Urban Water Supply and Sanitation Project lies in Dadhikot area, the then Dadhikot VDC.

The service area of the proposed subproject covers ward 4 and some parts of ward 1 of Suryabinayak Municipality. There are around 8293 number of private taps and around 2947 public taps within the municipality. However, coverage is not enough and is not systematic. In dry season of months, the proposed service area faces water scarcity. The level of services in terms of quality, quantity, coverage is quite insufficient. Regarding the perception of beneficiaries towards water quality, 77% of the respondents replied that the quality of supplied water is unsatisfactory due to bad taste and smell. 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. The survey showed that 0.7% of the households of the service area had pit latrines. It was observed that all the colleges/schools, hospital and government offices have toilets.

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

Categorization: Dadhikot 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 have been referred. 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 UWSSP to improve water supply and sanitation service delivery in ward number 4 and 1 of Suryabinayak Municipality. Investments under this subproject include DTWs, 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. 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. 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 project area is characterized by hilly terrain. The altitude ranges from 1290 m to 1900 m above mean sea level. The project area has undulating terrain warm and temperate climatic conditions. The average annual temperature is 17.9°C and the average annual rainfall is 1583 mm. Most precipitation falls between June to August. Generally April and May are the driest months of the year. The project area is bounded by nearby Hanumante River in the north. The project area doesn't fall within protected area. No ecologically sensitive areas are present in close vicinity of the project area.

The project area is featured with agricultural belts, scattered vegetation/forest and clustered settlements along with some scattered small settlements in hills. Although, the economy of the area is agriculture based, the survey shows that primary occupation of 41.5% household heads is services while 22.8% of them are involved in agriculture and 22.3% of them are involved in business. Around 7% are involved in foreign employment, and 2.3% in wage-based works.

Environmental Impacts: During the construction phase, impacts mainly arise due to slope stability concerns and concerns of vegetation protection. There is need of felling around 12 pine trees in *Dakshin Barahi*OHT site. The impacts will also be from the need to dispose of moderate quantities of waste soil as well as waste from construction campsites; and disturbance to residents, businesses, and local traffic due to the project activities. These temporary impacts of construction and will be minimized by using best construction methods. Traffic management will be necessary during pipe laying on busy roads. Occupational health and safety along with community health and safety aspects are also to be considered during the construction phase. Risks while working along the hilly terrain, and the current context of possible spread of viral infections are also among the challenges for the project development.

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 works along with implementation of WSP 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.

Environment ManagementPlan: 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.

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) 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.

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 safeguards teams will be mobilized in all work fronts and tiers. The contractor

will be required to prepare a Site Specific EMP document before start of the construction works, and the contractor will be required to depute a site based EHS focal person for the subproject.

Indicative cost for EMP implementation is NRs 2,820,595. The EMP and cost of EMP implementation will be included in civil works bidding and contract documents.

Consultation, Disclosure, and Grievance Redress Mechanism: Public consultations were done in the preparation of the subproject and IEE. The beneficiaries, the municipality office, WUSC and other stakeholders were consulted during the consultation. Consultations will be carried throughout the subproject development and its implementation period. A grievance redress mechanism will be in place to ensure any public grievances are addressed quickly.

Monitoring and Reporting: The PMO/RPMO and the CRDSMC will be responsible for environmental monitoring. The CRDSMC will submit monthly, quarterly and bi-annual 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: Dadhikot Urban Water Supply and Sanitation Project will bring a series of benefits to the local people - primarily improved accessibility to quality drinking water, and improved sanitation. However, there are some risks in the commencement of the subproject - primarily the impacts on the local environment while working in the hilly terrain with scattered settlements. The analysis shows that subproject benefits outweigh the risks and these potential risks can be overcome through proper planning, coordination and management. 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 (UWSSP) will support the Government of Nepal (the government) in providing better access to water supply and sanitation (WSS) in selected municipalities (project municipalities)[1] in Nepal. The Asian Development Bank (ADB) has supported the government in providing improved WSS services through three earlier projects.[2] Drawing on experience and lessons, this project will fund physical investments in WSS infrastructure in project municipalities and non-physical investments strengthening institutional and community capacity, service delivery, and advanced preparation of future investments.[3]

2. The Ministry of Water Supply (MoWS) is responsible for planning, implementation, regulation, and monitoring of WSS. The Department of Water Supply and Sewerage 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. UWSSPis 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 and

[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.

monitoring of UWSSP. There are Regional PMOs (RPMOs) to manage day-to-day project implementation at the subproject/municipality levels. After construction including a one-year O&M period by the contractor, subprojects will be operated by the municipality itself or a user association such as the Water Users Associations (WUAs).[8]

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

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

5. The municipality is served by existing sources. However, the system does not sufficiently meet the needs of the people, regarding both quantity and quality. For the knowledge of water quality, a DTW ground water sources close to project area has been referred. The results of the test have shown that chemical and microbial quality of water meets National Drinking Water Quality Standards (NDWQS) and the laboratory test report has been provided in Annex 8.

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-1below 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. 84; 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. 147 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.
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 1:10 for any tree cutting. (Complying with the national requirements)	Complied	Need of felling small to medium sized trees only. 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	No such issues in case of DTWs. For only one, and a small intake structure, this has been discussed, as it is an existing system and hence no 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 150 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	Complied	WQ of existing source within the

[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)

Subproject Selection Criteria in EARF		Status of Compliance (Complied / Not Complied / Not Applicable	Remarks (Provide basis of compliance)
	with National Drinking Water Quality Guidelines on Arsenic.[14]		service area has been taken as base (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, shops) to avoid noise impact.	Complied	Additionally, the WTP Units are compact units
14.	Proposed location of any WTP will be fenced or have security provided to them.	Complied	These have been incorporated in the design
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	NA	No public toilet in the proposed design
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.	NA	No public toilet in the proposed design
24.	Septic tanks will be designed as per national standards and codes to allow for maximum	NA	No public toilet in the proposed design

[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)
	retention of septage (minimum 3 years) and water sealing.		
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).	NA	No public toilet in the proposed design
26.	An O&M plan is developed providing details on the frequency and responsibility for collection and disposal of septage at approved site, and commitment to provide minimum operational staff and operate the facilities sustainably is given by WUAs or municipalities.	NA	No public toilet in the proposed design
27.	Hygiene promotion campaign and educational program is developed to promote open defecation free (ODF) in the town, and WUA or municipality commits to implementing it.	Complied	The total sanitation promotion has been inbuilt in this subproject; (Section VIII; Page 66, 68)

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, UWSSP' 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. ADB policy requires 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. As per the new EPA 2019 and EPR 2020 of GoN, the threshold of water supply projects requiring IEE study is the population range of 50,000 to 200,000. Since the design population of the proposed project is 49,194, the project doesn't require IEE.

Table I-2: Criteria for Requirement of IEE for Drinking Water Supply Projects as per Schedule 2; Clause H of Environment Protection Rules 2020

SN	Condition described in the Act and Rules	IEE Required as per the EPR Schedule 1, H	Conditions in this Project	Remarks
Clause H, Sub-clause 8	Supply of water to a population of	50,000 to 200,000	The design population is 49,194	IEE not required for GoN's EPR 2020

9. 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

10. The main objective of the IEE is to fulfill the requirements of ADB Safeguard Policy Statement (SPS), 2009. 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.

11. 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 subprojectwhich has also been informed to the stakeholders.

E. Relevancy of the Project

The project is selected on the basis of criteria developed in UWSSP, PAM. The criteria considers the definition of municipal subproject, approval of the municipality, location of project in areas other than protected, poverty level, existing water supply and sanitation situation, community interest and potential of urbanization. The project satisfies all the criteria mentioned above. From GoN perspective, the project contributes to service level improvement in water supply and sanitation services delivery. Hence, the project is instrumental to meet Nepal's SDG and National Targets. SDG 5 (Gender Equality and Social Inclusion), and SDG 6 (Availability of safe water and adequate sanitation facilities to all) are the main themes addressed by the project.

II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. Nepal's Environmental Policy Framework

12. 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)

13. 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

14. 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

15. 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

16. 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, privatesector including NGOs and user groups are clearly defined in scheme implementation and regulation and performance management in accordance with national decentralization policy.

5. Fifteenth Plan (2076/77-2080/81)

17. Fifteen Plan Approach Paper 2076 has envisioned to increase accessibility to modern infrastructure. It clearly states the objective of ensuring environmental cleanliness by proper provisions of basic sanitation services, faecal sludge management and waste water management. It also reiterates the need of considering the climate risks and disaster risks in water supply and sanitation interventions. The need of strengthening the capacities of the local government on sustainable service provision in water supply and sanitation sector is also clearly mentioned in the plan.

6. National Environmental Policy, 2076 BS (2019 AD)

18. The policy has versioned for the management of pollution, waste maintenance of greenery to ensure people's right to live in hygienic and healthy environment. Similarly, the policy has objective of mainstreaming the environmental concerns in developmental activities. It has emphasized to promote reuse and recycle of the waste. To prevent, control and minimize the pollution has proposed following policies and strategies;

- ✓ Efficient structure will be formed to prevent, control and minimize the pollution
- ✓ Promotion of environment friendly vehicles.
- ✓ Waste segregation as well as promotion of reuse and recycle technique similarly, proper disposal of the remaining solid waste has to be ensured.
- ✓ To maintain the hygienic aquatic environment direct release of polluted water, sewage and solid waste to the water body will be prevented.

19. While managing the solid and liquid waste, appropriate mitigation measures will be imposed to the source and minimize the potential adverse impacts on downstream area.

B. Government of Nepal Environmental Legal Framework

20. Environment Protection Act (EPA), 2054 B.S. (1997 A.D), requires a proponent to undertake Brief Environmental Study, or IEE or EIA of the proposed subproject and have the report approved by the concerned sector agency or ministry of environment, respectively, prior to implementation.

21. Schedules 1, 2 and 3 list down the projects of activities that require IEE and EIA, respectively. Screening carried out based on this confirms that this sub-project doesn't require IEE study for GoN's EPR 2020.

22. All other statutory clearances such as no objection certificates, 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. The contractor will need to comply with all the application national, provincial and local government laws and regulations.

23. 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
Environment Protection Act	2076 BS	The act emphasis on new aspects like provisions of Brief Environmental Study, IEE and EIA under the jurisdiction of local authority, provincial government, and central government. Need of Strategic Environmental Assessment for policies/plans/programs, and considerations of climate change for projects are among the newly enforced aspects of this act.	
Environment Protection Rules	2077 BS	Environment Protection Rules (EPR), 2020 has defined thresholds for environmental assessment under 3 categories; Brief Environmental Study, IEE and EIA. It has defined the roles of the provincial government and the local government as well in the process of environmental assessment of development projects.	
Labour Act Labour Rules	2017 2018	The Act emphasizes OHS Policy; Safety & Health Committee; OHS arrangements including child care center; workplace safety; environment of work place; and specific Labour Audit Additional rest period for certain female employees, Specific provisions relating to the safety of the works having health hazards are also there in the Act	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 the new EPR 2020, the subproject doesn't require an IEE. The authority to use water resource for this subproject has been obtained, and relevant documents are attached in 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.
		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	The EMP provides measures to comply with the relevant

Act/ Rule Policy/Law/Guideline	Year	Relevant Provisions	Remarks
		are two regulations for drinking water purposes: (i) Water Resources Regulation, 1993, setting out the implementation procedures for the Act; and (ii) the Drinking Water Regulation, 1998, which specifies compliance with the drinking water quality standards and control of water pollution (or sanitation) as it affects drinking water.	environmental quality standards and national drinking water quality standards.
Guidelines for Issuing Permission for Extraction and Use of Groundwater	2071 BS	Kathmandu Valley Water Supply Management Board (KVWSMB) has set the criteria for groundwater extraction and its use in this guideline. The guideline also defines the process for obtaining permission from the board for use of ground water in Kathmandu valley. It states the need of standard designs of deep tube wells as well.	The practical implication of this guideline is for non-governmental entities. This guideline is not targeted for the development of ground water projects under the government.
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.
Land Acquisition, Resettlement and Rehabilitation Policy	2015 A.D.	The policy is based on the principles that the assessment of land requirements needs to be carried out based on the alternatives having minimum impacts of land loss, and also the need of resettlement and rehabilitation works to ensure livelihoods of the affected persons and family is improved or at least restored at pre-project level. It also indicates the need to conduct social impacts assessment to identify impacts on affected people, community and vulnerable group, In case of Land acquisition and ownership transfer, land can be acquired also through voluntary donation which will be accepted only if the land provider has agreed without any pressure, and in presence of local authorities to donate land for the purpose. On the humanitarian ground, the policy also bases on the value that for revenue generating project, the project should create conducive situation in which the benefits generated by the project can be drawn-out to affected people.	
Forest Act	2076 B.S.	It stipulates that the GoN can develop a land use plan of a forest in order to maintain the balance of environment and development. It also provisions that the government can develop a specific forest conservation plan for a particular section of a national forest. It also states that the forest area can be used with approval for national priority projects.	Based on field assessment and site visits, few forest trees need to be cut. EMP discusses on compensatory plantation EMP stipulates no illegal quarrying of natural aggregate materials.

Act/ Rule Policy/Law/Guideline	Year	Relevant Provisions	Remarks
National Environmental Policy and Action Plan	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 orwork 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, elimination of forced labor and disseminate information on sexually transmitted diseases including HIV/AIDS to employees and local communities.
Updated 15-Yr Development Plan for Small Towns Water Supply &Sanitation Sector	2067 B.S. (2009 A.D.)	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.

C. International Environmental Agreements

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

TableII-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.

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

D. 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-3summarizes 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 SectionVII.
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. SectionIX
Carry out meaningful consultation with affected people &facilitate their informed participation. Ensure women's participation. Involve stakeholders, including affected people & concerned NGOs, early in the project preparation process & ensure that their views & concerns are made known to & understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to EA. Establish a	Key informant and random interviews have been conducted. A grievance redress mechanism for the resolution of valid subproject-related social and environmental issues/concerns is presented in Section VIII.

[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
GRM to receive & facilitate resolution of affected people's concerns & grievances on project's environmental performance.	
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, and 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. Only around 12 pine 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 destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.	The Subproject will not affect any physical cultural resource. The EMP recommends the measures to mitigate any such adverse impacts, and also in case of chance find.

28. During the design, construction, and operation of the subproject the PMO and 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.

E. 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

29. In order to meet the objectives of the IEE study a systematic and integrated methodology was followed in accordance with standard field study practices for IEE and with a continuous public consultation process.

A. Literature review

30. 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

31. 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

32. 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

33. 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.

34. 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

35. 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.

36. Consultations were held to interact with local people and stakeholders in order to collect information on demography and socio-economy of the project area. 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

37. Stakeholder consultations were conducted by CRDSMC team during June - September 2020. 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

38. 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.

7. Scoring of Impacts

39. 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 and Team Members for IEE Study

40. Upon meeting the ADB requirements for conducting IEE, an IEE report is prepared in a standard format meeting the requirements of ADB. The following experts were mobilized to complete the IEE study of Dadhikot 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	Er. Ram Chandra Devkota	Project Team Leader	Senior WASH Engineer
2	Yogesh Shakya	EnvironmentalSpecialist IEE Team Leader	Environmental Management
3	Samir Dhakal	Social Safeguards Specialist	Socio-economist
4	Sanjay Khadka	Engineer	Water supply and drainage design
5	Elina Pudasainee	Support Staff	

IV. DESCRIPTION OF THE PROJECT

A. Location of the Project

41. The Project area of Dadhikot Urban Water Supply and Sanitation Subproject lies in the then Dadhikot VDC, now Suryabinayak Municipality. Suryabinayak municipality is a city in the central part of Nepal and is located in Bhaktapur District of Kathmandu Valley. The municipality lies between Latitude 27°38'33" N to 27°40'08"N and Longitude 85°21'39" E to 85°28'35" E. Suryabinayak is one of the fast growing cities of Nepal. It lies on the right bank of Hanumante River, one of the major tributary of Bagmati River.The municipality is bordered by Bhaktapur Municipality, Changunarayan Municipality and Madhyapur Thimi Municipality on the north direction, Mahalaxmi Municipality on South-West direction, Panauti Municipality on South-East direction and Banepa Municipality on East direction.The Project area of Dadhikot Urban Water Supply and Sanitation Project lies in Dadhikot area, the then Dadhikot VDC. This VDC was merged with Sirutar VDC, Balkot VDC and Gundu VDC to form Anantalingeshwor Municipality. Later on Anantalingeshwor municipality was merged with the then Suryabinayak Municipality to form present Suryabinayak Municipality.

B. Type, Category and Need of the Sub-Project

42. The proposed "DadhikotUrban Water Supply and Sanitation Project" is a mix of ground water-basedand spring water source based water supply system project partially covering ward1and fully covering ward 4 of Suryabinayak Municipality. The subproject comprises of two major components - water supply and sanitation.The water supply part comprises of a ground (pumping) scheme along with a small spring intake system. A total of 15 tubewellsand 9 reservoirs; and a network of distribution lines have been proposed.

43. The people in project area are using water from sources like public/private taps, well/kuwa, tubewells, surface water sources like springs/rivers, rainwater harvesting, and other sources like tanker supplied water. majority of people within the project area are using ground water. Although the table shows that around 600 household are using tap water. There is existing water supply system, run by users committee, is supplying water to these house hold through pipe network. The main source of water for that existing system is ground water from different water boring. For the distribution of water supply the existing system has reservoir tank of different.sizes in different location. There is one ongoing construction of overhead tank of 450m^3 capacity. There are 5 existing deep tube borings for the existing water supply system and one pump station. After the completion of the OHT and well, these assets will be handed over to Dadhikot WUSC. The existing structures and deep tube well will also be incorporated by CRDSMC while designing the water supply scheme of Dadhikot area.

C. The Sub-Project

44. The DadhikotUrban Water Supply and Sanitation Project has been designed as an integrated piped water supply system based on ground water as well as spring water sourcethat will provide sufficient quantity and good quality of water to the residents of Dadhikot 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 Spring water source	15 1	200 to 250 m depth; 93.424 lps 0.32 lps; Existing
2.	Service Reservoirs (OHT/ RVT, Valve Chambers and surface valve box, etc.)		
	OHT	4 (1+3)	450 cu.m. existing no. 1, 450 cu.m., 400 cu.m. new nos. 2
	Ground Reservoir	5 (1+4)	100 cu.m. existing no. 1 200 cu.m., 100 cu.m., 20 cu.m. new nos. 2
			(Total 2140 cu. m.)
	Treatment facility subcomponents:		
3.	Aeration Tower/Pressure Filters	4 nos. (1 nos. x 4 sites) of each	2.5 m x 2.5 m each; One Aeration Unit and One Pressure Filter at each site
4.	Disinfection Units	5nos.	Mixing tank - 1000L Dosing tank - 250 L
5.	Water Quality Testing Laboratory	1 nos.	24 sq. m.
6.	Distribution Network	1 network	150 km.
7.	Pumps (including related accessories, electrical panels, etc.)	16nos. (including standby)	3 Nos. of operating+1 stand by pump at System 1, System 2 & System 3; 2 Nos. of operating+1 stand by pump at System 4 These pumps range from 25 HP to 35HP Single 2 HP pump near GRVT for pumping clean water to reservoir of System 4
8.	Fire Hydrants	20 nos.	
9.	House Connections.	3,598	For base year
10.	11 KV transmission lines	4 networks	375m, 124 m, 2200 m and 3780 m; Total 6479 m
11.	Electrical Transformers	4nos.	100 kVA - 2 nos.; 150 kVA, 200 kVA - 1 no. each
12.	Standby Electrical Generator	4 nos.	250 kVA, 100 kVA, 82.5 kVA, and 50 kVA
13.	Office Building	1 no.	175 sq. m.
14.	Guard House	5 nos.	33 sq. m. each
15.	Generator House	4 nos.	93 sq. m. each

45. The water supply system will be operated by the WUSC, and the WUSC will coordinatewith municipality on regular basis for effective service delivery.

1. Salient Features of the Project

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

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

S.N.	Items	Description
1	**Name of Project**	Dadhikot Urban Water supply and Sanitation Project Urban Water supply and Sanitation (Sector) Project
2	**Type**	Semi-Gravity (GW pumping to OHTs and Gravity Flow Water Distribution)
3	**Study Level**	Detail Engineer Design Study
4	**Location Area**	
	Province/District	Bagmati/ Bhaktapur
	Municipality	Suryabinayak Municipality
	Wards	Partial Areas of WN 1; Full coverage of WN 4
5	**Available Facilities**	
	Road	500 m South from Araniko Highway, Thimi
	Water Supply System	Existing springs and private tubewells
	Electricity/Communitcation	Available
	Health Services	Available
	Banking Facilities	Available
6	**Population status of the beneficiary of the subproject**	
	Present HHs Numbers and Population (2019): Survey Year	3,185 HHs; 19181 population (including rented)
	Base Year Population (2023)	21,672
	Design Year Population (2043)	49,194
	Weighted Growth Rate % (WGR)	4.14%
	Projected HHs in Base Year	3598
7	**Water Demand (MLD)**	
	Design Year (2043)	93.424 lps (average)
8	**Proposed Water Source**	
	Source Name	Ground water from Deep Tubewells One existing spring water source to be incorporated into the system
	Source Location	Within OHT sites within the project area
	Safe Yield (lps)	Adequate;0.32 lps out of 0.8 lps in Syangtang system
9	**Structures**	
	OHTs	450 m^3 circular OHT (one proposed and one existing), 400 m^3 rectangular OHT, 400m^3 circular GRVT, 200 m^3 rectangular GRVT, 100 m^3 GRVT (one proposed and one existing) and 20 m^3 GRVT (2 Nos)
	Deep Tubewells	4 Numbers in each system 1, 2 and 3 and 3 numbers in system 4, Total 15 numbers including standby
	Spring Intake	Intake for small spring source
	Electricity line	11 kVA HT line shall be stretched to about 6.479 km
	Transformers	4 nos. in total 100 kVA - 2 nos.; 150 kVA, 200 kVA - 1 no. each
	Generators	4 nos. in total 250 kVA, 100 kVA, 82.5 kVA, and 50 kVA
	Valve Chambers	121
	Office Building	1 No.
	Guard house/ Generator House	5 Nos.& 5 Nos.
	Pump House	2 Nos.
	Household Connection	3,598 Nos., Base Year
	Fire Hydrants	20
	Water Recharge Wells	46 (Institutional units)
	Reinstatement of ponds	3
	Transmission Pipe Network (m)	6,344 m
	Distribution Network (meter)	152 Km
10	**Total Cost of the Project (NRs.)**	790,361,427.33

2. Water Source Sustainability Assessment, and Water Quality Assessment

47. Wet season flow of Syangtang khola is 0.8 lps, and as per the climaticconditions upstream of the source, and as per the interaction with the locals, the study team concludes that the dry season flow is at least 75%, i.e. 0.6 lps. As per national and international practices, the environmentally safe tapping is taken as maximum of 80% after leaving back at least 20% of the dry flow. As per this, the maximum environmentally safe tapping yield would be up to 0.48 lps. The designed tapping yield from Syangtang khola is 0.32 lps, & is thus environmentally safe and sustainable.

48. The current water tapping is also at around 0.3 lps, but the system is not well managed and design period of the structures is exceeded. The project will establish a managed and long term system for the existing beneficiaries. The source is at Tamang settlement and the immediate settlements,like Khadka settlement, downstream of the source do not use its water for irrigation purpose as it is solely used for drinking water purpose, so there is no downstream water user conflict. This has been discussed with the stakeholders as well. (Annex 5)

49. Water sample test report of an existing spring source of Syangtang source, and DTW sources from existing tubewells in Uttisghari and Charkhandi locations of Dadhikot were collected during August 2020 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 table below exhibits findings with respect to NDWQS;

Table IV-3: Water Quality Assessment

SN	Parameters	Units	Test methods	Observed Values		NDWQS, Nepal
				Syangtang	Uttisghari	
1	pH at 27°C		Electromeric, 4500 – H^+ B, : APHA	7.3	7.6	6.5 - 8.5
2	Electrical Conductivity	µS/cm	Conductivity Meter, 2510 B, APHA	586	332	1500
3	Turbidity	NTU	Nephelometric, 2130 B, APHA	1	6	5
4	Total Hardness, $CaCO_3$	mg/l	EDTA Titrimetric, 2340 C, APHA	72	130	500
5	TDS	mg/l	2540 C, APHA	352	193	1000
6	Chloride	mg/l	Argentometric Titration, 4500 – Cl^- B, APHA	<5	1	250
7	Ammonia	mg/l	Direct Nesslerization, 4500 – NH_3C APHA	0.04	0.07	1.5
8	Nitrate	mg/l	UV Spectrophotometric Screening, 4500 –No_3 B, APHA	7.3	9.8	50
9	Flouride	mg/l	4500 –F^-D, APHA	0.3	0.24	0.5-1.5
10	Calcium	mg/l	EDTA Titrimetric, 3500 –Ca B &3111 B, APHA	28.8	52	200
11	Manganese	mg/l		<0.01	0.02	0.2
12	Arsenic	mg/l	SDDC, 3500 - As, C: APHA	<0.005	<0.005	0.05
13	Iron	mg/l	3111 B, APHA	0.02	0.1	0.3
14	Cyanide	mg/l	3111 B, APHA	<0.05	<0.05	0.2
15	Total Coliform *E. Coli*	CFU/100 ml	9222 B & D, APHA	75 Nil	Nil Nil	Nil Nil

Source: Laboratory Analysis, August 2020

3. Project Area and Subproject Components

50. Considering the topography, landuse, settlement pattern and use of existing facilities,five (5) water supply systems based on decentralized distribution system are proposed. In order to manage NRW in the proposed system, total system divided primarily into 9 DMAs. The project components are described in the sub-section below;

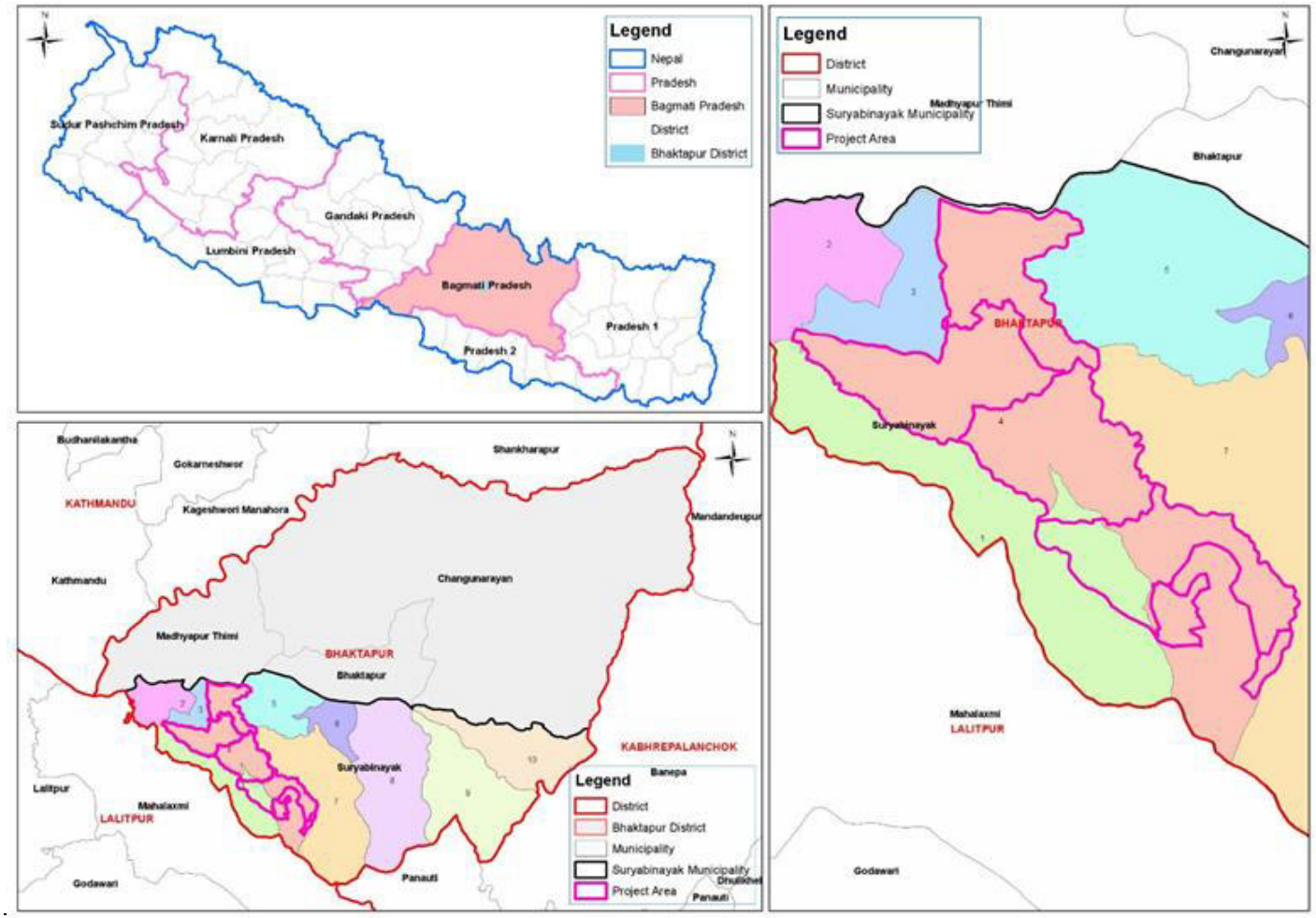


Figure IV-1: Location Map of the Project Area

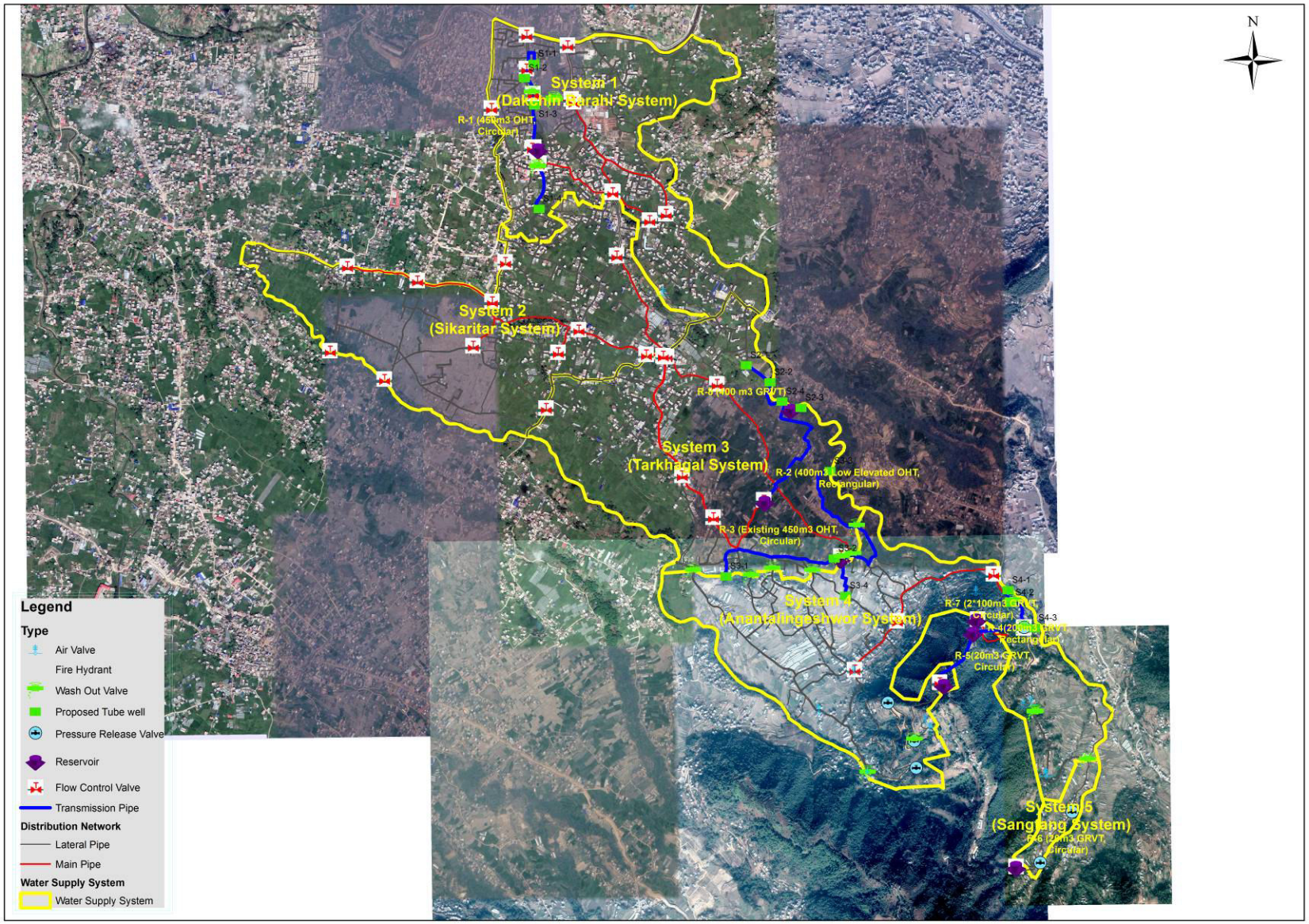


Figure IV-2: Project Area with Project Sub-Systems and Components

4. Project Sub-Systems:

51. Altogether five systems have been proposed in Dadhikot Urban Water Supply and Sanitation Project including the spring source. 15 deep tube wells have been proposed for four system which includes 4 standby tube wells. There is one spring source as well. Based on the geophysical investigation following results were drawn for the respective systems;

System 1 (Dakchin Barahi System)

52. Geophysical survey was carried out. According to the study, the depth of the tube well was recommended up to 250m. The formation of gravel, sand, clay may be encountered up to that depth. There are four deep tube well proposed in the system. Based on the available data the expected discharge in a properly installed well can be around 10-12 lt/sec. This system is designed to serve 14,759design year population of ward 4.

System 2 (Sikaritar System)

53. The study geotechnical study recommended that the tube well up to 250m can be installed in this area. There are four tube wells proposed in the area. Based on the available data the expected discharge in a properly installed well can be around 10-15 lt/sec. This system is designed to serve 16,773 design year population of ward 4.

System 3 (Tarkhagal System)

54. According to the report of geotechnical study, 100 m deep tube well is recommended in this area. The proposed tube wells location is scattered so the depth may vary. There are four tube wells proposed. Based on the available data the expected discharge in a properly installed well can be around 5-9 lt/sec.This system is designed to serve 11,722 design year population of ward 1.

System 4 (Anantalingeshwor System)

55. According to the geotechnical study report, tube well up to a depth 220m is recommended in this area. There are three tube wells proposed in the area. Based on the available data the expected discharge in a properly installed well can be around 5-8 lt/sec.This system is designed to serve 5,765 design year population of ward 4.

System 5 (Syangtang System)

56. Intake structure is used for collecting water from the surface sources. An existing water supply system has been using the spring water source of Syangtang source. This same spring source has also been proposed for System 5. This is small spring water source with discharge of 0.8 lps. But for the design only 0.32 lps has been considered. To capture the water from spring source a typical design of intake for small spring source has been proposed. This system is designed to serve 175design year population of ward 4.

5. Treatment Process

57. The water treatment process has been selected based on the raw water quality. The proposed treatment process aims to remove some concentrations of iron and turbidity in the ground water sources. It also kills pathogenic organisms present in raw water and ensures the presence of residual chlorine to kill the pathogenic organisms during the conveyance of treated water in pipelines. The treatment process consists of pressure filters and disinfection units.

58. **Aeration Towers and Pressure Filters**.Aeration units with air blowers are proposed to precipitate possible compounds of iron and manganese. Pressure filter made of mild steel is proposed to remove precipitated and suspended materials.Backwashing is to be done every week, and backwash is to be carried out also as per need during rainy seasons.

59. **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. Service Reservoirs

60. 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. 2043 is calculated as 1740Cum. The reservoirs will be constructed of RCC and is designed as overhead tank as the terrain suggests. The following table summarizes the requirement of reservoir tanks for the various systems;

Table IV-4: Requirement of Reservoir

SN	Type	Reservoir Size (Cum)	Remarks
1	OHT, circular	450	New Proposed; at Dakshin Barahi
2	OHT, circular	450	Existing; at Tarkhagal
3	OHT, rectangular	400	New Proposed; at Sikaritaar
4	GRVT, rectangular	400	New Proposed; at Sikaritaar
5	GRVT, rectangular	200	New Proposed; at Anantalingeshwor
6	GRVT, circular	100	Existing; at Anantalingeshwor
7	GRVT, circular	100	New Proposed; at Anantalingeshwor
8	GRVT, circular	20	New Proposed; at Anantalingeshwor
9	GRVT, circular	20	New Proposed; at Syangtang
Total		**2140**	

7. Distribution Network

61. 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. 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 152 km.

Table IV-5: Distribution Pipe Network

SN	Pipe Dimensions	Length of Pipes (m)
1	PE100 Pipe	140412.76
2	DI Pipe	11683.81
Total		**152096.57**

8. House Connections

62. The system has been designed, predominantly as house to house connections. The system has been analyzed for a design capacity of providing sufficient water till the design period of 20 years. However, initially during construction phase, 3598 house connections are provided to satisfy the need for the base year population.

9. Appurtenances

63. These shall primarily comprise of valve chambers to house flow control valves, air release valves. Flush out valves, Fire hydrant etc. Altogether there are 85 valve chambers in the proposed system for Pressure control valve, flow control valves, air release valves. Flush out valves. The RCC chamber has been proposed in all urban roads to cater the traffic load. Along with this, there are 20 fire hydrants proposed in the different location of the project. The selection of the location for the fire hydrant is based on the road width (wider), diameter of the pipe (big diameter) and pressure at the point (maximum).Air relief valve and flush valve are provided when there is immediate change in altitude forming either valley or ridge point of pipe line. If the pipe line forms valley, flush valve are provided at the valley point while air relief valves are provided at ridge point of pipe line to relief the air pressure inside the pressurized pipe network. Altogether there are 121 valve chambers and 6Pressure Control Valves in the proposed system. The SCADA system will have appurtenances like Pressure and flow control valves, throttling valves, Flow Transmitters, Level Sensors, etc.

10. Electrical

64. The proposed scheme has separate pumping station/tubewell site which needs power for water extraction from deep tubewell. All electrical systems are designed as new together with overhead transmission line. Accordingly, the transformer and other components are designed. One pump will be installed for each DTW, and hence there will be 15 pumps, each of capacity ranging from 25 HP to 35 HP.

11. Office Building/ Laboratory Room

65. A new office building is proposed to accommodate the required facilities like laboratory room, counters, managers room and store room. A double storey earthquake resistant RCC frame structure building for office. The site is yet to be finalized.A galvanized chain link fencing over 450 mm high parapet wall has been proposed from aesthetic and economic consideration. Separate vehicular and pedestrian Iron Gates are proposed in OHT and Deep Well sites.

12. Guard House and Generator room

66. A small guard house with kitchen and bathroom facilities have been proposed at each WTP premises and intermediate reservoir location. A framed structure generator house has been proposed for generator housing. RCC slabs have been proposed for roofing.

13. O&M Equipment and Tools

67. An assessment was done for the needed items. The UWSSP 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 number
(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 like electric pipe cutters, pipe wrenches etc.

D. Magnitude of Operation of the Project

68. The water supply system has been designed for a base year population of 21,672 for the year 2023. The system has been designed to tap ground water source from DTWs for a total design year population of 49,194 in 2043.Nine numbers of water reservoir tanks, including 2 existing, have been proposed at different locations considering in mind the elevation difference of the service area. The total capacity of these reservoirstotals to2140Cum storage capacity of reservoirs as proposed for the storage and distribution of water.

E. Proposed Schedule for Implementation

69. 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 2023 and considering design period as 20 year the design year has been taken as the year 2043.

70. 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

71. 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.

F. Project Requirements

1. Materials required for the project

72. 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 product.

2. Human Resources

73. The proposed Dadhikot Urban Water Supply and Sanitation Project entails both skilled and unskilled laborers for its construction and operation in the proposed site. Around 9100 man-days of unskilled laborers and around 4400 man-days of skilled labours is estimatedto be required on the basis of rate analysis. As far as possible they will be hired from the local market and its adjoining area. Priority will be given to local women and family members of the local poor and marginal families. Child labour will be strictly prohibited in the project.

3. Land required for the project components

74. Different public land parcels are identified for the project components. This has been assessed in coordination with the WUSC and has been consulted with the municipality office.

Table IV-5:Description of Project Component Sites and Land Required for the Project

S.N.	Component/ Sources	Location	Description of the environment	Land ownership	Minimum Land required	Land Available	Compensation/ Mitigation Measures	Documents Details
System-1:								
1	OHT (450 cu.m.), WTP, Pump house, Guard house	Suryabinayak Municipality, ward no.4, Dakshinbarahi	This is an elevated land near the main road, and there is need of felling around 12 trees. Land instability concerns are there. (Annex 11: Photo 1)	GoN land/Suryabinayak Municipality	1239.81 sq.m. (2-7-0-0)	1239.81 sq.m. (2-7-0-0), Plot no.2708	This is government land; slope protection works is required	Approval received from Municipality/ Ward Office
2	Deep boring, Pump house	Suryabinayak Municipality, ward no.4, Dakshinbarahi	This is an open land near the road side near Dakshinbarahi temple. (Annex 11: Photo 2)	GoN land/Suryabinayak Municipality	31.79 sq.m. (0-1-0-0)	95.37sq.m. (0-3-0-0), Plot no.2643	Not required. Vacant government land	Approval received from Municipality/ Ward Office
3	Deep boring, Pump house	Suryabinayak Municipality, ward no.4, Dakshinbarahi	This is an open land near park area and has no environmental concerns. (Annex 11: Photo 3)	GoN land/Suryabinayak Municipality	31.79 sq.m. (0-1-0-0)	127.16sq.m. (0-4-0-0), Plot no.2381	Not required. Vacant government land	Approval received from Municipality/ Ward Office
4	Deep boring, Pump house	Suryabinayak Municipality, ward no.4, Law College area	This is an open land and has no environmental concerns (Annex 11: Photo 4)	GoN land/Suryabinayak Municipality	31.79 sq.m. (0-1-0-0)	79.46 sq.m. (0-2-2-0), Plot no.1405	Not required. Vacant government land	Approval received from Municipality/ Ward Office
5	Deep boring, Pump house	Suryabinayak Municipality, ward no.4, Chakhuphant	This is a public land but temporarily used informally for agricultural purpose (Annex 11: Photo 5)	GoN land/Suryabinayak Municipality	31.79 sq.m. (0-1-0-0)	63.58 sq.m. (0-2-0-0), Plot no.61/223	Not required. Vacant government land	Alternative option/ approval received from Municipality/ Ward Office
System-2:								
6	OHT, SCADA Chamber	Suryabinayak Municipality, ward no.1, Tyare tole	This is an in-use land under ownership of the WUSC, and demolition of the existing tank is required (Annex 11: Photo 6)	WUSC own land	238.41 sq.m. (0-7-2-0)	238.41sq.m. (0-7-2-0), Plot no.974	Not required. In-use landunder the ownership of WUSC; Safe demolition required.	Copy of land ownership certificate available
7	Deep boring, pump	Suryabinayak	This is an open land currently not in any use.	WUSC own land	31.79 sq.m. (0-1-0-0)	79.46sq.m. (0-2-2-0),	Not required.	Copy of land

S.N.	Component/ Sources	Location	Description of the environment	Land ownership	Minimum Land required	Land Available	Compensation/ Mitigation Measures	Documents Details
	house, WTP, Guard house	Municipality, ward no.1, Charkhandi	(Annex 11: Photo 7)			Plot no.1487	Vacant land under WUSC ownership	ownership certificate available
8	Deep boring, pump house, WTP, GRVT, Guard house	Suryabinayak Municipality, ward no.4, Sikaritar Mahadevkhola	This site is a flat land near the banks of Mahadv khola. Concern of pollution onto the river during construction phase is a concern (Annex 11: Photo 8)	GoN land/Suryabinayak Municipality	762.96 sq.m. (1-8-0-0)	762.96sq.m. (1-8-0-0), Plot no.390	Not required. Vacant government land. No spoil to be disposed onto the river	Approval received from Municipality/ Ward Office
9	Deep boring; pump house	Suryabinayak Municipality, ward no.4, Sikaritar	It is an in-use land with no major environmental implications (Annex 11: Photo 9)	WUSC own land	31.79 sq.m. (0-1-0-0)	63.58sq.m. (0-2-0-0), Plot no.92	Not required. In-use land under the ownership of WUSC; Safe demolition required	Copy of land ownership certificate available
System-3:								
10	Deep boring, pump house, WTP, Guard house	Suryabinayak Municipality, ward no.4, Tarkhagal	This is an open land and is nearby agricultural land. So some precaution is required to avoid damage/disturbance to agricultural land (Annex 11: Photo 10)	WUSC own land	635.8 sq.m. (1-4-0-0)	635.8 sq.m. (1-4-0-0), Plot no.235	Not required. Vacant land under the ownership of WUSC	450 cum. existing OHT /copy of land ownership certificate available
11	Deep boring, pump house, WTP, Guard house	Suryabinayak Municipality, ward no.4, Jogipati	This is a plain open land and no environmental concerns are seen in proposed the site (Annex 11: Photo 11)	GoN land/Suryabinayak Municipality	31.79 sq.m. (0-1-0-0)	127.16sq.m. (0-4-0-0), Plot no.665	Not required. Vacant government land	Approval received from Municipality/ Ward Office
12	Deep boring, pump house	Suryabinayak Municipality, ward no.1	This is a small parcel of open land currently not in any use (Annex 11: Photo 12)	GoN land/Suryabinayak Municipality	31.79 sq.m. (0-1-0-0)	127.16sq.m. (0-4-0-0), Plot no.794	Not required. Vacant government land	Approval received from Municipality/ Ward Office
13	Deep boring, pump house, WTP, Guard house	Suryabinayak Municipality, ward no.1	There is a natural drainage at the site. No tree cutting is required. However, there will be loss of some plants.	GoN land/Suryabinayak Municipality	31.79 sq.m. (0-1-0-0)	95.37sq.m. (0-3-0-0), Plot no.591	Not required. Vacant government land, precaution	Approval received from Municipality/ Ward Office

S.N.	Component/ Sources	Location	Description of the environment	Land ownership	Minimum Land required	Land Available	Compensation/ Mitigation Measures	Documents Details
			(Annex 11: Photo 13)				is required so as not to damage the drainage	
System-4:								
14	Deep boring, pump house, WTP, Guard house	Suryabinayak Municipality, ward no.4, Bandh Bagaincha	This is a vacant land with only some bush and is near a garden. However, this is not a public space (Annex 11: Photo 14)	GoN land/Suryabinayak Municipality	349.69 sq.m. (0-11-0-0)	349.69sq.m. (0-11-0-0), Plot no.191	Not required. Vacant government land	Approval received from Municipality/ Ward Office
15	Deep boring, pump house, WTP, Guard house	Suryabinayak Municipality, ward no.4, Mahadevkhola	This is a plain open land near the river bank and there is no any vegetation in the site (Annex 11: Photo 15)	GoN land/Suryabinayak Municipality	31.79 sq.m. (0-1-0-0)	127.16sq.m. (0-4-0-0), Plot no.618	Not required. Vacant government land; slope cutting/slope protection needed	Approval received from Municipality/ Ward Office
16	Deep boring, pump house, WTP, Guard house	Suryabinayak Municipality, ward no.4, Birkhaman ko pasal mathi	This is a sloppy land, and since the site is just adjacent to the road-side drain (Annex 11: Photo 16)	GoN land/Suryabinayak Municipality	31.79 sq.m. (0-1-0-0)	127.16sq.m. (0-4-0-0), Plot no.15	Not required. Vacant government land; precaution must be taken so as to not damage the side drain	Approval received from Municipality/ Ward Office
17	GRVT, pump house, Guard house	Suryabinayak Municipality, ward no.4, Purano Pandhera	This is site with sloppy land, and hence land stability is a concern for this site (Annex 11: Photo 17)	GoN land/Suryabinayak Municipality	222.53 sq.m. (0-7-0-0), 604.01 sq.m. (1-3-0-0)	1017.28sq.m. (2-0-0-0), Plot no.510	Not required. Vacant government land; slope protection works will be required	Existing RVT/approval received from Municipality/ Ward Office
18	GRVT, pump house, Guard house	Suryabinayak Municipality, ward no.4	This site is located near the banks of Mahadev khola; environmental concern is there (Annex 11: Photo 18)	GoN land/Suryabinayak Municipality	158.95 sq.m. (0-5-0-0)	254.32sq.m. (0-8-0-0), Plot no.161	Not required. Vacant government land; precautions so as to not pollute	Approval received from Municipality/ Ward Office

S.N.	Component/ Sources	Location	Description of the environment	Land ownership	Minimum Land required	Land Available	Compensation/ Mitigation Measures	Documents Details
							the river	
System-5:								
19	Intake (spring water) and reservoir	Suryabinayak Municipality, ward no.4	The intake site is in-use site for existing intake; RVT will be constructed in the same site where the dilapidated existing RVT is present (Annex 11:Photos 19& 20)	GoN land/Suryabinayak Municipality	254.32 sq.m. (0-8-0-0)	254.32sq.m. (0-8-0-0), Plot no.510	Not required. In-use land under Syangtang Water User Committee	Approval received from Municipality/ Ward Office
20	Municipality building	Land yet to be identified			508.64 sq.m. (1-0-0-0)			WUSC has provided written commitment for land availability.

75. The consent letters, letters of land use rights, the certificates of WUSC registration, and commitment letter of WUSC have all been incorporated in Annex 10 of this report.

V. DESCRIPTION OF THE ENVIRONMENT

A. Physical Environment

1. Topography and Geology

76. Topography of the project area is characterized by hilly terrain. The altitude ranges from 1290 m to 1900 m above mean sea level.The southern part of the project area is more slopy than the northern part. Undulation of ground profile is seen in most part of the project area. The area lies in the north eastern part of the Kathmandu basin comprising of fluvio-lacustrine and alluvial fan deposits. Geologically, the proposed area lies in the Kalimati Formation (sticky black clay) where the area is surrounded in the south east by Precambrain to Devonion Tistung Formation, Sopyang Formation, Chandragiri limestone (Phulchowki Group rocks), Residual Soil and alluvial fan deposits.

2. Climate and Precipitation

77. The climate in Suryabinayak municipality is warm and temperate. In summer it has good of rainfall, whereas in winter has very little. In this municipality, the average annual temperature is 17.9 °C (64.2 °F). About 1583 mm (62.3 inch) of precipitation falls annually. The driest month is November, with 7 mm (0.3 inch) of rain. Most of the precipitation here falls in July, averaging 395 mm (15.6 inch). There is a difference of 388 mm (15 inch) of precipitation between the driest and wettest months.

3. Hydrogeology

78. According to the hydrogeological report of JICA (1990), Kathmandu valley has been divided into three groundwater districts; namely - Northern, Central and Southern Groundwater districts based upon their physical and geological structures. The proposed area lies in the Central Groundwater District. The upper part of this district is impermeable and composed of very thick black clay. The transmissivity of the aquifer ranges from 32 to 960 m^2/day.The project area is bounded by high hill in southern side.Thenorthern side is bounded by Hanumante khola, while the eastern part is surrounded by a small river called Mahadev Khola, and the western part is also surrounded by a small stream.

4. Ambient environment

79. Air quality is observed to be normal without major pollution condition. There are no industries in project area. Air pollution is caused by fugitive dust from vehicle movements particularly over unpaved roads and other unpaved grounds, construction activities, and wind action on unpaved exposed surfaces. 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.

80. Acoustic environment is also observed to be normal. The sources of noise in the project area are the construction activities and vehicle movement. The anthropogenic noise is confined to a few clustered settlements and in market places.

B. Biological Environment

1. Flora in the Project Area

81. Scattered forest area is present in the uplands of the sub-project area. Vegetations are dominated with Chilaune (*Schima wallichii*), Uttis (*Alnus nepalensis),* Bakaino (*Melia azederach*) and Maauwa (*Engethardita spicata*). Most of the other project structures are located in shrubs land and terraced land. Some of the shrubs and ground vegetation found in this area are Titepati (*Artemisia vularis*), Banmara (*Eupatorium adenophorum*), Ainselu (*Rubus ellipticus*), Siru (*Imperata cylindrica*), and Arthounge (*Heteropogon contortus*).The fodder requirement is met mainly by Khasru (Q*uercus semecarpifolia*) and Arkhaulo (*Quercus spicata*).Trees of Pipal (*Ficus religiosa*), Banyan (*Ficus benghalensis*), bel (*Aeole marmelos*), Koiralo (*Bauhiniavariegata*), Amala (*Phyllanthus Emblica*), Amba (*Psidium guajava*), lapsi (*Choerospondiasaxillariis*), orange (*Citrus sinensis*) are among other commonly found trees in the sub-project area. There are some community forests in the project area. *Dakshin Barahi Community Forest* lies in the project area.

2. NTFPs in the Project Area

82. The main NTFP species found in the subproject area are harro (*Termnalia chebula*), barro (*Terminalia bellirica*), amala (*Emblica officinalis*), kurilo (*Asparagus racemosus*), sikakai (*Acacia concinna*),Rudrakshya (*Elaeocarpus ganitrus*), Rosemerry (*Rosmarinus officinalis*), Titepate (*Artemisia Indica*), Sikakai (*Acadia rugata*) are among the NTFPs found in the sub-project area.

3. Fauna in the Project Area

83. The biodiversity nearby the project area is characterized by presence of many species of mammals and birds which are also observed in the project area. Common Leopard (*Panthera pardus),* Hanuman Langur (*Presbytis entellus)*,Rhesus Monkey (*Macaca mulatta)*, Common Palm Civet (*Paradosurus hermaphroditus)*, Jackal (*Canis aureus),* Wild Cat (*Felis chaus),* Indian Porcupine *(Histrix indica),* Common Rat (*Rattus rattus)*, bats (*Cynopterus sphinx*) are among the commonly found mammals in and near the sub-project area.Some of the common birds found in and near the sub-project area are jungle crow (*Corvus macrorhychos*), kalij pheasants (*Lophura leucomelana*), ban kukhura (*Gallus gallus*), spotted dove (*Streptopelia chinensis*), and koili (*Coculus canorus*).

84. To check 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.There is no rear, endangered or protected plant species in the project area.Common species of mammals, birds and other herpetofauna were recorded in the project area. No wild animal hunting takes place in the project area.

4. Protected Area

85. The project area is not located in ecologically sensitive area, and there are no protected areas within or in closeproximity of the sub-project area. Phulchoki mountain forests is around 10 kms from the sub-project area, and Shivapuri Nagarjun National Park is around 15 kms from the sub-project area.

C. Socio economic and Cultural Environment

1. Demography

86. The number of households to be served in the project area is 3,185 with 19,181 permanent populations.This covers 2682 HHs of ward number4 (*with major settlements like Gamcha, Tamang Gaun, Lubanjar, Birkhaman Tole, Neupane Tole, Jangam Tole, Tarkhagal, Krishna Mandir, Paropakar, Dudhmel, Sikaritar, Tyare Tole, Jogipati, Charkhandi, Om Sai Ganesh, Sai Ganesh, Shalimpati, Thapa Tole, Chitrapur, Kasman Tole, Phukandol, Khatri Tole, Hinchowk, Harshachowk, Amar Nagar, Dakshinbarahi, Srijanshil Tole, Makalepati*), and 323 HHs of ward number 1(*Tarkhagal, Pakandol, Karki Tole, Bishwarupeshwor Tole*) of Suryabinayak Municipality. The target HHs & population are presented in table below;

Table V-1: Service Area, HH and population (Survey year, 2020)

Metropolitan City	Ward No.	HHs	Population		
			Permanent	Rented	Total
Suryabinayak	1	323	1515	64	1579
	4	2862	13642	3960	17602
	Total	**3185**	**15157**	**4042**	**19181**

Source: Socio-economic Survey, 2020

87. Among the total permanent population (15,157) in the service area, 7597 are male and 7560 are female. Male population is slightly higher (50.1%) than the female population (49.9%).

Table V-2: Male/female population and Average HH size (Survey year 2020)

Town	Ward No.	HHs	Population			Average HH Size
			Male	Female	Total	
Dadhikot,	1	323	768	747	1515	4.4
Suryabinayak	4	2862	6829	6813	13642	5.0
Municipality	Total	**3185**	**7597**	**7560**	**15157**	4.9

Source: Socio-economic Survey, 2020

2. Caste / Ethnicity

88. The composition of community by caste/ethnic group is heterogeneous in nature. Therefore, diversity of culture, custom, tradition, norms and values are existing in the project area. The household survey of the sub project area has also reflected the cross section of major ethnic groups of the country.The survey revealed that Bhramins/Chettri are the main group of the project area comprising of 63.5%. About 34.5% of population areJanajati. Similarly, Dalit is comprises about 1% and other castes comprise about 1% within the service area.

Table V-3: Caste / Ethnicity

Ethnicity	Wards		Total	Percentage
	1	4		
Brahmin/Chettri	202	1821	2023	63.5
Janajati	116	984	1100	34.5
Dalit	4	29	33	1.0
Other Castes	1	26	27	0.8
Giri		2	2	0.1
Total	**323**	**2862**	**3185**	100.0

Source: Socio-economic Survey, 2020

3. Educational Status

89. There do exist various public and private institutions such as school and college, community based organization/NGO, bank and financial institution, hospitals, hotels and lodge within the service area. According to the institutional data obtained from the survey, 21 educational institutions including 20 schools with primary to higher secondary levels and 1 law collegewere recorded in service area. There are a total of around 6696 people including students, teachers and staff working in these institutions. Almost of the educational institutions are depending on both tapped water systems operated by existing WUSC.

4. Occupation

90. The economy of the municipality is agrarian although most of the households in the project area depend on more than one occupation. During the course of household survey of project area, detail information data has been collected about the major occupation and economic activities of all household head. The survey shows that highest number of population about 41.5% are engaged in services, 22.8% are engaged in agriculture sector, around22.3% population are involved in business while 7% are dependent on remittance. Similarly, small percentage of population depends on daily wages and industry. The percent of household by occupation is illustrated in the table below;

Table V-4: Occupation of Households of the Project Area

SN	Occupation	Wards		Total	Percent
		1	4		
1	Agriculture	107	605	712	22.8
2	Business	50	664	714	22.3
3	Services	113	1186	1299	41.5
4	Industry	1	21	22	0.7
5	Foreign Employment	14	206	220	7.0
6	Wages	15	56	71	2.3
7	Others	4	86	90	2.9
Total		**304**	**2824**	**3128**	**100**

Source: Socio-economic Survey, 2020

5. Household's Monthly Income Level

91. 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 3.1% have monthly income less than NRs 13,500, 17.9% of them have income range of NRs. 13,500-25,000 per month. Likewise, 47.6% of households fall under the income range of NRs. 25,001-50,000 categories. As the data shows 31.4% of households have income level more than NRs.50,000 per month.

Table V-6: Monthly Average Income Range

S.N.	Income Range (NRs.)	Wards		Total	%
		1	4		
1	<13,500	22	74	96	3.1
2	13,500-25,000	158	401	559	17.9
3	25,001-50,000	86	1403	1489	47.6
4	50001-100000	36	916	952	30.4
5	>100000	2	30	32	1.0
Total		304	2824	3128	100.0

Source: Socio-economic Survey, 2020

92. Among the total household, 3.1% have monthly income of less than Rs. 13500 and fall under poor category. Finding of socio-economic census survey depicts that the household average monthly income is NRs. 40,731.

6. Existing water supply condition

93. Only around 20% of the municipality is served by piped water supply distribution networks under Kathmandu Upatyaka Khanepani Limited (KUKL).The proposed project area is devoid of this service. The existing water sources in the sub-project area are both surface water based as well as ground water based. Springs & spouts, hand pumps, and private taps are the major existing water supply sources. *Pani Bhakari*, meaning - water reservoirs, is an ongoing campaign in the sub-project area under which the social campaigners have started storing water in the improved or human-made ponds and water reserves along with rainwater harvesting initiatives.There are around8293 number of private taps and around 2947 public taps within the municipality. The existing water source within the sub-project area is shown in table below;

Table V-5:Major Sources of Water Supply in the project area

SN	Water Source	Wards		Total	Percent
		1	4		
1	Innar/Kuwa	21	1193	1214	38.12
2	Tubewell/Handpump/Deep Well	3	12	15	0.47
3	Publice Tap	57	167	224	7.03
4	Private Tap	239	1432	1671	52.46
5	Mul/River/Pond	1	18	19	0.60
6	From water seller	2	38	40	1.26
7	Rainy water Collection		1	1	0.03
8	Other Source		1	1	0.03
Total		323	2862	3185	100.0

Source: Socio-economic Survey, 2020

Table V-6: Dissatisfaction about existing water quality

SN	Water Quality	Wards		Total	Percent
		1	4		
1	Bad smell and taste	3	243	246	77.0
2	Unacceptable colour and damage in teeth	1	74	75	23.0

Source: Socio-economic Survey, 2020

7. Existing Sanitation Condition

94. 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. There aresome stretches of drainage system for storm water as well as for the domestic sewage in the project area.

95. The municipality lacks sewage treatment plant, and a properly engineered final disposal site for solid waste. The solid waste is being disposed on the bank of Hanumante river. As per the survey, around 96.2% of the sampled HHs have an interest in improving the septage management system and are interested to pay for it.

96. The socio-economic study reveals that 99.4%of the households have permanent household toilet. The survey also shows that about 70.3% household have ventilated pit latrine where as 0.7% household have pit latrine. Similarly, 2.8% have cistern flush latrine while only 26.2% of household have water seal latrine. The sample data of different type of latrines used by different house hold in different wards is shown in table below;

Table V-7: Type of Household Latrine

S.N.	Toilet Type	Ward No.		Total	Percent
		1	4		
1	Pit Latrine	3	19	22	0.7
2	Ventilated Pit	305	1921	2226	70.3
3	Water Seal	15	828	828	26.2
4	Cistern Flush		90	90	2.8
Total		323	2843	3166	100.0

Source: Socio-economic Survey, 2020

8. Health and other institutions

97. General medical facilities for treatments are available in the service area. One (1) Health Care Centerand 1 municipalhospital is present inthe municipality. Most people are found aware in health and hygiene. People are aware about hand washing before touching and eating food, and after defecation etc.

98. Likewise, more than 18 governmental, non-governmental and financial institutions are existed in the area and providing services to the community. In total 87 different types of small/big industries and enterprises including hotels and poultry farms are found in the service area.The existing financial institutions are Mega Bank, Sunrise Bank and some cooperative firms are also in operation in the area.

9. Willingness to Pay

99. According to the study, 98.8 % of households are interested to pay for connection of private tap in service area and are willing to contribute 5% upfront cash.

100. The survey revealed that community has shown positive response toward the willingness to pay monthly water tariff. As per the findings, 66.9% household prefer to pay monthly water tariff in the range from Rs. 151 to 200 whereas about 13.7% of households prefer to pay in the tariff range from Rs. 201-250. Similarly, 10.5% of household are willing to pay

between Rs. 351-400 per month. Likewise, around 15.6 % of household are willing to pay more than Rs. 251 and up to Rs. 400. Very few are willing to pay more than Rs. 400 per month.

10. Affordability

101. The study has assessed affordability of community in term of monthly income level for expense on water supply and sanitation service. According to the survey, about 3.1% of household fall below poverty level as per the implementation guidelines (Income <13,500 per month). Hence, assessing the income level of households, more than 96.9 % of household can afford monthly water tariff and contribution of upfront cash. Hence, affordability of the community has been observed as encouraging and positive towards the program.

D. Major Environmental Problems of Project Areas

102. Some of the major environmental problems prevalent to Dadhikottown are as follows;

1. Air Quality

103. There are no large industries in the subproject area. Air pollution is caused by fugitive dust from vehicles movements particularly over unpaved roads andgrounds, 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. However, towards the northern belt of the project area, there is a brick factory named Dakshin Barahi Brick Factory, and this is a source of air pollution which may couple with the sources of air pollution from the sub-project.

2. Acoustic Environment

104. 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 Dadhikot town is within the national and international permissible standards at daytime and nighttime.

3. Water Quality

105. 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 shows the increase in turbidity occasionally.

4. Solid Waste Management

106. Solid waste management is being handled by the municipality in coordination with local private service providers. The municipality practices controlled final disposal approach. The private operators are providing door-to-door collection services. Some CBOs are conducting

awareness and capacity building in solid waste management in community level. The need of more systematic approach for solid waste management is at rise in the municipality.

5. Wastewater Management

107. There is no sewerage system in the project area. Wastewater from individual households is managed inside their premises. The socio economic survey conducted in 2020 shows that almost all households have their own toilet. There is no wastewater treatment plant in the project area. However, the survey shows that 96.2% of the sampled HHs showed an interest in improving the septage management system and are interested to pay for it.

6. Sanitation Services

108. Some of the households have semi-permanent household toilets. The proportion of households with water-sealed latrines is only 26.2%. Hence containment improvement is one of the areas of need in the sanitation sector of the project area. Awareness campaigns have been successful in the past, and hence this needs to be continued in spirit of Total Sanitation Campaign in coordination with public health and WASH stakeholders.

7. Heritage Sites and Physical Cultural Resources

109. Assessment of the cultural sites and PCRs in the project area was carried out. The following table lists them;

Table V-8: Heritage Sites and Physical Cultural Resources

SN	Heritage sites/PCRs	Location	Remarks
1	Anantalingeshwor temple	Ward 4	
2	Bindabasini temple	Ward 4	
3	Matareshwor temple	Ward 4	
4	Tribeni temple	Ward 4	
5	Bishworupeshwor Mahadev temple	Ward 4	
6	Ponds	Ward 1 & 4	

110. The project activities, however, will not affect these PCRs.

E. Climate change and Adaptation

1. General Concept

111. Climate change referring to significance changes in global temperature, precipitation, wind patterns and other measures of climate that occur one several decades or longer has been also observed in Bhaktapur district also. Dadhikot, as a part of Suryabinayak Municipality of the Bhaktapur district has been facing the effects of climate change. Hence, in the design issues like ground water availability and its quality for drinking purpose, droughts, flooding, ground water recharge and water leakage minimization are given prime importance. From the climate perspective the project four seasons are observed in the project area namely winter, pre-monsoon, monsoon and post monsoon. The project area lies in mid-hill region, one of the five physiographic reasons of the country.

2. Temperature Change

112. The temperature change tendency in the project area is significant as in other parts of the valley. The annual maximum temperature trend is 0.056°C/year. Monsoon season has the significantly highest positive trend of 0.058°C/year and pre monsoon has the lowest trend of 0.051°C/year. Seasonal and annual maximum temperature shows increasing trend. Likewise, average minimum temperature is increasing annually but in remaining seasons it is in decreasing trend.

3. Precipitation Change

113. The precipitation as part of hydrological cycle is influenced by temperature variations in the project area. The precipitation trend shows decreasing in all seasons with the highest decreasing of 1.30 mm/yr, indicating insignificant change. However in the long run it may affect in the water security in the project area if climate change mitigation measures be ignored. High intensity rainfalls with short duration, shifting of rainfall period and erratic rainfall patterns are being observed in the project.

4. Impact on fresh water availability

114. Year round fresh water availability for fresh water for drinking and other social, cultural and economic activities is vital for the survival of human life and prosperity of the overall society. Excessive extraction of ground water than its recharge, negligence in recharge and reuse of ground water, extreme climate events like intense raining in short periods, prolonged droughts and similar other natural as well as anthropogenic activities that pose threats to fresh water availability in the project area. Hence climate change adaptation and mitigation measures should also to be instrumental to achieve sustainable water management in the project area.

5. Impacts on floods and droughts

115. High intensity rainfalls with short duration has been contributing to excessive surface runoff with high overland flow velocity in the steep terrain of the project area resulting flash floods in surface water bodies of the project area. Massive concrete and bitumen surfaces developed by human settlements in the project area are also the additional factors contributing to excess flooding.

116. During long droughts caused by erratic rainfall pattern ground water sources are being depicted and require their recharge, conservation and minimal use for the sustainable environment and livelihood.

6. Climate Change Vulnerability and Risks Reduction

117. The design of the project considers the extent to which the system is unable to cope with the adverse effects of climate change including climate variability and extremes. Erratic rainfall pattern may cause unusual flooding and droughts resulting depletion of ground water of upper aquifers is the potential risk in the project, which can be treated as climate induced disaster. Therefore, the issue has been address in the design by extracting ground water from deep aquifers and recharging shallow aquifers. Apart from this, annual temperature rise by 0.056°C may increase the mosquito breeding in water ponds and swampy lands. This will lead to the rise of vector borne disease. Therefore, constructing ponds to recharge ground water seems to have some challenges mainly due to this reason.

7. Climate Change Mitigation

118. Community awareness program to limit the magnitude of global warming and its related effects will be conducted in the project area for reducing emission of greenhouse gases, especially carbon dioxide. In the project area the process of adjustment to expected climate and its effects shall be introduced in the design. The measures for climate change adaptation are mentioned in sub- section below;

8. Climate Change Mitigation and Adaptation Measures

119. The following implementable measures will be taken in the project area for climate change mitigation and adaptation;

1. Aware community to implement appropriate waste management practices (based on 3R principles - reduce, reuse, recycle)
2. Aware project beneficiaries to use low flow showerheads rather than baths and less water consuming flushing toilets
3. Minimize NRW by using quality construction materials particularly (PE pipes with electro-fusion joints and DI pipes with push on joints
4. Minimize NRW by delineating the project area into manageable DMAs/sub-systems
5. Plant additional plants in the community forests of the project area
6. Use ground water from deep aquifers
7. Maintain civil structures' height above inundation level
8. Use low water consuming technology at household level

120. The implementation action plan of the above mitigation measures is depicted the following matrix;

Table V-9: Implementation Action Plan

SN	Activity	Responsibility	Time Frame
1	Aware community to implement appropriate waste management practices (reduce, reuse, recycle)	CRDSMC, WUSC, Ward Committees and Community Activists, Users	Design, Construction and Operation Phases
2	Aware project beneficiaries to use low flow showerheads rather than baths and less water consuming flushing toilets	CRDSMC, WUSC, Ward Committees and Community Activists, Users	Design, Construction and Operation Phases
3	Minimize NRW by using quality construction materials particularly (PE pipes with electro-fusion joints and DI pipes with push on joints	CRDSMC, WUSC, Contractor	Design, Construction and Operation Phases
4	Minimize NRW by delineating the project area into manageable DMAs/sub-systems	CRDSMC, WUSC, Contractor	Design, Construction and Operation Phases
5	Set finished level of civil structures above inundation level	CRDSMC	Design and Construction Phase
6	Construction of Construction of 46 recharge pits; and rehabilitation of 3 recharge ponds	Contractor; facilitated by WUSC & supervised by CRDSMC	Design and Construction Phase
7	Greenery promotion activities	Contractor; facilitated by WUSC & supervised by CRDSMC	Design and Construction Phase

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

121. The potential impacts of the proposed Dadhikot 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

122. **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 5,500 man-days of skilled labors and 12,500 man-days of unskilled labors person days are required. Only2.3% of the locals of the project area are involved in daily wage-based labour works. Hence, local unskilled and semiskilled employment is going to be very limited. However, priority will be given to the locals whenever possible. 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.

123. **Skills Enhancement**. The construction of the water supply system and the distribution network is likely to enhance the skills of the locals 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.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.

124. **Enterprise Development and Business Promotion**. The service areas of Dadhikot town have mixed urban and semi-urban characteristics - predominant of urban settings. 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. The local marketplaces will see increased demand for food supplies. This will attract local agro-enterprises in the project area. Along with the implementation of the project, theseavenues 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 as the project area is also close to Suryabinayak core area and the Araniko highway.

2. Operation and Maintenance Phase

125. **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 is estimated that every household will save in average of 45 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)
45	350	15,750

Source: Socio-economic Survey 2019

126. This shows that in average, a household of service area will save time worth NRs 15,750 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).

127. **Development of market/commercial center**.The availability of good supply of drinking water will accelerate the rate of development of Dadhikot as a leading market centre. The project area already has 87 different types of industries,small and big hotels; and financial institutions likeMega Bank and some cooperatives along with 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.

128. **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.

129. **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. The current WUSC comprises of all women members. The successful implementation of this project will set an example for gender roles in social transformations.

130. **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, with reference to the National Living Standard Survey (NLSS, 2011), 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

131. 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.

132. 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.

133. 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.

134. 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;
- 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 considered during design	During the detailed engineering design stage, water samples from existing deep tube well were tested. 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 a pressure filter and disinfection and provisions for lab unit and kits. This IEE proposes “hands on” training by a licensed & accredited

REA identified Impacts/Issues/Concerns	Measures taken during FS/DED and IEE to mitigate impacts/issues/concerns
	laboratory for the first few years of operation under the Water Safety Plan included in the sub project design & continuing training there-after.
- Inadequate protection of water source	DTW has appropriate casing of tube wells including the installation of screens. Sources are 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 will 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 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.

2. Construction Phase

(i) Physical Environment

135. **Erosion and land surface disturbance**. Digging of trenches and excavation works during construction works for structures of water supply and inbuilt SCADA units 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. Dismantling works at Syangtang, Sikaritar and Tyare sites will also pose the potential of these impacts. These activities will causenuisance and discomfort to the locals.Gamcha area, Thapa tole, Kukandole and Jangam tole are some of the places where these disturbances can occur.

136. Public land will be used for construction of project components such as deep boring, treatment unit, OHT, office building and guard house. Nearly 4816.17 sq. m. of total land at 19 different sites for construction of project components except office building is required of which 937.79 sq. m. land in 4 different sites is under the ownership of WUSC and 3878.38 sq. m. required public lands has acquired by the WUSC at 15 different sites. For the office building around 508.64 sq. m. land area will be required and WUSC has made written commitment to acquire the land as soon as possible. However, no private land needs to be acquired. All the distribution and transmission pipelines will be placed in 90 cm trench and backfilled. Precautionary measures will be taken, proper backfilling of excavated trenches will be done and the excavated soil will be stacked properly. Construction activities will be, as far as possible, avoided during the rainy season. Topsoil will be conserved and resurfaced with compaction. Safe dismantling will be carried out with timely coordination with concerned stakeholders.

137. **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 200 m or deeper, 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. Recharge through reinstatement of 3 recharge ponds, and through installation of 46 institutional recharge pits have been proposed in the subproject.

138. **Damage to the Existing Facilities**. Market and core settlements of Gamcha area, Thapa tole, Kukandole and Jangam tole, and some inner settlementswith narrower access are likely to face such impacts 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 market area in spite of great care. A repair team will be on standby for the repair of water supply pipeline for immediate repairs.

139. Timely and proper reinstatement of any damage to public or private property will be carried out. A proper inventory of any damages to existing facilities will be kept. Any grievance regarding such damage will be dealt with priority and will be addressed timely.

140. **Air pollution and noise nuisance**. Boring of deep tube wells, laying of transmission & distribution pipes, construction of storage reservoirs, construction of office building along with generator & guard houses, and transport & installation of pumps are the major construction activities of the project. 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.

141. The air pollution concerns related to the project will be addressed by using the vehicles and equipments with low emissions. Regular water sprinkling will be carried out at places where dust pollution is caused due to plying of construction related vehicles. The vehicles carrying construction materials will be covered, and drop height of the hauling vehicles will be minimized. Burning of waste in the campsites or at construction sites will be restricted. The noise nuisance will be controlled by use of soft horns in vehicles used in construction. The construction activities near core settlements and/or healthcare facilities will be restricted after 7 pm and before 6 am. Construction schedules will be discussed with locals so as to minimize any disturbance in major community functions or activities.

142. **Impact on water bodies**. The project area is bounded byHanumante river in the northern side and Mahadev river in the eastern side. There will be some impacts on surface water bodies in close proximity to the project 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, and
(iii) Leakage & disposal of oil and grease from construction equipment.

143. The excavation works will cause turbidity in water up to a certain extent. However the quantity is limited, and the impact will be there for short period of time. Mitigation measures are avoiding disposal of spoil or waste onto water bodies, and restriction of washing and fishing by workers in local surface water bodies. The slurry from WTPs will be disposed off only in designated areas and regular monitoring of the river or stream water quality should be done.

144. **Waste Management and Disposal**. Generation of spoil from foundation works, pond reinstatement works, and recharge pits may cause problems if not well managed timely. Likewise, if not managed, disposal of solid waste from workers' campsites in the vicinity of surface water 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. Expecting that there will be around 50 workers in average each day, the waste generation from campsites could be 10 kgs/day. If not segregated and well disposed, this could pile and pollute the local environment.

145. Proper waste management and disposal system will be done during the construction period. Proper toilets for the workers will be installed before starting the work. Waste like excess grease, lubricants will be collected in plastic containers and will be sold to scrap dealer. Solid waste and other construction waste will be deposited near by the labour camp and will be cleared after the completion of the construction works. Spoil and dismantling waste will be disposed at designated sites only. The backfill sits along the irrigation dam sites of ward number 4 have been proposed for disposal of spoil generated from construction activities.

(ii) Biological Environment

146. The service area comprises a mix of built-up areas, scattered hill settlements, natural slopes, and some forest patches. Thus, there is risk of degradation of the local vegetation by the activities of the workforce's indirect involvements. However, sites have been selected to avoid any tree cutting. All the distribution pipelines pass along the roadside and only a few numbers of plants and bushes have to be cleared up within the transmission pipeline stretches. The impacts to human settlements include effects on cattle sheds, farmlands and small irrigation canals which will be very low and temporary impacts.

147. The potential environmental impacts of the subproject on local flora and fauna during construction and post construction phases will be low. There will be need of tree felling at reservoir site of *Dakshin Barahi*. This is a public land. Around 12 pine (*Pinus roxburghii*) trees will need to be cleared. However, some of them are very small and some are dry/old trees. Along the distribution line, there will be minimum loss of grazing land, and no loss of agriculture land. Some of the impacts that may likely to occur are described below;

148. IBAT information has been assessed. The project doesn't directly affect environmentally protected areas, core zones of biosphere reserves, or highly valued cultural property. 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).Thesubproject components require a very small area of land for implementation and environmental impacts on the vegetation and natural eco-system is not significant.

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

150. **Impact on aquatic life**.Hanumanteriver and Mahadev river are the major surface water flows that faces risk of pollution due to subproject activities. The construction activities mayindirectly disturb the water quality for a certain period of time and may cause adverse impact on aquatic life. But these effects will be short term in nature and local in scale.

151. Any kind of bird hunting or poaching by workforce will be strictly prohibited. Awareness programs will be conducted in the campsites and in the project communities regarding conservation of the wildlives. Code of conduct will be provided to all the technicians and workers regarding the activities that may disturb any migratory or local species of amphibians, birds and other fauna. The workforce will be given following instructions;

a. Strictly prohibition from fodder collection in any nearby forest area,
b. Restriction in conducting any activities in streams,
c. Ban of hunting and poaching activities or any activities related to that

(iii) Socio-economic Environment

152. **Disturbance to community activities**.Gamcha area, Thapa tole, Kukandole and Jangam tole, and some inner settlements with narrower accessare the areas where the community activities may be disturbed due to the project's construction activities. Local festivals and social events may be disturbed. 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.

153. Inorder 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.

154. **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.Local people and women above the age of 16 will be given preference for employment.

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.
(vi) The contractor will be supervised on development of SOPs/response plan to minimize the risk of CovID19 infections

156. **Community health and safety**
Since some of the construction works take place near the settlements, and the construction works of storm water drainage will be through the settlements, there are chances that the local people may face small accidental cases. This is critical primarily for children and old-aged people. Chances of communicable diseases are also a concern. Stock-piles sites, spoil disposal sites and movement of vehicles for construction activities are some of the aspects of construction works which may pose threat to health and safety of the community. Under the context of recent spread of the SARS-CoV-2 pandemic, the contractor will be required to prepare a Standard Operations Procedures (SOPs) as a response to any viral infection/s, and the workforce will be required to follow the SOPs.

157. **Resettlement, relocation and compensation issue.** The major structures are to be constructed either on public land or on land already belonging to WUSC. The municipality office has provided the needed consent for the use of required land parcels for the project component. Similarly, the distribution system network follows within the RoW of public roads. Therefore, resettlement or relocation is not required.

3. Operation & Maintenance Phase

158. **Chemical hazard**.Exposure to or consumption of high dose of 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.

159. **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 Hanumanteriver which may be susceptible to project activities like waste disposal.As the backwash water mainly contains suspended solids. Desilting pond 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 as provisioned for sludge management in O&M manual; and periodic monitoring of the river water quality should be done, as and if required.

160. **Impacts of use of diesel generators.** Use of generators is foreseen to be likely. The use of diesel generators will have some noise nuisance, and air pollutant emissions. This will be a nuisance for the locals within the close vicinity. However, this impact has been predicted to be of low significance.

161. To mitigate the concern, under suitable condition governed by location of water source, the electro-mechanical components will be placed as practicably far as possible from the major settlements, say more than 50 meters far from the major settlement or market area. In addition to this, the specifications of pumps and generators have been worked out so as to meet also low noise and pollution emissions.

162. **Occupational Health and Safety (OHS).** Provision of proper Personal Protective Equipment (PPEs) during maintenance works, cleaning works and while working in treatment units will be ensured, and monitoring will be carried out. Provision of adequate welfare facilities including clean water, soap, nailbrushes, disposable paper towels and washing facilities will be ensured. First Aid Kits will be provided. Provisions will also include clean water or sterile wipes for cleansing wounds, and a supply of sterile, waterproof, adhesive dressings.

163. O&M workers will be required to ensure that employees and line management understand the risks through proper instruction, training and supervision.The WUSC will need to implement SOPs along with safety plan specific to CovID19 infection risk.

164. **Community Health and Safety.** Community health and safety will also be considered. There will be restriction on unauthorized entry of local people in the OHT sites and the treatment plant area. Awareness in community level will be conducted to ensure that the locals do not face any health risks due to the project O&M activities, especially during maintenance and cleaning works.

C. Evaluation of the Impacts

165. 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/commercial Center	Indirect	M (20)	Lc (20)	Lt (20)	Significant (60)

Impacts	Nature	Magnitude	Extent	Duration	Total score and significance
Appreciation of land value	Indirect	M (20)	Lc (20)	Lt (20)	Significant (60)
Women Empowerment	Direct	M (20)	Lc (20)	Lt (20)	Significant (60)
Quality of Life Values	Indirect	M (20)	Lc (20)	Lt (20)	Significant (60)
Adverse Impacts					
Construction stage					
Physical Environment					
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 management and disposal	Direct	M (20)	Lc (20)	Mt (10)	Significant (50)
Biological Environment					
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)
Impacts of use diesel generators	Direct	L (10)	Lc (20)	St (5)	Insignificant (35)
Occupation health and safety	Direct	H (60)	Ss (10)	Mt (10)	Significant (80)
Community health and safety	Direct	M (20)	Ss (10)	Mt (10)	Insignificant (40)

VII. ANALYSIS OF ALTERNATIVES

A. With- and Without-Subproject Alternatives

166. Thesubproject area is a established urban settlement with further potential of urban growth. It lies in close connection to the Araniko 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. Doing nothing about these challenges would be allowing the subproject area 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.

167. 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 as it serves 3598 households in the base year 2023. The ultimate outcomes of the project will also add on for the achievement of targets of SDG 5th of achieving gender equality and women empowerment.

B. With subproject's location alternatives

168. Thesubproject area is a very needy area in terms of safe water needs. Strategically, the investment in water and sanitation in this belt will upgrade the overall socio-economic aspects of the district of Bhaktapur. It is within Suryabinayak municipality and is close to the core township of Bhaktapur and Kathmandu.This will also help the locals achieve the services equaling to the drinking water services that will soon be supplied to the valley by KUKL.

169. On the other hand, 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 cutting and damage to cultivated land has also been considered in site selection.

C. Alternatives Related to technology, materials and implementation procedure

170. Regarding the source and its technology of water extraction, the proposed deep tube well as source is more sustainable. The subproject area has Hanumante River which flows alongnorthern boundary of the project area. Though this perennial river could have been one of the water sources for the proposed system, the quality of water has deteriorated considerably, and will not be acceptable for drinking water approach. Hence, deep tube wells will be relatively more acceptable, reliable and sustainable source technology.

171. The proposed system is a small-scalesubproject. 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.

172. The distribution system is gravity based, and hence the operation will be easier, and cost effective. This will also add to the sustainability of the project in the long run.

173. 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.

174. 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

175. 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.

176. 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

177. 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.

178. 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 subproject in accordance with the subproject selection criteria for the project,assisting the municipality 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 contractor; support for capacity building; and overseeing safeguard compliance. The PMO will liaise with WUSC/municipality to sign the management agreement prior to the award of contract for each subproject. The PMO will also engage all consultants under the project.

179. The PMO (Kathmandu) will act as RPMO for central region projects. The PMO/RPMO will manage the detailed design and construction supervision with support from DSMC. The TDF will coordinate with PMO/RPMO, WUSC and the municipality at least on monthly basis.

180. The WUSC, on behalf of the WUA[2] or the municipality[3]will be responsible for operation and maintenance (O&M) of the water supply and sanitation facilities constructed, operating under a management agreement with DWSSM. WUSC consist of nine executive members,[4] 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.

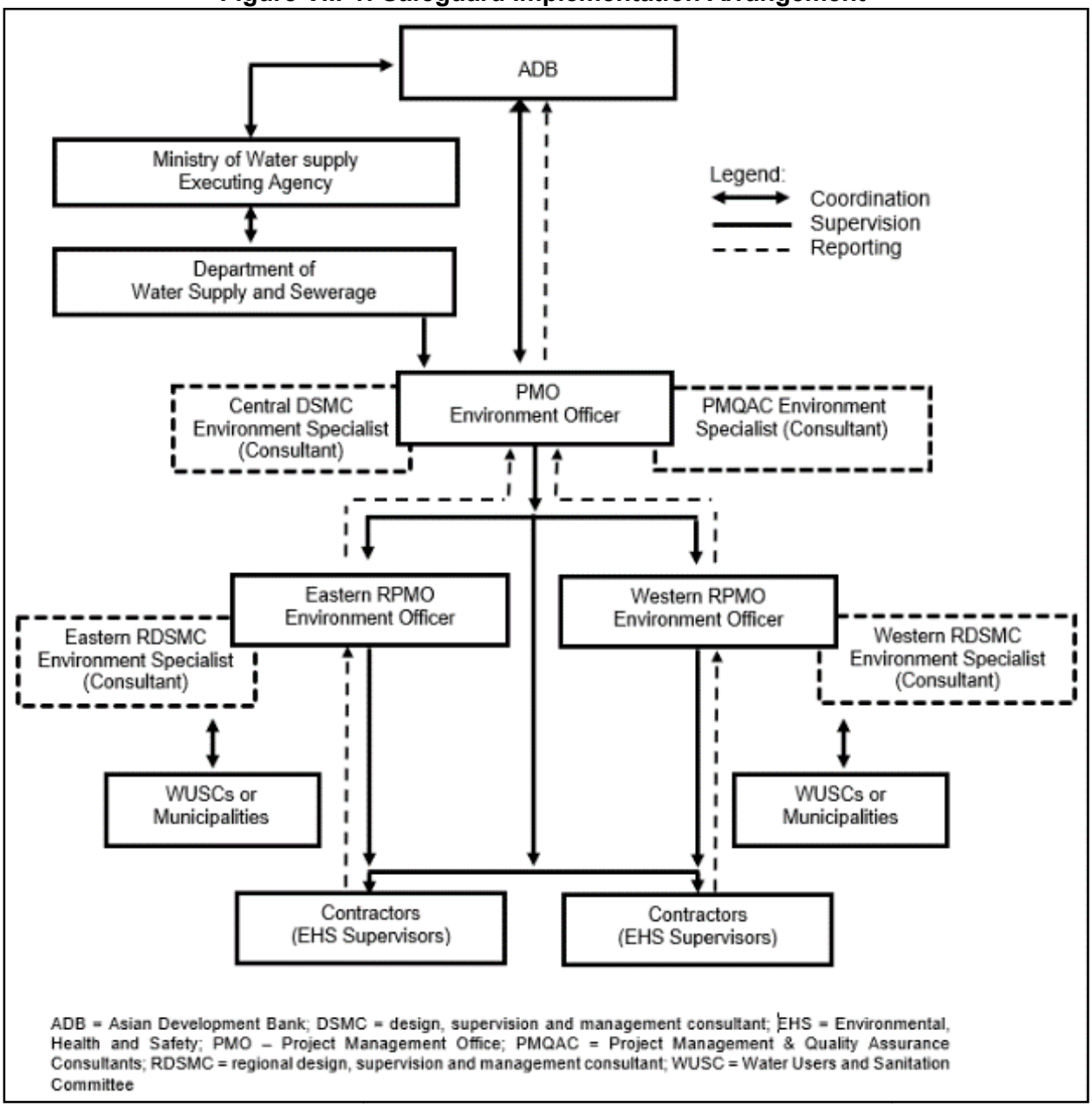
[1] DWSSM will continue the existing PMO established and operational for the Third Small Towns Water Supply and Sanitation Sector project.

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

[3] 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.

[4] 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

181. **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 IEE and EMP are updated based on detailed designs, that IEE/EMP prepared by DSMC 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 EMP is included in bidding documents and civil works contract;
(iv) provide oversight on environmental management aspects of the subproject and ensure EMP is implemented by PMO/RPMO and contractor;
(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 RPMO to properly carry out the environmental monitoring and assessments as per the EARF;
(viii) review, monitor and evaluate effectiveness with which the EMP is implemented, and recommend necessary corrective actions to be taken;
(ix) consolidate monthly environmental monitoring reports from PMO/RPMO and submit semi-annual monitoring reports to ADB;
(x) ensure timely disclosure of final IEE/EMP 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 IEE;
(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/RPMO, and WUA.

182. **Regional Project Management Office.** The environmental officer assigned by DWSSM to the PMO/RPMO will receive support from (i) the PMO environmental officer, (ii) environmental specialist from PMQAC; and (iii) the environmental specialist and EMP monitors of the CR-DSMC to carry out the following;

(i) prepare new IEE and EMP in accordance with the EARF and government rules;
(ii) include EMP 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 EMP including environmental monitoring by contractor;
(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 IEE.

183. **Project Management and Quality Assurance Consultant.** The Project Management and Quality AssuranceConsultants (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.

184. **Design, Supervision and Management Consultant.** The CR-DSMC will provide support to the PMO in the following areas;

(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 PMO 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 Committee (WUSC), 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.

185. **Civil Works Contractor.** The contractor will be required to designate an Environment, Health and Safety (EHS) supervisor to ensure implementation of EMP during civil works. Contractor needs to carry out all environmental mitigation and monitoring measures outlined in their contract. The contractor will be required to submit to PMO/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 and deputation of an EHS focal person by the contractor. The contractor will be required to undertake day to day monitoring and report to the PMO/RPMO and DSMC.

186. A copy of the EMP and 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 IEE document specify responsibilities in EMP implementation during design, construction and O&M phases.

187. The PMO/RPMO 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.

188. **Capacity Building**. The PMQAC 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 the project;
(ii) Review of IEE 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.

189. **Water Users' and Sanitation Committee.** WUSC is the eventual operator of the completed project. The key tasks and responsibilities of WUSCare, 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.

190. **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

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

192. The EMP will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between PMO/RPMO consultant and the contractor. 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.

193. 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 (S-EMP). The contractor shall allocate budget for compliance with these IEE, EMP and S-EMP measures, requirements and actions. The contractor will be required to submit to CRDSMC, for review and approval, a S-EMP 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. The contractor will need to depute a field based EHS focal person for the sub-project. No works can commence prior to approval of S-EMP.

TableVIII-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 $Ca(OCl)_2$ and provisions for lab unit and kits.	PMO, RPMO& DSMC	Incorporated in final design and communicated to contractors	Prior to award of contract
Sanitation	Contamination of groundwater due to seepage of wastewater from the toilet promoted under OBA.	- (i) Ensure the new toilets are constructed as per the standard designs; and (ii) provision of water supply to ensure efficient operation of the toilet.	PMO, RPMO & DSMC	Incorporated in final design and communicated to contractors	Prior to award of contract
Stockpile areas, Storage areas, Disposal areas, and workers camp (if needed)	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 camp (if needed). Written consent of landowner/s (not lessee/s) for reuse of excess spoils to agricultural land	During detailed design phase

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
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 & safety (OHS) for construction works. - Timely implementation of the EMP. - Development and execution of measures for any unanticipated 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. Dismantling works	- 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. - Consent will be taken before dismantling of existing structures. All the concerned stakeholders will be coordinated before dismantling. Safe dismantling will be carried out. This will be one of the components of S-EMP of the contractor.	Contractor	Records of sources of materials and records of potential areas of soil erosion; S-EMP 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 electric poles, 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 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	Contractor	List of any public or private infrastructure disturbed by the subproject works Minutes of meetings with the locals or affected persons.	As per need, or field-inspection if any such case is foreseen.

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		utilities will be restored or compensated to pre-work conditions.			
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)	- As far as possible, 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.
Acoustic environment	Construction activities will be on settlements along and near schools, and areas with small-scale businesses. Temporary increase in	- 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.	Contractor	Results of monitoring noise levels (Maintain maximum sound levels not exceeding 70 decibels when measured at a	Daily monitoring (when there are ongoing works) by contractor. Monthly inspection by RPMO& DSMC-ESS.

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	noise level and vibrations may be caused by excavation equipment, and the transportation of equipment materials, and people.	- 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 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.		distance of 10m or more from the construction sites) Number of complaints from sensitive receptors	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 - Dismantling waste to be used for backfilling, and needs to be disposed only at designated disposal site (proposed site is the backfill sites of the irrigation dams within the project area of ward 4)	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 12pine 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 Dakshin Barahi area, Anantaligeshwor area and WUSC building area - Tree felling will be avoided, and if any such cases occur, prior approval from the local bodies will be received and compensatory plantation @ 1:10 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
Impacts on Fauna	Disturbances to local and migratory birds,	- No heavy vehicles will be made available to run on the road that may disturb the	Contractor	Vehicles running nearby wildlife	Monthly visual inspection by RPMO& DSMC-ESS

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	reptiles and mammals	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. - Conducting environmental awareness activities for the workforce (especially with respect to importance of conservation and protection of wildlife)		inhabited area will be monitored Number of complaints from sensitive receptors on disturbance of poaching fishing, etc.	
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	Surface water body (Mahadev khola) will be monitored with respect to project activities; 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 Gamcha area, Thapa tole, Kukandole and Jangam tole, and some inner settlements with narrower access - 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	- 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 outside workers	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
	people and culture				
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. - Health & hygiene practices; precautions will be taken in response to current risk of CovID19 infections	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 Gamcha area, Thapa tole, Kukandole and Jangam tole, and some inner settlements with narrower access	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	- All disinfection chemicals require proper storage and handling practices - Provide safe storage for chemicals	Contractor during DLP; WUSC or operator after	Visual inspection	Daily (or as needed) by the operator.

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	ion generally results in irritation of the esophagus, a burning sensation in the mouth and throat, and spontaneous vomiting	- Ensure that the person is hired, with knowledge of chlorine use for disinfection process during operation - Ensure use of PPE while using chemicals - Use of chlorine guideline as per WHO (Annex 8)	DLP		
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.
Impact of use of diesel generators	Noise nuisance, disturbance to locals; and possible ambient air pollution	- Under suitable condition governed by location of water source, the electro-mechanical components will be placed as practicably far as possible from the major settlements, say more than 50 meters far from the major settlement or market area. - Regular maintenance of generators - Use of good quality fuel	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.
Occupational Health and Safety	Risk of physical and biological hazards for the workers in FSTP	- Provision of standard set of PPEs containing masks, face shield/visor, water proof gloves, boots, safety goggles and working suit - Provision of adequate welfare facilities including clean water, soap, nailbrushes, disposable paper towels and washing facilities. - Provision of First Aid Kits. Provisions should include clean water or sterile wipes for cleansing wounds, and a supply of sterile, waterproof, adhesive dressings. - Regular supervision and monitoring of provision and use of PPEs - Under the context of possibility of spread of the viral infections, the workers will be instructed for (a) compulsory use of masks along with other PPEs, (b) adequate supply of water for drinking & washing, (c) screening of health conditions of the	Contractor during DLP; WUSC or municipality after DLP	Records of use of PPEs Inventory of welfare utilities Medical screening records of the workers	Daily records Weekly inventory Every 3 months; or and as per need

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		workers - Development and implementation of specific SOPs for any emergency response required			
Risk of community hazards	There could be accidents like falling into open/damaged drains with open surface This also poses risks to animals and vehicles	- Restriction of unauthorized entry of people in the treatment plant area - Installation of warning sign boards in visible locations, and in local languages during maintenance periods and heavy rain periods - Under the context of possible spread of the viral infections, the workers will be instructed to have minimal contact with the community people.	Contractor during DLP; WUSC or municipality after DLP	Visual inspection Records of any accidents, and grievance records	For first year, DSMC After that WSUC daily inspection or as needed.

C. Environmental Monitoring Program

194. 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.

195. 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.

TableVIII-3: Environmental Pollution Monitoring Program

	Field	Stage	Parameters	• Location	Frequency	Standards	Responsibility
1.	Air quality	• Prior to construction to establish baseline • Construction phase	TSP, PM_{10}, SO_2, NO_x (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 constructi on period	• National Ambient Air Quality Standard s, 2003	Contractor
2.	Noise and vibration levels	• Prior to construction to establish baseline • Construction phase	Equivalent day and nighttime noise levels	• PTWs location; Reservoir location • Along water distribution mains • Construction campsite locations	• Once in a season (except monsoon) for the constructi on period	• National Noise Standard Guideline s, 2012	Contractor
3.	Water quality	• Prior to construction to establish baseline • Construction phase	TSS, pH, fecal coliform (other parameters as required)	• 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 constructi on	• National Drinking Water Quality Standard s, 2005	Contractor

D. Institutional Capacity Development Program

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

197. 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's regional laboratory or a private laboratory can be used for monitoring WQ until the WUSC becomes trained for this. 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 will 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.

198. 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

Items	Pre-construction/prior to construction	Construction	
Duration	1 day	1 day	1 day on a regular period to be determined by PMO, ICGs, and (provide if DRTAC or DSMC)
Particip ants	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

199. 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.

200. 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.

201. 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.

202. 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 as per an O&M Manual. The WSP, included in 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.

203. Cost of awareness program & WSP during contract period is NPR 200,000.00. Total Sanitation promotion will also be a core part of awareness programs and this will be conducted in coordination with the social safeguards team of the project. 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 ofEMP Implementation and Its Monitoring

	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Cost covered by
A	**Mitigation Measures**						
1	Protection works, slope stabilization works					750,000	Civil works contract
2	Rehabilitation, and reinstatement works					500,000	Civil works contract
3	Greenery management/ Promotion	Construction phase				575,000	Civil works contract
B	**Monitoring Measures**						
1.	Air quality and noise level monitoring	- Pre-construction - Construction	Per location	4		215000	Civil works contract
2.	Noise levels monitoring	- Pre-construction - Construction	Per location				Civil works contract
3.	Water Quality Test	Pre-construction - Construction	Per Location	12		107,500	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 PMQAC or DSMC contract
D	**Administrative Costs**						
1.	Legislation, permits, and agreements	Permit for excavation, tree-cutting permits, etc	As per requirement	NA	NA	NA	
		IEE preparation	Lump sum	1	500,000	500,000	DSMC contract
E	**Other Costs**						
1.	Public awareness	Focused on Community Health and Safety & Environmental Conservation, Total Sanitation;	As per requirement	Lump sum		169,345	Civil works contract – contractor's defect liability period

	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Cost covered by
		and Information dissemination					
2.	Additional WASH provisions	Focused on hygiene and safety				250,000	Civil works contract – contractor's defect liability period
3.	Water sprinkling	At active sites near settlement/ market areas (as needed)		Lump-sum		200,000	Civil works contract
4.	Social safeguards	Grievances, information disclosure, meetings		Lump sum		53,750	Civil works contract – contractor's defect liability period
5.	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 period
F	**External Monitoring Costs**						
	Environmental Specialist				100,000	100,000	PMO cost
	Sociologist				75,000	75,000	
	Support staff				25,000	50,000	
	Cost of monitoring visit by MoWS/DWSSM					200,000	
	Transportation and logistics					75,000	
TOTAL						**5,120,595**	

204. The EMP will be included in civil work bidding and contract documents. The cost of NRs 2,820,595 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

205. Field inspection of proposed sub project facility locations and pipeline alignments that had been identified was undertaken dated on January and February 2020.Due to continuous lockdown in different forms declared by the central and local government considering spread out the effects of CovID-19 in community level, the field work was interrupted from March 2020 to July 2020. Applying precaution measures site visit and interaction continued at the sub-project area from August 2020. 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	Basudev Thapa	Mayor, Suryabinayak Municipality
2	Juna Basnet	Deputy Mayor, Suryabinayak Municipality
3	Uttam Thapa	Chairperson, WN 4
4	Babu Kaji Kayastha	Chairperson, WN 1
5	Devraj Rajtheula	Ward Committee Member, WN 4
6	Anil Kumar Shrestha	Chairperson, WUSC
7	Rajendra Kumar Rajthala	Vice-Chairperson, WUSC
8	Shanti Karki	Secretary, WUSC
9	Rajendra Kakuju Shrestha	Treasurer, WUSC
10	Rohit Shrestha	Member, WUSC
11	Niru Gwala Shrestha	Member, WUSC
12	Putali Ghimire	Member, WUSC
13	Dil Bahadur Shrestha	Member, WUSC
14	Badri Khadka	Beneficiary, WN 4
15	Gangaram Khatri	Beneficiary, WN 4
16	Aaysuh Baral	Beneficiary, WN 4
17	Govinda Chaulagain	Beneficiary, WN 4
18	Kalpana Khadki	Dadhikot, WN 4
19	Deepa Thapa	Beneficiary, Neupanegaun, WN 4
20	Lali Shrestha	Beneficiary, Gamcha, WN 4
21	Mina Karki	Khadkagaun, WN 4

206. During the IEE preparation, consultations were undertaken. Formal and semi-formal public consultationswere conducted during December 2019, and June 2020 to September 2020. Safety aspects, greenery preservation, and chosing of safe construction campsites during construction were raised as among the concerns during the public consultation.

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

SN	Meeting	Date	Location	Outcomes
1	Stakeholder consultation	17th June 2020	Municipality office	Understanding of design and coverage area; and safeguards requirements of the project
2	Public consultation	13th September 2020	Ward Office, WN 4	Discussion on design aspects; availability of land for the project components; discussion on avoiding vegetation loss; and on environmental pollution and OHS aspects
3	Field/community consultation	14th September 2020	Municipality meeting hall	Sharing on details of project design and safeguards requirements; focus on women participation and empowerment; focus on exiting context of viral infection risks; discussion of water recharge options

207. The concerns raised by the stakeholders during public consultations have been addressed during preparation of this IEE report. The major environmental & social safeguards and sustainability related concerns raised during the consultations are;

(i) Employment opportunities for the locals
(ii) Underground water concerns and water quality
(iii) Need of timely completion of the project construction works as per targeted during the planning phase
(iv) Cost sharing and operational aspects of the project

208. 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 Municipality. PMO, ICG, Contractor 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.

209. ADB approved IEE Report, will be made 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 UWSSP websites.

B. Grievance Redress Mechanism

210. 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 Annex2-B.

211. 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.

212. 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.

213. 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,[20] 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.

214. 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

[20] 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.

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) **FirstLevelofGRM** (WUA level): Thefirst-level, which is also the mostaccessibleandimmediatevenueforquickresolutionofgrievanceswill bethecontractors, RDSMC field engineers and RPMO supervision personnel,who will immediately inform the WUA. Any personwitha grievancerelated tothe projectworkscan contactUWSSPto fileacomplaint.The municipal-level field office of the RPMO, in WUA's building, will documentthecomplaint within 24 hours of receipt of complaint in the field, and WUA or local bodies will immediatelyaddressandresolvetheissueatfield-levelwiththecontractor, supervision personnel of RPMO and RDSMC field engineers within 5 days of receipt of a complaint/grievance. The assigned RDSMC's Social Mobilizerwill be responsible to fully document:(i)nameofthe person,(ii)date of complaintreceived,(iii)natureofcomplaint, (iv) locationand(v)how the complaintwas resolved as well as to provide feedback to the complainant. Ifthecomplaintremainsunresolvedatthe local level within 5 days, the WUA will forward the complaint to the municipality level GRM.

(ii) **Second Level ofGRM** (Municipality level): Thecomplainant willbenotifiedby the WUA thatthe grievanceisforwardedto the Municipality-level GRC. The Municipality-level GRC will be called for a meeting, called and chaired by the Mayor.TheGRCwill recommend correctivemeasuresatthe 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 responsibleforprocessing andplacing all papersbefore the GRC,recordingdecisions,issuingminutesofthemeetings, providing feedback to complainantsandtakingfollowupactionsso thatformal ordersare issued anddecisions are carriedout.

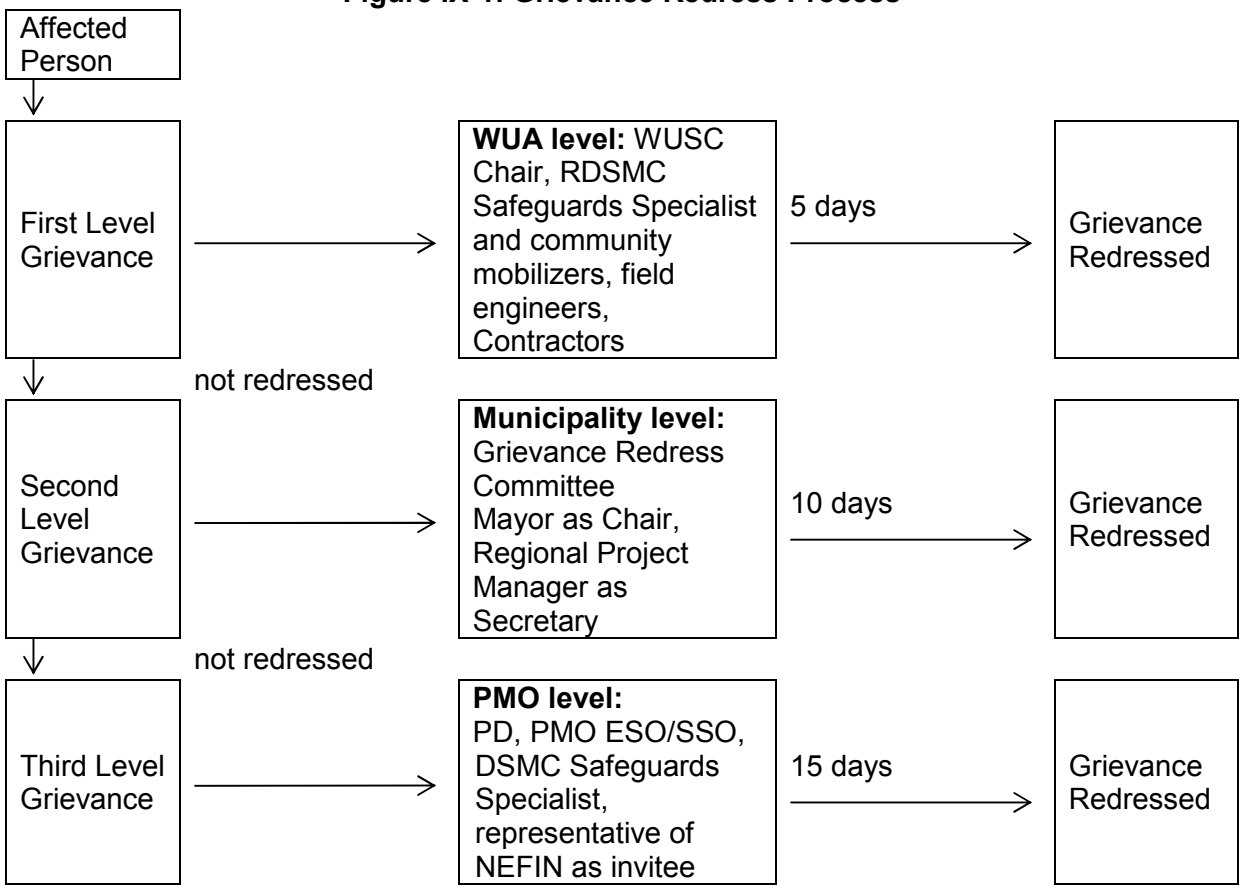
(iii) **Third Level of GRM** (PMO Level)**:** Any unresolved or major issues at Municipality level will be referred to the PMO for final solution. A representative of the Nepal Foundation for Indigenous Nationalities (NEFIN) will be invited to attend any meetings related to resolution of Indigenous Peoples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

215. 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.

216. 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.

217. 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 UWSSP 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.

218. **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.

219. **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.

220. **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

221. 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.

222. 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.

223. 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.

224. 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.

225. 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.

226. 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

227. The water supply and sanitation subproject proposed under UWSSP in Dadhikot Town is not an environmentally critical intervention. The IEE further concludes that;

(i) The subproject is not within 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.

228. 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 Gamcha area, Thapa tole, Kukandole and Jangam tole, and some inner settlements with narrower access 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.

229. 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 Bagmati Province.

230. Finally, based on the above findings, the classification of DadhikotUrban 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.

LITERATURE REVIEWED

- ✓ *ADB, 2003. Environmental Assessment Guidelines.*
- ✓ *Constitution of Nepal (2015). Ministry of Law, Justice and Parliamentary Affairs, Law Books Management Board, Kathmandu*
- ✓ *Environment Protection Act, (2019). Ministry of Forests and Environment Kathmandu*
- ✓ *Environment Protection Rules, (2020), Ministry of Forests and Environment, Kathmandu*
- ✓ *Environment Statistics of Nepal, CBS, 2011*
- ✓ *Environmental Impact Assessment Guidelines, (1993). National Conservation Strategy Implementation Project, National Planning Commission, His Majesty's Government, Nepal*
- ✓ *Detailed Engineering Design Report of Dadhikot Water Supply Sub Project, 2016*
- ✓ *Labor Act (1991), Ministry of Law, Justice and Parliamentary Affairs, Law Books Management Board, Kathmandu*
- ✓ *Local Self-Governance Act, (1999). Ministry of Law, Justice and Parliamentary Affairs, Law Books Management Board, Kathmandu*
- ✓ *Ministry of Population and Environment, 1999. Environment Protection Act, 1997 and Environment Protection Rules, 1999. (Amendment, 1999). Ministry of Law, Justice and Parliament Affairs, Nepal*
- ✓ *Municipality profile and baseline information of Suryabinayak Municipality, and National Population and Housing 2011, CBS, 2012*
- ✓ *National Transport Policy, (2001). Ministry of Physical Infrastructure and Transport, Government of Nepal, Nepal*
- ✓ *National Urban Policy (2007). Ministry of Law, Justice and Parliamentary Affairs, Law Books Management Board, Kathmandu*
- ✓ *Shrestha K 1998. Dictionary of Nepalese Plant names. Mandala Book Point, Kathmandu, Nepal.*
- ✓ *Solid Waste Management Act (2011). Ministry of Science and Technology and Environment, Kathmandu*
- ✓ *The Updated Fifteen-Year Development Plan for Small Towns' Water Supply and Sanitation Sector,2009*
- ✓ *Uprety, B.K (2003). Safeguard the Resources Environmental Impact Assessment Process and Practice, Kathmandu*
- ✓ *Water Resource Act (1992). Ministry of Law, Justice and Parliamentary Affairs, Law Books Management Board, Kathmandu*

ANNEXES

ANNEX 1: REA CHECKLIST

ANNEX 1:

RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST FORDADHIKOT 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: Dadhikot Urban Water Supply and Sanitation Project

Screening Questions	Yes	No	Remarks
A. Project Siting **Is the project area**			
Densely populated?		√	The population density is 0.167 per ha.
Heavy with development activities?		√	The distribution pipeline will partially go through RoW of road in the municipal settlementswith 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 and recharge of ground water
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.	√		$CaOCl_2$, 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?		√	$CaOCl_2$, 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. This may couple with local sources like brick factory
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. S-EMP development, and deputation of an EHS focal person by the contractor will be supervised
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. S-EMP development, and deputation of an EHS focal person by the contractor will be supervised

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 is 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 units 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	Not likely
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 Dadhikot 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?	Yes		Not significant because scale of work is small
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; 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	Yes	WUSC building, guard house	Not significant as the land required

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?
	workers?			is small
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	Yes	Undeveloped land will be used	Not significant as the unused 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?
	land?			land parcels are 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

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?
4.7	Construction or demolition wastes?	Yes	Small volume of construction waste during construction phase, and some waste during decommissioning will be generated	Not significant as 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?				

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?
6.1	From operation of equipment eg engines, ventilation plant, crushers?	Yes	Noise and vibration (limited) may cause community nuisance	Not significant as 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	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?
	limits of normal 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; however, positive aspects of in-migration are expected in the low-lands/flat lands of the project area
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	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?
	utilities, etc?			
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 Suryabinayak 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:	29th August 2020

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.

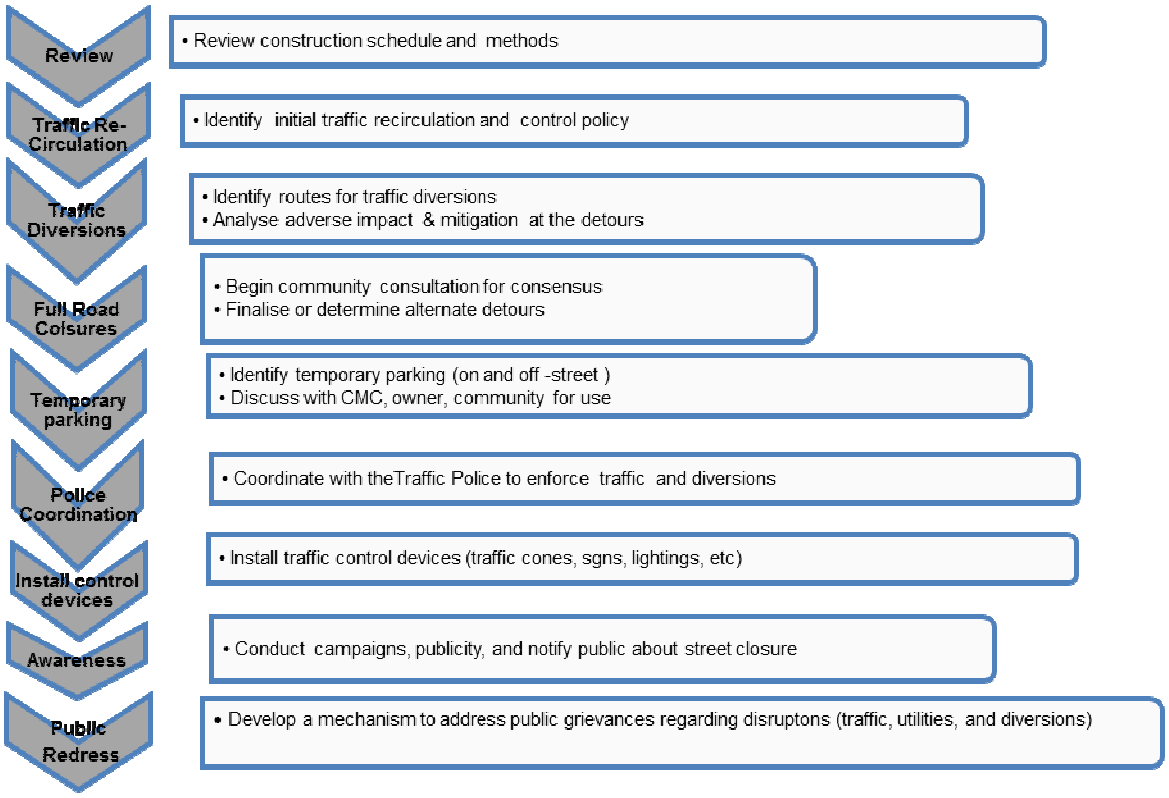
- Make traffic safety and temporary traffic control an integral and high-priority element of every project from planning through design, construction, and maintenance.
- Inhibit traffic movement as little as possible.
- Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they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

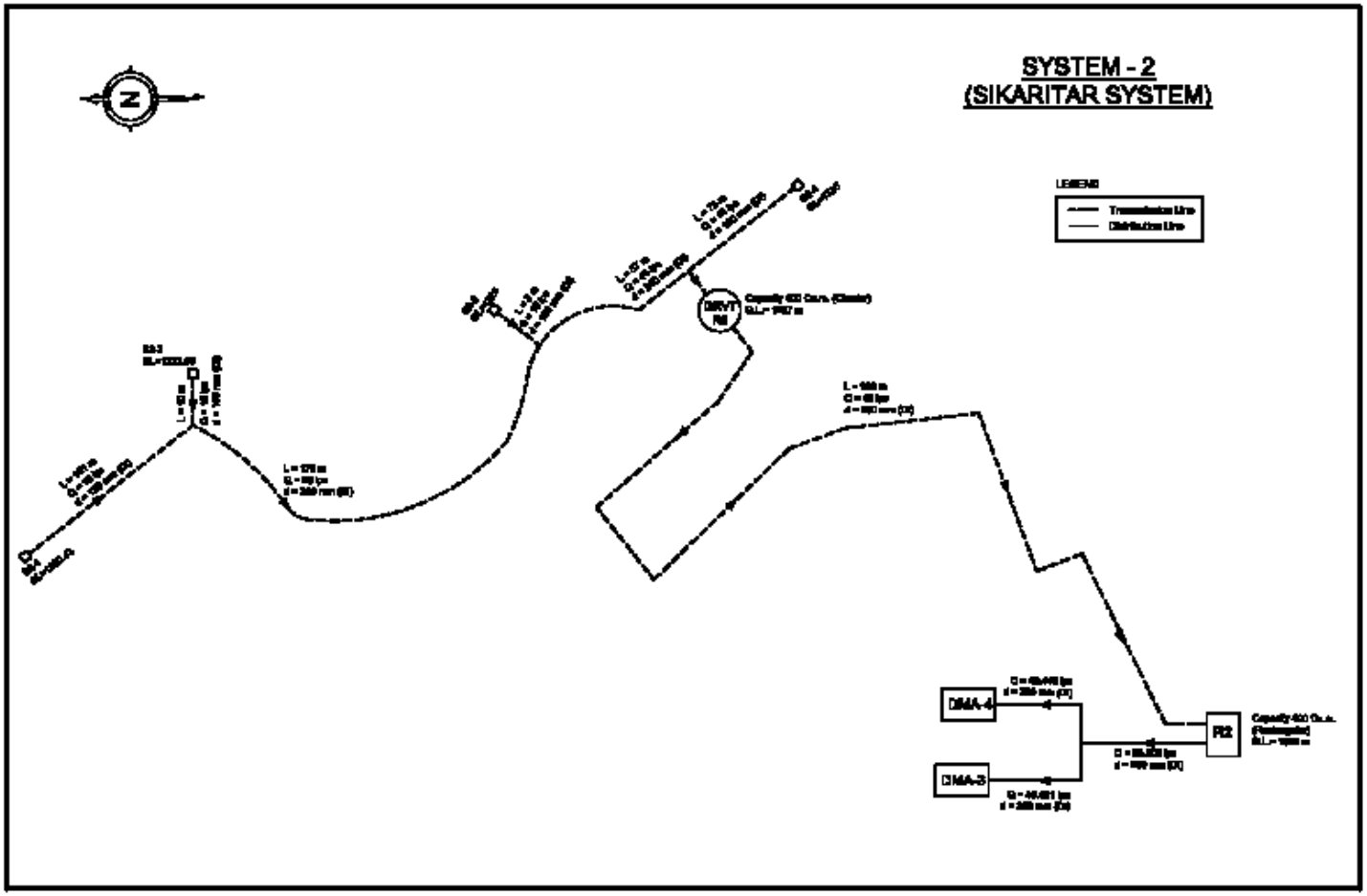
Position **Position**

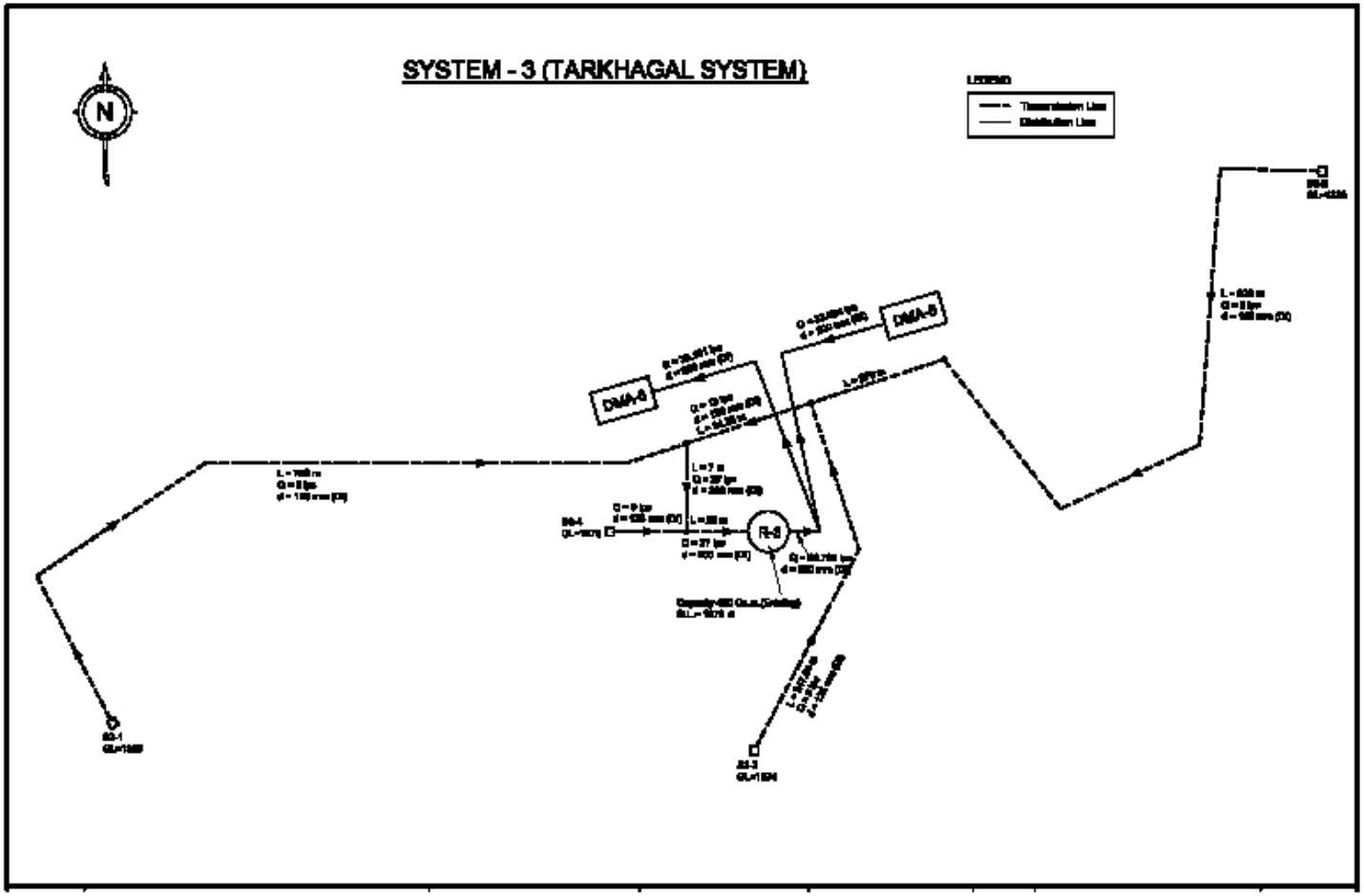
ANNEX 2-G: REFERENCE FOR PLANTATIONCOST BREAKDOWN (INDICATIVE)

SN	Activities	Unit	Description	Quantity	Area Req (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/day 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, ….)**	Months	Care taker	12	1	5000	**60000**	

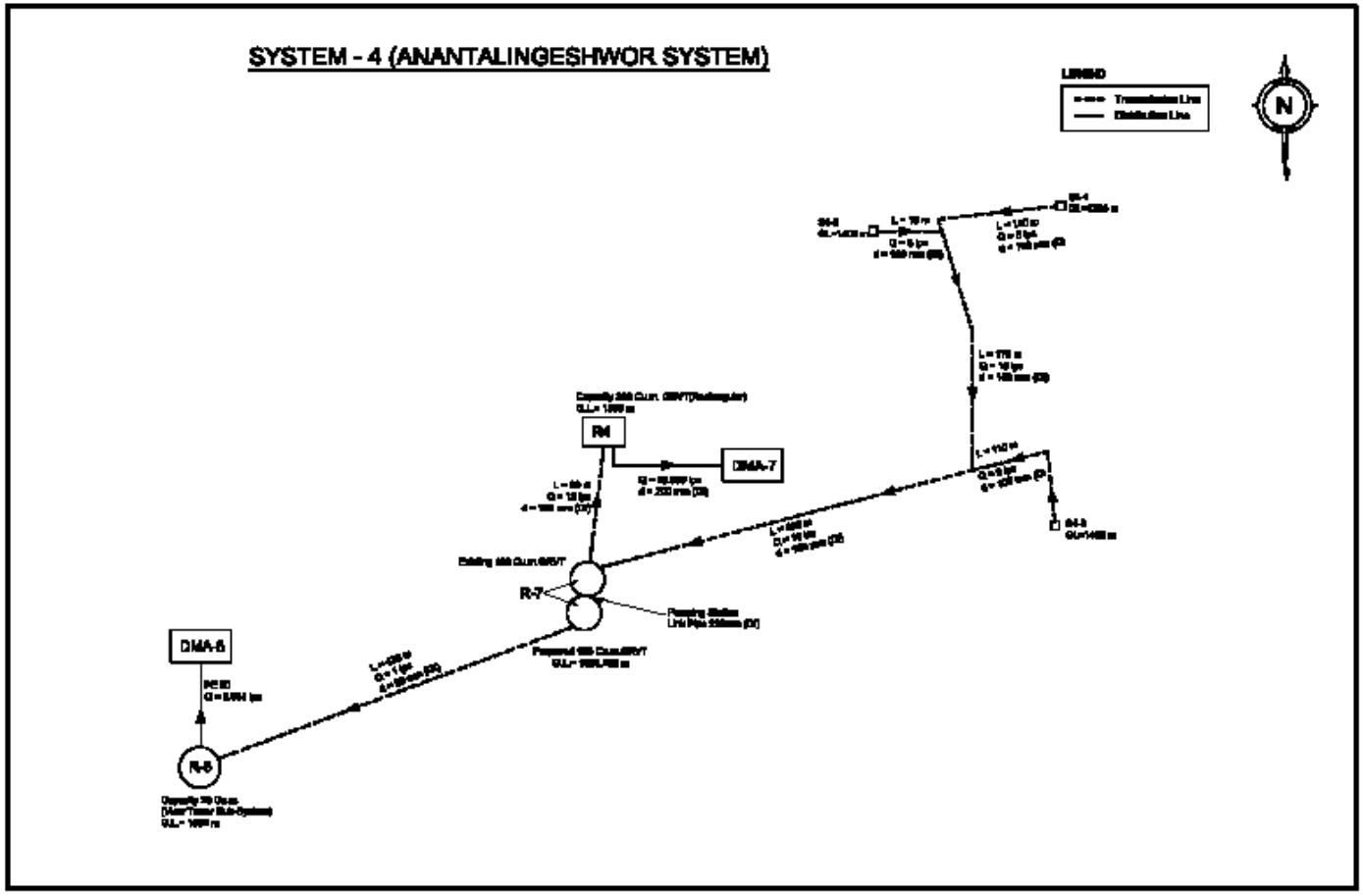
Note: If plantation is not possible in a single site, it can be carried out in multiple sites. E.g. Forest area nearby, Public Parks, road sides, office premise, or any other potential sites. The above reference will be updated as per the district rates of the project site

ANNEX 3:
PROJECT SERVICE AREA & LAYOUT

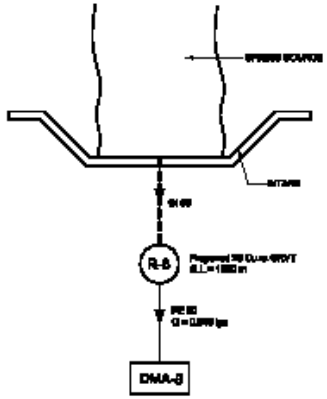

SYSTEM - 2
(SIKARITAR SYSTEM)
N
LEGEND
Transmission Line
Distribution Line
DMA-4
DMA-5
R2

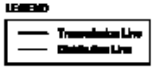

SYSTEM - 3 (TARKHAGAL SYSTEM)
N
DMA-8
DMA-9
R-8

SYSTEM - 4 (ANANTALINGESHWOR SYSTEM)



SYSTEM - 5 (SANGTANG SYSTEM)





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

Proximity Report

NEP UWSSP - DADHIKOT W20

Country: Nepal

Location: [27.7, 85.4]

Date of analysis: 08 June 2020

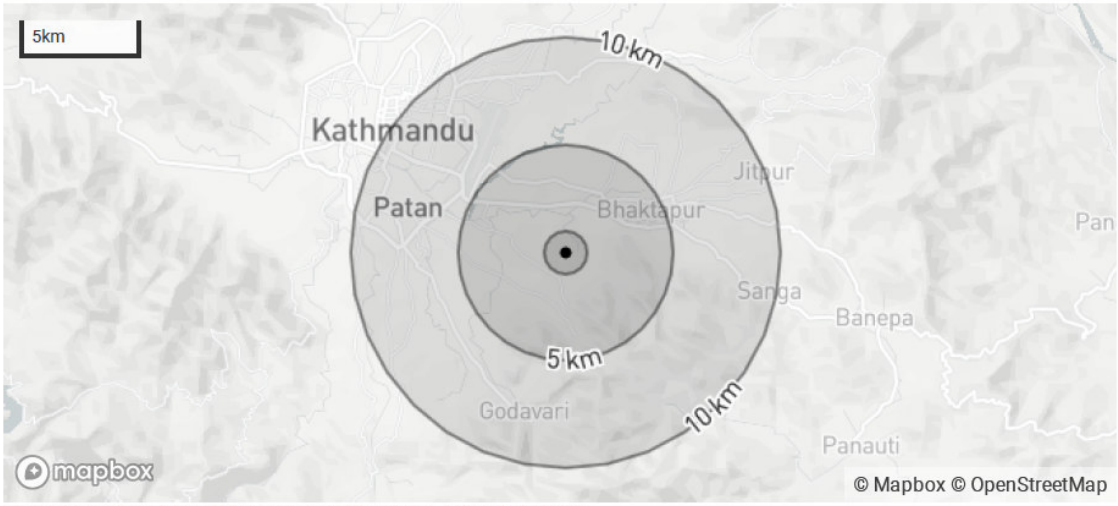
Buffers applied: 1.0 km | 5.0 km | 10.0 km

Generated by: Ninette Pajarillaga

Company/Subscriber: ADB

Overlaps with:

Protected Areas	1
Key Biodiversity Areas	1
IUCN Red List	61



Displaying project location and buffers: 1.0 km, 5.0 km, 10.0 km

Protected Areas

The following protected areas are found within 1.0 km, 5.0 km, 10.0 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Within buffer of
Phulchoki	10.0 km

Key Biodiversity Areas

The following key biodiversity areas are found within 1.0 km, 5.0 km, 10.0 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance
Phulchoki Mountain forests	10.0 km

ANNEX 5:
STAKEHOLDER CONSULTATIONS

Public Consultations

आज मिति २०६६/०५/२८ गतेका दिन मल सूर्यविनायक नगरपालिका को वडा ४ र ७ मा निर्माण हुन लागेको "दधिकोट शहरी खानेपानी तथा सरसफाई आयोजना" को DEED अध्ययनको क्रममा शहरी विकास बैंकको आवश्यकता अनुसार प्रारम्भिक वातावरणीय परीक्षण (IEE) अध्ययन गर्न पर्ने क्रममा मल आयोजनाबाट स्थानीय वातावरणमा पर्न सक्ने वातावरणीय प्रभावहरूका बारेमा निम्नानुसारका सरोकारवालाहरू/प्रतिनिधिहरूको उपस्थितिमा छलफल र जानकारीमैया आयोजन गरियो;

	उपस्थिति / नाम	संस्था / पद	दस्तखत
१.	श्री उत्तम थापा	वडा अध्यक्ष, सूर्यविनायक न.पा.-४	
२.	श्री काजु शाक्य	,, ,, - ७	
३.	श्री देवलाल राजवंशी	वडा सदस्य, सू.न.पा.-४	
४.	श्री अमित कुमार श्रेष्ठ	अध्यक्ष, दधिकोट शहरी उ.स.	
५.	श्री राजेन्द्र कुमार रजपाल	उपाध्यक्ष, ,,	
६.	श्री शान्ति कुमारी	सचिव, ,,	
७.	श्री सुरेन्द्र साकुन श्रेष्ठ	लेखा प्रमुख, ,,	
८.	श्री रोहित श्रेष्ठ	,,	
९.	श्री निरु शाक्य श्रेष्ठ	,,	
१०.	श्री पुतली धिमिरे	,,	
११.	श्री दिल बहादुर श्रेष्ठ	,,	
१२.	योगेश शाक्य	Environmental Specialist, BDA	
१३.	[illegible]	Social Safeguard Specialist	
१४.	मो. रुस्तम आलम	SCADA Specialist	
१५.	[illegible]		
१६.	[illegible]		
१७.	[illegible]		
१८.	आयुष बराल		
१९.	गोविन्द चौलागाईं		

छलफलका विषयहरू :

१. यस आयोजनाका प्राविधिक पक्षहरू उपर छलफल गरी निर्माण कार्यका लागि आवश्यक जग्गाहरू खरिद गर्न DUSC को स्वामित्व का लागि आवश्यक प्रक्रिया पुरा गर्नु पर्ने ।

२. मूल नदी तिर बोरिङ गरिने हुँदा र खोला सम्बन्धित आवश्यक अनुमति / रु दस्तुर प्रक्रिया पुरा गर्ने ।

३. यस आयोजनाका लागि आवश्यक पर्ने ६ MT संरचना निर्माणका लागि दक्षिण बस्ती क्षेत्रमा सम्झौता वा जग्गा खरिद गर्ने साईट छनोट गर्ने ।

४. आयोजनाको निर्माण कार्यका लागि आवश्यक Campsite वडा नं. ४ डाँडे खोला मा स्थानीय संग समन्वय गरी प्रयोग गर्न सकिने ।

५. निर्माणका क्रममा बिल्कने ढुङ्गा-गिट्टी व्यवस्थापन गर्न दधिकोट वडा ४ को सिंचाई बाँध नुनीको डाँडे प्रयोग गर्न सकिने ।

६. निर्माण चरणका स्थानीय रोजगारी लाई प्राथमिकता दिने र आवश्यकता अनुसार सीपमूलक तालीम, वातावरण संरक्षण सचेतना तथा पूर्ती सरसफाईका कार्यक्रमहरू यस यस IEE अध्ययन अन्तर्गत EMP तयार गरी लागु गरिने ।

७. यस आयोजना लागु गर्ने क्रममा स्थानीय तहको समन्वय गर्ने र समाधान गर्ने गुनासो व्यवस्थापन समिति (GRC) गठन भए बारे छलफल भयो ।

८. वडा नं. ४ स्थानान्तर सहरबाट हाल स्थानान्तर खानेपानी प्रणालीका प्रयोग भइरहेको पानी intake बनाई यस दधिकोट शहरी खानेपानी तथा सरसफाई आयोजनाको प्रणाली जोड्न हुँदा हाल यस क्षेत्रमा खानेपानी र सिंचाई प्रयोजनका लागि कुलो पानी खसर नपर्ने हिसाबले र हाल उक्त स्रोत उपयोग गरी रहेका स्थानीय उपभोक्ताहरूलाई खानेपानीको थप र सुचारु सुविधा उपलब्ध हुने देखिन्छ ।

UNOFFICIAL TRANSLATION

Today on 13th September 2020, a consultation was held regarding Dadhikot Urban Water Supply and Sanitation Project which is going to be implemented in ward 4 & ward 1 of Suryabinayak Municipality. As per the process of IEE study under the process of Detailed Engineering Design of the project, the project stakeholder's consultation on environmental implications of the project implementation has been discussed in presence of its stakeholders. Following decesion were under presence of the stakeholders as per;

Presence

1. Mr. Uttam Thapa, Chairperson, WN 4, Suryabinayak Municipality
2. Mr. Babu Kaji Kayastha, Chairperson, WN 4, Suryabinayak Municipality
3. Mr. Devraj Rajtheula, Member - Municipal Council
4. Mr. Anil K Shrestha, Chairperson, Dadhikot WUSC
5. Mr. Rajendra Kumar Rajthala, Vice-Chairperson, Dadhikot WUSC
6. Ms. Shanti Karki, Secretary, Dadhikot WUSC
7. Mr. Rajendra Kakuju Shrestha, Tresurer, Dadhikot WUSC
8. Mr. Rohit Shrestha, Member, Dadhikot WUSC
9. Ms. Niru Gwala Shrestha, Member, Dadhikot WUSC
10. Ms. Putali Ghimire, Member, Dadhikot WUSC
11. Mr. Dil Bahadur Shrestha, Member, Dadhikot WUSC
12. Mr. Yogesh Shakya, Environmental Safeguards Specialist, CRDSMC/BDA
13. Mr. Samir Dhakal, Social Safeguards Specialist, CRDSMC/BDA
14. Mr. Mohammad Rustam Aalam, SCADA Specialist, CRDSMC/BDA
15. Mr. Badri Khadka, Beneficiary
16. Mr. Badri Baral, Beneficiary
17. Mr. Gangaram Kharti, Beneficiary
18. Mr. Ayush Baral, Beneficiary
19. Mr. Govinda Chaulagain, Beneficiary

(Signed by all the participants)

Discussions:

- Regarding the development of the water supply facilities under the proposed project, it was discussed about its structures and relevant environmental implications of the project. It was also reiterated that there is need of completing the documentations for land use rights/authority by WUSC.
- The need of permissions/registration for use of water sources (spring and DTWs) were also discussed.
- Among the sites required for the project, one of the sites is at Dakshin Barahi area, and ther is need of felling trees. Design considerations will be made to minimize the loss of trees.
- Need of accesible and feasible site for establishment of a temporary campsite was discussed. It was discussed that the potential and proposed site of the workforce campsite is at Tyare tole of ward number 4
- The generation of construction spoil was discussed, and it was discussed that the spoil can be managed along the backfill sites of the irrigation dams within the project area.
- Employment opportunity for the locals was discussed. It was also discussed that environmental awareness acitivities, skill enhancement activities, and total sanitation activities will be conducted by the project. It was shard that the project will implement environmental safeguards works under EMP of the IEE document of the project.

- It was informed that any project related grievances will be coordinted and dealt throught the mechanism of Grievance Redress Mechanism that will be established.
- It was also discussed that the project will also incorporate the spring water source of Syangtang stream which is an existing source. The project will establish a managed system for the existing beneficiaries, and hence there will be no issues of downstream user, and there will be no concerns of need of water for local irrigation. Instead, the locals of Syangtang area will have better access to adequate safe water.

आज मिति २०७६/०५/२८ गतेका दिन यस सूर्यविनायक नगरपालिका को वडा नं. ४ र ९ मा संचालन हुन गईरहेको "दहिकोट शहरी खानेपानी तथा सरसफाई आयोजना" को Detailed Engineering Design को लागि सामाजिक सुरक्षण र वातावरणीय सुरक्षण सम्बन्धी विभिन्न पक्षहरु मा स्थानीय महिला /प्रतिनिधि सित जानकारी आदान प्रदान तथा छलफलमा निम्न उपस्थिति अनुसार भएको छ;

क्र.सं.	नाम / संस्था	हस्ताक्षर
१.	झानली कार्की विष्ट खा.पा	
२.	कल्पना खड्का पौडेल	
३.	दिपा थापा न्यौपाने गाँउ	
४.	लालि प्रेम गाम्या	
५.	मिना कार्की खड्का गाँउ	
६.	भगवती / शिवकोटी धर्मिक	
७.	मौचि घिमिरे //	
८.	सुजता घिमिरे	
९.	लिला आहा / भैरव	
१०.	Samir Dhakal, BDA - Social Safeguards Expert	
११.	योगेश शाक्य, BDA - वातावरण विद	
१२.	समीर ढकाल - सामाजिक सुरक्षण / लैङ्गिक	

छलफल तथा निर्णयहरु

१. यस आयोजनाको डिजाइन सम्बन्धी जानकारी दिई यसका जन सहभागिता र महिला सहभागिताका बारेमा छलफल भयो।

२. यो आयोजना जनसहभागिता र स्थानीय दायित्वका आधारमा परिकल्पना गरिएको र लागत कूल रकमको ५% रकम Upfront Cash उठाउनु पर्ने यसका आवश्यक समन्वय WUSC समितिले गर्ने विषयमा छलफल भयो।

३. यस आयोजनाको निर्माण चरणको कामका क्रममा सामाजिक र वातावरणीय सचेतनाका कार्यक्रम, सेमजारी र भेटघाटका अवसरहरू मा स्थानीय महिलाहरू अग्रसर हुन पर्ने र हुन सक्ने बारेमा छलफल गर्यौं।

४. डिप ट्युबवेल खन्ने क्रममा जमीन मुनिको पानी ओहोरनका काणा पर्ने सक्ने असर बारे छलफल हुँदा सबको Design पश्चा र Rainwater Harvesting / Recharge जस्ता पक्षा पनि यो परियोजनाका संलग्न हुने विषयमा छलफल गर्यौं।

५. हरियाली प्रवर्धन, सरसफाई र पूर्व सरसफाईका पाटाका पनि स्थानीय सहकार्यिता र सहकार्य आवश्यक हुने बारे छलफल भयो।

६. विज्ञान Viral संक्रमणका परिवेशमा यस आयोजनाको निर्माणका क्रममा कामदारहरूको र स्थानीयहरूको स्वास्थ्य; र विशेषगरी सामाजिक दुरी कायम गर्ने, active sites का विभाजन हुने/गर्ने बारे वृद्ध-वृद्धा र बालबालिकालाई यस बारेमा विषयमा पनि छलफल गर्यौं।

Unofficial Translation

A meeting has been held on 14th September 2020 with the local women and representatives on the environmental and social safeguards aspects under the process of Detailed Engineering Design of Dadhikot Urban Water Supply and Sanitation Project which is going to be implemented in ward 4 and ward 1 of Suryabinayak Municipality. The meeting was conducted in presence of the following participants;

Participants:
1. Shanti Karki, Secretary, Dadhikot WUSC
2. Kalpana Khadka, Beneficiary, Dadhikot
3. Deepa Thapa, Beneficiary, Neupanegaun, ward number 4
4. Lali Shrestha, Beneficiary, Gamcha, ward number 4
5. Meena Karki, Beneficiary, Khadkagaun, ward number 4
6. Bhagwoti Shiwakoti, Beneficiary, Harsha Chowk, ward number 4
7. Mohini Ghimire, Beneficiary, ward number 4
8. Sujata Ghimire, Beneficiary, ward number 4
9. Niru Gwacha Shrestha, Beneficiary, ward number 4
10. Yogesh Shakya, Environmental Safeguards Specialist, CRDSMC/BDA
11. Samir Dhakal, Social Safeguards Specialist, CRDSMC/BDA

Discussions:
1. The details of project design, and safeguards provisions of the project were discussed. The aspects of local public participation and women participation were discussed.

2. The concepts of local participation and local ownership inbuilt in the project design/modality was discussed with the participants. The need of proper coordination by the WUSC for the 5% up-front cash to be collected for the project start was discussed with the participants.

3. It was also discussed that the project will have social and environmental implications and hence there will be awareness activities on the same. The women of the project area will also have employment opportunities, and they could also have opportunity of trainings (skill enhancement) under this project. Need of their initiation was also discussed.

4. Concerns of deep boring in context of land surface subsidence was raised by the participants. The CRDSMC team explained on the safe design aspects in relation to extraction of underground water. The possibilities of recharge were also discussed.

5. Greenery promotion, environmental sanitation and total sanitation aspects were also discussed in context of the project, and it was discussed that these activities will require participation and cooperation from the local.

6. The present context of viral infection risks was also discussed. It was discussed that as the project's construction activities will start in the coming month, the locals will have to consider various aspects of OHS and community health & safety; e.g. minimization of interaction of the children/elderly with the workforce from outside areas.

Date |
Page |

आज मिति २०७७ साल असार महिनाको ३ गते बुधबार को दिन सहरी खानेपानी आयोजना मातहत दक्षिणकोट शहर खानेपानी मूल उपभोक्ता समितिमार्फत लागु गरिने शहरी खानेपानी आयोजनाको सम्भाव्यता (Feasibility) अध्ययनको प्रतिवेदन आयोजनाको परामर्शदाता BDA को प्रमुख एवं प्रतिनिधिहरूले समुदाय स्तरमा छलफल कार्यक्रम को आयोजना सूर्यविनायक नगरपालिकाको सभाभवनमा निम्न महानुभावहरूको उपस्थितिमा सम्पन्न भयो।

सं.	उपस्थिति	पद / जिम्मेवारी	सम्पर्क नं. हस्ताक्षर
१	माननीय महेश्वो बस्नेत	प्रतिनिधि सभा सदस्य, भ.पु.नि.क्षे.नं. २	
२	सूर्य विनायक न.पा. प्रमुख बासुदेव थापा	'प्रमुख' सू.न.पा.	
३	श्री विश्वनाथ भट्टराई	आयोजना प्रमुख 'शहरी खानेपानी' आ.	
४	श्री रामकुमार श्रेष्ठ	आयोजना उपप्रमुख '' ''	
५	श्री जुना बस्नेत	'उपप्रमुख सूर्यविनायक न.पा.	
६	श्री रामचन्द्र देवकोटा	प्रमुख BDA परामर्शदाता	
७	श्री मदन डङ्गोल	'इन्जिनियर' ''	
८	श्री समिर ढकाल	'समाजशास्त्री' ''	
९	श्री मिश्री प्रसाद श्रेष्ठ	'' Specialist GESI	
१०	श्री उत्तम थापा	वडा अध्यक्ष सू.न.पा.-४	
११	श्री तारा सापकोटा	नगर कार्यपालिका सदस्य, सू.न.पा.	
१२	श्री अरिहन्त कुमार श्रेष्ठ	'दक्षिणकोट शहर खा.पा.उ.स. (अध्यक्ष)	
१३	श्री राजेन्द्रकुमार राजथला	'उपाध्यक्ष' ''	
१४	श्री लोक बहादुर खिंड	'कोषाध्यक्ष' ''	
१५	श्री सुमङ्गल न्यौपाने	'अध्यक्ष' ख्यास्मान खा.पा.उ.स.	
१६	श्री पविता श्रेष्ठ	'उपाध्यक्ष' ''	
१७	श्री मिठाराम न्यौपाने	'कोषाध्यक्ष' ''	
१८	श्री बाबुकाजी प्रानन्धर	सदस्य दक्षिणकोट खानेपानी'	
१९	श्री विदुर खड्का	'' ''	
२०	श्री मणीराज खड्का	'' ''	
२१	श्री स्तार राजथला	'' ''	
२२	श्री बद्री खड्का	'कार्यालय प्रमुख '' ''	
२३	श्री [illegible]		

Date |
Page |

सि.नं.	उपस्थिति	जिम्मेवारी	हस्ताक्षर
२४.	संजय खड्का	Engineer	
२५.	सुरज सिग्देल	Contract Managament expert	
२६.	राजु लुइटेल	वडा सदस्य	
२७.	योगेश शाक्य	यातायात विशेषज्ञ, BDA	
२८.	सुभद्रा अधिकारी	Civil Engineer	
२९.			
३०.			

A meeting was held on 17th June 2020 (2077/03/03) regarding Urban Water Supply Project which is going to be implemented under Urban Water Supply and Sanitation Project through Dadhikot Water Supply and Sanitation Committee.Team Leader and Representatives of Consultant Team organized a discussion program at Suryabinayak Municipality, meeting hall. The meeting was conducted in presence of the following participants:

Participants:

1. Honorable Mr. Mahesh Basnet, Member of Parliament, Bhaktapur, No.2
2. Mr. Basudev Thapa, Mayor, Suryabinayak Municipality
3. Mr.Bidhyanath Bhattarai, Project Director, Urban Water Supply and Sanitation Project
4. Mr.Ram Kumar Shrestha, Deputy Project Director,Urban Water Supply and Sanitation Project
5. Mrs. Juna Basnet, Deputy Mayor, Suryabinayak Municipality
6. Mr. Ram Chandra Devkota, Team Leader, BDA Consultant
7. Mr. Madan Dangol, Engineer, BDA Consultant
8. Mr. Samir Dhakal, Sociologist, BDA Consultant
9. Mr. Mishri Prasad Shrestha, GESI Specialist
10. Mr. Uttam Thapa, Ward Chairperson, Suryabinayak-4
11. Mrs. Tara Sapkota, Municipality Executive Member, Suryabinayak Municipality
12. Mr. Anil Kumar Shrestha, Chairperson, Dadhikot Brihat Water Supply and Sanitation Committee
13. Mr. Rajendra Kumar Rajthala, Vice-chairperson, Dadhikot Brihat Water Supply and Sanitation Committee
14. Mr. Lekh Bahadur Bishta, Treasurer, Dadhikot Brihat Water Supply and Sanitation Committee
15. Mr. Suman Neupane, Chairperson, Syangtang Water Supply Users Committee
16. Mrs. Pavitra Shrestha, Vice-chairperson, Syangtang Water Supply Users Committee
17. Mr. Mitharam Neupane, Treasurer, Syangtang Water Supply Users Committee
18. Mr. Babukaji Manandhar, Member, Dadhikot WSS Committee
19. Mr. Bidur Khadka, Member, Dadhikot WSS Committee
20. Mr. Maniraj Khadka, Member, Dadhikot WSS Committee
21. Mr. Star Rajthala, Member, Dadhikot WSS Committee
22. Mr. Badri Khadka, Office In charge, Dadhikot WSS Committee
23. Mr. Surendra Dhwoj Shrestha, Accountant, Dadhikot WSS Committee
24. Mr. Sanjay Khadka, Engineer
25. Mr. Suraj Sigdel, Contract Management Expert
26. Mr. Raju Lubanjar Shrestha, Ward Member
27. Mr. Yogesh Shakya, Environment Specialist, BDA
28. Ms. Subhadra Adhikari, Civil Engineer

(Signed by all the participants)

ANNEX 6:
SURVEY QUESTIONNAIRE

१. परिचय

१.१ अन्तर्वाता दिने ब्यक्तिको नाम ठेगाना:

(क) जिल्ला: (ख) गा.वि.स:

(ग) टोल रस्थान: (घ) वार्ड नं.:

१.२ पारिवारिक विवरण

(क) घरमुलिको नाम: श्रीमान् र श्रीमती

.....

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

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

(ज) बसेको वर्ष: (झ) शिक्षा :

(ञ) कुल परिवार संख्या .....

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

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

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

२. साक्षरता : (तपाईको परिवारमा)

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

जम्मा					

३. कृषि (भु-उपयोग)

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

छ □ छैन □

३.२ यदि छ भने कति छ ? रोपनीमा भन्नुहोस :

क.सं.	स्वामित्व	खेत	बारी	खरवारी	वन	कैफियत
१	आफ्नै					
२	सगोलको					
३	कमाई आएको					
४	कमाउन दिएको					
५	जम्मा					

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

कस.	ठाउँको नाम	जग्गा				कैफियत
		खेत	वारी	खरवारी	वन	

३.४ तपाईको जग्गा आयोजना भित्र पर्छ रु ९एभिबकभ ःभलतष्यल तजभ अफउयलभलत या उचयवभअत धजभचभ ज्ज ाबकि०

घर

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

खेत

□ पाखो बारी
□ जंगल
□ अन्य

□ अन्दाजी मूल्य (चलनचल्तीमा) नेरु.

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

घर ☐ गोठ ☐

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

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

	संख्या	क्षेत्रफल
गोठ		
अन्य (खुलाउने)		

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

क्रंसं.	खाद्यान्न वाली	वाली लगाएको क्षेत्रफल	उत्पादन परिणाम
१. खाद्यान्न बाली			
	धान		
	गहु		
	मकै		
	कोदो		
	दाल गेडागुडी		
	अन्य		
२. नगदे वाली			
	आलु		
	तोरी		
	तरकारी		
	अन्य		

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

क्रंसं.	बोटविरुवा	विरुवा संख्या		जम्मा
		फल लाएको	फल नलाएको	
१	फलफूल			
२	कागती			
३	सुन्तला			
५	आँप			
६	मेवा			
७	अम्बा			
८	लिच्ची			
९	कटहर			
१०	केरा			
११	आरु			
१२	नास्पाती			

कंसं.	बोटविरुवा	विरुवा संख्या		जम्मा
		फल लाएको	फल नलाएको	
१३	आरुवखडा			
१४	अन्य			
१५	डाले घाँस			
१६	पाखुरी			
१७	काभ्रो			
१८	वडहर			
१९	खनायो			
२०	टाकी			
२१	गिदरी			
२२	अन्य			
२३	इन्धनको लागि प्रयोग गर्ने बोट विरुवा			
२४	काठमा प्रयोग हुने बोटविरुवा			
२५	वाँस निगालो			

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

भयो ☐ भएन ☐

३.७ यदि अप्रर्याप्त भयो भने कति महिनाको लागि पुगेन रु महिना

(क) तिन महिना (ख) छ महिना

(ग) नौ महिना (घ) बाह्र महिना

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

क. ऋण गरेर ख. नोकरीबाट भएको आम्दानीबाट

ग. व्यापारीको आम्दानीबाट घ. भारी बोकेर भएको आम्दानीबाट

ड. दैनिक मजदुरबाट भएको च. अन्य .....

३.९ पशुपालन सम्बन्धी :

तपाईको घरमा कति /कस्ता पशु पक्षीहरु पाल्नु भएको छ रु

क.सं.	पशुपंक्षी	संख्या
१	गाई	
२	गोरु	
३	भैसी	
४	बाछा	
५	बाछि	
६	पाडा	
७	पाडि	

क.सं.	पशुपंक्षी	संख्या
८	राँगो	
९	घोडा	
१०	बाखा	
११	बोका	
१२	खसी	
१३	पाठा/पाठी	
१४	सुँगुर/बंगुर	
१५	हाँस	
१६	कुखुरा	
१८	अन्य (खुलाउने)	

४. घर परिवारको वार्षिक औषत आम्दानी :

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

५. घर परिवारको वार्षिक औषत खर्च :

विवरण	जम्मा रकम (रु.)	विवरण	जम्मा रकम (रु.)
चामल		ीचया	
द्याल		दाउरा	
मकै		बिजुली	
तरकारी		मट्टितेल	
दुघ/दही		औषधि	
माछा/मासु		शिक्षा	

विवरण	जम्मा रकम (रु.)	विवरण	जम्मा रकम (रु.)
तेल/ध्यू		कपडा	
मर-मसला		चाडपर्व	
नुन		अन्य	
चिनी			
		जम्मा खर्च	

६.पानीको आपूर्ति

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

गर्छु □ गर्दिन □

(ख) यदि खोलाको पानी प्रयोग गर्नु हुन्छ भने कुन प्रयोजनको लागि प्रयोग गर्नुहुन्छ रु

सिंचाई □ नुहाउने, कपडा धुने □

पिउने □ अन्य □

७.स्वास्थ्य सम्बन्धि:

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

थिए □ थिएनन् □

(ख)यदि थिए भने निम्न विवरण दिनुहोस् रु

क्रसं	नाता	पुरुष	महिला	उमेर	रोग
१					
२					
३					
४					

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

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

(घ) त्यहाँ निको नभए कहाँ जानुहुन्छ रु क्रमश उल्लेख गर्नुहोस ।

क्रं.सं	जाने ठाउँ	रहेको स्थान	दूरी (कि.मी.)
१	अस्पताल		
२	हेल्थपोस्ट		
३	हेल्थ सेन्टर		

४	आयुर्वेदिक औषधालय		
५	निजि क्लिनिकरऔषधी पसल		
६	धामी झाक्री		
७	अन्य		

८. महिलाको अवस्थाः

(क) श्रमको वर्गिकरण

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

(ख) सम्पत्तिमा अधिकार

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

(ग) निर्णय प्रक्रियामा अधिकार

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

९. मुआब्जा सम्बन्धी:

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

नगद □ जग्गाको सट्टा जग्गा □ अन्य □

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

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

१०. प्रस्ताव कार्यान्वयन गर्दा के कस्तो प्रभाव पर्न सक्दछ सो सम्बन्धी राय सुझाव छ
सकारात्मक: नकारात्मक:

Household Survey

1= Introduction

1=1 Name and Address of Respondent

-1_ District -2_ Municipality.

-3_ Tole -4_ Ward No.

1.2Family Description/Details

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

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

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

-8_ Year of Stay -9_ Education

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

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

1.3Children going to School -6-15 years_

Total	Going School		Not going School	
	Male	Female	Male	Female

2= Literate(in 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 Municipailty/Ward?
Yes☐ No ☐

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

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

3.3Is there any land out to Municipality/Ward area?

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

3.4Is 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			

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

Yes ☐ No ☐

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

-a_ 3 Month -b_ 6 Month

-c_ 9 Month (d) 12 Month

3.8How 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=9Livestock 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	Malecalf	
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	
EggHen duck selling		Fish selling	
Selling of male and female calf/Ox		Others	
Male &Female Buffalo/selling ÷		Total-3_	
Sheep/Goat/ Male goat/ Castrated goat/selling			
Pig selling			
Hen/Duck selling			
Total -2_			
Total income -123_			

5=Annual expenses of Household

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

6=Utilization of water

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

Yes☐ No☐

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

Irrigation ☐ Bathing and clothes ☐

Drinking ☐ Others ☐

7= Health related

-A_ Any family members were sick on last year?

Yes☐ No☐

-B) If it was then give detail of it

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

-Types of disease 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

NS Lab Accreditation No.: 08/065-66
VAT/PAN No.: 300124309
Regd. No. 5180/052/053

"Training For Success"

Tel : 977-1-4475674, 4418156
Fax No: 977-1-4479642

Water

SAVE WATER

Engineering & Training Centre (P.) Ltd.

Laboratory, R & D on Total Water Management, Treatment & Consultancy

Test Report/Certificate

Name of Sender: BDA Pvt. Ltd.
Project: Dadhikot Urban Water Supply Project
Sample No:300 /077/078
Date of Receipt: 09/08/2020
Sampled by : Client

Source: Boring Water
Analyzed date : 09/08/2020 - 11/08/2020
No. of Samples: 01
Location : Uttisghari, Bhaktapur

Parameters	Units	WHO GV	NDWQS	Result	Methods used
PHYSICAL					
Turbidity	NTU	5	5 (10)	**6.0**	2130 B, APHA, 23rd EDITION
pH	-	6.5 - 8.5	6.5-8.5*	**7.6**	4500-H^+ B, APHA, 23rd EDITION
Color	Hazen	15	5(15)	**5.0**	2120 B, APHA, 23rd EDITION
Taste	TFN	-	Not Objectionable	**N. O.**	2160 B, APHA, 23rd EDITION
Odor	TON	-	Not Objectionable	**N. O.**	2150 A., APHA, 23rd EDITION
Total Dissolved Solids	mg/l	1000	1000	**193.0**	2540 C., APHA, 23rd EDITION
Conductivity	µS/cm	-	1500	**332.0**	2510 B, APHA, 23rd EDITION
Lab Temperature	^{0}C	-	-	**25.9**	2550 B, APHA, 23rd EDITION
CHEMICAL					
Iron	mg/l	0.3	0.3 (3)	**0.1**	3111 B, APHA, 23rd EDITION
Manganese	mg/l	0.5	0.2	**0.02**	3111 B. APHA, 23rd EDITION
Arsenic	mg/l	0.01	0.05	**<0.005**	3114 C,APHA, 23rd EDITION
Cadmium	mg/l	0.003	0.003	**<0.003**	3111 B, APHA, 23rd EDITION
Chromium	mg/l	0.05	0.05	**<0.05**	3111 B. APHA, 23rd EDITION
Cyanide	mg/l	-	0.07	**<0.05**	3111 B. APHA, 23rd EDITION
Fluoride	mg/l	1.5	0.5-1.5*	**0.24**	4500F- D. APHA, 23rd EDITION
Lead	mg/l	0.01	0.01	**<0.01**	3111 B. APHA, 23rd EDITION
Ammonia	mg/l	1.5	1.5	**0.07**	4500-NH_3 F., APHA, 23rd EDITION

Analyzed by

Checked by

Nepal Laboratory Accreditation Scheme — Accredited Laboratory No.

Authorized Signature

Note: 1. The result refer only to the parameters tested of the samples provided to our laboratory or collected by us for analysis as specified. Endorsement of the product is neither inferred nor implied.
2. Any duplication of this report can not be used as evidence in the court of law and should not be used in any advertising media without prior written permission to us.
3. The total liability of our company for the product is limited to the invoiced amount only.

NS Lab Accreditation No.: 08/065-66
VAT/PAN No.: 300124309
Regd. No. 5180/052/053

"Training For Success"

Tel : 977-1-4475674, 4418156
Fax No: 977-1-4479642

SAVE WATER

Water

Engineering & Training Centre (P.) Ltd.

Laboratory, R & D on Total Water Management, Treatment & Consultancy

Test Report/Certificate

Name of Sender: BDA Pvt. Ltd.
Project: Dadhikot Urban Water Supply Project
Sample No:300 /077/078
Date of Receipt: 09/08/2020
Sampled by : Client

Source: Boring Water
Analyzed date : 09/08/2020 - 11/08/2020
No. of Samples: 01
Location : Uttisghari, Bhaktapur

Parameters	Units	WHO	NDWQS	Result	Methods used
Chloride	mg/l	250	250	1.0	4500-Cl B, APHA, 23rd EDITION
Sulfate	mg/l	-	250	<5.0	4500-SO4. APHA, 23rd EDITION
Nitrate	mg/l	50	50	9.8	4500-NO3- B., APHA, 23rd EDITION
Copper	mg/l	2	1	<0.01	3111 B., APHA, 23rd EDITION
Total Hardness	mg/l as $CaCO_3$	500	500 (Max)	130.0	2340 C., APHA, 23rd EDITION
Calcium	mg/l	-	200	52.0	3500 - Ca B., APHA, 23rd EDITION
Zinc	mg/l	-	3	0.07	3111 B., APHA, 23rd EDITION
Mercury	mg/l	0.001	0.001	<0.001	3112 B., APHA, 23rd EDITION
Aluminum	mg/l	-	0.2	<0.01	3500-Al B. APHA, 23rd EDITION
BIOLOGICAL					
Total Coliform	CFU/100ml	N.I	Nil	75	9222 B, APHA, 23rd EDITION
E. Coli	CFU/100ml	N.I	Nil	Nil	9222 D., APHA, 23rd EDITION

APHA: American Public Health Association, Standard Methods for the Examination of Water & Waste Water.
WHO GV: World Health Organization Guideline Value, 2006 Update, NDWQS: National Drinking Water Quality Standard, 2062 (Nepali,
* These values show lower and upper limits, () Values in the parenthesis refers the acceptable values only when alternative is not available.

Comment: The observed values indicate the lower valne of Fluoride as per NDWQS limit. Water was found with slighly presence of turbidity. Biologically, the sampled water is contaminated with Coliforms.

Nepal Laboratory Accreditation Scheme — Accredited Laboratory No. 65-66

Analyzed by

Checked by

Authorized Signature

Note: 1. The result refer only to the parameters tested of the samples provided to our laboratory or collected by us for analysis as specified. Endorsement of the product is neither inferred nor implied.
2. Any duplication of this report can not be used as evidence in the court of law and should not be used in any advertising media without prior written permission to us.
3. The total liability of our company for the product is limited to the invoiced amount only.

NS Lab Accreditation No.: 08/065-66
VAT/PAN No.: 300124309
Regd. No. 5180/052/053

"Training For Success"

Tel : 977-1-4475674, 4418156
Fax No: 977-1-4479642

SAVE WATER

Water

Engineering & Training Centre (P.) Ltd.

Laboratory, R & D on Total Water Management, Treatment & Consultancy

Test Report/Certificate

Name of Sender: BDA Pvt. Ltd.
Project: Dadhikot Urban Water Supply Project
Sample No:301 /077/078
Date of Receipt: 09/08/2020
Sampled by : Client

Source: Spring Water
Analyzed date : 09/08/2020 - 11/08/2020
No. of Samples: 01
Location : Syangtang Tamang Gaun, Bhaktapur

Parameters	Units	WHO GV	NDWQS	Result	Methods used
PHYSICAL					
Turbidity	NTU	5	5 (10)	**1.0**	2130 B, APHA, 23rd EDITION
pH	-	6.5 - 8.5	6.5-8.5*	**7.3**	4500-H^+ B, APHA, 23rd EDITION
Color	Hazen	15	5(15)	**5.0**	2120 B, APHA, 23rd EDITION
Taste	TFN	-	Not Objectionable	**N. O.**	2160 B, APHA, 23rd EDITION
Odor	TON	-	Not Objectionable	**N. O.**	2150 A., APHA, 23rd EDITION
Total Dissolved Solids	mg/l	1000	1000	**352.0**	2540 C., APHA, 23rd EDITION
Conductivity	µS/cm	-	1500	**586.0**	2510 B, APHA, 23rd EDITION
Lab Temperature	^{0}C	-	-	**25.2**	2550 B, APHA, 23rd EDITION
CHEMICAL					
Iron	mg/l	0.3	0.3 (3)	**0.02**	3111 B, APHA, 23rd EDITION
Manganese	mg/l	0.5	0.2	**<0.01**	3111 B. APHA, 23rd EDITION
Arsenic	mg/l	0.01	0.05	**<0.005**	3114 C,APHA, 23rd EDITION
Cadmium	mg/l	0.003	0.003	**<0.003**	3111 B, APHA, 23rd EDITION
Chromium	mg/l	0.05	0.05	**<0.05**	3111 B. APHA, 23rd EDITION
Cyanide	mg/l	-	0.07	**<0.05**	3111 B. APHA, 23rd EDITION
Fluoride	mg/l	1.5	0.5-1.5*	**0.3**	4500F- D. APHA, 23rd EDITION
Lead	mg/l	0.01	0.01	**<0.01**	3111 B. APHA, 23rd EDITION
Ammonia	mg/l	1.5	1.5	**0.04**	4500-NH_3 F., APHA, 23rd EDITION

Nepal Laboratory Accreditation Scheme — Accredited Laboratory No. P.L.P.

Analyzed by

Checked by

Authorized Signature

Note: 1. The result refer only to the parameters tested of the samples provided to our laboratory or collected by us for analysis as specified. Endorsement of the product is neither inferred nor implied.
2. Any duplication of this report can not be used as evidence in the court of law and should not be used in any advertising media without prior written permission to us.
3. The total liability of our company for the product is limited to the invoiced amount only.

NS Lab Accreditation No.: 08/065-66
VAT/PAN No.: 300124309
Regd. No. 5180/052/053

"Training For Success"

Tel : 977-1-4475674, 4418156
Fax No: 977-1-4479642

SAVE WATER

Water

Engineering & Training Centre (P.) Ltd.

Laboratory, R & D on Total Water Management, Treatment & Consultancy

Test Report/Certificate

Name of Sender: BDA Pvt. Ltd.
Project: Dadhikot Urban Water Supply Project
Sample No:391 /077/078
Date of Receipt: 09/08/2020
Sampled by : Client

Source: Spring Water
Analyzed date : 09/08/2020 - 11/08/2020
No. of Samples: 01
Location : Syangtang Tamang Gaun, Bhaktapur

Parameters	Units	WHO	NDWQS	Result	Methods used
Chloride	mg/l	250	250	13.8	4500-Cl⁻ B. APHA, 23rd EDITION
Sulfate	mg/l	-	250	<5.0	4500-SO4. APHA, 23rd EDITION
Nitrate	mg/l	50	50	7.3	4500-NO3- B., APHA. 23rd EDITION
Copper	mg/l	2	1	<0.01	3111 B., APHA, 23rd EDITION
Total Hardness	mg/l as $CaCO_3$	500	500 (Max)	72.0	2340 C., APHA, 23rd EDITION
Calcium	mg/l	-	200	28.8	3500 - Ca B., APHA, 23rd EDITION
Zinc	mg/l	-	3	0.24	3111 B., APHA, 23rd EDITION
Mercury	mg/l	0.001	0.001	<0.001	3112 B., APHA, 23rd EDITION
Aluminum	mg/l	-	0.2	<0.01	3500-Al B. APHA, 23rd EDITION
			BIOLOGICAL		
Total Coliform	CFU/100ml	Nil	Nil	>300	9222 B, APHA, 23rd EDITION
E. Coli	CFU/100ml	Nil	Nil	Nil	9222 D., APHA, 23rd EDITION

APHA: American Public Health Association, Standard Methods for the Examination of Water & Waste Water,
WHO GV: World Health Organization Guideline Value, 2006 Update, NDWQS: National Drinking Water Quality Standard, 2062 (Nepal).
* These values show lower and upper limits, () Values in the parenthesis refers the acceptable values only when alternative is not available.

Comment: The observed value of Fluoride is found to be lower as per NDWQS limit.
Biologically, the sampled water is contaminated with Coliforms.

Nepal Laboratory Accreditation System — Accredited Laboratory No.

Analyzed by

Checked by

Authorized Signature

Note: 1. The result refer only to the parameters tested of the samples provided to our laboratory or collected by us for analysis as specified. Endorsement of the product is neither inferred nor implied.
2. Any duplication of this report can not be used as evidence in the court of law and should not be used in any advertising media without prior written permission to us.
3. The total liability of our company for the product is limited to the invoiced amount only.

NS Lab Accreditation No.: 08/065-66
VAT/PAN No.: 300124309
Regd. No. 5180/052/053

"Training For Success"

Tel : 977-1-4475674, 4418156
Fax No: 977-1-4479642

SAVE WATER

Water

Engineering & Training Centre (P.) Ltd.

Laboratory, R & D on Total Water Management, Treatment & Consultancy

Test Report/Certificate

Name of Sender: BDA Pvt. Ltd.
Project: Dadhikot Urban Water Supply Project
Sample No:302 /077/078
Date of Receipt: 09/08/2020
Sampled by : Client

Source: Boring Water
Analyzed date : 09/08/2020 - 11/08/2020
No. of Samples: 01
Location : Charkhandi, Bhaktapur

Parameters	Units	WHO GV	NDWQS	Result	Methods used
PHYSICAL					
Turbidity	NTU	5	5 (10)	**1.0**	2130 B, APHA, 23rd EDITION
pH	-	6.5 - 8.5	6.5-8.5*	**7.4**	4500-H^+ B, APHA, 23rd EDITION
Color	Hazen	15	5(15)	**<5.0**	2120 B, APHA, 23rd EDITION
Taste	TFN	-	Not Objectionable	**N. O.**	2160 B, APHA, 23rd EDITION
Odor	TON	-	Not Objectionable	**N. O.**	2150 A., APHA, 23rd EDITION
Total Dissolved Solids	mg/l	1000	1000	**355.0**	2540 C., APHA, 23rd EDITION
Conductivity	µS/cm	-	1500	**592.0**	2510 B, APHA, 23rd EDITION
Lab Temperature	^{0}C	-	-	**26.2**	2550 B, APHA, 23rd EDITION
CHEMICAL					
Iron	mg/l	0.3	0.3 (3)	**0.11**	3111 B, APHA, 23rd EDITION
Manganese	mg/l	0.5	0.2	**0.5**	3111 B, APHA, 23rd EDITION
Arsenic	mg/l	0.01	0.05	**<0.005**	3114 C,APHA, 23rd EDITION
Cadmium	mg/l	0.003	0.003	**<0.003**	3111 B, APHA, 23rd EDITION
Chromium	mg/l	0.05	0.05	**<0.05**	3111 B, APHA, 23rd EDITION
Cyanide	mg/l	-	0.07	**<0.05**	3111 B, APHA, 23rd EDITION
Fluoride	mg/l	1.5	0.5-1.5*	**0.23**	4500F- D, APHA, 23rd EDITION
Lead	mg/l	0.01	0.01	**<0.01**	3111 B, APHA, 23rd EDITION
Ammonia	mg/l	1.5	1.5	**0.21**	4500-NH_3 F., APHA, 23rd EDITION

Nepal Laboratory Accreditation Scheme Accredited Laboratory No.

Analyzed by

Checked by

Authorized Signature

Note: 1. The result refer only to the parameters tested of the samples provided to our laboratory or collected by us for analysis as specified. Endorsement of the product is neither inferred nor implied.
2. Any duplication of this report can not be used as evidence in the court of law and should not be used in any advertising media without prior written permission to us.
3. The total liability of our company for the product is limited to the invoiced amount only.

NS Lab Accreditation No.: 08/065-66
VAT/PAN No.: 300124309
Regd. No. 5180/052/053

"Training For Success"

Tel : 977-1-4475674, 4418156
Fax No: 977-1-4479642

SAVE WATER

Water

Engineering & Training Centre (P.) Ltd.

Laboratory, R & D on Total Water Management, Treatment & Consultancy

Test Report/Certificate

Name of Sender: BDA Pvt. Ltd. — **Source: Boring Water**
Project: Dadhikot Urban Water Supply Project — **Analyzed date : 09/08/2020 - 11/08/2020**
Sample No:302/ 077/078 — **No. of Samples: 01**
Date of Receipt: 09/08/2020 — **Location : Charkhandi, Bhaktapur**
Sampled by : Client

Parameters	Units	WHO	NDWQS	Result	Methods used
Chloride	mg/l	250	250	**19.8**	4500-Cl⁻ B, APHA, 23rd EDITION
Sulfate	mg/l	-	250	**27.9**	4500-SO4, APHA, 23rd EDITION
Nitrate	mg/l	50	50	**1.7**	4500-NO3- B., APHA, 23rd EDITION
Copper	mg/l	2	1	**<0.01**	3111 B., APHA, 23rd EDITION
Total Hardness	mg/l as $CaCO_3$	500	500 (Max)	**204.0**	2340 C., APHA, 23rd EDITION
Calcium	mg/l	-	200	**81.6**	3500 - Ca B., APHA, 23rd EDITION
Zinc	mg/l	-	3	**0.05**	3111 B., APHA, 23rd EDITION
Mercury	mg/l	0.001	0.001	**<0.001**	3112 B., APHA, 23rd EDITION
Aluminum	mg/l	-	0.2	**<0.01**	3500-Al B. APHA, 23rd EDITION
BIOLOGICAL					
Total Coliform	CFU/100ml	Nil	Nil	**8**	9222 B, APHA, 23rd EDITION
E. Coli	CFU/100ml	Nil	Nil	**Nil**	9222 D., APHA, 23rd EDITION

APHA: American Public Health Association, Standard Methods for the Examination of Water & Waste Water,
WHO GV: World Health Orgarization Guideline Value, 2006 Update, NDWQS: National Drinking Water Quality Standard, 2062 (Nepal),
* These values show lower and upper limits, () Values in the parenthesis refers the acceptable values only when alternative is not available.

Comment: The observed value indicates the lower value of fluoride and Manganese are found to be higher as per the NDWQS limit. Biologically, the sampled water is contaminated with Coliforms.

Nepal Laboratory Accreditation Scheme — Accredited Laboratory No.

Analyzed by *Checked by* *Authorized Signature*

Note: 1. The result refer only to the parameters tested of the samples provided to our laboratory or collected by us for analysis as specified. Endorsement of the product is neither inferred nor implied.
2. Any duplication of this report can not be used as evidence in the court of law and should not be used in any advertising media without prior written permission to us.
3. The total liability of our company for the procuct is limited to the invoiced amount only.

ANNEX 9:
CHECKLISTS

A. Physical Environment

Parameter	**Description**
Topography	
Geology (Rock and Soil Types)	
Erosion and Sedimentation	
Quarry Sites	
Sites for Labour Camp	
Site for Storage and Stockpiling	
Access and Diversion if necessary	
River Training Works	
Land Use	
Air Quality	
Water Quality	
Noise Level	
Spoil disposal sites	
Drainage Network and Ground Water	
Status of Channel Shifting	

B. Vegetation and Wildlife

Vegetation in the project area

SN	Local Name	Botanical Name	Location	Vegetation Type	Local Status	Local Use	Protection Status		
							GoN	IUCN	CITES

Mammals in the project area

SN	Common Name	Scientific Name	Habitat	Local Status	Crop/Livestock Raider	Local Use	Protection Status		
							GoN	IUCN	CITES

Birds Sighted in the project area

SN	Common Name	Scientific Name	Type	Habitat	Local Status	Protection Status		
						IUCN	CITES	GoN

Herpeto-fauna in the Project Area

S.N.	Local Name	Scientific Name	Habitat	Local Status	Status Code			Local Use
					CITIES	IUCN	GoN	

Fish in the Project Area

S.N.	Local Name	Scientific Name	Status of Occurrence	Migratory Status/Season	Observed Location

C. Socio-Economic and Cultural Environment

Parameter	Description
Demography a) Population (Male, Female) b) Caste Ethnicity c) Language d) Religion and Culture e) Literacy	
Occupation	
Migration Patten	
Public Health and Sanitation	
Drinking Water Supply	
Education Facilities	
Communication	
Fuel and Energy	
Road and Transportation	
Land Holding	
Food Sufficiency	
Irrigation	
Health Care System	
Market	
Business and Industries	
Religious and Cultural Sites	
Non governmental activities	
Development Potential	
Detail of Project Affected Structures	

D. Landslides and Erosion Prone Areas

SN	Locations or (Left/Right)	Size of Failure	Cause of Failure	Protection Structure

Settlements and Population

SN	Settlement	Ward	HH	Population			Caste/Ethnicity
				Male	Female	Total	

ANNEX 10:
CONSENT LETTERS FROM LOCAL STAKEHOLDERS

Recommendation and Approval from Municipality for use of Public Lands and Extraction of Ground Water

सुर्यबिनायक नगरपालिका
नगर कार्यपालिकाको कार्यालय
कटुन्जे, भक्तपुर

पत्र संख्या :-०७७/७८
चलानी नं :- ६९९

मिति २०७७।०६।०५

श्री भूमिसुधार तथा मालपोत कार्यालय
भक्तपुर, नेपाल
श्री नापि कार्यालय
भक्तपुर, नेपाल

विषयः खानेपानी आयोजनाको लागि सरकारी पर्ती जग्गा प्रयोग सम्बन्धमा ।

सूर्यविनायक नगरपालिका वडा नं ४ मा संचालित दधिकोट शहरी खानेपानी योजनाको इन्टेक, बोरिङ्ग, ट्याङ्की पानी प्रशोधन केन्द्र, गार्ड हाउस, आदि निर्माणका लागि उक्त क्षेत्रमा रहेका सार्वजनिक पर्ती जग्गा व्यवस्थापन गर्न ४ नं वडा समितिको सिफारिस सम्बन्धमा मिति २०७७।०६।०४ गतेको ८४ औं कार्यपालिका बैठकमा छलफल हुदां वडा नं ४ का अध्यक्ष श्री उत्तम थापाको संयोजकत्वमा गठित उपसमितिको समेत सिफारिसका आधारमा तपसील बमोजिमका कित्ता जग्गाहरु मध्ये तपसील बमोजिमको आवश्यक पर्ने क्षेत्रफल जग्गा रहेको स्थान, स्वामित्व र क्षेत्रफल खुलाइ सो जग्गा प्राप्ति सम्बन्धमा सम्बन्धित खानेपानी उपभोक्ता समिति र सम्बन्धित आयोजनाबाटै आवश्यक प्रकृया पुरा गरेर मात्र निर्माण कार्य अगाडी बढाउने व्यवस्था हुनका निर्णयानुसार सिफारिस गरिएको छ ।

आवश्यक पर्ने सार्वजनिक तथा पर्ति जग्गाको विवरण

१. दक्षिण बाराही क्षेत्र (System 1)

क्र.सं.	अवस्थिति (स्थान वडा क्षेत्र)	कित्ता नं.	क्षेत्रफल	आवश्यक पर्ने जग्गा	स्वामित्व	कैफियत
१	साविक दधिकोट गा.वि.स. वडा नं.९ (१), दक्षिण वाराही हाल सुर्यविनायक न.पा. वडा नं.४	२६४३	१-९-०-०	०-३-०-०	सरकारी प्रति जग्गा	१ थान डिप बोरिङ्ग गर्न, पम्प हाउस निर्माण गर्न तथा सो बोरिङ्ग गरी प्राप्त जलश्रोत उपयोग गरिने ।

कमल सवाली
प्रमुख प्रशासकीय अधिकृत

सुर्यबिनायक नगरपालिका
नगर कार्यपालिकाको कार्यालय
कटुञ्जे, भक्तपुर

पत्र संख्या :-०७७/७८
चलानी नं :-

२	साविक दधिकोट गा.वि.स. वडा नं.९ (१), दक्षिण बाराही हाल सुर्यविनायक न.पा. वडा नं.४	२३८१	२०-५-०-०	०-४-०-०	सरकारी प्रति जग्गा	२ थान डिप बोरिङ्ग गर्न गर्न, पम्प हाउस निर्माण गर्न तथा सो बोरिङ्ग गरी प्राप्त जलश्रोत उपयोग गरिने ।
३	साविक दधिकोट गा.वि.स. वडा नं.९ (१), दक्षिण बाराही हाल सुर्यविनायक न.पा. वडा नं.४	२७०८	२२-५-०-०	०-१२-०-०	सरकारी प्रति जग्गा	पश्चिम उत्तर कुनामा बोरिङ्ग भएको र गर्न, पम्प हाउस, जेनेरेटर भवन निर्माण गर्न /पूर्व दक्षिण तर्फ थुम्को माथि ओभरहेड ट्याङ्की बनाई जलश्रोत उपयोग गरिने ।
४	साविक दधिकोट गा.वि.स. वडा नं.९ (२), ल कलेज हाल सुर्यविनायक न.पा. वडा नं.४	१४०५	०-२-२-०	०-२-२-०	सरकारी प्रति जग्गा	१ थान डिप बोरिङ्ग गर्न, पम्प हाउस निर्माण गर्न तथा सो बोरिङ्ग गरी प्राप्त जलश्रोत जलश्रोत उपयोग गरिने ।
५	साविक दधिकोट गा.वि.स वडा नं.७ क चर्खुफाँट हाल सुर्यविनायक न.पा. वडा नं.४	६१/२२३	०-२-०-०	०-२-०-०	सरकारी प्रति जग्गा	१ थान डिप बोरिङ्ग गर्न, पम्प हाउस निर्माण गर्न तथा सो बोरिङ्ग गरी प्राप्त जलश्रोत जलश्रोत उपयोग गरिने ।

कमल अधिकारी
प्रमुख प्रशासकीय अधिकृत

सुर्यबिनायक नगरपालिका
नगर कार्यपालिकाको कार्यालय
कटुञ्जे, भक्तपुर

पत्र संख्या :-०७७/७८
चलानी नं :-

२. सिकारीटार क्षेत्र **(System 2)**

क्र.सं.	अवस्थिति (स्थान वडा क्षेत्र)	कित्ता नं.	क्षेत्रफल	प्रदान गर्ने जग्गा	स्वामित्व	भएको वा निर्माण हुने संख्या
१	साविक दधिकोट गा.वि.स. वडा नं.३ (ख), त्यारेटोल हाल सुर्यविनायक न.पा. वडा नं.१	९७४	०-७-२-०	०-७-२-०	दधिकोट बृहत खा.पा.	ट्याङ्की रहेको/ओभरहेड ट्याङ्की र गार्ड हाउस बनाउन जलश्रोत उपयोग गरिने ।
२	साविक दधिकोट गा.वि.स. वडा नं.३ (क) हाल सुर्यविनायक न.पा. वडा नं.१, चरखण्डी	१४८७(सा.कि.नं. ४४२)	०-२-२-०	०-२-२-०	दधिकोट बृहत खा.पा.	डिप बोरिङ्ग र पम्प हाउस रहेको / बोरिङ्ग सुधार गरी सो बोरिङ्ग गरी प्राप्त जलश्रोत जलश्रोत उपयोग गरिने ।
३	साविक दधिकोट गा.वि.स. वडा नं.७ (ग), सिकारीटार महादेव खोला , हाल सुर्यविनायक न.पा. वडा नं.४	३९०	२-११-०-०	०-११-०-०	सरकारी प्रति जग्गा	डिप बोरिङ्ग र पम्प हाउस रहेको / जमिन सतहमा ट्याङ्की निर्माण गर्न, जेनेरेटर भवन निर्माण गर्न, पानी प्रशोधन संरचना निर्माण र भएको बोरिङ्ग सुधार गरी थप एउटा बोरिङ्ग समेत गरी सो बोरिङ्गहरुबाट जलश्रोत उपयोग गरिने ।

कमल ज्ञवाली
प्रमुख प्रशासकीय अधिकृत

सुर्यबिनायक नगरपालिका
नगर कार्यपालिकाको कार्यालय
कटुञ्जे, भक्तपुर

पत्र संख्या :-०७७/७८
चलानी नं :-

४	साविक दधिकोट गा.वि.स. वडा नं.७ (ग), जोगी पाटी हाल सुर्यविनायक न.पा. वडा नं.४	९२	०-२-०-०	०-२-०-०	दधिकोट बृहत खा.पा.	डिप बोरिङ्ग र पम्प हाउस रहेको र बोरिङ्ग सुधार उक्त बोरिङ्ग गरी प्राप्त जलश्रोत उपयोग गरिने ।

३. तर्खागाल क्षेत्र (System 3)

क्र.सं.	अवस्थिति(स्थान वडा क्षेत्र)	कित्ता नं.	क्षेत्रफल	प्रदान गर्ने जग्गा	स्वामित्व	भएको वा निर्माण हुने संख्या
१	साविक दधिकोट गा.वि.स. वडा नं.३ (ख), तर्खागाल हाल सुर्यविनायक न.पा. वडा नं.१	२३५	०-१३-०-०	०-१३-०-०	दधिकोट बृहत खा.पा.	ओभरहेड ट्याङ्की रहेको / पम्प हाउस निर्माण गर्न, १ थान डिप बोरिङ्ग गर्न, तथा सो बोरिङ्ग गरी प्राप्त जलश्रोत उपयोग गरिने ।
२	साविक दधिकोट गा.वि.स. वडा नं ७ (घ) सिकारीटार हाल सुर्यविनायक न.पा. वडा नं.४	६६५	१-०-०-०	०-४-०-०	सार्वजनिक प्रति	१ थान डिप बोरिङ्ग गर्न, पम्प हाउस निर्माण गर्न तथा सो बोरिङ्ग गरी प्राप्त जलश्रोत उपयोग गरिने ।
३	साविक दधिकोट गा.वि.स. वडा नं.३ (क) २	७९४	०-४-०-०	०-४-०-०	सार्वजनिक प्रति	१ थान डिप बोरिङ्ग गर्न, पम्प हाउस निर्माण गर्न तथा सो बोरिङ्ग गरी प्राप्त

कमल सवाली
प्रमुख प्रशासकीय अधिकृत

सुर्यबिनायक नगरपालिका
नगर कार्यपालिकाको कार्यालय
कटुञ्जे, भक्तपुर

पत्र संख्या :-०७७/७८
चलानी नं :-

	हाल सुर्यविनायक न.पा. वडा नं.१					जलश्रोत उपयोग गरिने ।
४	साविक दधिकोट गा.वि.स. वडा नं.३ (ख), हाल सुर्यविनायक न.पा. वडा नं.१	५९१	०-३-०-०	०-३-०-०	सार्वजनिक प्रति	१ थान डिप बोरिङ्ग गर्न, पम्प हाउस निर्माण गर्न तथा सो बोरिङ्ग गरी प्राप्त जलश्रोत उपयोग गरिने ।

४. स्याङ्गतान धारा क्षेत्र (System 4)

क्र.सं.	अवस्थिति(स्थान वडा क्षेत्र)	कित्ता नं.	क्षेत्रफल	प्रदान गर्ने जग्गा	स्वामित्व	भएको वा निर्माण हुने संख्या
१	साविक दधिकोट गा.वि.स. वडा नं.४ (१), मुहान सिँचाई बाँध हाल सुर्यविनायक न.पा. वडा नं.४	२४	०- ३-०-०	०- ३-०-०	दधिकोट बृहत खा.पा.	बोरिङ्ग वा सम्पवेल बनाई पानी संकलन गर्न तथासो बोरिङ्ग गरी प्राप्त जलश्रोत उपयोग गरिने ।
२	साविक दधिकोट गा.वि.स. वडा नं ४ (१) सँचाई बाँध बगैचा हाल	१९१	२-०-०-०	०- ४-०-०	सार्वजनिक प्रति	१ थान डिप बोरिङ्ग गर्न, तथा सो बोरिङ्ग गरी प्राप्त जलश्रोत उपयोग गरिने ।

कमल शंखाली
प्रमुख प्रशासकीय अधिकृत

सुर्यबिनायक नगरपालिका
नगर कार्यपालिकाको कार्यालय
कटुञ्जे, भक्तपुर

पत्र संख्या :-०७७/७८
चलानी नं :-

	सुर्यविनायक न.पा. वडा नं.४					
३	साविक दधिकोट गा.वि.स. वडा नं.४ (१) विर्खमान पसल माथि महादेव खोला हाल सुर्यविनायक न.पा. वडा नं.४	६१८	१७५-९-०-०	०-४-०-०	सार्वजनिक प्रति	१ थान डिप बोरिङ्ग गर्न, तथा सो बोरिङ्ग गरी प्राप्त जलश्रोत उपयोग जलश्रोत उपयोग गरिने ।
४	साविक दधिकोट गा.वि.स. वडा नं.४ (१) विर्खमान पसल माथि महादेव खोला हाल सुर्यविनायक न.पा. वडा नं.४	१५	१-१-०-०	०-४-०-०	सार्वजनिक प्रति	१ थान डिप बोरिङ्ग गर्न, तथा सो बोरिङ्ग गरी प्राप्त जलश्रोत उपयोग गरिने ।
५	साविक दधिकोट गा.वि.स. वडा नं.४ (१),	५१०	५७०-५-०-०	तीनै प्रयोजनको लागि जम्मा	सार्वजनिक प्रति	स्याङ्गतान धारा खानेपानीको हाल १ लाख लिटर ट्याङ्की रहेकोमा आवश्यकता

कमल ज्वाली
प्रमुख प्रशासकीय अधिकृत

सुर्यबिनायक नगरपालिका
नगर कार्यपालिकाको कार्यालय
कटुञ्जे, भक्तपुर

पत्र संख्या :-०७७/७८
चलानी नं :-

क्र.सं.	अवस्थिति(स्थान वडा क्षेत्र)	किता नं.	क्षेत्रफल	प्रदान गर्ने जग्गा	स्वामित्व	भएको वा निर्माण हुने संख्या
१	साविक दधिकोट गा.वि.स. वडा नं.४ (१), हाल सुर्यविनायक न.पा. वडा नं.४	५१०	५.७०-५-०-०	०-६-०-०	सार्वजनिक प्रति	हाल स्याङ्तान धारा खानेपानीको मूल रहेकोमा सो मूल उपयोग गर्न अनुमति प्रदान गरिएको र आवश्यकता अनुसारको टयाङ्की बनाई जलस्रोत उपयोग गरिने ।

(कमल ज्वाली)
प्रमुख प्रशासकीय अधिकृत

बोधार्थ तथा कार्यार्थ:
श्री जिल्ला प्रशासन कार्यालय
भक्तपुर, नेपाल
श्री Urban Water Supply and Sanitation (Sector) Project
पानी पोखरी, काठमाण्डौ ।
श्री दधिकोट वृहत खानेपानी तथा सरसफाई मूल उपभोक्ता समिति
सूर्यविनायक, ४ गाम्बा ।

UNOFFICIAL TRANSLATIONS

Suryabinayak Municipality
Office of the Municipality
Katunje, Bhaktapur

Letter No.: 077/78
Reference No.: 419 Date: 21th September 2020 (2077/06/05)

Land Reform and Land Revenue Office,
Bhaktapur, Nepal
Maintenance Office,
Bhaktapur, Nepal

Subject: Recommendation letter for use of Government land

As per the recommendation of Mr. Uttam Thapa, Chairperson of Ward No.4 of the municipality, regarding management of the public land of the ward for construction of intake, boring, water tank, water treatment plant, guard house etc. for Dadhikot Urban Water Supply Project, a discussion was held at 84th executive meeting of the municipality dated 2077/06/04 (20th September 2020) regarding the subject matter. Based on the recommendation, we hereby recommend, with our decisions, for required provisions from your office so that the construction works can be initiation only after completion of necessary procedure by concerned Water Supply Users Committee and the project for acquiring land use rights necessary for the required area of land from the following land parcels with following details of its location, ownership and area.

Description of required public and barren lands

Dakshin Barahi area (System-1)

S.N.	Location (Ward, tole)	Parcel no.	Area	Required land	Ownership	Remarks
1	The then Dadhikot VDC, Ward No. 9 (1), Dakshin Barahi, present Suryabinayak Municipality, Ward No.4	2643	1-9-0-0	0-3-0-0	Government barren land	For construction of 1 nos. boring, pump house and use of water resource through boring
2	The then Dadhikot VDC, Ward No. 9 (1), Dakshin Barahi, present Suryabinayak Municipality, Ward No.4	2381	20-5-0-0	0-4-0-0	Government barren land	For construction of 2 nos. boring, pump house and use of water resource through boring
3	The then Dadhikot VDC, Ward No. 9 (1), Dakshin Barahi, present Suryabinayak Municipality, Ward No.4	2708	22-5-0-0	0-12-0-0	Government barren land	Existing boring at western east corner. For construction of boring, pump house and generator house. Construction of overhead tank at east south side on the top of hill, and use of water

						resource through boring
4	The then Dadhikot VDC, Ward No. 9 (2), Law College, present Suryabinayak Municipality, Ward No.4	1405	0-2-2-0	0-2-2-0	Government barren land	For construction of 1 no. boring, pump house and use of water resource through boring
5	The then Dadhikot VDC, Ward No. 7 Ka, Chankhuphant, present Suryabinayak Municipality, Ward No.4	61/223	0-2-0-0	0-2-0-0	Government barren land	For construction of 1 no. boring, pump house and use of water resource through boring

Sikaritar area (System-2)

S.N.	Location (Ward, tole)	Parcel no.	Area	Required land	Ownership	Remarks
1	The then Dadhikot VDC, Ward No. 3 Kha, Tyare tole, present Suryabinayak Municipality, Ward No.1	974	0-7-2-0	0-7-2-0	Dadhikot Brihat Water Supply and Sanitation	Existing Tank. For construction of overhead tank and guard house and use of water resource through boring
2	The then Dadhikot VDC, Ward No. 3 Ka,present Suryabinayak Municipality, Ward No.1, Charkhandi	1487 (then parcel no. 442)	0-2-2-0	0-2-2-0	Dadhikot Brihat Water Supply and Sanitation	Existing deep boring and pump house. For rehabilitation of the boring and use of water resource through boring
3	The then Dadhikot VDC, Ward No. 7 (Ga), Sikaritar Mahadev Khola, present Suryabinayak Municipality, Ward No.4	390	2-11-0-0	0-11-0-0	Government barren land	Existing deep boring and pump house. For construction of water tank at surface land, generator house, water treatment plant and construction of 1 no. new boring with rehabilitation of existing boring, and use of water resource through boring
4	The then Dadhikot VDC, Ward No. 7 Ga, Jogipati, present Suryabinayak Municipality, Ward No.4	92	0-2-0-0	0-2-0-0	Dadhikot Brihat Water Supply and Sanitation	Existing deep boring and pump house. For rehabilitation of the boring and use of water resource through boring

Tarkhagal Area (System-3)

S.N.	Location (Ward, tole)	Parcel no.	Area	Required land	Ownership	Remarks
1	The then Dadhikot VDC, Ward No. 3 Kha, Tarkhagal, present Suryabinayak Municipality, Ward No.1	235	0-13-0-0	0-13-0-0	Dadhikot Brihat Water Supply and Sanitation	Existing Overhead Tank. For construction of pump house, 1 no. boring and use of water resource through boring
2	The then Dadhikot VDC, Ward No. 7 Gha, Sikaritar, present Suryabinayak Municipality, Ward No.4	665	1-0-0-0	0-4-0-0	Government barren land	For construction of 1 no. boring, pump house and use of water resource through boring
3	The then Dadhikot VDC, Ward No. 3 Ka, 2 present Suryabinayak Municipality, Ward No.1	794	0-4-0-0	0-4-0-0	Government barren land	For construction of 1 no. boring, pump house and use of water resource through boring
4	The then Dadhikot VDC, Ward No. 3 Kha, 2 present Suryabinayak Municipality, Ward No.1	591	0-3-0-0	0-3-0-0	Government barren land	For construction of 1 no. boring, pump house and use of water resource through boring

Syangtan Dhara Area (System-4)

S.N.	Location (Ward, tole)	Parcel no.	Area	Required land	Ownership	Remarks
1	The then Dadhikot VDC, Ward No. 4 (1), Muhan Sinchai Bandh, present Suryabinayak Municipality, Ward No.4	24	0-3-0-0	0-3-0-0	Dadhikot Brihat Water Supply and Sanitation	For construction of boring or sump well and use of water resource through boring
2	The then Dadhikot VDC, Ward No. 4 (1), Sinchai Bandh Bagaincha, present Suryabinayak Municipality, Ward No.4	191	2-0-0-0	0-4-0-0	Government barren land	For construction of 1 no. boring and use of water resource through boring
3	The then Dadhikot VDC, Ward No. 4 (1), Birkhaman Pasal mathi, Mahadev Khola, present Suryabinayak Municipality, Ward No.4	618	175-9-0-0	0-4-0-0	Government barren land	For construction of 1 no. boring and use of water resource through boring
4	The then Dadhikot	15	1-1-0-0	0-4-0-0	Government	For construction

	VDC, Ward No. 4 (1), Birkhaman Pasal mathi, Mahadev Khola, present Suryabinayak Municipality, Ward No.4				barren land	of 1 no. boring and use of water resource through boring
5	The then Dadhikot VDC, Ward No. 4 (1), present Suryabinayak Municipality, Ward No.4	510	570-5-0-0	2-0-0-0 (for 3 nos. of construction)	Government barren land	Since 1 lakh liters capacity of existing Syangtan Dhara source, it can be used the source as per required. Required of new water tank at the area of View Tower. For deep boring at the way of Anantalingeshwor Temple *(Birkhaman Pasal mathi, purano pandhera)*and use of water resource through boring
6	The then Dadhikot VDC, Ward No. 5(Ka)	161	7-8-0-0	0-8-0-0	Government barren land	Existing tank (50 thousand liters capacity). For construction of large size of tank and use of water resource

Tarkhagal Area

S.N.	Location (Ward, tole)	Parcel no.	Area	Required land	Ownership	Remarks
1	The then Dadhikot VDC, Ward No. 4 (1), present Suryabinayak Municipality, Ward No.4	510	570-5-0-0	0-6-0-0	Government barren land	Existing Syangtan Dhara intake. Allowed to use the source and construction of water tank as per requirement

(Sign and Stamp)

(Kamal Gyawali)

Chief Administrative Officer

CC and for action

Shri District Administrative Office
Bhaktapur, Nepal,
Shri Urban Water Supply and Sanitation (Sector) Project,
Pani Pokhari, Kathmandu.
Shri Dadhikot Brihat Water Supply and Sanitation Main Users Committee,
Suryabinayak, 4, Gamcha.

WUSC Registration Certificate

अनुसूची-२

(नियम ६ को उपनियम १ सँग सम्बन्धित)

६६१४८२६ स्था.वि.अ.

६६१२२४१ कार्यालय

नेपाल सरकार

संघीय मामिला तथा स्थानीय विकास मन्त्रालय

जिल्ला विकास समितिको कार्यालय

भक्तपुर

उपभोक्ता संस्था दर्ता प्रमाणपत्र

दर्ता मितिः २०७२।३।३०

दर्ता नम्बरः २१५०

जिल्ला जलस्रोत समिति, भक्तपुर

मितिः २०७२/०३/३०

श्री दधिकोट वृहत खानेपानी तथा सरसफाई मुल उपभोक्ता समिति
अनन्तलिङ्गेश्वर नगरपालिका, दधिकोट, भक्तपुर

श्री दधिकोट वृहत खानेपानी तथा सरसफाई मुल उपभोक्ता समिति, अनन्तलिङ्गेश्वर न.पा., वडा नं. १७ दधिकोट, भक्तपुर, जलस्रोत ऐन, २०४९ को दफा ५ उपदफा (२) तथा जलस्रोत नियमावली, २०५० को उपनियम (१) बमोजिम २०७२ साल ०३ महिना ३० गतेमा यस कार्यालयमा दर्ता गरी यो दर्ता प्रमाणपत्र प्रदान गरिएको छ, जलस्रोत ऐन २०४९ र जलस्रोत नियमावली २०५० बमोजिम आफ्नो कार्य संचालन गर्नु होला ।

सही :

नाम थर : कमला घिमिरे

पद : योजना अनुगमन तथा प्रशासकिय अधिकृत

योजना अनुगमन तथा प्रशासकिय अधिकृत

Annex-2
(Under rule 6, sub-rule 1)

6614826- Local Development Officer
6612241-Office

Government of Nepal
Ministry of Federal Affair and Local Development
Office of District Development Office
Bhaktapur

Users Committee Registration Certificate

Registration Date: 15th July 2015 (2072/03/30)
Registration No.: 2150

District Water Resource Committee, Bhaktapur

Date: 15th July 2015 (2072/03/30)

Shri Dadhikot Brihat Water Supply and Sanitation Committee
Anantalingeshwor Municipality, Dadhikot, Bhaktapur

This registration certificate has been provided toDadhikot Brihat Water Supply and Sanitation Committee, Anantalingeshwor Municipality, Ward No.11, Dadhikot, Bhaktapur with registration in this Office dated 15th July 2015 (2072/03/30).According to Water ResourceAct 2049, clause no.5 sub-clause (2) and Water Resource Regulation, 2050, sub-rules (1), may now continueexecution of works as per Water Resource Act, 2049 and Water Resource Regulation 2050.

Signature of Authorized Officer:

Name: Kamala Ghimire
Designation: Planning, Monitoring and Administrative Officer

Commitment letter of land availability for Office Building

फोन नं.: ०१-५६३५९२६

दर्ता नं. २१५०/०७१/०७२

दधिकोट बृहत खानेपानी तथा सरसफाई मूल उपभोक्ता समिति

२०७०

सुर्यविनायक न.पा.-४, गाम्चा, भक्तपुर

पत्र संख्या: ९/२०७६/०७८

च.नं.: ६

मिति: २०७७।०४।३०

श्री शहरी खानेपानी आयोजना,
खानेपानी तथा ढल व्यवस्थापन विभाग,
पानीपोखरी , काठमाडौ, नेपाल ।

विषय : समितिको कार्यालय भवनको लागि जग्गा उपलब्ध गराउने प्रतिबद्धता सम्बन्धमा ।

उपरोक्त सम्बन्धमा, यस दधिकोट बृहत खानेपानी तथा सरसफाई मूल उपभोक्ता समितिमा त्यस शहरी खानेपानी योजना लागू गर्ने सिलसिलामा विस्तृत अध्ययन प्रतिवेदन तयारी गर्ने क्रममा समितिको नँया कार्यालय भवन निर्माण गर्नको लागि जग्गा उपलब्ध गराउनुपर्नेमा हाल उपयूक्त जग्गा, सो को क्षेत्रफल समेत पहिचान र यकिन नभएको अवस्थामा सम्वन्धित वडा कार्यालय तथा नगरपालिकासँग आवश्यक समन्वय गरी यथासक्य छिटो समितिको कार्यालय भवनको निर्माण गर्नको लागि समितिको तर्फबाट जग्गा उपलब्ध गराउने प्रतिबद्धता व्यक्त गर्दछु । आवश्यक कारवाही अगाडि बढाउनुहन हार्दिक अनुरोध छ ।

बोधार्थ:

१. BDA प्रा.लि, ओसोभवन कमलादी, काठमाडौं ।

अनिल कुमार श्रेष्ठ
(अध्यक्ष)

Dadhikot Brihat Water Supply and Sanitation Committee
2070
Suryabinayak Municipality-4, Gamcha, Bhaktapur

Letter No.: 1/2077/078
Reference No.: 7 Date: 14th August 2020 (2077/04/30)

Shri Urban Water Supply and Sanitation Project,
Department of Water Supply and Sewerage,
Panipokhari, Kathmandu, Nepal.

Subject: Commitment of land availability for Office Building

In reference to the above subject;in the context of preparation of detail study report for implementation of urban water supply project under Dadhikot Brihat Water Supply and Sanitation Committee, it is required to provide the land for construction of new Office Building. In this regard, now appropriate land and required area is not identified so that, in coordination with concern Ward Office and Municipality, it has made commitment to provide the land for construction of Committee's Office Building as soon as possible. It is requested to take necessary further action.

CC.:

1. BDA P. Ltd., Osho Bhawan, Kamaladi, Kathmandu.

(Signed and Stamped)

Anil Kumar Shrestha
(Chairperson)

ANNEX 11:
PHOTOGRAPHS

Photo 1: Proposed site at Dakshinbarahi for OHT, Treatment Plan and Guard House, WN 4

Photo 2: Proposed deep boring site near Dakshin Barahi temple at Dakshinbarahi, WN 4

Photo 3: Proposed deep boring site at an open land near park area at Dakshinbarahi, WN 4

Photo 4: Proposed deep boring site at open land at Law College area, WN 4

Photo 5: Proposed deep boring site at an open land at Chakhuphanta, WN 1

Photo 6: Proposed OHT site at existing ground reservoir tank at Tyare tole, WN 1

Photo 7: Proposed OHT site at existing ground reservoir tank at Charkhandi, WN-1

Photo 8: Proposed GRVT, WTP, Guard house and deep boring site at

Photo 9: Proposed deep boring, WTP and Guard house site at Sikaritar,

Photo 10: Proposed deep boring, WTP & Guard house site, Tarkhagal, WN 4

Photo 11: Proposed deep boring site at Jogipati, WN 4

Photo 12: Proposed deep boring site at WN 1

Photo 13: Proposed deep boring site at WN 1

Photo 14: Proposed deep boring, generator house and guard house site at Bandh Bagaicha aera, WN 4

Photo 15: Proposed deep boring site at location near Bandh area at the bank of Mahadev khola, WN 4

Photo 16: Proposed deep boring site at area Birkhaman ko pasal mathi, WN 4

Photo 17: Proposed site for construction of 2 GRVTs, pump house, guard house, WTP at Pandhera, WN 4

Photo 18: Proposed GRVT construction site with boring near bank of Mahadev khola, WN 4

Photo 19: Proposed spring intake site at existing spring intake, Syangtang - WN 4

Photo 20: Proposed GRVT site at existing tank, Syangtang - WN 4

Photo 21: Public Consultation to discuss environmental concerns

Photo 22: Community Level Public Consultation

Incorporation of ADB's comments (22nd October 2020) in IEE report of Dadhikot UWSS Project

SN	Review Notes	Comments	Incorporation	Remarks
1	The EARF selection criteria matrix in Table I-1 is confusing as it discusses compliance with the specific criteria for public toilet, but line item 23 in the same table mentions that there is no public toilet included in the design. The EMP also has discussion on public toilets.	Clarification on the inclusion of public toilets. If included, provide more detailed description and the proposed locations in Section IV (Description of the Project);	The correction has been made by removing the public toilet contents, as the design doesn't include public toilet	
2	There is insufficient description of the exact locations and immediate vicinities of each subproject component, particularly on the proposed tube well locations, intake location, treatment plant locations, reservoir locations, public toilets, etc.	Additional information on exact locations and immediate vicinities of each subproject components such as proposed tube well locations, intake location, treatment plant locations, reservoir locations, public toilets, etc. Street level maps of these locations and photos should be included in Section IV;	The description of all the proposed sites of each components of the project has been provided with site name and photographs; Table IV-5 and photographs in Annex 11	
3	In paras. 47 and 48, the withdrawal rate of water from the Shangtang khola is 0.32 lps, which is below the safe yield of 0.42 lps. However, there is no description on the withdrawal rate at present (if currently being used as drinking water source).	Clarification on the current water withdrawal rate at Shangtang khola. Is the designed tapping rate under the subproject higher than that present water withdrawal by the town?; and	The existing water tapping rate is almost equal to the proposed tapping rate sub-section C-2 of Chapter IV; Paragraph 48; Page 21	
		More description on the specific downstream uses and users of Shangtang khola.	The additional details on downstream user have been added in sub-section C-2 of Chapter IV; Paragraph 48; Page 21	

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): Dadhikot (Suryabinayak, Bhaktapur District) Water Supply and Sanitation Subproject**		
Loan No.:	3711	**Package No.:**	**W20**
Components:	OHTs	450 m^3 circular OHT (one proposed and one existing), 400 m^3 rectangular OHT, 400m^3 circular GRVT, 200 m^3 rectangular GRVT, 100 m^3 GRVT (one proposed and one existing) and 20 m^3 GRVT (2 Nos)	
	Deep Tubewells	4 Numbers in each system 1, 2 and 3; and 3 numbers in system 4, **Total 15 numbers** including standby	
	Spring Intake	Intake for small spring source (Syangtang khola)	
	Electricity line	11 kVA HT line shall be stretched to about 6.479 km	
	Transformers	4 nos. in total 100 kVA - 2 nos.; 150 kVA, 200 kVA - 1 no. each	
	Generators	4 nos. in total 250 kVA, 100 kVA, 82.5 kVA, and 50 kVA	
	Valve Chambers	121	
	Office Building	1 No.	
	Guard house/ Generator House	5 Nos. & 5 Nos.	
	Pump House	2 Nos.	
	Household Connection	3,598 Nos., Base Year	
	Fire Hydrants	20	
	Water Recharge Wells	46 (Institutional units)	
	Reinstatement of ponds	3	
	Transmission Pipe Network (m)	6,344 m	
	Distribution Network (meter)	152 Km	
	Public Toilets	???	
Contract Type:	Civil Works		
Date of IEE:	September 2020		

Draft IEE?	Updated/Revised IEE?	Others
		Based on the report, it is the final IEE and components are based on final detailed engineering design. However, there is a need to confirm based on the required further assessments below.

	Activity	Status		Detailed Comments and Further Actions Required
1.	Environmental assessment has been satisfactorily conducted based on ADB REA Checklist and scoping checklist.[21]	**Yes**	**No**	(i) The EARF selection criteria matrix in Table I-1 is confusing as it discusses compliance with the specific criteria for public toilet, but line item 23 in the same table mentions that there is no public toilet included in the design. The EMP also has discussion on public toilets. There is a need to clarify this, and include in Section IV. (ii) There is insufficient description of the exact locations and immediate vicinities of each subproject component, particularly on the proposed tube well locations, intake location, treatment plant locations, and reservoir locations, Public toilets, etc. Street level maps of these locations and photos should be included in Section IV. (iii) It is noted that in paras. 47 and 48, the withdrawal rate of water from the Shangtang khola is 0.32 lps, which is below the safe yield of 0.42 lps. However, there is no description on the withdrawal rate at present (if currently being used as drinking water source).
		X		

[21] 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.

	Activity	Status		Detailed Comments and Further Actions Required
				For immediate action: Revise the IEE report to include: (i) Clarification on the inclusion of public toilets. If included, provide more detailed description and the proposed locations in Section IV (Description of the Project); (ii) Additional information on exact locations and immediate vicinities of each subproject components such as proposed tube well locations, intake location, treatment plant locations, reservoir locations, public toilets, etc. Street level maps of these locations and photos should be included in Section IV; (ii) Clarification on the current water withdrawal rate at Shangtang khola. Is the designed tapping rate under the subproject higher than that present water withdrawal by the town?; and (iii) More description on the specific downstream uses and users of Shangtang khola.
2.	Environmental assessment based on latest project components and design	**Yes** X	**No**	See above comments.

	Activity	Status		Detailed Comments and Further Actions Required
3.	Statutory Requirements[22]		Forest Clearance	The IEE report explicitly states 12 pine trees will be cut. Ensure that PMO/RPMO obtain appropriate clearance (forest clearance or tree cutting clearance), including for any other unanticipated cutting of trees during the design and pre-construction phase. No civil works will commence unless forest clearance or tree cutting 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

[22] If applicable, include date accomplished or obtained.

	Activity	Status					Detailed Comments and Further Actions Required
							in the SEMR.
			Permit to Operate (or equivalent)				To be obtained by PMO/RPMO if needed. No civil works will commence unless permit to operate (or equivalent), if required, is obtained. PMO to report status in the SEMR.
			Others				
5.	Policy, legal, and administrative framework	**Adequate**		**Not Adequate**			Section II discusses the policy, legal and administrative framework of the subproject.
		X					
		Included discussions and requirements of the:					
		Yes	National regulation/law on EIA				
		Yes	Environmental agency				
		Yes	Relevant international environmental agreements				
		Yes	Environmental standards (IFC's EHS Guidelines)				
6.	Anticipated environmental impacts and mitigation measures	**assessed impacts and risks:**		**mitigation measures included:**			
				Yes	**No**	**n/a**	
			Biodiversity conservation	X			Protection status of species at the project sites was verified through IUCN Red List and IBAT. All species identified are categorized as Least Concern, except for one mammal (Common Leopard) that is considered Vulnerable. No endangered or critically endangered species was found in the project area. The IEE report mentions that that project will not encroach any forest area. The EMP provides measure that contractor/s will not encroach forest areas.
			Pollution prevention and abatement	X			

	Activity	Status					Detailed Comments and Further Actions Required
			Health and safety	X			Community and occupational health and safety measures are included.
			Physical cultural resources	X			No PCRs identified at the subproject sites.
			Cumulative impacts			X	
			Transboundary impacts			X	
7.	Impacts from Associated Facilities[23]	**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 total EMP budget of NPR 5,120,595, of which NPR 2,820,595 is to be contractors' cost and the balance to be borne by either PMO or DSMC (Consultants).
		X					
10.	EMP implementation integrated in FAM/PAM and bid documents	**Yes**		**No**			(i) Included in PAM during loan processing. (ii) Section IX 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 VII discusses the conduct of consultations. The latest one on 21 June 2019. (ii) Annex I shows a minutes of meetings, with translation in the
		X					

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

	Activity	Status		Detailed Comments and Further Actions Required
				English language. **For next step:** (i) Conduct continuous consultation activities with all stakeholders, including the downstream users of Shangtang Khola. Ensure to conduct at least one consultation with these downstream users prior to any civil works at the intake location.
12.	Grievance Redress Mechanism	**Yes**	**No**	
		X		
		Description of GRM.		Section IX discusses the GRM.
		GRC members identified.		Section IX discusses the GRC membership.
		GRM established and notified?		GRM is established. PMO to confirm in the SEMR that (i) GRM is notified and GRC members have the capacity to address project-related grievances/complaints, and (ii) contractors are given instructions and orientation on GRM.
13.	Disclosure	To be complied	Endorsement to disclose on ADB website	To be complied after endorsement from PMO is received by ADB.
		To be complied	Disclosed on project website	To be complied by PMO once clearance of the IEE is received from ADB.
		To be complied	Relevant information available to stakeholders and affected people in language and form they understand.	To be complied by PMO once clearance of the IEE is received from ADB.
14.	Mobilized PMO Environment Specialist	**Yes**	**No**	This is confirmed in the SEMR for January – June 2019.
		X		
15.	Mobilized RPMO Environment Specialist	**Yes**	**No**	This is confirmed in the SEMR for January – June 2019.
		X		
16.	Mobilized PMQAC / DRTAC Environment Specialists	**Yes**	**No**	This is confirmed in the SEMR for January – June 2019.
		X		

	Activity	Status		Detailed Comments and Further Actions Required
17.	Mobilized DSMC/RDMSC Environment Specialists	**Yes**	**No**	This is confirmed in the SEMR for January – June 2019.
		X		
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		This package is not yet awarded. But Section VIII explains that contractor has the responsibility to appoint an environment supervisor.
20.	Awareness training on compliance to safeguard requirements	**Yes**	**No**	Section VIII discusses the institutional capacity development program, schedule, and topics for the subproject.
		X		
21.	Monitoring and Reporting	**Yes**	**No**	
		X		Section X clarifies the monitoring and reporting roles of stakeholders.
22.	**Others/Remarks**			
	Documents/References:	1. IEE report of Dhadikot Subproject 2. EARF of UWSSP.		